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# New Zealand as the 'knowledge society': The foresight project and the tertiary white paper[1]

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ABSTRACT
A comprehensive set of reforms was instituted by the National Government in 1990 under Simon Upton, the Minister of Research, Science and Technology. The reforms were based on a number of principles which originated in public choice theory and served as a basis for the restructuring of the public sector as a whole. Investing in Science for Our Future (MoRST, 1992) presents an early snapshot of the Government's statement of science priorities in the 1990s. It is abundantly clear that a certain instrumental view of knowledge underlies the document. The overall strategic direction for New Zealand science emphasised a partnership with the private sector, a concentration of resources in those research areas where result can be readily exploited for economic gain, a concentration of effort on research in economic sectors which already have a competitive advantage. In essence, this view represented a market model of knowledge.

## Introduction: Changes to the New Zealand science regime in the early 1990s

A comprehensive set of reforms was instituted by the National Government in 1990 under Simon Upton, the Minister of Research, Science and Technology (see Peters, 1994). The reforms were based on a number of principles which originated in public choice theory and served as a basis for the restructuring of the public sector as a whole (Scott et al, 1990; Boston, 1991). These principles, for example, emphasise: the clear separation of policy advice from the allocation of public funding and the conduct of research and development; the contestability of policy advice and funding; the prioritising of science for the production of public good science outputs; the government purchase of R & D services (on contract) needed to achieve its stated outcomes; the commercialisation, corporatisation and competitive neutrality of public research agencies (see, for example Shaw, 1990; Scobie and Jacobsen, 1991).

To a large extent these principles which have served as a basis for the restructuring of science reflect what Christopher Hood (1990) and others have called New Public Management (NPM). NPM is characterised by a series of shifts: from policy development to management; from aggregation to disaggregation in public service organisation (disaggregated budgets, internal markets and rivalry); from planning and public service welfarism to a stress on cost-cutting and labour discipline; from process to output controls and accountability mechanisms (performance measurement); from permanent public bureau production to term contracts and private sector delivery (Hood and Jackson, 1991: 178). NPM combines "new institutional economics" (public choice theory, principal-agency theory, and transaction cost theory) built around ideas of contestability, user choice,

transparency, and incentive structures, with elements of the fashionable 'corporate culture' doctrines of the 1980s. Hood (1991 :3) notes that NPM is associated with: attempts to slow down or reverse government growth in terms of public spending and staffing; the shift toward privatisation and quasi-privatisation and away from core government institutions; the development of automation, particularly in information technology, in the production and distribution of public services.

Criticisms have been raised in New Zealand about the restructuring process and the new science policy regime. There were criticisms of the cuts in Government spending since the early 1980s, of the department of Scientific and Industrial Research (DSIR) redundancies and the loss of some 200 scientists in the three years to 1991. There have been criticisms of the ideological parameters within which science must now take place: some worry that the new system will promote short-term research at the market end of the spectrum, rather than longer-term, basic research. This fear was reinforced by the commercial orientation of the Crown Research Institutes (CRIs), which have a strong representation from the private sector. There have been criticisms of the bureaucratic nature of the new system which is seen as being both more centralised and less flexible than the old one. With ten CRIs, a Ministry and a Foundation, in addition to high setting-up costs, suspicion has been expressed that more is being spent on administration and less on science than under the previous system.

*Investing in Science for Our Future* (MoRST, 1992) presents an early snapshot of the Government's statement of science priorities in the 1990s. It is abundantly clear that a certain instrumental view of knowledge underlies the document. The overall strategic direction for New Zealand science is stated as being

> to foster a sustainable, technologically advanced society which innovates and adds value, especially to our strong base of biological production (p. 24).

Yet New Zealand's conception of state-funded science is not greatly different from those that underlie science policy regimes elsewhere in the West (see Peters, 1991). Science is valued primarily for its capacity to "add value", and support "innovation, enterprise and exporting" so that New Zealand can "attain the growth in incomes and employment needed for an improved quality of life" (p. l). Strategic goals emphasised a partnership with the private sector, a concentration of resources in those research areas where result can be readily exploited for economic gain, a concentration of effort on research in economic sectors which already have a competitive advantage. In essence, this view represented a market model of knowledge.

## The shift to "the knowledge society"[2]

As we have briefly outlined, the science policy regime in New Zealand has undergone a number of changes since the early 1990s. In particular there has been a shift from strategic planning to scenario building and science foresight built around the concept of "the knowledge society", a term recently adopted by the Ministry of Science, Research and Technology (MoRST). The concept is embedded in a discourse of futurology and the MoRST Foresight Project which is a future-oriented public discussion exercise designed to encourage a consensus among various sector groups in New Zealand concerning a "desirable future". The exercise is based on the notion of foresight which is neither a form of prediction or planning but rather an analysis of global trends, how they will affect New Zealand and, given national resources, how the country might take advantage of them. The project links government investment with New Zealand's development towards becoming a "knowledge society" on the understanding that the Government's strategic investment in public good science and technology must be used effectively to underpin New Zealand's development as a knowledge society, driven by technology, if New Zealand is to compete successfully in the global economy.

