

ABSTRACT

UNIVERSITY OF NEW ENGLAND

Thesis Title:

"Budgetary Strategies for large scale Research and Development Organizations: With special reference to the Institute of Advanced Studies, Australian National University."

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Problem:

Present budgetary strategies or techniques in use by large and complex research and development organizations fall short of satisfying the special needs these organizations have, whatever the financial circumstances. A budgetary strategy, CRA is developed and presented for the purpose of removing these shortcomings.

Methodology Adopted:

A wide selection of literature and official publications dealing with budgeting was reviewed. This was complemented by the author's experience as a budgeting practitioner in the Institute of Advanced Studies, Australian National University, Canberra, and responses from a number of Australian universities to a questionnaire designed to provide information about current budgetary practices in use.

Brief Resume:

Changing financial circumstances, which can range from one of growth to one of stringency, have emphasised the importance of sound budgetary strategies and planning processes in large and complex research and development organizations. The goals and functions adopted for research and development work undertaken at Australian universities, and public and private research and development organizations are examined within the context of their operational modes, focussing particularly on those factors which effect the planning, approval and implementation of budgets.

Special issues, such as "public accountability" obligations, the desirability of retaining budgetary flexibility and the requirement of integrating the budgetary and accounting systems are examined individually. It is issues of this kind which have not been addressed properly by budgetary strategies currently in vogue.

Applying relevant conclusions reached by some notable organizational theorists, and drawing on the experiences of other organizations (both in Australia and overseas) it proved possible to isolate those special needs which warrant incorporation in a budgetary strategy better suited to large and complex research and development organizations. The new budgetary strategy developed in this dissertation has been accorded the acronym CRA (Core + Research Activity). Although a 'hybrid', the CRA budgetary strategy is designed to isolate the 'core' function, which represents the service and support facilities that under-pin research activities being pursued, from each research activity supported by the organization.

Apart from the 'core' function each research activity becomes the basic unit for measuring budgetary and accounting performance. In selecting such a unit of measurement the main advantages are: each activity is readily identified permitting more effective control; unused resources can be isolated and redistributed to areas in need thereby optimising the practice of flexibility; and, lastly, it facilitates the integration of the budgetary and accounting systems.

The need to supplement the CRA budgetary strategy with the processes of Resource Management and Strategic Planning is also argued. Although the CRA budgetary strategy was designed initially for large and complex research and development organizations (i.e., Australian universities and public research and development organizations), one of the conclusions reached is that it is also capable of being applied in any organization where, apart from the 'core' element, the operations can be separated into identifiable units.

October, 1983

BUDGETARY STRATEGIES
for large scale Research
and Development Organizations:
With special reference to
The Institute of Advanced Studies,
Australian National University

by

Peter J. Grimshaw

A dissertation submitted in partial fulfillment
of the requirements for the degree of
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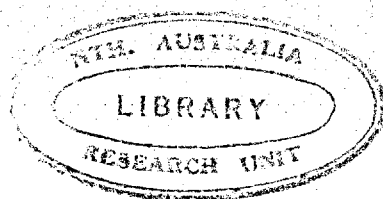


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A student of budgeting is unable to complete the long apprenticeship required unless he or she has applied the art over the full range of fluctuating financial circumstances that can arise. It is the variety of circumstances experienced which stimulate and encourage the budget practitioner to formulate new ideas aimed at solving particular problems.

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BUDGETARY STRATEGIES

for large scale Research and Development Organizations:

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The Institute of Advanced Studies,

Australian National University

CHAPTER 1

INTRODUCTION

Australia's post-war economic expansion period began to lose momentum by the mid-1960s. This slowing down process proved a temporary setback, although the economic activity which followed adopted a more cautionary approach.

The latter half of the 1970s, however, heralded the arrival of a period of contraction for Australia's economy. External influences, in particular the substantial increase in the price per barrel of crude oil charged by the Organization of Petroleum Exporting Countries (O.P.E.C.), contributed to this contraction. These changing financial circumstances have forced Australian organizations to re-examine and make changes to their budgetary strategies or techniques.

Organizations engaged in research and development work such as Australian universities and public and private research and development organizations represent one group where the changing financial circumstances have introduced special problems. As a consequence these organizations have been forced to adjust their budgetary strategies and planning processes in order that they could cope with these changed circumstances.

The purpose of this dissertation, therefore, is to examine the effect of changed circumstances in the context of budgetary strategies and the planning processes which are used in Australian universities and public and private research and development organizations. Special attention will be given to the problems these organizations have experienced in attempting to superimpose on their organizational structures budgetary strategies which have achieved a degree of popularity elsewhere.

In recognition of the problems a research and development organization can experience in adopting budgetary strategies designed with other purposes in mind, a "hybrid" budgetary strategy described as CRA (Core + Research Activity) will be introduced. It will be argued that the CRA budgetary strategy is better suited to and caters for the special needs of research and development organizations.

The task set by the writer has developed from direct involvement in the

preparation of budgets at the Institute of Advanced Studies (I.A.S.) of the Australian National University, Canberra, over the past 20 years. The origin of the CRA budgetary strategy concept draws on the writer's experience of budgeting within the framework of the I.A.S. and having to apply different budgetary applications over a wide spectrum of financial circumstances. This direct involvement in the budgeting processes of a large and complex research and development institution has been complemented by extensive reading on the topic, visits to universities in Great Britain, Europe, Canada, the United State of America, the Pacific and Southeast Asia and an appreciation of budgetary strategies or techniques used in Australian tertiary educational institutions.

THE PROBLEM

Until recently little research has been undertaken by Australian universities about themselves. A number of journals are now providing the outlet for this deficiency to be overcome. One of the first authoritative journals to appear was *The Australian University* in July, 1963. Although this Journal ceased publication some years ago the articles published during its lifetime contain valuable historical source material. The *Journal of Educational Administration* and the more recent *Journal of Tertiary Educational Administration* include articles which assist the educational planner. Another journal of interest is *Vestes*. Unfortunately, as some of the articles published in this journal represent a particular viewpoint or present-day values are relied on when past events are interpreted, caution needs to be exercised in accepting their scholarly merit. What is noticeable is that the occasional article which appears in these journals and concerns the allocation of resources within Australian tertiary educational institutions tends to treat budgeting in a superficial manner.

The lack of adequate published material on administrative and financial arrangements applying at Australian universities during the post-World War II phase is a handicap for a researcher. This period is probably the most dynamic so far experienced throughout the Australian university sector because of the extraordinary changes the university system had to accommodate. It has been a period of rapid university growth, with the federal government increasing substantially its financial assistance. This

period can be regarded as being instrumental in laying the foundations for the processes of funding the operations of Australian universities that were to follow.

With the end of World War II the Commonwealth Government began providing additional funds to Australian universities under such initiatives as the Commonwealth Reconstruction and Training Scheme. As the federal government's involvement in the funding of Australian universities increased it was inevitable that some form of control would need to be introduced if for no other reason than to satisfy "public accountability". One of the outcomes of the Murray Report of 1957 was for the Commonwealth Government to establish the Australian Universities Commission (A.U.C.) two years later, with this organization being replaced subsequently in 1977 by the Tertiary Education Commission (T.E.C.).

Both the A.U.C. and the T.E.C. incorporated into their roles the task of preventing unnecessary duplication amongst the programmes presented to them by Australian universities. The recommendations the A.U.C. and T.E.C. in turn presented to the federal government for approval stressed the need for balanced growth and development to be achieved. One significant feature adopted by the A.U.C. and continued by the T.E.C. has been to introduce a formula approach as the basic yardstick for calculating the division of resources amongst Australian universities. The formula introduced adopts the student as the common denominator permitting the allocating of resources to be geared to the "weighted student unit" (WSU) or the "equivalent full-time student" (EFTS). It would seem that by adopting a formula approach this practice has tended to play down the importance of developing a budgetary strategy which embodies the distinctive character noticeable in the operations of an Australian university. This may also be one of the reasons why there is a sparsity of published material on the budgetary practices applying at Australian universities.

The lack of published material on budgetary practices is not confined to Australian universities. When a review of the literature is made on this aspect for public research and development organizations established by the Commonwealth Government a similar deficiency is noticeable. It is possible that as these types of organizations are required to observe Treasury and financial guidelines determined by the Commonwealth Government a need did not exist for separate documented evaluations to be produced.

The Commonwealth Scientific and Industrial Research Organization (C.S.I.R.O.) and the Australian Atomic Energy Commission (A.A.E.C.) are two public research and development organizations which have been established by the federal government. These Organizations rely on their published annual reports which each is obliged to place before the Commonwealth Parliament to make public their financial statements. Occasionally these annual reports are supplemented by brochures. However, these brochures usually deal with aspects of current research and are not designed for the purpose of providing financial or budgetary information.

Research and development work undertaken by a private research and development organization is designed ultimately to assist in maximising profits. It is this underlying factor which discourages the private organization to reveal details of research work-in-progress as this could prove of benefit to the organization's competitors. The annual reports distributed to shareholders couch research and development work in general terms. In some instances the point is made that the cost of research and development work undertaken is written-off against profits in the year in which it is incurred.

Having regard to the lack of published material on budgetary strategies applying at large and complex research and development organizations, augmented by the special needs and problems these kind of organization experience in their operations, has encouraged the research embraced in this dissertation.

This dissertation, therefore, will consider the present budgetary strategies or techniques used in large and complex research and development organizations. During the course of this review the advantages and disadvantages of existing systems will be scrutinised, with emphasis being placed on retaining those aspects considered to be beneficial. The deficiencies apparent to the writer in continuing the present budgetary strategies or techniques will be outlined and the writer will develop and present an alternative budgetary strategy or model.

It will be argued that the alternative budgetary strategy or model, described as CRA (Core + Research Activity), although representing a "hybrid", is better suited to the special needs of research and development organizations. Four main grounds will be presented to support this conclusion. Firstly, the CRA approach establishes an identifiable unit

for measuring budgetary and accounting performance. Secondly, having such a unit facilitates the integration of the budgetary and accounting systems. Thirdly, CRA separates the service and support facilities from research and development activity. Finally, the adoption of a budgetary and accounting unit which is readily identifiable aids resource management and long-term planning strategies. In proffering the CRA budgetary strategy the benefits which flow from this strategy will be tested against the budgeting experience of the Research Schools which comprise the Institute of Advanced Studies of the Australian National University.

The central problem of this dissertation, the development of a budgetary strategy better suited to the needs of a large and complex research and development organization, will amount mainly to a theoretical study and will rely heavily on a review of the literature, complemented by the budgetary experiences of the I.A.S. throughout periods of changing financial circumstances.

EXAMINATION AND ANALYSIS

From the outset it is necessary to define what is meant by the term "budget". Kohler has provided three definitions in his work, *A Dictionary for Accountants*. He describes a "budget" as: *"A financial plan serving as a pattern for and a control over future operations"*; *"... any estimate of future costs"* or *"... a systematic plan for the utilization of man power, material or other resources."*⁽¹⁾ In short, any statement of plans and expectations involving future activities where income is compared against revenue amounts to a "budget". Bearing in mind that this dissertation addresses itself to the budgeting and planning processes necessary for large and complex research and development organizations, Kohler's description of a "budget" as *"a financial plan serving as a pattern for and a control over future operations"* is better suited for focussing attention on the budgetary aspects that will emerge from the arguments presented.

With this understanding of the term "budget" in mind, issues relating to the development of a budgetary plan for large and complex research and development organizations will be examined in Chapter 2. Of direct relevance will be the need to pay regard to the aims, objectives or goals of the organization, for these have a bearing on establishing operational priorities. However, it will become apparent that research and development

organizations also have special characteristics which influence budgetary planning. In order that these special characteristics are identified, the university and both the public and private research and development organizations will be examined separately. Chapter 2 is designed specifically to identify the differences which exist between universities and the public and private research and development organizations and how the approach to budgetary planning is preconditioned by the aims, objectives or goals each organization has determined.

The development of budgetary strategies or techniques as an aid to management planning is examined in Chapter 3. Budgetary strategies that have enjoyed a measure of popularity and success, such as Incremental Budgeting, Formula Budgeting, Planning-programming Budgeting (PPB) and Zero-base Budgeting (ZBB) will be highlighted. The manner in which budgetary means can be applied to control the operations of a university or a public research and development organization will then be considered. The purpose of this Chapter will be to demonstrate to the reader the extent a budgetary strategy can influence management's long-term planning. Equally, a budgetary strategy can be employed by management to inject confidence into some sectors of the organization or dampen activity in other areas.

The difference between public and private research and development organizations will be dealt with in Chapter 4. By far the most important aspect which distinguishes the two organizations is the statutory obligations of the public organization, as distinct from the profit incentive a private organization is required to pursue on behalf of its shareholders. It will be argued that these two types of organizations have separate and distinctive characteristics which influence the kind of budgetary strategies adopted by their respective managements.

Although Chapters 2 and 4 will be designed to highlight the operational differences that exist when an Australian university, a public research and development organization and its counterpart in the private sector are compared, Chapter 5 will demonstrate that there are circumstances which create a comparable approach to problem-solving. A number of examples will be cited to illustrate this point. One will be the effect external decision-making can have on these types of organizations. Another will be the comparison of affluent times which favour a growth situation, with periods of financial stringency that can lead to the curtailment of research activity. An argument will also be presented that when income is

static or the annual grants received are less in real money terms, the extent of budgetary activity increases in proportion. Furthermore, the "static state" financial situation provides the impetus for the redirection of resources even if it is at the expense of older but less productive activities. Chapter 5 will also consider briefly the increasing interest Australian governments now have in the financial operations of public institutions and management's obligation to become more accountable to the financing authority. This Chapter is also designed to demonstrate that the choice of research activities management can support is dependent on the extent of income received by the organization.

In the light of the shortcomings highlighted in the earlier Chapters the purpose of Chapter 6 will be to develop an alternative budgetary strategy or model better suited to the needs of large and complex research and development organizations. As a first step the operational nature and the special requirements of a research organization will be outlined.

The budgeting experiences of the Research Schools of the I.A.S. at the A.N.U. will be reviewed in Chapter 6 and details provided of innovatory schemes introduced in an attempt for these Research Schools to enjoy maximum flexibility in the allocation of resources. The flexibility stressed in this approach will emerge as an important aspect of long-term planning. The CRA budgetary strategy will, therefore, be recognised as one which emphasises the desirability of separating the core element from research activities in the operational infrastructure of a research and development organization. Although designed initially for application in research and development organizations it will become evident that a further benefit the CRA budgetary strategy has to offer is its capacity to apply the technique to any organization where the operations of budgetary measurement can be grouped into activities or distinguishable segments.

