Technology and the Australian state: the changing political discourse on technology in Australia 1975-1985

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8. THE TECHNOLOGY RESEARCH UNIT

Introduction

In the previous chapter I examined the Myers Inquiry as a political response to the "technology as threat" perspective that dominated the so-called technological change debate in the late-1970's. Although the Inquiry is generally perceived to have been a failure, and it certainly failed to precipitate any substantial action by the Fraser Government, I argued that it played an important symbolic role and made a significant contribution to the discourse on technological change. But the political response to the technology as threat view was not restricted to the Federal Government. State governments also responded to the concerns raised about the social implications, and particularly the believed employment effects, of technological change. A new type of government response was considered necessary in the face of rapid and pervasive technological change with often unforeseen long-term consequences. Technology assessment, accompanied by new consultative decision-making processes, was widely advocated as the response required.

An early example of such a response by a State Government was the Victorian Automation Committee, established as a "top level" committee in 1967, with union and employer representation, to report on technological change and its likely effects. Although it provided a forum for discussion on the issue, it met infrequently and had neither the power, personnel nor finances to perform satisfactorily.1 Another example was the Tasmanian Redundancy and Technological Change Advisory Committee, an ad hoc tripartite committee established in 1975 to consider possible courses of action to deal with redundancies arising from technological change. The role of this body was limited to making recommendations on sources of alternative employment for displaced employees.2
The New South Wales Labor Government (1976-1987) also responded to the concerns by establishing Australia’s first technology assessment body within the state apparatus, the Technology Research Unit (originally called the Technological Information and Research Unit), in 1979. This was a significant initiative at a critical time of high unemployment and economic stagnation. High expectations of the Unit were created by the political rhetoric at the time of its establishment. However, a few years after its establishment, it was reduced in size by the government and its vestiges were eventually absorbed into broader departmental policy formulation machinery. The “rise and fall” of the Technology Research Unit illustrates well the issues arising from state intervention to deal with the social aspects of technological change. In some ways, the case study is analogous to that of the Myers Inquiry, but unlike that episode the Unit has been very little studied and indeed rarely commented upon.

This chapter is in two main parts. The first part presents an account of the origins and eventual demise of the Technology Research Unit. This development is set against a political context of a changing orientation of the State government toward new technology (a shift that reflected a national trend). While in the late 1970’s, the Unit was established against a background of concern about the employment effects of technological change, by the early 1980’s the government’s emphasis was on the promotion of new technology as a strategic means to achieve economic revitalisation. The second part of the chapter evaluates the experience of the Unit, and locates this within a more general critical examination of the concept of technology assessment. In doing so, it picks up threads introduced in the previous chapters.

1. The Unit's Political Origins

The Unit was established against a background of growing concern about high levels of unemployment within the State. By the late 1970's, the State of New South Wales had the highest rate of unemployment in Australia and consequently the economy occupied the foreground of political attention. The associated concern about the employment effects of technological change led to a proposal to establish an assessment body. The origins of this body can be traced to discussions within the State Parliamentary Labor Party. In 1977, a paper was presented to a Parliamentary party seminar advocating a policy on automation. It proposed a State "Department of Technology" to advise the Government "... on the need for specific legislation and action that might be required to offset some of the more disruptive effects of the uncontrolled introduction of automation". However, it was not until September 1978 that action was taken.

The promise of action was made by the Premier in delivering the State Labor Party's 1978 pre-election policy speech. In this he stated:

"We are entering a new era of technology which for all its great promise and benefits threatens the way of life of thousands of Australian families. If there is no planning and preparation for this new industrial revolution the result will be unparalleled dislocation and disruption ... The task before us all, Government, unions and business, is to make technology work for the people, to harness the new technology to the needs of the community so that the new industrial revolution now upon us means not more unemployment but more opportunities for all." (5)

To prepare for this "revolution" the Government, if re-elected, proposed to create a Ministry of Technology and to establish an advisory unit of "experts on technological change" whose role would be "... to advise the Government on the ways to offset the disruptive effects of change and to co-ordinate the activities of employers, trade unions
and other community bodies in their efforts to deal with the impact of technological change".

After the return to office of the Wran Government in October 1978, the new ministerial portfolio of technology was created. The first Minister of Technology was Mr P.D. Hills and it was under his auspices that the technology advisory unit was set up. During the establishment period, from October 1978 to October 1979, the administrative machinery within the Department of Industrial Relations and Technology was mobilised to bring the new advisory body into being. But there was a problem here of seeking an increase in the public service's staff establishment at a time of economic constraint. This necessitated negotiations on the size and structure of the Unit, and these effectively delayed its formal establishment for nearly a year.

2. The Bureaucratic Machinations

Definition of the Unit's Role

Formal action was initiated by a letter (less than two weeks after the election) from the Premier to the Minister of Technology requesting proposals on the implementation of the election promise. In response to this, the Minister consulted with Professor G.W. Ford, a specialist in organisational behaviour, who had for some time been commenting on the problems of change confronting Australia. At a meeting with the Minister on 1 December, issues relating to the proposed "technological change unit" (as it was then referred to) were discussed and Professor Ford made a number of suggestions. Among these he proposed an "information and research unit" to provide information and advice on organisational and social change.

As a result of the consultations with Professor Ford, a set of nine principal functions for the envisaged unit were formulated. Given the administrative location of the proposed
unit, and the concerns that had led to its initialisation, it is not surprising that these functions were strongly oriented to the employment aspects of technological change. Fundamentally, the Unit was to function as a technology assessment body. This function was to encompass not only the employment and social assessment impact of technological change, but also a technology promotion role, i.e. to:

"...foster the introduction of modern technology and innovative development in industry bearing in mind the desirability of synchronising such changes with the pace at which other sections of industry could absorb displaced labour."

As part of its assessment function, the Unit was to consider the industrial relations implications and make recommendations "... to ensure co-operative efforts are made by both management and unions to solve resultant problems with a minimum of industrial disputation or hardship to the parties ...". Also as part of this function, the Unit was to make recommendations on workforce planning and policy. Other functions of the Unit were: to act as an information resource centre and to provide independent analysis of reports and proposals submitted by the New South Wales Science and Technology Council (see below) to the Minister.

Negotiations Over the Unit's Staffing

The suggested functions for the Unit were conveyed to the Premier in a letter dated 8 December 1978. This letter also outlined the proposed staffing of the Unit, i.e. "... it will call for coordinated management of a multi-disciplinary group of highly qualified and enthusiastic officers". Twelve researchers, covering a range of disciplinary backgrounds, support staff, a director (who was also to be an executive member of the Science and Technology Council) and a deputy director were sought as a "staffing nucleus" to establish the Unit. The Premier replied in February the following year that, although he agreed with the principal functions and with most of the staffing suggestions, he considered that the Unit should commence on a more modest basis, i.e. with only four
research staff, and that "... the need for additional expertise can be gauged in the light of the Unit's functioning". The Premier further urged that action be taken to establish the Unit as "early as possible".

The Minister's response to the Premier indicated disappointment that the Unit was to be established on such a limited basis "... it would be undesirable for our endeavours to prepare for and cope with technological change to appear to be merely token efforts". However, action was commenced with a memo (March 1979) from the department's undersecretary to the Secretary of the Public Service Board seeking an increase of ten positions over the approved staff establishment. Four of these were to be support staff (i.e. clerks and typists), four research staff and one the director with "... status equal to an assistant undersecretary". The director was also to be made an executive member of the Science and Technology Council, and later (i.e. 18 July) such a position was sought by the Minister and approved by the Public Service Board (16 August). The memo also proposed that an existing Youth Employment Unit be integrated with the Technological Change Unit "... in view of their common interest in the problems of unemployment".