In the period leading up to the new millennium, a comprehensive review of the priorities for public good science and technology is to be carried out, under the umbrella of the Foresight Project with four phases, including: an overview designed to establish a context for thinking about the future; the development of sector strategies which involves developing a widely shared and compelling understanding of what is important for New Zealand; the identification of the priorities for public good science and technology; and, finally, implementation of new priorities and investment processes from July 2000.

It is claimed that while the future is not entirely predictable, there are trends which are presently unfolding that must be taken into the foresight process and the project specifies seven such trends, including: the knowledge revolution; globalisation; global science and technology trends; changing consumer behaviours and preferences; industry convergence; environmental issues; and, social organisation. This discussion will focus upon the "knowledge revolution". We are informed that the 'knowledge revolution' constitutes a significant global paradigm shift which is changing the structure of New Zealand's economy and society. Knowledge is the key to the future because it, rather than capital or labour, drives productivity and economic growth and, unlike either capital or labor, it cannot lose its value which may even increase with future applications. Knowledge, we are informed, "includes information in any form, but also includes know-how and know-why, and involves the way we interact as individuals and as a community" (MoRST, 1998).

Knowledge economies are those which are directly based on the production, distribution and use of knowledge and information. This is reflected in the trend towards growth in high-technology investments, high-technology industries, more highly-skilled labour and associated productivity gains. Knowledge, as embodied in people (as "human capital") and in technology, has always been central to economic development. But it is only over the last few years that its relative importance has been recognised, just as that importance is growing. This description of the 'knowledge revolution' is sprinkled with references to Alvin Toffler, Peter Drucker, Tapscott *(Digital Economy),* Negroponte *(Being Digital),* Charles Handy, Kevin Kelly, Hazel Henderson, and Paul Hawken.

The framework, the philosophy and the process of planning for the future in the knowledge age that MoRST adopts is a form of management theory called *scenario building* born out of the dissatisfaction with strategic planning during the 1980s. Scenario building theory is seen to overcome the conceptual limitations of strategic planning including, its elitism and lack of engagement with sector representatives and its lack of vision and orientation to the future. Wallace and Packer (1998) indicate that the concept of scenario originates in film practice, as a kind of scaffolding or framework for the production of a movie and they describe its popularisation in the corporate world by Royal Dutch Shell and its subsequent adoption as a tool of business management (see Peter Schwartz, *The Art of the Long View).*

The hindsight process of reflecting on the past is seen as a useful way of seeing the "paradigm shifts" that have occurred in New Zealand. The Ministry offers the following description of the past and the future as a series of Kuhnian 'paradigm shifts': from the regulation, protectionism, public ownership, welfarism, egalitarianism of the 1970s to de-regulation, open markets, privatisation, self-responsibility and the age of the self-achiever in the 1990s. The big question, it is maintained, for the Ministry futurologists is to guess what will be the paradigm for 2010?

This appropriation of the discourse of philosophy and history of science misuses the concept of paradigm and while it may be pointed out that Kuhn himself, it is alleged used the term in a myriad of different ways, it is clear at least that he was using it to explain the shift from Newtonian to Einsteinium physics. 'Paradigm' in Kuhnian discourse is meant to convey very important large conceptual shifts that occur relatively rarely in science. The Ministry use of the term, it might be argued, debases its original meaning and leads to its hyper-inflation.

The Foresight Project uses scenario building to develop an awareness of irrevocable events while reviewing priorities for public good science and technology. On this basis possible strategic

responses to these scenarios are developed. The Foresight Project identifies three possible scenarios for New Zealand:

> *Possum in the Glare.* New Zealand is caught like a possum in the glare of the oncoming future. But possums are hardy creatures, and New Zealand muddles along by finding new markets for traditional agricultural products, and combating falling prices with new production technologies …
>
> *Shark Roaming Alone.* After a period of economic difficulty, New Zealand has adapted quickly to keep up with the changes of the early 21st Century. Rapid uptake of new technology and the Internet, and the success of the entrepreneurial approach, have made us a highly individualised society of sharks …
>
> *Nga Kahikatea Reaching.* New Heights Around the World, there is much interest in the social change that has occurred in New Zealand over the first decade of the 21st Century. What marks New Zealand out from other countries is a strong and widely shared sense of purpose a national intent. A nation of kahikatea, standing together . . .

We might inquire as to whether this really represents anything like a futures exercise or rather, as I shall maintain, expresses rather obviously *present* fears. The second feature that deserves comment is the limited and ideological nature of the choices that are constructed for us. What determines the number of scenario-narratives we should construct/ Why three rather than twenty-three? Is there an optimum number? In scenario building methodology also we must ask always ourselves who is constructing these *future narratives* and for what purposes. What are the choices that the scenario builder forcing us to make and are these choices always mutually exclusive? Is there ever a genuine choice to be made or is the process here always one that is intended to trade upon particular ideologies?

For instance, in applying these critical questions to the scenarios mentioned above: is there any one or group who would willing choose the first? Who would want to choose the prospect of a possum caught in the glare of an on-coming future, or, for that matter a shark roaming alone? The Nga Kahikatea option, symbolising an indigenously approved future and is the one we are narratively engineered to embrace, is the only genuine option.

