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Universities as a Critic and Conscience of Society:
A Study of Four Universities’ Involvement in the
Royal Commission on Genetic Modification

A thesis submitted in partial fulfilment
of the requirements for the degree of

Master of Applied Science

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Abstract

In recent decades, Aotearoa New Zealand's universities have become increasingly involved in the commercialisation of new technologies. Simultaneously, questions have arisen about their ability to critique these new technologies in a broad and balanced fashion, and to discharge their statutory role as a critic and conscience of society (i.e., their CCS role). Given the existence of these questions, this study explored the extent to which four universities (the universities of Auckland, Canterbury, Lincoln and Otago) discharged their CCS role during the Royal Commission on Genetic Modification. Interviews with university personnel, a Content Analysis of submissions, and a series of requests under the Official Information Act 1982 were used to gain insight into events within the four universities, and the interests and pressures that shaped the activities of university personnel. Based upon the results of this investigation I have concluded that the four universities implemented their CCS role in a weak fashion. While the four universities played an active part in the Royal Commission's inquiry, the flow of information from university personnel, to the Royal Commission, was constrained in a number of ways. As a result, it is likely that the Royal Commission only received a fraction of the knowledge and ideas that university personnel possessed on the subject of gene technology. It is also likely that areas of consensus and conjecture, amongst university personnel, were never adequately highlighted. Unless the universities' CCS role can be revitalised, their contribution to future societal debates and decision-making processes may be similarly constrained.

Keywords: Universities, Aotearoa New Zealand, commercialisation, gene technology, critic and conscience of society, academic freedom, Royal Commission on Genetic Modification.
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Chapter 1: Introduction

During an intriguing history, universities have played a plethora of roles in their host societies. Amongst these roles they have trained the Christian clergy, designed weapons for the military, circulated the ideologies of the social elite, harboured revolutionaries, and mixed “cathedral ritual and astrophysics without apparent embarrassment” (Marginson & Considine, 2000, p.1). This convoluted tapestry of roles is the heritage of the modern university. It is a heritage that contributes to the modern university’s complex character, and that provides fertile ground for theorising about its ‘place’ in society.

While the university system of Aotearoa New Zealand is young compared to systems established in some European countries, it too has developed its own complex personality. With its “roots…in the soil of British colonialism” (Peters, 1997, p.19) and with an initial focus on serving the needs of the British colony (Beaglehole, 1937, pp.1-13; Peters, 1997, pp.19-20), the raison d’être of the university system has gradually broadened. By 1959, a committee investigating Aotearoa New Zealand’s system observed:

...greatly increased contemporary recognition of the importance of the universities as centres of independent thought; as guardians of the accumulated culture of the past; as social and scientific laboratories for the accumulation of new knowledge; and as “pilot plants” for the experimental applications of new knowledge to the solution of economic, technological, social, and cultural problems. (Hughes Parry, Andrew & Harman, 1959, pp.9-10)

And following another four decades of evolution, and a reform period in which they experienced “far-reaching challenges to their status, role and character” (Peters & Roberts, 1999, p.18), the universities of Aotearoa New Zealand are now asked to provide a diverse assortment of services.

Within their current portfolio the universities are asked to serve as “a critic and conscience of society” (Education Act 1989, Section 162(4)(a)(v)), a role that requires them to scrutinise and critique societal developments. Simultaneously, the universities are being asked to play a more active role in creating knowledge with commercial potential (e.g., new forms of gene technology, nanotechnology and information technology), and commercialising the knowledge that they do create.
As it has been proposed that this latter role may compromise the universities' ability to scrutinise new technologies on behalf of society, and thus to discharge their role as a critic and conscience of society, this study explores the activities of four Aotearoa New Zealand universities during the Royal Commission on Genetic Modification. The purpose of this chapter is to introduce the issues that underpin and contextualise the study, and the rationale and methodology that has guided it, in advance of the more detailed treatment that these issues receive in subsequent chapters.

1.1 Universities and the Commercialisation of Knowledge

In recent decades, developments in knowledge have been widely acclaimed as the platform of future economic success (e.g., see Drucker, 1993, p.7; Gibbons et al., 1994, p.49; OECD, 1998, p.24). In response, the governments of industrialised nations have sought to incorporate universities into their strategies for economic development, companies have attempted to forge closer ties with universities, and universities have been motivated to take a more active role in the commercialisation of knowledge (Etzkowitz & Leydesdorff, 1997a, pp.1-5; OECD, 1998, pp.7-8). The heightened attempts of universities to contribute to the economic development of nation-states, to engage in entrepreneurial activities, and to collaborate with industrial partners, are several manifestations of this more active role.

Of course, none of these behaviours are completely novel. In Aotearoa New Zealand, for example, the universities have endeavoured to contribute to the economic development of the nation throughout their history. University personnel have engaged in forms of entrepreneurial activity, such as consulting, for some time. And, to provide but one example of university-industry collaboration, Lincoln University, of which I am a student, has a long history of collaboration with the land-based industries of Aotearoa New Zealand.

However, what is new for universities in the current era is the scope of their involvement in the commercialisation of knowledge. In ages past universities limited their involvement in commercial activities because they considered them to be extraneous to their purpose, and inconsistent with goals such as institutional autonomy, impartiality, and the pursuit of truth (Etzkowitz, 1997, p.141; Etzkowitz, Webster & Healey, 1998a, pp.3-4; Jaspers, 1960, p.132; Slaughter & Leslie, 1997, pp.4-5).
Consequently, while universities took a specific interest in the advancement of knowledge, they generally left the commercialisation of knowledge to private enterprises and governmental bodies (Etzkowitz, 1997, p.141; Sutz, 1997, p.11).

In contrast, universities in the current era are institutionalising economic functions, taking over the management of their intellectual property, developing their own production facilities, and engaging in a variety of commercial relationships with industrial partners (e.g., see Etzkowitz & Leydesdorff, 1997b; Etzkowitz, Webster & Healey, 1998b; OECD, 1998). These commercial relationships are of many types, and include strategic alliances, licensing and royalty agreements, and joint ownership of spin-off companies, business incubators, research consortia and science parks.

The density of these new activities and relationships have led commentators to speak of “a new phase in the history of the university” (Marginson & Considine, 2000, p.4), and to coin phrases such as “the Enterprise University” (Marginson & Considine, 2000, p.3) and “academic capitalism” (Slaughter & Leslie, 1997, p.1). Rhoades and Slaughter (1998, p.39) express the view that there has been a “dramatic inversion” in the ideology that underpins universities. They observe that while it was once reasoned that universities could serve the public interest by distancing themselves from commercial activities and avoiding conflicts of interest, now it is reasoned that universities will serve the public interest if they actively pursue commercial gain. Slaughter and Leslie (1997) comment that the changes underway are “destabilizing patterns of university professional work developed over the past hundred years” (p.1). And Etzkowitz and Leydesdorff (1997a) suggest that universities and industry are collaborating to such an extent that their institutional boundaries are being “elided and replaced by a web of ties” (p.3).

In the midst of all these changes, concerns have arisen that the universities will abandon some of their previous functions. The role of Aotearoa New Zealand’s universities as a critic and conscience of society is one role that is perceived to be under threat. In the following section, I discuss this role and explain why this perception has emerged.

1.2 The Role of Aotearoa New Zealand’s Universities as a Critic and Conscience of Society

According to current legislation, a defining characteristic of New Zealand’s universities is that they are institutions that “accept a role as critic and conscience of society”
The universities are asked to play this role (hereinafter referred to as the CCS role) because it is thought that by formulating and expressing ideas about society, however controversial or peculiar the ideas may be, they can have a number of positive effects. Amongst these positive effects it is thought they can help to enrich societal debates, encourage reflection and critical thinking within society, and facilitate an ongoing discussion about how society could be improved.

By no means is the CCS role the exclusive preserve of the universities and their academic staff. As Boston (1995) observes:

> Academics have no monopoly or special privilege when it comes to wisdom, moral virtue or ethical insight. Nor are they alone in having the right, and on occasion responsibility, to criticise political, social and economic institutions. And nor are they alone in having the capacity to make telling criticisms. In a free society all citizens enjoy the benefits of freedom of speech, including the right (within the law) to offer critical comment about any matter over which they have a concern. (p.143)

However, while the universities do not have a monopoly on the CCS role, there are several reasons why they should concern themselves with it.

Perhaps the strongest of these reasons stems from university personnel's extensive involvement in scholarship and research. As a result of this involvement, university personnel are often well placed to appraise various aspects of society, and, particularly when they possess knowledge that others do not, they have a “moral responsibility to disseminate their knowledge and use it for the common good” (Boston, 1995, p.144).

One could also reason that it is proper for the universities to undertake the CCS role because they are predominantly funded from the public purse, and thus have some responsibility to concern themselves with the public's interests. Or, bearing in mind the rights of academic freedom that university personnel are granted under current legislation, one could reason that university personnel have a greater freedom (and responsibility) to speak their mind on a range of societal issues, than do many other professionals.

However, the universities' increasing involvement in the commercialisation of knowledge problematises these reasons, just as it threatens to undermine the universities' capacity to implement their CCS role. As Marginson and Considine (2000) observe, the embrace of commercial prerogatives by the modern 'Enterprise University' has the potential to constrict a number of its previous roles. They comment:

> In the pure form of the Enterprise University, the goal is not the fulfilment of a range of social, economic and cultural purposes: it is
serving its corporate self as an end in itself. By believing that they
must imitate business in order to work with business, universities
are in danger of forgoing some of the very elements that enable
them to make a distinctive contribution: teaching for
personal/cultural development rather than immediate skills, long-
term research programs, critical and reconstructive scholarship, an
institutional space not owned by one or another powerful social
agent but obliged to relate to all. (pp.243-244)

With regard to the CCS role of Aotearoa New Zealand's universities, there are a
number of reasons why this particular role may become constricted in the modern era.
Firstly, as the universities seek to create intellectual property it is possible that they
will neglect certain areas of research and scholarship and, as a consequence, lose their ability
to serve as society's critic and conscience. In other countries, the universities' pursuit of
intellectual property has already been associated with a greater focus on research that is
narrow and applied, at the expense of research that is curiosity-driven or focused on
complex long-term issues (Gibbons et al., 1994, p.78; Krimsy, Ennis & Weissman, 1991,
recently commented, if the humanities and social sciences are weakened by "the
overwhelming drive of market forces in a university-industry complex" (para.40), it is
possible that universities will be unable to guide society through the "moral and policy
thicket" (para.40) that accompanies the technologies they create.

Secondly, in an age in which entrepreneurial universities are obtaining a greater
proportion of funding from other sources, it is less clear whose interests they serve. The
increasing proportion of funds they obtain from industry gives them some motivation,
and responsibility, to attend to the interests of their industrial partners. Similarly, as their
future becomes more dependent on the success of their entrepreneurial activities, they
gain a motivation to act in a manner that furthers, and does not impair, such activities.
Collectively, these changes threaten the universities' CCS role, because they have the
potential to divert the universities' attention away from the public's interests, and to
constrict the universities' ability to provide society with impartial information.

Thirdly, as Aotearoa New Zealand's universities embrace commercial goals there is
the possibility that university personnel will experience constraints on their academic
freedom and, for example, be discouraged from expressing opinions that could impair
their universities' commercial interests. This proposition is leant credence by a number
of recent publications that have addressed this issue (e.g., see De Boni, 2002, April 8;
Jones, Galvin & Woodhouse, 2000, pp.20-22; Kelsey, 2000, pp.232-239; Reidy, 2000,
January 5; Savage, 2000, pp.113-121; Wealhall, 2002, April 10). It is also leant credence
by research that has been carried out in other countries. For example, in a recent survey of social scientists within Australian universities, 73% of respondents thought that there had been a deterioration in their academic freedom during the past four years, 81% of these respondents related the deterioration to the increasing commercialisation of their university, and 49% of respondents reported that they had experienced a reluctance to criticise institutions that provided large research grants or other forms of support (Kayrooz, Kinnear & Preston, 2001, Executive Summary).

Given these possibilities, it is relevant to investigate the extent to which Aotearoa New Zealand’s universities are able to implement their CCS role in the current era. This study does so by exploring the role of four Aotearoa New Zealand universities in the Royal Commission on Genetic Modification. Before explaining the objective of my study in greater depth, I first wish to provide some background information on gene technology and the Royal Commission’s inquiry.

1.3 Gene Technology and the Royal Commission on Genetic Modification

Since the 1970s, scientists have developed a number of techniques that enable them to extract, insert and transform genes from deoxyribonucleic acid (DNA) molecules (Barnum, 1998, pp.17-22, 49-68; Macer, Bezar & Gough, 1991, pp.2-3; Primrose, 1991, pp.13-26; RCGM, 2001b, pp.79-84). These techniques have revolutionised the ability of human beings to study, and alter, cells and organisms. For example, they have made it possible for human beings to develop new inheritable characteristics in organisms at considerably faster rates than could be achieved previously (Macer et al., 1991, p.3; RCGM, 2001a, p.362). In addition, the techniques have enabled human beings to transfer genes between cells and organisms in ways that are “not found in nature” (RCGM, 2001a, p.362). In this document I use the term gene technology to refer to these techniques, as well as the organisms and products that are derived from their use.

Research utilising gene technology began in Aotearoa New Zealand during the 1970s, in conjunction with similar research efforts in other countries (Macer et al., 1991, p.14). Fuelled by the promise of new remedies for health, environmental and economic problems, as well as fears that the nation’s biological industries could be placed at risk should Aotearoa New Zealand fail to keep pace with other nations, consecutive governments injected funding into the development of gene technology (Macer et al.,
1991, p.14; White, Easton, Hunt & Mossop, 1985, p.1). By the 1990s, the use of gene technology in Aotearoa New Zealand, for a variety of research and industrial purposes, had become widespread (see RCGM, 2001b, pp.84-99; Statistics New Zealand, 2001).

Coinciding with this increased usage, as well as an “intense and escalating international debate about genetic engineering” (Rogers-Hayden & Hindmarsh, 2002, October, p.44), gene technology became a focal point of discussion in Aotearoa New Zealand. Public opinion surveys conducted throughout the 1990s consistently identified that the people of Aotearoa New Zealand held diverse opinions on gene technology (see Couchman & Fink-Jensen, 1990; Cram, Pihama & Barbara, 2000; Gamble, Muggleston, Hedderly, Parminter & Richardson-Harman, 2000; IBAC, 2000a; Macer, 1998). The proceedings of several national fora highlighted that scientists held a range of opinions as well (see Lynch, 1997; Saunders, J., 1999, April 15). And reflecting this mixture of opinion, a range of organisations in Aotearoa New Zealand, including environmental, industry, Māori and consumer groups, began to vigorously debate the issues that surrounded gene technology.

In October 1999, just prior to the 1999 General Election, the Green Party of Aotearoa New Zealand presented a petition to Parliament that called for a Royal Commission to investigate genetic engineering. Royal Commissions of Inquiry have been described as “the most serious response to an issue available to the Government” (Fitzgerald, 2001, p.13), and the Green Party’s petition, which contained 91,061 signatures, argued:

...that given the public concern and scientific debate over the use of recombinant DNA technology (genetic engineering), a Royal Commission is urgently needed to enquire into and advise on the ethics, scientific uncertainties, health risks and benefits, environmental effects, and economic repercussions of genetic engineering of food crops, animals, and other organisms. (Fitzsimons, 1999, para.1 of the petition)

Shortly after the 1999 general election and the Green Party’s attainment of an influential position in Parliament, Helen Clark, the new Prime Minister of Aotearoa New Zealand, announced her Government’s intention to initiate the Royal Commission on Genetic Modification (RCGM, 2001b, p.50).

Four Commissioners were appointed to conduct the inquiry. They were given $NZ6.2M in funding and a time period of 15 months. And they were instructed to inquire into, and report upon, a number of sizeable issues. These issues included:
“the strategic options available to enable New Zealand to address, now and in the future, genetic modification, genetically modified organisms, and products” (RCGM, 2001a, p.364);

“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” (RCGM, 2001a, p.364);

“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” (RCGM, 2001a, p.365);

“the Crown’s responsibilities under the Treaty of Waitangi in relation to genetic modification, genetically modified organisms, and products” (RCGM, 2001a, p.365); and

“the main areas of public interest in genetic modification, genetically modified organisms, and products” (RCGM, 2001a, p.364).

Consequently, the Royal Commission on Genetic Modification provided a significant opportunity for societal debate. As Hope (2001) explains:

> It was the first time anywhere in the world that a national government suspended its commitment to existing policy in order to make room for a thorough public discussion of the issues surrounding GM policy. (p.441)

Given the significance of this opportunity, I considered it relevant to explore the willingness, and ability, of Aotearoa New Zealand’s universities to contribute to the Royal Commission’s inquiry. In the following section I discuss the objective of my study in more detail.

### 1.4 Research Objective

The universities of Aotearoa New Zealand participated in the Royal Commission’s inquiry in a number of ways. For example:

- four universities (the universities of Auckland, Canterbury, Lincoln and Otago) presented written and oral submissions during the Royal Commission’s Formal Hearings, and called a number of university personnel to present written and oral submissions on their behalf;
Executives from Aotearoa New Zealand's eight universities, and particularly executives from the universities of Auckland and Otago, provided support for the activities of the New Zealand Life Sciences Network throughout the Royal Commission's inquiry; and

numerous university personnel from Aotearoa New Zealand's eight universities, acting as either individuals or representatives of an organisation other than their own university, prepared briefing papers at the Commissioner's request, presented submissions during the Royal Commission's Formal Hearings, spoke at hui or public meetings that had been arranged, or forwarded written submissions to the Royal Commission.

While I would have preferred to explore the contributions that each of Aotearoa New Zealand's eight universities made to the Royal Commission's inquiry (and, for example, why some universities made greater contributions than others), time constraints made this problematic. Instead I opted to focus on the contributions that had been made by four universities who, by way of their participation in the Formal Hearings, had played a highly visible part in the Royal Commission's inquiry. As a consequence of this decision, my study became focused around one central research question: to what extent did the universities of Auckland, Canterbury, Lincoln and Otago implement their role as a critic and conscience of society, during their involvement in the Royal Commission on Genetic Modification?

I considered an exploration of this question to be significant for two principal reasons. Firstly, despite the CCS role being listed as a defining characteristic of Aotearoa New Zealand's universities in current legislation, there have been few attempts to investigate the universities' commitment to this role (Boston, 1995, p.147; Jones et al., 2001, p.25). Consequently, I considered it relevant to investigate if the universities were attempting to implement this role in the current era, and thus whether they were providing Aotearoa New Zealand with a service that they were asked, and funded, to provide.

Secondly, as I have previously highlighted, it is possible that the universities' increasing involvement in the commercialisation of knowledge may be undermining their ability to implement their CCS role. Given this possibility, I considered it timely to investigate if the universities were able to implement their CCS role in the current era.

In addition, it is relevant to note that I considered the Royal Commission's inquiry to be a useful case study for several particular reasons. As the Royal Commission's
inquiry was focused upon a number of high-profile and complex issues, it provided an opportunity to explore the universities' willingness to help Aotearoa New Zealand address such issues. As the universities were one of the primary sites where gene technology was being utilised and researched, it provided a good opportunity to explore the universities' willingness to share their knowledge and insights with their host society. And, as the outcomes of the Royal Commission's inquiry had the potential to impact on the interests of many people in Aotearoa New Zealand, as well as the universities' own commercial interests, it provided a test of where the universities' priorities rested in the current era.

Having discussed the objective of my study, and its significance, I now wish to discuss the steps I took to advance my central research question. Consequently, the following section provides an explanation and evaluation of the main features of my methodology.

1.5 Methodology

In order to advance my research question it was first necessary to devise a framework that I could use to evaluate the universities' activities during the Royal Commission's inquiry. Following an exploration of the rationale of the universities' CCS role, and the relationship that exists between the CCS role and the concept of academic freedom, I decided to structure my evaluation framework around a set of rights (or freedoms) that are associated with the concept of academic freedom. Included within this set are the rights of university personnel to freely express their views, to disseminate the results of their research, and to participate in professional and representative bodies.

As with all high-level goals (such as justice and the fulfilment of the Treaty of Waitangi), the CCS role of Aotearoa New Zealand's universities lends itself to a multiplicity of interpretations. My decision to structure my evaluation framework around this set of rights meant that there were a number of facets of the CCS role, and the concept of academic freedom, that I did not endeavour to assess. However, it also meant that my study became focused on a set of rights that are commonly regarded as integral to the universities' CCS role. As Jones et al. (2000), of the New Zealand

Universities Academic Audit Unit, explain:

...freedom of this nature enables academics to voice their opinions and ideas, and publish their findings, without fear of reprimand. When this is the case, and when academics utilise the channels of publication, speech making, and teaching open to them, they place themselves in a position where they can have a profound influence on the way in which those around them think and respond to the world. In this manner, academic staff and the university system as a whole can function as critic and conscience of society. (p.2)

In utilising this set of rights as the basis of my evaluation framework, I reasoned that the universities would have implemented their CCS role to the best of their ability if all interested university personnel (i.e., those who possessed views that they wanted to share) had been able to express their views to the Royal Commission. Conversely, I reasoned that if university personnel had held back, or had been restricted, from expressing certain views, then the universities would have failed to provide society with a full and lively examination of gene technology and the issues it raised for Aotearoa New Zealand.

The design of my evaluation framework was also based on the recognition that the universities had contributed to the Royal Commission's inquiry in multiple ways. As it was possible that the universities could have tried to implement their CCS role through any or all of these contributions, I considered it necessary to explore each of the main forms I had identified. These included:

- the submissions that each university presented during their involvement in the Formal Hearings (which I refer to, hereinafter, as the University Submissions);
- the support that University Executives provided for the activities of the New Zealand Life Sciences Network, as well as the Network's actual activities; and
- the contributions and experiences of university personnel who participated in the Royal Commission's inquiry as individuals, or as representatives of an organisation other than their university (whom I shall refer to, for simplicity's sake, as the Other Contributors).

Collectively, these features of my evaluation framework helped to guide my process of data collection by stimulating a number of subsidiary research questions. For example:

- What motivated the various contributions? Was the universities' role as a critic and conscience of society a motivating factor?
What processes were used to create the University Submissions? Did these processes enable university personnel, who held views on gene technology, to convey their views to the Royal Commission?

What was the content of the various contributions? Whose views were, and were not, represented within the University Submissions and the submissions of the New Zealand Life Sciences Network?

What were the experiences of the Other Contributors? Did University Executives encourage and support university personnel to participate in the Royal Commission's inquiry? Were the Other Contributors able to express all of their views on gene technology?

In addition, a number of features of my research topic and setting guided my process of data collection. Firstly, I was confronted with an abundance of data sources, including an extensive database of submissions that had been forwarded to the Royal Commission (and that could be accessed via the Royal Commission's Internet site). I wanted to search these data sources for relevant information, but their volume, coupled with the time constraints I faced, presented me with a challenge. In response to this challenge, I created several boundaries to focus my search. For example, I chose to focus on the contributions that had been made by university staff members, as opposed to university students. And, while I tried to identify the submissions that had been made by Other Contributors, after six months of intermittent searching, I chose to focus on the submissions that I had been able to locate.

Secondly, while I wanted to use the extensive database of submissions that was available on the Royal Commission's Internet site, I was conscious of the need to look beyond these submissions, and to speak to the university personnel who had been involved in, or who had witnessed, their production. In addition, as it was likely that university personnel would possess different views on their universities' involvement in the Royal Commission, and would have had different experiences during the Royal Commission's inquiry, I considered it important to seek information from a variety of people within each university. In particular, I considered it important to seek information from University Executives who had overseen the production of the University Submissions, or who had supported the activities of the New Zealand Life Sciences Network. I also considered it important to seek information from the university personnel who I had identified as Other Contributors, regardless of the nature of their views on gene technology.
Thirdly, as there was a considerable time delay between the completion of the Royal Commission's inquiry and my attempts to seek information from university personnel (approximately 15 to 20 months), there was the possibility that university personnel's recollection of events may have been poor, or altered by events that had occurred during the intervening period. Consequently, in order to construct an accurate impression of the events that had occurred, I considered it important to search for data, such as internal communiqués and media statements, that had been produced during the Royal Commission's proceedings.

And fourthly, as I was scrutinising the activities of universities and various university personnel, the possibility existed that my research would meet resistance in some quarters. While I assumed that University Executives would be selective in the information that they released to me, I was also aware that they had some obligation to assist with my study. Not only were they officers of institutions that received large quantities of public funding, they were also officers of institutions that were committed to processes of research and scholarly inquiry. Consequently, on occasions when I felt that University Executives had provided me with inadequate assistance, I considered it appropriate to pursue the matter.

As a result of my subsidiary research questions, and the features of my research topic and setting that I have just explained, I chose to collect data using a number of methods. The methods I used, and their various strengths and weaknesses, are discussed in Chapter 4. However, in order to briefly summarise:

1. I read through the submissions that the four universities, the New Zealand Life Sciences Network, and various Other Contributors had made. While reading through these submissions I searched for, and collated, information that related to my subsidiary research questions. In addition, I used a Content Analysis (a highly structured form of analysis) to evaluate some aspects of these submissions.

2. I sent letters to the Vice-Chancellors of the four universities outlining a number of my subsidiary research questions. Subsequently, I was able to interview Professor Roy Bickerstaffe (who had co-ordinated Lincoln University's contribution to the Royal Commission's Formal Hearings), and I received a written response from Dr Jack Heinemann (who had played a similar role within the University of Canterbury). Dr John Hood (the Vice-Chancellor of the University of Auckland) and Dr Graeme Fogelberg (the Vice-Chancellor of the University of Otago) chose not to assist with my research questions.
3. As Dr Hood and Dr Fogelberg had chosen not to assist me, I endeavoured to further my research process by requesting information from the universities of Auckland and Otago under the Official Information Act 1982. In addition, in order to gain insight into the events that had taken place, I utilised the Official Information Act 1982 to request various documents and communiqués that had been produced within the universities during the Royal Commission’s inquiry. In total, I submitted four requests for official information to the University of Auckland, two requests to the University of Otago, and one request to Lincoln University.

4. I sent letters to thirty university staff members who I had classified as Other Contributors. Within these letters I outlined a number of my subsidiary research questions, and, subsequently, I interviewed fifteen members of this target group and received written responses from two others.

In summary, I endeavoured to advance my central research question by exploring the extent to which university personnel were able to express their views on gene technology during the Royal Commission’s inquiry. In order to do so I assessed the most visible contributions that the four universities made to the Royal Commission’s inquiry, and utilised a range of methods to explore their substance, the motivations and processes that underpinned them, and the experiences of those who were involved.

Inevitably, the methodology that I utilised to construct an answer to my research question was limited in a number of ways. For example, as I have previously mentioned, there were other dimensions of the CCS role that it would have been relevant to assess. Due to the research techniques I utilised, I was only able to engage with a small number of university personnel. In addition, I made little attempt to engage with university personnel who, for whatever reason, avoided an active role in the Royal Commission on Genetic Modification. All of these factors impacted on the scope of my study.

However, despite these limitations, my methodology enabled me to produce a structured assessment of the universities’ activities. It also enabled me to gain insight into the internal culture that was operative within the four universities, and the interests and pressures that shaped the activities of a group of university personnel. In the following section I briefly outline some of the insights that my study has provided, while explaining the content of the chapters that follow.
1.6 Chapter Synopsis

In this chapter I have begun to situate my study, and in the following two chapters I continue this process. In Chapter 2 I explore the universities’ increasing involvement in the commercialisation of knowledge, as well as the commercial interests that the four universities had developed around gene technology at the time of the Royal Commission’s inquiry. Then, in Chapter 3, I turn my focus to the universities’ role as a critic and conscience of society, discussing, in the process, the rationale and operational requirements of this role. The content of Chapter 3 provides a useful foundation for Chapter 4, in which I discuss two facets of my methodology in greater depth: the framework that I used to evaluate the four universities’ involvement in the Royal Commission’s inquiry, and the research methods that I used to collect information. By discussing these topics in depth, I aim to provide additional information about the logic, as well as the boundaries, of my investigation.

In Chapters 5 to 7 I describe and analyse a different form of contribution that the universities made to the Royal Commission’s inquiry. In Chapter 5 my focus is on the University Submissions. In Chapter 6 I focus on the activities of a group of University Executives who were affiliated with the New Zealand Life Sciences Network. And in Chapter 7 I analyse the contributions and experiences of the Other Contributors.

Throughout these three chapters I highlight a number of factors that constrained the flow of information from university personnel, to the Royal Commission on Genetic Modification. While some university personnel were assisted to communicate their positive views on gene technology, other university personnel, who held alternative views on gene technology, lacked this support. The activities of some University Executives created barriers for gene technology critics who were trying to explain their concerns. And within some universities, social pressures created feelings of anxiety and trepidation amongst some university personnel. As a result of these constraints on information flow I conclude, in the eighth and final chapter, that the four universities implemented their CCS role in a weak fashion.
Notes

1 As evidence of this theorising, in the past decade universities have been variously referred to as “institutions of cultural reproduction” (Filmer, 1997, p.52), “degree factories” (Jourde, 2003, September, p.6), the “temple of knowledge” (Parenti, 1995, p.176), “service centres for multinational corporations” (Peters & Roberts, 1999, p.79), and the “ideological apparatus of the nation-state” (Readings, 1996, p.14).

2 I consider it appropriate to use this collective term because these techniques, organisms and products are all technologies that involve, or result from, the modification of genetic material. In addition, I prefer the term gene technology to alternatives such as genetic modification and genetic engineering because these alternative terms are sometimes used as verbs, rather than as nouns, and thus can give rise to confusion. The potential for confusion is amplified in the present case because the Royal Commission on Genetic Modification used the term genetic modification as a verb, a definition which included the act of genetically modifying cells or organisms, but which did not include the products or genetically modified organisms that result from such actions.

3 As Fitzgerald (2001, p.13) explains, one reason why Royal Commissions of Inquiry are held in such high regard is because they are seen to be more politically independent and credible than other forms of inquiry. The Department of Internal Affairs, the government department that oversees Royal Commissions of Inquiry, recommends that a Royal Commission be considered in situations where “there is considerable public anxiety about the matter”; “a major lapse in Government performance appears to be involved”; “circumstances giving rise to the inquiry are unique with few or no precedents”; “the issue cannot be dealt with through the normal machinery of Government or through the criminal or civil courts”; or “the issue is an area too new, complex or controversial for mature policy decisions to be taken” (Fitzgerald, 2001, pp.9-10).

4 For a full list of the issues that the Royal Commission on Genetic Modification was asked to inquire into, and report upon, see RCGM (2001a, pp.364-366).

5 Throughout this document I use the term ‘Executives’ to refer to the upper management of Aotearoa New Zealand’s universities (i.e., the Vice-Chancellors, Deputy Vice-Chancellors, and the managers of various faculties and departments).

6 At the outset of my study I had hoped that I might consider the activities of Aotearoa New Zealand’s eight universities. As an initial step in my empirical research I sent letters to the Vice-Chancellors of the Auckland University of Technology, Massey University, the University of Waikato, and Victoria University of Wellington, inquiring why their universities had not become formal participants in the Royal Commission’s Formal Hearings. However, the responses that I received made it evident that considerable further research would be needed if I was to arrive at any sound conclusions, and, consequently, I set this avenue of inquiry aside.
Chapter 2: Universities and the Commercialisation of Knowledge

In recent decades, universities throughout the world have adopted a more active role in the commercialisation of knowledge. Their increased attempts to contribute to national and regional innovation networks, collaborate with industrial partners, create knowledge with commercial potential, and create business ventures from their employees’ expertise and intellectual property, are several components of this more active role (Etzkowitz, 1999, pp.204-212, 217-228; Etzkowitz & Webster, 1998, pp.21-46; Rhoades & Slaughter, 1998, pp.37-39; Sutz, 1997, pp.11-12).

Observing these changes, Slaughter and Leslie (1997) have argued that academic capitalism, which they define as “institutional and professorial market or marketlike efforts to secure external moneys” (p.8), is permeating universities. While they recognise that university personnel have often participated in economic markets to some extent, they suggest that the changes in university practice are so significant that they represent a change “in kind rather than in degree” (p.5).

Leydesdorff and Etzkowitz (1997), who describe the changes as a “revolution” (p.158), are of a similar opinion. They argue that as universities accept a role in governmental strategies for wealth creation, and forge closer ties with industrial partners, the sharp boundaries that once distinguished the university sector from the industrial and governmental sectors are disappearing. In their place a web of interconnections has taken hold, a web that Leydesdorff and Etzkowitz (1997) refer to as “a triple helix of university-industry-government relations” (p.155).

In this chapter I explore the involvement of the universities of Auckland, Canterbury, Lincoln and Otago in the commercialisation of knowledge, and, in particular, knowledge associated with gene technology. In Section 2.1, I attempt to place their involvement in context by discussing the factors that have stimulated universities, throughout the world, to concern themselves with the commercialisation of knowledge. In Section 2.2, I discuss how these factors have stimulated changes in Aotearoa New Zealand’s university system. Then, in Section 2.3, I focus on the commercial interests that the four universities had developed around gene technology at the time of the Royal Commission on Genetic Modification.
2.1 The Stimulants of Change

2.1.1 Economic Globalisation and the Knowledge Wave

During the latter half of the twentieth century, as both a cause and a consequence of revolutions in communication and transportation technology, the promulgation of 'free trade' policies, and the evolution of international policy institutions and frameworks, the spatiality of economic markets became increasingly global (Peters & Roberts, 1999, p.74). In the course of this process of economic globalisation, international economic competition has intensified, traditional markets have been destabilised, and companies and nation-states have begun to search for new means of achieving a competitive advantage in the global marketplace (Gibbons et al., 1994, pp.46-48; Slaughter & Leslie, 1997, pp.31-36).