Apart from reviewing published literature on budgetary strategies and planning processes in use at large and complex research and development organizations, assisted by the writer's direct involvement in budgeting it was hoped from the outset that the methodology selected would be improved by approaching each Australian university and seeking their co-operation in the completion of a questionnaire. The nine questions posed to each Australian university are detailed in Appendices "B" and "C".

The questionnaire was designed principally to elicit answers to three main questions. Firstly, to ascertain the total value of income received

by Australian universities, as distinct from that received through grants approved by the federal government on the recommendations of the T.E.C. An examination of the T.E.C.'s Report for the 1982-84 Triennium reveals that the extent of the 1982 grants, for example, places the Australian university sector in the billion dollar bracket and is not an insignificant amount when viewed in the context of Australia's overall economy. Secondly, it was necessary to determine the variety of budgetary strategies practised by Australian universities. The variety of budgetary strategies in use and their degree of sophistication would permit an assessment to be made on the final question, that being the progress Australian universities are making to improve their budgetary strategies.

The questionnaire resulted with a response rate of 74%. Those Australian universities which failed to respond can be placed within two distinct groups. The first was a long established university (i.e., pre-World War II) where a re-organization of the business and financial administration is currently in progress as evidenced by the senior administrative post under advertisement and from the supporting information supplied. The remaining four universities that did not respond were opened after 1960 or a period which followed the immediate post-World War II university expansion boom.

With less than a 100% response rate such a result has limited the extent to which the information could be used in a meaningful way and support the methodology selected for this dissertation. Nevertheless, where particular issues are discussed the opinions of those Australian universities which did respond to the questionnaire are included. The fact that less than a 100% response rate resulted in itself suggests greater encouragement is necessary for Australian universities to reveal and justify the budgetary strategies each has adopted.

The importance of resource management and strategic planning as an integral part of the budgetary and accounting process will be presented in the first part of Chapter 7. Having established the importance and relevance of resource management and strategic planning a review will then be made of the theoretical analysis presented in this dissertation.

An evaluation of the budgetary model CRA will follow, with special reference to its capacity of enabling new research and development programmes to be introduced into the large and complex organization

irrespective of the money supply. With emphasis being placed on the accountability of Australian universities and public research and development organizations, the future of these organizations appears to lie with management adopting more rigorous budgetary strategies in their overall planning processes. Finally, Chapter 7 will suggest areas of budgetary significance which lend themselves to further investigation and research. It is also hoped that the views and arguments presented in this dissertation will attract constructive criticism or stimulate interest from other budget practitioners and lead to the continuation of research aimed at further improvement and refinements to the budgetary strategies of large and complex research and development organizations.

CHAPTER 1

REFERENCES

- (1) Kohler, E. L., A Dictionary for Accountants. Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1956, p.67.

CHAPTER 2

LARGE SCALE RESEARCH AND DEVELOPMENT ORGANIZATIONS

As a step towards considering budget strategies better suited for large scale research and development organizations it is first necessary to indicate what is meant by the term organization, and identify some of its prime characteristics.

A review of the literature illustrates that there are many and varied definitions which have been developed by theorists to describe an organization. Some of these definitions have emerged following the analysis by a theorist of the results of a study used to examine an organization, or a number of organizations, from a particular perspective. By and large the definitions which have emerged from studies of this kind enjoy an enriching quality, even though they may tend to place emphasis on certain organizational aspects.

At this point of time the relative newness of organizational theory suffers from a major drawback. The terminology adopted to describe aspects of this behavioural science has not yet been codified sufficiently to encourage uniformity amongst writers of organizational theory. This lack of uniform terminology is very apparent when the writings of theorists of the United Kingdom are compared with their counterparts of the United States of America.

The purpose of this section is therefore twofold. A review will be undertaken of a selection of definitions devised by some noted theorists to describe organizations, or particular facets of organizational activity. The aim of this review will be to place in the correct perspective those definitions which have application in describing large scale research and development organizations. The second purpose will be to indicate the sense in which terminology, frequently appearing in the works of organizational theorists, is to be used in this dissertation.

When the many and varied definitions that have gained general acceptance in describing an organization are compared, what becomes apparent is that size or purpose is not a factor which has to be incorporated into the definition. However, organizational theorists do tend to place emphasis on a particular aspect of organizational activity.

There are a number of examples which support this conclusion. Firth regards an organization as implying "... a systematic ordering of positions and duties which define a chain of command."⁽¹⁾ In this definition the emphasis is being placed on having a hierarchical structure within the organization where positions are ranked according to their degree of importance.

The inference which can be drawn from this definition is that the operational infrastructure of an organization is more complex as the organization becomes larger. The reason for this is that more positions in the organizational hierarchy will be necessary to ensure management decision-making is implemented in a smooth and orderly manner. The definition Firth has proposed would, therefore, prove suitable for describing a large scale research and development organization.

A different emphasis is made by Litterer in his definition of an organization. While recognising that "*Organizations consist of individuals and small groups, as well as an arrangement of these elements into larger collectivities*,"⁽²⁾ he regards "... an organization ... to be a social unit within which people have achieved somewhat stable relations (not necessarily face-to-face) among themselves in order to facilitate obtaining a set of objectives or goals."⁽³⁾

In this definition the theorist is placing greater importance on the people who are part of the organization. Litterer acknowledges that the activities performed by individuals in an organizational setting will not always be harmonious, nor is it likely each will have the opportunity to interact frequently and on a regular basis. Nevertheless, Litterer is of the opinion that by working together as a cohesive social unit this will allow the objectives or the goals of the organization to be achieved. Implicit in his definition is a recognition that the larger the organization the more people are involved. Where units of a large organization are located at different work sites there is every likelihood the opportunity for occasional face-to-face contact will be minimised even further.

From Litterer's definition it is possible to conclude that friction amongst individuals will also increase in proportion to the number of people circumscribed by the organization. Only by working towards achieving set goals is it possible for individual relationships to be

stabilised in the organization. Litterer's definition would also prove acceptable for describing a large scale research and development organization.

Elements of the definitions advanced by Firth and Litterer are brought together by Blau and Scott. In the opinion of Blau and Scott formal organizations are "... established for the explicit purpose of achieving certain goals."⁽⁴⁾ To achieve this purpose the organization is required to have "... a formal status structure with clearly marked lines of communication and authority."⁽⁵⁾

For the reasons presented earlier in this Chapter the definition proposed by Blau and Scott appears better suited to describing a large scale research and development organization. The need to define the chain of command advocated by Firth has been widened by Blau and Scott to emphasise three key elements - structure, communication and authority. These three elements are an essential part of an organization, but moreso for a large organization.

A somewhat different approach is taken by Etzioni to those of other organizational theorists. In considering the impact on society of organizational activity Etzioni was prompted to conclude:

"We are born in organizations, educated by organizations, and most of us spend much of our lives working for organizations. We spend much of our leisure time paying, playing and praying in organizations. Most of us will die in an organization, and when the time comes for burial, the largest organization of all - the state - must grant official permission."⁽⁶⁾

The main point which can be drawn from this observation is the differing goals and objectives Etzioni highlighted for each of the organizations he was referring to. The emphasis Blau and Scott place on an organization having to accomplish the goals determined by management, is also shared by Etzioni. In his general definition of organizations where, he admits, he has been influenced by Talcott Parson's earlier work,⁽⁷⁾ Etzioni regards organizations as being "... social units (or human groupings) deliberately constructed and reconstructed to seek specific goals."⁽⁸⁾ Elaborating on the term "goal" Etzioni regards this as the desired state of affairs an organization wishes to realise.⁽⁹⁾

The need for an organization to be able to achieve certain goals is the one factor which features in each of the definitions developed by Litterer, Etzioni and Blau and Scott. To some extent the fact that this dissertation concentrates on large scale research and development organizations suggests that the main goals - "research" and "development" - have already been identified. However, these main goals are too broad to convey a worthwhile understanding of the particular goals a research and development organization would need to determine to fulfil its purpose.

The essential task of an organization's management is to tease out particular goals and, where necessary, refine earlier set goals, or establish new goals better suited to changed circumstances, whether these are the result of internal or external pressures. If management is able to perceive the organization's goals clearly, adjustments to cope with changed circumstances can be introduced more speedily. The awareness needed of management to the organization's goals is perhaps best illustrated when it comes to the selection of those choices which are competing for access to limited resources.

THE IMPORTANCE OF ISOLATING GOALS AND OBJECTIVES

Although general agreement appears to have been reached amongst organizational theorists on the importance of isolating an organization's goals and objectives, a divergence of opinion is noticeable when it comes to separating goals from functions.

Adopting a positive approach Etzioni is untroubled by what he distinguishes as an organization's goals. Apart from constituting the legitimacy of the enterprise Etzioni argues that goals justify the existence and activities the organization pursues. Furthermore, "... *goals serve as standards by which members of an organization and outsiders can assess the success of the organization - i.e., its effectiveness and efficiency.*"⁽¹⁰⁾ Despite this positive approach Etzioni recognises that in some cases a goal established initially by an organization will be realised subsequently. When this situation occurs new goals will need to be introduced. Often the creation of new goals may prove better suited to the needs of the organization. It is these

new or introduced goals Etzioni regards as **real goals**, as distinct from the **stated goals** of the organization. What separates the two in the operational sense is that **real goals** generally attract resource support ahead of the requirements of **stated goals**.

While Etzioni recognised there was a need for an organization to be able to introduce new goals as circumstances warranted, the approach taken by Thompson and McEwen concentrates on the impact environmental change has on goal redefinition. Using the term "environment" in the widest sense Thompson and McEwen suggest that an organization's goals do change where *"A continuing situation of necessary interaction between an organization and its environment introduces an element of environmental control ..."*⁽¹¹⁾

The relevance of a change in the texture of the environment was also noticed by Emery and Trist following their study of a United Kingdom food-canning company in the early 1960s. The conclusion they reached was that:

"The changed texture of the environment was not recognized by an able but traditional management until it was too late. They failed entirely to appreciate that a number of outside events were becoming connected with each other in a way that was leading up to irreversible general change."⁽¹²⁾

The separation of an organization's functions from its goals seems to rely mainly on how the organization is being viewed. Within the organization goals are regarded as those aims which have to be achieved at some subsequent stage. Nevertheless, an organization is able to exercise control over its own destiny. It can select and change goals as circumstances dictate, but the selection and change process may be influenced by factors which lie beyond the immediate control of the organization.

Outside factors which could affect the goals determined by an organization are: environmental change; unavailability of raw materials; a fall in the labour supply, or a drop in demand for the goods or services being offered. When an organization is being viewed as an integral part of a society or community its specific goals are of secondary importance to the function the organization serves in the community or society context. This was the conclusion that Weissenberg reached. He observed that:

"... all organizations have functions to perform. The function which the organization performs is the contribution it makes to the larger social system of which it is a part."⁽¹³⁾

What Weissenberg had in mind was the need to separate clearly the goals the organization had set from the function an organization performed when viewed on a wider scale - the community or society view. The distinction is easier to understand if the two are considered in the light of their areas of influence. At the community level an organization provides employment, supports local enterprise and generates resource distribution. When considered at the national level an organization can be placed within the economy of a social system, or used as a measurement for maintaining the norms and values held by society.

The large scale research and development organization can readily be perceived within a functional framework of this kind. The location of the organization allows it to contribute and participate in activity at the community level; while the organization's contribution at the national level may be considerable. The organization may also influence research and development of global significance.

While Weissenberg believed it was important to separate the functions of an organization from its goals the need for such a clear distinction is not shared by Perrow. Adopting the premise that *"Organizations are established to do something; they perform work directed toward some end,"*⁽¹⁴⁾ Perrow is disinclined to make a distinction between "goals" and "functions". The approach Perrow adopts is to divide an organization into five "goal" categories. The goal descriptors he has chosen are: societal goals; output goals; system goals; product goals, and derived goals.⁽¹⁵⁾

These goal descriptors can be defined in simple terms as follows:

societal goals: the contribution the organization makes to society in general,

output goals: the variety of benefits individuals in society derive from contact, whether direct or indirect, with the organization,

system goals: the manner in which the organization operates in the performance of its chosen

role,

product goals: the peculiar characteristics of the goods or services produced or offered by the organization,

derived goals: the ability of the organization to adjust to and influence change by redefining its system or product goals.

Perrow's approach does overcome many of the difficulties Silverman noted other organizational theorists had experienced in defining an organization's goals. Silverman acknowledges that the approach taken to goal definition depends on the research interests of each theorist. This is best illustrated by the example Silverman quotes of the sociological analysis approach used by Udy. A formal organization is described by Udy as having "... objectives which are explicit, limited and announced."⁽¹⁶⁾ From this Silverman concluded: *"The advantage of considering organisations in this manner lies not so much in its appeal to common-sense (indeed the commonsense view of the nature of the goal of a particular organisation is often rejected by such writers) but in the way in which it provides a referent by which to judge the 'health' of the system in comparison to others."*⁽¹⁷⁾

Until agreement is reached amongst organizational theorists whereby organizational activity can be described in standardised terminology it will prove necessary for each writer to indicate in what context terms, such as "goals" or "functions", are being used. As this dissertation addresses itself to resource allocation in large scale research and development organizations the goals to be considered are primarily those determined by the organization. For this reason the term "goals" will refer to this aspect of an organization's operations. Where large scale research and development organizations are being considered as a collective group and within a national context the term "function" will be used.

The organizational structure of a large scale research and development organization is readily identified with the formal organization Udy was considering in his sociological analysis. The extent of this formal organizational structure is very apparent when the large scale research

and development organizations of Australia are examined. Apart from research and development activities being pursued at Australian universities, most Australian large scale research and development organizations have been created by government and their corporate powers flow from an Act or Statute. Two such organizations which fit this description are: the Australian Atomic Energy Commission, and the Commonwealth Scientific and Industrial Research Organization.

The organizational characteristics of these two organizations, together with those of universities and private research and development organizations, will now be considered, paying particular regard to the three key elements Blau and Scott isolated, i.e., structure, communication and authority. The goals specified for these organizations will be appraised and an assessment made of the budgetary consequences in achieving their fulfillment.