On the basis of this scenario building exercise and after consultation with the different sector groups, in early 1999 a set of 17 target outcome descriptions were arrived that outline a series of desirable outcomes for the future of New Zealand which can be significantly progressed by research, science and technology activity. These are as follows:

- A Culture of Innovation
- Anticipation & Creation of New Markets
- Distinctive & Positive Cultural Identity
- Empowered Individuals & Communities
- Globally Connected New Zealand
- Healthy, Diverse, Resilient Ecosystems
- High Health Status
- Infrastructure for a Knowledge Society
- Knowledge & Learning Networks
- Maori Development
- New Health Care Possibilities
- People & Their Physical Environments

- Security in Hazardous Environments
- Self-Determination & Ethical Principles
- Sustainable Ecosystem Use
- Wealth from Biological & Physical Resources
- Wealth from New Knowledge-based Business

Are these outcomes equally desirable? How do we distinguish between them? How coherent is the list and what, in detail, do they mean? There are also some critical questions to ask concerning both the notion of the knowledge society and the process of scenario building. First, is this really scenario building? Are these equally valid or possible options? Is there any hard data to distinguish these three possible scenarios? How does one "test" the viability of one scenario over another? Do all three scenarios really constitute desirable futures?

Second, if strategic planning has its problems so too does scenario planning. The focus on investment-driven science and technology policy focus makes some simplistic assumptions about the concept of knowledge and the "knowledge revolution". For one thing, the Foresight Project does not make the standard philosophical distinction between 'knowledge' and 'information'. On the traditional *true, justified belief* account of knowledge, which goes back to Plato, the following logical conditions are said to apply. For A (a knower) to know *that p* (where 'p' is a proposition or statement): 1) A must believe that p; 2) p must be true; and, 3) A must be justified that p. In other words, there is a belief condition, a truth condition and a justification condition, all of which must be met for something to count as knowledge. Whereas for data to qualify as information, none of these conditions must be met: for information to count as information there is no belief condition, no truth condition, no justification condition. All that has to occur is for data to be sent from a sender to a receiver and that data as information may not be true, believed or justified. There are, as we all know, forms of 'disinformation', 'infomercials', increasingly 'edutainment' and so on that clearly do not count as knowledge. The Foresight Project conflates 'knowledge' with 'information' and, thereby, also perpetrates flawed accounts of both the production and consumption processes of knowledge and of knowledge institutions (see Peters, 1993, 1996a, 1996b; Peters and Marshall, 1995; Peters and Roberts, 1998, 1999).

Third, The Foresight Project does not consider the history of the notion of the 'knowledge society' or the 'information society' or associated concepts like the 'global information society'. These are not uncontested terms. They are value-laden and theory-laden concepts that have been part of social and cultural theory for over thirty years. The notion of the 'information society' passed into the sociological literature soon after Daniel Bell and Alain Touraine had written on 'post-industrialism' in the late sixties. Bell had focused upon the centrality of theoretical knowledge and the social and institutional changes required for the 'knowledge' society. Touraine predicted the rise of new social movements associated with the shift to post-industrialism. His analysis led him to emphasise the way in which social life, including education, was being increasingly integrated into the realm of production. During the seventies and eighties the notion of the 'information society' became part of a theory-laden and contested discourse about the future of advanced liberal societies. The debate had begun much earlier. The 'cybernetics group', including Norbet Weiner, Claude Shanon, Von Neuman, and, perhaps surprisingly, the anthropologists, Margaret Mead and Gregory Bateson, had met regularly during the 1940s to talk about systems theory and its applications. Together they had helped shape the culture of the Cold War. During the 1960s, Fritz Machlup and Marc Porat charted the employment effects of an emerging US "information economy" and argued for productivity gains from investment in the information sector. Several generations of sociologists, economists, philosophers of technology, geographers, engineers and politicians have debated the meaning and significance of the technical transformations wrought by communications and information technologies in the post-war period. What this means is that there is no innocent approach to these terms or their unproblematic use which can be hived-off from the

accumulation of theory, especially the sociology of post-industrialism and post-Fordism, to which they belong. There is a public obligation on the part of MoRST officials to acknowledge these theory contexts and to present them clearly as part of the overall discussion, especially since one particular contemporary variant of this discourse on the 'information society' is closely tied to neo-liberalism. It is wildly utopian; it uses a hyperbolic language of "revolution" and attempts to conjure up a vision of the future; it emphasises universal and abstract 'techno-fix' solutions to social and economic problems; it focuses upon the technical transformation of society, highlighting the commercial benefits; and it approaches technology in general as something that, in itself, is neutral, denying the necessity of social or political analysis.

Fourth, the Foresight Project embraces a discourse of futurology in a very narrow sense: the discourse is at once populist and ahistorical. The discourses of futurology and of futurisms (in the plural) have always been a defining feature of modernism and modernity and these discourses, it could be argued, seem to become most popular at the turn of the century or millennium. Are they millennium products? At any rate, the futurisms of European formalist thought originate in pre-Revolutionary Russia and has strong conceptual links with a formalist poetics. We must remember that there is a strong future-orientation and element of prophecy in the counter-Enlightenment thought of both Schopenhauer and Nietzsche, both of whom strongly influenced the cultural sites of *fin-de-siécle* Vienna and the northern Italian cities, which were sites for Filippo Marinetti's futurism. Futurism was the first attempt in the twentieth century to reimagine life as it was then being transfixed by new technologies a cl to invent a machinic utopia that both extended and remodelled culture.