Within this context, developments in knowledge have been widely acclaimed as the platform of future economic success. As examples of this acclaim, Drucker (1993) has argued that we are moving from a capitalist to a post-capitalist knowledge society in which "the basic economic resource...is and will be knowledge" (p.7); Thurow (1996) has argued that "knowledge and skills...have become the key ingredient in the late twentieth century's location of economic activity" (p.68); Duderstadt (2000) has referred to knowledge as "an engine of economic growth" (p.40); and within Aotearoa New Zealand, where the emergence of knowledge-based models of economic development has become colloquially known as the 'knowledge wave', the Tertiary Education Advisory Commission (2001) recently observed that:

A fundamental shift is occurring, away from the use of raw materials and labour costs as the basis of competitive advantage, towards an emphasis on knowledge as the form of capital that drives economic growth. (p.20)

As knowledge has moved to the hub of economic strategising, governments around the world have responded in a similar manner. Having recognised that universities possess physical and social infrastructure that can facilitate knowledge development, they have made efforts to control the activities of universities. For example, they have removed block grants and used contract-based funding to manipulate the activities that occur within universities (Etzkowitz & Webster, 1998, pp.35-36; OECD, 1998, p.7; Slaughter & Leslie, 1997, pp.12, 37). In addition, they have sought to encourage the universities to play a more active role in the commercialisation of

The competitive advantage that can be derived from knowledge in the global marketplace has also encouraged industries to adjust their relationship with universities. Whereas science-based industries were once content to perform their research and development 'in house', now they are attempting to forge closer ties with universities so that they might share expertise and research facilities, reduce the costs associated with knowledge development, gain access to knowledge developed within the universities, and limit their competitors' access to this knowledge (Bonaccorsi & Piccaluga, 1994, p.233; Etzkowitz, Webster & Healey, 1998c, pp.xi-xii). Reflecting this change in attitude, industries have become significant financiers of university research in recent decades (OECD, 1998, p.7; Soley, 1995, p.11), and they have helped to initiate and finance a plethora of collaborative ventures with university personnel (Etzkowitz & Leydesdorff, 1997a, pp.2-3; Slaughter & Leslie, 1997, p.7).

The manner in which governments and industries have responded to economic globalisation and the 'knowledge wave' help to explain why universities are taking a more active role in the commercialisation of knowledge. Also of importance are the commercial opportunities that have emerged for universities, as their services, expertise and intellectual property have become prized commodities. However, while these factors are of considerable explanatory value, they do not fully explain why universities have been so willing to abandon past traditions and embrace commercial pursuits. In order to create a fuller explanation, it is also important to note that patterns of neo-liberal economic reform have had a telling impact on many universities.

2.1.2 Neo-liberalism and the Corporatisation of Universities

During the latter half of the twentieth century, policies that emphasised the role of 'markets' in organising human activity became dominant in many parts of the world (MacEwan, 1999, p.4). These policies, as well as the ideas that guide them, are commonly referred to as neo-liberalism (Colclough, 1993, pp.5-6; MacEwan, 1999, p.4;
Olsens, 2002, p.1; Peters & Roberts, 1999, p.12). They are policies that have had a significant impact on universities throughout the world.

As one component of neo-liberal policy, governments have sought to corporatise universities; that is, they have endeavoured to restructure universities so that they will function like a company in a competitive market environment. In practice, the process of corporatisation has been similar in a number of countries. Firstly, governments have provided a smaller proportion of university funding and have encouraged universities to play a greater role in financing their own activities (Etzkowitz & Webster, 1998, pp.35-36; OECD, 1998, p.7; Slaughter & Leslie, 1997, p.1; Sutz, 1997, p.15). As Sutz (1997) explains:

The increasing demand for funds from universities and research institutes gets a similar response worldwide: support yourselves! That is to say, connect yourselves with industries and the government, offer your knowledge and your capacity to generate new knowledge, and charge for it. (p.15)

Secondly, governments have sought to create conditions that will encourage universities to compete with each other, and with other organisations (e.g., polytechnics and private research laboratories), for fee-paying students and research contracts (Slaughter & Leslie, 1997, pp.42-50; OECD, 1998, pp.15-16). And thirdly, governments have used various innovations to encourage a business ethos within universities. Amongst these innovations, they have required universities to operate according to corporate models of governance, and they have introduced new systems of accountability and quality assessment (Currie & Vidovich, 1998, pp.117-121; Slaughter & Leslie, 1997, pp.43-52).

One major consequence of this reform process has been the destabilisation of university funding. In the wake of the reforms, universities have not been able to rely on governments to meet their funding needs, and, within the competitive market environment in which they now operate, their operating revenue has fluctuated from year to year. As a consequence of this instability in their funding base, universities have been strongly motivated to search for new sources of revenue (OECD, 1998, p.71; Sutz, 1997, p.13). The eagerness of modern universities to forge closer ties with industrial partners, to furnish their own entrepreneurial ventures, and to actively engage in the commercialisation of knowledge, needs to be understood in this context. As I will discuss in the following section, the influence of neo-liberalism can be observed within Aotearoa New Zealand, as it can in many countries throughout the world.
2.2 Aotearoa New Zealand’s Universities in an Era of Change

During the 1980s and 1990s, the reform of research, science and technology policy, and education policy, had a momentous impact on Aotearoa New Zealand’s universities. These reforms were shaped by the process of economic globalisation, and the prominence that knowledge-based models of economic development gained in the strategies of consecutive governments. These reforms also need to be understood in the context of Aotearoa New Zealand’s neo-liberal economic reforms, which were instigated by the Fourth Labour Government in 1984, and continued by subsequent governments throughout the 1990s.

2.2.1 The Reform of Research, Science and Technology Policy

Within Aotearoa New Zealand, the assertion that knowledge (and thus research, science and technology) would be central to the nation’s economic well-being, became a central theme of policy discourse during the 1980s and 1990s (see Bollard, 1986, pp.11-13; Ministerial Working Party on Science and Technology, 1986, pp.v-vii; Ministry of Research, Science and Technology, 1995a, p.2, 1995b, p.18, 1998, p.8, 1999b, p.1). In accordance with this assertion, consecutive governments endeavoured to increase their control of research activities within Aotearoa New Zealand, so that they might direct the process of knowledge development.

In 1989, as a step towards this goal, the Labour Government created two new institutions. The first of these, the Ministry of Research, Science and Technology (or MORST), was created to provide a forum for discussions over national science strategies, and an institutional agent that could link research, science and technology policy with economic development policy (Palmer, C. M., 1994, pp.31-37, 41-45). The second of these institutions, the Foundation for Research, Science and Technology (or FRST), was created to provide the Government with a mechanism for controlling public investment in research, science and technology (Palmer, C. M., 1994, p.37). In keeping with the spirit of the neo-liberal economic reforms of the time, FRST became known as a “purchase agent” (Ministry of Research Science and Technology, 1999a, p.3), because its task was to purchase research on behalf of the Government.
In the years that followed the creation of MORST and FRST, consecutive governments utilised these institutions to influence the activities of publicly funded research providers, such as the universities and the Crown Research Institutes. During the early 1990s, government funding that had previously been allocated to the research providers was systematically re-allocated to FRST (Palmer, C. M., 1994, pp.31-51). FRST then organised this funding into a number of contestable research funds and, in accordance with a series of research priorities that had been determined by MORST, invited research providers to bid for specific research contracts (Palmer, C. M., 1994, pp.31-51).

As the Ministry of Research, Science and Technology (1995a) explain, collectively, these innovations “gave the Government the opportunity to examine and alter its priorities across all fields of science, irrespective of the de facto priorities set under the old departmental structures” (p.5). With regard to Aotearoa New Zealand’s universities, these innovations had two major effects.

Firstly, they increased the government’s control over the direction of university research (Easton, 1997, p.238; Savage, 2000, p.7). Research funding that had previously been allocated to the universities to spend as they pleased became directed toward specific research projects that governments considered to be of high priority. As Spoonley (1993, p.35) explains, this included many research projects that were intended to create “products” with commercial potential.

Secondly, the replacement of block research grants with contestable research contracts destabilised the funding base of the universities. Following a brief transition period, during which FRST ring-fenced a certain amount of their research funding, the universities were forced to compete with Crown Research Institutes, private research institutions, and each other, for the limited pool of FRST research contracts (Palmer, C. M., 1994, p.51). This competitive process made it difficult for the universities to predict the quantity of research funding that they would secure in any given year, and created a motivation for them to seek out new sources of funding.

In addition to the innovations that I have described so far, consecutive governments used a range of other initiatives to entwine universities into their economic development strategies. Between 1997 and 1998, the government engaged representatives from the university and industrial sectors in a collaborative planning exercise they named the Foresight Project (Ministry of Research, Science and Technology, 1998, p.5). In policy documents such as Blueprint for Change, the Ministry of
Research, Science and Technology communicated the Government's desire to create "wealth from new knowledge-based enterprises" and "accelerated commercialisation of new ideas and technologies" (Ministry of Research, Science and Technology, 1999b, p.20). And during the 1990s, several new pools of contestable funding were created to stimulate university-industry collaboration. For example, an aim of the Technology for Business Growth fund, created in 1990, was to encourage research institutions and industry to co-operate in the "development and exploitation of technology" (Foundation for Research, Science and Technology, 1991, February, p.3). To provide a second example, an aim of the New Economy Research Fund, created in 1999, was to finance research that could "provide starting points for tomorrow's knowledge based businesses" (Ministry of Research, Science and Technology, 1999a, p.6).

The fact that some of Aotearoa New Zealand's universities have become involved in a plethora of entrepreneurial ventures, and collaborations with industrial partners, suggests that these initiatives have operated with some success. However, before I explore the commercial interests that the universities of Auckland, Canterbury, Lincoln and Otago had developed around gene technology, I first wish to discuss a second branch of public policy reform that had a major impact on the universities during the 1980s and 1990s.

2.2.2 The Reform of Education Policy

During the mid to late 1980s, as part of the Fourth Labour Government's programme of neo-liberal economic reform, a series of reports called for a radical reformation of Aotearoa New Zealand's universities (see Hawke, 1988; New Zealand Government, 1989a, 1989b; The Treasury, 1987). Consistent with the philosophy of neo-liberalism, the reports called for the universities to be restructured so that they would function like companies in a competitive market environment. In addition, the reports proposed a series of reforms that would enable the Government to increase its control over the universities. While this second facet of the policy proposals was largely inconsistent with the philosophy of neo-liberalism, it was consistent with the Government's desire to entwine the universities in its programmes of economic development.

Amidst vociferous debates and a "saga of ideological battles" (Patterson, 1991, p.2), some of these policy proposals were implemented during 1989. With the passage of
the State Sector Amendment Act (No.2) 1989, the Labour Government removed the role of university councils as the employer of university staff and centralised this power in the hands of each university's Chief Executive Officer (or Vice-Chancellor). And later in 1989, with the passage of the Education Amendment Act 1989, the Labour Government took over the University Grants Committee's role in approving academic developments within the universities, negotiating and allocating government funding, and reviewing university expenditure (New Zealand University Students' Association, 1994, p.35; Patterson, 1991, p.124). As Gould (1988, pp.221-239) explains, prior to these changes a purpose of the University Grants Committee had been to protect the autonomy of the universities, and the academic freedom of university personnel, by providing a buffer between the universities and government.

The legislation introduced in 1989 was but a precursor to the sweeping changes that were created with the passage of the Education Amendment Act 1990. Amongst these changes:

- A new funding regime was consolidated that replaced the previous system of block grants, negotiated on a quinquennial basis, that had been in place during the time of the University Grants Committee (Gould, 1988, p.17; Tertiary Education Advisory Commission, 2001, p.39). Under the new regime, government funding for each university could fluctuate from year to year, depending on how many equivalent full-time students were enrolled at the university and the level of funding that a government chose to provide per equivalent full-time student (Patterson, 1991, p.148; Tertiary Education Advisory Commission, 2001, p.68).
- It became possible for other tertiary education institutions (e.g., colleges of education, polytechnics and wananga) to take on functions, such as the granting of degrees, which had previously been the exclusive domain of the universities (New Zealand University Students' Association, 1994, p.36; Peters & Roberts, 1999, p.18).
- Each university was required to have a written charter of goals and purposes, and the Minister of Education was given the power to stipulate matters that must be addressed in each university's charter (New Zealand University Students' Association, 1994, p.37; Patterson, 1991, p.147).
- In addition, each university was required to abide by the Public Finance Act 1989, a requirement which necessitated that they produce a list of performance
indicators, a statement of service performance, and an annual report that included an audited financial statement (Patterson, 1991, p.148).

The legislative changes of 1989 and 1990 had a major impact on the universities of Aotearoa New Zealand. Through the abolition of the University Grants Committee, the new funding regime, the increased power of the Minister of Education, and the requirements of the Public Finance Act, the Government increased its ability to monitor, and manipulate, the universities' activities (Butterworth & Tarling, 1994, p.242; Patterson, 1991, pp.176-177). And by centralising power in the hands of the Vice-Chancellors, introducing new accountability mechanisms, and encouraging the universities to compete for students, the Labour Government brought about a fundamental change in the nature of the universities. Commenting in the aftermath of the new legislation, Patterson (1991) argued that a “free-market philosophy” (p.185) had permeated the universities, and that competition for resources had been created in what had been an “essentially complementary tertiary sector” (p.186). Butterworth and Tarling (1994) commented that an environment of “individual and institutional competition” (p.239) had been promoted “at the expense of cooperation and mutuality” (p.239). And the New Zealand University Students’ Association (1994) argued that Aotearoa New Zealand’s universities had experienced the “most fundamental and radical change since the establishment of the first universities in the late nineteenth century” (p.1).

Concurrent with the sweeping legislative changes just described, the universities also experienced a marked decline in government funding during the latter part of the Fourth Labour Government’s reign. Scott and Scott (2000, p.11) report that government funding per equivalent full-time student decreased from $NZ10,405 in 1988 to $NZ9,213 in 1990. In part this decline was a by-product of the rapid growth in university students, and university expenses, which was occurring at the time (see Scott & Scott, 2000, p.10). However, the decline was also a by-product of the Labour Government’s programme of neo-liberal economic reform and its desire to move towards a ‘user-pays’ funding regime.

This decline in government funding, coupled with a sharp increase in the number of enrolled university students, created financial turmoil within the universities during this period. This turmoil continued after a National Government came to power in the 1990 General Election and, in due course, extended the programme of neo-liberal economic reform that the Fourth Labour Government had begun (Kelsey, 1995, pp.6-7, 120-121). As Savage (2000, p.50) explains, one of the major policy initiatives of the
National Government, during its reign from 1990 to 1999, was to reduce its financial support for the universities. By 1999, government funding per equivalent full-time student had descended to $NZ6,915 (Scott & Scott, 2000, p.11). With the universities also experiencing instability in their research funding during the 1990s, this decade of declining government support gave the universities a strong motivation to search for new sources of revenue.

In the course of this search for new sources of revenue, Aotearoa New Zealand's universities began to compete for fee-paying students, research contracts, and funding from the industrial sector. Some of the universities chose to develop their own entrepreneurial ventures, with the hope of profiting from the expertise and intellectual property that they possessed. In addition, as I will explain in the following section, each of the four universities at the heart of my study developed a commercial interest in gene technology.

2.3 Gene Technology and the Commerce of the Four Universities

Throughout the world the modern biotechnologies, of which gene technology is an example, have been a focal point of university forays into the commercialisation of knowledge (Etzkowitz & Webster, 1998, pp.28-30; Kenney, 1986, pp.1-7; Krimsky, Ennis & Weissman, 1991; McKelvey, 1997, pp.67-69). In the opinion of Kenney (1986), university personnel's "pervasive role" (p.4) in the modern biotechnology industry, during its development in the 1970s and 1980s, was "unique in the annals of business history" (p.4). And since Kenney's observation, universities have continued to play a dramatic role in the evolution of this industry (see Krimsky, Ennis & Weissman, 1991; Zucker, Darby & Armstrong, 2002).

A similar pattern has emerged in Aotearoa New Zealand. In this section I explore the commercial interests that the universities of Auckland, Canterbury, Lincoln and Otago had developed around gene technology at the time of the Royal Commission on Genetic Modification. As commercial ventures involving gene technology often have a lengthy development phase (Biotechnology Taskforce, 2003, p.5; Ministry of Research, Science and Technology, 2003, p.5), I will sometimes refer to ventures that were formalised, and announced, shortly after the Royal Commission had completed its inquiry. While it is possible that a number of long-term commercial prospects figured in
the thoughts of university personnel during the Royal Commission's inquiry, I have chosen to restrict my focus to ventures that were announced by the universities prior to 31 December 2001.

2.3.1 Teaching and Research

In the competitive market environment in which they now operate, the universities' teaching and research activities are also their 'core business'. Consequently, in order to understand the four universities' commercial interest in gene technology it is important to understand that, at the time of the Royal Commission's inquiry, gene technology was heavily utilised within their teaching and research programmes.

Since the 1970s, gene technology had been repeatedly identified as a technology that could expand human understanding of biological processes, and that could contribute to the economic development of Aotearoa New Zealand (see Hunt et al., 1983, pp.3-10; Macer et al., 1991, pp.1-13; White et al., 1985, p.1-9). As a result, by the time of the Royal Commission's inquiry, some of Aotearoa New Zealand's universities had spent approximately 25 years developing teaching and research infrastructure around gene technology (e.g., research laboratories, library collections, and teaching and research staff with specific skills). Gene technology was in common use in a wide range of university departments (including those concerned with medical and health sciences, plant sciences, animal sciences, food sciences and microbial sciences), and had become intertwined with an integral part of the universities' teaching and research revenue.

In the course of their submissions to the Royal Commission, university spokespeople explained the relationship that existed between gene technology and the teaching and research revenue of their university. For example, they explained that access to gene technology enabled their university to:

- offer certain degree programmes and thus attract a certain group of fee-paying students (Bellamy, 2000, p.5; University of Auckland, 2000, p.11; University of Canterbury, 2000, p.8; University of Otago, 2000, pp.1-4);
- maintain its research programmes, fulfil its present research contracts, and secure research contracts in the future (Bellamy, 2000, pp.2-5; Conder, 2000, pp.2-6; Field, 2000, p.5; Smith, 2000, pp.6-7; University of Auckland, 2000, p.1; University of Canterbury, 2000, p.8; University of Otago, 2000, pp.1-4);
• protect its investment in teaching and research infrastructure (Conder, 2000, p.2; University of Auckland, 2000, p.3); and
• maintain its international standing, image, prestige, and ability to compete in the global marketplace (Field, 2000, p.1; Lincoln University, 2000, p.6; Smith, 2000, p.1; University of Auckland, 2000, p.10; University of Otago, 2000, p.1).

In addition to these explanations, some university spokespeople attempted to emphasise the significance of this teaching and research revenue to their university (see Box 1 for a selection of relevant quotations). The terms and statistics that university spokespeople used to convey this significance were disparate, and thus it is difficult to determine whether this stream of revenue was more important for some universities than others. However, while they utilised different terms and statistics, their comments demonstrated that gene technology was tied in with a valuable stream of revenue for each of the four universities.

2.3.2 Entrepreneurial Ventures

Aside from their teaching and research revenue, the universities of Auckland and Otago had attained another form of commercial interest in gene technology. As a result of the access to gene technology that they had enjoyed prior to the Royal Commission, the biological and medical research teams of these universities had developed certain forms of expertise and intellectual property. As I will shortly explain, both universities had created a number of entrepreneurial ventures to capitalise on these developments.

In contrast, at the time of the Royal Commission’s inquiry, attempts to commercialise expertise and intellectual property were just gaining momentum within the universities of Canterbury and Lincoln. Both universities had created a limited liability company to support and administer entrepreneurial ventures: Canterprize Limited in the case of the University of Canterbury, and Lincoln Ventures Limited in the case of Lincoln University. In addition, both universities were helping to develop the Canterbury Innovation Incubator, a facility that was intended to nurture entrepreneurial activities by university staff and students (Innovation incubator announced, 2000, December 6). However, by the close of 2001, to my knowledge, neither university had structured a major entrepreneurial venture around gene technology. As a consequence,
Box 1: The Significance of Gene Technology as a Component of Teaching and Research Revenue

**University of Auckland**

New technologies, including genetic modification technologies, are inextricably interwoven into extensive areas of the University. The University has a considerable investment in human capital, teaching, and research infrastructure to support these activities associated with genetic technologies. That investment is at considerable risk if such technologies were unavailable or unreasonably restricted. (Conder, 2000, p.2)

...a very considerable part of the research and scholarly activity currently undertaken in the School of Biological Sciences is dependent upon access to, and use of, genetically modified organisms. Any changes to current regulatory systems that might unduly restrict such access would severely impact upon the work of both staff and students. It is my professional opinion that, should we be unable to access genetic technologies and genetically-modified organisms, the financial stability of the School would be placed at risk. Current courses, class sizes and staffing levels would not be able to be maintained. Significant down-sizing, staff reductions and a decline in standards inevitably would follow. (Bellamy, 2000, p.2)

**Lincoln University**

Universities are part of the global Tertiary education market. To be competitive in this global market requires access to important emerging technologies such as genetic modification. (Field, 2000, p.6)

Genetic modification currently accounts for 20% of the Institution research income excluding land and equipment costs. (Lincoln University, 2000, p.10)

**University of Otago**

Currently, the University of Otago holds research contracts involving the use of GMO techniques and products that total $34M. Any measures that restrict the use of GMO techniques and products would place these contracts in jeopardy. (Smith, 2000, p.7)

The international reputation of the University of Otago contributes to the decision of full-fee paying international students to enrol at Otago. This full-fee paying enrolment contributes $12.5M to the budget of the University as well as providing significant foreign currency earning for New Zealand of approximately $25M. Denial of access to modern research tools and techniques would diminish the reputation of New Zealand and the University and so adversely impact this source of revenue. (Smith, 2000, p.7)

**University of Canterbury**

Genetic engineering has been in widespread use for over 25 years, particularly in universities and thereafter in technical institutions. It's a fundamental aspect now of all our biological teaching. It occurs in all parts of the biology curriculum... (Pratt quoted in RCGM, 2000, October 27, p.671)
the content of this section will focus on the entrepreneurial ventures of the universities of Auckland and Otago.

Within the University of Auckland, entrepreneurial ventures were given impetus in 1989 with the creation of Auckland UniServices Limited (UniServices), a company that was designed to serve as the University’s commercial arm. Throughout the 1990s, UniServices endeavoured to commercialise the University of Auckland’s expertise, manage the University’s research and consultancy contracts, protect the University’s intellectual property, and develop new business ventures. The University of Auckland’s financial accounts indicate that UniServices operated, and expanded, with considerable success. For example, during the 2000 financial year, UniServices generated $NZ36.9M of revenue for the University of Auckland (Auckland UniServices Limited, 2002, p.7), a marked increase from the $NZ3.1M it generated during 1990 (University of Auckland, 1991, p.xiii).

At the time of the Royal Commission’s inquiry, it was evident that a considerable proportion of UniServices’ revenue was tied in with applications of gene technology within the University of Auckland. Within UniServices' written submission to the Royal Commission it was explained that “a growing intellectual property and commercial portfolio” had emerged from medical, biomedical and biological research within the University, and that gene technology was “fundamental” to this research (Auckland UniServices Limited, 2000, p.1). And during his presentation to the Royal Commission, John Kernohan (the Chief Executive Officer of UniServices) explained:

Last year UniServices undertook $11 million worth of research for biotechnology and pharmaceutical companies mainly outside of New Zealand. We employed university resources and supplemented that in various ways ourselves. Much of this work involves genetic engineering… (Kernohan quoted in RCGM, 2000, October 30, p.741)

In addition, it was evident that UniServices had helped to generate, and finance, a number of start-up companies and business ventures that were reliant on gene technology to some extent. For example:

- During 1995, NeuronZ Limited was developed around the research of Professor Peter Gluckman’s biomedical research team and UniServices invested $NZ2M in this company (Corbett, 2001, September 8-9; University of Auckland, 2001, p.17).
- During 1998, UniServices helped to establish Physiome Sciences Incorporated in Princeton, New Jersey (University of Auckland, 1999, p.34). The aim of this start-up company was to create models of biological processes, utilising biological
research in tandem with breakthroughs in information technology (Levin, 2000, pp.7-8).

- During 1999, partly motivated by a lack of venture capital that NeuronZ Limited had experienced, UniServices helped to establish a venture capital resource that became known as the New Zealand Seed Fund (Corbett, 2001, September 8-9; NZPA, 2000, July 27). After the Fund had successfully raised $NZ16M it went on to invest these funds in NeuronZ Limited and several other modern biotechnology start-up companies (Corbett, 2001, September 8-9).

- Also during 1999, UniServices helped to establish EPITCO Limited within the United Kingdom (Har Lee, 1999, October 15). As Har Lee (1999, April 29) explains, EPITCO Limited was established to exploit cancer therapies that were being developed within the University of Auckland's Cancer Society Research Centre, and to “tie up deals with large pharmaceutical outfits” (p.C3).

At the time of the Royal Commission’s inquiry, some of these start-up companies were perceived to have great commercial potential for the University of Auckland. For example, in the course of his submission, Dr Jeremy Levin (the Chief Executive Officer of Physiome Sciences Incorporated) explained that Physiome had attracted $US50M of investment (Levin, 2000, p.1) and was interested in funding biological research within Aotearoa New Zealand’s universities (Levin, 2000, p.7). And speaking in the wake of contracts that EPITCO Limited had signed with Vion Pharmaceuticals and AstraZeneca, John Kernohan of UniServices stated:

The effect of starting these companies and tie-ups with the likes of AstraZeneca mean UniServices and the University of Auckland get rich....There's a period where you need to build-up good ideas, staff and a reputation before the funds really flow. We're now realising some of those funds. (Kernohan quoted in Springall, 2001, March 15, p.15)

In the course of his submission to the Royal Commission, John Kernohan also explained that UniServices had “further start-up opportunities in the biotechnology field in view” (Kernohan quoted in RCGM, 2000, October 30, p.742). In accordance with Kernohan’s statement, in the latter half of 2001 two new ventures were formalised and announced. During October 2001, UniServices helped to launch Proacta Therapeutics Limited, a company that aimed to capitalise on research that was underway within the University of Auckland’s Cancer Society Research Centre (MacLeod, 2001, November 2; NZPA, 2001, November 3). And during December 2001, EndocrinZ Limited, a company that was structured around the work of scientists within the University of
Auckland’s Liggins Institute, was registered with the New Zealand Companies Office (NZPA, 2002, April 10).

The University of Auckland’s willingness to engage in entrepreneurial ventures was matched, to some degree, by the University of Otago. During the 2000 financial year, the University of Otago attained $NZ35.7M of revenue from its “commercial and consulting activity” (University of Otago, 2001, p.70), a result that was interpreted to be a clear demonstration of the University’s “growing success...at forming business relationships” (University of Otago, 2001, p.70). And as Ian Smith, the University’s Deputy Vice-Chancellor (Research and International) explained to the Royal Commission, applications of gene technology within the University had proved to be a valuable source of intellectual property. He commented:

In the past three months the University has been in commercial negotiation with various parties concerning the development and commercialisation of parts of its intellectual property portfolio. Interest is both from New Zealand and international investors. Most of the interest is in intellectual property created through the application of GMO techniques and products...The potential initial payments within the current negotiations exceed $15M. (Smith, 2000, pp.7-8)

In similarity with the University of Auckland, the University of Otago had also helped to generate start-up companies that were reliant on gene technology. For example, during 2000, intellectual property that had been created within the laboratory of Associate Professor John Tagg, and venture capital provided by a group of local business people, was used to establish Blis Technologies Limited (Senescall, 2000, September 5; University of Otago, 2002, p.9). In the course of this process the University of Otago recouped approximately $NZ2.5M from the sale of intellectual property, and when Blis Technologies listed on the New Zealand Stock Exchange in September 2000, the University of Otago received 20% of Blis Technologies’ shares (Blis Technologies Limited, 2001, pp.25-26; Senescall, 2000, September 5). Providing a second example, in August 2001 the University of Otago helped to launch Pacific Edge Biotechnology Limited, a company that aimed to use the University’s Cancer Genetics Laboratory as its “powerhouse” (NZPA, 2001, August 10, para.10).

The universities’ involvement in this realm of commercial pursuits, corporate shareholdings and venture capital had a number of consequences at the time of the Royal Commission’s proceedings. Firstly, it meant that the universities of Auckland and Otago had a direct commercial interest in a number of entrepreneurial ventures that were reliant, to varying degrees, on applications of gene technology. A summary of the
ventures that I have described, along with details of each university's financial stake in these ventures, is provided in Box 2.

Secondly, as a result of the universities' willingness to encourage entrepreneurialism, they had formed close relationships with several companies that were utilising gene technology. For example, at the time of the Royal Commission's inquiry:

- The laboratories of Protemix Corporation Limited had been established within the University of Auckland's School of Biological Sciences (University of Auckland, 2001, p.15);
- Zenith Technology Corporation Limited, a company formed by two former staff members of the University of Otago, was working with the University of Otago to commercialise several items of intellectual property (Macfe, 2003, April 1); and
- ViaLactia BioSciences, a biotechnology venture with $NZ150M of funding from the New Zealand Dairy Board, had established itself within the University of Auckland's Medical School (Collins, 2001, June 15; University of Auckland, 2001, p.17).

Thirdly, there were a number of people who held a position within one of the universities and who simultaneously possessed a role, or a financial stake, in one of the entrepreneurial ventures that I have described. In order to provide a few demonstrative examples:

- Professor Peter Gluckman was the Dean of the Faculty of Medicine and Health Sciences at the University of Auckland, and a Director and Chief Scientific Officer of NeuronZ Limited (Gluckman quoted in RCGM, 2000, October 30, p.744);
- Trevor Scott was a member of the University of Otago's Council (University of Otago, 2001, p.4), and a Director of the New Zealand Seed Fund (New Zealand Seed Fund Management Limited, 2001);
- Professor Peter Hunter was a faculty member of the University of Auckland's Department of Engineering Science, and a member of Physiome Science's Scientific Advisory Board (Caldwell, 2000, October, p.5);
- Assistant Professor John Tagg was an Associate Professor of Microbiology at the University of Otago, and a Consultant for Blis Technologies (Blis Technologies Limited, 2001, pp.7, 26);
Box 2: The Gene Technology-Related Entrepreneurial Ventures of the Universities of Auckland and Otago

University of Auckland

Auckland UniServices Ltd
- Wholly owned by the University of Auckland.
- At the time of the RCGM, Auckland UniServices held $11M of gene technology-related research contracts with biotechnology and pharmaceutical companies (Kernohan quoted in RCGM, 2000, October 30, p.741).

NeuronZ Ltd
- The largest tranche of NeuronZ Ltd’s shares was owned by Auckland UniServices Ltd (Corbett, 2001, September 8-9, p.B6).

Physiome Sciences Incorporated
- Partly owned by Auckland UniServices Ltd (University of Auckland, 1999, p.34).

EPTICO Limited
- 26% of EPTICO Limited’s shares were owned by Auckland UniServices Limited (Har Lee, 1999, April 29, p.C3)

Proacta Therapeutics
- Partly owned by Auckland UniServices Limited (Sheeran, 2001, December 16, p.5)

University of Otago

At the time of the RCGM, the University of Otago was anticipating over $NZ15M of payments in connection with its gene technology-related intellectual property (Smith, 2000, p.7).

Blis Technologies
- 20% of Blis Technologies’ shares were owned by the University of Otago (Blis Technologies Limited, 2001, pp.25-26).

New Zealand Seed Fund Management Ltd
- Partly owned by Auckland UniServices Ltd (Hood, 1999, p.6).

NeuronZ Ltd
- The third largest tranche of NeuronZ Ltd’s shares was owned by New Zealand Seed Fund Management Limited (Corbett, 2001, September 8-9, p.B6).

Pacific Edge Biotechnology Limited
- 2.5M shares were owned by New Zealand Seed Fund Management Limited (Pacific Edge Biotechnology Limited, 2001, p.5)

EndocrinZ Limited
- Partly owned by New Zealand Seed Fund Management Limited (EndocrinZ Limited, 2002)

Blis Technologies
- 20% of Blis Technologies’ shares were owned by the University of Otago (Blis Technologies Limited, 2001, pp.25-26).

Pacific Edge Biotechnology Limited
- 15% of Pacific Edge Biotechnology Limited’s shares were owned by the University of Otago (Pacific Edge Biotechnology Limited, 2001, p.5).

NB: The companies highlighted in blue were formed prior to, or during, the proceedings of the Royal Commission’s inquiry. The companies highlighted in green were registered with the New Zealand Companies Office shortly after the Royal Commission’s inquiry had been concluded (between 1 August 2001 and 31 December 2001).
• Professor Garth Cooper was a Professor of Chemistry and Biochemistry within the University of Auckland (Cooper, 2000, p.1), and the co-founder of Protemix Corporation Ltd (Owen, 2003, September 3, p.6); and

• Jennifer Gibbs was a member of the University of Auckland’s Council (University of Auckland, 2001, p.8), and a shareholder of NeuronZ Ltd (Corbett, 2001, September 8-9, p.B6).

There is no doubt that a number of positive benefits may be derived from these links that have developed (and that continue to develop) between the universities of Auckland and Otago, and the modern biotechnology industry. Amongst these potential benefits, it is possible that the universities will provide society with a greater quantity of beneficial technologies, become more responsive to societal needs, and increase their autonomy as they progress towards economic self-sufficiency. The present Government has often rehearsed such benefits as they have encouraged the universities to contribute to economic development (e.g., see Hodgson, 2001, p.1; New Zealand Government, 2002, pp.6-7), as have University Executives when they have stressed their enthusiasm for entrepreneurial ventures (e.g., see Hood, 1999, pp.4-6; Smith quoted in RCGM, 2000, October 25, p.511).

However, while the entrepreneurial spirit of the universities brings opportunities, it has also stimulated concern. One commonly expressed concern is that universities may be losing their ability to critique technological developments on behalf of society. Given this concern, this study explores the ability of the universities of Auckland, Canterbury, Lincoln and Otago to critique gene technology, and to implement their role as a critic and conscience of society, during the Royal Commission on Genetic Modification’s inquiry. The rationale of this role, and its operational requirements, are discussed in the following chapter.