From April until September 1979, negotiations continued on the acceptable size of the Technological Information and Research Unit (renamed by the Minister because the new name "... more adequately describes the intended functions of the Unit ...") and on the appropriate level for the director's position. Advertisements for four Grade I Research Officers and a director were placed in the national news media at the end of July. However, in a letter from the Minister to the Premier of 18 July it was noted that:

"... it is very doubtful that with such limited experienced staff the Unit will be able to function at the level being expected of it. I have discussed it with Professor Ford and am of the opinion that it would be potentially embarrassing for Government if the Unit commenced without several highly qualified research officers. The level of experience required cannot be expected of the Grade I Research Officers presently being recruited, though with appropriate supervision, their contribution to the Unit will be a valuable one."
At the same time, a letter was sent to the Chairman of the Public Service Board:

"I believe it would be unrealistic to expect the four Research Officers Grade I positions already advertised, to bring with them the amount of experience needed to fulfil the expectations already existing for the Unit’s operations."

To remedy this expected deficiency of expertise, it was proposed that two extra positions of chief research officer be created. Agreement to appoint two senior research officers was eventually granted by the Premier's Department (13 August) and approved by the Public Service Board, and these positions were advertised in September.

The establishment period ended with the appointment of a director, who commenced duties in early October, and of the first research officers. The Technological Information and Research Unit (TIRU) thus became operational, but not on the scale originally sought by the Minister of Technology, a year after it was promised by the Premier in his election policy speech.

3. Political Rhetoric and Great Expectations

While within the bureaucracy, hidden from the public eye, there were manoeuvrings over the establishment of the Unit, the Minister made a number of public statements on technological change. In these he referred to the embryonic TIRU. The rhetoric he used was important for it raised various expectations of the Unit and its role, not only among those outside the state but also among those who came to work within the Unit. Over the period from March to October 1979, the Minister made five main public statements on technology: in the first of these, he announced the proposal to establish a TIRU, while in the last he indicated that the Unit was operational.8
Preparedness in the Face of Radical Change

Two central themes can be seen in the Minister's statements. The first was on the nature of contemporary technological change and its implications for employment levels. Technological change was to become "sweeping" and "rapid and diverse", and as such would have dramatic economic and employment consequences:

"The type of technological change we now confront can be so sweepingly, rapidly and cheaply introduced that failure by governments to monitor its introduction on a continuing basis might bring adverse economic and social consequences. It may cause the disappearance of industries through loss of domestic markets, disarray of industrial objectives, inability to compete, large scale unemployment including perhaps a whole generation of unemployed youth. Ultimately the collapse of the current social and economic structure of Australian society would not be an impossible consequence." (9)

The second main theme in the Minister's statements was on the general lack of preparation in Australia to deal with this technological onslaught:

"No authority in Australia has precise knowledge of the number of persons made redundant in the last two years due to advances in technology. No authority exists to measure any of the consequences. In terms of understanding the human impact of technological change and automation, we are the 'unprepared society'." (10)

Further, this unpreparedness was exacerbated by the Federal Government's refusal to take action on the problem:

"One is not the slightest bit encouraged to believe that the Federal Government, as it exists at present, will act courageously to prevent a worsening of unemployment as a direct result of technological change. I do not believe it is capable of coming to grips with the vast problem of youth unemployment, which will reach terrible proportions with the addition of a quarter of a million new young job-seekers approaching the Australian labour market each year until the end of the 1980's." (11)

Because of these concerns, the Minister indicated that the New South Wales State Government had decided to take the initiative. The message conveyed was that the Government "... of ... the largest manufacturing State in the Commonwealth and the
largest workforce" recognised the problem and was not going to remain unprepared, because:

"In this state at least the new Technological Information and Research Unit will be a watchdog in this respect. There will be nothing vague and academic about this Unit. It will be all about real, live, Australian people with ideals and ambitions." (12)

The Proposed Unit as a "Watchdog"

In his statements the Minister outlined the proposed nature of this new "watchdog" unit. Given that Australia's unpreparedness to deal with the social impacts of technological change had been attributed to a lack of appropriate knowledge, a central function of the Unit was to be the collection and dissemination of information. This information was to be provided for (a) Government, so that it could "... make policy on the best available knowledge ...", (b) other interested groups such as unions and management "... to allow them to develop policies appropriate to the needs of their members and employees ...", and (c) the wider public thereby meeting the need for "... information which is vital to understanding and coping with the technological changes we will face in the 1980's". The Unit was to obtain this information from research and from existing national and international data bases.

The proposed Unit was to consult widely among unions, government and managements in performing its functions, and it was to work closely with related advisory bodies within the state apparatus, i.e. the Work Advisory Unit, the Industrial Relations Unit and the Youth Employment Unit. In performing its functions, TIRU would not operate in the same way that other state agencies did:

"The Unit will not be a traditional hierarchical organisation - members of the Unit will work in project teams to develop and carry out information gathering and research." (13)
The Minister publicly summarised the Unit's functions as collecting and analyzing information on the interaction between technology and society (especially the effects of technological change on the level and quality of employment), disseminating this information within the state apparatus and to the public, and assisting in policy development (i.e. "... to suggest priorities and constructive Government action ...").14

The rhetoric used in these statements clearly raised great expectations of the Unit, especially as to what could be achieved as a result of its activities:

"I hope that through research, information, public discussion and a climate of cooperation between all concerned, we can look for a society in which technology is used in ways that are beneficial and in which benefits are shared." (15)

Let us now look at how the Unit actually performed, and whether the reality matched the rhetoric.

**CONTRADICTION AND CONTROVERSY: 1979-1981**

The Director and four research officers took up their positions between late September and October 1979, so it is from this period that the work of the Unit began. Administratively, the Unit did not fare well in its formative stages. In the first place, it started from scratch with no accumulated administrative infrastructure or informational resources. It was located within a very conservative and bureaucratic department, largely concerned with regulatory and administrative functions, and which had limited experience of research. The formal communication process of the department substantially reduced the Unit's contact with its Minister and required it to negotiate with senior bureaucrats who were, on the whole, unsympathetic to the Unit. Several of the earlier proposals for the Unit were not implemented. The decision that the Director of the Unit would also be appointed as an executive member of the Science and Technology Council was reversed by the Minister. The Minister's proposal to integrate the Youth Employment Unit with TIRU was never
carried out. Further disruption came with the Cabinet reshuffle of February 1980 when the Minister, Mr P.D. Hills, lost the technology portfolio to the Minister of Mineral Resources, Mr R. Mulock, and in March 1980 the Unit was transferred to the Department of Mineral Resources and Technology. But despite these problems, the Unit began to operationalise the functions that had been set out for it by the Government and the Minister.

There are two main aspects of this operationalisation process that I will consider here. Firstly, the Unit's members initiated a largely self-determined work programme, creating a range of products (e.g. reports, submissions, information resources, etc). Secondly, below the "public" surface, the process of operationalisation was not without its problems and there was ongoing discussion among the Unit's members (and occasionally involving the Minister) on its appropriate role within the administrative apparatus of the New South Wales State Government.

1. Getting Going: The Initial Work Programme

Defining a Work Programme

The Unit's research and analysis activities were to focus on the relationship between technological change and employment, with secondary focuses on the implications of technological change for organisations, industrial relations, education and training, and labour market planning. The emphasis was to be on practical application, i.e. the activities were to be oriented toward the provision of policy advice to government and of "useful information" to other groups. This was a large and difficult area to deal with, especially given the lack of existing research information, a paucity of established data bases and a range of conflicting perspectives on what the important issues were and how these might be approached. Further, over and above the Unit's own work programme, its members were expected to perform various tasks arising from the Unit's location within the state
apparatus, e.g. dealing with ministerial correspondence, responding to requests for information from other agencies and the media, representation on committees and working parties, drafting ministerial speech notes and responding to requests for inputs on policy formulation. Indeed, the Unit's Director estimated that "Effectively, no more than half to three-quarters of the working time of the professional staff is available for work on projects consciously planned by the Unit."¹⁶

In defining an appropriate work programme, the Unit was constrained in what it could set out to do by the size of its staff. Although by the end of 1980 the Unit had an approved staff establishment of 15, the largest number ever actually employed was 9 (i.e. a director, 5 research officers and 3 support staff). Prioritisation of its work programme was therefore an important early task of the newly-established Unit.