ORGANIZATIONAL CHARACTERISTICS AND BUDGETARY IMPLICATIONS

UNIVERSITIES

The earlier sections of this Chapter have accomplished two main purposes. Firstly, a comparison proved possible of the different definitions theorists had developed to describe an organization. Secondly, in analysing these definitions the majority of theorists stressed the importance for an organization to achieve certain goals. It also became evident that goal achievement could be affected by external influences where the environment, or new political decisions, brought about change.

The organizations being considered by these theorists were Weber's ideal type, being bureaucratic in structure and supported by a hierarchical authority system. However, any institution which is organized along collegial lines does not fit this mould. Organizations operating along collegial lines generally experience problems in defining their goals.⁽¹⁸⁾

A university is an organization which incorporates special features. McCaig regards today's universities as complex organizations.⁽¹⁹⁾ Based on their studies, the complexities and special features attaching to universities prompted Cohen and March to conclude that:

"The American college or university is a prototype organized anarchy. It does not know what it is doing. Its goals are either vague or in dispute. Its technology is familiar but not understood. Its major participants wander in and out of the organization."⁽²⁰⁾

A more cynical interpretation had been developed a few years earlier by Perrow. Having regard to their traditional place in society and the goals they espoused Perrow described universities as:

"... those two-headed relics of a Pleistocene age ... committed to the preservation of knowledge and values on the one hand and to the 'frontier' of knowledge and 'dynamic wellspring of change' on the other, offer new courses and programs which appear to differ little from the abandoned ones."⁽²¹⁾

The world-wide universality of the university system seems to suggest these problems apply equally elsewhere rather than be confined to the United States of America. When writing on the Australian situation Dufty is more circumspect than Cohen, March and Perrow. He points out that:

"The university is a pluralistic system, often fractured by conflict along lines of disciplines, groups of academic staff and administrators and rifts between professional Schools ... Because the social structure is loose, ambiguous, shifting and poorly defined the power structure has similar characteristics. A clearly laid down power hierarchy would conflict both with reality and with prevailing social norms."⁽²²⁾

Quite independent of the pluralistic system noticeable in the operations of Australian universities the Commonwealth Government's Commonwealth Education Act, 1945, envisaged greater participation by the Commonwealth in the field of education, apart from establishing the Commonwealth Office of Education.⁽²³⁾

Towards the end of World War II, the Commonwealth Reconstruction Training Scheme was introduced and this permitted ex-servicemen and women to train at the tertiary level.⁽²⁴⁾ This was followed by the introduction of the Commonwealth Scholarship Scheme to benefit young matriculants. The

Commonwealth Reconstruction Training Scheme brought with it a rapid expansion in university enrolments and, in turn, this exerted considerable pressure on the available resources of Australian universities. So acute was the problem that Professor R. C. Mills, then Director of the Commonwealth Office of Education and Chairman of the Universities Commission "... urged the government to investigate the whole question of the mutual responsibilities of government, community, and the universities."⁽²⁵⁾

The Murray Report of 1957 encouraged the Commonwealth Government to announce its intention to make grants to the States for university purposes and, two years later (in 1959) established the Australian Universities Commission (A.U.C.) and its subsequent replacement by the Tertiary Education Commission (T.E.C.) in 1977.⁽²⁶⁾

The main role adopted by the A.U.C. and its successor has been to analyse the needs nominated by Australian universities and later submit recommendations to the Commonwealth Government on the resource allocations proposed for each Australian university. The co-ordination and control aspects of the A.U.C. and T.E.C. have been aimed at avoiding duplication of academic endeavour and achieving a more even spread of resources. To this end a number of formulae has been used. For example, the Fifth Report (May, 1972) of the A.U.C. saw the introduction of EFTS (equivalent full-time students) as the basis for measuring the student load of faculties and departments.⁽²⁷⁾ While, in the Universities Commission Report for the 1977-79 Triennium, the effect the reduction proposed in the allocation of general recurrent grants, was seen as "... a reduction in real resources per student."⁽²⁸⁾ What becomes apparent is that in both cases the student is the basis of measurement and resource allocation for a faculty or department is geared to student numbers.

The complexity and special features of Australian universities and their pluralistic system operational mode has, to a large extent, been nullified by the independent scrutiny of the A.U.C. and its successor the T.E.C. Furthermore, scrutiny of this kind has proved more palatable at a time when "public accountability" of taxpayers' money is encouraged at federal government level. This approach has also been responsible for imposing on Australian universities budgetary parameters. While Australian universities still enjoy a measure of flexibility in the

eventual allocation of their annual recurrent grants they are obliged to take heed of the Tertiary Education Commission's reaction if any move away from approved programmes was contemplated.

PUBLIC RESEARCH AND DEVELOPMENT ORGANIZATIONS

Unlike a university a public research and development organization is established by government to meet a particular need. There are several such organizations which fall within this rubric. The first of these organizations selected for the purpose of this examination will be the Commonwealth Scientific and Industrial Research Organization (C.S.I.R.O.). Established by an Act of the Commonwealth Parliament in 1949⁽²⁹⁾ Section 9 regulates the powers and functions of the Organization. Primarily the Organization is expected to initiate and carry out scientific research and investigations in the area of primary and secondary industries. In pursuing this primary aim the Organization trains research workers, awards scholarships and fellowships, awards grants for scientific research, collaborates with other organizations engaged on similar research and publishes the results of the research undertaken. A secondary task is responsibility for testing and determining standards for scientific apparatus and instruments used in industry.

The ambivalent nature of the aims specified in the Act permits the Organization to enjoy a high degree of flexibility in its operations. The research work of the C.S.I.R.O. is carried out in five Institutes. Each Institute is made up of Divisions and Units having related research interests. The Organization's 1980/81 **Annual Report** reveals that 41 Divisions and five Units were housed in these five Institutes.⁽³⁰⁾ An organization chart of the C.S.I.R.O., based on the 1980/81 position, is detailed in Figure 1.

Under Section 25 of the Organization's Act an annual appropriation is approved by Parliament during the Budget Session. The leadup to Parliament approving an appropriation involves each Division in an Institute preparing a proposed annual estimate of expenditure. After consolidation into an Institute's overall proposal the estimates are examined by the management before referral to the Executive. Once the support of the Executive has been obtained the Organization's budget is referred to the responsible Minister for presentation to Parliament. The cycle of events associated

ORGANIZATION STRUCTURE OF C.S.I.R.O.

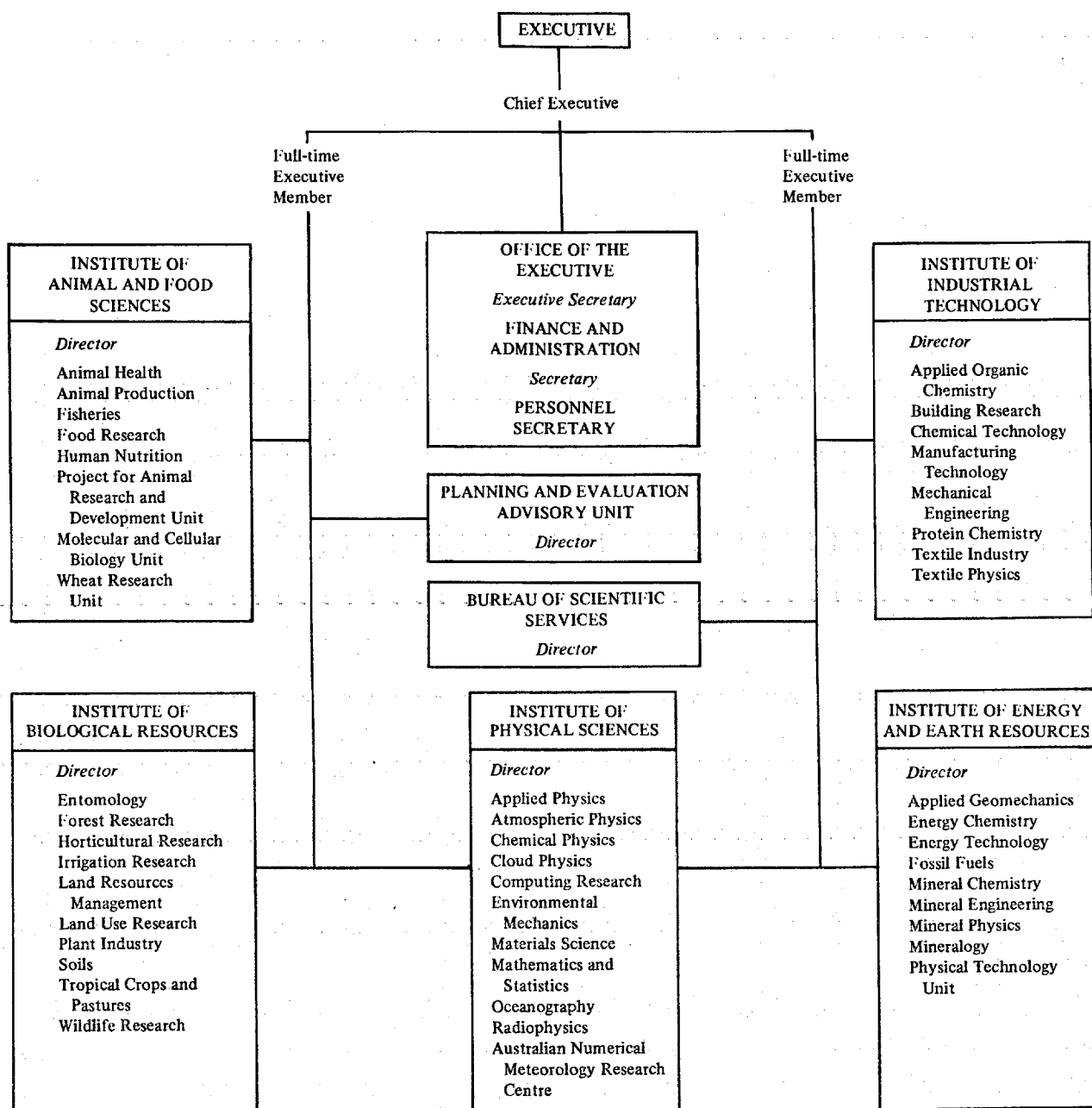


Figure 1 - Organization chart of C.S.I.R.O.
at 1 September 1981

with the preparation of the Organization's budget is presented in diagrammatic form in Figure 2.

Although the Commonwealth Department of Finance has the opportunity to examine the annual estimates of the C.S.I.R.O. and furnish comments, the Organization has more direct input into its annual budget preparation than an Australian university. The annual report the Organization is required to place before the responsible Minister under Section 30 of its Act is accompanied by financial statements audited by the Commonwealth Auditor-General. This provides the extent of "public accountability" imposed by the Commonwealth Government on the C.S.I.R.O. Other public research and development organizations have a similar obligation included in their Acts.

Similar to the C.S.I.R.O., the Australian Atomic Energy Commission (A.A.E.C.) was also established by an Act of the Commonwealth Parliament in 1946.⁽³¹⁾ The functions of the Commission can be divided into four areas, three of which have national strategic significance. The first area permits the Commission to undertake, arrange or encourage the States of the Commonwealth, other organizations or individuals to explore for, mine and treat uranium and allied minerals. The second area of interest is to purchase or sell, on behalf of the Commonwealth, uranium and allied minerals. The third functional activity is to construct atomic energy plants both for defence and peaceful purposes. Finally, and similar to the C.S.I.R.O., the Commission is charged with the responsibility of training research workers, awarding scholarships and fellowships, awarding grants for research into uranium or atomic energy, collaborating with other organizations engaged in similar research, the collection and distribution of information related to uranium or atomic energy and the publication of research results.

The research work of the A.A.E.C. is undertaken by nine Divisions which are part of what is described as the Research Establishment.⁽³²⁾ An organization chart of the A.A.E.C., also based on the 1980/81 position but upgraded to reflect changes introduced in 1981/82, is detailed in Figure 3.

Section 9 of the Commission's Act provides for an executive comprising a Chairman, a Deputy Chairman and three other members. The preparation of the Commission's annual estimates and subsequent approval of an appropriation by Parliament during the Budget Session, follows the same procedural steps taken by the C.S.I.R.O. "Public accountability" is also

C.S.I.R.O. - BUDGET SCHEDULE - 1985/86

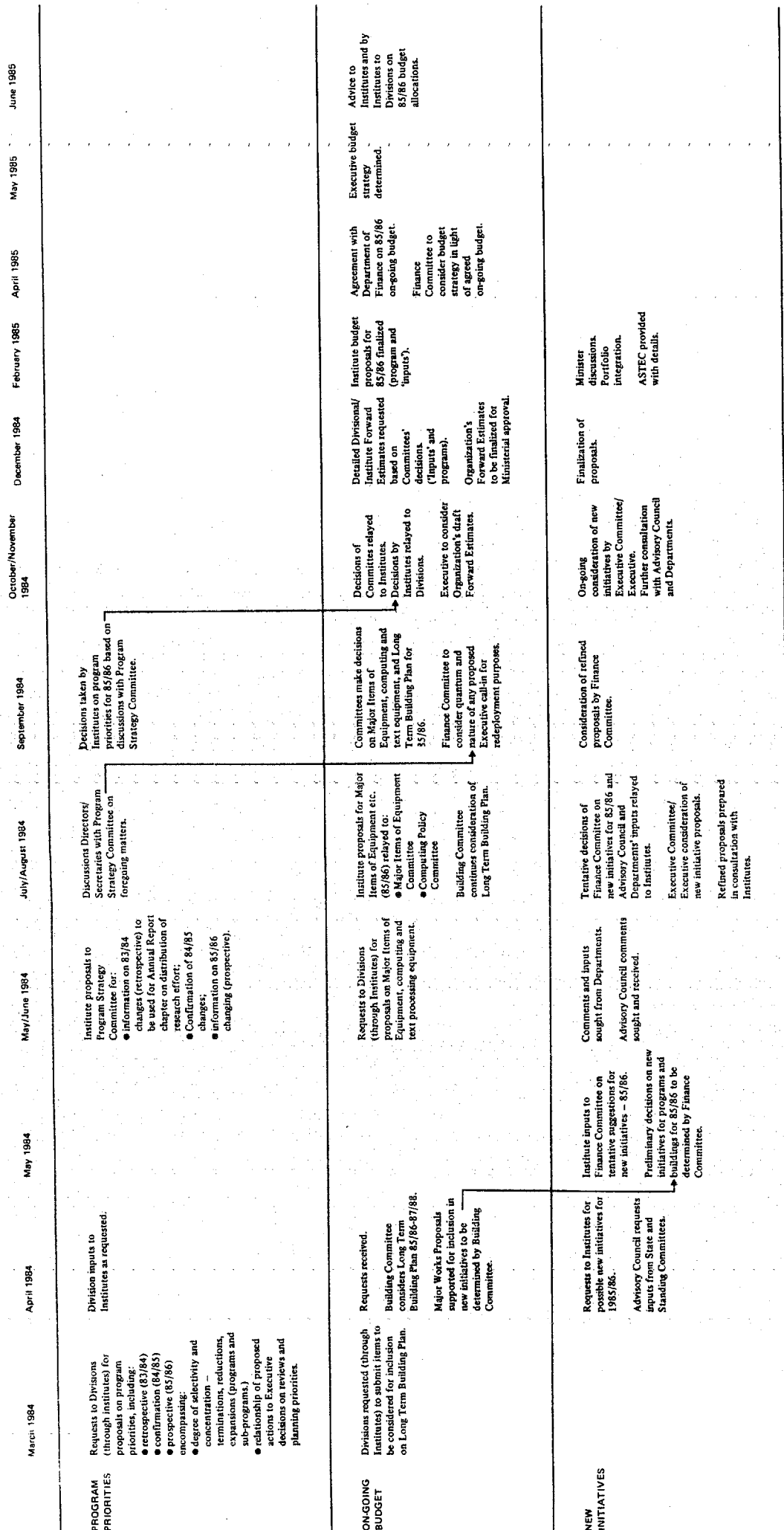


Figure 2 - Budget schedule adopted by C.S.I.R.O. for the 1985/86 financial year.