Notes

1 Within Aotearoa New Zealand, public policy is created, financed and implemented within a number of portfolios, each of which is overseen by a government ministry and minister. As, during the 1980s and 1990s, the universities were affected by public policy reforms that were advanced within the research, science and technology portfolio, and the education portfolio, I have chosen to focus on these two branches of public policy reform in turn.
As Butterworth and Tarling (1994, p.242) have documented, it did not take long for an Aotearoa New Zealand Government to flex its new powers. Shortly after the 1990 General Election, funding that had been pledged to the University of Waikato’s Law School by the Labour Government was refused by the newly installed National Government. The funding was later to be partially restored, “but only after the costs in litigation, compensation and international publicity were rehearsed for the new Minister’s edification” (p.242).

As Kenney (1986, p.4) explains, start-up companies are typically joint business ventures that are formed by university personnel who provide expertise and intellectual property, entrepreneurs who provide business acumen and management expertise, and private investors who provide venture capital. In this sense, a start-up company is distinct from a company such as Auckland UniServices Limited, which is wholly owned by the University of Auckland.

These concerns are not unique to Aotearoa New Zealand and, indeed, have been expressed in many countries where universities have put past traditions aside in order to pursue entrepreneurial ventures. For example, see Hashimoto (1999, pp.244-249) for an account of concerns that were expressed in Japan during the 1960s, and Kenney (1986, pp.73-82) for an account of concerns that were expressed in the United States of America during the 1980s.
Chapter 3: The Role of Aotearoa New Zealand’s Universities as a Critic and Conscience of Society

During the policy reforms of the Fourth Labour Government, many people perceived that the institutional autonomy of Aotearoa New Zealand’s universities, and their capacity to serve as societal critics, was under threat (Butterworth & Tarling, 1994, pp.142-150; Patterson, 1991, pp.58-64; Savage, 2000, pp.43-48). As a consequence of this perceived threat, when several policy documents recommended that the universities be formally recognised as “a critic and conscience of society” (e.g., Hawke, 1988, p.52; New Zealand Government, 1989a, p.24, 1989b, p.41), this recommendation was well received (Butterworth & Tarling, 1994, p.192; Savage, 2000, p.46). Subsequently, with the passage of the Education Amendment Act 1990, the CCS role became enshrined, in law, as one of the universities’ defining characteristics.

The inclusion of the CCS role, within the Education Amendment Act 1990, has been interpreted in different ways. Some commentators interpreted it as an attempt, by the Fourth Labour Government, to recognise a legitimate role of the universities. For example, Holborow (1995) commented:

As one of those involved in working parties debating drafts of the bill in 1989 prior to its introduction to Parliament, I am happy to testify that the inclusion of this section was in no way inadvertent. The then Minister, Mr Phil Goff, supported its inclusion and so did the Opposition, on the basis that it was regularly cited in the British, Australian and some North American literature about the role of the university. (p.19)

However, others viewed the Government’s actions more cynically, and interpreted them as an attempt to placate university personnel, and to pander to their egos, at a time of radical change within the university sector (e.g., see Allan, 2003, March 7).

It is also a moot point whether Aotearoa New Zealand’s universities have ever successfully implemented their role as a critic and conscience of society. While the CCS role is an institutional role, allocated to the universities of Aotearoa New Zealand, its exercise is dependent on the activity of individuals within each university. The activities of university personnel in this regard have had mixed reviews. For example, following a study of Aotearoa New Zealand’s universities in the early 1980s, the OECD (1983) commented:
Radical critics of New Zealand society can certainly be found. Social scientists and students of the humanities in universities and elsewhere use the opportunities that a free society offers to expose what they believe to be the complexities, contradictions and hypocrisies that lie close to the surface of economic and social routines. (p. 10)

In contrast, Jesson (1997) has argued that “New Zealand... has never had a significant number of intellectuals who have contributed to society by being critics of it” (pp. 10-11), and, in the opinion of Kelsey (1995), university personnel have served as social critics “rather too rarely” (p. 327).

Despite this variety of sentiments, spokespeople for Aotearoa New Zealand’s universities regularly affirm their university’s commitment to the CCS role (e.g., see NZAAU, 1996a, p. 4, 1996b, p. 4, 1997a, p. 5, 1997b, p. 8, 1998a, pp. 4-5, 1998b, p. 5). And for some commentators at least, the role of critic and conscience of society is central to the universities’ raison d’être (see Boston, 1995, pp. 143-147; Jones et al., 2000, p. 23; Reid, 2001, pp. 193-195). For example, Jones et al. (2000), of the New Zealand Universities Academic Audit Unit, have commented:

"It is central to what universities exist for, across research, teaching and community service, and without it the character of universities would be transformed beyond recognition." (p. 23)

Such expressions of support are worthy of further exploration and so, in the following section, I describe a number of societal benefits that are associated with the universities’ CCS role. Then, in Section 3.2, I focus upon the operational requirements of the universities’ CCS role, emphasising, in the process, the relationship that exists between the exercise of this role and the exercise of academic freedom.

### 3.1 The Rationale of the CCS Role

The fact that universities are asked to serve as a critic and conscience of society, and that university spokespeople regularly affirm their university’s commitment to the CCS role, suggests that this role is perceived to have some worth. What does society gain from having universities that act as its ‘critic and conscience’? Below I discuss three replies to this question that are commonly stated in the literature.
3.1.1 Access to the knowledge that university personnel possess

As part of the universities' role as a critic and conscience of society, university personnel are expected to actively engage with society. For example, they are expected to share their knowledge with society's members, and apply their knowledge to the issues that confront society (Boston, 1995, pp.143-144; Grimshaw, 2003, March 28). While this is partly achieved through the interaction between staff and students within the universities, the CCS role also requires university personnel to reach out, beyond their immediate environs, to the wider communities of which they are a part.

It is thought that society gains numerous benefits when university personnel reach out in this manner. As a result of university personnel's involvement in teaching and scholarship, they are often well placed to remind society's members about the knowledge and lessons that their society has attained, and the values and traditions that their society has embraced, in former times (Duderstadt, 2000, p.41). In addition, as a result of their research activities and their engagement with various professions, university personnel often possess insights, and new forms of knowledge, that can inform decision-making processes, encourage progress, and highlight problems in society (Bok, 1982, p.18; Boston, 1995, p.144; Filmer, 1997, p.57).

A good demonstration of this latter point is provided by the case of the "Canterbury Doctors" (Savage, 2000, p.115). During the mid 1990s, whilst the National Government was endeavouring to commercialise healthcare in Aotearoa New Zealand, several staff members of the University of Otago's Christchurch School of Medicine raised concerns about patient safety at Christchurch Hospital (Savage, 2000, pp.115-116). When the managers of Christchurch Hospital ignored their concerns, this group of university personnel decided to share their insights and concerns with the public, "claiming that it was their right as academics to raise these issues" (Savage, 2000, p.116). By doing so, they helped to prompt an inquiry, by the Health and Disability Commissioner, which revealed that their concerns had been well founded (Bruce, 1998, October 21; Kelsey, 2000, p.234). In addition, they helped to stimulate an intense debate about the state of healthcare in Aotearoa New Zealand (Savage, 2000, p.116). This latter outcome resonates with the next issue I discuss.
3.1.2 *A Contest of Ideas*

Universities are asked to serve as a critic and conscience of society, in part, to ensure that there will be a contest of ideas in society. To some extent, it is expected that university personnel will create a contest of ideas as they share their knowledge with society’s members. Reflecting the ‘critic’ aspect of the CCS role, university personnel are expected to produce a contest of ideas by critiquing the beliefs, practices, policies and institutions that are established, or developing, within their society (Arblaster, 1974, pp.20-21; Filmer, 1997, p.57). And reflecting the ‘conscience’ aspect of the CCS role, in the course of their critiques, university personnel are expected to consider, and enunciate, values and principles that they consider to be important (Green, 1969, pp.321-322; Jesson, 1997, p.9).

When university personnel act in this manner they are thought to create a “space for a critical analysis of social issues” (Currie, 1998, p.3), a space in which positive aspects of society can be affirmed and in which negative aspects of society can be highlighted (Boston, 1995, pp.146-147). And, as Kennedy (1997) explains, when university personnel ask difficult questions such as “What have we become?” (p.265) and “Why don’t we do things differently?” (p.265), their actions help to “reflect society to itself, and at the same time challenge that self-image” (p.265).

Just as importantly, when university personnel act in this manner they are thought to nurture a society in which the exchange of information and opinion are seen as positive, and in which citizens are encouraged, and assisted, to think critically about the society they live in (Kelsey, 2000, p.244; Malcolm, 1999, December, pp.20-22). As Malcolm (1999, December) explains:

> The legislation states that a university is primarily concerned with advanced learning; its principal aim is to develop intellectual independence. This gives the clue to its role as a critic and conscience of society. It fulfills that role through the nurturing and maintaining of those qualities of mind that give people the intellectual capacity and resources to exercise moral and social judgements for themselves. It is fulfilled through creating and maintaining a community in which freedom of thought and expression is fundamental, a community in which all knowledge is open to rational enquiry and contestable on the basis of available evidence. (p.21)

As a third type of benefit, when university personnel act in this manner they are thought to provide a valuable counterweight to those who hold power in society. While
this benefit of the CCS role is intertwined, to some degree, with other benefits that I have already mentioned, it merits further discussion.

### 3.1.3 A Counterweight to Those Who Hold Power

As a component of their CCS role, university personnel are asked to provide a check on those who hold power in society. As part of this duty they are expected to maintain “a position of critical independence” (Jesson, 1997, p.9) and a willingness to:

- challenge “sources of power and authority” (Jesson, 1997, p.9);
- “confront orthodoxy and dogma” (Said, 1994, p.11);
- explore “how power is abused in particular cases” (Scott, 1996, p.177); and
- advocate for the interests of those who lack power in society, or a voice in decision-making processes (Said, 1994, p.11).

Throughout history there have been numerous examples of universities, and university personnel, who have endeavoured to play such a role. For example, Green (1969, pp.321-322) recalls that in Medieval Europe, where religious orders possessed great power, universities were “repeatedly in conflict with their temporal and ecclesiastical superiors” (p.9). Coser (1965, pp.215-225) describes how the activities of a group of French university personnel, between 1894 and 1906, helped to secure a pardon for a civil servant (Alfred Dreyfus) who had been unjustly imprisoned by the French Government. And Gouldner (1979, p.16) observes that within the United States of America, during the 1970s, many university personnel helped to debate, and challenge, their country’s involvement in the Vietnam War.

These examples help to demonstrate some of the societal benefits that are associated with this facet of the CCS role. Generally speaking, when university personnel challenge and critique powerful institutions, it is thought that they help to curb the power of these institutions and to sustain the openness of society (Dworkin, 1996, p.189; Olssen, 2002, p.37; Turner, 1988, p.111). In addition, it is thought that by representing “all those people and issues that are routinely forgotten or swept under the rug” (Said, 1994, p.11), and working to combat injustice, discrimination and cruelty, university personnel can help to create a society that is more just and fair (Fernando, Hartley, Nowak & Swineheart, 1990, p.6).
3.2 The Operational Requirements of the CCS Role

In discussing the rationale of the universities' CCS role, I have touched upon a number of activities that are linked to this role. The attempts of university personnel to share their knowledge with society's members, to produce a contest of ideas in society, and to provide a check on those who hold power in society, are all aspects of this role. Collectively, they help to depict what it means, in practice, for a university to serve as a critic and conscience of society. In this section I explore, in more detail, the operational requirements of the CCS role.

At the outset it is important to note that, while university spokespeople regularly affirm their university's commitment to the CCS role, the operational requirements of this role lack clarity. This lack of clarity is demonstrated by the occasional disputes that occur, between university personnel and University Executives, over the proper exercise of this role (e.g., see De Boni, 2002, April 8; Norrie, 1999, August 21; Richards, 1998, October 13). It is also demonstrated by the experiences of staff members within the New Zealand Universities Academic Audit Unit, who, in the course of a series of conversations with university personnel, discovered that interpretations of the CCS role varied. For example, following discussions with representatives of the University of Otago (OU), the Unit's audit panel reported:

The panel discussed with a large number of people the statutory requirement on universities to take on a role as 'critic and conscience of society', and was not entirely reassured by the responses it received. Oral support was expressed at the highest levels of OU, and some examples given of this occurring. OU can furnish examples of socially influential research and reports, it appropriately supports the community by the extensive involvement of staff in media comment, and it recognises this by listing in the OU newsletter the names of the staff involved. However, this is not necessarily carrying out a critic or conscience role, although several people interviewed by the panel felt that it is... (NZAAU, 1996a, p.4)

However, this is not to say that there is a complete lack of consensus over the operational requirements of this role. In the following section I discuss why the exercise of academic freedom, and a group of rights and responsibilities, are considered to be integral to the CCS role.
Within the literature, the universities' role as a critic and conscience of society, and the concept of academic freedom, are often discussed in tandem (e.g., see Jones et al. 2000; Martin, 1995; Reid, 2001; Scott, 1996, pp.177-178; Turner 1988, pp.105-109). In part, this is because it is commonly accepted that academic freedom enables university personnel, and thus universities, to serve as a critic and conscience of society. As Jones et al. (2000) explain:

Universities need to create an optimal environment within which academic freedom can survive and flourish. It is only when they espouse this ethos, that the exercise of the role of critic and conscience can be fostered and rewarded within the university sector as a whole. (p.23)

The concept of academic freedom actually entails a number of interconnected rights (or freedoms) that intersect with the universities' CCS role. Amongst these is the right of university personnel to engage in research, and to choose their own research topics (Jones et al., 2000, p.15; UNESCO, 1997, p.30). Many people in society do not have the opportunity or inclination to engage in research, and, for those who do, many have personal circumstances that steer them away from complex or controversial topics. By giving university personnel the freedom to explore topics that they deem to be important, including topics that are complex or controversial, it is thought that society will reap an assortment of valuable information (Bok, 1982, p.73; O'Hear, 1988, pp.15-16; Scott, 1996, pp.166-167).

A second type of freedom that intersects with the universities' CCS role is the right of university personnel to form their own conclusions (Dworkin, 1996, pp.189-190; Jones et al., 2000, p.7; Seligman et al., 1967, pp.162-163). Academic freedom, in this sense, is freedom from the obligation to conform to current theories and beliefs, as well as freedom from "externally applied presuppositions about where...investigations will lead" (Jones et al., 2000, p.7). Such freedoms are considered integral to the universities' CCS role because they enable university personnel to critique society from a position of independence. As Jaspers (1960) comments:

The university is meant to function as the intellectual conscience of an era. It is to be a group of persons who do not have to bear responsibility for current politics, precisely because they alone bear unlimited responsibility for the development of truth. (p.132)
A third type of freedom that is commonly associated with the concept of academic freedom, is the right of university personnel to communicate their knowledge and ideas. This right actually entails a number of more specific rights, including:

- the right to disseminate research findings (Jones et al., 2000, p.15; UNESCO, 1997, p.30);
- the right to "question and test received wisdom, to put forward new ideas and to state controversial and unpopular opinions" (Education Act 1989, Section 161(2)(a));
- the right to express opinions about one's own university (Jones et al., 2000, p.6; UNESCO, 1997, p.30);
- the right to participate in the activities of professional or representative bodies (Jones et al., p.6; UNESCO, 1997, p.30); and
- the right, while exercising the above freedoms, to the support of University Executives (Education Act 1989, Section 161(4); Jones et al., 2000, p.16; UNESCO, 1997, p.29).

While the intent of many of these rights is self-explanatory, university personnel's right to the support of University Executives may benefit from further explanation. When university personnel critique aspects of society, and put forward their ideas, they risk entering into conflict with members of society. As Arblaster (1974, p.21) notes, "criticism and challenge are always apt to be resented". Based on this recognition, it is frequently argued that, in order for university personnel to act as a critic and conscience of society, University Executives need to play a supportive role. To be more specific, it is argued that University Executives need to encourage "creativity, radical ideas and criticism of the status quo" (Jones et al. 2000, p.1), and assist university personnel to express their knowledge and ideas (Arblaster, 1974, pp.20-21; Duderstadt, 2000, p.241; Jones et al., 2000, pp.1-4; Martin, 1995, p.106; Said, 1996, p.223; Scott, 1996, p.178; Turner, 1988, pp.106-109). Section 161(4) of the Education Act 1989, which instructs University Councils and Vice-Chancellors to preserve and enhance the academic freedom of university personnel, is in keeping with such sentiments.

This point illustrates an important aspect of the concept of academic freedom: the freedoms and rights of university personnel are tied in with a group of responsibilities. University Executives (e.g., the Vice-Chancellors), and others with a role in university governance (e.g., the members of a University Council), gain a responsibility to create conditions that nurture the freedoms and rights of university personnel. In addition, as a
result of the rights that they are granted, university personnel also gain a number of responsibilities. As Tight (1988) has commented:

...while academic freedom may be given to or assumed by academics, as a privilege or as a necessary part of their job, this carries with it an inevitable *quid pro quo* in terms of expectations, responsibility and accountability. (pp.129-130)

Several of these responsibilities are integral to the universities’ CCS role. For example, it is commonly recognised that it is important for university personnel to act with honesty and integrity in the course of their activities (Evans 1999, pp.21-23; Hook, 1969, p.37; Jasper, 1960, p.19; Jones et al., 2000, p.2; Kennedy, 1997, p.210; Russell, 1993, p.41; UNESCO, 1997, p.31). In the words of Jones et al. (2000):

To function [as a critic and conscience of society]...dialogue has to occur between universities and society, dialogue that will only be possible if university staff act with integrity and if this integrity is widely respected outside universities. (p.2)

Similarly, Kennedy (1997) observes:

The relationship between universities and their public is more dependent on trust than anything else. For this reason, perhaps, mendacity is viewed as the least forgivable blot on academic duty. (p.210)

A second type of responsibility that is commonly associated with academic freedom, and the universities’ CCS role, is the responsibility of university personnel to abide by commonly accepted academic practices. As Seligman et al. (1967) declared:

The liberty of the scholar within the university to set forth his conclusions, be they what they may, is conditioned by their being conclusions gained by a scholar’s method and held in a scholar’s spirit; that is to say, they must be the fruits of competent and patient and sincere inquiry, and they should be set forth with dignity, courtesy, and temperateness of language. (Seligman et al., 1967, p.169)

Within the literature on academic freedom a large number of academic practices are held to be important in this regard, including:

- use of evidence to support arguments (Russell, 1993, p.44; UNESCO, 1997, p.31);
- full and open presentation of methods (Bok, 1982, p.171);
- abidance by ethical standards (Evans, 1999, pp.16-21; Jones et al., 2000, p.19; Russell, 1993, p.44; UNESCO, 1997, pp.30-31); and
- attempts to fairly address the conflicting ideas of others (Evans, 1999, p.16; Jones et al., 2000, pp.19-20; UNESCO, 1997, p.31).
These responsibilities, along with the rights I discussed earlier, are by no means the only components of academic freedom that are mentioned in the literature. However, they are a group of rights and responsibilities that are particularly pertinent to the universities’ CCS role. If limitations are placed on the freedoms and rights I have discussed, it can be reasoned that the ability of university personnel to share their knowledge with society’s members, to produce a contest of ideas in society, and to provide a check on those who hold power in society, will also be limited. It is also possible that university personnel’s activities, in the presence of such limitations, will be characterised by “dullness” (Arblaster, 1974, p.18), “conformity” (Dworkin, 1996, p.189), and a “careful conservatism” (Said, 1996, p.219).

Similarly, it can be reasoned that the universities’ exercise of the CCS role will be impaired if university personnel fail to abide by the responsibilities I have discussed. Of course, university personnel may still help to produce a contest of ideas in society when they use their freedom to express falsehoods, suppress the ideas of others, or to curry favour with powerful organisations. However, such actions are likely to have a number of detrimental effects on debates, planning, and decision-making within society, and, for this reason, they are inconsistent with the rationale of the CCS role.

3.2.2 Why do the Operational Requirements of the CCS Role Lack Clarity?

Given that the relationship between academic freedom and the CCS role is commonly accepted, why do the operational requirements of the CCS role lack clarity? A major reason for this lack of clarity is the ambiguous nature of academic freedom, and the rights and responsibilities that I have described. As Menand (1996) has commented:

A...deeply misleading assumption informing the debate over the future of the university is the notion that there exists some unproblematic conception of academic freedom that is philosophically coherent and that will conduce to outcomes in particular cases which all parties will feel to be just and equitable. No such conception exists... (p.5)

Three areas of debate within the literature help to demonstrate this point. Firstly, while it is commonly accepted that university personnel should receive support from University Executives, as they endeavour to communicate their knowledge and ideas, opinions differ regarding the appropriate level of support. For example, during a series of audits carried out by the New Zealand Universities Academic Audit Unit, University
Executives often commented that university personnel were free to communicate their views and argued that this demonstrated their support for the CCS role (Jones et al., 2000, p.3). However, given the many barriers that can prevent university personnel from acting as a critic and conscience of society (e.g., lack of time or fear of reprisals), Jones et al. (2000) have argued that University Executives need to be more proactive in their support. For example, they suggest that it is important for University Executives to actively encourage research on uncomfortable topics, and to create incentives (such as rewards, recognition and financial assistance) that can encourage university personnel to share their knowledge and ideas with society’s members (Jones et al., 2000, pp.3-4).

Secondly, opinions vary as to whether the right of university personnel to communicate their knowledge and ideas, and to receive support from University Executives, should be constrained according to their areas of expertise. Some commentators, such as Jones et al. (2000, pp.6-9) and Tight (1988, p.118), argue that academics should have no special freedom to speak on topics that lie outside their areas of expertise. In the opinion of Tight (1988), for example:

There seems to be no reason why an academic should have any more right to exercise academic freedom in an area outside their acknowledged expertise than, say, a student or, for that matter, a member of the general public. This is not to say that academics, or anyone else, should be prevented from expressing their non-specialist views, but it should be clear that these are made in a non-academic capacity (and ideally, perhaps, should be made privately or off-campus). (p.118)

However, other commentators reject this argument on the basis that ‘expertise’ is problematic to define, and that academics need to be encouraged to address a variety of societal issues. For example, Bok (1982) comments:

Who is to say whether Bertrand Shaw was merely a playwright and Bertrand Russell only a logician – and hence incompetent to speak on the great social and political questions of the time? (Bok, 1982, p.29)

Similarly, Olssen (2001, March 16) argues:

If it is to serve an important function, academic freedom must allow academics a far greater latitude than speaking in their own area of expertise. It must allow them to speak on anything at all! In short, it must allow them to act as the “critic and conscience of society”. (p.11)

Thirdly, while it is commonly accepted that university personnel should have the right to critique practices within their own university (Jones et al., 2000, p.6; UNESCO, 1997, p.30), debates occur over the bounds of this freedom. For example, Jones et al.
argue that the freedom of university personnel to critique their own university is implicit within the universities' CCS role, but they qualify this by stating:

Use of academic freedom as an excuse to criticise routine aspects of university spending or management structure, or to carry out character attacks on senior university personnel is a travesty of the notion of academic freedom. (p.6)

It is not uncommon for such provisos to be stated in the course of disputes between University Executives and university personnel. For example, it has been argued in the midst of such disputes that the right to criticise one's own university carries with it the responsibility to be fair and reasonable (Evans, 1999, pp.16-17), and to express criticisms in a manner that enables debate (Savage, 2000, p.181).

The longevity, and frequency, of debates over the operational requirements of academic freedom, suggests that they are difficult to resolve. Therefore, in order to develop an evaluation framework for the purposes of my study, it was necessary for me to adopt a position on several aspects of academic freedom and the universities' CCS role. While the evaluation framework I developed is not without its shortcomings, by explaining its rationale and boundaries, within the following chapter, I aim to clearly convey the logic of my investigation.

Notes

1 Despite the fact that the CCS role is listed in current legislation as one of the universities' defining characteristics, there have been few attempts to define the operational requirements of this role. The most detailed attempt that I have come across is an evaluation framework discussed by Jones et al. (2000), which draws upon their insights as members of the New Zealand Universities Academic Audit Unit. However, in the wake of this attempt, Olssen (2001, March 16) has severely criticised the conception of the CCS role that Jones et al. (2000) promote, demonstrating, in the process, the contested nature of the CCS role.

2 Winner (1986) argues that criticism levelled at new forms of technology is particularly prone to resentment. In his opinion, critics of literature, music, theatre and arts tend to have a well-established role in society, which is valued for the bridge it provides between artists and audiences. In contrast, critics of technology are often accused of being anti-progress and are "not yet afforded the same glad welcome" (p.xi).
Chapter 4: The Evaluation Framework and Research Methods

The central aim of my study was to develop an answer to the following research question: to what extent did the universities of Auckland, Canterbury, Lincoln and Otago implement their role as a critic and conscience of society, during their involvement in the Royal Commission on Genetic Modification? In Chapter 1 I outlined the methodology I used to develop an answer to this question. In this chapter I explain two facets of my methodology in greater depth: the framework I used to evaluate the four universities' involvement in the Royal Commission on Genetic Modification, and the methods I used to collect information.

4.1 The Evaluation Framework

At the time of my study, there was no established framework that I could use to evaluate the universities' involvement in the Royal Commission's inquiry. As a result, it was necessary for me to create my own framework. In this section I seek to explain:

- how my evaluation framework is focused upon one of several operational requirements of the CCS role, namely, the right of university personnel to communicate their knowledge and ideas;
- how I have interpreted this right; and
- the content of my evaluation framework.

4.1.1 The Focus of the Evaluation Framework

In Chapter 3 I described a number of rights and responsibilities that are associated with the concept of academic freedom, and that need to be exercised if the universities are to implement their CCS role. Exploring the exercise of any of these rights and responsibilities would provide insight into the universities' ability to implement their CCS role. However, as a result of the time constraints I faced, I decided to focus upon one
aspect of academic freedom that was integral to this role: the right of university personnel to communicate their knowledge and ideas (see Box 3).

It is important to note that, by focusing in this manner, I have not sought to explore a number of dimensions of the universities' CCS role. Given a greater period of time it would have been interesting to explore some of these dimensions. For example, it would have been interesting to explore university personnel's ability to select their own research topics, and to research contentious aspects of gene technology, in the years that preceded the Royal Commission's inquiry.

However, I settled upon this focus for two principal reasons. Firstly, I perceived that I could evaluate the exercise of this right in a meaningful fashion, in the time that I had available. In contrast, the exercise of other rights and responsibilities was more difficult to evaluate. For example, it was difficult to identify any robust procedure that I could use to evaluate the honesty and integrity of university personnel. And, to provide a second example, in order to evaluate university personnel's ability to research aspects of gene technology, I would have needed to engage with an unwieldy data set, e.g., data associated with research policies and levels of research funding, within the four universities, throughout the 1990s.

Secondly, I perceived that this would be a relevant, and interesting, focus for my evaluation framework. At the time of the Royal Commission on Genetic Modification, some concern existed about university personnel's ability to express views on contentious topics (see Jones et al., 2000, pp.20-22; Kedgley, 2000; Kelsey, 2000, pp.232-239; Savage, 2000, pp.113-121). For example, with regard to the Royal Commission's impending inquiry, Kedgley (2000) had commented:

For science to flourish we need strong independent universities where scientists feel confident to speak out and to push back the frontiers of knowledge; a climate where scientists are encouraged to think for thoughts' sake, and above all a climate where scientists have the freedom to speak out as the critic and conscience of society. Instead we have a climate developing where dissent is not tolerated and where scientists are actively discouraged from acting as the critic and conscience of society. (para.7)

By exploring university personnel's ability to communicate their knowledge and ideas about gene technology, I sought to explore the validity of this concern.
Box 3: Rights and Responsibilities that are Integral to the Universities’ Role as a Critic and Conscience of Society

- The right of university personnel to engage in research and to choose their own research topics.

- The right of university personnel to form their own opinions about the topics they study.

<table>
<thead>
<tr>
<th>The Focus of the Evaluation Framework</th>
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<tbody>
<tr>
<td>- The right of university personnel to communicate their knowledge and ideas, including:</td>
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<tr>
<td>- the right to disseminate research findings;</td>
</tr>
<tr>
<td>- the right to “question and test received wisdom, to put forward new ideas and to state controversial and unpopular opinions” (Education Act 1989, Section 161(2)(a));</td>
</tr>
<tr>
<td>- the right to express opinions about one’s own university;</td>
</tr>
<tr>
<td>- the right to participate in the activities of professional or representative bodies; and</td>
</tr>
<tr>
<td>- the right, while exercising the above freedoms, to the support of University Executives.</td>
</tr>
</tbody>
</table>

- The responsibility of university personnel to act with honesty and integrity.

- The responsibility of university personnel to abide by commonly accepted academic practices.
4.1.2 Interpreting the Rights of University Personnel

As observed in Chapter 3, the right of university personnel to communicate their knowledge and ideas can be interpreted in a number of ways. For example, opinions differ over the level of support that university personnel should receive from University Executives, whether this right should be constrained according to each academic's area of expertise, and the responsibilities that university personnel should discharge before they criticise their own university.

These are all difficult issues to resolve. What constitutes an appropriate level of support may, quite justifiably, be deemed to vary, depending on the resources that University Executives have at their disposal. And any attempt to regulate the public utterances of university personnel, and to make them conditional on notions such as 'expertise' and 'responsibility', has the potential to constrain their ability to act as a critic and conscience of society. For example, if university personnel were only permitted to critique aspects of society on the basis of empirical research, this may prevent them from critiquing society on the basis of theory, morality or reason.

Rather than attempting to define who should have a right to express their views, and to receive support from University Executives, I chose to regard all views as worthy of expression. Having adopted this position, my principal interest was in exploring whether all university personnel had an equal opportunity to express their views, and whether, to use the phrase of Tight (1988), there had been an "even-handedness of treatment" (p.128) within the universities.

There were two facets of the Royal Commission's inquiry that, in my opinion, helped to justify this position. Firstly, the Royal Commission had been created to investigate some extremely broad topics, including:

- "the strategic options available to enable New Zealand to address, now and in the future, genetic modification, genetically modified organisms, and products" (RCGM, 2001a, p.364);
- "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" (RCGM, 2001a, p.365); and
- "the main areas of public interest in genetic modification, genetically modified organisms, and products" (RCGM, 2001a, p.365).
Due to the breadth of these topics, a wide range of university personnel could have made a valuable contribution to the Royal Commission’s inquiry. University personnel who held knowledge about ethical, cultural, economic or environmental issues that intersected with gene technology, had just as much potential to contribute to the inquiry as those who possessed an understanding of the technical aspects of gene technology.

Secondly, the Royal Commission was investigating a number of high profile and contentious topics. Consequently, for this inquiry to be rigorous, it was important for all manner of views to be expressed and considered. For example, it was just as important for university personnel who were enthusiastic about gene technology to explain their views, as it was for university personnel who held reservations.

Collectively, my focus on the right of university personnel to communicate their knowledge and ideas, and my interpretation of this right, provided the foundation for my evaluation framework. Having explained this foundation, I now wish to explain the content of my framework.

4.1.3 The Content of the Evaluation Framework

In Chapter 1 I described three forms of contribution that the universities made to the Royal Commission’s inquiry:

1. the submissions that each university presented during their involvement in the Formal Hearings (the University Submissions);
2. the support that a number of University Executives provided for the activities of the New Zealand Life Sciences Network; and
3. the contributions that a number of university personnel (the Other Contributors) made while acting as individuals, or representatives of an organisation other than their own university.

In order to evaluate the extent to which the universities implemented their CCS role during the Royal Commission’s inquiry, I reasoned that it was important to evaluate each of these contributions in turn.

Drawing upon my interpretation of university personnel’s right to communicate their knowledge and ideas, I considered how I could evaluate the compatibility of each form of contribution with the universities’ CCS role. These considerations formed the
content of my evaluation framework. They are discussed below and they are summarised, at the end of this section, in Table 1.

The University Submissions were a facet of the universities’ involvement in the Royal Commission on Genetic Modification that caught my attention from the outset. In former eras it was unusual for an Aotearoa New Zealand university to adopt an institutional stance on public policy issues. As Perkins (1973) once observed, during a speech at the University of Canterbury:

Those in charge of our political life often complain that the universities sound like a discordant orchestra without a conductor – even on matters close to their own interest, let alone on issues of more general public policy....A professor is, as Carl Becker has said, a person who thinks otherwise. The university as an institution has at its core a constituency prepared to resist vigorously the very idea of a university position on anything. (pp.18-19)

Thus, while considering the University Submissions, I wondered if a special attempt had been made to summarise the knowledge and ideas that existed within each university, as this action would have been very much in keeping with the universities’ CCS role. I also wondered if the University Submissions had communicated the views of some university personnel while neglecting the alternative views of others, as such an action would be at odds with the universities' CCS role. In summary, I reasoned that the University Submissions would have been consistent with the universities’ CCS role to the extent that they assisted university personnel to communicate their knowledge and ideas.

With regard to the support that some University Executives provided for the activities of the New Zealand Life Sciences Network, I reasoned that University Executives, like all university personnel, had a right to express their views on gene technology. However, due to the authority and influence they possessed, I also reasoned that University Executives had a special responsibility to encourage, and to avoid inhibiting, the expression of alternative views. Consequently, while evaluating the activities of University Executives during the Royal Commission’s inquiry, I reasoned that these activities would have been consistent with the universities’ CCS role to the extent that they assisted university personnel to communicate their views on gene technology.

Finally, with regard to the activities of the Other Contributors, I reasoned that their activities would have been consistent with the universities’ CCS role to the extent that they had enabled university personnel to communicate their views on gene technology. Prior to the Royal Commission’s inquiry there had been speculation that some university...
personnel, who held concerns about gene technology, were afraid to express their concerns in the public arena (see Kedgley, 2000). Consequently, I was interested to see if this group of university personnel had experienced any constraints during their involvement in the Royal Commission's inquiry, and whether they had been able to express all of their views on gene technology.

It is important to note, therefore, that the lines of reasoning I have described played two important roles within my methodology: firstly, they provided a framework that I could use to evaluate the universities' involvement in the Royal Commission's inquiry; and secondly, they guided me as I searched for relevant information. In the following section I explain the research methods that I used, in the course of my study, to collect information.