Fifth, the Foresight Project is grounded in corporatist management theory of scenario building. While such a theory is inclusive of sector interests and less elitist than its predecessor strategic planning, it still carries with it the ethos of the corporation and reflects the interests of business rather than the interests of the wider society or nation. Wallace and Packer ( 1998) ask of MoRST's Foresight Project's scenarios "who is telling the story, and therefore whose perspective is at least implicitly being privileged?" and they suggest that scenarios, normally used as a business tool for controlling to a future of a company, tends to assimilate the nation to the status of a corporation. They comment that the almost exclusive focus of the scenarios is upon the relation between technology and the economy (and, in particular, economic growth and productivity). Not only are social and cultural issues consigned to economic ends insofar as they are mentioned at all but the technological forces that are allegedly responsible for propelling us into the future are acultural and asocial; they exist some how apart from culture and society, and impact upon it.

Finally, and in related terms, the Foresight Project tends to focus upon the investment side of the ledger and attempts to answer the question of national priorities in science and technology. It does not move from the question of the "knowledge society" to questions of the main "knowledge institutions" or the way these are being transformed. There is, for example, little or no attention given to New Zealand's universities or tertiary education institutions and there does not seem to be any linkage between science and technology policy on the one hand, and the review of tertiary education. Arguably, in the United Kingdom there is a better articulation between these related policy areas.

## Universities and the knowledge economy: Shifts in the production of knowledge

It is no accident that the Dearing Report uses the central concept of the 'learning society' as its grand legitimating narrative for restructuring the knowledge institutions which comprise the higher education sector. By contrast, in New Zealand, MoRST's Foresight Project relies on the grand narrative of the "knowledge revolution" and a scenario building philosophy to order and set its priorities in science and technology policy. The project specifies seven global mega-trends, including: The Knowledge Revolution; Globalisation; Global Science and Technology Trends;

Changing Consumer Behaviours and Preferences; Industry Convergence; Environmental Issues; and, Social Organisation. The "knowledge revolution" is seen to constitute a significant global paradigm shift which is changing the structure of New Zealand's economy and society. Knowledge is the key to the future, MoRST analysts argue, because it, rather than capital or labour, drives productivity and economic growth and, unlike either capital or labour, it cannot lose its value (which may even increase with future applications). Knowledge "includes information in any form, but also includes know-how and know-why, and involves the way we interact as individuals and as a community" (MoRST, 1998).

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There have been some changes to the new knowledge economy, as many theorists have pointed out. Fundamental to understanding the new global economy has been a rediscovery of the economic importance of education (Papadopoulos, George, 1994). The OECD and the World Bank have stressed the significance of education and training for the development of "human resources", for upskilling and increasing the competencies of workers, and for the production of research and scientific knowledge, as keys to participation in the new global economy.

One of the clearest statements of this kind of understanding of what has been called "the knowledge-based economy" comes from a recent OECD report entitled *Employment and Growth in the Knowledge-Based Economy* (1996), proceedings of a conference held in Copenhagen in 1994 which was designed to address the conceptual difficulties of economic theory in coming to terms with the core concepts of 'knowledge' and 'information'. The opening paper by Dominique Foray and Bengt-Ake Lundvall (1996: 29) gives a very real sense of the stakes involved. Having provided interpretations of the knowledge-based economy, considered the empirical evidence and trends, and made some conceptual clarifications (going back to Polanyi's *tacit* knowledge), they conclude:

> While information technology makes more kinds of knowledge codifiable, and thereby accelerates the processes of innovation, change and learning, some elements of tacit knowledge have become more important than ever for economic performance and success. The traditional dichotomy between public and private knowledge is becoming less relevant. Hybrid forms of knowledge which are neither completely private not completely public are becoming increasingly important. More and more strategic know-how and competence is developed interactively and shared within sub-groups and networks.

They continue:

> These changes may be regarded as parts of an ever further-reaching process of socio-economic change -- we are moving towards a networked learning economy where the opportunity and capability to access and join knowledge and learning-intensive networks determine the relative success of individuals and forms.

What is fascinating about this statement (and the chapter as a whole) is that the complete absence of reference to traditional knowledge-institutions, the acknowledgement of the tacit dimension in knowledge, and the recognition of the hybridisation of knowledge forms.

Both Peter Drucker (1993) and Michael Porter (1990) emphasise the importance of knowledge -- its economics and productivity -- as the basis for national competition within the international marketplace. Lester Thurow (1996: 68) suggests that "a technological shift to an era dominated by man-made brainpower industries" is one of five economic tectonic plates which constitute a new game with new rules: "Today knowledge and skills now stand alone as the only source of comparative advantage. They have become the key ingredient in the late twentieth century's

location of economic activity." These understandings seem to be supported from the evidence of so-called "new growth theory".