In January 1980, at a Unit staff meeting it was decided that "a solidly thought out priority list of research action" should be devised.¹⁷ By April 1980 a list of priority "projects" for the Unit had been agreed to.¹⁸ Four criteria were used to prioritise possible projects. That is, projects were sought which would (a) address issues of "... urgency and substantial current concern"; (b) produce "... a tangible and valuable outcome of direct ... benefit within at most six to nine months"; (c) be relevant to a substantial number of people in the State; and (d) be likely to lead to further work for the Unit. Using these criteria, 14 projects were identified as possibilities for the Unit's initial work programme, and of these 8 were selected for immediate action due to their "over-riding priority". Of these 8 projects, 3 were to be primarily internally-oriented and directly concerned with providing an information base and conceptual foundations for the fledgling Unit (these projects were a policy analysis of technological change, preparation of a response to the Myers Inquiry Report, and the development of an information base); two were to be topical case studies (i.e. one on word processors and the other on communications satellites), and three were to be aimed at issues raised by the Minister in his statements (covering the areas of the quality of work life, industrial relations and technological
change). The expected outcomes of these projects were to include: improved understanding of the processes of technological change, a greater understanding of the Unit's functions, improved public awareness of the issues relating to technological change, statistical and other information data bases (to facilitate the monitoring of trends and developments), guidelines for industrial relations negotiations, policy reports and publications.

**The Unit in Operation**

Work commenced on these priority projects alongside the performance of non-project work, and a number of other projects which were seen to be opportune were also pursued. The work programme was somewhat ambitious, and not all of the projects that were initiated delivered tangible outcomes. Plans to publish the Unit's work through four separate report series never eventuated, instead reports and papers were published in an ad hoc way. However, by early 1982, two and a half years after its inception, the Technology Research Unit (it had adopted the simpler title in October 1980) had made significant achievements in its main areas of research and information dissemination. It had produced, for example, a series of discussion reports on issues concerning technological change and employment. Another significant achievement was the establishment of an information resource centre, based around a specialist library and which was open to the public.

Further, the Unit's members had not only been engaged in project-based activities, they had also prepared submissions for various inquiries, had addressed a wide range of organisations and community groups, liaised with other state agencies, management organisations and trade unions, and participated in various working parties. The raising of public awareness was initially seen as an important activity, and much time and energy was devoted to this.
So, in a modest and low key way, the Unit was carrying out most of the functions set for it by the Minister: it was collecting information about the relationship between technological change and employment, it was analyzing this information in the quest for understanding, and it was disseminating information to a wide range of interested parties. The only problematic function was that of policy development, where the role of the Unit was not clear. Herein lay a source of contention among the Unit's members. An issue of some concern within the Unit was what it could, and should, achieve beyond the provision of information. The problem was that of articulating knowledge with action in the social management of technological change.

2. Uncertainty, Confusion and Frustration over the Unit's Role

Knowledge and Action

From its inception, the Unit had to confront and attempt to manage a fundamental contradiction of its existence. On the one hand, political rhetoric had created particular expectations about what the Unit would achieve. That is, the Unit as a "watchdog" was to provide early warning and objective knowledge as the basis for action to deal with the social problems arising from technological change. Wider expectations of significant change were also raised. The existing anarchic process of technological change, with its socially disruptive effects, was to be managed through government intervention and cooperative decision making processes. On the other hand, the Unit was a small and purely advisory body, located within the state apparatus but with no administrative, executive or regulatory functions. There was no institutional mechanism by which the Unit's knowledge could be translated into action, i.e. there was no link between the Unit's information role and the Government's policy formulation process other than through advice to the Minister. Thus, the Unit's ability to meet the expectations of it was strictly limited. The Unit's members, most of whom were committed to the action suggested by the political rhetoric, recognised this contradiction and sought to deal with it while at the
same time attempting to bring the Unit into being as an effective and authoritative body. The problems of dealing with this contradiction led to confusion, frustration and, at times, conflict within the Unit.

Empowering the Powerless

In early discussions within the Unit about its role, two perspectives were influential in shaping the approach of the Unit’s members. The first was the adoption of a view of technological change that was considerably more radical than the prevailing view and that which had been espoused by the Myers Inquiry. The Unit’s view was based on a recognition of the essentially political nature of technology and a rejection of the belief that technology is neutral and value-free. The Unit’s members saw technology not as autonomous but as an integral part of society and which had to be considered within its social context. Given this perspective, they recognised the continuing political and social conflicts over the distribution of wealth, power and control and argued that technology, as a social product designed to achieve the ends of particular social groups, was enmeshed in these conflicts. As an early discussion paper from the Unit put it:

"The most fundamental kind of conflict that we must recognise in society and direct our attention to is the conflict over the sharing of wealth and power. There are other kinds and levels of conflict to be identified.

With respect to technology, the fundamental conflict is manifest in the inequality of decisions about (control over) technology and of the distribution of the products of technology." (20)

Such a view on the social nature of technology raised fundamental questions about, firstly, the distribution of the benefits and costs associated with technological change and, secondly, the control of technological development. The key issues surrounding technological change, the Unit’s members argued, were neither technical nor administrative but were inherently political in that they were about equity and justice, and the distribution of power and control:
"The ... questions ... about the distribution of costs and benefits and about control, make it clear that the debate is not just a technical and economic one, but social, political and moral. It is about the social order and about the justice of that order, as well as about its efficacy ..." (21)

Associated with this view of technology, a second perspective was that the appropriate role of the Unit - in making technology "work for the people" - was the empowerment of those groups which could be disadvantaged by technological change but which had no control over technology; for example:

"The ultimate goal of TIRU is .... to achieve some degree of redistribution of wealth and power in society, and specifically a redistribution of control over and benefits from technology." (22)

So, in relation to its policy development functions:

"... our policy inputs to government should be concerned with widening equality and increasing the scope of democratic participation." (23)

There was a divergence of views on the possible ways of achieving this empowerment, but the approaches were generally variations on the theme that knowledge can confer power. In its simplest version, the argument was that knowledge would politicise the community. That is, public education and awareness-raising programmes would create greater understanding of the processes of technological change among community members. As part of this understanding, the choices involved in technological development, usually hidden by the ideology of technological determinism, would be more widely recognised. Such a recognition would form the basis of a reassertion of the primacy of political processes in technology decision making:

"Knowledge is power. If knowledge and understanding about new technology and its interaction with society becomes widely diffused, the hegemony of those who currently make decisions that affect us will be challenged. Decision-making based on sectoral interest or on paternalism may be replaced progressively by decision-making that involves community participation." (24)
This idealistic view, of course, could be challenged on the grounds that knowledge is not necessarily power, and may instead lead to enlightened impotence. It also overlooked the reality that perceptions of the social order are shaped through struggles on an ideological terrain, in which competing ideologies seek predominance. A more developed version of the theme advocated that the Unit in its empowerment role should provide strategic information. This version was based on the argument that information dissemination was not enough, for this could not resolve the fundamental conflicts of interest inherent in the issues surrounding technological change. The issues of equity, power and control, and hence the distribution of costs and benefits, could only be effectively resolved in arenas of struggle. Therein lay a role for Government and the Unit in their attempts to "harness technology for the needs of the community". A role for the Unit was to provide strategic information for subordinate groups:

"... we should be working to help the subjects or the victims of technological change, to help them become better informed and thereby better placed to challenge the traditional managerial monopoly on deciding when, where and how new technologies will be introduced." (25)

This role would be located within a government policy and legislative framework aimed at redressing the power and informational disparities in the adversarial processes determining when and how new technologies would be introduced. A possible government policy statement articulating this was drafted for discussion within the Unit:

"In sharing the benefits of technological change, it is government policy to facilitate the widespread dissemination of information and opinion on new technologies and their consequences, with a view to creating a more informed and aware public; one in which community groups, trade unions, and individuals may participate in decisions which affect their lives. In addition, the government is committed to introducing remedial legislation where appropriate, to encourage the disclosure of information, discussion, negotiation and reconciliation of interests, to facilitate public participation and private accountability on technological change." (26)
Pragmatism and the Politics of Survival

Against these more radical perspectives, as discussed by the Unit's members in its formative stages, was a recognition of the Unit's position, with its "extremely fragile" independence and its very limited capacity to effect change. This limited capacity of the Unit to achieve change was seen as an aspect of the limitations of government action generally. This was because, Unit members argued, most of the decisions on technological innovation in the capitalist economy - like investment and resource allocation decisions generally - were made outside the state. Any government action which sought to redress the adverse consequences of technological change, therefore, would be "at the margins" of this decision making. Similarly, because of the structural limitations on government action in a capitalist economy "there seems little chance that governments of any political persuasion ... could do a great deal about establishing popular participation in technological change and planning activities generally". So, to temper their reformist zeal, the Unit's members had some appreciation of the political structures upon which their survival and capacity to effect change depended.