ORGANIZATION STRUCTURE OF
AUSTRALIAN ATOMIC ENERGY COMMISSION

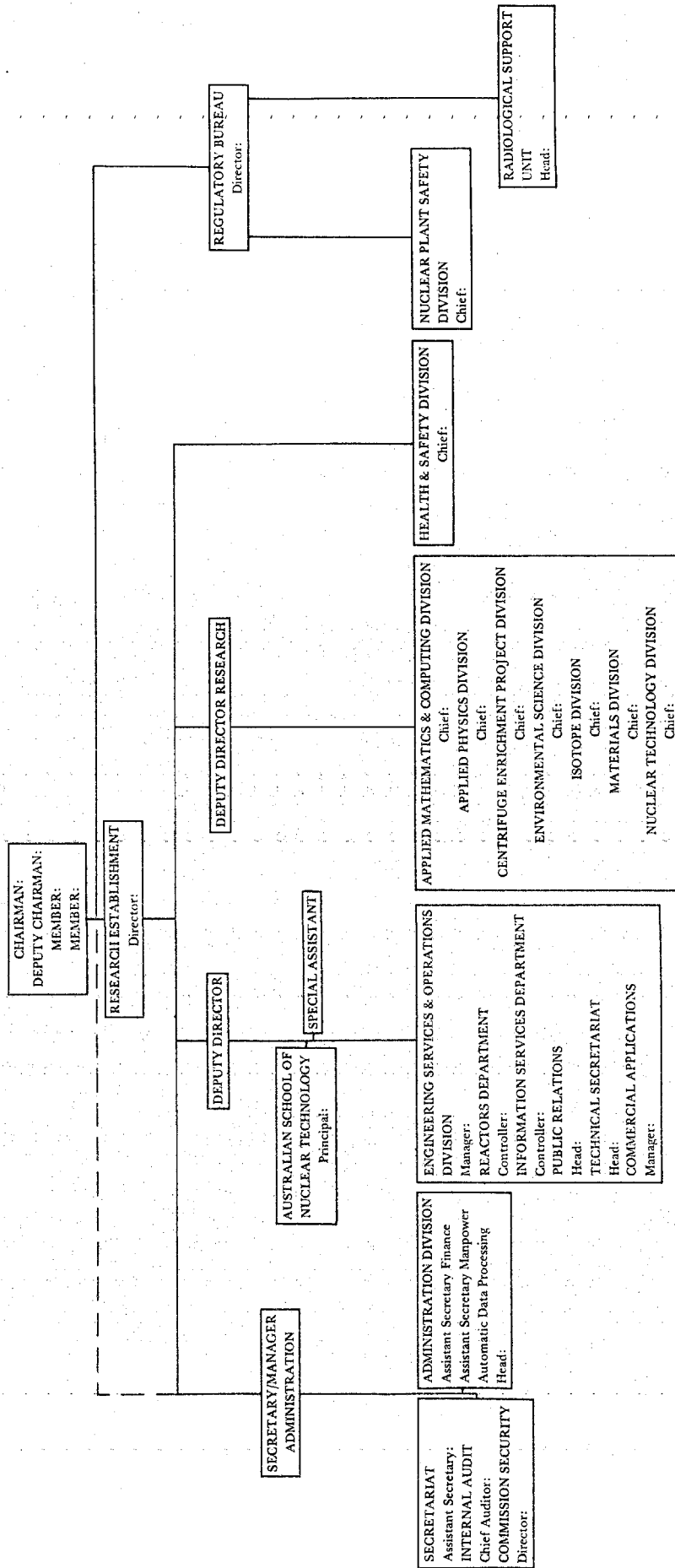


Figure 3 - Organizational Chart of A.A.E.C. at June 1983

similar to that of the C.S.I.R.O. Section 31 of the Commission's Act requires the Commission to present to the responsible Minister an annual report of its operations, accompanied by financial statements duly audited by the Commonwealth Auditor-General.

In examining the functions expected of the C.S.I.R.O. and the A.A.E.C. each is given responsibility for research and development spanning broad fields of national interest. It is the organization which eventually determines the area of research interest to be pursued and this, in turn, influences the compilation of the Organization's budgetary estimates. Unlike an Australian university these organizations are not subject to a constraining influence imposed on them by a peer assessment group, such as the T.E.C.

PRIVATE RESEARCH AND DEVELOPMENT ORGANIZATIONS

The method of attracting finance to establish a private organization would encounter little interest from the investing public if the sole purpose of the organization was to conduct research and development. A statement of this kind requires further explanation. To attract capital the initiators of a proposed company issue a prospectus inviting the public to subscribe to the share capital being offered. The public has to be assured that the aims of the proposed company justify financial support and that a reasonable return, in the form of regular annual dividends, will be forthcoming on the investment made. Few members of the investing public would be prepared to wait for the outcome of a research activity which could take a number of years to develop as a marketable product before earning a profit.

It is for this reason that a private organization's first priority is to become a viable enterprise and fulfil its prime goal. However, in an attempt to remain competitive most large scale private organizations set aside resources for research and development.

Large Australian organizations, such as General Motors-Holden, the Broken Hill Pty Co Ltd, Colonial Sugar Refining Co Ltd (now simply known as CSR) and Comalco have introduced planning, research or development divisions within their organizational structure.⁽³³⁾ These divisions are funded in the same manner as the production divisions, usually on an annual basis. Nevertheless, because research and development is a long-

term process the usual practice of private organizations is to observe a programme which covers several years. A programme spanning a number of years permits the monitoring of costs over a more reasonable time scale. A good example is the approach taken by General Motors-Holden when they introduced the Holden motor car in 1948.⁽³⁴⁾ Until the early 1960s a period of four years applied between the introduction of new models. During these four yearly cycles some cosmetic changes were incorporated but, basically, the main body design remained unchanged. The early 1960s caused General Motors-Holden to move away from a four year change cycle when unpopular models introduced onto the market created a down-turn in sales. The present drop in the demand for new motor cars may force General Motors-Holden to reconsider its future policy for introducing new models. The present economic slump could have the effect of extending the period between new models appearing on the showroom floors. In this event such a development would suggest a contraction in the planning workforce of the organization is likely.

BHP,⁽³⁵⁾ CSR,⁽³⁶⁾ and Comalco⁽³⁷⁾ are large scale private organizations that maintain some form of planning, research or development divisions. The main task of these divisions is to explore alternate uses of their existing products, devise new marketable products, or propose innovatory schemes likely to enhance the organization's earning potential. Speaking in Melbourne on 23 November 1976 Sir Ian McLennan, when reviewing innovations that had taken place in Australian technology for the years 1970-75, indicated that "... the preponderance of innovations lie in the manufacturing sector ..."⁽³⁸⁾ Of the 66 innovations, which could be isolated for the 1970-75 period, the distribution amongst sectors of industry was:

Services	10%	(7)
Mining	5%	(3)
Primary	14%	(9)
Manufacturing	71%	(47)

The bias favouring the manufacturing sector suggests the incentive for introducing new innovations in this area is the strongest. What is also noticeable is that private organizations are reluctant to make public details of their planning, research or development achievements until the product or process has been patented.

The fickle nature of shareholders presents the biggest threat to the future financing of a private organization's research and development division. Unless shareholders are kept informed regularly by management of the contribution being made to the organization's overall well-being by the research and development division, this area of the organization's activity can be stifled for funds in times of economic contraction.

The financial management of a large scale private research and development organization contrasts sharply to its counterpart in the public sector. Each division prepares an estimate of operating costs for the forthcoming financial year and draws attention to items of a capital nature which may be due for replacement. These estimates are then scrutinised by the organization's finance or accounting section and a budget is prepared for presentation to management. The responsibility for approving the organization's budget rests with management, although management needs to be in a position to vindicate the budget approved at the annual meeting of shareholders. The procedural steps of a typical large scale private organization in the preparation of its annual estimates is detailed in Figure 4.

In Australia some private organizations have avoided establishing research and development divisions. The reason for this is that public organizations, such as the C.S.I.R.O., came into being because the government of the day was persuaded that an organization of the C.S.I.R.O. pattern could assist industry with research and development projects. By adopting this approach the need for the private organization to undertake its own research and development could be avoided, together with the unnecessary duplication of effort. Where survival depends on an organization's ability to remain competitive it is naive to expect a large organization to rely solely on external sources for research and development input. The more likely arrangement is to establish a research and development division within the organization which can liaise with outside bodies as circumstances require.

SUMMARY

The intention of this Chapter has been threefold. As a first step, an examination was made of the various descriptions some notable theorists

TYPICAL PRIVATE ORGANIZATION

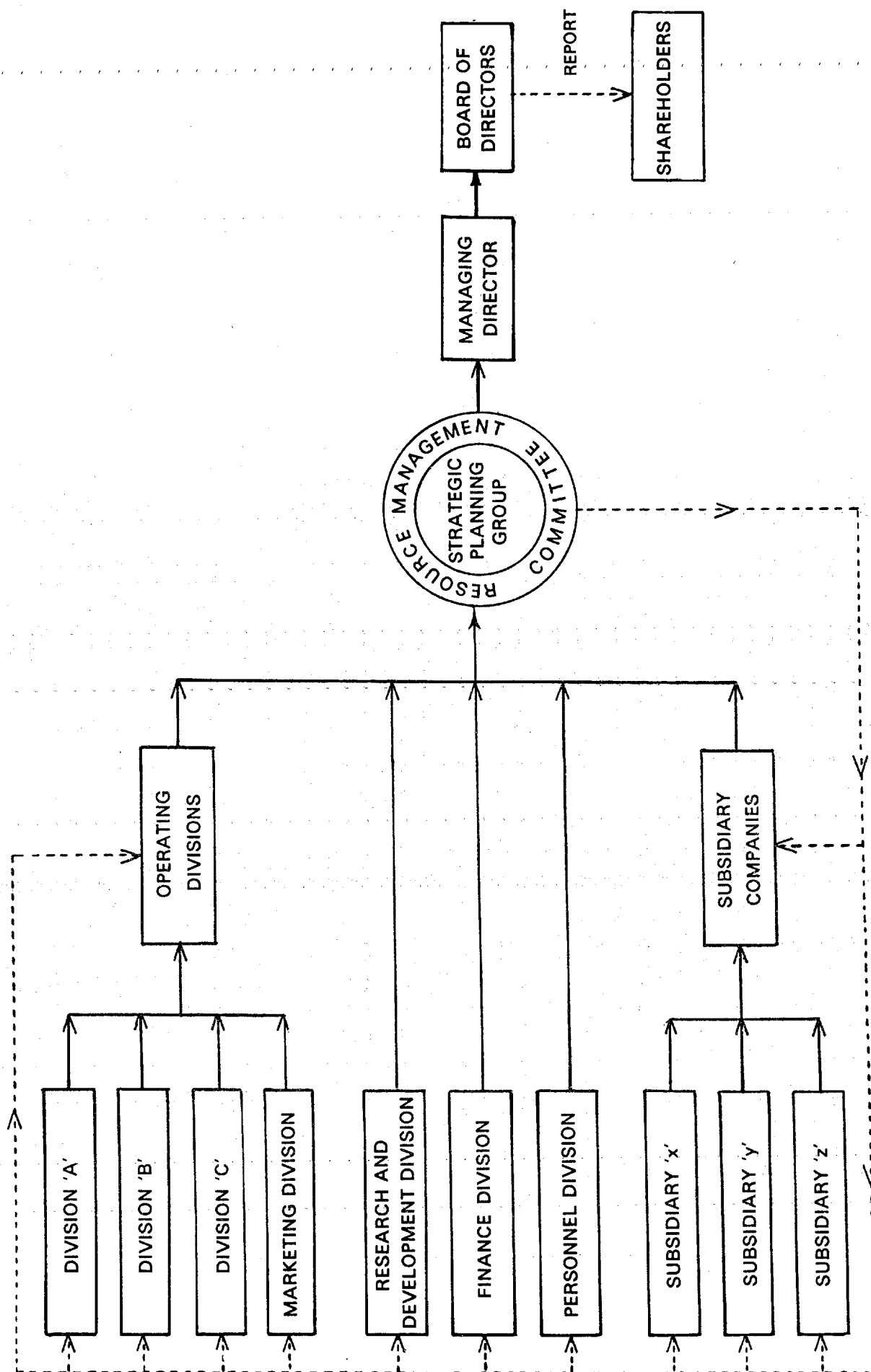


Figure 4: Budget cycle of a typical private organization incorporating research and development activity.

have developed to define an organization. One of the important points which emerged from these definitions was the need to pinpoint goals. However, it became apparent that goals tend to be broad in scope and that to accommodate changing circumstances it is necessary for organizations to redefine earlier set goals or establish new goals.