Neo-classical economics does not specify how knowledge accumulation occurs. As a result there is no mention of human capital and there is no direct role for education. Further, in the neo-classical model there is no income "left over" (all output is paid to either capital or labour) to act as a reward or incentive for knowledge accumulation. Accordingly, there are no externalities to knowledge accumulation. By contrast, new growth theory has highlighted the role of education in the creation of human capital and in the production of new knowledge. On this basis it has explored the possibilities of education-related externalities. In short, while the evidence is far from conclusive at this stage there is a consensus emerging that education is important for successful research activities (e.g., by producing scientists and engineers), which are, in turn, important for productivity growth and; education creates human capital, which directly affects knowledge accumulation and therefore productivity growth (see Report 8, "Externalities in Higher Education", Dearing, 1997).

Beyond so-called new growth theory there are changes occurring in the production of knowledge that require close examination. Let me mention briefly two attempts to discuss these changes. First, Gibbons and his colleagues, sketch the differences between what they call Mode 1 knowledge and Mode 2 knowledge:

> In Mode I problems are set and solved in a context governed by the, largely academic, interests of a specific community. By contrast, Mode 2 knowledge is carried out in a context of application. Mode 1 is disciplinary while Mode 2 is transdisciplinary. Mode 1 is characterised by homogeneity, Mode 2 by heterogeneity. Organisationally, Mode 1 is hierarchical and tends to preserve its form while Mode 2 is more heterarchical and transient. Each employs a different; type of quality control. In comparison with Mode 1, Mode 2 is more socially accountable and reflexive (Gibbons et al, 1994: 3).

What Gibbons calls Mode 2 knowledge is ethically-informed, grounded research that reflects the needs of its various constituencies in the community and often emerges out of on-going, collaborative relationship with the corporate sector, diverse ethnic communities state agencies and local government. It is likely to involve a form of applied research that may be developmental or directed to "testing" existing knowledge or beliefs, often involving, directly or indirectly, policy analysis and evaluation. This is not to say that new knowledge or research based upon it rules out conceptual investigation, scholarship or creative work. In fact, these forms ought to be become more prominent, especially in the realms of book publishing, performance, presentation, artwork and design.

What distinguishes contemporary knowledge production from more traditional forms based on highly systematised disciplinary bodies of knowledge, is the focus on practical problems, and hence on negotiation amongst a multiplicity of interested perspectives from within the community. Michael Gibbons and his colleagues also recognise that ways in which:

> the contrast between pre-social science and pre-scientific humanities is breaking down. Mixed arenas have emerged in which natural scientists, social scientists, humanists and activists of all sorts are publicly debating issues that no longer respect the traditional boundaries between natural sciences and the humanities' (p. 100).

The focus on Mode 2 knowledge and on practical problems would seem to warrant and legitimate different forms of research, 01· at least, to favour some forms over others: the market survey; the poll (statistically significant); the consumer questionnaire; the structured or unstructured interview; and, all forms of qualitative research (case study, participant observation, interview, policy evaluation, analysis and review) which valorize a kind of instrumentalism and utility (or "socially useful knowledge") over knowledge for its own sake. It is only since the 1960s, for instance, in the United States, beginning with President Kennedy's administration, that the so-called policy sciences have gained respectability, become institutionalized, and an indispensable part of "scientific" or "expert" government. Increasingly and in relation to these developments questions of the ethics and politics

of research (especially of bi-cultural or multi-cultural research) have been raised and seen as being involved at every point of the research process.

Second, and perhaps more contentiously, Gerard Delanty (1998) argues that the role of the university is undergoing a transition in late modernity as a result of structural shifts in the production and legitimation of knowledge. The older goal of the democratization of the university has now been superseded by new challenges arising from the dual processes of the globalization and fragmentation of knowledge cultures. These arise from the following developments:

- the separation of knowledge (research) from the post-sovereign state that no longer exclusively supports Big Science;
- the rise of new regulatory regimes that impose an 'audit society' on the previously autonomous society;
- a separation of research from teaching (education);
- the decoupling of knowledge from society and the replacement of the public by target constituencies;
- the functional contradiction between science and economy in the increasing specialization of knowledge and the decline in occupational opportunities;
- the de-territorialization of knowledge as a result of new communication technologies and knowledge flows;
- the crisis of scientific rationality under conditions of the 'risk society', reflexivity and the new demands for the legitimation of knowledge.

Delanty's view is a global one and some of the trends he announces have less obvious application to New Zealand but what is of importance are changes to the global economy that emphasize: (1) the internationalization of higher education, and; (2) an emerging political economy of higher education based upon an informational division of intellectual labour. Higher education has become a global international service and in an era of mass access and reducing state funding, the internationalization of sites for teaching and research is a necessary strategy for institutional survival. Yet it must take place with considerable care and on the basis of long-term cultural exchange.