The Unit's location also presented obstacles to its ability to effect change. Established within a bureaucracy, the Unit had to struggle to maintain its independence, to gain authoritativeness and to satisfy its political creators. In trying to establish itself as an effective agency whose role was to implement optimistic and somewhat nebulous policy (e.g. "... to develop appropriate policies to meet the challenge of rapid and complex technological changes ..."), the Unit was confronted by a number of structural disadvantages. Firstly, it had no power base. While other state agencies derived administrative power from a number of sources, including legislation and regulatory functions, access to resources and control over programmes, the Unit had no statutory basis, no regulatory functions, no access to resources, and no control over programmes. Further, as a new and small agency, dealing with an issue that was not central to the political agenda, it had little influence within the political and administrative arenas.
Secondly, many of the issues relating to technological change that the Unit dealt with, e.g. industrial relations, labour market policy, education and training, health, etc., came within the purview of other much larger and powerful agencies within the state apparatus. The Unit thus had to seek to bring its perspectives to bear on those agencies as they formulated and implemented their own policies and programmes. In so doing, the Unit both had to establish its credibility and it had to justify its intervention in the domain of other portfolios. Thirdly, given the essentially political nature of the contentious issues surrounding technological change, the Unit was working in a very politically sensitive area.

Redefining the Unit’s Role

The nature of, and the appropriate role for, the Unit were the subjects of intense discussion among the Unit’s members during its first year, and were even considered by the Minister in late 1980. In commenting on this discussion, the Director noted:

"Although in a formal sense its functions have been defined by the Government, it has become increasingly clear to those within the Unit that these present conflicts and contradictions, (are) leading to uncertainty, confusion and frustration about the intended or desirable role of the Unit. This confusion is shared by some people outside the Unit." (27)

Matters came to a head in December 1980 when the Minister asked for a paper outlining options for the future of the Unit. In response to this, the Director drafted a discussion paper on the Unit’s background, problems and possible future options.28

Six alternative operating styles for the Unit were presented, and one of these was recommended as the most promising. Dismissed was the “high profile” style leading to expectations of change that had been promoted in the original Minister’s statements. It was seen as "... inappropriate ... simple-minded ... and potentially embarrassing to the Government when the cargo cult is finally exposed". The high profile image, and the
great expectations it fostered, had diminished anyway under the second Minister who in
his public statements avoided any suggestions of the Unit being a "watchdog" and any
claims about what the Unit could achieve. Also dismissed was the role, earlier favoured
by Unit members, of overtly providing support to the "victims" of technological change:
"such an interventionist role would make the Unit very vulnerable, even with a Labor
Government, and ignores the problem that there is no single issue or clearly defined
constituency/clientele". Instead, the preferred style was stated to be a combination of low
public profile with modest ambitions of achieving results through policy work within the
state apparatus. A number of organisational options for the Unit (including: establishment
on a statutory basis, integration with the Science and Technology Council, relocation of
the Unit to another department, and disbanding the Unit) were also canvassed, but it was
concluded "... none of the purely organisational options ... make immediate sense ...".

The Director's draft options paper was discussed among the staff, and a statement of their
preferred option was formulated.29 There was general agreement with the proposed low
key style and modest ambitions; i.e. the preference was for "... a modest Unit in terms of
staff, size, resources, and expectations". However, the central role of the Unit was seen
to be research: "Research as the primary activity, based on moderate ambitions, in the
recognition that the Unit's credibility and viability rest fundamentally on a proven track-
record in research. Information gathering should be affirmed as central to the Unit's
research capabilities". The Unit's other activities were seen to be dependent on this, e.g.
with respect to its policy development function "... policy options can only emerge on the
basis of sound knowledge and understanding of the issues addressed". On the
organisational status of the Unit, maintenance of the status quo was preferred.

This was clearly an acceptable option for the bureaucracy and for the Government. With
this shift in orientation, and the consensus on it among the Unit's members, the
uncertainty and confusion about the Unit's role appeared to be resolved.
The Beginning of the End

The Unit had been established against a background of great expectations raised by political rhetoric. In operation, its achievements were much more modest than what had been suggested at its inception. The politically-attributed role of assisting in the "harnessing of technology for the needs of the community" was not achieved, and was not achievable, through the activities of the Unit. The unrealistic expectations of the Unit and the contradictions of its existence created frustration and uncertainty among the Unit's members. This was eventually resolved in 1981 by lowering the expectations, moderating the radical perspectives and re-orienting the Unit to a more modest and lower key research-based organisation.

From late-1981 the fortunes of the Unit began to wane, largely as a result of a shift in the Government's approach to new technology. As one of the Unit's long-term members argued:

"... it was downhill from 1981. There was a sense that the Unit had missed its opportunity." (30)

The final act in this drama is presented in the following section.


The Unit's Loss of Identity and Independence

From the end of 1981 the days of the Unit were numbered, and there was a gradual erosion of the staff establishment. The Director, who was seconded to the Commonwealth Education Commission in November 1981 and who eventually resigned
in 1983, was never replaced. By 1985 there were only three research officers remaining, and the Unit’s support staff were also providing administrative services for the Science and Technology Council. The Unit’s independence was also diminished over this period. In 1983, the administrative and support functions of the technology-focused agencies (i.e. the Unit and the Council’s Secretariat) within the Department of Industrial Relations were "rationalised". The Unit and the Council were placed under the umbrella of a Technology Directorate, although the two preserved their own budgets, staff establishments and separate roles. The positions of director of the Unit and head of the Council’s secretariat were replaced by a Director of Technology. The first person appointed to this new position took up duties in December 1983.31

In 1984, responsibility for the Technology Directorate was transferred to a newly-created Ministerial portfolio of Small Business and Technology. Administratively, the Directorate was placed within the Department of Industrial Development and Decentralisation, also part of the new Minister’s portfolio. Within the Technology Directorate, which was primarily oriented towards technology promotion, the Unit’s role became more of a servicing one and its individual identity, as an "expert" technology assessment agency, was considerably reduced. The final steps in the Unit’s loss of identity and independence began with the resignation of the Director of Technology in March 1985 and ended with administrative reorganisation within the department. Following the former, the position of Director of Technology was abolished and what had been the joint role of Executive Member of the Council was dedicated solely to heading the Council’s secretariat and had no responsibility for the Unit.32 In the departmental reorganisation the Unit was absorbed into a broader departmental Policy Division. By this stage, to all intents and purposes, the Unit no longer existed as an administrative entity in its own right.

So, over the period 1979 to 1985, the Unit went from being a relatively autonomous technology assessment agency with a maximum staff establishment of fifteen, to becoming a partner agency - with a much reduced staff - in a technology-promoting
administrative directorate. Later, with the dissolution of the Technology Directorate, the Unit's staff residue was absorbed into the policy division of its host department, thereby marking its demise. What happened? As I argued above, the political rhetoric surrounding the Unit's establishment had created unrealistic expectations about what the Unit could actually achieve. By the time the Unit's members came to terms with this (and particularly the limited nature of their role in the state apparatus) it was too late, for the Government's perspective on technology had begun to change. In the emerging climate of technology as opportunity, the earlier focus on the negative aspects of technological change was becoming of lesser political relevance. Let us now look at the shift in the political orientation towards technological change.