The next step was to codify the terminology used in this dissertation. In this respect the term "goal" is to be used in connection with the research and development tasks being pursued by an organization. Only when large scale research and development organizations are being considered as a collective group, and in a national context, will the term "function" have relevance.

Finally, the organizational characteristics of an Australian university, a public research and development organization and its private organization counterpart were examined. The individual characteristics of each type of organization highlighted separate and distinct budgetary implications.

When considered in the Australian context the "public accountability" aspect is of direct relevance to the financing of research and development undertaken at universities and such public organizations as the C.S.I.R.O. and the A.A.E.C. This suggests that whatever budget strategy is developed for these type of organizations it must be capable of being understood readily and be able to satisfy penetrating public scrutiny. Although the accountability aspect of the private research and development organization is confined to shareholders a similar approach would assist its management.

Whichever large scale research and development organization is being considered the need for systematic funding assumes an important part of its operations. This need suggests that the management of an organization requires a budgetary strategy capable of adjusting readily to shifts in research and development programmes. Budgeting as a management strategy will be considered in the next Chapter.

CHAPTER 2

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CHAPTER 3

BUDGETING AS A MANAGEMENT STRATEGY OR TECHNIQUE

The study of organizations has increased significantly since the end of World War II. One area of organizational activity which has attracted attention has been the structure of organizations and, in particular, the decision-making process.

The study of organizational structures had been encouraged by the earlier work of Max Weber. In developing his **bureaucratic model**, Weber argued that the ideal type of complex organization was hierarchical in structure, relying on **rational legal authority**.⁽¹⁾ The following characteristics have been extracted and are designed to summarise the essential features of Weber's **bureaucratic model**:

- (1) an on-going organization, having defined goals and governed rules,
- (2) the application of the division of labour within the organization according to competence and the capacity for authority to be exercised and enforced,
- (3) the organization to be structured on hierarchical lines which are well defined,
- (4) the prescription of the conduct of the organization's employees by imposing rules and sanctions,
- (5) divorcing the operational side of the enterprise from its ownership,
- (6) appointments to positions in the hierarchy to be made on competence and merit,
- (7) the activities of the organization to be properly documented.

The stress Weber placed on **rational legal authority** operating within a bureaucracy attracted a number of subsequent organizational theorists to concentrate their attention on the decision-making processes which occurred in organizations. The hierarchical structure of an organization provides the capability for effective decision-making provided, of course,

the organization has competent leaders.

In Chapter 2 it was noted that the budget proposals adopted eventually by both public and private research and development organizations were those which had received the approval of management, or the leaders of these type of organizations. Decision-making, therefore, is a reflection on the organization's leadership. In his researches into leadership Perrow has made the point that "... leadership is specific to the circumstances and the tasks demanded of the leader ...", and then proceeds to remind his readers that "... the formal organization is a highly relative process, with different combinations of supervisory-leadership skills and practices being required at different levels of supervision in the same organization and at different times in the life of an organization."⁽²⁾ The peculiar situation associated with leadership and decision-making applying in a collegial-type organization - a university - will be considered in more detail later in this Chapter.

The decision-making process of organizations was an aspect Litchfield researched. He reached the conclusion that five activities can be isolated which affect the decision-making process:

- "1. *Recognizing an occasion for decision, i.e. a need or an opportunity.*
2. *Analysis of the existing situation.*
3. *Identification of alternative courses of action.*
4. *Assessment of the probable consequences of each alternative.*
5. *Choice from among alternatives."*⁽³⁾

When these five activities are placed within a budgetary framework Smithies suggests that decision-making is a process which involves six stages: the determination of policy objectives; planning; programming; budget formulation; budget (or programme) execution, and budget (or programme) review.⁽⁴⁾ The steps proposed in this budgetary framework can readily be applied to the budgetary decision-making necessary in an Australian university or a public or private research and development organization. The only differences which emerge from these three types of organizations are the level at which approval can be given to implement the proposed budgetary plan. As highlighted in Chapter 2 the approval of

the proposed budgetary plan of an Australian university or a public research and development organization comes from outside the organization.

The need for an organization to pursue budget planning is consistent with a number of the activities Litchfield had suggested were a necessary part of the decision-making process. Budgeting does involve an examination of the existing position. In considering a course of action there will be alternatives that could prove equally beneficial. Where there are alternatives it is necessary to explore the consequences of each. Eventually, after assessing the pros and cons of each alternative course of action, a choice will be made. Essentially a budget plan is the outcome of choosing between competing choices. However, before proceeding further to consider budgetary applications, it is first necessary to review the origin and development of budgeting.

ORIGIN AND DEVELOPMENT OF BUDGETING

The word "budget" conjures up in the minds of most people a variety of different meanings. For some, it will relate to the financial planning a Federal or State government has decided on for the ensuing year, and can imply increased taxes, either direct or indirect, for the individual wage-earner. The Concise Oxford Dictionary, for example, associates the word "budget" with the annual estimate of revenue and expenditure of a country. Common usage of the word "budget", encouraged by media advertising, will prompt others to associate the word with the extent of personal planning necessary when buying a home, financing the purchase of a new motor car, or simply managing the family's weekly food bills. The need to "budget" to accomplish certain given ends attainable in the future is practised more widely today, throughout all levels of society, than hitherto. Yet, how the term "budget" was derived is probably least appreciated by those who incorporate budgeting in their planning approach.

The word "budget" is derived from the old French word *bougette*, meaning a small bag or pouch.⁽⁵⁾ When the English Exchequer of the medieval Court used a small white leather pouch to carry his seal, it was described as the Exchequer's *bougette*. With the passage of time the Chancellor of the Exchequer's proposals for financing government expenditure became known as his "budget", and phrases, such as to "open his budget", were used when he presented his proposals to Parliament.

Gradually the word "budget" came to be applied more to describe the Chancellor of the Exchequer's proposals and, today, any statement of plans and expectations involving future activities, where income is compared against revenue, is referred to simply as a "budget".

There are many and varied definitions which have been developed to describe a "budget". Perhaps the three which best describe the word "budget" in the planning sense are those advanced by Kohler. He advocates that the term "budget" implies: *"A financial plan serving as a pattern for and a control over future operations"*; *"... any estimate of future costs"*; or *"... a systematic plan for the utilization of man power, material or other resources"*.⁽⁶⁾ Implicit in these three definitions is the multiplicity of purposes which exist at the time budgets are being constructed.

The need to compare expenditure with anticipated revenue is now an important part of government fiscal planning. In preparing a "budget" a government is able to forecast whether a surplus of revenue over expenditure will occur or, if expected revenue is to fall short of approved expenditure, how the shortfall is to be financed. Where a shortfall is apparent the type of options available to government can include borrowing, or increasing direct or indirect taxes. The "budget" is also one means by which a government can regulate a nation's economy; either by injecting confidence in some sectors, e.g., imposing quotas on the importation of overseas manufactured goods or utilising tariff protection; or dampening activity in other areas, e.g., increasing the interest rates on borrowings or reducing favourable taxation concessions on plant and equipment replacements.

In reviewing the literature, which is devoted to the development of present-day budgetary techniques, what becomes apparent is the contribution and influence the United States of America has made in this field. The main reason for the extent of this influence appears to have evolved from the **Budget and Accounting Act** passed in the United States in 1921. Prior to the introduction of this Act, civic agitation for budgetary reform at all levels of government had been mounting throughout the previous decade.⁽⁷⁾ Not only did this Act furnish a statutory basis for improving fiscal procedures, but it permitted the President to establish the Bureau of the Budget. The future responsibility for preparing an integrated plan

of the U.S. Government's financial estimates was vested in this Bureau. An important aspect of the 1921 Act was to reverse the former trend toward departmental self-determination, by restoring to the President the control of fiscal planning and expenditure.

The influence subsequent Presidents, through the Bureau of the Budget, have had on introducing or supporting the continuation of particular budgetary techniques has tended to make some of these techniques more fashionable than others. The extent of this influence will be discussed more fully later in this Chapter when, for example, zero based budgeting is being considered. The apparent success of the United States in applying budgetary techniques to the fiscal planning process has encouraged other countries to adopt the practice. Most noticeable are Third World countries but, to a large extent, this move may be due more to securing funding from the World Bank which demands long range fiscal planning. A good example of one country which has devoted considerable resources to the integration of current budgetary techniques into the development of fiscal planning and strategy is the Philippines.⁽⁸⁾

With the Act of 1921 the initial period which followed in the United States was one that has since been described "... as the control era in which the emphasis was on legality and honesty."⁽⁹⁾ In effect, public budgeting was used as a device to control the financial activities of public officials.

At this stage it is relevant to consider some of the more commonly used budgetary techniques which have emerged since 1921. As alluded to earlier a number of these techniques enjoyed short periods of popularity, while others are still in vogue, or have been modified as a consequence of a critical appraisal of the application the technique was designed to serve. This Chapter will now attempt to extract the salient features of the budgetary techniques selected and, where possible, relate these to the experience of the users, and assess what benefits these experiences have to offer in applying the techniques to budgeting in an Australian university or a public or private research and development organization.

REVIEW OF RECOGNISED BUDGETARY STRATEGIES OR TECHNIQUES

INCREMENTAL BUDGETING

The "control era", which originated from the U.S. Budget and Accounting Act of 1921, was based on the approach that each "line-item" was considered against the previous year's financial allocation to determine if an increase or decrease was warranted. This budget technique has been described as **Incremental Budgeting**, somewhat of a misnomer, because the word "increment" signifies increase. As both increases and decreases are incorporated into this budgetary approach what is necessary is to distinguish between what can be termed "incremental creep" and "incremental ebb". In his analysis of the incremental method of budgeting Lindblom was able to prize out six important characteristics. The characteristics he extracted are:

- (1) only that limited set of policy alternatives that are politically relevant, these typically being policies only incrementally different from existing policies;
- (2) analysis of only those aspects of policies with respect to which the alternatives differ;
- (3) a view of the policy choice as one in a succession of choices;
- (4) the marginal values of various social objectives and constraints;
- (5) an intermixture of evaluation and empirical analysis rather than an empirical analysis of the consequences of policies for objectives independently determined; and
- (6) only a small number out of all the important relevant values. (10)

Incremental Budgeting is probably the least difficult budgetary technique to apply. "Incremental creep", in the form of higher costs for goods and services, is built on the budget estimates approved for the previous year. However, as Moss and Gaither have pointed out, this method of seeking approval to fund proposals fosters "power politics" and intrigue between the applicant organization and the funding authority. (11)

The main drawback of **Incremental Budgeting** is that it focuses on additional resources being requested,⁽¹²⁾ or "... *accepts the existing base and examines only the increments which extend the current budgeting program into the future.*"⁽¹³⁾ This precludes a review of the total resource allocation package, and discourages any incentive for operational efficiency, as economies achieved in one area cannot be re-allocated elsewhere.

Nevertheless, for governments **Incremental Budgeting**, in the form of "incremental creep", depicts a more gradual increase in funding, unsullied by breaks or steep upturns. It is the inflexibility, inherent with the **Incremental Budgeting** technique, which discourages its use in an Australian university situation because it is necessary to build-up an incentive system to permit a "... *degree of decentralisation of decision-making and flexibility of transfer between expenditure heads.*"⁽¹⁴⁾ Present financial stringencies being experienced in Australia, which brings with it a "static state" situation, do encourage the application of the **Incremental Budgeting** technique. However, this is over-ridden by the pressures within public and private organizations for greater efficiency and effectiveness in allocating resources. Within an organization certain aspects of activity could be budgeted for by applying the **Incremental Budgeting** technique. For example, where the activity remains within prescribed limits and no growth is likely. In this respect where **Incremental Budgeting** was used for such an activity it would need to be viewed as a sub-technique and be subservient to the main budgetary technique the organization had implemented. Operational efficiency would flow from the predominant budgetary technique and thereby overcome the main drawback of **Incremental Budgeting**.

FORMULA BUDGETING

The concept of **Formula Budgeting** is one which is better suited to resource allocation in a tertiary educational institution. The use of this budgetary technique for universities and colleges was first suggested by Trevor Arnett in his publication, **College and University Finance**, published in 1922. Arnett had noted that although many of the trustees serving on the boards of management of American universities were businessmen, accustomed to strict accounting and reporting procedures, they seldom

applied such accounting practices to the allocation of resources within the universities they served. Rather than focus attention on the relationships between activities and costs, Arnett formed the conclusion that budgeting, in a tertiary educational environment, had to be based on a system which, from the outset, enhanced the viability and effectiveness of scholars and students.

Later, towards the end of the 1930s, John Dale Russell developed and tested methods of systematically analysing tertiary educational institutions' expenditure. On the basis of the approach pioneered by these two researchers, the "modern" formula approach to budgeting first appeared in the early 1950s, with the development of the California faculty-staffing formula.

In a world more orientated to the use of definitions or recipes, a system which is geared to the formula approach is more readily understood and this allows it to enjoy an immediate psychological advantage. Budgeting by means of applying a formula, particularly in the area of higher education, is more readily acceptable because it tends to treat all participating factors equally. For example, by applying staff/student ratios as a basis for resource allocation, the size of a department, faculty or institution does not become the determining factor.

Probably one of the most lucid definitions of a "budget formula" is the one devised by Miller. He defines a "budget formula" as "... *an objective procedure whereby quantitative data dealing with the relationships between programs and costs are manipulated in such a manner as to arrive at an estimate of future budgetary requirements.*"⁽¹⁵⁾ There are three important points contained in Miller's definition which require amplification. By "objective procedure" Miller is implying that a "budget formula" presents the financial requirements of the organization factually and is unaffected by emotion, speculation or personal prejudice. The use of the term "quantitative data" encompasses the activities and needs of the organization in numerical or monetary terms. Finally, the inclusion of the word "manipulated" indicates there are alternatives which could be adopted to achieve the end result.

The three main advantages **Formula Budgeting** has to offer are: much of the uncertainty associated with resource allocation is removed; the time spent on competing for resources is substantially reduced; and cost

prediction becomes more viable.⁽¹⁶⁾ It will be recalled that in Chapter 2 mention was made of the approach adopted by the A.U.C. in 1972 to introduce funding based on EFTS. The greater reliance placed on using a formula approach to support recommendations made to the Commonwealth Government for the allocating of resources to Australian universities has two distinct advantages. Firstly, it demonstrates to the Government, and the Commonwealth Department of Finance in particular, that the basis of calculation is unbiased and not subject to skewness. Secondly, the approach is readily appreciated for it introduces a measure of fairness into a complex system which, otherwise, could attract widespread criticism.