Let me highlight for a moment the second point by addressing Delanty's emphasis on new communications and information technologies. The shift from a literary to post-literary culture has transformed the modern university in terms of its teaching and research missions. The modern western university was a print technoculture shaped by print technologies for the creation, storage and transmission of knowledge. The shift to a new technoculture is being shaped by digital technologies for the storage and exchange of information. New technocultures require new forms of organisation and spark new hybrid forms of academic practice whether it be in teaching or research. Directors of research in new universities, whether they be here or in Australia or elsewhere, will need to understand these new exigencies in order to be effective and help shape emerging research technocultures based on 'networking' of all kinds (see Peters & Roberts, 1998).

The traditional universities in New Zealand sometimes have been slow to take up the teaching and research opportunities provided by these new technologies, especially in courses and research devoted to the new communications technologies. The development of a new university technoculture based on digital technologies also transforms scholarly publishing, alters the nature of academic writing, and presents new possibilities for "networked" research. New universities need to remain critical of such developments, alert to the risks and dangers, at the same time as exploring them. For instance, a commissioned paper by Global Alliance Limited, written for the Australian Review of Higher Education (the West Report) suggests that the reducing government fee structure, the associated shift of power to the consumer, increasing international competitive exposure, together with changes in the technology of production and consumption will lead to the "hollowing out of the university". The report is worth quoting at some length on this point, as it postulates the end of the state-funded bureaucratic university:

> The vertically integrated university is a product of brand image, government policy, history and historical economies of scale in support services. If government policy is no longer biased in favour of this form, and technology liberates providers from one location, then we would expect to see new forms arising such as multiple outlet vertically integrate specialist schools and web based universities ... Specialist service providers, such as testing companies and courseware developers will arise, as will superstar teachers who are not tied to any one university. Many universities will become marketing and production coordinators or systems integrators. They will no longer all be vertically integrated education version of the 1929 Ford assembly plant m Detroit (p. 12).

The report suggests that the overall results of these combined forces of change are an increased segmentation of markets, an increased specialization and customization of supply of courses and an increased specialization of providers. The new university business system will take the form of one of a series of possible business models: low cost producer university; Asia middle class web university; Harvard in Australia university; world specialist school university. I do not believe that these scenarios exhaust the possibilities by any means or that they constitute the most desirable organizational forms.

## New Zealand's Tertiary Review: The reform of university research function

These new understandings of the global economy and recognised shifts in the production of knowledge have motivated western governments, guided by neoliberal theories, to begin the process of restructuring universities. In the late 1990s, the British Australian and New Zealand governments convened reviews of higher education to determine the shape and imperatives of the sector for the twenty-first century. The terms of reference for these inquiries have been written against the kind of changes to the global economy and policy issues identified above.

The two main tradition functions of the university -- research or the production of knowledge, and teaching or its dissemination and acquisition -- are being radically transformed. As central knowledge institutions of the modern state universities and other institutions in the tertiary sector are seen as providing a convenient marriage with public good science and private enterprise. The liberal ideal is undergoing radical change with the emphasis in reforming the university institution falling upon the resourcing of research and teaching on the one hand, and governance and enhanced· accountability, on the other (see e.g., Ministry of Education, 1998).

In the postwar period, and especially since the 1980s, national university systems have experienced a huge growth in both participation and demand, leading to the phenomenon of "massification". This growth is, in part, the result of demographic changes, but also, in part, of deliberate policies designed to recognize and harness the economic and social importance of "second chance" education and "lifelong" education. In a competitive global economy the accent has fallen on the development of human capital. Universities have become more market-oriented and consumer-driven as a consequence of funding policies designed to encourage access at the same time as containing government expenditure. As a result, the costs of a university education in many countries has been transferred to the students themselves and governments have moved away from the premises of universal provision to favor targeting as a means of addressing questions of equity of access.

In some countries, like Australia and New Zealand, there have been strong moves to change both the size and composition of governing bodies, from a fully representative stake-holders or "democratic" model to one based upon a board of directors, modelled on the private corporation. Enhanced accountability arrangements, influenced by the new managerialism, have followed the principles of New Public Management, designed not only to improve allocative and productive efficiency but also to create incentives to pass costs on to government and consumers.

There have been two main phases of neo-liberal reform of New Zealand's tertiary sector: the first began in 1988 with the release of the so-called Hawke Report (1989) and its sister policy

documents *Learning for Life* (1990) under the fourth Labour Government, and; the second, took place under the present National government with the Tertiary Review and the release of the Green Paper (MoE, 1997) and White Paper *Tertiary Education in New Zealand: Policy Directions for the Twenty-First Century* (MoE, 1998). Where the first wave concentrated upon the reform of administration, the second has concentrated mostly on issues of resourcing and government, in conjunction with accountability issues (see e.g., Peters, 1989, 1992; "Critique of the White paper", in Peters and Roberts, 1999). In this section, I will refer only to changes to the research function of the university recommended by the Green and White Papers, linking them to earlier themes.