1. Ambivalence Towards Technology

In the political discourse over technological change there had always been a recognition of the opportunities presented by new technology, but earlier this aspect had been overshadowed by the concerns about the associated social disruptions. Thus, although the initial focus of the Technology Research Unit was on the employment impacts of technological change, an original function had also been to stimulate technological change, i.e."... to foster the introduction of modern technology and innovative development in industry...". This ambivalence towards technology at the time was also evident in the re-establishment of the Science and Technology Council as a statutory body.

The Council had originally been established in 1975 by an administrative decision of the previous government to act as an advisory body within the Premiers Department. In July 1977 the Wran Government decided to establish the Council as a statutory body. The establishing legislation broadened the scope of the Council's terms of reference so as "... to provide the Council with a more balanced role and give it a more forceful and relevant approach to present day needs ...". In addition to its science and technology policy functions, the Council was also to give consideration to three extra areas. That is, it was...
to report and make recommendations on the social and economic consequences of scientific and technological developments, it was to raise public awareness about such developments and their consequences, and it was to stimulate "desirable" technological change.\(^{35}\) The recognition of the social implications of science and technology, was thus embedded in the statutory functions of the Council.

In its first report, the Council explicitly acknowledged this role:

"The new Council has been formed by the Government at a time of great public concern about, and interest in, science and technology, and their development and application in society. There is a common recognition that technological development has two aspects - one of which is potentially beneficial to societies, and the other potentially the cause of serious and widespread problems. Thus, the management of this development is an issue of great concern to government." (36)

It was a role that informed the Council's early work programme, for among the various projects initiated there was one on technological development aimed specifically at social objectives (i.e. "technology to assist disabled persons") and another on the impacts of technological change (i.e. "technological impact on the work environment").

Thus, there was clearly some overlap between the functions of the Unit and the Council in the early stages. However, a working arrangement between the two agencies, based on a division of labour, soon developed. The social consequences of technological change, and recommendations on remedial government action, became the Unit's responsibility. On the other hand, the promotion of science and technology, and recommendations for appropriate government action in this area, were agreed to be more properly within the Council's jurisdiction.\(^{37}\)

In the early 1980's, then, the New South Wales State Government had two agencies providing independent and complementary advice on science and technology. But reflecting the political concerns of the time, the Unit was the larger of the two, it had more
resources and was given (initially at least) a higher public profile by political rhetoric. This was to change as the perspective that technological innovation was strategically important to the State economy gained political currency.

2. The Emerging Perspective

The emerging view which was to gain dominance was that, rather than being a major contributor to unemployment, new technology was vital for the survival of industry in a competitive environment, and hence for the maintenance of employment levels. This technology as opportunity perspective was being promoted nationally as I shall discuss in the next chapter, but was also applied at the State level. It was a perspective that was actively promoted within New South Wales by the Council. The Council's promotion of technology as opportunity drew on consultant research which examined the performance of the manufacturing sector in New South Wales. Three studies were particularly important here. The first, a survey of the R & D performance of New South Wales companies, raised concerns about the State's technological and industrial prospects. On the basis of this study's findings, the Council concluded that:

"... an adequate local private enterprise R & D base is an important factor in ensuring continued economic well-being. The findings reported in this paper combine, in the Council's view, to form a basis for concern about the vitality of private enterprise R & D in New South Wales, and point to the need to conduct a detailed exploration of the present parlous position." (39)

The second study revealed "... the poor and declining condition of New South Wales industry, particularly with regard to its capability and commitment to develop and introduce new technology effectively". That study's authors concluded there were good arguments for the State Government to take action to remedy this adverse situation:

"There are good reasons for NSW government initiatives to promote the development and introduction of technology in industry. The state of industry itself, and the deeply-held attitudes of managers emphasising limitations and difficulties suggests that industry cannot cure itself. More importantly, NSW cannot afford to lose its manufacturing industry. An
economy based too heavily on natural resources is extraordinarily vulnerable to economic fluctuations and pressures. Without a local capability we become completely dependent on, and at the mercy of, foreign suppliers and controllers of technology and manufactured goods.

Nor can the viability of manufacturing industry be left to market forces. The international nature of the market, and the state of decline of industry, combine to ensure such forces would encourage the destruction of the State's industrial capability. There is no question of being forced to support technology which will displace jobs. Rather, government initiatives could encourage the development and introduction of the kind of technology that creates new markets and new jobs." (41)

The authors made a number of recommendations for appropriate government action, and these were taken up by the Council and advocated to the Minister of Technology. In so doing the Council argued:

"In the Council's view urgent Government action is required to provide an environment conducive to technological innovation and application. By encouraging the development of high technology enterprises and the application of new technologies in traditional industries, the Government can facilitate a reversal of the present decline in the economic and employment opportunities in the State's manufacturing sector." (42)

This was to sow the seed for the most significant government action on technology since the establishment of the Unit in 1979.

The third study reinforced this perspective.43 Based on interviews with a sample of senior executives from "high technology" companies and senior state bureaucrats, it advocated Government support for new "high technology" companies to help reverse the decline in the State's manufacturing sector. By the time this report was published, the perspective of technology-led industrial revitalisation was firmly established. The diagnosis and recommendations for remedial action had been derived by research consultants largely on the basis of interviews with company executives. It was clearly a corporate view, and the primary beneficiaries of the government actions proposed would be private enterprises.
3. The New Policy Emphasis

The findings and recommendations from studies such as the above three were used as the basis for the Council's advice to the State Government. One important aspect of this advisory role was the formulation of policy recommendations. While initially the Council produced broad policy guidelines, it later moved away from this approach and instead recommended detailed programmes aimed at achieving the Government's stated policy goals. Two main areas became the focus for this policy role: the revitalisation of traditional industries through the stimulation of technological innovation and the promotion of new "high technology" enterprises.

The New South Wales Government responded positively to the lobbying of the Council, and others, on the need for active technology promotion measures. Symbolising this more active interest, a Technology Committee of Cabinet was established by the Premier in March 1983. The Committee was created to provide a forum for coordinating technology policies across the State Government's areas of responsibility. Shortly after its inception, the Committee was responsible for two major developments in technology policy. The first was the formulation of a State Technology Development Policy and the second was the implementation of an Advanced Technology Development programme. Both of these developments had arisen from Council initiatives.

The State Technology Development Policy

The Technology Development Policy, which was adopted by the Government in August 1983, arose from a project initiated by the Council. The aim of this project had been "... to develop an overall strategy for the State to maximise the economic and employment benefits of technological innovation ...". This was taken up by the Government, and the Council assisted in the formulation of the official policy. The key objective of this policy was stated to be:
"To stimulate the application and development of science and technology in New South Wales in such a way that the community can receive the maximum benefits, and where necessary to ameliorate any unavoidable negative consequences of these changes; that is, to make technology work for the people, now and in the future." (47)

Of the policy's specific objectives, the main thrust was to be the promotion of science and technology in order to achieve economic development goals, notably employment generation and industrial development. But the earlier concerns about the social implications of technological change were also addressed by specific objectives. The rhetoric of social concern was a significant aspect of this Technology Development Policy, as it had been for the earlier response. The message promoted was that the Government's actions in this area would be in the interest of all groups.