While a **Formula Budgeting** approach can be applied to estimating the number of teaching staff required to satisfy enrolment predictions, a university could experience difficulty in maintaining a flexible approach to resource allocation if it relied solely on this budgetary technique. Resource allocation, based on the application of a formula, could become a bureaucratic entrenched process whereby departments or faculties with the largest number of students would enjoy a distinct advantage over small departments or faculties. An approach of this kind would generate conflict amongst teaching departments or faculties and could lead to a situation where some departments or faculties would seek to have their post-graduate students accorded greater value than under-graduate students, when the formula determinants were being devised. Alternatively, those departments or faculties which attract few students will, as Dufty points out, be *"... forced into using meaningless phrases such as 'academic balance' in the absence of objective criteria."*⁽¹⁷⁾

It would seem that in a situation where the T.E.C. has a responsibility to place before the Commonwealth Government recommendations which consolidate the triennial funding sought by the present 19 Australian universities, the adoption of formulae, based on staff/student ratios (e.g., EFTS or WSU [weighted student unit]), is both logical and even-handed. However, within the tertiary educational institution itself, and particularly where research needs to be separated from teaching loads, **Formula Budgeting** is linear in its approach to funding. If Australian universities maintain a "steady state", or enrolments gradually decline over the next decade, less funding, in real terms, will be generated by persevering with a formula approach.⁽¹⁸⁾ Furthermore, Australian universities must retain flexibility within their own fiscal decision-

making structures to permit the funding of teaching and research activities which, to society at large, may not appear to have any immediate practical use.

The main advantage of **Formula Budgeting** indicated earlier in this section offers a budgetary technique suitable for use in a large scale public research and development organization, such as the C.S.I.R.O., where research activity is conveniently isolated into divisional groupings. The use of **Formula Budgeting** removes the uncertainty associated with resource allocation, reduces the amount of time having to be spent on the allocation of resources, and permits cost prediction.

Unlike Australian universities these large organizations do not have a unit of measurement, e.g., students, which permits the application of the formula approach that discounts the size of the division. Possibly each research project could become the unit of measurement. The difficulty with this approach is the likelihood that larger divisions would generate more research activities than the smaller sister divisions. The end result would be the continuation of the financial advantage of the larger divisions. The phasing out of completed research activities and the phasing in of new research activities also suggests **Formula Budgeting** does not allow the extent of flexibility the organization would require to re-arrange and redirect resources to cope with the changed circumstances.

A similar argument can be tendered in respect of the private research and development organization. Nevertheless, in the private organization the profit motive is the underlying factor which effects the distribution of resources. Management can, more readily, ignore sound budgetary practice and channel additional resources to a particular section of the organization if it is convinced the injection of additional funds will result with lasting long-term benefits.

Formula Budgeting is a budgetary technique which, undoubtedly, is better suited to organizations having a unit of measurement which pervades the whole organization. Similar to **Incremental Budgeting** it would be possible to apply **Formula Budgeting** as a sub-technique of a more dominant budgetary technique.

PLANNING-PROGRAMMING BUDGETING (PPB)

The third budgetary technique to be considered in this Chapter will be

Planning-programming Budgeting (PPB). A form of programme budgeting had been developed by the U.S. industrial firm DuPont during World War I, and by General Motors in the early 1920s.⁽¹⁹⁾ However, when Henry Ford II assumed control of the Ford Motor Company at the end of World War II, he enticed several executives of General Motors to join him and help solve the very serious financial problems facing his company.

These executives introduced to the Ford Motor Company the budgetary techniques which had been used at General Motors. Complimentary with this step, Henry Ford II recruited a group of ex-airforce officers, known as the "Whiz Kids", to assist with the planning involved. One of these "Whiz Kids" was Robert S. McNamara. When McNamara later became Secretary for the U.S. Department of Defense, he enlisted the aid of the Rand Corporation and, in 1961, introduced programme budgeting throughout his Department.⁽²⁰⁾ Initially PPB was regarded as a management system, and this probably accounts for the abbreviation PPBS, which appears in some of the literature on this topic, to describe the system as a whole rather than its separate and distinct characteristics.

By 1965 this budgetary technique had proved so successful in the Department of Defense that President Johnson *"... directed that planning-programming budgeting be implemented in the remainder of the agencies of the Federal Government and ... encouraged State and local governments to adopt this system."*⁽²¹⁾

A review of the literature dealing with PPB emphasises the difficulty writers have experienced in providing a simple definition of this budgetary technique. Benveniste describes programme budgeting as *"... the application of systems analysis to budgeting so that resources used as inputs are justified in terms of specific program goals (outputs)."*⁽²²⁾ Whereas Smithies' description is more sweeping for he regards programme budgeting as involving *"... the use of budgetary techniques that facilitate explicit consideration of the pursuit of policy objectives in terms of their economic costs, both at the present time and in the future."*⁽²³⁾

Rather than tease out an acceptable definition, a more meaningful understanding will be gained if an outline is provided of the main elements of PPB, and how these contribute towards constructing a budget. Else and Marshall have identified three main elements: These are:

- (1) the various activities are grouped into programme

categories (the programme part of this budgetary technique);

- (2) from the programme a plan can be produced which includes details of how the programme is to be financed (the planning part); and finally,
- (3) each area of the organization involved in nominating a programme will then submit an argued case, justifying the reason why the programme should be funded (the budgeting part).⁽²⁴⁾

In working towards accomplishing the requirements of these three elements a number of the essential aspects of PPB emerge. Firstly, each objective needs to be specified carefully, and then the total objectives be subject to systematic analysis. Secondly, relevant alternatives should be explored and examined if, for no other reason, than to ascertain whether there are other ways and means of achieving the objectives determined. Thirdly, each alternative needs to be costed, including both direct and indirect costs, highlighting what commitment would be involved beyond the first, or active, budget year. Fourthly, each alternative needs to be assessed on its effectiveness, and measured on how close it comes to satisfying the desired objective. Finally, a comparison and analysis is made of the alternatives, with the view of selecting "... *that combination of alternatives that promises the greatest effectiveness, for given resources, in achieving the objectives.*"⁽²⁵⁾

The essential feature of PPB is that this budgetary technique focuses on the process of comparison and co-ordination, and permits the revision of objectives, programmes and budgets in the light of changed circumstances and experience.⁽²⁶⁾ It is an "output budgeting" technique⁽²⁷⁾ and, when used in an educational environment "... *translates longer-term macro-educational plans into more concrete action and budgetary terms for shorter periods and for particular sub-systems.*"⁽²⁸⁾

In assessing the PPB technique what does become apparent is its highly structured nature for use in long range planning. This implies little opportunity for input from the lower levels of management, and a corresponding lack of understanding at this level of management for "... *transforming goals and objectives into a workable budget.*"⁽²⁹⁾

The fact that PPB "... implies a highly centralised decision-making structure which is fundamentally bureaucratic in character"⁽³⁰⁾ is the chief obstacle for this type of budgetary technique to be used in an Australian university setting, where the present organizational structure, based on collegial lines, generally precludes decisions being taken before widespread consultation has occurred. Nevertheless, there are certain facets of the PPB budgetary technique which could be adapted by Australian universities. The grouping of various activities into programmes, and the need to justify each activity, would assist Australian universities in satisfying their "public accountability" obligations.

The difficulties foreshadowed for the public research and development organization, such as the C.S.I.R.O., in adopting the Formula Budgeting technique would be almost removed if PPB was introduced. The advantage PPB would enjoy in a C.S.I.R.O.-type organization is its ability to accommodate research programmes and prove flexible enough to adjust to change. Each research programme becomes a budget feature, uninfluenced by size and research dimension. The prime difficulty that would emerge would be the lack of opportunity lower echelons of management were given to contribute meaningful input into budgetary development.

This difficulty would also prove a drawback for the private research and development organization. The main attraction to the private organization of PPB as a budgeting technique is its highly structured nature, tailored to central decision-making. In these circumstances only management would be fully conversant with the organization's budgetary position, thereby enhancing its position of power in the organization's structure.

ZERO-BASE BUDGETING (ZBB)

The last budgetary technique to be considered in this Chapter will be that of Zero-base Budgeting (ZBB). This technique is one of the more recent to emerge in the United States with Presidential blessing. In fact, it was President Jimmy Carter who issued a directive on Valentine's Day, 1977, that ZBB was to be adopted throughout the U.S. Federal Government.⁽³¹⁾ Why did this budgetary technique receive so much enthusiastic support initially, only to attract cynical comment a few years later with such observations as:

"Medicine shows are back. Modern-day drummers are promoting zero-base budgeting as the latest snake-oil cure for financial ills."⁽³²⁾

A budget approach, similar to ZBB, was first advocated by Verne Lewis in 1952.⁽³³⁾ Later, in 1970, Peter Phyrre published an article in the *Harvard Business Review*, entitled "Zero-base Budgeting", which described the implementation of this budget technique to certain sections of Texas Instruments Inc.⁽³⁴⁾ Prior to being elected Governor of the State of Georgia, in November 1970, Jimmy Carter had campaigned on the central issue of re-organizing Georgia's State Government.⁽³⁵⁾ On assuming office, he began restructuring the financial management of the State, and invited Peter Phyrre to Atlanta in February, 1971 "... to discuss the feasibility of installing this system in the State government of Georgia."⁽³⁶⁾

Similar to PBB various descriptions have been used in an attempt to define accurately the meaning of ZBB. Based on Phyrre's work with the State of Georgia, he defines ZBB as:

"An operating planning and budgeting process which requires each manager to justify his entire budget request in detail, and shifts the burden of proof to each manager to justify why he should spend any money. This procedure requires that all activities and operations be identified in decision packages which will be evaluated and ranked in order of importance by systematic analysis."⁽³⁷⁾

An alternative definition is provided by Benveniste, who regards ZBB as being "... budgeting based on the assumption that all programs have to be rejustified anew (i.e., we start anew each year with zero budget and justify all activities). Therefore, in theory at least, zero base budgeting should rely on evaluation to provide justification that each program and activity is achieving the desired objectives."⁽³⁸⁾

The only major difference between these two definitions is the importance Phyrre placed on the input each manager, at whatever level in the organization's structure, will contribute to the formulation of the total budget. This is one of the important differences between PPB and ZBB. As highlighted earlier in this Chapter, the PPB approach is geared to budgetary formulation by senior management adopting an overview

approach. Whereas, ZBB relies on the contribution any manager, with a responsibility for a budgetary activity in the organization, to justify the funding of his activity of operations for the budgetary year, or the period under assessment. Hence, wider participation throughout all levels of management is a key factor of the ZBB budgetary technique.

In general terms ZBB concentrates on three main organizational activities. These activities are:

- (1) the goals the organization wishes to achieve;
- (2) the activities determined by the organization to achieve these goals; and
- (3) what resources are necessary to fund the priorities determined by the organization.

There is, however, an alternative approach. Based on the original conception of ZBB, decision packages are placed within three levels of alternative funding. The three funding levels are:

- (1) a Minimum level;
- (2) a Current level; and
- (3) an Improvement level.⁽³⁹⁾

The "Minimum level" represents the level below which the programme cannot fall and remain viable; the "Current level" represents the present level of funding being received by the organization; while the "Improvement level" is the cost of funding the packages which have been incorporated in the "improvement" plan. This approach serves to highlight a basic problem which has been encountered by the users of the ZBB budgetary technique - the problem of costing "Improvement level" packages at too high a percentage of the "Current level".⁽⁴⁰⁾

Taking as the broad outline the three main organizational activities isolated above, it is possible to identify the progressive steps the ZBB budgetary technique follows. These identifiable steps are:

- (1) clarification of organizational goals and objectives;
- (2) examination of existing structure, functions, and activities;
- (3) identification of decision units;

- (4) development of decision packages;
- (5) review and ranking of decision packages; and
- (6) preparation of a budget.⁽⁴¹⁾

In considering these steps, and what is involved to achieve them, it helps clarify one issue which relates to the terminology - zero-base - incorporated in the description of this budgetary technique. The words "zero-base" are a misnomer. ZBB is not "... the act of starting budgets from 'scratch', or requiring each program or activity to be justified from the 'ground up'".⁽⁴²⁾ Rather "ZBB refers to the review and justification of selected, not all, current program elements starting somewhere at a point in the base area and not necessarily at 'zero base'".⁽⁴³⁾

More importantly, ZBB, as a budgetary technique, offers an organization the opportunity for increased communication between top, middle and lower management to achieve greater efficiency and effectiveness in the operations of the activities or programmes.⁽⁴⁴⁾ In this way it recognises the contribution "program managers" can make to an organization's well-being because they "... have more in-depth knowledge of program requirements, maintenance needs, intended and unintended outputs and potential program impacts than do the budget and fiscal personnel."⁽⁴⁵⁾

With the many benefits flowing from the ZBB budgetary technique it would seem, at first glance, that such a budgetary approach could have application in any large scale research and development organization. It will be recalled that ZBB relies heavily on a number of organizational characteristics. Two of these were goals and activities (or packages). It is the "goal" aspect which would present difficulties for an Australian university to adopt ZBB. As Dufty has so poignantly reminded us, "... very few universities and similar organizations have specifically and operationally identified their objectives. Most statements of goals and missions are couched in vague generalities such as 'to provide a liberal education', 'to foster an integrated approach to knowledge', etc."⁽⁴⁶⁾ Even if Australian universities adopted Etzioni's approach of utilising real goals for the purpose of ZBB budgeting, thereby omitting stated goals from budgetary consideration, the obligation to adhere to a university's Act or Statute could be placed in jeopardy and attract criticism on "public accountability" grounds.

A second difficulty could arise for Australian universities in the ranking of activities or packages in an order of priority. It is also probable that the multiplicity of activities, so much a part of normal university operations, would prove so large that the number would become unmanageable.⁽⁴⁷⁾ Furthermore, the extent of supporting documentation (paperwork), which would prove necessary to permit judgements to be exercised in ranking priorities, would be more time-consuming than the end result warrants, having regard to the manner in which the collegial system operates.