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Consistency with the CCS Role</th>
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</thead>
<tbody>
<tr>
<td>The University Submissions</td>
<td>Dependent on the extent to which the submissions assisted university personnel to communicate their knowledge and ideas during the Royal Commission's inquiry.</td>
</tr>
<tr>
<td>University Executives' support for the activities of the New Zealand Life Sciences Network</td>
<td>Dependent on the extent to which these activities assisted university personnel to communicate their knowledge and ideas during the Royal Commission's inquiry.</td>
</tr>
<tr>
<td>The activities of the Other Contributors</td>
<td>Dependent on the extent to which these activities enabled university personnel to communicate their knowledge and ideas during the Royal Commission's inquiry.</td>
</tr>
</tbody>
</table>
4.2 Research Methods

4.2.1 Review of Existing Information

Before attempting to collect new information, it made sense to make use of any relevant information that existed in the public domain. In the case of my research topic, an extensive amount of relevant information existed. As I spent several months reviewing this information at the outset of my study, I will briefly describe these sources of information and how I utilised them.

One source of information that I drew upon heavily was the Internet site of the Royal Commission on Genetic Modification (www.gmcommission.govt.nz). During the Royal Commission’s inquiry, and following its conclusion, this Internet site was used to disseminate information that the Royal Commission had received. During the course of my study, the information I was able to access at this Internet site included:

a) the written submissions that all Interested Persons and their witnesses presented during their participation in the Royal Commission’s Formal Hearings;

b) transcripts of the proceedings of each day of the Royal Commission’s Formal Hearings;

c) electronic copies of over ten thousand written submissions that the Royal Commission received, following its request for submissions from the public; and

d) transcripts of the proceedings of the hui that were conducted as part of the Royal Commission’s Māori Consultation Programme.

In addition, following a search for information on the four universities’ involvement in the Royal Commission’s inquiry, which utilised Internet search engines and various electronic databases (including Newztext and Index New Zealand), I identified a number of other sources of information. These included periodicals, published within a university, in which University Executives had commented on their university’s involvement in the Royal Commission’s inquiry. In addition, it included newspaper articles and Internet sites, in which university personnel had written about their experiences during the Royal Commission’s inquiry.

In total, this collection of information included over one thousand pages of written text. In order to make use of this information, I read through it and collated relevant information into paper or electronic files. Many of the examples and quotations that appear in the following chapters are a by-product of this process. In addition, as a result
of this process, I was able to identify a number of topics that required further exploration.

4.2.2 Content Analysis of Submissions

In order to explore various written submissions in greater detail, I used a method that is known as Content Analysis. There are two characteristics that help to define Content Analysis, and to set it apart from other methods used to analyse the content of written documentation. Firstly, Content Analysis is used to analyse the content of written documentation in quantitative terms (Berger, 1998, p.116; Crano & Brewer, 2002, p.245; Neuendorf, 2002, p.1; Singleton & Straits, 1993, p.381). This is achieved by defining a set of categories that are of interest, and by using a set of procedures to count the instances of each category that occur within a document. Secondly, as Content Analysis involves a set of defined categories and procedures, it is a systematic method that can be explicitly described (Adams & Schvaneveldt, 1985, p.305; Babbie, 1998, pp.129-133; Crano & Brewer, 2002, p.245; Hodson, 1999, pp.65-66; Krippendorf, 1980, pp.49-50; Neuendorf, 2002, p.1). I chose to use Content Analysis in the course of my study, primarily, because of this latter characteristic.

As an analytical method, Content Analysis also has several limitations that are worth noting at the outset. Firstly, while Content Analysis is useful for exploring features of written documentation that can be simply and reliably counted, it is of little use for exploring other, more qualitative, features of written documentation. Secondly, as a consequence of the “multifunctionality” (Sigman, Sullivan & Wendell, 1988, p.171) of language, the application of a Content Analysis inevitably relies on a plethora of interpretative processes that are difficult to explain. Therefore, while a Content Analysis is meant to follow a clearly defined procedure, in reality, this is only possible to a limited extent.

The Content Analysis that I carried out followed a number of steps. As a first step in my procedure, I needed to focus my analysis somehow. As I have mentioned previously, I was interested in exploring which views had, and had not, been included in various submissions. After reading through a large number of submissions I decided to analyse two aspects of their content that seemed particularly relevant: the extent to which each submission had addressed various applications of gene technology (e.g., applications
in research, healthcare and food production); and the manner in which each submission evaluated various applications of gene technology (i.e., the number of positive, neutral and negative evaluations that had been stated with regard to each application).

As a second step in my procedure, I designed a Coding Framework that defined various applications of gene technology, various types of evaluation, and the procedures I would use to count instances of each application and evaluation. The design of my Coding Framework was achieved partly through an iterative process, in which I formulated, trialled, and refined procedures as I re-read submissions. In addition, it was influenced by several salient aspects of the gene technology debate. For example, as applications of gene technology in food production had been a focus of conjecture, during and after the Royal Commission’s inquiry, I chose to define this application within my Coding Framework. A copy of the Coding Framework that I utilised, in the course of this study, is presented in Appendix 1.

Choosing which submissions to analyse was the third step in my procedure. As I was interested in developing an in-depth analysis of the University Submissions I decided to analyse the Interested Person submission that each university had presented to the Royal Commission, as well as the Witness Briefs that had been presented by each university’s appointed representatives³. In addition, as part of my exploration of the New Zealand Life Sciences Network’s activities, which had been supported by a group of University Executives, I decided that it would be interesting to analyse the Interested Person submission that the Network had presented to the Royal Commission.

Applying the Coding Framework to this group of submissions was the fourth step of my Content Analysis. This involved working through each submission on a paragraph-by-paragraph basis, coding the content of each paragraph according to the procedures set out in the Coding Framework. Initially, I worked through this process on two occasions for each submission, before settling on an appropriate set of codes. However, as some sections of the submissions proved difficult to code (e.g., sections in which submitters had used vague terminology), and as I did not always apply my Coding Framework in a consistent manner (perhaps as a result of fatigue or lack of concentration), I considered it necessary to work through this process on a third occasion as well.

This final application of my Coding Framework enabled me to explore the reliability of my coding procedure, and was the fifth step in my Content Analysis. Three weeks after I coded the submissions, I randomly selected one-third of the submissions
and re-coded them. Then, in order to evaluate the reliability of my coding procedure, I counted the number of codes that I had entered consistently on each occasion (the number of agreements), and the number of codes that I had entered differently (the number of disagreements). The number of agreements and disagreements that I counted, with reference to each section of my Coding Framework, are displayed in Table 2.

Table 2: The Reliability of my Coding Procedure

<table>
<thead>
<tr>
<th>Section of the Coding Framework</th>
<th>Number of Agreements</th>
<th>Number of Disagreements</th>
<th>Proportion of Agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section A</td>
<td>766</td>
<td>73</td>
<td>91%</td>
</tr>
<tr>
<td>Section B1</td>
<td>674</td>
<td>81</td>
<td>89%</td>
</tr>
<tr>
<td>Section B2</td>
<td>676</td>
<td>78</td>
<td>90%</td>
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<tr>
<td>Section B3</td>
<td>670</td>
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The results of this reliability test illustrate that there was a degree of inconsistency with my analytical technique, and provide an indication of the extent of this inconsistency. While the definition of an 'acceptable' level of intra-rater reliability is debatable, the levels of intra-rater reliability achieved in this study were comparable to other studies, published in the literature, that had utilised Content Analysis (e.g., Beyer & Ogletree, 1998; Pappalardo & Ringold, 2000, p.83). However, due to the inconsistency associated with my analytical procedure, and the fact that I have not explored the inter-coder reliability of my procedure, I have chosen to be cautious while interpreting the results obtained. Consequently, in the chapters that follow I use these results to illustrate the major trends that I identified in these submissions, and not their subtle nuances.

4.2.3 Seeking Information from the Other Contributors

While I endeavoured to make use of the large quantity of relevant information that existed in the public domain, I was also conscious of the need to look beyond this information. Consequently, I considered it important to contact university personnel
who could be classified as Other Contributors, and to ask them about their activities and experiences during the Royal Commission’s inquiry.

I set about identifying university personnel who could be classified as Other Contributors by exploring the content of the Royal Commission’s Internet site. By October 2002, I had identified 30 university staff members, and a number of students, who appeared to fit my classification. While it would have been ideal to contact all of these people, the time constraints associated with my study necessitated that I focus my efforts in some manner. Consequently, I chose to seek information from the 30 university staff members I had identified.

After the Lincoln University Human Ethics Committee approved my research approach, I sent a collection of material to each member of this target group. Amongst this material was an introductory letter which outlined several of my research questions, a three-page document that summarised my research, a one-page document which explained the procedures I would use to protect the anonymity of participants, and a consent form (see Appendix 2 for copies of these documents).

Of the 30 people I contacted, 2 people chose to prepare a written response to the questions I had outlined in my letter, and 15 consented to an interview. In order to protect the anonymity of these people, I have replaced their names with pseudonyms in the chapters that follow, and I have randomly allocated male and female pseudonyms so that the sex of each participant will be unclear. While it would be informative to provide additional details about this group of participants, such as the universities that they were from, such details might compromise the anonymity of some participants. For this reason I have chosen not to provide such details, although I can confirm that I received information from people within each of the four universities.

Of the 13 people who chose not to participate in my study, 3 people explained that they had not been a member of a university at the time of the Royal Commission’s inquiry (and were therefore outside my target group), 7 explained that they were unable to participate due to other time commitments, and 3 people did not provide any reason for their decision. Interestingly, reflecting the sensitive nature of my research topic, one person explained that they had chosen not to participate, in part, because others “would be able to trace me” (Elton, personal communication, November 12, 2002).
4.2.4 Interviews with the Other Contributors

The fifteen interviews I carried out with the Other Contributors require further explanation. The interviews were carried out either over the phone or in a face-to-face setting. Each interview was carried out with a shared understanding, between the participants and myself, about the steps I would take to protect their anonymity. With the prior consent of each participant, an audio recording was made of each interview. In addition, it is relevant to note that each interview was loosely structured around a set of questions that I had outlined in my introductory letter, but was flexible in the sense that I altered the order of these questions, and developed new questions, as each interview progressed. Consequently, the interview format that I used, to draw upon the terminology of Singleton and Straits (1993), was “partially structured” (p.249).

Following each interview I transcribed the contents of the audio recording I had made. While time consuming (some interviews had lasted between one and two hours), this process was valuable as it enabled me to review, and consider, the comments that each participant had made. In some instances, participants asked to see the transcript that I produced, and took the opportunity to modify their comments or to highlight comments that should be treated as 'off the record'. After the transcripts were complete I was then able to work through them methodically, searching for relevant information, and adding this information to the paper and electronic files that I had been assembling.

The limitations of interviews, as a method of collecting information, are well documented. One of the central limitations of interviews is that they involve social interaction and, at times, the character of this interaction can distort the information that is received (Babbie, 1998, p.291; Brewer & Hunter, 1989, p.46; Singleton & Straits, 1993, p.262). During this phase of my research I became aware of one particular facet of the interview process that may have distorted the information I received. Despite the procedures I was using to protect their anonymity, some participants were anxious while describing their experiences during the Royal Commission’s inquiry. To the extent that this anxiety caused participants to withhold information during the interview process, my ability to gain insight into their experiences may have been constrained.

In addition, there was another limitation of the interview process that it is important to mention. The interviews that I carried out took place between November 2002 and February 2003, a considerable time after the Royal Commission’s inquiry had been completed. As some participants admitted that their memory of past events was
poor, this cast doubt over the validity of some of their recollections. In addition, it is possible that more contemporary events, such as the industrial disputes that were occurring within several universities during 2002, may have influenced the opinions of some participants.

Despite these limitations, the interviews were still a valuable and important component of my research process. One of the main strengths of the interviews, as a method of collecting information, was the flexibility that they afforded. Unlike more rigid research methods, the interview process enabled me to ask participants to clarify points that they had made, and to elaborate on new issues that they had raised. In addition, these interviews provided me with an opportunity to explore a series of events and experiences that had not been documented elsewhere, and that may never have been documented unless this group of university personnel had been given the opportunity to speak in confidence. In this manner, the fifteen interviews I carried out provided me with valuable insights into the internal culture of the four universities.

4.2.5 Seeking Information from University Executives

In order to gain insight into the events that occurred within the four universities, during the proceedings of the Royal Commission, I also considered it important to seek information from University Executives. As various Executives had managed the production of the University Submissions, or had contributed to the activities of the New Zealand Life Sciences Network, they were in a good position to provide factual information about these activities. In addition, as I was attempting to scrutinise the universities' involvement in the Royal Commission in a balanced fashion, I wanted to explore, and consider, University Executives' views on this matter.

Due to the flexibility they provide, my initial preference was to carry out interviews with Executives. As I was unsure which Executives I needed to speak with, I sent a letter outlining a group of research questions, and two items of supporting information, to the Vice-Chancellor of each university (see Appendix 3 for copies of these documents). Within my letters I asked each Vice-Chancellor to assist with my research questions, or, if appropriate, to refer me to another person, within their university, who might be able to assist me.
The responses that I received from this initial approach varied considerably. For example:

- Dr Jack Heinemann of the University of Canterbury, who had been asked to respond to my letter by Professor Bob Kirk (the University’s Acting Vice-Chancellor), wrote to me within a fortnight and provided substantive answers to my questions;

- just over two months after I had sent a letter to Dr Frank Wood (the Vice-Chancellor of Lincoln University), and after I had followed up my letter on a number of occasions, I was able to interview Professor Roy Bickerstaffe (the Director of Lincoln University’s Postgraduate and Research School) in a face-to-face setting;

- just over two weeks after I had sent my initial letter, I received a written response from Dr Graeme Fogelberg (the Vice-Chancellor of the University of Otago), in which he informed me that he had chosen not to participate in my study; and

- just over two weeks after I had sent my initial letter to Dr John Hood (the Vice-Chancellor of the University of Auckland), and after I had made a telephone call to his office in order to follow up my letter, I received an email informing me that the University of Auckland would not be taking part in my study.

The information that I received from Dr Heinemann and Professor Bickerstaffe, concerning the activities of the universities of Canterbury and Lincoln, helped to answer a number of my questions. In contrast, as Dr Fogelberg and Dr Hood had chosen not to assist me, I lacked information about the activities of the universities of Auckland and Otago. As a result, I decided to write a second letter to Dr Fogelberg and Dr Hood asking them to reconsider their decision. However, neither Vice-Chancellor was willing to adjust their position.

My inability to secure interviews with a greater number of University Executives was disappointing to me, since interviews were my preferred method of collecting information. In addition, it is possible that my inability to secure a greater number of interviews has had an effect on the balance of my study, as I had limited opportunities to hear, and consider, the views of some Executives. However, while my initial requests for assistance had a low yield, I was still able to collect information from University Executives through other, more coercive, means. I did so by submitting a series of requests for official information.
4.2.6 Requests for Official Information

Under the Official Information Act 1982, universities in Aotearoa New Zealand, and thus the officers of each university, have a number of obligations when they receive a request for official information. Amongst these obligations, they need to make official information available “unless there is good reason for withholding it” (Official Information Act 1982, Section 5), they need to provide “reasonable assistance” to those who request official information (Official Information Act 1982, Section 13), and they need to respond to requests within 20 working days (Official Information Act 1982, Section 15). A large proportion of the information that I was attempting to collect from University Executives could be defined as official information. Therefore, in instances where I lacked information on a topic, I submitted formal requests for this information under the Official Information Act 1982 (for an example, see Appendix 4).

I used these requests as a last resort because of their coercive nature, and the burden that they impose on those who must process, and respond, to each request. In addition, these requests were a relatively inefficient method of collecting information, as it was sometimes necessary to submit a series of formal requests in order to achieve clarity on an issue. In total, I filed four requests with the University of Auckland, two requests with the University of Otago, and one request with Lincoln University.

Despite these disadvantages, my requests for official information proved to be a valuable component of my research process. In most instances my requests were dealt with promptly and professionally. Consequently, by submitting these requests, I was able to access a great deal of information that had been previously inaccessible. Amongst this information were University Executives’ explanations of various events that had occurred, within their universities, during the proceedings of the Royal Commission. In addition, I was able to obtain copies of documentation that had been produced within the universities during the Royal Commission (e.g., memoranda, letters, e-mails and draft submissions), which provided a useful historical record.

Collectively, this assortment of research methods helped me to collect a large quantity of information that was relevant to my primary research question. In the following three chapters I use this information, and the evaluation framework I outlined in Section 4.1, to analyse three forms of contribution that the universities made to the Royal Commission’s inquiry. In Chapter 5 I focus on the University Submissions. In
Chapter 6 my focus is on the support that a group of University Executives provided for
the New Zealand Life Sciences Network's activities. And in Chapter 7 I analyse the
activities and experiences of the Other Contributors.

Notes

1 These two facets of my methodology help to convey the logic, and boundaries, of my research.
   However, I have chosen to explain them at this stage of my thesis, principally because they were difficult to
   explain in advance of Chapter 3 (and, in particular, my discussion of the operational requirements of the
   CCS role).

2 Given the complexities involved with this task, and the sensitive nature of my research topic, I
   considered it important to analyse the submissions in a systematic manner that could be explained and
   scrutinised. As Carney (1972) notes, if it is clearly stated what a researcher has been looking for, and where
   they have been looking for it, then it is possible for the reader to “check on how the facts were obtained”
   (p.17).

3 While I had obtained the transcript of each university’s oral presentation to the Royal Commission, I
   chose not to analyse these oral presentations since, for the most part, they reiterated the content of the
   Interested Person submissions and Witness Briefs.

4 Within the Content Analysis literature, the form of reliability test that I have used is considered to be one
   of the weakest available. It is considered a weak form of reliability testing because it involves only a single
   coder, and thus does not explore how other people might apply the Coding Framework to the same data
   set. In addition, it is considered to be a weak form of reliability testing because it may be distorted by the
   coder’s ability to recall how they had previously coded a document.

5 By no means can I claim to have identified all of the Other Contributors. Identifying university
   personnel who fitted this classification was a difficult task for two primary reasons. Firstly, there were a
   large number of submissions on the Royal Commission’s Internet site that I needed to search through.
   And secondly, I did not know the names of all the staff and students who were affiliated with the four
   universities. In the course of my research, and the interviews I carried out with Other Contributors, I was
   able to identify fourteen additional university staff members who fitted this classification. While I did not
   have the time to carry out interviews with these people, I did attempt to explore their involvement in the
   Royal Commission’s inquiry (e.g., by reviewing their submission and searching for media comment).

6 Rather than inventing surnames for each university staff member, the pseudonyms I have used only
   involve a first name. For example, I have used pseudonyms such as Elton, Amanda, Nicholas and Sarah.

7 The Office of the Ombudsmen, who oversee the implementation of the Official Information Act 1982,
   define official information as “All information held by a Department, a Minister of the Crown in his or her
   official capacity, or an organisation subject to the [Official Information Act] or Local Government Official
   Information and Meetings Act” (Office of the Ombudsmen, 2002, Chapter 3, p.4). In addition, they
   explain that “the definition of official information also includes knowledge of a particular fact or state of
   affairs held by officers in such organisations” (Office of the Ombudsmen, 2002, Chapter 3, p.4).

8 As I had received some assistance from Professor Roy Bickerstaffe, the request I submitted to Lincoln
   University was of a considerably smaller scale than the requests I submitted to the universities of Auckland
   and Otago. I used this request, primarily, to obtain copies of documentation that had been produced
   within Lincoln University during the Royal Commission’s inquiry.
Chapter 5: The University Submissions

In this chapter I discuss the submissions that the universities of Auckland, Canterbury, Lincoln and Otago presented during the Royal Commission's Formal Hearings. I refer to these submissions (collectively) as the University Submissions, and I intend this term to encompass the written and oral submissions that were presented by each university (in its capacity as an Interested Person), as well as the written and oral submissions that were presented by each university's appointed representatives (in their capacity as witnesses).

My discussion will be structured around several facets of the University Submissions: the motives that underpinned their production (Section 5.1), the processes that were used to create them (Section 5.2), their content (Section 5.3), and their consistency with the universities' CCS role (Section 5.4). Throughout these sections I argue that the primary intent of the University Submissions was to protect and enhance university personnel's ability to access a certain genre of gene technology application (i.e., laboratory-contained applications for teaching and research purposes). While this primary intent reflected University Executives' concern for the teaching and research activities of gene technology users, and the economic well-being of their universities, it was largely inconsistent with the universities' CCS role.

5.1 Motives for the University Submissions

At the time of the Royal Commission's inquiry, gene technology was widely utilised in the teaching and research laboratories of the four universities. Following the Commissioners' announcement that they would be holding Formal Hearings, people within each university instigated the production of the University Submissions with a common aim in mind: to protect and enhance university personnel's ability to access laboratory-contained applications of gene technology. Within the universities' applications for Interested Person status, memoranda circulated by University Executives, and the University Submissions, justifications were provided for this aim. As these justifications provide insight into the rationale of the University Submissions, it is logical to address this topic at the outset of this chapter.
Those involved with the University Submissions were concerned that the Royal Commission's outcomes could affect the academic mission of their universities, i.e., the ability of university personnel to disseminate knowledge (through use of gene technology in teaching), pursue new knowledge (through use of gene technology in research), and keep abreast of new knowledge developed elsewhere. For example, while applying for Interested Person status, on behalf of the University of Canterbury, Dr Jack Heinemann explained that:

The University could be affected by Government decisions that affect the cost or legality of manipulating genes since these techniques are of fundamental importance in the teaching of genetics, medicine, population biology, microbiology, conservation biology, taxonomy, and other biological disciplines; research in medicine, ecology, genetics, population and conservation biology, evolution, risk assessment (e.g., horizontal gene transfer) and other biological disciplines; and the development of commercial technologies. (J. Heinemann, personal communication, October 21, 2002)

Drawing upon a similar rationale, Dr John Hood (the Vice-Chancellor of the University of Auckland) sent a memorandum to staff members of the University of Auckland and explained that:

The University is aware that the research and teaching activities of at least several hundred staff at the University of Auckland could potentially be affected, depending on the nature of decisions made by the Government, following recommendations arising from the Commission. Conceivably, these decisions could also impact significantly upon this University's ability to undertake its published mission and to achieve its academic goals. Therefore it has been decided that the University will give evidence to the Commission. (J. Hood, personal communication, September 4, 2000)

The University Submissions were also motivated by pecuniary considerations. As the universities' teaching and research activities are their core business, there was concern that the Royal Commission's outcomes might affect the universities' ability to secure contestable research contracts, attract (full fee-paying) international students, and generate intellectual property and patents. Box 1 (in Chapter 2) contains a selection of quotations, taken from the University Submissions, which illustrate these concerns.

As a third form of justification for their chosen aim, some University Executives explained that it was problematic and unnecessary for their university's submission to address the many topics that the Royal Commission was inquiring into: problematic because it would be difficult to achieve a consensus position on these topics in the time period available, and unnecessary because university personnel were free to express their
views on gene technology through other means. For example, in a memorandum to staff members of the University of Auckland, circulated while his University's submission was being prepared, Dr John Hood made both of these points. He stated:

[The University of Auckland's] evidence will be limited to the potential impacts upon the University's current and expected future involvement with genetically modified organisms (GMOs) in teaching and research....No opinion on the desirability or otherwise of GMOs will be presented, however, given that there is unlikely to be any single collective University view that could be assembled in the time available. For this reason I have decided that the views of individual members of the University community are best left to any private submissions they may wish to make to the Commission.
(J. Hood, personal communication, September 4, 2000)

The desire to protect and expand university personnel's access to laboratory-contained applications of gene technology had a number of consequences. From the outset, those involved with the University Submissions chose not to address the diversity of views that university personnel held on laboratory-contained applications of gene technology. In addition, they chose not to address the diversity of views that university personnel held on many other aspects of gene technology. The processes that were used to create the University Submissions reflected these decisions.

5.2 The Creation of the University Submissions

The processes that were used to create the University Submissions were not discussed in any significant detail (if at all) within the University Submissions. Consequently, while these submissions were presented to the Royal Commission in the name of each university, it was unclear whose views they did, and did not, address.

Before I discuss the processes that were employed within each university, it is important to note that the Commissioners’ procedures created some constraints, and some opportunities, for those who had instigated the University Submissions. In terms of constraints, from the Commissioners’ announcement that the four universities had been granted Interested Person status (on 17 August 2000), to the deadline for the universities' written submissions (on 2 October 2000), the universities had 31 working days to produce their written submissions. When coupled with the existing work commitments of university personnel, this meant that the University Submissions had to be crafted under time pressure. As a second constraint, each university was allocated 80
minutes of presentation time at the Royal Commission's Formal Hearings. This meant that it was necessary for those involved to prioritise topics while planning their university's oral submission.

While the universities were allocated a limited quantity of presentation time, no restriction was placed on the quantity of written material that they could submit to the Royal Commission. This created an opportunity because it meant that the universities could produce expansive written submissions, without the need to prioritise the topics they addressed, if they so desired. In addition, the Commissioners invited the four universities (and all other Interested Persons) to comment upon any of the broad topics that had been detailed in their Terms of Reference. Therefore, while university representatives had applied for Interested Person status on specific grounds (that the teaching and research activities of university personnel stood to be affected by the Royal Commission's outcomes), the opportunity existed for university personnel to address other topics as well.

The Royal Commission's procedures are important to consider because they provided a framework for submitters. The manner in which University Executives responded to these procedures, and the constraints and opportunities they entailed, is the topic of the following two sub-sections.

5.2.1 The Working Groups

Within each university, University Executives assembled small teams of university personnel and charged them with the task of creating their university's submission. Throughout this chapter I refer to these assemblages of university personnel as the Working Groups. The University Executives responsible for creating the Working Groups, and the university personnel they selected, are listed in Table 3.

The composition of the Working Groups reflected University Executives' desire to focus on laboratory-contained applications of gene technology within their university. Of the 31 people who were members of the universities' Working Groups, 29 fulfilled one or more of the criteria below:

1. they had managerial responsibilities concerning teaching and research activities within their university (e.g., Dr Ellen Förch, Professor Roger Field and Dr Ian Smith);
Table 3: The Convenors and Members of the Working Groups

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<th>University of Auckland</th>
<th>University of Canterbury</th>
<th>Lincoln University</th>
<th>University of Otago</th>
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<tr>
<td>Dr John Hood</td>
<td>Professor Bob Kirk</td>
<td>Professor Roger Field</td>
<td>Dr Ian Smith</td>
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<tr>
<td>Vice-Chancellor</td>
<td>Pro Vice-Chancellor</td>
<td>Director of Postgraduate and Research School, and Deputy Vice-Chancellor</td>
<td>Deputy Vice-Chancellor (Research and International)</td>
</tr>
<tr>
<td>Professor Marston Conder</td>
<td>Professor Roy Bickerstaff</td>
<td>Chair of the Lincoln University Research Committee, and Head of the Molecular Biotechnology Group</td>
<td>Associate Professor Clive Ronson</td>
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<tr>
<td>Deputy Vice-Chancellor (Research)</td>
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<td>Biological Safety Officer and member of the University of Otago's Institutional Biological Safety Committee</td>
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The Members of the Working Groups

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<th>University of Otago</th>
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<tr>
<td>Professor Dick Bellamy</td>
<td>Dr Jack Heinemann</td>
<td>Professor Roger Field</td>
<td>Dr Ian Smith</td>
</tr>
<tr>
<td>Dean of the School of Biological Sciences</td>
<td>Department of Plant and Microbial Sciences</td>
<td>Director of Postgraduate and Research School, and Deputy Vice-Chancellor</td>
<td>Deputy Vice-Chancellor (Research and International)</td>
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<tr>
<td>Dr Nigel Birch</td>
<td>Dr Andrew Pratt</td>
<td>Professor Roy Bickerstaff</td>
<td>Associate Professor Clive Ronson</td>
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<td>Chair of the University of Auckland's Institutional Biological Safety Committee</td>
<td>Interim Chair of the University of Canterbury's Institutional Biological Safety Committee</td>
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<td>Professor Ross Clark</td>
<td>Dr Barry Palmer</td>
<td>Matthew Kent</td>
<td>Emeritus Professor George Petersen</td>
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<td>Developmental Medicine and Biology</td>
<td>Animal and Food Sciences Division</td>
<td>Postgraduate student researching within the Molecular Biotechnology Research Group Laboratories</td>
<td>Member of the University of Otago's Institutional Biological Safety Committee</td>
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<td>Professor Marston Conder</td>
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<td>Dr Ellen Förch</td>
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<td>Department of Biochemistry</td>
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<td>Dr Glenn Buchan</td>
<td>Associate Professor Ingrid Winship</td>
<td>Department of Microbiology</td>
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<td>Department of Microbiology</td>
<td>Associate Dean for Research, Faculty of Medical and Health Sciences</td>
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<td>Biological Safety Officer and member of Lincoln University's Institutional Biological Safety Committee</td>
<td>Department of Microbiology</td>
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<td>Animal and Food Sciences Division</td>
<td>Deputy Chair of the University of Otago's Institutional Biosafety Committee</td>
</tr>
<tr>
<td>Professor Garth Cooper</td>
<td>Dr Martin Kennedy</td>
<td>Dr Barry Palmer</td>
<td>Dr David Green</td>
</tr>
<tr>
<td>School of Biological Sciences</td>
<td>Department of Pathology and Molecular Medicine, Christchurch School of Medicine</td>
<td>Animal and Food Sciences Division</td>
<td>Member of the University of Otago's Institutional Biological Safety Committee</td>
</tr>
<tr>
<td>Dr Ellen Förch</td>
<td>Dr Martin Kennedy</td>
<td>Professor Alison Stewart</td>
<td>Dr Martin Kennedy</td>
</tr>
<tr>
<td>Director of External Research Programmes</td>
<td>Head of the Plant Pathology Research Group</td>
<td>Head of the Plant Pathology Research Group</td>
<td>Department of Pathology and Molecular Medicine, Christchurch School of Medicine</td>
</tr>
<tr>
<td>Professor John Fraser</td>
<td>Dr Robin McFarlane</td>
<td>Dr Robyn McFarlane</td>
<td>Professor Robin Olds</td>
</tr>
<tr>
<td>School of Medicine</td>
<td>Biological Safety Officer and member of Lincoln University's Institutional Biological Safety Committee</td>
<td>Biological Safety Officer and member of Lincoln University's Institutional Biological Safety Committee</td>
<td>Department of Pathology</td>
</tr>
<tr>
<td>Professor Peter Gluckman</td>
<td>Dr Graham Wallis</td>
<td>Dr John Kernohan</td>
<td>Dr Graham Wallis</td>
</tr>
<tr>
<td>Dean of the Faculty of Medical and Health Sciences</td>
<td>Department of Microbiology</td>
<td>Department of Auckland UniServices Ltd</td>
<td>Department of Zoology</td>
</tr>
<tr>
<td>Dr John Kernohan</td>
<td>Dr Parry Guilford</td>
<td>Dr John Taggart</td>
<td>Dr Parry Guilford</td>
</tr>
<tr>
<td>CEO of Auckland UniServices Ltd</td>
<td>Department of Biochemistry</td>
<td>Faculty of Law</td>
<td>Department of Biochemistry</td>
</tr>
<tr>
<td>Professor Mike Taggart</td>
<td>Dr Glenn Buchan</td>
<td>Associate Professor Ingrid Winship</td>
<td>Department of Microbiology</td>
</tr>
<tr>
<td>Faculty of Law</td>
<td>Department of Microbiology</td>
<td>Associate Dean for Research, Faculty of Medical and Health Sciences</td>
<td>Department of Microbiology</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>University of Auckland</th>
<th>University of Canterbury</th>
<th>Lincoln University</th>
<th>University of Otago</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor Marston Conder</td>
<td>Professor John Fraser</td>
<td>Dr Robin McFarlane</td>
<td>Associate Professor John Tagg</td>
</tr>
<tr>
<td>Deputy Vice-Chancellor (Research)</td>
<td>School of Medicine</td>
<td>Biological Safety Officer and member of Lincoln University's Institutional Biological Safety Committee</td>
<td>Department of Microbiology</td>
</tr>
</tbody>
</table>
2. they used, or had used, gene technology in the course of their teaching and research activities (e.g., Professor Garth Cooper, Dr Jack Heinemann, Dr Jonathan Hickford and Associate Professor John Tagg); or

3. they were involved with their university's Institutional Biological Safety Committee (e.g., Dr Nigel Birch, Dr Andrew Pratt, Dr Robin McFarlane and Associate Professor Clive Ronson).

The only members of the Working Groups that did not fit any of the above criteria (to my knowledge) were Professor Mike Taggart and Dr John Kernohan, who were both members of the University of Auckland's Working Group.

The composition of the Working Groups also reflected University Executives' desire to address their topic of focus from certain perspectives. Included in the Working Groups were people who could provide a user's perspective on gene technology and the current regulatory environment. Also included were University Executives who could provide information on the importance of gene technology to the academic mission, and economic well-being, of their university. Notably absent from the Working Groups were university personnel who, while not directly involved in the use of gene technology, were commentators on some aspect of the technology, e.g., its ethical, cultural, environmental or political implications.

By appointing certain people to the Working Groups, University Executives were able to influence the eventual content of the University Submissions. They were also able to shape the content of the University Submissions through the processes they employed, or encouraged, while creating these submissions.

5.2.2 The Processes of the Working Groups

By and large, the members of each Working Group produced their university's submission as a team. Tasks were shared amongst the members of each group with some members preparing sections of their university's Interested Person submission, and some members (who had been selected to appear as a witness for their university) preparing Witness Briefs and oral presentations. In addition, through email correspondence, the internal circulation of documents, and occasional meetings, Working Group members were able to contribute to, and comment upon, the contributions that other Working Group members had made.
The processes of the four Working Groups did differ in several respects though. One difference was the extent to which they obtained input from people who were external to their university. Interaction with external parties was particularly noticeable in the case of two Working Groups, namely, the Working Groups of the University of Auckland and the University of Otago. In order to ensure they were “singing a similar tune” (C. Ronson, personal communication, September 21, 2000)\textsuperscript{6} to the Commissioners, members of these two Working Groups collaborated with one another during the preparation of their submissions. Both of these Working Groups engaged the services of Mr Mark Christensen, a Christchurch-based lawyer who was involved with Biotenz Incorporated and the New Zealand Life Sciences Network. In addition, members from both Working Groups were in contact with representatives of the New Zealand Life Sciences Network. I mention these forms of external interaction in order to illustrate that the submissions of the University of Auckland and the University of Otago arose not just from procedures internal to the two universities, but also from a process of inter-organisational collaboration that occurred at the time of the Royal Commission.