While lip service is given to the role that the tertiary sector plays in New Zealand's future and, in particular, to improving the country's "competitive edge" and generating "economic growth, employment opportunities, productivity, and social cohesion" (p. 3) there is little evidence of direct matching of this policy with MoRST's promotion of New Zealand as a "knowledge society". Indeed, there is little direct recognition of the link between "the knowledge society" and "knowledge institutions". The Green Paper four objectives -- increased participation, especially for under-represented groups, the improvement of the quality of qualifications, research and teaching, and value for the taxpayers' dollar -- seem only to mention "research" in passing and not in terms that resonate with MoRST's strategy and scenario building exercise. The Green Paper is more concerned with "quality" than with any explicit strategy to link research to the MoRST Foresight project. For instance, the Green Paper was concerned that the present definition of "degree" and its relationship to research and its definition is too imprecise such that there is little accountability for quality. The government has decided to review this relationship, tightening up the definition of research and the relationship to that of "degree" in 2001.

The White Paper makes major changes to the way research is funded. At present research carried out as part of tertiary education is funded through the EFTS student funding system so that institutions receive funding on the basis of student numbers. The White Paper follows elements of a research funding approach used in both Australia and the United Kingdom, where some portion of research funding in tertiary education will be driven by "the quality of the research itself because the research has a value in its own right" (p. 11). Accordingly, the White Paper indicates that $20 million of the approximately $100 million estimated to be devoted to research, will be transferred to a contestable pool, while the remaining fund will be allocated on a per-student tuition basis except that subsidy rates will vary according to programme category. Non-degree programmes will receive no additional research subsidy per EFTS; undergraduate degree programmes will receive $500; "taught" or, paper-based, postgraduate programmes and diplomas will receive $2,400; and, high-level research degrees (MA, PhD) will receive $3,800.

The assessment process is described in the White Paper in the following terms:

> The assessment process that establishes how the contestable research fund will be distributed will consider the demonstrated quality and capacity of the researchers, the quality of the proposed research portfolio, the extent to which the portfolio will develop the future innovation and human resource capabilities of New Zealand, and the cost-effectiveness of the work. The future focus of these criteria will ensure that not all funding goes to established researchers; new and innovative thinking can also be rewarded. Over time, consideration will be given to shifting more of the research funding into the contestable pool. These considerations will be based on experience with the new assessment mechanism (p. 11).

Only tertiary providers will be eligible to apply and "funding for up to three years may be allocated to strategically-focused research portfolios rather than short-term projects", with initial applications being called for in 1999 for allocation the following year. The operation of the contestable pool will be reviewed in 2001 and subject to its results, the "size of the contestable pool will be increased gradually to $80 million over a three-to-five-year period starting in 2002" (p. 31). The fund is said to be targeted at basic or pure research and the White Paper indicates that "an agency experienced in managing contestable research funds will administer allocation of the fund" (p. 33).

Clearly, the White Paper continues the original impulse, first mentioned by Gary Hawke (the Hawke Report, 1988), to separate teaching and research and to gain greater (perhaps clearer) accountability through the principle of contestability. These changes, it might be argued, do link with changes made to the science policy regime, particularly, in terms of making public good science contestable within a set of government priorities. When the White Paper mentions the mechanism for allocation suggesting that "Advantage could then be taken of the considerable expertise that has been built up through administering similar contestable research funding" (p. 33) it is obviously referring to the Foundation of Research, Science and Technology FoRST) – - the agency set up to administer and purchase public good science. There is a hint that FoRST may even become the agency responsible for administering research which is currently funded through Vote Education as part of the EFTS system.

If FoRST were to take on this responsibility as part of its mission, albeit with or without direct university representation and control, then FoRST would become the agency, with MoRST's policy advice support, responsible for directly harnessing, steering, administering and purchasing government-funded research in New Zealand. While this may provide for greater accountability through provisions of contestability and, perhaps, better co-ordination of the national research effort and public good science, it also holds certain dangers for universities in terms of academic freedom and institutional autonomy. It also will mean, almost certainly, a reduction of subsidy as other non-university degree-granting providers gain an ever-increasing slice of the pie, even though the fund is targeted at basic or pure research. The 1990 Education Act (Section 254 [a]) enabled other institutions apart from universities to grant degrees provided that such degrees were taught mainly by people engaged in research. By late 1997 NZQA had approved 134 non-university taught degrees. The distribution of research funds and relative shares between universities and other tertiary provides will crucially depend upon the contestability trial Ind the redefinitions of "degree" and "research".

The major stakeholders, including the New Zealand Students' Association, The Association of University Staff (AUS), and the Vice-Chancellors' Committee (NZVCC), have all consistently opposed the separation of teaching and research. NZVCC (1998: S. 3.2), in particular, make the argument for the interdependence of teaching and research:

> Although the universities recognised a clear distinction between undergraduate and postgraduate levels of teaching and expectations of students, the normal practice is that academic staff teach at both levels and that the contribution of research to teaching is important in both contexts.

The NZVCC then proceed to outline the specific mechanisms by which the two are considered inseparable:

- direct inclusion of their own research, and the research of others, in course content;
- requirement of students to conduct research or use research skills m their assignment work;
- requirement of students to conduct laboratory experiments and participate in field trips;
- the use of colleagues to teach in areas of their research expertise;
- the use of external experts to give lectures or lead seminars (eg. visiting fellows, practitioners, professionals, external researchers, etc.);
- the presentation of research seminars by staff and postgraduate students (section 3.2).