There are two further reasons which Anthony believes need to be taken into account when assessing the value of ZBB. From his investigations into ZBB Anthony points out that a "*... budget process is not primarily a ranking process. It is primarily the fine tuning of an approved program.*"⁽⁴⁸⁾ For this reason he believes ZBB goes further than being a new budgetary technique. Anthony also notes that ZBB does not interface with any accounting system.⁽⁴⁹⁾

Despite these drawbacks ZBB, similar to PPB, has a number of attractive features which would prove of value in drawing up the budgets of Australian universities. The improvement of communication between all levels of a university's structure, and wider involvement of those at the "work face" in assisting with budget planning and development, has many advantages. Not least of all would be a better understanding of resource allocation throughout a campus community, where existing systems tend to be covered in mystique or appear incomprehensible.

For an organization of the C.S.I.R.O. model ZBB is attractive because of the involvement of management throughout the various levels of the organization's structure. As each level of management is involved in the budget planning process this would lead ultimately to improved communication, both upwards and downwards. Research activities would be subject to more regular scrutiny, allowing unused resources to be detected quicker and be re-allocated elsewhere.

The practice of establishing research projects, or decision packages, within the various divisions of the C.S.I.R.O. provides the type of "goal" envisaged under ZBB. Nevertheless, that Organization, similar to an Australian university, would need to highlight the distinction between real goals and stated goals when reporting annually to its responsible

Minister.

The depth of involvement required by ZBB in the budget formulation task is most likely to discourage the adoption of this budgetary technique by a private research and development organization. Participation by junior management in the budgetary process could encourage the questioning or criticism of decisions eventually taken by top management. This is where PPB enjoys an advantage over ZBB. One factor in favour of ZBB for the private organization is that this budgetary technique cannot be interfaced with any accounting system. Consequently, having two separate systems - the accounting system on the one hand, and the budgetary system on the other - would avoid top management in a private organization having to disclose comparisons of actual expenditure against budgetary forecast.

The application of the ZBB budgetary technique appears to be better suited to the public research and development organization where goals, activities or decision packages imply the same thing and the "public accountability" obligation can be satisfactorily answered.

CONTROLLING ORGANIZATIONAL OPERATIONS BY BUDGETARY MEANS

Earlier in this Chapter the point was made that, in essence, a budget plan is the result of making a selection between competing choices. This statement is too simplistic. A more definitive description of what is intended by the use of the term "budgeting" has been developed by Lee and Johnson. These researchers have offered the following description:

"Budgeting is intended as a mechanism for setting goals and objectives, for identifying weaknesses or inadequacies in organizations, and for controlling and integrating the diverse activities that are carried out by numerous subunits within large bureaucracies, both public and private. Budgeting is a means by which complex organizations can be guided to produce intended consequences."⁽⁵⁰⁾

This broad description suggests that a "budget" can be used to serve a number of purposes. It is possible to extract four such purposes:

- (1) a budget can amount to a plan, which sets out the proposals and decisions for those in control of an

organization's operations;

- (2) a budget may be a **forecast** of the results expected rather than be an expression of deliberate intentions;
- (3) a budget may be the **authorization** which permits the organization to proceed on a certain course of action;
- (4) a budget may act as the **yardstick** to measure the efficiency of the organization's operations.⁽⁵¹⁾

In fulfilling either of these purposes a point which needs to be clarified is the unit of measurement used to compile a budget. The use of monetary terms is the most common because *"Money is usually the simplest common unit in which to summarize all the diverse activities of a business, government or other authority"*.⁽⁵²⁾ However, there are other units which can be used in the preparation of budgetary information: for example, man-years, hours of work, or staffing numbers, could prove more meaningful where manpower planning is under examination. The use of weight and volume may be of more relevance for the forecasting of mine or quarry operations.

Although there are significant differences between the operational approach of an Australian university, a public research and development organization and a private research and development organization, the method necessary to develop a budgetary strategy for each organization will be similar. Either of these types of organizations will need to view the budget as the master-plan for allocating limited resources between different and competing activities. Implicit in this approach is that the finance available for funding activities will be less than the total package of activities proposed. The limitation on the funds available contributes to a situation where each activity is in competition with the others.

For the Australian university and the public research and development organization the budget is the plan of the organization's activity. Once the plan is approved it becomes the authorization for the organization to proceed and spend moneys on manpower, the purchase of equipment or the acquisition of services. The private research and development organization will use the budget for an additional purpose. In this setting the budget

will provide the forecasts necessary to guide management in determining policy concerning production output; the setting of prices, geared to the cost of production; and what capital expenditure outlays will prove necessary during the duration of the budget period.

The purpose for which a budget is to serve seems to fall into two parts, depending on the type of organization involved. The Australian university and public research and development organization regard their approved budget as the justification for proceeding with expenditure on the activities included in the budget plan. The budget is both the justification and the vehicle by which these organizations can account to the public over the use of taxpayers' money. On the other hand, the budget of a private research and development organization is geared more to minimising the cost of production to maximise profits. In short, the budget of a private organization aims to yield a surplus of income over expenditure.

The means whereby the operations of an Australian university, the public research and development organization and its counterpart in the private sector can be controlled, will now be examined in more individual detail.

UNIVERSITIES

The overall method of funding Australian universities in recent times has remained unchanged, although successive Commonwealth Governments have introduced subtle variations. The Murray Report of 1957 had recommended to the then Commonwealth Government that a system of triennial funding of Australian universities would lead to greater efficiency in the allocation of resources and further proposed there be "*... introduced to Australia the method of consultation that was used by the Universities Grants Committee in Britain*".⁽⁵³⁾

Triennial funding had the advantage of providing adequate lead-time for the acquisition of expensive equipment items, commensurate with the up-grade of technology Australian universities were so badly in need of, and the orderly planning of building expansion. From 1961 to 1975, despite the rejection by the Commonwealth Government of the A.U.C. Report of the 1967-69 triennium (the Third Report),⁽⁵⁴⁾ some growth in annual recurrent grants was included and this permitted modest expansion. If anything, the

inclusion of funds, which enabled modest expansion, discouraged Australian universities from experimenting with the redirection of existing resources. The conclusion which can be drawn from this experience is that where a growth component is included in financial allocations little pressure is exerted on an organization to re-assess the value and worth of existing programmes.

One of the subtle changes alluded to earlier in this Section was the suspension of triennial funding to Australian universities by the Commonwealth Government in 1976. The concept of the "rolling triennium" was introduced, which virtually amounted to no more than allocating finance to Australian universities on an annual basis.⁽⁵⁵⁾ The approach taken by the government triggered off uncertainty in the planning phase followed by Australian universities. The degree of uncertainty meant that new undergraduate courses or new research programmes Australian universities were keen to establish could lack continuity because there was no guarantee that future funding would be forthcoming.

Nevertheless, the "rolling triennium" approach did force Australian universities to examine their existing under-graduate courses and research programmes. New courses and research programmes could only be introduced at the expense of hiving-off some former activities.

The subtle changes adopted by the Commonwealth Government in its approach to the funding of Australian universities touch on one of the fundamental phenomena the study of organizations has revealed. The organizational theorist, Mary Follett, spent much of her time examining the effects of change experienced by organizations. Her interest had been attracted to the manner orders are given in an organization, and how these orders are received and obeyed at the various levels of an organization's structure. Follett observed that many workers, operating at all levels within the organization's hierarchical structure, were reluctant to accept change. She concluded that to overcome the reluctance apparent three strategies had to be implemented by management: *"(1) build up certain attitudes; (2) provide for the release of these attitudes; (3) augment the released response as it is being carried out."*⁽⁵⁶⁾

The paradox which emerges is that while universities, as organizations, are able to cope with and adjust to change where it concerns teaching and research, Australian universities had not prepared, nor had they conditioned

themselves, to meet and adjust to a contraction in resource allocation.

The situation facing Australian universities since the mid-1970s can be considered from a different perspective. It involves relating the study undertaken by Burns and Stalker in the early 1960s to one of the conclusions this study revealed, in that, self-started innovations originating within an organization are more likely to succeed rather than those which are super-imposed on the organization from outside. Burns and Stalker's study centred on a scheme whereby young engineers and scientists, who showed promise, were seconded to a major government contractor located in central Scotland who produced electronic components. The aim of the secondments was to permit the young men to gain valuable on-the-job experience so that, when they return to their own firms, they would bring with them the research and development skills they had acquired. What surprised management was the scheme's inability to achieve the initial aim.

Following their investigations Burns and Stalker found that when innovation was introduced success was dependent on "*... the management and decision structure of the firm - the way jobs were distributed, the way information was channelled, the way problems were dealt with.*"⁽⁵⁸⁾ The Burns and Stalker findings are analogous to the situation Australian universities found themselves in when limitations were being super-imposed from without. But there was a further difficulty. Acting within the collegial-type approach, Australian universities relied on the committee system. These committees could agonise for days over deciding whether to introduce a new teaching course or float a new research programme in the full knowledge that funding limitations imposed from outside would pre-condition the outcome. Restrictions, over which no control was possible, were being placed on the kind of inputs Australian universities were accustomed to in their decision-making processes. If the government, through the T.E.C., had given Australian universities more lead-time to prepare themselves for the adjustments necessary to operate under a "rolling triennium" arrangement a smoother transition period would have occurred, and much critical comment of the high-handed attitude displayed could have been avoided.

The "rolling triennium" phase continued until the end of 1979. Despite criticisms of the "rolling triennium" concept it would seem that during the four years of its operations the T.E.C. was able to develop a

variety of cost indices having relevance to educational expenditure. Australian universities were also spared the problem of having to earmark funds for future upward salary movements. The T.E.C. provided additional funds to supplement salary costs where increases occurred as a result of periodic National Wage Case decisions, approved award movements or decisions handed down by the Academic Salaries Tribunal.

The A.U.C., and its successor the T.E.C., have both, from time to time, issued a variety of warnings to Australian universities on the trends it has perceived. In paragraph 9.11 of the A.U.C.'s Fifth Report (the 1973-75 Triennium), the warning given was:

"The Commission points out that if a university enrolls substantially fewer students than those for whom the grants provide, it will be receiving funds at an unnecessarily high level and may become committed to levels of expenditure which cannot be sustained in following triennia."⁽⁵⁹⁾

The application of the EFTS or WSU formulae is a means the T.E.C. has to measure any variation to student numbers when compared with the grants provided. The T.E.C., acting in both the co-ordinating and watch-dog role conferred on it by the Commonwealth Government, discourages duplication of activity amongst Australian universities, and more particularly if investigations reveal that the circumstances do not support the introduction of a nominated teaching course or research programme.

Today an Australian university is only involved in two stages of the budgetary process - the preparation and execution stages. Apart from the "balancing" and watch-dog roles performed by the T.E.C., an Australian university can only exert meaningful budgetary control at the preparation stage.

During the planning phase of a budgetary plan an Australian university must pay regard to circumstances likely to bring about change. One important factor that can contribute significantly to change in a university environment is the attitude of students. Little's survey of a sample of student opinion undertaken in 1967 provided evidence that students were "... calling for courses that are personally and socially more relevant, and for teaching arrangements that are more responsive to those who are the learners".⁽⁶⁰⁾

The fact that a number of students were choosing to opt out of

university studies did encourage a number of researchers to investigate the reasons. Lawrence undertook an exploratory study at Monash University in 1972,⁽⁶¹⁾ and later, Williams and Ainsworth carried out a more in-depth study of the position being experienced at the University of Sydney in 1975.⁽⁶²⁾ Four main reasons emerged from the Williams and Ainsworth Study - financial; illness; not coping; and changes to the student's life goals.⁽⁶³⁾

The reason, "changes to the student's life goals", attracts particular attention is because over the past five years many students, after completing their secondary education, are more concerned about finding a job than proceeding to study at the tertiary level. Evidence available at present suggests Australian universities face a further challenge in competing with the Colleges of Advanced Education. The Colleges offer courses which are more industry orientated, thus increasing the potential of the student to gain employment on graduation.

The changed circumstances connected with student enrolment at Australian universities are unlikely to vary while unemployment in Australia remains high. The T.E.C.'s Report on the 1982-84 Triennium reflects the view presented by Australian universities to the Commission. Paragraph 3.43 of that Report reveals the extent of the widespread concern:

"Universities generally consider the current economic circumstances to be a major factor influencing school-leavers not to enter universities, at least as full-time students directly from school. In a period of high unemployment, a number of school-leavers who would normally be expected to enter universities, are seeking and obtaining employment ... Universities also believe that students are seriously questioning the relevance of a university education compared with other forms of post-school training open to them."⁽⁶⁴⁾

The increasing numbers of part-time and mature-age students enrolling at Australian universities⁽⁶⁵⁾ has helped stabilise student numbers but this development has required universities to offer lectures and conduct tutorials at times more convenient to part-time students with work commitments. As Australia moves towards the 21st Century universities will be forced to improve on their long range planning forecasts. One area of

vital concern to Australian universities will be demographic patterns. If "zero population growth" becomes a feature of the future Australian society there is every likelihood that Australian universities will need to depend more on part-time and mature-age students making up their overall student mix.

Finally, there is one additional factor which has a bearing on the means by which Australian universities can control their budgets. The rapid expansion of Australian universities in the immediate post World War II years brought about unprecedented growth. A similar experience occurred in the United States. Dresch has noted that in America "*... the experience of growth also encouraged the development of growth-dependent structures and relieved the educational establishment of the need to devise adaptive mechanisms that did not rely on growth for their effectiveness*".⁽⁶⁶⁾ Dresch goes on to observe that "*... the evolution of tenure practices and policies necessarily was influenced critically by the experience of virtually uninterrupted growth*".⁽⁶⁷⁾

In its 1982-84 Report, the T.E.C. noted that when 1979 is compared with 1977 the number of tenured positions at Australian universities had declined.⁽⁶⁸⁾ The T.E.C. went on to conclude that "*... some universities have made little or no use of limited tenure appointments while others have made a significant number of their recent appointments in this way*".⁽⁶⁹⁾ Nevertheless, the T.E.C. urged caution and has suggested that "*By judicious use of different types of appointment universities should be able to restore in a reasonable time a proper balance to their staffing structure*".⁽⁷⁰⁾ The use of "fractional" and fixed term appointments in the future, and the encouragement of existing staff to avail themselves of early retirement, are some of the means Australian universities can initiate to achieve greater flexibility in the distribution of resources. Early retirements, however, do carry financial penalties in the form of superannuation and accrued long service leave payments.

By exercising control of the budget an Australian university is able to ensure the approved budgetary plan is maintained. This assists the organization to satisfy the extent of "public accountability" expected of it. However, if the Commonwealth Government should decide that the future approach to the funding of Australian universities continue in a "static state" mode, these organizations may be forced to solicit funds from elsewhere if research programmes are to be maintained at the desired level.