The rhetoric of the Policy presented the Government as seeking to advance all interests, and where necessary to protect the interests of those likely to be disadvantaged by change. Specific actions were suggested in the Policy through which this balancing of interests could be achieved. That is, through consultation with trade unions and industry, industrial relations procedures "... relevant to a period of rapid technological change" were to be formulated; "venues" for wider community participation in technology decision-making were to be provided; the Government was to act as a "model user" to demonstrate how new technologies could be introduced and applied to improve services and working conditions; and regulatory legislation was to be reviewed to ensure that it adequately protected the community and the workforce from adverse impacts. The reality, however, did not match up to this rhetoric. The policy promoted technological development in order to achieve economic goals, and acted mainly by directly benefiting private enterprises through subsidies, grants, loans, and the provision of information. Any broader social objectives were reduced to secondary considerations, if they were considered at all, in the administration of the technology promotion measures. Furthermore, none of the specific actions to address the social goals was implemented in any substantive way.
The Advanced Technology Programme

The technology promotion thrust of the Development Policy was embodied in the Government's Advanced Technology Programme, which had been announced by the Premier in February 1983. The two elements of this programme had their origins in recommendations from the Council. These recommendations were that the Government establish (a) a unit to provide information and to liaise with companies intending to introduce or develop new technologies, and (b) a technology development fund. These recommendations were implemented during 1983. An Advanced Technology Centre was located within the Department of Industrial Development and Decentralisation and was "... dedicated to the development, support and growth of advanced technology in NSW through the creation of new advanced technology firms and the incorporation of advanced technology into existing enterprises." The main roles of the Centre were to administer an Advanced Technology Development Assistance Fund, and to stimulate interest in, and inform industry about, new technological developments. The Fund was created to provide loans, loan guarantees and grants primarily to companies to assist them in the development and application of new technology.

At the Fund's inception, it was stated that favourable consideration would be given to proposals which could demonstrate beneficial employment effects. Other social concerns were also built into the administration of the Fund. On the one hand, the Fund was to foster industrial development; hence one of its stated purposes was:

"... to assist private enterprise organisations in New South Wales to develop and introduce advanced technologies so as to increase productivity, efficiency and competitiveness ..." (51)

On the other hand, the Fund was also intended to advance social goals, i.e. it was to be used:
"... to assist other organisations, such as educational and training institutions, professional and industry associations and trade unions, to carry out projects which can promote the use of science and technology in achieving the Government's economic and social development goals." (52)

But although a few grants were made in the latter area, the scheme was mainly concerned with commercial industrial development and the great bulk of the assistance provided was for the development and introduction of new technology by companies. Despite the rhetoric, the fund was predominantly aimed at increasing the efficiency and productivity of the State's industries, and thereby their profitability. The stimulation of profitability through the introduction of new technology was an important ingredient in industrial revitalisation. Other social considerations, such as employment creation, were secondary to this and were expected to occur as a "second order" effect of industrial revitalisation.

By 1985, the notion of the State Government regulating technological change in order to ensure desirable social outcomes, as earlier rhetoric had suggested, was no longer on the political agenda. The thrust of Government's technology policy was to stimulate technological innovation in industry to foster economic development and growth, and it was maintained that as a result of this, broader social goals would be achieved. Technology's "sunrise" was casting its warm glow over the State.

The New Political Climate and the Demise of the Unit

As a result of this shift in policy emphasis, the Technology Research Unit, established in response to the "technology as threat" perspective, was of considerably reduced relevance. Its residual functions consisted of only one aspect of the policy formulation role of the department charged with implementing the advanced technology programme and the Unit had been absorbed into that department's policy machinery. In the new climate of technology as opportunity, the central agency providing "independent" advice to the Government was the Science and Technology Council, and so it flourished.
In retrospect, the question arises as to whether it could have been otherwise. Could the Unit have provided the knowledge and policy recommendations as the basis for implementable Government actions both to effectively address the social disruptions associated with technological change and to democratise technology decision making? Or was such a radical prospect precluded at the outset by the politics of the state in a capitalist economy? The following section examines this question and in so doing develops a broader critique of the notion of technology assessment.

TECHNOLOGY ASSESSMENT AND THE RHETORIC OF CONTROL

In the preceding account of the rise and fall of the Technology Research Unit can be found the three main reasons for its inability to perform as expected and for its eventual demise. Firstly, political rhetoric raised unrealistic expectations of the Unit and of the governmental actions that would result from the Unit's technology assessment activities. Secondly, the size, status and location of the Unit within the bureaucratic apparatus ensured that it could neither operate as a truly independent agency nor produce authoritative policy prescriptions. Thirdly, with the shift in the technology policy emphasis and the reassertion of the ideology of technological progress that this entailed, the Unit's relevance to the State Government was considerably diminished.

The case study of the Technology Research Unit, and the factors contributing to its demise, raises issues for the institution of technology assessment (TA) generally. Implicit in the political rhetoric at the Unit's inception was a particular model of TA which had informed the earliest institutionalisation of TA in the United States. This model has been found wanting, both theoretically and practically, and features such as those that I identified to have contributed to the Unit's lack of impact have also been identified as contributing to the disappointing performance of other TA agencies. The following
discussion, therefore, examines each of the above three factors and relates them to a more general critical analysis of the concept of TA.

1. Unrealistic Expectations: Knowledge and Policy Making

The political rhetoric at the time of TRU's establishment implied a technocratic model of TA, a model which was based on a particular account of the relationship between scientific knowledge and politics. According to this model, TA is performed by independent "experts" (usually, natural scientists, engineers and economists) who analyze technological developments to determine their likely social and environmental effects. As a result of this analysis, the experts make policy recommendations which would "... contribute to society's effort to direct technological developments in a beneficial manner ...". There are thus two major components to the assessment process under this model: impact analysis and policy analysis. In the former component, analysts apply "neutral and objective" scientific techniques to identify and forecast the impact of existing and projected technological developments. This systematic impact analysis is located in a framework of causality theory. That is, a technology as an impactor causes impacts as direct effects, and these impacts in turn may act as causes to produce other indirect or "higher order" effects. The central impact assessment task is to understand the interactions between technology and social systems, or in other words to develop objective knowledge which constitutes "an empirical domain of justified expectations". According to the technocratic model, the use of scientific methods by independent experts ensures that the analysis is objective and impartial.

This objectivity and neutrality is also considered to apply to policy analysis, the second component of the assessment process. In this, the identified impacts are evaluated with respect to societal goals and values, and various alternative policy options formulated to deal with any desirable and undesirable consequences. While these alternatives may be derived through a process of "neutral analysis" (e.g. through the application of cost-
benefit analysis), the choice among the policy options is passed to the political arena. By so doing, the "factual" issues (the domain of science) are believed to be separated from any judgements of value (the domain of politics).

Three central tenets can be identified in this model of technocratic TA as a basis for "rational" policy making. The first is that a "systematic, comprehensive, objective and value-free analysis" would produce "objective knowledge" about the social impacts of technological change, and that the "facts" so revealed can be distinguished from issues of value. The second is that this knowledge would be instrumental in policy formulation, i.e. accepted as decisive in a process of rational-comprehensive decision making. The third is that the appropriate remedial action would be taken by governments to avoid the predicted negative consequences and to ensure the realisation of the anticipated benefits. The process, according to the model, represents a useful and valid framework for "the anticipatory management of change".

None of the three tenets stands up to critical scrutiny, and the technocratic model has been widely criticised. Wynne, for example, dismisses the model because:

"... it represents a political rhetoric which implicitly serves simultaneously (a) to rationalise certain central structural features of corporate capitalist society, and (b) to conceal the arbitrary and at the very least debatable nature of the basis of legitimation of some social institutions fundamental to that society.

... the ideal of technology assessment as hitherto developed in influential quarters is in important respects politically and intellectually superficial." (56)

Furthermore, in practice the TA agencies created under this model did not perform according to the expectations of them. Let us now look critically at this model and its underlying assumptions.
The Ideological Nature of "Objective Knowledge"

Fundamental to the technocratic model is a positivist interpretation of scientific knowledge. According to this model, scientific method, as a process of "neutral" inquiry, consists of a series of technical decisions concerned with discovering the "truth" about an object of inquiry. The outcome of this inquiry is considered to be value-free "objective knowledge", an objectively true account which is intersubjectively verifiable (or falsifiable). But this interpretation has been shown to be untenable, not least because it is based on an inadequate theory of meaning which overlooks the value commitments, presuppositions and interests implicit in the scientific concepts and methods used. Meanings are context-bound and derive from conceptual systems constructed to interpret experience. The choices made to establish meanings for the concepts used in the process of scientific inquiry must be regarded as complex and partisan rather than objective and neutral.