NZVCC (1998: S. 3.4) suggest that full contestability is "illogical" given the basis of academic appointment of staff based on teaching and research duties, and the fact that, if full contestability were introduced, it would be dependent upon successful research bidding. The Committee propose six additional arguments against a fully contestable approach to research resourcing from Vote Education which are worthy of noting here:

- The funds available to support the dual function are not generous by international standards or even in comparison with New Zealand schools in some cases. For example, the average level of funding in the senior secondary schools in 1997 is $4,733. The Non Study Right subsidy rate for Category A students in 1997 is $4,753, only $20 better than the average funding for New Zealand secondary school students.
- To sustain the teaching/research position of departments that were unsuccessful in the contestable pool universities would either have to renegotiate the conditions of employment of staff or raise fees. Neither proposition would be desirable or easy to achieve.
- On what basis would contestability be organised? The PGSF is organised on a complex system of programmes that are relevant to Government's Research Science and Technology goals. The Marsden Fund is organised on the basis of research excellence classified into 7 broad discipline groups. The latter offers the better model and the 1997 funding round certainly indicates that the number of preliminary proposals for support in 1997 (1179) compared with the number of successful proposals (58) offers plenty of scope for expanding support. But before adopting that as the model one needs to be aware that the funds go to individuals or research groups, that the average size in 1997 was $120,000 and the proposals are generally for a 3-year funding round. None of this suggests that the Marsden model could easily be adopted for application to Vote Education;
- The administrative costs of a contestable research pool would be high if selection relied on a process of peer review as Marsden and PGSF do.
- Implementation of contestability on the basis of excellence is likely to disadvantage non-university providers that do not have the established staff, facilities and track record to compete successfully. This may seem a strange point to put forward in a university submission but it is undoubtedly correct and one that makes the political consequences of contestability very unpalatable.
- The NZVCC also agrees with the point made in the Green Paper (p.33) that a contestable basis for Vote Education research funds may lead to an undue focus on research to the detriment of teaching.

The NZVCC argue that a non-contestable approach can both encourage and reward research excellence, especially since the promotion and career mobility of academic staff depends on research and teaching, and the Committee provide a useful discussion of ensuring greater transparency and accountability other than through the contestability of research funds.

## Concluding note: New Policy articulation

In the recent Cabinet reshuffle in early 1999, the Prime Minister, Jenny Shipley, has regrouped in the lead-up to the elections. The 'drys' including Wyatt Creech (as deputy leader), John Luxton, Bill English, Max Bradford, Tony Ryall, Roger Sowry, Maurice Williamson and Murray McCully now present a younger and more vital image of the National-led multi-alliance government. Significantly, Max Bradford, one of the strongest supporters of the Employments Contracts Act ( 1991) and also the Minister of Enterprise and Commerce, has been made the first-ever Minister of Tertiary Education. Some in indication of the policy implications of linking the two portfolios under Max Bradford can be gained from a recent speech "Industrial Relations into the 21 51 Century" (3 March, Auckland, 1999) where the Minister first outlines the five fundamental elements of the government's broad economic framework as: "an open, internationally competitive economy; low inflation and interest rates; low tax rates and fiscal prudence; an open, transparent and predictable legal and business system; and flexible labour markets which enable business to adjust to their changing markets at home and abroad".

Bradford then itemised his five-point plan intended to further promote innovation and create internationally competitive products and services:

- lifting New Zealanders' skills and New Zealand's intellectual knowledge base, and championing the success of winners;
- better focusing and direction of the Government's effort in research and development;
- improving access to risk capital (including investor investment capital) by the knowledge based economy;
- ensuring regulations and laws support, and not frustrate, innovation and the knowledge based economy; and
- actively promoting success and help build a culture supportive of innovation and enterprise.

The Employment Contracts Act is seen as the cornerstone of both the economic fundamentals and the five point plan.

At an address two days later Max Bradford, wearing his hat as Minister of tertiary education, talked of increasing New Zealand's intellectual knowledge base as a goal relation to of the Tertiary White Paper, which he said emphasises the importance of the sector "in improving New Zealand's competitive edge, economic growth, employment opportunities, productivity and, what we call 'social cohesion"'. He emphasised the importance of "activating the link between the business sector, education sector and Research and Development".

While the Minister seemed to distance himself from the White Paper, which is perhaps not surprising given the personal political risks concerning its implementation in an election year, he also seemed to have backed away from a strictly utilitarian account of universities as simply providing the research, innovation and knowledge necessary for the business sector in New Zealand to be able to compete successfully in the global economy.

Yet there still is too little recognition of the complexities of any possible relationship between universities and the business sector: of the need to initiate a culture of corporate sponsorship, genuine partnership, joint venture and exchange. Also the notions of the 'knowledge society' and the 'knowledge based economy' which drive the broader economic strategy have little theoretical depth, developed as it is with little respect for the diverse extant literature, or with scant regard for notions such as 'knowledge institutions' or 'knowledge sites' and 'knowledge workers', upon which such a conception might be seen to rest.

## Notes

1. An earlier paper has benefited from the constructive criticisms of Matthew Fitzsimons.

2. This section is based upon material taken from Chapter 1, *University Futures and the Politics of Reform* (Peters & Roberts, 1999).

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