The procedures of the Working Groups also differed in a second respect, namely, the extent to which they attempted to include the views of university personnel who were external to the Working Groups. As each Working Group utilised a different consultation procedure, I will describe each in turn.

Lincoln University's Working Group made no significant attempt to consult with other university personnel. Instead, a conscious decision was made to produce the University’s submission in a small group. According to Professor Roy Bickerstaffe, who oversaw the production of Lincoln University’s submission, draft versions of the submission were not circulated because doing so “may have created problems for witnesses receiving internal unfair treatment and comments” (R. Bickerstaffe, personal communication, January 10, 2003). Consequently, few staff and students within Lincoln University witnessed their University’s submission prior to its presentation to the Royal Commission.

In the case of the other three Working Groups, limited attempts were made to consult with other university personnel. Within the University of Auckland, Dr John Hood (the Vice-Chancellor) sent a memorandum to all university staff members on 4 September 2000. In this memorandum he described the intended focus of the University’s submission and invited “staff involved with GMO teaching or research...[to] convey a short summary of their concerns” to a member of the
University's Working Group (J. Hood, personal communication, September 4, 2000). He also explained that it would "probably not be possible for the University's submission to be circulated generally prior to the hearings" (J. Hood, personal communication, September 4, 2000), and, indeed, the first opportunity that most university personnel had to view their University's submission was when it was posted on the Royal Commission's Internet site.

Within the University of Otago, a rushed attempt was made to consult a group of university personnel late in the production process. On Friday 22 September 2000, a draft version of the University's Interested Person submission was posted on the Internet site of the Centre for Gene Research (a research centre within the University). On the same day, Associate Professor Clive Ronson (the convenor of the University's Working Group) sent an email to staff and students on the Centre for Gene Research's distribution list, informing them of the opportunity to view the University's draft submission, and requesting "constructive criticisms" by Tuesday 26 September 2000 (C. Ronson, personal communication, September 22, 2000). Consequently, staff and students on the Centre's distribution list had a brief opportunity (two working days) to comment upon their University's Interested Person submission, while many other staff and students received no such opportunity.

Of the four Working Groups, the Working Group of the University of Canterbury utilised the most inclusive process. According to Dr Jack Heinemann (a member of the two-person Working Group), meetings, "open to all members of the University community", were convened in order to discuss the focus of the University's submission (J. Heinemann, personal communication, October 21, 2002). Following these meetings, Dr Andrew Pratt (the second member of the two-person Working Group) prepared a draft of the University's Interested Person submission and circulated this draft to a selection of university departments, and to any university staff members who had expressed an interest. Based upon the information received from this consultation procedure, Dr Pratt then "collated the results and sent revised drafts out accordingly" (J. Heinemann, personal communication, October 21, 2002).

While the University of Canterbury's Working Group made greater attempts to include the views of other university personnel, their attempts, like those of the other Working Groups, were limited in significant ways. Firstly, while they consulted a group of university personnel, the Working Groups offered no guarantee that they would incorporate the views of others. Instead, the Working Groups retained editorial power
and the right to incorporate, or omit, views as they saw fit. Secondly, the Working Groups’ consultation processes were framed by the focus that had been chosen for the University Submissions (i.e., the importance of laboratory-contained applications of gene technology within each university). This meant that university personnel were asked to contribute knowledge and ideas that were consistent with this focus. It also meant that, with the partial exception of the University of Canterbury’s Working Group, the Working Groups specifically sought to consult with users of gene technology, and not with university personnel in general.

As each Working Group produced their university’s submission as a team, it is reasonable to conclude that the University Submissions represented the views of the Working Group members. In addition, as a number of Working Group members were gene technology users, and as several Working Groups attempted to consult with gene technology users, it is possible that the University Submissions represented, to some extent, the views of this interest group. However, as the Working Groups’ consultation procedures were extremely limited, the University Submissions should not be regarded as the views of all university personnel. Indeed, as I discuss in the next section of this chapter, and in Chapter 7, the content of the University Submissions did not reflect the diversity of views that existed within each university.

5.3 The Content of the University Submissions

In order to explore the content of the University Submissions, I carried out a Content Analysis of the written submissions that each university presented to the Royal Commission. As depicted in Figure 1, these submissions were focused on a specific category of gene technology application, namely, laboratory-contained applications for teaching and research purposes. I will begin this section by discussing the approach that the authors of the University Submissions took to their topic of focus, before discussing the manner in which they addressed several other applications of gene technology.
Figure 1: References to Applications of Gene Technology Within the Written Submissions of Each University

The proportion of paragraphs in which the application was referred to

<table>
<thead>
<tr>
<th>Type of application</th>
<th>Auckland</th>
<th>Canterbury</th>
<th>Lincoln</th>
<th>Otago</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory-contained applications for teaching/research</td>
<td>80%</td>
<td>40%</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>Teaching/research applications in general</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Applications in healthcare</td>
<td>60%</td>
<td>20%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Other applications</td>
<td>0%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
</tr>
</tbody>
</table>

NB: See Appendix 1 for definitions of the terms used in this Figure.
5.3.1 Laboratory-contained Applications for Teaching and Research Purposes

The manner in which the authors of the University Submissions addressed laboratory-contained applications of gene technology reflected their desire to protect and expand university personnel's access to these applications. Illustrating their desire to protect university personnel's access, the authors of the University Submissions expressed a multitude of positive evaluations about this application genre (see Figure 2). For example, they commented that the risks associated with this application genre were "minimal" (Palmer, B., 2000, p.2), "very low" (Smith, 2000, p.7) or "negligible" (Lamont, 2000, p.1; University of Canterbury, 2000, p.11). They emphasised many benefits that this application genre could provide, commenting that these applications were:

- "crucial for the successful conduct of research and teaching" in a number of academic disciplines (Cooper, 2000, p.5);
- assisting "industries to produce products in a sustainable manner" (Field, 2000, p.7);
- "seeding the development of new biotechnological enterprises" (Lincoln University, 2000, p.11); and
- "expanding the value of exports so important to the economic viability of New Zealand" (Lincoln University, 2000, p.10).

And, as a further component of their case, the authors listed a series of adverse consequences that may result if these applications were to be banned, or excessively regulated, in the future. For example, they commented that excessive regulation could:

- "seriously arrest research in NZ's scientific community" (Kent, 2000, p.6);
- "impair NZ conservation and...lead to a decrease in biodiversity and an increase in extinctions" (University of Canterbury, 2000, p.12);
- "reduce significantly the ability...for industries to develop their products and markets" (Lincoln University, 2000, p.10); and
- "lead very quickly to the disadvantaging of all New Zealanders who look to research as an important component of national wealth creation" (Smith, 2000, p.6).

Reflecting their desire to expand university personnel's access to laboratory-contained applications of gene technology, the authors of the University Submissions complained that the present regulatory system was unnecessarily restrictive and that, as a consequence, it was stifling university personnel's teaching and research activities.
Figure 2: Evaluations of Gene Technology Within the Written Submissions of Each University

2(a) University of Auckland

The type of gene technology application that was evaluated

- Laboratory-contained applications for teaching/research
- Teaching/research applications in general
- Applications in healthcare
- Other applications

The number of evaluations that were stated

- Negative
- Neutral
- Positive

2(b) University of Canterbury

The type of gene technology application that was evaluated

- Laboratory-contained applications for teaching/research
- Teaching/research applications in general
- Applications in healthcare
- Other applications

The number of evaluations that were stated

- Negative
- Neutral
- Positive

2(c) Lincoln University

The type of gene technology application that was evaluated

- Laboratory-contained applications for teaching/research
- Teaching/research applications in general
- Applications in healthcare
- Other applications

The number of evaluations that were stated

- Negative
- Neutral
- Positive

2(d) University of Otago

The type of gene technology application that was evaluated

- Laboratory-contained applications for teaching/research
- Teaching/research applications in general
- Applications in healthcare
- Other applications

The number of evaluations that were stated

- Negative
- Neutral
- Positive

NB: See Appendix 1 for definitions of the terms used in this Figure.
(see Lincoln University, 2000, p.7; University of Auckland, 2000, pp.14-18; University of Canterbury, 2000, pp.1-2, 5-7; University of Otago, 2000, pp.4-7). For example, the University of Canterbury's Interested Person submission remarked:

The HSNO act [i.e., the Hazardous Substances and New Organisms Act] has led to an overly regulated environment for low risk work which has established serious disincentives to essential biological research with no evidence of improved safety...It is inappropriate that regulatory agencies, e.g. ERMA, should have the financial incentive of charging for risk assessments. This approach has underpinned an overly interventionist approach focussed on an organism by organism basis. (University of Canterbury, 2000, pp.1-2)

Similarly, the University of Otago’s Interested Person submission commented:

Some of the provisions of the HSNO Act (1996) have had a significant negative impact on the University’s ability to carry out such research and have significantly and unnecessarily increased the compliance costs associated with GM research. (University of Otago, 2000, p.1)

In tandem with these criticisms, the authors of the University Submissions recommended a series of changes to the regulatory process. Some of the recommendations that were advanced were lengthy and detailed, particularly those that were expressed within the submissions of the University of Auckland and the University of Otago (see University of Auckland, 2000, pp.19-20; University of Canterbury, 2000, pp.1-2, 5-7; University of Otago, 2000, pp.7-9). However, in general terms, the recommendations advanced within the University Submissions sought to:

- decrease the range of laboratory-contained applications that university personnel had to gain formal approval for;
- decrease the role of the Environmental Risk Management Authority in the regulation of laboratory-contained applications; and
- expand the regulatory role of the universities’ Institutional Biological Safety Committees (committees predominantly comprised of university personnel).

While the University Submissions were largely focused on protecting and expanding university personnel’s access to laboratory-contained applications, it is important to note that they divulged a lot of constructive information. For example, they provided a critique of the present regulatory system from a user’s perspective, and discussed a number of anomalies that were associated with the present system. They discussed the internal procedures that were used by their Institutional Biological Safety Committee to approve and regulate laboratory-contained applications within their
In addition, they discussed the insight that university personnel had gained into the safety of laboratory-contained applications of gene technology, as a result of their involvement with these applications.

However, it is also important to note that, in commenting upon laboratory-contained applications of gene technology, the University Submissions only divulged the views of a small group of people within each university. As I discuss in Chapter 7, a consensus of opinion did not exist within the universities about the benefits and risks of this application genre, nor the changes that were needed to the regulatory system. By focusing solely on the views of the Working Group members and gene technology users, and excluding the views of other university personnel, the University Submissions presented an appraisal of this application genre that was narrow and lacked balance.

5.3.2 Other Gene Technology Applications

The authors of the University Submissions were predominantly focused on laboratory-contained applications of gene technology. However, they also used the University Submissions to express views on a number of other gene technology applications (see Figures 1 and 2).

Some of these applications received a considerable amount of attention. The importance of gene technology for teaching and research purposes was frequently spoken of in a general sense (see Conder, 2000, p.2; Field, 2000, pp.7-9; Lincoln University, 2000, p.12; University of Canterbury, 2000, pp.12-13). Also, drawing upon their experience in medical teaching and research, and clinical practice, representatives of the University of Auckland and the University of Otago discussed a number of gene technology applications in healthcare (see Buchan, G., 2000, pp.5-7; Cooper, 2000, pp.4-7; University of Otago, 2000, pp.12-23; Winship, 2000, pp.6-13).

There were scattered references to a number of other gene technology applications. For example, the University of Otago’s Interested Person submission and Professor Richard Bellamy (of the University of Auckland) commented on the value of field trial research (see Bellamy quoted in RCGM, 2000, October 25, pp.495-496; University of Otago, 2000, pp.13-14), with the University of Otago warning that “The banning of field trials in New Zealand would...seriously compromise the ability of New Zealand scientists to commercialise research” (University of Otago, 2000, p.14). The University
of Canterbury's Interested Person submission expressed several concerns about high-risk applications of gene technology, commenting, for example, that “some high risk work is beyond the bounds accepted by society” (University of Canterbury, 2000, p.1). And, to provide a third example, three representatives of Lincoln University (Professor Roy Bickerstaffe, Professor Roger Field and Dr Barry Palmer) spoke of the importance of gene technology for Aotearoa New Zealand's biological industries (see Bickerstaffe, 2000, p.8; Field, 2000, p.7; Palmer, B., 2000, p.9).

In addition, gene technology was sometimes discussed in a general sense. For example, Dr Barry Palmer (of Lincoln University) commented that “There is enormous potential to use GM technology to improve production, preserve the environment and improve human and animal health” (Palmer, B., 2000, p.7); the University of Otago commented that “the United States and most other developed nations have actively embraced GM technology totheir economic and strategic advantage” (University of Otago, 2000, p.19); and Matthew Kent (of Lincoln University) remarked that:

The potential for New Zealand to reap financial and social benefits from the development and ownership of the technology is great. The development of such desirable technologies will permit New Zealand to trade this intellectual property on the international market. This will represent the forerunner of Biocurrency, the currency of the future. (Kent, 2000, p.6)

While the authors of the University Submissions held strong views on these topics, there were a number of staff members and students, within the four universities, who did not agree with their views. Consequently, the authors' commentary, on various applications of gene technology, was one contentious facet of the University Submissions. As I explain in the following section, it was not the only facet of the University Submissions that attracted controversy.

5.3.3 Perceptions of the University Submissions' Content

Interestingly, those who were involved with the University Submissions did not consider the content of the submissions to be controversial. For example, in the opinion of Dr Jack Heinemann (a member of the University of Canterbury's Working Group), the University of Canterbury's submission “was highly focused on educational issues at the core of our institutional function, and thus unlikely to have met with disagreement from within” (J. Heinemann, personal communication, October 21, 2002). And to provide a
second example, Professor Roy Bickerstaffe (of Lincoln University's Working Group) commented that Lincoln University's submission "was a non-political university case" (R. Bickerstaffe, personal communication, January 10, 2003). However, in the course of my research I encountered a number of university personnel who disagreed with the content of their university's submission.

This is not to say that the University Submissions were without support. I spoke with university personnel who argued that it was important for their university to protect their teaching and research activities. For example, Kevin told me:

The university has an important role in backing and supporting research into a number of different diseases. A lot of us consider that we are doing some good for mankind in the research that we do...and the University is an appropriate institution to protect that interest. (Kevin, personal communication, December 10, 2002)

Other university personnel stressed that their university's submission had conveyed important information to the Royal Commission and, in this sense, had made a constructive contribution to the Royal Commission's inquiry. For example, Amanda commented:

I think that each university has an obligation to present its perspective....The universities are both the producers and users of genetic technology at present. Well, they are among the producers and users. And they have an important role to play in that production and use. I think that if they didn't make a contribution it would be to the detriment of the whole debate. (Amanda, personal communication, December 13, 2002)

However, as I indicated earlier, a number of university staff members were displeased with their university's submission. Some opposed the very act of presenting a University Submission, as they felt it created a false impression of university personnel's views. Maria explained her concern in the following terms:

What I object to, I think, is the official University-view on biotech, because I don't think it reflects the diversity of views of the staff....I wouldn't have objected if it was a group submission, say if the Biotech Group put in a strong submission supporting it....But to make a claim that the University now supports biotech - I don't know who the University is in that case....To be quite frank, I have profound objections to the assumption that there is a collective view when significant numbers of the university community were not consulted. (Maria, personal communication, November 20, 2002)

Several university staff members were concerned that the scope of their university's submission had been too narrow. For example, Associate Professor Peter Wills (a staff
member of the University of Auckland) commented, during his presentation at the Royal Commission’s Formal Hearings, that:

[The University of Auckland] limited what it was going to have to say just to those aspects of the subject which influenced its teaching and research from the point of view of those who were participating in those direct activities. There was no consideration given to producing a comprehensive submission given the insights of all members of the university who have expertise in that area, which is what I would have wished for from a university which has expertise in all sorts of areas and people with different points of view. (Wills quoted in RCGM, 2000, November 13, p.1048)

Other university personnel felt dismayed that the representatives of their university had been given license to express opinions outside their area of expertise, or were concerned that university representatives had appraised gene technology in an unbalanced fashion. With regard to this latter point, Amanda told me:

I think one aspect that the universities didn’t pursue as much as they could have done, although that may change in time, is that there are a lot of unknowns about genetic modification. And to put the case forward from a university in such a manner that one can only see the good, and not anything else, is to be perhaps a bit naïve. (Amanda, personal communication, December 13, 2002)

These comments provide further evidence that the University Submissions were a partial reflection of the views that existed within each university’s community. In addition, they provide evidence that concerns existed, amongst university personnel, about the enthusiastic appraisals of gene technology that were contained within the University Submissions.

5.4 The University Submissions and the Universities’ CCS Role

The University Submissions can be justified on a number of grounds. Under the Education Act 1989, University Executives have a responsibility to ensure that their universities “meet international standards of teaching and research” (Education Act 1989, Section 162, 4(a)(iii)). In the modern era, University Executives also have a responsibility to guard the commercial interests of their universities. By creating the University Submissions, and using these submissions to protect and expand university personnel’s access to laboratory-contained applications of gene technology, University Executives acted in a manner that was consistent with these responsibilities.
Nevertheless, the University Submissions were largely inconsistent with the universities’ role as a critic and conscience of society. In Chapter 4 I reasoned that the University Submissions would be consistent with the universities’ CCS role to the extent that they assisted university personnel to communicate their knowledge and ideas on gene technology. The University Submissions did enable a small group of university personnel (i.e., the Working Group members) to communicate their knowledge and ideas to the Royal Commission, and for this reason they were not entirely incompatible with the universities’ CCS role. However, the University Submissions were never intended to explore the knowledge and ideas that existed within each university, and their content did not reflect the diverse views that university personnel held.

Indeed, the act of creating and presenting the University Submissions was characterised by an inequality of treatment. For example:

- University Executives encouraged some university personnel (e.g., the Working Group members) to play an active role in the Royal Commission’s inquiry, but did not encourage others;
- a number of University Executives and gene technology users were given the opportunity to address the Royal Commission on behalf of their university, but other university personnel were not; and
- University Executives provided this group of university personnel with access to a prestigious component of the Royal Commission’s inquiry (the Formal Hearings), but did not share this access with other university personnel.

The bias that was inherent in these processes had a number of consequences. Firstly, the submissions commented upon laboratory-contained applications from a limited range of perspectives; they did not provide the broad and balanced critiques that could have been established if the views of a wider group of university personnel had been included. Secondly, the submissions contained a paucity of information on many of the gene technology applications that the Royal Commission was inquiring into, and on which university personnel held personal and professional opinions. And thirdly, as I will discuss in Chapter 7, some university personnel, who had not been consulted during the creation of the University Submissions, struggled to communicate their knowledge and ideas during the Royal Commission’s inquiry. All of these consequences sit uneasily with the universities’ CCS role.

Of course, it could be argued that the inequalities I have listed were inevitable to some extent. Those who set out to produce the University Submissions had limited
financial resources, other work commitments, and a limited period of time to prepare the submissions. Consequently, it was always going to be difficult for them to prepare submissions that reflected the diversity of views that university personnel held on gene technology.

There is some worth to this argument. However, if University Executives had wished to implement their universities’ CCS role in the course of the University Submissions, there were a number of steps they could have taken. For example, they could have:

- encouraged a wider group of university personnel to prepare written submissions for the Commission (bearing in mind that there was no limit to the quantity of written evidence that each university could submit);
- distributed the resources they did have (e.g., financial resources and presentation time at the Formal Hearings) in a more equitable fashion; or
- invited a broader, more representative, group of university personnel to participate in the Working Groups.

The approach adopted by the Royal Society of New Zealand, during the Royal Commission’s Formal Hearings, is interesting in this regard. The Royal Society of New Zealand is a statutory body that represents the interests of scientific societies and their members (amongst other duties). Based upon a recognition that the Royal Society’s members had different perspectives on gene technology, and different areas of expertise, a decision was made to present a two-part submission during the Formal Hearings. One part of the Royal Society’s submission addressed the views of a group of biological scientists within the Society, while the second part addressed the views of a group of social scientists. In the introduction to their submission, the authors explained why they had opted for this approach. They remarked:

In preparing this submission the Society canvassed the opinion and comments of the appropriate member societies and of the Academy…Understandably there was some disparity, both of perception and opinion, between the views expressed by the experimental biological scientists and the social scientists. Because these viewpoints formed separate coherent wholes, and because there was a strong desire to represent our views to the Commission as clearly and concisely as possible, the submission is presented in two parts. (Royal Society of New Zealand, 2000, pp.1-2)

The activities of the Royal Society demonstrate one approach that University Executives could have used to address university personnel, and their views, in a more equitable fashion. However, while University Executives did not make this effort, it is
possible that they sought to implement their universities’ CCS role through other means.
In the following chapter I discuss and analyse the support that some University
Executives provided for the activities of the New Zealand Life Sciences Network, an
organisation that played a prominent role throughout the Royal Commission’s inquiry.

Notes

1 When I refer to ‘laboratory-contained applications of gene technology’, I mean gene technology
applications that take place in one of four types of containment facility: PC1, PC2, PC3 or PC4 facilities.
At the time of the Royal Commission’s inquiry the physical design, management and operation of these
facilities were prescribed by organisations such as the Australia Standards Authority and the Ministry of
Agriculture and Forestry, and were intended to minimise the possibility of genetically modified organisms
(or other products of genetic modification) being released into the natural environment. My use of the
term ‘laboratory-contained applications’ is not intended to encompass field tests (or trials) of genetically
modified organisms. The Hazardous Substances and New Organisms Act 1996 stipulates that field tests
involve “the carrying on of trials on the effects of the organisms under conditions similar to those of the
environment into which the organism is likely to be released” (Section 2(1)). Consequently, field tests
generally take place outside of PC1, PC2, PC3 or PC4 facilities and could, for example, involve the study of
gene technology within paddocks or glasshouses.

2 In order for a university to achieve Interested Person status, and thus the right to present a submission
during the Royal Commission’s Formal Hearings, university representatives had to prove to the
Commissioners that their university had an interest in the Royal Commission’s inquiry that was “apart
from that in common with the public” (RCGM, 2001b, p.115).

3 The quotation is taken from the University of Canterbury’s application for Interested Person status. It
was included within a letter that Dr Jack Heinemann wrote to me on 21 October 2002.

4 For an example of the confusion that this caused during the Royal Commission’s inquiry see RCGM
(2000, October 25, pp.486-487), in which Professor Marston Conder (the University of Auckland’s Deputy
Vice-Chancellor (Research)) is cross-examined by Mr Pearson (a member of the Royal Commission’s legal
counsel).

5 At the time of the RCGM, each university had an Institutional Biological Safety Committee that, under
delegation from the Environmental Risk Management Authority, was authorised to regulate certain uses of
gene technology.

6 The quotation is taken from an email that Associate Professor Clive Ronson (the Convenor of the
University of Otago’s Working Group) wrote to Dr Nigel Birch (a member of the University of Auckland’s

7 A criterion for joining the Centre for Gene Research is that university personnel must, in some way, be
“involved in DNA cloning, DNA sequencing, gene expression, gene structure or studying the wider
implications of recombinant DNA technology such as bioethics” (Centre for Gene, 2001, November,
Members section, para.4).

8 When I refer to the universities’ written submissions, I mean the Interested Person submission and
Witness Briefs that were presented to the Royal Commission on behalf of each university (i.e., Bellamy,
2000; Bickerstaffe, 2000; Buchan, G., 2000; Conder, 2000; Cooper, 2000; Field, 2000; Fraser, 2000;
Guilford, 2000; Hickford, 2000; Kent, 2000; Lamont, 2000; Lincoln University, 2000; MCFarlane, 2000;
Palmer, B., 2000; Ronson, 2000; Smith, 2000; Stewart, A., 2000; Tagg, 2000; University of Auckland, 2000;
University of Canterbury, 2000; University of Otago, 2000; Wallis, 2000; Winship, 2000). The oral
submissions that university representatives presented, by and large, reiterated the content of these written
submissions. For this reason I focused my analysis on the written submissions.
Chapter 6: University Executives and the Activities of the New Zealand Life Sciences Network

The New Zealand Life Sciences Network (the Network) was established during 1999, at a time when the gene technology debate was escalating in Aotearoa New Zealand. In its Constitution, submitted to the New Zealand Companies Office in May 2000, the Network declared its intention to promote the “strategic economic opportunity available...from the application of biotechnology in the expanding knowledge age” (NZLSN, 2000a, p.2). In keeping with this objective, the Network embarked on a major campaign during the Royal Commission on Genetic Modification.

At the outset of its campaign the Network explained that it would be “seeking an outcome from the Royal Commission which will give the Government the necessary level of comfort to continue to promote and invest in the current biological science construct” (NZLSN, 2000b, Summary section, para.6), and it began recruiting supporters. By October 2000, when it forwarded its Interested Person submission to the Royal Commission, the Network felt able to declare that:

The New Zealand Life Sciences Network (Inc), its member organisations and the organisations with whom it has close links; represent the views of the significant majority of the investment made in biotechnology and genetic modification in this country. (NZLSN, 2000c, p.11)

Amongst its supporters were the NZ Dairy Board, the Meat Industry Association of New Zealand, the Federated Farmers of New Zealand, the New Zealand Biotechnology Association, a collection of Crown Research Institutes, and a group of University Executives (NZLSN, 2000c, pp.2-3).

By supporting the Network’s activities this group of University Executives made a contribution to the Royal Commission’s inquiry. In this chapter I explore the forms of support that University Executives provided (Section 6.1), the activities that the Network engaged in (Section 6.2), and the consistency of University Executives’ actions with the universities’ CCS role (Section 6.3). In the process I argue that the University Executives’ actions reflected their desire to protect and expand university personnel’s access to gene technology. However, in the course of their actions, these Executives treated university personnel in an inequitable fashion, and created several barriers for
university personnel who were trying to express concerns about gene technology. In these respects, their actions were inconsistent with their universities' CCS role.

6.1 The Support Provided by University Executives

During the proceedings of the Royal Commission on Genetic Modification, University Executives provided two forms of support for the Network's activities. One form of support was provided by the Vice-Chancellors of Aotearoa New Zealand's eight universities who, collectively, make up the New Zealand Vice-Chancellors' Committee. In the course of its submission to the Royal Commission, the New Zealand Vice-Chancellors' Committee declared that it "fully endorses the recommendations and findings of the Lifesciences [sic] Network" (NZVCC, 2000, p.1). Through this statement the eight Vice-Chancellors helped to affirm the Network's activities. However, as this affirmation had minimal impacts on other university personnel, I do not focus upon it in this chapter.

In contrast, a second form of support, provided by several Executives within the universities of Auckland and Otago, did affect university personnel who were trying to express views on gene technology. During the proceedings of the Royal Commission, this group of University Executives helped to finance the activities of the Network. As a result, they became implicated in the activities of the Network, and the interactions that the Network had with a number of university personnel.

Within the University of Otago, Executives decided to enlist their University as a financial member of the Network. According to Jan Flood (the University's contact person for requests under the Official Information Act 1982), the University of Otago paid the Network $NZ28,125 in membership subscriptions during the Royal Commission's inquiry: $NZ16,875 in August 2000 and $NZ11,250 in March 2001 (J. Flood, personal communication, February 12, 2003). As this financial support was provided in the name of the University of Otago, Dr Graeme Fogelberg (the University's Vice-Chancellor) became implicated in the Network's activities. In addition, Dr Ian Smith (the University's Deputy Vice-Chancellor (Research and International)) was implicated in the Network's activities because he engaged with the Network, as a representative of the University of Otago, during the Royal Commission's proceedings (J. Flood, personal communication, February 12, 2003).
Within the University of Auckland, Executives chose not to enlist their University as a member of the Network\(^1\). However, a decision was made to enlist Auckland UniServices Limited (UniServices), the University's commercial arm, as a financial member\(^2\). As Dr John Hood (the University's Vice-Chancellor), Professor Marston Conder (the University's Deputy Vice-Chancellor (Research)), Professor Richard Bellamy (Dean of the University's Faculty of Science), Professor Peter Gluckman (Dean of the University's Faculty of Medical and Health Sciences) and Professor Peter Brothers (Dean of the University's Faculty of Engineering) were Directors of UniServices at the time, they were implicated in this decision, and the activities of the Network that followed. In the course of my research I attempted to ascertain the extent of financial support that UniServices (and thus UniServices' Directors) had provided for the Network's activities. However, in response to the information request I submitted to the University of Auckland, Grant Wills (the University's contact person for requests under the Official Information Act 1982) told me that UniServices was a “company operating in a commercial environment”, and claimed that the University of Auckland did not hold information on this subject (G. Wills, personal communication, March 20, 2003).

The financial support that this group of University Executives provided was interesting in two respects. Firstly, it was interesting because they acted in a manner that differed from Executives in other universities. There may have been a number of reasons why other Executives chose not to sponsor the Network's activities. However, in the case of Lincoln University's Executives at least, it was evident that they felt uncomfortable about a strong alliance with the Network. As Professor Roy Bickerstaffe (the Director of Lincoln University's Postgraduate and Research School) explained to me:

> Lincoln University was presenting a case on sustaining its excellence and teaching in an independent way. We did not want to be tied up with another organisation which had connections with some industries and non-university organisations. This connection may have been perceived to be a political connection. (R. Bickerstaffe, personal communication, January 10, 2003)

Secondly, the financial support that these Executives provided was interesting given their universities' commercial interest in gene technology. As I discussed in Chapter 2, the universities of Auckland and Otago had been developing a number of entrepreneurial ventures that were dependent, to some extent, on gene technology. As a consequence, these universities had a form of commercial interest in gene technology, at the time of the Royal Commission's inquiry, that other universities did not. The
expenditure and revenue that was associated with these ventures may help to explain why Executives in these two universities, and not other universities, were willing to sponsor the Network’s activities.

I phrase this comment in a speculative fashion because, in the course of my study, the University Executives did not explain their motives in any depth. Following my requests for official information, Grant Wills (of the University of Auckland) did not provide any explanation of the Executives’ motives, and Jan Flood (of the University of Otago) simply stated that “The University was... anxious to protect the right of its staff and students to work at the cutting edge of molecular biology research” (J. Flood, personal communication, February 12, 2003). Given the brevity of these explanations I decided to study the Network’s activities during the Royal Commission, in order to explore what the Network, and its financiers, attempted to achieve.

6.2 The Activities of the New Zealand Life Sciences Network

The New Zealand Life Sciences Network engaged in a major campaign during the Royal Commission’s inquiry. During the year ended 30 June 2001, the time period in which the bulk of the Royal Commission’s inquiry took place, the Network spent $NZ754,132 on its “Operating Expenses and Royal Commission of Enquiry Project” (NZLSN, 2001a, p.1). Amongst the multiple strands of its campaign, the Network:

- encouraged its supporters to collaborate with one another by inviting them to meetings, and facilitating information exchanges;
- engaged in a public relations campaign and maintained a constant presence in Aotearoa New Zealand’s major daily newspapers and Internet-based newswires;
- facilitated a lobbying campaign that was intended to achieve “political education about GE and GMOs” (NZLSN, 2000b, Summary section, para.5); and
- played a substantial role in the Royal Commission’s Formal Hearings in its capacity as an Interested Person.

In this section I focus on two aspects of the Network’s activities. In Section 6.2.1 I discuss the submissions that the Network presented, as their content illustrates what the Network, and its supporters, tried to achieve during the Royal Commission. Then, in Section 6.2.2, I focus on the adversarial nature of the Network’s campaign and how this campaign affected university personnel.
6.2.1 The Submissions of the New Zealand Life Sciences Network

As I have previously explained, organisations that were granted Interested Person status had the opportunity to participate in the Royal Commission’s Formal Hearings, to present written and oral submissions to the Royal Commission, and to invite witnesses to present evidence on their behalf. The Network responded to these opportunities by inviting ten witnesses to present evidence on its behalf. This included seven witnesses who travelled from other countries to be present at the Formal Hearings. It also included several witnesses (Adolf Stroombergen, Tamati Cairns and Paora Ammunson) who were commissioned, by the Network, to produce original work. In addition, the Network and its representatives prepared, and presented, voluminous written submissions during the Royal Commission’s inquiry. These included a 78-page Interested Person submission, 226 pages of Witness Briefs, a 60-page Legal Submission, and a 131-page Closing Submission.

By supporting the production of these submissions, the University Executives demonstrated their desire to protect, and expand, university personnel’s access to gene technology. Several of these University Executives had already demonstrated this desire through their involvement with the submissions of the University of Auckland and the University of Otago. However, whereas their universities’ submissions had focused on laboratory-contained applications of gene technology, the Network’s submissions were much broader in focus. Figure 3 and Figure 4, which are derived from a Content Analysis of the Network’s Interested Person submission, are provided to illustrate this point.

Throughout their submissions, the Network and its representatives endorsed gene technology in a general sense. For example, they argued that:

- “The evidence of benefit derived from biotechnology and the possibilities opened up by genetic modification is overwhelming” (NZLSN, 2000c, p.32);
- “The availability of GM technology is crucial to the economic wellbeing of New Zealand’s primary industries and those industries that support them” (NZLSN, 2001b, p.78); and that
- “...it would be a disaster for New Zealand and generations yet to come if we were to reject, even for a short time, the most important knowledge the human race has developed in its history to date” (NZLSN, 2000c, p.13).
Figure 3: References to Applications of Gene Technology Within the Network's Interested Person Submission

![Bar chart showing the proportion of paragraphs in which each type of application was referred to. Gene technology (in a general sense) is the most referred to, followed by Other applications.]

Figure 4: Evaluations of Gene Technology Within the Network's Interested Person Submission

![Bar chart showing the number of evaluations stated for each type of application. Gene technology (in a general sense) received the most evaluations, followed by Other applications.]