A more acceptable account of scientific inquiry recognises that the formulation of "technical" issues (e.g. the identification and definition of technical problems, the choice of appropriate methods, etc) is inherently a value-laden and hence political process involving various political assumptions and commitments. The positivist approach that underlies the technocratic model of TA thus has an ideological content, and as critical theorists such as Brain Fay have shown, this is biased towards supporting the existing social order. Technocratic TA can therefore provide neither a politically neutral nor value free analysis. Rather it provides a partisan account, located within a taken for granted framework of market economics and utilitarian ethics, which implicitly articulates a particular model of society; in Brian Wynne's terms, this model is "...the materialistic, suburban, leisure-society, corporate-societal paradigm."

Not only does TA fail to provide the "objective knowledge" claimed under the technocratic model, it also cannot achieve the expected comprehensiveness of analysis. The
expectation of technocratic TA was that multi-disciplinary teams of analysts would identify causal chains of impacts which would be likely to occur in society over time. To facilitate this, various mathematical and other analytical forecasting techniques were developed and advocated as offering more reliable predictions.\textsuperscript{62} In practice, this expectation has been found to be wanting. There are two major limitations to this approach which render the expectation of comprehensiveness to be unrealistic: the implicit model of technological change adopted and the interpretation of the relationship between technology and society.

The model of technological change implicit in most assessments accepts the practices of technological development as given and confines them to a "black box".\textsuperscript{63} Such an approach ignores the social content of technology, and because of this cannot provide an adequate account of the complexities and uncertainties of technological change as a social process. As I discussed in Chapter 2, Langdon Winner encapsulates well the vagaries of this process, and its unintended consequences, with the term "technological drift".\textsuperscript{64} The outcomes of this "drift" are heterogeneous in their nature (e.g. new technologies may constitute incremental changes to existing technologies, or they may be "radical" new developments) and effects (e.g. the same new technology may have different social implications in different social contexts), synergistic and uncertain. This uncertainty of outcome cannot be reduced through the application of "more sophisticated" techniques of analysis in forecasting.

Furthermore, the technological determinism implicit in this approach (i.e. technologies cause impacts) does not adequately capture the complex inter-relationships between technology and society. Neither are the deficiencies of this determinism redressed by the addition of societal "feedbacks" into the model of technology development. The relationship is much more complex than the model of internalist technology practice guided by "external" feedbacks suggests. Technology, as I have emphasised, is a social product and its implementation is mediated through social institutions. Outcomes are not automatically predestined, but are contingent on social interactions involving different
groups of actors in arenas of struggle. Given this reality, the prediction of the possible social ramifications of a technological development is an impossible task. To the extent that the limits on comprehensiveness are recognised, analysts have to make judgements on what aspects are important to study. Such judgements introduce political components into the so-called "neutral" inquiry process, which is another aspect of its inherent partisan nature.

Analysis in the Play of Power

If the technocratic model's interpretation of the nature of analytical knowledge can be shown to be untenable, its expectations of the role of such knowledge in policy making were even more so. According to the technocratic model, analytical knowledge should be used instrumentally in a "rational" decision-making process. But as Lindblom and others have demonstrated, "rational-comprehensive" methods have strict limitations in political decision-making, and instead policy making is an "untidy process", i.e. it is....

"... an extremely complex process without beginning or end and whose boundaries remain most uncertain. Somehow a complex set of forces together produces effects called 'policies' ... one can look at all of government and politics as a policy-making process" (66)

In the "play of power" which constitutes the policy process, analytical knowledge becomes "partisan analysis" and as such plays an important role:

"Not usually an alternative to politics, analysis commonly operates as an indispensable element in politics. It becomes a method of exerting control. Rather than making frontal attacks on policy problems, it more often meets certain needs of people, especially officials, to control others in political interaction." (67)

The play of power is a process in which "political rationality", i.e. action oriented toward the goal of political survival, prevails and in which various actors within the state interact to exercise influence, control or power over other actors.
Because of this "primacy of political rationality", certain policy options may be precluded from consideration. Political survival depends on mobilising support for policies and actions, and at the least ensuring diffuse mass loyalty. Actions which could alienate significant or particularly influential groups and constituents, or which could elicit negative reactions from them, are therefore hazardous and often politically unacceptable. Also, many aspects of economic decision-making, including decisions on the development and deployment of new technology, are conducted outside the bounds of the state in a capitalist economy. Such structural limitations on the ability of state actors to manoeuvre, and the "mobilisation of bias" within the state to ensure a "healthy economy", further mitigate against the unproblematic acceptance of TA prescriptions in policy formulation. In this environment, the findings of assessments can rarely be authoritative, but instead are most often reduced to only one (and not necessarily a privileged one) of a range of inputs into political decision making.69

The three central tenets of technocratic TA, therefore, are not realisable in practice: analysis does not provide neutral and objective knowledge; assessment findings are not used instrumentally to formulate "rational" policy; governmental action to ensure the anticipatory management of change does not automatically follow from assessment prescriptions.

2. Alternative Models of TA and the Problem of Independence

Growing recognition of the shortcomings of the technocratic model resulted in the formulation of alternative models for TA. One of these was the so-called "adversarial assessment" modelled on adversarial legal processes.70 It was this sort of model that informed the Myers Inquiry, as opposed to the technocratic model implicit in the political rhetoric associated with the Technology Research Unit's establishment. The adversarial model can be criticised on the same grounds as the technocratic model with respect to its
belief that technical and political questions can be clearly separated, for this misrepresents the reality that political commitments are embodied in the former.

Another more recent alternative has been the strategic-political approach, as has been advocated for example within the Netherlands.\textsuperscript{71} This approach is based on a recognition that: (i) technological forecasting is limited rather than comprehensive; (ii) TA is not objective, politically neutral or value free; (iii) policy formulation is a diffuse process of negotiation; and (iv) in the policy process TA findings are rarely used instrumentally. Under this model, the role of TA is to provide information which will assist various interested groups develop their own strategies toward technological developments. In other words, it is an explicitly politicising activity in that it seeks "to increase the political options" with regard to technology. As I noted above, this type of approach was considered by members of the Technology Research Unit in its early stages, but was not developed due to the internal politics of survival within the state bureaucracy. Herein lies a major obstacle to the realisation of this radical potential of institutionalised TA within the state: the status and location of state-based TA agencies means that they cannot be entirely independent bodies.

This lack of independence, due either to a dependence on state funding and/or to location within the state apparatus (e.g. within a larger bureaucratic structure), has two major implications for what such agencies are able to achieve. Firstly, the activities of agencies within the state are shaped by various ongoing political and administrative demands arising from the routine business of government and public administration. This creates a tendency for such agencies to be reduced to a predominantly servicing role.\textsuperscript{72} Secondly, the need to survive in a political environment requires that an agency be neither seen to be overly radical nor unresponsive to changing political demands. Survival becomes an especial problem for agencies which actively advocate policies in opposition to the dominant thrust of Government policy at a given time. While such agencies may be created when a controversial social issue dominates the forefront of political debate (as did
the social implications of technological change), they often work against those more powerful agencies responsible for the formulation and implementation of economic policy (with their central concern to sustain capital accumulation). When a government changes, and/or the issue is displaced from the political limelight, they become vulnerable to marginalisation or even abolition. Considerations such as these effectively mitigate against the development of any "radical" activities and ensure the maintenance of a "conservative" bias.

So, TA in its original conception could not perform according to the expectations of it. Alternative TA models also have shortcomings, a major one being the lack of independence of their implementing agencies within the state apparatus. The state is not, political claims to the contrary, a neutral arbiter of the "public interest" with respect to technological change. But although TA has not played the instrumental role in policy making that political rhetoric suggested, it has nevertheless played other important political roles. In the new political climate where a "technological imperative" predominates, these other implicit roles have become even more important.