The type of gene technology application that was evaluated

The type of evaluation that was stated
- Negative
- Neutral
- Positive

NB: See Appendix 1 for definitions of the terms used in these Figures.
The Network and its representatives also endorsed several contentious uses of gene technology, including field trial research and applications of gene technology in food production. However, before I describe the manner in which these uses were endorsed, I first wish to explain why they were contentious.

Prior to the Royal Commission's inquiry there was a high level of concern, within Aotearoa New Zealand, about the environmental release of genetically modified organisms (see IBAC, 2000b, pp.3-13; RCGM, 2001b, pp.50-51). Those who were concerned argued that the environmental release of genetically modified organisms had the potential to tarnish Aotearoa New Zealand's "clean and green" image, endanger a number of industries, and place the natural environment at risk (IBAC, 2000b, p.3). As field trial research involved the use of genetically modified organisms in naturalistic settings, such as paddocks and greenhouses, it was a use of gene technology that many people opposed. For similar reasons, many people opposed the use of genetically modified organisms in agriculture and horticulture.

In response to this controversy, when the Labour-Alliance Government initiated the Royal Commission on Genetic Modification, it also introduced a voluntary moratorium on applications to field trial, or release, genetically modified organisms (RCGM, 2001b, pp.50-51). The purpose of the voluntary moratorium was to suspend such applications until the Royal Commission had completed its inquiry, and the Government had been able to consider the Royal Commission's findings (Hobbs, 2000, June 15). As a consequence of the Government's actions, the merits of field trial research, and applications of gene technology in food production, became a major topic of debate during the Royal Commission's inquiry.

While many people in Aotearoa New Zealand held concerns about these applications, the Network's submissions endorsed them in emphatic fashion. For example, with regard to field trial research, the Network and its representatives argued that:

- "...limiting the use of genetic modification to the laboratory is arbitrary and nonsensical because it inhibits the development of further vital knowledge about the performance of GMOs in the environment" (NZLSN, 2001b, p.10);
- "...the country's future economic well-being would be seriously undermined if a GM moratorium was imposed" (Stroombergen, 2000, pp.4-5); and that
“Any option which involves restricting GMOs to the laboratory or to medical applications means that New Zealand will lose the opportunity to use the technologies to promote sustainability” (NZLSN, 2001b, p.71).

Within its submissions the Network also endorsed applications of gene technology in food production. While it conceded that “New Zealand GM opportunities are in high value specialised products...not in commodity crops” (NZLSN, 2000c, p.6), the Network argued that:

- “The overwhelming public interest...is and will be driven by the economic benefits to be derived from the application of genetic modification to agriculture” (NZLSN, 2000c, p.58);
- “The next generations of genetically modified food crops will provide significant benefits for human health and nutrition” (Moore, 2000, p.2); and that
- “New Zealand agriculture and society as a whole would stand to benefit by adopting relevant and safe GM crops” (Stewart, C. N., 2000, p.6).

These resounding endorsements were used to support the Network’s major recommendations. In general terms, the Network recommended that the Royal Commission should report, to the Government, that gene technology could make important contributions to the “health of the public” (NZLSN, 2000c, p.14), the “viability of agriculture, horticulture and other biology based industries” (NZLSN, 2000c, p.14), “the development of new trade opportunities” (NZLSN, 2000c, p.14), and the “development of sustainable responses to significant environmental issues” (NZLSN, 2000c, pp.14-15). And, in tandem with this proposition, the Network recommended that “The Government should continue to make substantial investment in, and seek investment support for, a wide range of scientific research and development of GMOs and GM products” (NZLSN, 2001b, p.118).

The Network also argued that the regulation of gene technology, in Aotearoa New Zealand, needed to be modified in a number of ways. For example, the Network recommended a number of changes to the regulation of laboratory-contained applications of gene technology, reinforcing, in the process, several recommendations that had been advanced in the University Submissions (see NZLSN, 2001b, pp.104-110). In addition, the Network recommended that the Government should “immediately lift” the voluntary moratorium on field trial research and the environmental release of genetically modified organisms, so that “appropriate research and development” could proceed (NZLSN, 2001b, p.119).
Reflecting upon the content of the Network's submission there are two points that I wish to emphasise. Firstly, by supporting the Network's submissions, a group of University Executives supported submissions that had a large scope. In part, the Network's submissions helped to reinforce recommendations that had been advanced in the University Submissions, in relation to laboratory-contained applications of gene technology. However, the Network's submissions were also broader in focus than the University Submissions and pressed for outcomes, such as the lifting of the voluntary moratorium, which would expand the types of research and entrepreneurial ventures that university personnel could engage in.

Secondly, the Network's submission helped a group of University Executives to express their enthusiasm for gene technology and various applications of gene technology, but they did not communicate the variety of views that university personnel held on these subjects. There were people within the universities of Auckland and Otago who did not share the Network’s views. These people did not benefit from the financial investment that University Executives made in the Network's activities. Indeed, as I explain in the following section, this investment was, in some respects, to their detriment.

6.2.2 The Adversarial Nature of the New Zealand Life Sciences Network’s Activities

The Network's activities, during the Royal Commission on Genetic Modification, were characterised by an adversarial approach. At the outset of its campaign the Network informed its member organisations that it would be addressing “all aspects of the debate from the member's [sic] viewpoint” (NZLSN, 2000b, Summary section, para.8), and that it would be challenging people and organisations that were opposed to gene technology (NZLSN, 2000b, Background section). This 'us versus them' mentality pervaded the Network’s campaign and contributed to its reputation as the “most aggressive and well-organised lobby group in the pro-GE camp” (Bone, 2002, August 17, p.28)

The adversarial approach that the Network adopted had implications for a number of university personnel. In the course of its campaign the Network provided some university personnel, who were enthusiastic about gene technology and its place in Aotearoa New Zealand, with forms of support. Others, who were expressing concerns about gene technology, found themselves being challenged and opposed by the Network's representatives. Of course, the Network was not the only organisation that
challenged university personnel during the Royal Commission’s inquiry. However, unlike other organisations, the Network did so with the support of University Executives.

Three components of the Network’s activities help to illustrate its adversarial approach, and the implications that this approach had for university personnel. The first of these is the manner in which the Network’s representatives portrayed proponents and opponents of gene technology.

Throughout the proceedings of the Royal Commission on Genetic Modification, the Network’s representatives attempted to cast proponents of gene technology in a positive light. For example, they claimed that the Network’s members and supporters were “responsible” (Rolleston quoted in RCGM, 2000, November 1, p.858) and “pragmatic” (Hodson quoted in RCGM, 2001, March 12, p.04683). And they emphasised to the Commission that it was important to “work with scientists, Governments, international agencies and multi-national companies to ensure the benefits of new technologies are delivered to all those who need them” (NZLSN, 2000c, pp.13-14).

Some university personnel, who the Network classified as proponents of gene technology, benefited from the Network’s rhetoric. As a result of the Network’s activities these ‘proponents’ were presented to the Commissioners, and the people of Aotearoa New Zealand, in favourable terms. However, the opposite was true for university personnel who the Network regarded as opponents of gene technology.

These people had to cope with an organisation that, on a number of occasions, depicted them in a negative fashion. For example, during the proceedings of the Royal Commission, the Network and its representatives described opponents of gene technology as “ideological” (NZLSN, 2000c, p.26) and “risk averse” (Hodson quoted in RCGM, 2001, March 12, p.04683). They claimed that “present opposition to responsible use of biotechnology is not based on careful scientific assessment of the risks involved” (NZLSN, 2000c, p.25), and that opponents of gene technology were driven by their “political, religious or values position” (NZLSN, 2001b, p.101). And they emphasised to the Royal Commission that “we must not give way to those who would have us destroy the very research which will lead to greater knowledge and therefore certainty about what, if any, the real dangers are which we confront” (NZLSN, 2000c, p.14).

The activities of the Network’s legal team, during the Royal Commission’s Formal Hearings, were a second component of the Network’s adversarial approach. Prior to describing these activities it is first necessary to provide some contextual information.
While designing the Formal Hearing process, the Commissioners decided to utilise a quasi-judicial format in which participants could present evidence, and cross-examine one another, in a public setting. In response to this format, a number of organisations that had been allocated Interested Person status, including the Network, employed legal counsel. Mr Chris Hodson QC\(^1\) and Mr Mark Christensen were two members of the Network’s legal team and, during the Royal Commission’s Formal Hearings, they interacted with university personnel in several ways.

As one dimension of their activities, the Network’s legal team assisted a number of university personnel, including those who presented submissions on behalf of the University of Auckland\(^1\), Auckland UniServices Limited, and the University of Otago. For example, they reviewed and edited draft submissions that these people had prepared, before they were forwarded to the Royal Commission. In addition, members of the Network’s legal team were present at the Formal Hearings to introduce these submitters, and to protect them during any cross-examination that they might face.

While this group of university personnel received support from the Network’s legal team, other university personnel received opposition. During the Formal Hearings, a number of academics from the universities of Auckland and Otago found themselves being cross-examined by the Network’s lawyers. During this cross-examination the information they had provided, and the opinions they had expressed, were scrutinised.

In some instances this scrutiny was a lengthy and exhaustive process. For example, following their presentation to the Formal Hearings, Dr Hugh Campbell (a staff member of the University of Otago) and the other representatives of the Organic Product Exporters Group, were cross-examined by Chris Hodson QC for approximately two hours (see RCGM, 2000, December 6, pp.2131-2162). To provide a second example, following his 45-minute presentation, Associate Professor Peter Wills (a staff member of the University of Auckland) was cross-examined, by Mark Christensen, for approximately 95 minutes (see RCGM, 2000, November 13, pp.1054-1084).

Another aspect of Associate Professor Peter Wills’ cross-examination is also worthy of mention. During the Formal Hearings, Peter Wills had expressed concerns about gene technology in his capacity as a Theoretical Biologist. However, during cross-examination, Mark Christensen attempted to raise questions about the motives that underpinned Peter Wills’ concerns (see RCGM, 2000, November 13, pp.1083-1084). Having referred to a submission that Peter Wills had written on the Security Intelligence Amendment Bill in 1999, Mark Christensen suggested that Peter Wills’ opposition to

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\(^1\) QC: Queen’s Counsel
genetic modification stemmed, primarily, from his opposition to the “globally dominant economic ideology” (Christensen quoted in RCGM, 2000, November 13, p.1084). While it is unclear if Mark Christensen’s approach made any impact on the Commissioners, it was a line of cross-examination that Peter Wills did not appreciate. In an open letter to Dr John Hood (the Vice-Chancellor of the University of Auckland), Wills expressed his concerns and stated:

You are free to read the transcript and imagine the position that your representative put me in. Referring to my relationship with the Security Intelligence Service was pathetic, as was the suggestion that I had not made reference to enough scientific papers. In spite of all the trivial nonsense that was intended to be personal I cannot see how the University could condone such a general waste of the Commission’s time. I made a special effort to give of my expertise and sought an enlightening discussion in that most public of forums, but the academic-industrial-governmental biotech complex, of which the University is a prominent member, sought only to diminish my credibility rather than lead an intelligent response to the difficult issues. (Wills, 2001, September 20, para.5)

The content of the Network’s Closing Submissions provides a third illustration of the Network’s adversarial approach. During the Formal Hearings the Commissioners had explained that Interested Persons were entitled to present Closing Submissions, and that these submissions “could be a summary of the Interested Person’s own position; a critique of other submissions; or both” (RCGM, 2001b, p.125). Most of the organisations that had been granted Interested Person status did not utilise this opportunity. However, the Network’s representatives responded by presenting a 131-page written submission (see NZLSN, 2001b), and a 125-minute oral submission (see RCGM, 2001, March 12, pp.04666-04700).

Consistent with the adversarial approach they had employed throughout the Royal Commission’s inquiry, the Network’s representatives used these Closing Submissions to support, and oppose, the views of various university personnel. Specific attempts were made to scrutinise and rebut the arguments that had been made by some university personnel, such as Associate Professor Peter Wills and Dr Hugh Campbell, with whom the Network did not agree (see NZLSN, 2001b, pp.12-13, 16-17, 40-41, 81-85, 101-103). For example, having summarised Peter Wills’ views on field trial research the Network claimed that he had made assertions that were “not supported by scientific evidence” (NZLSN, 2001b, p.17). In contrast to the scrutiny that Peter Wills and Hugh Campbell received, the views of other university personnel, who the Network agreed with, were simply reiterated and affirmed (see NZLSN, 2001b, pp.65-69, 78-81, 94-97).
The three facets of the Network's adversarial campaign that I have discussed all had a common ingredient: they involved the inequitable treatment of university personnel. The University Executives’ involvement in this campaign raises questions about their commitment to the academic freedom of some university personnel, such as the gene technology critics that reside in their universities. Their involvement also raises questions about their commitment to their universities’ CCS role.

6.3 The Actions of University Executives and the Universities’ CCS Role

In Chapter 4 I outlined the logic of my evaluation framework. In the process, I argued that University Executives had a right to communicate their views on gene technology, as did all university personnel. I also argued that due to their status within the universities, University Executives had a responsibility to assist university personnel to communicate their views on gene technology, whatever their views might be. Based on these considerations, I reasoned that University Executives' actions would be consistent with their universities’ CCS role to the extent that they enabled university personnel to communicate their views on gene technology.

By supporting the Network’s activities a group of Executives, within the universities of Auckland and Otago, were able to express their enthusiasm for gene technology and several contentious applications of gene technology. In doing so, they displayed a willingness to play an active part in a high profile societal debate. In addition, it is likely that they helped to communicate views, and advance recommendations, that were supported by various people within their universities. In these respects, the University Executives’ actions were consistent with their universities’ CCS role.

However, their actions were inconsistent with this role in two respects. Firstly, in the course of their actions this group of University Executives treated university personnel, within the universities of Auckland and Otago, in an inequitable fashion. As had been the case with the University Submissions, financial resources were invested in a manner that enabled some university personnel to communicate their views to the Royal Commission, but not others. In addition, as a result of their financial investment, these University Executives were implicated in the Network’s activities, and the various forms of support, and opposition, that the Network provided for university personnel.
Secondly, by investing in an organisation that opposed some university personnel, the University Executives created barriers for these people. During the proceedings of the Royal Commission, the Network’s representatives produced submissions and communiqués that portrayed a group of university personnel, who were opposed to various aspects of gene technology, in a negative fashion. In addition, the Network’s representatives made a specific attempt to scrutinise the views of some university personnel, and to challenge these university personnel before the Commissioners. In the process, a number of university personnel were placed in a pressured position. As Nicholas explained to me, “it was like an affront to your whole scholarship when people cast aspersions on your work...you felt humiliated and it was terribly difficult” (Nicholas, personal communication, November 12, 2002). It is also possible that the actions of the Network’s representatives may have undermined the credibility of some university personnel, or diverted attention from the issues they were trying to raise.

In making these points I do not mean to assert that University Executives should never challenge university personnel in public. In some instances a challenge may be in keeping with the universities’ CCS role. For example, if university personnel act dishonestly in the midst of a societal debate, it would be appropriate for University Executives to bring this dishonesty to the public’s attention.

However, in the case at hand, the University Executives’ actions were not motivated by such concerns. The university personnel who participated in the Royal Commission’s inquiry were attempting to communicate views, on gene technology, that they sincerely held. The support that the University Executives provided for the Network’s activities created constraints, and obstacles, for some of these participants. As I discuss in the following chapter, these were not the only obstacles that university personnel encountered.

Notes

1 During the proceedings of the Royal Commission, representatives of the New Zealand Life Sciences Network stated that the University of Auckland had been a member of the Network (see NZLSN, 2000c, p.2). However, in the course of my research, Grant Wills (the University of Auckland’s contact person for requests under the Official Information Act 1982) claimed that the University of Auckland had “never been a member of the Life Sciences Network” (G. Wills, personal communication, March 4, 2003). Since my correspondence with Grant Wills, Fisher (2003, November 16) has raised further questions about the accuracy of the Network’s membership list at the time of the Royal Commission’s inquiry.
The decision to enlist UniServices as a financial member of the New Zealand Life Sciences Network, but not the University of Auckland, was interesting. In the course of my study, Grant Wills (the University of Auckland’s contact person for requests under the Official Information Act 1982) explained that the University had not been enlisted as a financial member of the Network because “While some individuals and groups within the University may have sympathy for the aims of this group the University respects also the contrary view” (G. Wills, personal communication, March 3, 2003). Given this reasoning, the decision to enlist UniServices as a financial member was curious. UniServices is separate from the University of Auckland in some senses, as it is a separate legal entity, and it has its own objectives and responsibilities. However, in other senses, UniServices is strongly linked with the University of Auckland. For example, it is wholly owned by the University of Auckland, and it is governed, in part, by University Executives. Given these linkages, the decision to enlist UniServices as a member of the Network was always going to reflect upon the University of Auckland, and the University Executives that serve as UniServices’ Directors.

Amongst the witnesses that presented evidence on behalf of the New Zealand Life Sciences Network were Professor Klaus Amman (of the University of Bern), Dr Gary Comstock (of Iowa State University), Dr Steven Hughes (of the Nuffield Council on Bioethics and the University of Exeter), Professor Martina McGloughlin (of the University of California), Dr Patrick Moore (of Greenspirit in Canada), Julian Morris (of the Institute of Economic Affairs in London), and Assistant Professor Neal Stewart (of the University of North Carolina).

For those not familiar with the terminology, QC is an abbreviation for Queen’s Counsel. In practice, a Queen’s Counsel is a senior barrister who can be employed to act as an advocate, for their clients, in courts and other settings.

Interestingly, during the course of my study, Francis Wevers (the Executive Director of the New Zealand Life Sciences Network) told me that “At the time the Royal Commission was established Auckland University joined the group of entities, members and non-members of the Network, which clubbed together to purchase legal counsel and advice” (F. Wevers, personal communication, March 6, 2003). Having informed Grant Wills (the University of Auckland’s contact person for requests under the Official Information Act 1982) of Francis Wevers’ claim, Grant Wills refuted this claim and told me that the University of Auckland had not employed any legal counsel during the proceedings of the Royal Commission (G. Wills, personal communication, April 7, 2003). However, during the University of Auckland’s presentation at the Formal Hearings, Chris Hodson QC introduced the University of Auckland’s representatives and stated “May it please the Commission, I appear for the University of Auckland” (Hodson quoted in RCGM, 2000, October 25, p.470). Chris Hodson’s statement indicates that he had some form of relationship with the University of Auckland’s representatives, at the time of the Royal Commission. Therefore, there appears to be some disparity between Chris Hodson’s actions and the claims of Grant Wills.

When Associate Professor Peter Wills wrote his letter he was under the impression that the University of Auckland had been a financial member of the New Zealand Life Sciences Network (see Wills, 2001, September 20). Wills’ impression was understandable given that the Network had claimed, during its Interested Person submission, that the University of Auckland was one of its member organisations (see NZLSN, 2000c, p.2). While the Network’s claim was misleading, Wills’ concerns about his cross-examination are still of interest.
Chapter 7: The Activities of the Other Contributors

In addition to the people who contributed to the University Submissions, and the University Executives who supported the New Zealand Life Sciences Network’s activities, there were a number of other people, within the four universities, who participated in the Royal Commission’s inquiry. For simplicity’s sake I refer to these people, collectively, as the Other Contributors.

During the course of my study I identified 42 university staff members who could be classified as Other Contributors. While it is likely that there were many Other Contributors who escaped my awareness, I chose to explore the activities of these 42 people for the following reasons.

Firstly, I reasoned that their activities could be linked with their universities’ CCS role. University Executives had not focused on this role while creating the University Submissions, or supporting the activities of the New Zealand Life Sciences Network. Nevertheless, it was possible that various university staff members, in the course of their personal activities, had helped to implement their universities’ CCS role.

Secondly, I reasoned that the activities of these 42 people could help me to understand the internal culture of the universities. For example, I reasoned that if some university personnel had been encouraged to express contentious views on gene technology, then others might have enjoyed comparable support. Likewise, I reasoned that if some university personnel had struggled to engage with the Royal Commission, or had felt unable to express all of their views, then other university personnel might have experienced similar constraints.

In this chapter I outline the results of my exploration by discussing the content of the Other Contributors’ submissions (Section 7.1), the freedoms and obstacles that some Other Contributors experienced (Sections 7.2 and 7.3), and the consistency of the Other Contributors’ activities with the universities’ CCS role (Section 7.4). The central argument that I construct throughout these sections, and that I impress in Section 7.4, is that the Other Contributors’ activities were partially consistent with the universities’ CCS role. This group of university personnel were able to exercise certain freedoms during the Royal Commission’s inquiry, and were able to express diverse perspectives on gene technology. However, some university personnel experienced obstacles as they attempted to participate, obstacles that were detrimental to their universities’ CCS role.
7.1 The Submissions of the Other Contributors

During the Royal Commission’s inquiry, the Other Contributors presented submissions of many types. Some Other Contributors prepared “background papers” on the Commissioners’ request (RCGM, 2001b, p.109). Some spoke at public meetings or hui that the Royal Commission had arranged. Some forwarded brief e-mails following the Commissioners’ call for “public submissions” (RCGM, 2001b, p.140). And some played a prominent role in the Royal Commission’s Formal Hearings.

As a second point of contrast, the Other Contributors expressed a wide range of views on gene technology (see Box 4). For example, they discussed an assortment of gene technology applications, including applications in healthcare, food production, laboratory-contained research, field trial research and environmental management. They commented on various aspects of these applications, including their cultural, environmental, legal, ethical, technical and economic dimensions. They assessed the implications of these technologies for a variety of interest groups, including Māori, biological scientists, Christians, people with health disorders and farmers. And they expressed a variety of sentiments about these applications, including enthusiasm, anxiety and aversion.

The multifarious nature of the Other Contributors’ views reinforces several assertions that I have made in the previous two chapters. Firstly, it supports my assertion (in Chapter 5) that a diversity of views existed, within the universities, on various facets of gene technology. Just as gene technology was the subject of mixed opinion and controversy amongst the people of Aotearoa New Zealand, so too was it the subject of mixed opinion and controversy within the four universities.

Secondly, it reinforces my assertion (in Chapter 5) that the University Submissions communicated the views of some, but not all, university personnel. The Other Contributors heralded from a range of university departments and research programmes, and they possessed expertise in disciplines as diverse as Environmental Science, Law, Biochemistry, Marketing, Public Health, Economics, Genetics, Māori Studies, Sociology and Bioethics. In the course of their submissions these people addressed many issues, and expressed many views, that the University Submissions had failed to mention.

Thirdly, it reinforces my assertion (in Chapter 6) that a number of university personnel, within the universities of Auckland and Otago, did not agree with the views of the New Zealand Life Sciences Network. Within these two universities were a number
Box 4: Extracts from the Other Contributors' Submissions

**Rosemary Du Plessis (Department of Sociology and Anthropology, University of Canterbury)**

Basic principles, vital to Maoritanga, are challenged by the practices associated with GM technologies, and these are [maori], life essence or unique life force, whakapapa, the connections between all living things, and kaitakanga, the guardianship of natural and physical resources. (Du Plessis quoted in RCGM, 2001, January 24, p.2688)

**Dr Michael Easte (Department of Biochemistry, University of Otago)**

Research from genetically modified animals is predicted to lead to developments in understanding, in diagnosis and in treatment of human disease in the coming decades. Such treatments and new diagnostic tools may offer hope and the chance of normal lives for individuals and families who are affected by genetic disease. (Eccles, 2000, p.1)

**Professor Grant Gillett (Bioethics Centre, University of Otago)**

The systems we are dealing with and which we have become very effective at intervening in, are systems, the complexity of which we are only embarking upon the journey to understand. Even the internal and interwoven dynamics of a single living cell represent a vast area of scientific knowledge yet to be opened up. We understand some things about cells, and we can do extremely powerful things to them, but the full complexity of the system in which we are intervening is something that none of us would believe we are close to fully understanding. (Gillett quoted in RCGM, 2001, February 21, p.03888)

**Professor Peter Gluckman (Dean of the Faculty of Medical and Health Sciences, University of Auckland)**

Biotechnology is the most active area other than information technology world wide in the global knowledge based economy. Genetic modification (GM) at many levels is at the core of biomedical and biological research and of the biological aspects of the knowledge economy. Without the ability to exploit GM in an appropriate manner in training and in industry, New Zealand cannot participate in the knowledge economy. (Gluckman, 2000, p.2)

**Simon Kerr (Social Science, Tourism and Recreation Group, Lincoln University)**

While not all GE technology and projects carry high risk, nevertheless New Zealand must act with great prudence and caution before allowing any specific GE process, experiment or project to take place. Of importance is the recognition that GE is not simply the concern of the scientific community, and is not simply a scientific process, but is a cultural and political process which impacts the interests of all New Zealanders. (Kerr, 2000, p.1)

**Associate Professor Donald Law (School of Biological Sciences, University of Auckland)**

The techniques of genetic modification and the use of GMOs is widespread in New Zealand and internationally in the area of molecular-based diagnostics. They have become an integral part of modern diagnostic technology. (Love, 2000, p.2)

**Staff and Students Affiliated with the Otage University Ecumenical Chaplaincy**

We advocate the need for ongoing informed debate concerning genetic engineering at all levels of our society to enable all voices to be heard and respected. Whilst not opposed to all applications of genetic engineering, we raise serious concerns about the need for safety and containment of all genetically modified organisms. We urge the commission and the government to attend seriously to the intuitive dis-ease elicited by genetic engineering, being felt by many in our nation. This dis-ease has a spiritual and ethical basis. (OUEC, 2000, p.4)

**Tim Rochford (Department of Public Health, Wellington School of Medicine, University of Otago)**

…research has produced little evidence that genetic modification will address the real causes of Maori ill health. (Rochford, 2000, p.1)

**Associate Professor Camille Saunders (Agriculture and Economics Research Unit, Lincoln University)**

…while world markets are in a state of flux, the technology in a state of development, NZ with its unique island location and its clean green image has much more to gain by staying GM free currently, than not. (C. Saunders, 2000, p.4)

**Dr Andrew Shelling (Department of Obstetrics and Gynaecology, University of Auckland)**

There are significant advantages for patients for the continued use of genetic modification, genetically modified organisms, and products. 1 in 3 will be affected by genetic disease, so it is important that this technology is available. Conversely, there is significant damage if they are restricted. (Shelling, 2000, p.2)

**Dr Liz Slooten (Director of Environmental Science, University of Otago)**

This technology has the potential to be the largest human-induced change to the environment that has ever occurred. Rather than the passive transfer of materials such as pollutants, this technology potentially involves the transfer and proliferation of human-induced changes through biological processes. In my view as a scientist, insufficient information is currently available about the risks associated with widespread commercial use of this technology, certainly in food production. (Slooten, 2000, p.1)

**Benno Tipene-Matua (Department of Maori, University of Canterbury)**

The issue of how to deal with Maori concerns regarding low-risk applications being dealt with by IBSCs has yet to be sorted out by either ERMA or the IBSCs throughout the country. These types of approvals highlight the difficulty and danger of dealing with tangible and intangible risks. While these experiments pose low physical risk to people and the environment, the cultural risks and risks to Maori have raised much concern among those Maori who have been made aware of these experiments. (Tipene-Matua, 2000, p.7)

**Associate Professor Peter Wills (Department of Physics, University of Auckland)**

The limitations and uncertainties inherent in our current knowledge of molecular biology, ecology and evolution severely constrain our ability to draw valid conclusions about the outcomes of genetic modification. This is so to the extent that we must regulate with the utmost caution any current human enterprise in this field. (Wills, 2000a, p.2)
of people who held concerns about field trial research or the environmental release of genetically modified organisms, and who saw benefits in the voluntary moratorium that was in place (see Booth, 2000, p.1; Campbell, 2000, pp.3-5; OUEC, 2000, pp.2-7; Slooten, 2000, p.1; Wills, 2000b, pp.2-5). For example, while addressing the Commissioners on behalf of the Organic Product Exporters Group, Dr Hugh Campbell (of the University of Otago) argued:

...New Zealand would not experience any adverse economic effects if a moratorium on commercial release of GMOs in primary production was imposed for a period of some years. In fact, trade modelling suggests that this would actually increase returns to farming through accessing GM-free markets. Longer term prospects require considerably more analysis which could be undertaken while a moratorium was in force. (Campbell, 2000, p.5)

And to provide a second example, Associate Professor Peter Wills (of the University of Auckland) stated:

The eventual ecological and evolutionary effects of genetic engineering are expected to be extraordinary...Reasonable caution demands that the products of genetic engineering should not be released into the environment. New Zealand should adopt its current “GE-free” status as a national policy, applied to both natural and managed ecosystems. (Wills, 2000b, p.2)

The multifarious nature of the Other Contributors’ views is also notable for another reason. It illustrates that these university staff members enjoyed certain freedoms during the Royal Commission’s inquiry, freedoms which enabled them to express diverse views on gene technology, and to disagree with views that had been expressed by various University Executives. These freedoms are the focus of the following section.

7.2 Freedoms Experienced by the Other Contributors

Most of the Other Contributors I spoke with perceived that they had some freedom to communicate their knowledge and ideas during the Royal Commission’s inquiry. During my interaction with these people they told me of the various consultation procedures that the Royal Commission had utilised, and how they had used these procedures to disseminate their research findings, express their personal opinions, and advocate for various interest groups.
In addition, it is important to note that I spoke to a number of people who felt satisfied with their level of freedom. These ‘satisfied’ people were located within each of the four universities, and they held a range of views on gene technology. In order to explain the satisfaction that they felt, there are several aspects of their experience that are worth mentioning.

To begin with, this group of satisfied people felt that they had been able to engage with the Commissioners in the manner they desired. They were aware that their universities had presented submissions to the Royal Commission, and that various University Executives held strong opinions about gene technology. However, they did not feel that they had been hindered, in any way, from expressing their personal views on gene technology. For example, Hannah commented, “my perception is that the debate hasn’t been muted or stifled in any way” (Hannah, personal communication, December 19, 2002). Similarly, Patrick told me:

> We’re given enough scope, in many ways, to be able to do those sorts of things – be involved in consultations and write submissions….So I was pretty much supported all the way and not suppressed in any way. (Patrick, personal communication, February 11, 2003)

Patrick’s comment also illustrates a second issue I wish to highlight: there was a feeling, amongst this group of satisfied people, that it was normal for university personnel to present submissions from time to time. They did not believe that they needed to seek approval from university colleagues, or University Executives, before expressing their views on gene technology. And some of these people considered that they had an inherent right, and responsibility, to contribute to the inquiry that was taking place. For example, during the course of an interview Chris commented, “it never crossed my mind that I should consult the University before making a submission” (Chris, personal communication, December 12, 2002). Similarly, having told me of the responsibilities she associated with her profession, Sarah commented, “we had information…so I would have been reasonably quick to accept that, yes, we have to show up personally and do our bit” (Sarah, personal communication, November 13, 2002).

As a third aspect of their experience, this group of university personnel felt that there were aspects of their work environment that helped them to participate in the Royal Commission’s inquiry. Kevin and Lisa explained that they were able to use their work time to contribute to the submissions of other (non-university) organisations (Kevin, personal communication, December 10, 2002; Lisa, personal communication,
November 14, 2002), with Lisa observing that her university allowed “most academics to work on governmental or quasi-governmental or community bodies which have some connection with their own work” (Lisa, personal communication, November 14, 2002). Kevin, Matthew, Michael and Patrick told me that they had received encouragement and support from their university colleagues, as they set about participating in the Royal Commission’s inquiry (Kevin, personal communication, December 10, 2002; Matthew, personal communication, March 20, 2003; Michael, personal communication, February 5, 2003; Patrick, personal communication, February 11, 2003). And from Patrick’s perspective, there were some personal incentives in his work environment that encouraged him to play a part in the inquiry. He told me:

It was good for my profile, good for my research, good for networks and funding and other opportunities. And it was good for the profile of my University department. (Patrick, personal communication, February 11, 2003)

Collectively, these experiences illustrate that university personnel possessed some freedom at the time of the Royal Commission’s inquiry. Aotearoa New Zealand’s universities may have become more commercially orientated in recent times but, at the time of the Royal Commission’s inquiry, they were organisations that provided their employees with a certain amount of latitude. However, this is not to say that university personnel were completely free.

7.3 Obstacles Experienced by the Other Contributors

During the course of my study I did not find any evidence that university personnel had been prohibited from participating in the Royal Commission’s inquiry, or speaking on certain topics. However, I did identify two obstacles that made it difficult for some university personnel to engage with the Royal Commission. There were people within each of the four universities who experienced the first type of obstacle: a lack of support from University Executives. And the second type of obstacle, a fear of reprisals, was reported by a group of people within the universities of Auckland and Otago.
7.3.1 A Lack of Support from University Executives

In Chapter 5 I described how University Executives supported small groups of university personnel as they participated in the Royal Commission’s inquiry, via the University Submissions. While University Executives did support these small groups of people, they did not provide comparable forms of support to other university personnel. The vast majority of university personnel were not approached by University Executives and encouraged to participate in the Royal Commission’s inquiry. Nor were they given the opportunity to speak on behalf of their universities during the Royal Commission’s Formal Hearings.

As I indicated earlier, this lack of support did not trouble all university personnel. Some university personnel, such as Patrick, possessed “energy, passion and drive” (Patrick, personal communication, February 11, 2003), and were able to communicate with the Commissioners in the manner they desired. In addition, some university personnel were involved with (non-university) organisations that encouraged them to participate in the Royal Commission’s inquiry, provided them with access to the Royal Commission’s Formal Hearings, and assisted with the financial costs that were associated with their participation.

However, the lack of support that University Executives provided did have two notable ramifications. Firstly, it meant that only the most motivated university staff members chose to participate in the Royal Commission’s inquiry. Within the four universities, university staff members had multiple demands on their time, including teaching responsibilities, research activities, postgraduate supervision and administrative duties. Therefore, a decision to contribute to the Royal Commission’s inquiry, in some substantial fashion, was a decision that involved some personal sacrifice. For example, Nicholas told me that he had done a lot of work on his submission after 5p.m., following a full day at work. He explained the pressure that he had felt at this time in the following manner:

You know you have to do this. You know that it could be important...[But] you're doing it at the end of a day and there's enormous time pressure. It's very hard to actually consider something thoughtfully and carefully. You just really need to go with what's at your fingertips. It's very fraught. (Nicholas, personal communication, November 12, 2002)
David indicated that he, and his university colleagues, had experienced a similar pressure. He commented:

The whole time around the Commission was very stressful. I mean it was stressful for academics participating in it...We were fitting in around the end of our academic year, around exams, exam marking, at the time of maximum student demand. (David, personal communication, November 12, 2002)

While Nicholas and David elected to participate in the Royal Commission’s inquiry despite the time pressures they faced, it is likely that other university personnel were not so motivated. If University Executives had made a greater effort to be supportive, a greater number of university personnel might have opted to make a contribution.

Secondly, without support from University Executives some university personnel were unable to gain quality access to the Commissioners. This particular consequence of University Executives’ actions is difficult to explain in a concise fashion. Consequently, I will explain it in several steps.

In order to understand this consequence, it is important to understand that the Royal Commission utilised a range of consultation procedures, and that some of these consultation procedures provided better access to the Commissioners than others. For example, people who participated in the Royal Commission’s Formal Hearings enjoyed high quality access to the Commissioners: they were able to engage with the Commissioners in a formal and prestigious setting, they were able to speak for a guaranteed period of time, and they were able to address any questions that the Commissioners raised. In contrast, people who attended the public meetings and hui that the Royal Commission had arranged, or who responded to the Royal Commission’s call for “public submissions” (RCGM, 2001b, p.140), experienced lower quality access: these consultation procedures were less formal and prestigious, and they featured a large number of participants who were vying for the Commissioners’ attention.

Next, it is important to understand that there were University Executives, within each university, who had some control over access to the Formal Hearings. Once the Royal Commission had allocated Interested Person status to the four universities, these University Executives had the power to decide who would, and would not, have the opportunity to contribute to the University Submissions. As I explained in Chapter 5, the University Executives in question granted this opportunity to small Working Groups that were predominantly comprised of gene technology users, Institutional Biological Safety Committee members, and other University Executives.
Finally, it is important to understand that the decisions of University Executives had implications for some university personnel. The university personnel who were appointed to create the University Submissions were provided with access to the Formal Hearings, and thus with high quality access to the Commissioners. Simultaneously, the views of some other university personnel, who were not invited to contribute to the University Submissions, were diverted away from the Formal Hearings and into public meetings, hui and public submissions. Amongst the university personnel whose views were diverted in this manner were people who had expertise in a range of areas (e.g., Environmental Science, Māori Studies and Public Policy), and several people who disagreed with aspects of their university's submission.

As these people lacked quality access to the Commissioners, it is possible that their views received little attention during the Royal Commission's inquiry. I make this point cautiously because it is difficult to gauge the amount of attention that various university personnel received. However, one need only look through the References that are cited in the Commissioners' Report to see that they placed a lot of emphasis on the Formal Hearings (see RCGM, 2001a, pp.382-406). Views that were expressed during the Formal Hearings are heavily referred to in this report. In sharp contrast, the report makes scant reference to views expressed by the thousands of people who participated in the Royal Commission's public meetings, hui and public submission process. If University Executives had provided a wider range of university personnel with access to the Formal Hearings, it is likely that their views would have featured more prominently in the Commissioners' deliberations.

7.3.2 A Fear of Reprisals

During my study I also learnt of a second obstacle that several Other Contributors had experienced: a fear of reprisals. Of the seventeen Other Contributors who participated in my study, three Other Contributors reported this obstacle. These three people were located within the universities of Auckland and Otago and, interestingly, they all held concerns, of some variety, about gene technology.

What do I mean by 'a fear of reprisals'? These three people were concerned that the expression of unpopular views, in a high profile forum such as the Royal Commission on Genetic Modification, might expose them to a number of risks. For
example, all three people were concerned that they might displease University Executives, and jeopardise their projects and career prospects within the universities (Amanda, personal communication, December 13, 2002; David, personal communication, November 12, 2002; Mark, personal communication, November 22, 2002). Amanda was concerned that she might be “rounded on” by her university colleagues (Amanda, personal communication, December 13, 2002). And, at the time of the Royal Commission, David was concerned that he might compromise his access to research funding (David, personal communication, November 12, 2002).

Despite the concerns that these three people held, they all made a decision to participate in the Royal Commission’s inquiry. However, Amanda and David did indicate that their participation had been shaped, to some extent, by the concerns they held. David, who had been intending to represent a certain organisation at the Royal Commission’s Formal Hearings, decided against this course of action (David, personal communication, November 12, 2002). And Amanda indicated that she held some views on gene technology that she had chosen not to express. She told me:

I would personally like to see more scientists able to get up and make a stand, and not be fearful of any internal politics of the University. There are a bunch of people within the University that are very pro genetic modification, just as in the Green Party there are a lot of people who are anti genetic modification. And my feeling is that if I stood up and I made some statements that were quite provocative, I might get rounded on by someone. So I don’t really think that there is complete freedom here. I’m debating inside myself will I want, at some stage, to make a stand and say what I’m really thinking. And I might do. But I know that there could be some people who would strongly disagree with me, and who would be seeking to protect their own interests. (Amanda, personal communication, December 13, 2002)

In addition to the effect they had on Amanda and David’s behaviour, the fears that Amanda, David and Mark described are significant for another reason. These fears suggest that there were facets of their work environment that unsettled these three people, and that may have unsettled other university personnel as well. Two facets of the universities of Auckland and Otago, as a place of work, seem particularly relevant in this regard.

Firstly, gene technology was heavily utilised in the teaching, research and entrepreneurial activities that were occurring within the two universities. This created tension between university personnel, at the time of the Royal Commission’s inquiry, because the inquiry’s outcomes had the potential to enhance or denigrate the academic
careers, research programmes and commercial investments of a large number of university personnel. As David explained:

> Around the time of the Royal Commission there was no doubt that it felt like a culture war at the universities. It was perceived that the great project of Science was under threat, and that people who positioned themselves against [gene technology] had an ideological agenda or an axe to grind. (David, personal communication, November 12, 2002)

A comment that was made by Nicholas also helped to illustrate the tension of the time. While Nicholas did not speak of any tensions in his own personal relationships, he did provide a vivid description of the tensions that existed between some gene technology proponents and opponents in his university. He commented:

> I work in medicine. You see that's the nice side that people are not so angry about...I almost feel like there's a collective sigh of relief when I introduce myself and say that I study that side of it. And if you study the other side of it, the food, you're headed for disaster...It's really hard to sustain a friendly relationship with people whose livelihood is absolutely threatened by public reaction against this sort of technology. (Nicholas, personal communication, November 12, 2002)

Secondly, University Executives held a lot of power in the universities, and it was clear that some University Executives were eager to protect their university’s investment in gene technology. Being aware of this, Amanda, David and Mark were concerned how various Executives might react if they were to cross them in public. University Executives had reprimanded Amanda and Mark in the past, for comments that they had made. And neither Amanda, David nor Mark felt that there were procedures in place, at the time of the Royal Commission’s inquiry, that could protect them from future reprimands and reprisals.

Given these facets of university personnel’s work environment, it is likely that there were other university personnel who shared the fears that Amanda, David and Mark spoke of. It is difficult to gauge the commonality of these fears since I only spoke to a small number of people within each university, and since there are many other factors that may have influenced how university personnel felt (e.g., their job security, the internal culture of their university departments, and their personal dispositions). However, their fears provide evidence of another obstacle that hindered some university personnel, during the Royal Commission’s inquiry. In a similar fashion to the first obstacle I described (a lack of support from University Executives), it is likely that these fears had a detrimental effect on the implementation of the universities’ CCS role.
7.4 The Other Contributors’ Activities and the Universities’ CCS Role

Throughout this thesis I have argued that a certain culture needs to be operative within the universities if they are to implement their CCS role, a culture in which university personnel are free to express their knowledge and ideas. The experiences of the Other Contributors indicate that they were able to exercise this freedom to various degrees. For this reason, the Other Contributors’ activities were partially consistent with the universities’ CCS role.

Clearly, some aspects of the Other Contributors’ activities were in accordance with this role. All of the university personnel I spoke with had enjoyed a certain amount of freedom during the Royal Commission’s inquiry. These freedoms enabled them to participate in the Royal Commission’s inquiry, advocate for various interest groups, and communicate an abundance of knowledge and ideas. All of these actions contributed to the scope and breadth of the Royal Commission’s inquiry, and helped to nurture the societal debate that accompanied the Royal Commission’s inquiry.

However, it was also evident that some university staff members encountered obstacles as they attempted to engage with the Royal Commission. The Other Contributors that I identified received little support from University Executives and, as a result of this lack of support, some lacked quality access to the Commissioners. In addition, I spoke with several university staff members, within the universities of Auckland and Otago, who felt vulnerable while expressing their concerns about gene technology.

Of course, expressing radical ideas and challenging the status quo are difficult tasks, even within the most supportive of environments. Nevertheless, the experiences of various Other Contributors suggest that there were not enough support structures in place, within the universities, to nurture and safeguard the academic freedom of university personnel. In the absence of these support structures it is possible that a number of university personnel struggled, in various ways, to engage with the Royal Commission. It is also possible that, in the absence of these support structures, the Royal Commission only received a fraction of the information that university personnel possessed on gene technology.

The absence of adequate support structures has another important implication as well: it provides further evidence that, at the time of the Royal Commission’s inquiry, University Executives did not place priority on their universities’ CCS role. As a
consequence of University Executives’ stance, the responsibility, expenses and risks that are associated with the implementation of the CCS role were displaced on to others. This included the university staff members who used their personal time and financial resources to participate in the Royal Commission’s inquiry. It also included the various (non-university) organisations that provided university personnel with access to the Royal Commission’s Formal Hearings, financial assistance, and various other forms of support (e.g., publicity). The significance of this displacement of responsibility, and various other implications of my research findings, are explored in the following chapter.

Notes

1 Identifying Other Contributors was difficult for several reasons. Firstly, I did not know the names of most staff and students within the four universities. Secondly, the Royal Commission received tens of thousands of submissions during the course of its inquiry. Thirdly, the names of the university staff members and students who had supported various submissions were not always disclosed (e.g., see New Zealand Association of Scientists, 2000, p.1; New Zealand Biotechnology Association, 2000, p.1; OUEC, 2000, p.2). As a result of these difficulties, it is likely that I only identified a small proportion of the Other Contributors that existed.

2 It is possible that some of these 42 people saw their activities, during the Royal Commission’s inquiry, as external to their role as a university staff member. For example, it is possible that some chose to participate for the simple reason that they were citizens of Aotearoa New Zealand, with personal beliefs and opinions that they wanted to share. However, for the purposes of my study I have assumed that the activities of these 42 people can be linked with the universities.

3 I am limited in my ability to describe the past experiences of these people as to do so would potentially reveal their identity. However, in general terms, their experiences revealed a readiness, on the part of University Executives, to regulate the activities of university personnel in the public domain, and to censure those who displeased them.
Chapter 8: Conclusions, Implications and Questions Arising

During recent decades, Aotearoa New Zealand’s universities have played an increasing role in the commercialisation of knowledge. This increasing role has been accompanied by new activities, values, and institutional arrangements, and it has stimulated questions about the universities’ ability to implement their CCS role in the modern era. Given the existence of these questions, I have explored the extent to which four universities implemented their CCS role during the Royal Commission on Genetic Modification. In this final chapter I discuss three topics as I bring my study to a close.

During the previous three chapters I have described and analysed three types of contribution that university personnel made to the Royal Commission’s inquiry. In the first section of this chapter, I draw upon the content of these preceding chapters while explaining my central conclusion: that the universities of Auckland, Canterbury, Lincoln and Otago implemented their CCS role in a weak fashion during their involvement in the Royal Commission on Genetic Modification.

In the second section of this chapter I consider the implications of this conclusion, and argue that it is concerning for a number of reasons. In particular, I argue that the universities’ weak commitment to their CCS role:

- may have impaired the Royal Commission’s inquiry;
- illustrates that tensions exist between the universities’ CCS role and their (expanding) role in the commercialisation of knowledge; and
- may impair the process of technology development in Aotearoa New Zealand.

As a result of these concerns, there are good reasons for exploring the universities’ activities in greater depth. Therefore, in the third and final section of this chapter, I discuss several questions that have arisen from my study. As Aotearoa New Zealand’s universities continue to embrace new entrepreneurial activities, and new relationships with the private sector, these questions need to be addressed if the universities’ contemporary role in society is to be understood and accommodated.
8.1 Conclusions

While the CCS role is listed, in current legislation, as a defining characteristic of Aotearoa New Zealand's universities, there have been few attempts to investigate the universities' commitment to this role. During this study I attempted to address this shortfall. I did so by focusing my research around one central research question: to what extent did the universities of Auckland, Canterbury, Lincoln and Otago implement their role as a critic and conscience of society, during their involvement in the Royal Commission on Genetic Modification?

In order to develop an answer to this question I created an evaluation framework and explored an aspect of academic freedom that is central to the universities' CCS role: the right of university personnel to communicate their knowledge and ideas. In the process, I reasoned that the universities would have implemented their CCS role to the best of their ability if all interested university personnel (i.e., those who possessed knowledge or ideas that they wanted to share) had been able to engage with the Royal Commission. Conversely, I reasoned that if university personnel had held back, or had been restricted, from expressing certain views, the universities would have failed to provide society with a full and lively examination of gene technology and the issues it raised for Aotearoa New Zealand.

Having evaluated three types of contribution that the universities made to the Royal Commission's inquiry, using my evaluation framework, it is clear that a number of university personnel were able to express their views on gene technology. For example:

1. University Executives encouraged small groups of university personnel to contribute to the University Submissions, and to participate in the Royal Commission's Formal Hearings;
2. a group of University Executives sought to promote gene technology through their alliance with the New Zealand Life Sciences Network; and
3. a number of university personnel, acting independently of University Executives, engaged with the Royal Commission in various ways.

Therefore, it is clear that the universities did play an active part in the Royal Commission's inquiry, and that they did implement their CCS role to some extent.

However, it is also clear that the universities implemented their CCS role in a weak fashion. I have reached this conclusion for two principal reasons. As the first of these reasons, there were a number of factors that constrained the flow of information from
university personnel to the Royal Commission on Genetic Modification. As a consequence of these constraints, it is likely that the Royal Commission only received a fraction of the knowledge and ideas that university personnel possessed on the subject of gene technology.

One constraining factor was evident within each of the four universities: University Executives supported small groups of university personnel to engage with the Royal Commission, but they failed to support many others. In the absence of support from their universities' leaders, only the most motivated university personnel sought to engage with the Royal Commission, and some university personnel, who were eager to engage, struggled to gain quality access to the Commissioners.

In addition to a lack of support from University Executives, there were some further constraining factors that affected university personnel within the universities of Auckland and Otago. Some university personnel found it difficult to engage with the Royal Commission because they were being challenged and criticised by the New Zealand Life Sciences Network, an organisation that was supported by Executives from their own universities. And some university personnel, who held concerns about gene technology, felt vulnerable during the Royal Commission's inquiry and limited their activities accordingly.

My central conclusion (that the four universities implemented their CCS role in a weak fashion) is also based upon a second observation. During the Royal Commission's inquiry, the activities of University Executives, and the various constraining factors I have described, affected some university personnel, and the expression of certain types of information, more than others. Consequently, it is likely that the information the Royal Commission received from the universities was biased in certain ways, and that points of consensus and conjecture, amongst university personnel, were never adequately highlighted. Two forms of bias are particularly worthy of mention.

Firstly, while there were structures in place that facilitated the expression of positive appraisals of gene technology, several factors hindered the expression of alternative appraisals. For example:

1. university personnel who were enthusiastic about laboratory contained applications of gene technology were encouraged (by University Executives) to speak on behalf of their university, but university personnel who were concerned about various aspects of gene technology were not;
2. University personnel who were enthusiastic about gene technology received support from the New Zealand Life Sciences Network, while other university personnel, who were concerned about gene technology, received opposition; and

3. It was university personnel who held concerns about gene technology, not those who were supportive of the technology, who feared that their views might displease senior university personnel.

Secondly, while structures were in place that facilitated the expression of technical information about gene technology (e.g., information about containment procedures and biological safety considerations), these structures did not facilitate the expression of alternative types of information. For example:

1. University Executives encouraged a number of gene technology users to contribute to the University Submissions as Working Group members, but they did not encourage sociologists, philosophers, economists, or many other experts within their universities, to participate in this process; and

2. While some Working Groups consulted with gene technology users as they prepared their universities’ official submissions, they made limited attempts to consult with other university personnel.

Collectively, the constraints on information flow that I observed, and the bias that these constraints introduced, underpin my central conclusion. While considering the validity and fairness of my conclusion it is important to note that some of the constraints I have outlined were, perhaps, not surprising. The financial resources that University Executives had at their disposal were finite, and, therefore, it was always going to be difficult for them to support a large number of university personnel. Whenever University Executives express strong views on a public policy issue, as they sometimes need to do, this is likely to unsettle some university personnel. And as a result of the high-profile nature of the Royal Commission’s inquiry, it was always likely that some university personnel would approach this inquiry with feelings of trepidation.

However, this does not mean that stronger implementation of the universities’ CCS role was an impossibility. During the course of the Royal Commission’s inquiry, University Executives could have made a greater effort to affirm the importance of their universities’ CCS role, and to encourage university personnel to participate in this inquiry. University Executives could have utilised the limited financial resources at their disposal to support a range of university personnel, with diverse views and areas of expertise, to access the Royal Commission’s Formal Hearings. In addition, since they were aware that
university personnel held strong and contradictory views on gene technology, University Executives could have avoided strong ties with the New Zealand Life Sciences Network and its adversarial campaign.

Given that these alternatives existed my study indicates that University Executives' commitment to their universities' CCS role, at the time of the Royal Commission, was poor. In the following section I explore the implications of this particular finding, as well as several other observations that I have made.

8.2 Implications of the Research Findings

Judgements about the worth of the universities' role are dependent on what one considers the proper role of the universities to be. For example, if it is deemed proper for Aotearoa New Zealand's universities to support the Government's strategy for knowledge-based economic development, some of their actions might be viewed positively. However, since my focus has been on the value of the universities' CCS role, the four universities' weak implementation of this role raises a number of concerns.

8.2.1 Implications at the Time of the Royal Commission on Genetic Modification

Throughout the twentieth century the universities of Auckland, Canterbury, Lincoln and Otago were major sites of teaching, research and intellectual activity in Aotearoa New Zealand. Consequently, at the time of the Royal Commission on Genetic Modification, they possessed a substantial amount of information and expertise that intersected with the Royal Commission's inquiry. By sharing this information and expertise, they had the potential to make a valuable contribution to this inquiry.

While discussing my conclusion I stated that, given the universities' weak implementation of their CCS role, it is likely that the Royal Commission only received a fraction of the knowledge and ideas that university personnel possessed; that the information the Royal Commission did receive, from the universities, was biased in certain ways; and that areas of consensus and conjecture that existed, amongst university personnel, were never adequately highlighted. It is difficult to elaborate on these points since my study does not support conclusions about the number of university personnel
who struggled to engage with the Royal Commission, or the significance of their views.
However, the universities' weak implementation of their CCS role did have two
implications, at the time of the Royal Commission's inquiry, that are worth discussing in
more specific terms.

Firstly, the universities failed to ensure that a rigorous debate occurred over the
technical aspects of gene technology. Biological and medical scientists within the
universities were members of a small group of people, within Aotearoa New Zealand,
who had an expert understanding of the technical aspects of gene technology, e.g., how
gene technology was used in various research applications, the effectiveness of various
containment procedures, and the biophysical risks associated with various research
applications. It would have been in keeping with the universities' CCS role if attempts
had been made to ensure that a range of university scientists, with differing views,
engaged with the Royal Commission. By doing so, the universities could have helped to
highlight areas of agreement and disagreement within the scientific community. In
addition, they could have helped to ensure that the assumptions and biases of various
scientists did not pass unchallenged. Such a process could have had a number of
beneficial effects for the inquiry that was taking place. As Beck (1992/1986) has
commented:

Only when medicine opposes medicine, nuclear physics opposes
nuclear physics, human genetics opposes human genetics or
information technology opposes information technology can the
future that is brewed up in the test-tube become intelligible and
evaluable for the outside world. (p.234)

Given the universities' weak implementation of their CCS role, there is no
guarantee that society was provided with these services during the Royal Commission's
inquiry. University scientists did not have an equal opportunity to engage with the Royal
Commission, or to challenge one another's views. And since other organisations that
employed technical experts, such as the Crown Research Institutes and private research
companies, had commercial interests that they were trying to protect, it is possible that
the technical aspects of gene technology were never debated in a thorough and rigorous
fashion.

Secondly, the universities failed to make a full and lively contribution to the
broader aspects of the Royal Commission's inquiry. The Royal Commission was not just
investigating the technical dimensions of gene technology. It was also instructed, in its
Terms of Reference, to explore the strategic options that were available to Aotearoa New
Zealand, and the cultural, ethical, environmental, political and economic dimensions of
gene technology. Just as the universities had the potential to create substantial submissions on the technical aspects of gene technology, they also had the potential to make sizeable contributions to these broader aspects of the inquiry.

However, since University Executives did not place importance on these broader aspects of the inquiry, it is possible that some valuable information was never communicated to the Royal Commission. Maria, a social scientist, and one of the university staff members that I interviewed during this study, expressed this very concern. She stated:

I would have very much liked to have seen the University debate the wider issues.... There's a lot of issues that need to be raised and by the University not doing that it is basically saying, well, this is simply a technical issue; or conversely, that this University has absolutely no expertise in [the] social assessment or ethical assessment of these issues, which I certainly don't think is correct either. I think we have quite a lot of expertise in the social science field that can make a significant contribution to the role of biotech in this country... I think that we've missed out a significant component of what should have been, or what could have been, a very valuable contribution to the debate. (Maria, personal communication, November 20, 2002)

The extent to which the Royal Commission's inquiry suffered as a result of the universities' failings is unclear. In order to judge this issue it would be important to investigate the extent of relevant information that university personnel did, and did not, share with the Royal Commission. It would also be important to investigate whether others were able to provide various forms of expertise, in the absence of university personnel. While this study did not investigate these issues in depth, the concerns noted here are logical consequences of the universities' weak implementation of their CCS role.

8.2.2 Implications for Understanding: Tensions Between Roles

Prior to this study there were differences of opinion about the universities' ability to perform their CCS role. When questioned on the topic, University Executives had asserted that their universities were committed to the CCS role (see NZAAU, 1996a, p.4, 1996b, p.4, 1997a, p.5, 1997b, p.8, 1998a, pp.4-5, 1998b, p.5). In contrast, a host of other commentators had suggested that the universities' expanding role in the commercialisation of knowledge could be impairing the academic freedom of university personnel, and the vitality of the CCS role (e.g., Jones et al., 2000, pp.20-22; Kedgley, 2000; Kelsey, 2000, pp.232-239; NZAAU, 1996a, p.4, 1998a, pp.4-5; Reidy, 2000, January
This study was motivated by my desire to clarify this issue. Its results indicate that concerns about the universities' expanding role in the commercialisation of knowledge are well founded.

To be more specific, the results of this study highlight two ways in which the universities' commercial interest in gene technology impaired their performance of the CCS role. Firstly, the universities' commercial interest in gene technology affected the priorities of University Executives. Understanding that the Royal Commission's inquiry had the potential to enhance or denigrate the commercial interests of their universities, University Executives became highly motivated to protect these interests. Concurrently, University Executives' motivation for adopting a neutral approach, and facilitating the expression of diverse views, was diminished.

Secondly, the universities' commercial interest in gene technology affected how university personnel felt while engaging with the Royal Commission. University personnel were aware of the investment their universities had made in gene technology and some, who held concerns about gene technology, felt uncomfortable while 'swimming against the tide'. Such feelings had minimal implications for university personnel who were determined to express their views. However, it is possible that they stifled debate in university departments where the pressure to conform, or to please financiers, was more pronounced.

While considering the significance of these issues, it is instructive to note that there was some correlation between the scale of the universities' commercial interests in gene technology, and their pattern of activity during the Royal Commission's inquiry. At the time of the Royal Commission's inquiry, all of the four universities utilised gene technology within their teaching and research programmes (i.e., their core business). In addition, the University of Auckland and the University of Otago had an additional form of commercial interest in gene technology, as they had developed several entrepreneurial ventures to capitalise on their expertise and intellectual property. It was Executives from these two universities that provided support for the New Zealand Life Sciences Network's campaign and, in so doing, displayed a heightened desire to achieve certain outcomes from the Royal Commission's inquiry. The processes that were used to produce the submissions of these two universities featured very limited forms of consultation. In addition, within these two universities, some university personnel constrained their activities, during the Royal Commission's inquiry, because they feared reprisals.
In contrast to the University of Auckland and the University of Otago, attempts to develop entrepreneurial ventures around gene technology were just gaining momentum within Lincoln University, and the University of Canterbury, at the time of the Royal Commission’s inquiry. Executives within these universities decided to avoid financial ties with the New Zealand Life Sciences Network. Of the four Working Groups that produced the University Submissions, the Working Group of the University of Canterbury displayed the greatest willingness to consult with members of their university’s community. In addition, none of the university personnel that I interviewed within Lincoln University, or the University of Canterbury, mentioned reprisals as a core concern.

One possible interpretation of this pattern of findings is that as a university’s commercial interest in gene technology expanded, University Executives’ determination to achieve certain outcomes from the Royal Commission’s inquiry increased, as did constraints on open debate. However, while the observed pattern may be the result of a causal relationship between these variables, it does not prove that a simple causal relationship exists.

There are other factors that may help to explain why various universities, and University Executives, acted in different ways. For example, I have paid little attention to the managerial style of University Executives during this study, but it is a variable that may help to explain their conduct. It is also possible that University Executives acted in different ways because different traditions were operative within their universities.

In addition, there are many factors that may help to explain the universities’ weak implementation of their CCS role. For example:

1. the financial instability and competitive mentality that was introduced into the university sector during the neo-liberal reform period (as discussed by Patterson, 1991, pp.118-194; Peters & Roberts, 1999, pp.11-29; and Savage, 2000, pp.36-70), may help to explain why University Executives were so eager to safeguard and expand their universities’ commercial prospects;

2. it is important to remember that, during the Royal Commission’s inquiry, University Executives were eager to protect the teaching and research interests of university personnel, and that they were not solely motivated by pecuniary considerations;

3. the vulnerability of rank-and-file university personnel in a work environment that features powerful University Executives (as discussed by Savage, 2000, pp.142-
123

143), contestable funding processes (as discussed by Olssen, 2002, pp.39-46), and weak grievance procedures (as discussed by Savage, 2000, pp.202-209), may help to explain why some university personnel felt anxious while engaging with the Royal Commission; and

4. since there have been few attempts to explore the universities’ commitment to their CCS role, it is possible that Aotearoa New Zealand’s universities have never been truly committed to this role.

While my study does not provide a precise explanation of the universities’ weak implementation of their CCS role, it does indicate that there are tensions between this role and the universities’ involvement in the commercialisation of knowledge. It is difficult for the universities to critique a new technology in a broad and balanced fashion, and to nurture open debate, when they have a pecuniary interest in the technology. As the universities are creating entrepreneurial ventures around a host of new technologies at present, this may cause problems for the process of technology development in Aotearoa New Zealand.

8.2.3 Implications for Technology Development in Aotearoa New Zealand

Since the Royal Commission’s inquiry, successive governments have encouraged Aotearoa New Zealand’s universities to commercialise new technologies (see Hodgson, 2003, pp.1-2; Hodgson, 2004, pp.1-2; Ministry of Education, 2002, pp.10-12; Office of the Prime Minister, 2002, pp.6-7). In response to this encouragement, as well as the commercial benefits that they perceive, the universities have continued to involve themselves in the commercialisation process. As a result, the universities are nurturing an increasing number of entrepreneurial ventures, and university-industry relationships are developing around a number of emerging technologies (including new forms of biotechnology, nanotechnology, and information technology).

Government Ministers and University Executives regularly speak of the benefits of these developments. For example, Pete Hodgson, the current Minister for Research, Science and Technology, has argued that these developments can help to “grow more New Zealand businesses” (Hodgson, 2003, May 27, para.5), “accelerate the commercial development of innovations in publicly funded research” (Hodgson, 2003, May 15, para.1), and stimulate “more relevant research” (Hodgson quoted in Anderton, 2002,
May 23, para.5). And while commenting on specific developments within their universities, University Executives have argued that they can be a “hub in the exploitation of...intellectual property” (Smith quoted in Hill-Cone, 2002, May 24, p.26), and that they can help to “give New Zealand a bigger slice of a competitive international market” (Taylor quoted in University and industry collaborate, 2004, June 2, para.10).

While these benefits are considerable, my research findings indicate that the universities' expanding role in the commercialisation of knowledge is not without its problems. Tensions exist between this expanding role and the universities' CCS role. As the universities develop commercial interests around emerging technologies, it is possible that they may lose the ability to critique these technologies in a broad and balanced fashion.

Such an eventuality would have a detrimental effect on debates, and decision-making processes, in Aotearoa New Zealand. New technologies bring with them a range of challenges: they create new opportunities and risks that are difficult to understand, they create new powers for those who control them, they can dramatically alter the way in which society's members interact with the natural environment and each other, they test the limits of society's ethical and moral codes, and they often necessitate innovations in public policy and legislation. If society's members are to address new technologies in a manner that is informed and robust, rather than naïve and imprudent, it is important that they have access to the knowledge and ideas that university personnel possess.

Any demise of the universities' CCS role could also create problems for the Government’s strategy of knowledge-based economic development. As I discussed in Chapter 2, the Government's strategy involves the creation of what Etzkowitz and Leydesdorff (1997a) refer to as a “triple helix” (p.1), that is, an innovation system that features close links between the Government, universities, and industries. At present, the universities’ responsibility to nurture academic freedom, and to act as a critic and conscience of society, helps to differentiate them from the other organisations involved in the triple helix. It can also help them to make several distinctive contributions to the triple helix that would be lost, should these responsibilities be neglected. In order to develop this point, I will explain three contributions that the universities can make, but which may be under threat.

Firstly, if university personnel are able to participate in open debates over new technologies, the universities can provide the triple helix with a source of internal critique and reflection. For example, they can help to scrutinise, and challenge, the practices and
plans of the triple helix. However, in the absence of open debates within the triple helix, the possibility is created that the development of Aotearoa New Zealand’s knowledge economy will be based upon unchallenged assumptions, poor science, and ‘tunnel vision’. Such a situation would create risk for all those who invest time and money in the activities of the triple helix, including the taxpayers of Aotearoa New Zealand.

Secondly, if university personnel with a range of perspectives and expertise are able to debate new technologies in an open fashion, they can stimulate innovation within the triple helix. It is widely recognised that the development of new knowledge can benefit from the open exchange of information (e.g., see Florida & Cohen, 1999, pp.590-591; Jaspers, 1960, pp.75-82). In addition, it is commonly argued that the development of new knowledge can benefit from interdisciplinary and transdisciplinary processes (e.g., see Barnett, 2000, pp.104-105; Klein, 2004; Nissani, 1997). If some university personnel are unable to debate new technologies, because their views are seen to be irrelevant or unconstructive, the triple helix stands to lose the ideas and innovations that these people can bring.

Thirdly, if the universities nurture open debate they can help to build trust, amongst society’s members, in the activities of the triple helix. Past studies have shown that:

- people trust organisations, and the information they provide, when they act in a manner that is truthful and free of bias (Hunt & Frewer, 2001, pp.46-48; Salter & Frewer, 2001, pp.7-8);
- the people of Aotearoa New Zealand have little trust in the information that the government and industry provide on emerging technologies (e.g., see Macer, 1998, pp.21-24; Tanaka, Jeffries & Broom, 2002, p.43);
- the people of Aotearoa New Zealand have a relatively high degree of trust in the information that universities provide on emerging technologies (e.g., see Macer, 1998, pp.21-24; Tanaka et al., 2002, p.43); and that
- it takes a long time to build a reputation as a trustworthy source of information (Slovic, 2000, pp.319-323).

Therefore, unless the universities can nurture open debate, and preserve their reputation as a trustworthy source of information, the members of the triple helix may find that their activities are increasingly distrusted, and resisted, by society’s members. As Slovic (2000) has commented, “Numerous recent studies clearly point to lack of trust as a critical
factor underlying the divisive controversies that surround the management of technological activities" (p.317).

In summary, any demise of the universities' capacity to nurture academic freedom, and to act as a critic and conscience of society, has the potential to create a number of problems for technology development in Aotearoa New Zealand. Each of these problems provides justification for further research into the universities' ability to discharge their CCS role, and the changes that accompany the universities' involvement in the commercialisation of knowledge. In the final section of this chapter I discuss several specific topics that are worthy of exploration.

8.3 Questions Arising

While I have developed an answer to one central research question, this study has generated many additional questions. This is due, in part, to the limitations of my study. Consequently, it is appropriate to conclude this thesis by discussing several limitations of my study and several questions that need to be explored if the universities' place in society, in the modern era, is to be understood and accommodated.

8.3.1 Freedom For Whom? Freedom For What?

In the Charters that Aotearoa New Zealand's universities have recently produced, on the request of the Labour-Progressive Government, they have affirmed their commitment to the concept of academic freedom (see Lincoln University, 2004, p.11; University of Auckland, 2003, p.1; University of Canterbury, 2003, p.3; University of Otago, 2003, p.3). However, the results of this study, and several others (e.g., Kayrooz et al., 2001; Savage, 2000, pp.113-121), indicate that the commercial pursuits of modern universities can constrain academic freedom in a number of ways.

What remains unclear, however, is the extent of these constraints. During this study I only engaged with a small number of university personnel. Consequently, this study is unable to support strong conclusions about a number of related issues, including:

- the proportion of university personnel who are affected by these constraints;
- the distribution of these constraints within the universities;
• how these constraints affect various domains of speech and inquiry; and
• the actual effect that these constraints have on the behaviour of university personnel.