3. The Political Role of Technology Assessment

Despite its revealed shortcomings, TA remains a persistent theme in politics. Its survival is not surprising, for as Langdon Winner points out, TA embodies the political philosophy of utilitarianism-pluralism and "... since it accepts the major premises and disposition of traditional liberal politics, it is entirely safe." That is, its political survival owes much to the reality that it presents no radical challenge to the existing order. It is also politically attractive in that it offers a means to mitigate contradictions inherent in the capitalist-technological order.

TA, and its embodiment in such organisations as the TRU, was conceived as a political response to the technology as threat perspective. As I have discussed previously, that
perspective centred on concerns about the negative social and environmental effects of technological change and the widespread belief that technology was beyond human control. Two major demands arose from these concerns. The first was that there should be more centralised control, through government regulation for example, over the anarchic process of technological development. The second was a demand for wider social involvement in technology decision-making. These demands represented a fundamental challenge to the existing order in which technology decision-making remains the preserve of corporate and state elites. In response to these concerns and demands, TA offered first and foremost symbolic reassurance. It did this through the assertion of a rhetoric of control, i.e. by propagating a belief that change could be proactively "managed" so as to ensure the appropriation of benefits and a minimisation of costs. Through the machinery of TA, the new technique designed to facilitate the "anticipatory management of change", faith was fostered in the order's ability to direct technological change so as to maximise societal benefit, but without the need to substantially modify that order. As Langdon Winner wryly observes:

"One cannot help but admire the ever-recurrent ability of liberal thought to perform marvellous patch jobs to remedy its own flaws. Yes, the engine of change is running amok. But with more data, new studies, more funding, a renewed awareness, an alarm clock under the pillow, and a few minor adjustments here and there ..., we can return to normal." (74)

Substantively, the existing political order and its premises, commitments and decision-making structures is not challenged by TA. Instead, TA plays an important role in legitimising that order, for it takes the political-economic framework of the order as a given (thereby precluding, a priori, policy options deriving from alternative frames of reference) and propagates the belief that, with marginal adjustments, social consensus can be achieved and the interests of all groups harmonised. Most importantly, the institution of TA, with its associated "participatory" mechanisms, represents a means of containing the demands of subordinate groups, such as trade unions, for greater involvement in technology decision making. Such groups may participate in the activities of TA agencies,
but this does not confer on them any greater power of decision over technological developments. For example, although there has been a high degree of public participation on the advisory panels of the US Office of Technology Assessment, the power of technology decision making remains within the hands of technocratic elites. After analyzing the experience of public participation in US regulatory agencies generally, Dickson concluded that:

"... decisions were still to be left to conventional power groups. The practical outcome is that public participation has been used to legitimise decisions still made largely by private decision-makers, rather than to shift the political basis on which they are made. Dissent has been successfully contained and neutralised." (75)

An apt term to refer to this sort of situation is Carole Pateman's "pseudo-participation", for it represents an attempt to persuade subordinate groups to accept decisions that have either been already made or are in the process of being made.

In a climate where the technology as threat perspective prevailed, TA played an important political role in sustaining the status quo, through symbolic reassurance, legitimation of the order and the containment of subordinate group challenges to technology decision making structures. As the climate changed and the promotion of technology to achieve economic goals became the dominant political orientation, other roles of TA have become more prominent. One of these has been the identification of the benefits arising from, and the support of, technological development. The shift of emphasis has been away from the "technology harassment" image associated with the "early warning" approach, towards a more "positive" orientation of supporting technology policy. Another role has been to promote the public acceptance of technology. The fostering of scientific and technological "literacy" and the acceptance of new technology have became central themes in the new political climate of technology as opportunity as I shall demonstrate in the next chapter.
Thus, TA has been a resilient concept which has been progressively adapted to meet the political requirements of it. In a context of widespread concerns about the social and environmental implications of technological change, the original concept of "early warning" TA, based on a technocratic model of decision-making but with symbolic public participation, was conceived. In the more recent political context which emphasises the strategic economic importance of technology, TA oriented towards the support of technology policy has emerged as the prevalent approach. Throughout both periods, TA has been important politically in promoting the ideology of technological progress and in containing subordinate group pressures. TA does have a radical potential, however, in that it can be used to provide strategic information for contending groups in arenas of struggle over technological developments. But to the extent that the development of this strategic-political approach is dependent on state support, its full potential is unlikely to be realised given the dominant thrust of government policies towards new technology.
NOTES AND REFERENCES


2. Department of Industrial Relations, Submission to Myers Inquiry (No. 136) p.5.


5. ibid p.394.

6. Data for the sections on the rise and fall of the Unit came from two main sources: (a) interviews with members of the Unit; and (b) documents from the Unit's files, notably file TRU 2 No. 79/655: Establishment of TIRU.


8. The first was a speech on 21 March to open the Amalgamated Metal Workers and Shipwrights Union (AMWSU) Conference on "The future of metal trades manufacturing". The last of the five statements was a speech on 17 October to open the 5th International Electrical, Electronic Engineering, Measurement and Control Convention (IEEEMC).


11. Minister's speech to the AMWSU Conference (op. cit.), p.6.

12. ibid p.7.

13. Minister's ANZAAS speech (op. cit.).

14. Minister's speech to the IEEEMC convention (op. cit.).

15. ibid.


17. TIRU Minutes of Meeting (23 January 1980).

18. TIRU Projects (April 1980).


20. Notes on discussion ... on possible priorities and strategies for TIRU (Internal paper for discussion, 21 November 1979).
21. B. Smith (Unit Director), 1981, "Technological change: what the real questions are" p.54, in Goldsworthy (ed.).

22. Notes on discussion ... (21 November 1979) op.cit.


25. Notes from a discussion ... (23 July 1980) op. cit.

26. ibid.


28. ibid.

29. Memo to the Director from TRU staff (February/March 1981).

30. Peter Bryant (acting head of Unit), personal communication.


33. For an account of the Council's origins, see its first Annual Report as a statutory body (covering the period from 22 February to 30 June 1980), p.15.

34. Minister for Technology, in the Second Reading Debate in the Legislative Assembly (19 September 1979) on the NSW Science and Technology Council Bill.

35. See s.8(1)(a) of the Science and Technology Council Act 1979 (No. 125).


37. P. Bryant (Officer in Charge) memo. to the Minister 23 March 1982.


39. ibid. p.ii.


41. ibid, p.2.

42. ibid., Council's letter of transmission to the Minister for Technology.

43. NSW Science and Technology Council (October 1983) Development of High/New Technology Companies in New South Wales.


48. For example, the application of science and technology to "social development goals" (e.g. with respect to the quality of working life, the environment, industrial relations, education, health and social welfare) was to be promoted; the Government would seek to ensure that decisions on the development and implementation of new technology were made after social impact assessments and that, where it was found to be necessary, actions taken to ameliorate any unavoidable negative impacts; knowledge-sharing on technological change was to be "public discussion and democratic decision making" on technology choices was to be promoted.

49. "Problems and prospects" (November 1982) op. cit., pp.i-ii.

50. NSW Industrial Development Ambassador (July 1984), No. 8, p.6.


52. ibid.

53. For the disbursement of ATDAF funds, see the Annual Reports of the Department of Industrial Development and Decentralisation, 1983-1986.

54. For a discussion of the technocratic model of TA, see Wynne (1975).


57. For example, see Gray (1982) and Mayo (1982).

58. For a critique of positivism in scientific methodology, see Shapiro (1981) pp.1-64, and for an overview of the changing metascientific discourse see Pollak (1983). The emerging view of science as a social construction owes much to recent sociology of scientific knowledge; see Knorr-Cetina and Mulkay (1983).


60. Fay (1975) pp.57-64.


62. See, for example, the review of TA methodology by J. Ronayne, presented as Paper M in Volume 4 pp.405-428 of the Myers Report (1980).


64. Winner (1979) p.99.


67. ibid p.28.

69. For a further discussion on this aspect of policy, see Lindblom and Cohen (1979).
70. See Green (1970) and Folk (1972).
71. For example, Smits et al (1984).
72. This has certainly been believed to be the case for the US Office of Technology Assessment; see Gray (1982).
74. ibid p.91.
78. ibid; see also Nelkin (1986) pp.54-56.