In order to understand the contributions that university personnel can (and cannot) make to future societal debates, it is important that these issues are explored in more depth. For example, if it is understood that certain groups of university personnel find it difficult to speak on certain topics, then the information that universities disseminate can be placed in context. In addition, it may be possible to develop procedures that can bolster academic freedom in problem areas.

The quality of university personnel's academic freedom can be partly understood by studying practices and policies within the universities. For example, Jones et al. (2000, p.3) argue that it is important to explore whether University Executives encourage university personnel to share their views with society's members (e.g., by providing them with time to engage in societal debates), and whether they reward university personnel that do so (e.g., by recognising their efforts during performance appraisals). In addition, it may be useful to explore university policies on media comment, the consultation procedures of University Executives, and the employment contracts of university personnel.

However, perhaps the most effective means of establishing the quality of academic freedom within Aotearoa New Zealand's universities would be to survey a large number of university personnel and to ask them about this issue. To my knowledge, a survey of this type has never been carried out in Aotearoa New Zealand. Given the conjecture that currently exists about the state of academic freedom in the universities (e.g., see De Boni, 2002, April 8; Jones et al., 2000, pp.20-22; Kedgley, 2000; Kelsey, 2000, pp.232-239; Reidy, 2000, January 5; Savage, 2000, pp.113-121; Wealthall, 2002, April 10), the results of such a survey would be of considerable interest.

8.3.2 What Other Factors Affect the Universities' CCS Role?

This study has demonstrated that tensions exist between the universities' CCS role and their role in the commercialisation of knowledge. However, when considered in general terms, it has provided limited insight into the factors that affect the universities' CCS role. There are two main reasons for this.
First and foremost, this study was designed to evaluate the universities’ implementation of their CCS role; it was not designed to explain the universities’ implementation of this role. Therefore, while my methodology enabled me to observe several factors that affected the universities’ CCS role, it did not enable me to determine the importance, and explanatory value, of these factors.

Secondly, my evaluation of the four universities’ activities was bounded in a number of ways. For example, my evaluation focused on practices within the universities, rather than on more macroscopic, and microscopic, variables that affect the universities’ CCS role. In addition, while evaluating practices within the universities, I focused on a specific process of change (the universities’ expanding role in the commercialisation of knowledge), a specific set of actors (a group of University Executives and Other Contributors), a specific aspect of academic freedom (the right of university personnel to communicate their knowledge and ideas), and a specific setting (the Royal Commission’s inquiry). As a result of these boundaries, my evaluation process left many issues unexplored.

In order to develop a clearer understanding of the factors that affect the universities’ CCS role, it is necessary to overcome these limitations of my study. For instance, there is a need to study the impact of a broader range of factors. In this regard it would be relevant to explore the impact of macroscopic factors such as:

- the Government’s funding of the university system; and
- the universities’ dependence on funds from various interest groups (e.g., the biotechnology industry).

There are a number of specific practices, within Aotearoa New Zealand’s universities, that it would be relevant to explore. For example, it would be interesting to investigate:

- if current performance appraisal mechanisms encourage, or discourage, university personnel from sharing their views with a wider, non-academic audience; and
- how research themes, adopted by the universities, affect university personnel’s ability to research contentious topics.

In addition, it would be relevant to explore factors that are more microscopic, and that guide the behaviour of individuals within Aotearoa New Zealand’s universities. For example, it would be interesting to explore:

- how much importance university personnel place on the CCS role;
- University Executives’ interpretation of the CCS role;
the values that are embraced by the Vice-Chancellors of Aotearoa New Zealand's universities; and

whether, as Jesson (1997) suggests, Aotearoa New Zealand's intellectuals are “prone to timidity as well as conformity” (p.11).

While exploring the relative importance of such factors, it would also be relevant to study a broader range of the universities' activities. As this study has demonstrated, exploring the universities' involvement in a high-profile societal debate can provide insight into the factors that affect the universities' CCS role. However, exploring the ability of university personnel to participate in more routine aspects of community life, such as local meetings, policy fora, and the popular press, may also provide valuable insights.

8.3.3 Are the Universities' Roles Incompatible?

Aside from the research question I have investigated in this study, and the additional questions I have posed so far in this section, there is scope for asking a more fundamental question: is it possible for universities to act as a critic and conscience of society, and to play an active role in the commercialisation of knowledge, at the same time? Or, in other words, are the universities' roles incompatible?

This study provides evidence that the universities' involvement in the commercialisation of knowledge can hamper the implementation of their CCS role. There is also evidence, within the literature, that suggests that the universities' commercial pursuits will be impaired if they place too much emphasis on their CCS role. For example, following a study of universities in the United States of America, Argyres and Liebeskind (1998) observed that:

...the privatization and commercialization of biotechnology research conducted in U.S. universities has been delayed and diminished in scope by parties seeking to uphold the tradition of open science practices, and thereby sustain the intellectual commons for the use of society at large. (pp.450-451)

The tension between these two roles is understandable, as they are driven by different rationales and aims. For example, the universities' role in the commercialisation of knowledge requires them to follow rules that are laid down by others (e.g., governmental strategies for economic development); in contrast, the universities' CCS
role is subversive to some extent, as it is founded on the recognition that universities can serve society by challenging rules and the power structures from which they emanate.

It is also relevant to note that these two roles can benefit from different institutional arrangements. Whereas the universities' role in the commercialisation of knowledge can benefit from greater collaboration between universities and industry, the universities' CCS role benefits when the universities enjoy autonomy and independence. To provide a second example, the universities' entrepreneurial activities can benefit from a governance system in which power is centralised, and in which University Executives can quickly respond to changes in the marketplace; in contrast, the universities' CCS role can benefit from a governance system in which power is more evenly distributed, and in which there is an opportunity for an open contest of ideas.

In summary, the compatibility of these roles is a topic that needs to be investigated in greater depth. At present it is often assumed that these two roles can be performed in tandem. This assumption underpins the Government's current policies. This assumption also underpins assertions, made by University Executives, that their universities are committed to both roles. The results of my study demonstrate that this assumption is problematic.

Notes

1 Indeed, when considered alongside my research findings, some comments that have been made in the past take on a prophetic quality. For example, following its audit of Lincoln University (LU), and its observation of changes that were taking place within Lincoln University, the NZAAU (1998a) commented:

As a small university, LU must concentrate its efforts, and for this reason research themes are selected by LU. Care should be taken to ensure that this does not unduly restrict the areas into which an individual could move...nor become a constraint on staff's ability to speak on issues. If LU adopts a relatively narrow focus, determined by funder and customer expectations, its capacity to act as a critic and conscience may be limited in scope. (pp.4-5)

During the Royal Commission's inquiry, University Executives' attempts to protect and expand university personnel's access to gene technology had this very effect.

2 I am not the first person to observe that, in the midst of an important societal debate, Aotearoa New Zealand's universities have exercised their CCS role in a weak fashion. For example, Boston (1995, pp.147-148) and Jesson (1997, pp.11-12) have argued that Aotearoa New Zealand's academics failed to generate sufficient debate during the neo-liberal reforms of the 1980s and 1990s, with Boston (1995) commenting that the academics were "remarkably silent and seemingly inactive" (p.147), and Jesson (1997) commenting that their response was "ho-hum" (p.11).
During the course of my study, Aotearoa New Zealand's universities, and their commercial arms, have continued to invest in a number of start-up companies. Amongst these companies are Comone Limited and Immune Solutions Limited (which are housed within the University of Otago's Centre for Innovation); Nanochuster Devices Limited, Syft Technologies Limited and Whisper Tech Limited (which are partly owned by the University of Canterbury's commercial arm); and Protemix Corporation Limited (which is housed within the University of Auckland's School of Biological Sciences).

Previous explorations of academic freedom in Aotearoa New Zealand, such as the study of Savage (2000) and the audits carried out by the New Zealand Universities Academic Audit Unit, have been limited in a similar way.
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Appendix 1: The Coding Framework
Coding Instructions

1. Code each paragraph independently.

2. A list of bulleted statements is regarded as a component of the preceding paragraph, so long as the bullet points are no longer than one sentence in length. If a bullet point is longer than one sentence in length, it should be regarded as a separate paragraph.

3. Do not code the headings that appear in a submission, or the instructions that are associated with the submission template.

4. Multiple codes may apply within a paragraph.

5. Do not enter a single pattern of codes more than once for each paragraph. The purpose of the coding exercise is to determine the topics that submitters discussed within each paragraph, not how many times they discussed a topic within a paragraph.

6. If a given topic is discussed in more than one paragraph, code that topic for each separate paragraph that it is discussed in.

7. It may be necessary to 'read around' a paragraph in order to determine how it should be coded. Reading the preceding section heading on the submission template, and the paragraphs preceding and following the paragraph in question may be useful.

8. Assume that when a submitter from a University refers to their current use of genetic modification in research or teaching, they are referring to research or teaching activities that take place in containment.
A. Dimensions of the Gene Technology Debate

Which applications of genetic modification, genetically modified organisms, or products are referred to in the paragraph?

- **No reference**
  - Definition: There is no reference to genetic modification, genetically modified organisms, or products

- **General**
  - Definition: Reference to genetic modification, genetically modified organisms or products in a general sense, without any reference to a specific application.

- **Research or Teaching in General**
  - Definition: Reference to the use of genetic modification, genetically modified organisms, or products for research/teaching purposes in general, without it being stipulated whether that research/teaching is contained in laboratories, partially contained or uncontained.

- **Research or Teaching Contained in a Laboratory**
  - Definition: Reference to the use of genetic modification, genetically modified organisms, or products for research/teaching within a contained laboratory (i.e., a PC1, PC2, PC3 or PC4 containment facility).

- **Research or Teaching That is Not Contained in a Laboratory**
  - Definition: Reference to the use of genetic modification, genetically modified organisms, for research/teaching that involves environmental release or field trials (defined here as research that occurs outside of a laboratory as defined above).

- **Unspecified Commercial Applications**
  - Definition: Reference to the use of genetic modification, genetically modified organisms, or products in unspecified commercial applications.

- **Applications in Food Production and Land-based Industries**
  - Definition: Reference to the use of genetic modification, genetically modified organisms, or products in food production, related land-based industries (e.g., agriculture, horticulture), and other land-based industries (e.g., forestry).

- **Applications in Healthcare**
  - Definition: Reference to the use of genetic modification, genetically modified organisms, or products in healthcare (e.g., medicines, vaccines, diagnostic techniques).

- **Applications in Environmental Management**
  - Definition: Reference to the use of genetic modification, genetically modified organisms, or products for environmental management (e.g., pest control, bioremediation).

- **Environmental Release**
  - Definition: Reference to the release of genetically modified organisms or products into the environment, without the reason for release being stipulated (i.e., whether the release is for research purposes, commercial purposes or some other purpose).

- **Unclear**

- **Other**
B. Evaluation of the Effects of Gene Technology

Work through steps B1 to B3 for each unique evaluation that is discussed in the paragraph. A unique evaluation is an evaluation that has a unique pattern of coding. Do not code evaluations that relate to present policy that affects the use of genetic modification, genetically modified organisms or products.

B1. What activity is the evaluation related to?

- Use or avoidance of gene technology in a general sense
- Research or teaching in general
- Research or teaching contained in a laboratory
- Research or teaching that is not contained in a laboratory
- Unspecified commercial applications
- Applications in food production and land-based industries
- Applications in healthcare
- Applications in environmental management
- Environmental release
- Unclear
- Other

B2. What type of evaluation is stated?

- A Positive Evaluation
  Includes:
  a) Reference to positive effects associated with the use of genetic modification, genetically modified organisms or products;
  b) Reference to negative effects associated with the avoidance of genetic modification, genetically modified organisms or products;
  c) Statements that assert that no positive effects are associated with the avoidance of genetic modification, genetically modified organisms or products;
  d) Statements that assert that no negative effects are associated with the use of genetic modification, genetically modified organisms or products;
  e) Reference to positive effects that may result if the use of genetic modification, genetically modified organisms or products is encouraged to a greater extent; and
  f) Reference to negative effects that may result if the use of genetic modification, genetically modified organisms or products is restricted to a greater extent.

- A Negative Evaluation
  Includes:
  a) Reference to positive effects associated with the avoidance of genetic modification, genetically modified organisms or products;
  b) Reference to negative effects associated with the use of genetic modification, genetically modified organisms or products;
  c) Statements that assert that no positive effects are associated with the use of genetic modification, genetically modified organisms or products;
  d) Statements that assert that no negative effects are associated with the avoidance of genetic modification, genetically modified organisms or products;
  e) Reference to positive effects that may result if the use of genetic modification, genetically modified organisms or products is encouraged to a greater extent; and
  f) Reference to negative effects that may result if the use of genetic modification, genetically modified organisms or products is restricted to a greater extent.
A Neutral Evaluation
Includes:
(a) Assertions that the effects of the use or avoidance of genetic modification, genetically modified organisms or products are unclear or uncertain.

B3. Who or what is being affected?

- The Economic Sector
  Definition: Includes reference to specific business people, companies, and industrial sectors, that do not fit under the university or health sectors above. Also includes reference to the New Zealand economy, or the economies of other nations.

- The University Sector
  Definition: Includes reference to a university, specific university departments, university scientists and researchers, university students, and university activities such as teaching and research.

- The Research Sector
  Definition: Includes reference to research providers, researchers and scientists, or research/science in general.

- The Health Sector
  Definition: Includes reference to healthcare providers, medical practitioners, patient groups (people who suffer from a health disorder), activities such as medical progress, diagnosis, research and therapy, or human health in general.

- Maori
  Definition: Includes any instance in which Maori are specifically referred to as an affected party.

- The Environment
  Definition: Includes reference to the natural environment, animals, plants, ecosystems, biodiversity or natural resources, or to activities related to environmental management.

- Society in general
  Definition: Includes reference to New Zealand and New Zealanders, or to society in general.

- Unclear
  Definition: Use this code in situations where the locus of an evaluation is unclear.

- Other
Appendix 2: Information Sent to the Other Contributors
Dear [name of university staff member]

I am a postgraduate student at Lincoln University, in the process of collecting information for my Masterate thesis. The Lincoln University Human Ethics Committee has approved my research project and I am writing to request your assistance with several of my research questions.

To briefly summarise, my research aims to explore the role that New Zealand’s universities played in the formal hearings of the Royal Commission on Genetic Modification (RCGM). At present I am endeavouring to understand the experiences of university personnel who presented submissions to the RCGM, outside of their university’s official submission to the RCGM. I have noted that you presented a submission to the Royal Commission. For this reason, I write to invite you to participate in my research.

Participation in this research project is voluntary. I have enclosed two documents with this letter in order to provide you with more detailed information about the focus and aims of my research, so that you will be in a position to make an informed decision. The first document, entitled ‘Research Summary’, contains a brief description of my research. The second document, entitled ‘Research Procedures’, outlines the procedures that I will use to store any information that participants provide, and to protect the confidentiality of participants. These procedures were outlined in the research description that has been approved by the Lincoln University Human Ethics Committee.

My research is focused upon a sensitive topic and participation carries some risks. While I will use pseudonyms when I refer to participants, given the limited number of university personnel who have been active in New Zealand’s genetic modification debate, it is possible that people who read my research may form judgements about the identity of participants. I believe that it is important that you are informed of this risk, and that you consider it while deciding whether you wish to participate in this research.
If you decide to participate in this research, there are a number of topics that I would value your response on. These are listed below for your consideration:

1. Did you endeavour to have input into your university's official submission? If so, what were your experiences in this regard?

2. Why did you decide to contribute viewpoints outside of your university's official submission?

3. Did your university encourage you, in any way, to contribute your viewpoints to the Royal Commission on Genetic Modification? If so, please describe.

4. Did your university hinder you, in any way, from contributing your viewpoints to the Royal Commission on Genetic Modification? If so, please describe.

5. What reaction, if any, was there within your university, in response to the viewpoints that you offered to the Royal Commission on Genetic Modification?

6. What is your opinion of your university's decision to present a submission to the Royal Commission on Genetic Modification?

7. Are you aware of the process that your university employed to produce its official submission to the Royal Commission on Genetic Modification? If so:
   i) what steps were taken in order to produce the university's submission?
   ii) what opportunities were there for university personnel to have input into the university's submission?

8. Are there any other staff members within your university that you believe I should invite to participate in this research?

If you decide to participate in this research, please complete a copy of the consent form that is attached with this letter and return it to me in the addressed envelope provided. A second copy of the consent form is also provided for your own record.

You are welcome to participate in the manner that suits you best. For example, you are welcome to provide written responses to the questions outlined above, or to discuss the questions with me over the phone or in person. It would be beneficial for my research if I could make an audio recording of any interview that takes place. However, I will respect your preference in this regard. Please indicate on the consent form if you consent to an audio recording being made, or leave that section unsigned if you would prefer that an audio recording was not made.

I can be contacted at amburya@kea.lincoln.ac.nz if you have any queries about my research project, or if you would like to arrange an interview. You are also welcome to direct queries about my research project to my supervisors, Dr. Ton Bührs (buhrst@lincoln.ac.nz) and Dr.
Stefanie Rixecker (rixeckes@lincoln.ac.nz). If I have not heard from you, I will e-mail you during the week of the 11th of November to check that you have received this letter, and to determine whether you are willing to participate in this research.

Thank you for considering my requests.

Yours faithfully

Alan Ambury
Master of Applied Science candidate
Environment, Society and Design Division, Lincoln University
Research Summary

Research Topic
The Role of New Zealand's Universities in the Formal Hearings of the Royal Commission on Genetic Modification.

Research Supervisors
Dr. Ton Bührs
Environment, Society and Design Division
Lincoln University
buhrst@lincoln.ac.nz
(03) 325 2811, extn 8708

Dr. Stefanie Rixecker
Environment, Society and Design Division
Lincoln University
rixeckes@lincoln.ac.nz
(03) 325 2811, extn 8643

Research Aims and Background
The central aim of this research project is to explore the role that New Zealand's universities played in the formal hearings of the Royal Commission on Genetic Modification (RCGM). The research is relevant because of recent transformations that have been occurring in New Zealand's universities, in which the universities have become increasingly entrepreneurial and collaboratively involved with the private sector. These transformations are thought to be altering the internal culture of the universities, and their interactions with the wider community. It is envisaged that this research project will provide valuable insights into the role of New Zealand's universities in a contemporary public policy debate, and the opportunities and threats that are associated with the universities' recent transformations.

The transformations that have been occurring in New Zealand's universities have also been occurring in universities throughout the developed world. They have been spurred by patterns of economic globalisation, the emergence of new models of knowledge-based economic development, governmental attempts to entwine universities in national and regional innovation systems, and programmes of economic reform within nation-states (Etzkowitz & Leydesdorff, 1997; Gibbons et al., 1994; OECD, 1998; Slaughter & Leslie, 1997). Throughout the developed world, universities have responded to these pressures and opportunities by internalising intellectual property management and technology transfer activities, accepting a role in the development of national and regional economies, and engaging in a host of collaborative relationships with the private sector (Etzkowitz & Leydesdorff, 1997; OECD, 1998). These new activities represent a significant shift in the institutional mission of universities, which, in times past, embraced goals such as institutional autonomy, eschewed an active role in the commercialisation of knowledge, and consequently earned the moniker of 'the ivory tower' (Etzkowitz, Webster & Healey, 1998; Jaspers, 1960; Slaughter & Leslie, 1997; Sutz, 1997).
Not surprisingly, these developments have been greeted with both acclaim and consternation. Some commentators see positive outcomes and suggest, for example, that the transformations will enable universities to become more responsive to societal needs (Gibbons et al., 1994; OECD, 1998). In contrast, other commentators suggest that the transformations may inhibit the traditional 'public good' functions of the universities, such as their role as an impartial critic of societal developments (Kenney, 1986; Peters & Roberts, 1999; Soley, 1995).

Amidst such speculation, events associated with the formal hearings of the RCGM provide an opportunity to research the contribution that New Zealand's universities made to a contemporary debate over public policy. It is envisaged that this research will have multiple benefits. Firstly, it will provide insight into the role that New Zealand's universities played in a debate over the use of genetic modification within New Zealand. Secondly, it will provide insight into the role that New Zealand's universities may play in future public policy debates. Thirdly, it will facilitate a valuable discussion on the opportunities and threats associated with the recent transformations of New Zealand's universities.

Methodology

Four of New Zealand's universities (Lincoln University, the University of Auckland, the University of Canterbury, and the University of Otago), numerous university personnel, and several organisations that are affiliated with a New Zealand university, presented submissions to the Royal Commission on Genetic Modification. This research project explores the contribution that New Zealand's universities made to the Royal Commission by studying the content of these submissions, the processes that universities utilised to construct their submissions, and each university's reasons for presenting, or not presenting, an institutional submission to the RCGM.

Cognizant that some of these issues are contentious, a core aspect of my methodology is to invite a variety of university personnel to participate in this research project, including university officers who helped to construct their university's submission, and university personnel who presented submissions to the RCGM outside of their university's official submission. By adopting this methodology, I hope to instil balance into this research project.

References


Research Procedures

The following procedures, concerning the utilisation and storage of data, were outlined in a research description approved by the Lincoln University Human Ethics Committee. I accept responsibility for implementing these procedures and detail them here for your information.

How will the anonymity of subjects be assured in written or oral presentation of the research, or in general discussion?
The names of participants will not be mentioned. Pseudonyms will be used and this will be explicitly stated in the course of any presentation. While such safeguards protect the anonymity of participants, I do not consider that they guarantee the anonymity of participants, given the limited population of New Zealand, and the even more limited population of New Zealand academics who are actively engaged in the debate over genetic modification.

Who will have access to the consent forms and data?
The researcher and supervisors.

How and where will the consent forms and data be stored?
Consent forms and any physical data provided by participants will be stored in a locked filing cabinet within the locked university office of my supervisor. Some data may be stored in an electronic form on the computer of the researcher. When this is the case, the data will be coded to protect the anonymity of the participant.

How will the confidentiality of the consent forms and data be assured?
The consent forms and data will not be shown to any third parties.

Are there any plans for future use of the data beyond this Masterate research project?
It is possible that the data collected may be utilised in publications other than my Masterate thesis. If the data is utilised in publications other than my Masterate thesis, the data will be treated in a manner that is consistent with the terms set out above.
The Role of New Zealand's Universities in the Formal Hearings of the Royal Commission on Genetic Modification

Consent Form

Your rights
If you participate in this research project you have the right to:
   a) Ask any further questions about the research which occur to you in the course of your participation.
   b) Refuse to answer any particular question.
   c) Withdraw from the study at any time.
   d) Access, correct, or retract any information that you have provided.
   e) Indicate any information that you do not wish to be published or presented to others.

Consent statement
I, __________________________, have read and understood the description of the research project. On this basis, I agree to participate in the research project with the understanding that:
   a) Information that I provide may be used in a number of publications that Alan Ambury may write, or presentations that Alan Ambury may give.
   b) My name will not be stated in any presentation or publication, but this may not guarantee my anonymity.

Signed: __________________________

Date: __________________________

Further, I consent to an audio recording being made if I participate in an interview.

Signed: __________________________

Date: __________________________
Appendix 3: Information Sent to the Vice-Chancellors
Dear [name of Vice-Chancellor]

I am a postgraduate student at Lincoln University, in the process of collecting information for my Masterate thesis. My research aims to explore the role that New Zealand’s universities played in the formal hearings of the Royal Commission on Genetic Modification (RCGM). At present I am endeavouring to understand the process that [name of university] employed to produce its submission to the RCGM. I would greatly value your assistance with this task. If there are others within the university who you consider to be more able to answer my questions, I would be grateful if you could refer me to these people.

I have enclosed a document with this letter (entitled ‘Research Summary’) in order to provide you with a more detailed description of my research project. I have also enclosed a signed affidavit, in order to verify my status as a postgraduate student at Lincoln University.

If you choose to participate in this research project there are a number of topics that I would value your response on. These are listed below for your consideration:

1. On what grounds did [name of university] apply to participate in the formal hearings of the RCGM?
2. Who within the university was responsible for organising the production, approval and delivery of the university’s submission?
3. What steps were taken in order to produce the university’s submission?
4. What opportunities for input were university personnel provided with?
5. Several witnesses presented written and oral submissions to the Royal Commission on behalf of [name of university]. How were these witnesses selected?
6. Was there any disagreement within the university over the content of the university’s submission? If so, how were disagreements dealt with?
You are welcome to participate in this research in the manner that suits you best. For example, you are welcome to provide written responses to the questions outlined above, or to discuss the questions with me over the phone. If you choose to participate via the latter option, I would appreciate it if I could make an audio recording of any interview that takes place.

I can be contacted at amburya@kea.lincoln.ac.nz if you have any queries about my research project, or if you would like to arrange an interview. You are also welcome to direct queries about my research project to my supervisors, Dr. Ton Bührs (buhrst@lincoln.ac.nz) and Dr. Stefanie Rixecker (rixeckes@lincoln.ac.nz). If I have not heard from you, I will call you during the week of the 28th of October to determine whether you are willing to participate in this research and, if you are willing, the method of participation that would suit you best.

It is the policy of the Lincoln University Human Ethics Committee that research projects that seek information from public figures or professional persons, in the areas of their duties or competence, are not required to apply for ethical approval. However, such research projects are still bound by the provisions of the Privacy Act 1993. Your rights under the Privacy Act 1993 are detailed on the attached consent form for your consideration. If you do elect to participate in this research, please complete this consent form and return it to me in the addressed envelope provided.

Thank you for your assistance.

Yours faithfully

Alan Ambury
Master of Applied Science candidate
Environment, Society and Design Division, Lincoln University
Research Summary

Research Topic
The Role of New Zealand's Universities in the Formal Hearings of the Royal Commission on Genetic Modification.

Research Supervisors
Dr. Ton Bührs
Environment, Society and Design Division
Lincoln University
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(03) 325 2811, extn 8708

Dr. Stefanie Rixecker
Environment, Society and Design Division
Lincoln University
rixeckes@lincoln.ac.nz
(03) 325 2811, extn 8643

Research Aims and Background
The central aim of this research project is to explore the role that New Zealand's universities played in the formal hearings of the Royal Commission on Genetic Modification (RCGM). The research is relevant because of recent transformations that have been occurring in New Zealand's universities, in which the universities have become increasingly entrepreneurial and collaboratively involved with the private sector. These transformations are thought to be altering the internal culture of the universities, and their interactions with the wider community. It is envisaged that this research project will provide valuable insights into the role of New Zealand's universities in a contemporary public policy debate, and the opportunities and threats that are associated with the universities' recent transformations.

The transformations that have been occurring in New Zealand's universities have also been occurring in universities throughout the developed world. They have been spurred by patterns of economic globalisation, the emergence of new models of knowledge-based economic development, governmental attempts to entwine universities in national and regional innovation systems, and programmes of economic reform within nation-states (Etzkowitz & Leydesdorff, 1997; Gibbons et al., 1994; OECD, 1998; Slaughter & Leslie, 1997). Throughout the developed world, universities have responded to these pressures and opportunities by internalising intellectual property management and technology transfer activities, accepting a role in the development of national and regional economies, and engaging in a host of collaborative relationships with the private sector (Etzkowitz & Leydesdorff, 1997; OECD, 1998). These new activities represent a significant shift in the institutional mission of universities, which, in times past, embraced goals such as institutional autonomy, eschewed an active role in the commercialisation of knowledge, and consequently earned the moniker of 'the ivory tower' (Etzkowitz, Webster & Healey, 1998; Jaspers, 1960; Slaughter & Leslie, 1997; Sutz, 1997).
Not surprisingly, these developments have been greeted with both acclaim and consternation. Some commentators see positive outcomes and suggest, for example, that the transformations will enable universities to become more responsive to societal needs (Gibbons et al., 1994; OECD, 1998). In contrast, other commentators suggest that the transformations may inhibit the traditional 'public good' functions of the universities, such as their role as an impartial critic of societal developments (Kenney, 1986; Peters & Roberts, 1999; Soley, 1995).

Amidst such speculation, events associated with the formal hearings of the RCGM provide an opportunity to research the contribution that New Zealand's universities made to a contemporary debate over public policy. It is envisaged that this research will have multiple benefits. Firstly, it will provide insight into the role that New Zealand's universities played in a debate over the use of genetic modification within New Zealand. Secondly, it will provide insight into the role that New Zealand's universities may play in future public policy debates. Thirdly, it will facilitate a valuable discussion on the opportunities and threats associated with the recent transformations of New Zealand's universities.

Methodology

Four of New Zealand's universities (Lincoln University, the University of Auckland, the University of Canterbury, and the University of Otago), numerous university personnel, and several organisations that are affiliated with a New Zealand university, presented submissions to the Royal Commission on Genetic Modification. This research project explores the contribution that New Zealand's universities made to the Royal Commission by studying the content of these submissions, the processes that universities utilised to construct their submissions, and each university's reasons for presenting, or not presenting, an institutional submission to the RCGM. Cognizant that some of these issues are contentious, a core aspect of my methodology is to invite a variety of university personnel to participate in this research project, including university officers who helped to construct their university's submission, and university personnel who presented submissions to the RCGM outside of their university's official submission. By adopting this methodology, I hope to instil balance into this research project.

References


The Role of New Zealand’s Universities in the Royal Commission on Genetic Modification

Consent Form

Your rights
If you participate in this research project, you have the right to:

a) Ask any further questions about the research which occur to you in the course of your participation.
b) Provide information on the understanding that your confidentiality can be protected if requested.
c) Refuse to answer any particular question.
d) Withdraw from the study at any time.
e) Access, correct, or retract any information that you have provided.
f) Indicate any information that you do not wish to be published or presented to others.

Consent statement
I, ___________________________, have read and understood the description of the research project. On this basis, I agree to participate in the research project with the understanding that information that I provide may be used in a number of publications that Alan Ambury may write, or presentations that Alan Ambury may give.

Signed: ___________________________
Date: ___________________________

Further, I consent to an audio recording being made if I participate in an interview.

Signed: ___________________________
Date: ___________________________
Appendix 4: An Example of a Request for Official Information
9 December 2002

Dear Mr Wills

I write to request the following information from the University of Auckland under the Official Information Act 1982:

1. A copy of the application that the University of Auckland forwarded to the Royal Commission on Genetic Modification in order to apply for Interested Person status within the formal hearings of the aforementioned Commission.

2. A copy of any communiqués, reports or draft submissions that were produced by the Working Group¹ that had the responsibility for producing the University of Auckland’s submission to the Royal Commission on Genetic Modification.

3. A copy of any orders or instructions that were issued by the University Council, the University Senate or the Vice-Chancellor to the aforementioned Working Group, including any terms of reference that were issued.

4. A copy of the minutes that arose from any meeting of the aforementioned Working Group.

5. Sections of the minutes of any meetings of the University Council, that took place between November 1999 and September 2001, in which the Royal Commission on

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¹ On the 25th of October 2000, during the University of Auckland’s oral submission to the Royal Commission on Genetic Modification, Professor Marston Conder, in describing the process that had been used to create the University’s submission, stated that a Working Group had been announced by the University Senate and given the responsibility of producing the University of Auckland’s submission to the Royal Commission on Genetic Modification.
Genetic Modification or the University of Auckland's involvement in the Royal Commission on Genetic Modification are mentioned or discussed.

6. Sections of the minutes of any meetings of the University Senate, that took place between November 1999 and September 2001, in which the Royal Commission on Genetic Modification or the University of Auckland's involvement in the Royal Commission on Genetic Modification are mentioned or discussed.

7. Any information held by Dr. John Hood (Vice-Chancellor), Professor Thomas Barnes (the current Deputy Vice-Chancellor for Research), Professor Marston Conder (the Deputy Vice-Chancellor for Research at the time of the Royal Commission on Genetic Modification), or personnel within the Office of the Vice-Chancellor pertaining to:
   a) The names of the people who comprised the Working Group that had the responsibility for producing the University of Auckland's submission to the Royal Commission on Genetic Modification.
   b) Any opportunities for input into the University of Auckland's submission to the Royal Commission on Genetic Modification that university personnel were provided with.
   c) The process that was used to select the five witnesses (Professor Marston Conder, Associate Professor Ingrid Winship, Professor Garth Cooper, Professor Richard Bellamy and Professor John Fraser) that presented submissions to the Royal Commission on Genetic Modification on behalf of the University of Auckland, including the criteria that their selection was based upon.

In order to clarify the information requests above it may be useful if I briefly discuss my reason for filing these requests. I am a postgraduate student at Lincoln University, in the process of collecting information for my Masterate thesis. The topic of my research is "The Role of New Zealand's Universities in the Formal Hearings of the Royal Commission on Genetic Modification". At present I am seeking to understand the process that the University of Auckland utilised in order to produce its submission to the Royal Commission on Genetic Modification.

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2 Sections of the minutes in which the Royal Commission on Genetic Modification, or the University of Auckland's involvement in the Royal Commission on Genetic Modification are not mentioned or discussed may be omitted.

3 Sections of the minutes in which the Royal Commission on Genetic Modification, or the University of Auckland's involvement in the Royal Commission on Genetic Modification are not mentioned or discussed may be omitted.

4 I draw your attention to the definition of official information outlined in the Office of the Ombudsman's Practice Guidelines: Guide A3 (p.4; available at http://www.ombudsmen.govt.nz/downloads/%20Guidelines/guideA3_02.pdf), which states: "The Ombudsmen consider that the definition of official information also includes knowledge of a particular fact or state of affairs held by officers in such organisations or Departments in their official capacity. The fact that such information has not yet been reduced to writing does not mean that it does not exist and is not 'held' for the purposes of the Act."
Modification, as well as its reasons for involvement in the Royal Commission on Genetic Modification.

Please contact me urgently if you consider any of the information requests above, or the totality of information requests above, to be:
   a) lacking in due particularity;
   b) likely to incur a financial charge; or
   c) not possible to respond to within 20 working days.
I am willing to refine any requests that fit the criteria above. I can be contacted by email at amburya@lincoln.ac.nz

If a decision is made to refuse any of the information requests above, I request that you provide me with the reason for any refusal and the grounds in support of each reason.

Thank you for your assistance.

Yours faithfully

Alan Ambury
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Environment, Society and Design Division
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