One important aspect of such an eventuality would be the need for Australian universities to avoid becoming the hand-maiden of their benefactors.

PUBLIC RESEARCH AND DEVELOPMENT ORGANIZATIONS

In Chapter 2 the point was made that public research and development organizations are established by government to meet a particular need. The instrument which establishes organizations of this kind in Australia is by an Act of either the Commonwealth, or one of the State Parliaments. For the purpose of this examination the focus will be on a public research and development organization established by the Commonwealth Parliament. The main reason for selecting a public research and development organization of this kind is the role it is expected to perform of a national character.

Earlier two examples of this type of organization were singled out - the C.S.I.R.O. and the A.A.E.C. Both of these organizations are accorded legal powers under their separate Acts to assume certain responsibilities and undertake particular functions. In devising these responsibilities and functions the emphasis has been placed on those activities which incorporate matters of national involvement or importance. Generally, these responsibilities and functions are expressed in very broad terms. As a consequence, the executive management of these organizations have the task of interpreting these responsibilities and functions into individual activities or programmes.

Undertaking the activities and programmes expected of these organizations can be discerned more readily and, for that matter, be controlled easier, if the activities and programmes are grouped together and enjoy a common thread. The method used widely in complex organizations is to group activities together, according to specialization, as Divisions, Branches or Units. Divisions and Units comprise the research component of the C.S.I.R.O.'s organizational structure; although these are clustered together and slotted into five Institutes, responsible for a broad area of research interest.

In the C.S.I.R.O. each Institute is the responsibility of a Director who, in turn, is answerable to the Organization's Executive. Annually, each Division prepares a budget plan of the anticipated expenditure associated with its area of responsibility for the forthcoming financial year. The

bulk of the funding sought will be to sustain research work in progress. Nevertheless, new activities are nominated, as the occasion demands, to fulfil the obligation the Organization has to assist primary and secondary industries. The research requests prepared at Divisional level are then consolidated into a draft budgetary plan of the Institute. Prior to the Organization's overall budget being finalised for presentation to the Executive for consideration some additions, deletions or variations can occur at Institute level.

While some contribution has been forthcoming at the junior level of management in developing the Organization's draft budgetary plan, the budget which will eventually be submitted to the responsible Minister for approval,⁽⁷¹⁾ will be the one that has the support of the Executive. The responsibility conferred on the Organization's Executive touches on the matter of "leadership" when considered within an organizational theory context.

The Executive of the C.S.I.R.O. consists of a Chairman and eight other members, of which five need to possess scientific qualifications,⁽⁷²⁾ and are appointed by the Governor-General. The Chairman and four other members are full-time appointees. As the appointments are made by the Governor-General (generally, on the recommendation of the Government), individuals within the organization have no opportunity to influence the outcome. This is in sharp contrast to the manner in which an Australian university appoints its chief executive officer - the Vice-Chancellor.

The requirement of Section 11(4) of the Organization's Act that "*five members of the Executive possess scientific qualifications*", is not inconsistent with Gouldner's theory of group tensions. The emphasis placed on the need for five out of the total Executive membership of nine to have scientific qualifications is an indication that interest groups will endeavour to maintain their influence in a particular power base by ensuring their own kind are appointed to positions where power is exercised. The pattern of making appointments in this manner, Bellows maintains, "*... stems from the inter-action of the group members out of which group goal-seeking behavior emerges.*"⁽⁷³⁾ An appointee to the Executive of the C.S.I.R.O. would be placed in the situation Gouldner has highlighted of having been the actor of latent roles in the past and now becoming the performer of manifest roles on assuming the duties of the new position.⁽⁷⁴⁾

Herzberg, on the other hand, would approach the matter of leadership expected of a member of the Executive from a different direction. On his premise that "... leadership is a characteristics of the individual who exercises it ...", he would go on to stress "... that a leader will be able to lead a given group only if the characteristics of this group are such that his kind of person can be its leader, and if the group accepts this leadership."⁽⁷⁵⁾

In an organization, such as the C.S.I.R.O., where emphasis is placed on the scientific nature of the research, the reasons supporting the government's decisions to have an Executive with a strong scientific background is understandable. At the least a substantial part of the Executive will comprehend the general thrust of the research, even if the fine detail proves unfamiliar. The scientific bond existing in the C.S.I.R.O. is sufficient to achieve for a member of the Executive the situation which Bellows suggests: "... the creative leadership style must pervade the entire organization; the organization must be immersed in it. Mutual goals and understanding must be present up and down and across the system."⁽⁷⁶⁾ Nevertheless, a leader can influence the organization he is associated with, either by the quality of decisions taken, or the individualistic style displayed in his leadership role.⁽⁷⁷⁾

When the Executive of the C.S.I.R.O. comes to the task of considering the draft budgetary plan they will be conscious of two prime areas of planning input. The first area of input will be generated from the Organization's five Institutes, where the Executive will be alerted to programmes that are being wound down or phased out. Detail concerning the introduction of new programmes will, generally, be accompanied by explanatory notes and an indication of their anticipated duration. The second area of input may flow from government sources. An example of this kind of activity could involve researching ways and means of reducing soil erosion, so evident in the recent drought experienced in Australia. If this project is accepted by the Executive as one requiring a high priority, the draft budget plan of the Division of Soils in the Institute of Biological Resources, may need to be varied or modified.

The Executive is faced with the task of balancing the choices it has before it with the resource allocation likely to be appropriated by the Parliament. With the scientific qualification bias reflected in the membership of the Executive, care must be exercised to avoid the situation

Etzioni suggested could occur in a professional organization where: *"A professional may endanger the integration of the professional organization by over-emphasizing the major goal activity and neglecting secondary functions."*⁽⁷⁸⁾

The Executive of the C.S.I.R.O., in effect, undertakes a "fine-tuning" exercise of the draft budget referred to it. This is where the control aspect of this phase of the budget is exercised. What emerges is both a budget plan and a budget forecast. Further control of the budget will prove possible when the implementation stage follows its authorization.

PRIVATE RESEARCH AND DEVELOPMENT ORGANIZATIONS

A private research and development organization enjoys a distinct advantage over a university and a public research and development organization. This type of organization is able to handle "in-house" all of the stages associated with a budget - from the preparation stage, through to the authorization and implementation stages. The "in-house" capability also means that during the period a budget plan is designed to serve it is easier for adjustments to be made to the plan in the light of experience.

Viewed in an organizational context the private research and development organization embodies all those characteristics which are apparent in other complex organizations. Each private organization will vary slightly, mainly due to the individualistic style displayed by its top management. In some private organizations the organizational structure will accord with Weber's bureaucratic theory, in that, one line of authority stretches from top to bottom. Such an organization *"... may be very complicated and have many branches, but it always has one center of authority where final decisions are made and conflicts can be resolved."*⁽⁷⁹⁾ Where these circumstances exist Etzioni points out that: *"The main authority line is directly related to the primary goal activity of the organization and only individually to secondary (means) activities."*⁽⁸⁰⁾

The one centre of authority approach practiced in some private organizations is both favoured and reinforced on the grounds that the goal of the organization is to make a profit. In this regard Etzioni observed that:

"Profit-making might be selected because they believe that it is the way for them to fulfil their personal or departmental

goals, or because they believe in principle that a private enterprise should make a profit."⁽⁸¹⁾

Earlier in this Chapter it was pointed out that the budget of a private research and development organization is geared more to minimising the cost of production to maximise profits. Profitability is the main criterion used in a private organization to measure success. But this end result cannot occur as a matter of course. The main factor which affects the private organization is market forces. To a large extent the impact of market forces is beyond the control of the private organization because "Output is dictated by what the producer can sell and how much the consumer is prepared to pay for it."⁽⁸²⁾ The demand pattern which emerges forces the private organization to regulate its output and prices to the extent that in the long run income will exceed expenditure.

After investigating many different types of organizations Etzioni has concluded that there is a need to distinguish what is meant by "effectiveness" as distinct from "efficiency". The distinction between the two he proposes is:

"The actual effectiveness of a specific organization is determined by the degree to which it realizes its goals",

while,

"The efficiency of an organization is measured by the amount of resources used to produce a unit of output."⁽⁸³⁾

From this Etzioni is able to conclude that: "Efficiency increases as the costs (resources used) decrease".⁽⁸⁴⁾

While this rule of thumb is rational, it is not without its problems. Etzioni foresaw the most immediate flaw when he noted that: "An efficient company might make no profits, perhaps because of a declining market, and an inefficient one may return a high profit, because of a rising market."⁽⁸⁵⁾ At the other end of the scale is the situation where efficiency may be increased by producing more goods but the quality of the goods produced may prove to be inferior.

The success of the private organization is almost totally dependent on the market. While favourable public relations, in the form of sound advertising techniques, can prove helpful this means is insufficient to capture the total potential market. What this implies is that the manage-

ment of a private organization is unable to regard its budget as a rigid plan or authorization. The approach must be flexible so that budgetary policy can be modified to accommodate changing circumstances. Unless management is able to vary its budget quickly the plan nominating a profit as the end result could produce a substantial loss, i.e., where income is less than the cost of production.

Budgetary control exercised by the management of a private organization is, therefore, preconditioned to minimising the cost of production and maximising profits. Nevertheless, it is also evident that: *"Private businesses engage in many activities for which profitability and consumer demand cannot provide any directly measurable indication of what is required."*⁽⁸⁶⁾ A good example of such an activity would be the location of a research and development unit in a private organization. Indeed, many of the activities undertaken by such a unit would be directed towards long-term achievements and contact with the consumer confined to seeking views and opinions to gauge the pattern of trends customers have in mind for the future.

Unlike a university or public research and development organization the important aspects of the "budget" for a private organization are geared more to the "forecast" and "yardstick" capability. The "budget" provides the private organization with the "forecast" which then serves as the "yardstick" for the measurement of efficiency. It is the "yardstick" purpose of the "budget" which alerts management to the need for budget variations. Management of the private organization enjoys a further advantage over the university and the public research and development organization. Although management is ultimately accountable to the enterprise's shareholders, it enjoys a position of strength in being able to present arguments supporting action aimed at maximising profits. Basically, shareholders' interest in a company centres around the extent of return from their investment.

SUMMARY

The intention of this Chapter was to define what is meant by the term "budget" and then proceed to acquaint the reader with a number of budgetary techniques which have been used in one form or another for the past 70 years.

In particular the contribution and influence of the United States of America in adapting recognised budgetary techniques to all levels of government spending, chiefly aimed at satisfying "public accountability", was noted.

Four recognised budgetary techniques were selected for examination. The techniques selected were: Incremental Budgeting; Formula Budgeting; Planning-programming Budgeting (PPB); and Zero-base Budgeting (ZBB). Their choice was twofold. Firstly, it proved possible to demonstrate a gradual sophistication in the approach to budgeting - from a "line by line" incremental increase approach, to the need for management to justify each programme or activity used in ZBB. Secondly, these budgetary techniques are those which could have application in a large scale research and development organization.

During the discussion of each budgetary technique the opportunity was taken to point out the advantages and disadvantages an Australian university, a public research and development organization, and its counterpart in the private sector would encounter if such a technique was adopted. What emerged was that each of the four budgetary techniques did not satisfy all of the budgetary requirements necessary to accommodate the complex operations of an Australian university nor a public research and development organization. The needs of the private research and development organization, geared more to generating a profit, suggested that its budgetary approach was essentially "forecast/measurement" in character, demanding the utmost of flexibility. Both PPB and ZBB were unable to provide the private organization with the kind of budgetary technique best suited to its requirements.

The conceptual budgetary techniques examined in this Chapter will form the basis of the analysis conducted in Chapter 5 and the comparison with the alternative model proposed in Chapter 6. The aim of Chapter 6 will be to propose an alternative budgetary model of more relevance to the research and development activities of an Australian university and a public research and development organization. Apart from introducing "efficiency" in the distribution of resources the proposed new budgetary technique will be aimed at satisfying the requirements engendered by "public accountability".

CHAPTER 3

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- (66) Dresch, S. P., "Dynamics of growth and decline", in Millett, J. D. (Ed.), *Managing Turbulence and Change*. Jossey-Bass, San Francisco, 1977, p.29.
- (67) *Ibid.*, p.29.
- (68) T.E.C. Report 1982-84 Triennium, *op. cit.*, p.48. Also refer to Table 4.9 at p.49.
- (69) *Ibid.*, p.79.
- (70) *Ibid.*, p.79.
- (71) Science and Industry Research Act, 1949-1968. Section 12.
- (72) *Ibid.*, Section 11.
- (73) Bellows, R., *Creative Leadership*. Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1959, p.49.
- (74) Gouldner, A. W., "Cosmopolitans and Locals", in Litterer, J. A. (Ed.), *Organizations: Structure and Behavior*. John Wiley and Sons, New York, 1963, p.359.
- (75) Herzberg, F., Mausner, B., Peterson, R. O., and Capwell, D. F., *Job Attitudes: Review of Research and Opinion*. Psychological Service of Pittsburgh, Pennsylvania, 1957, pp.132-133.
- (76) Bellows, *op. cit.*, p.48.
- (77) Herzberg, F., Mausner, B., Peterson, R. O., and Capwell, D. F., *op. cit.*, p.133.
- (78) Etzioni, A., *Modern Organizations*. Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1964, p.82.
- (79) *Ibid.*, pp.85-86.
- (80) *Ibid.*, p.86.
- (81) *Ibid.*, p.6.
- (82) Edwards, R. S., and Hines, J. S., *op. cit.*, p.22.
- (83) Etzioni, *op. cit.*, p.8.
- (84) *Ibid.*, pp.8-9.
- (85) *Ibid.*, p.9.
- (86) Edwards, R. S., and Hines, J. S., *op. cit.*, p.24.

CHAPTER 4

FEATURES SEPARATING PUBLIC FROM PRIVATE ORGANIZATIONS

In the light of the material considered in Chapters 2 and 3, this is an appropriate point to examine public and private organizations and separate those features which are peculiar to each of these complex organizations.

The importance which notable theorists have stressed in isolating the goals and objectives of an organization was reviewed in Chapter 2. By extending the salient points made by the theorists selected, it proved possible to relate these points to the organizational structure and method of operations evident in an Australian university, a public research and development organization and its counterpart in the private sector.

The approach taken in Chapter 3 moved from the broad to the particular. A number of more commonly used budgetary techniques were discussed and their possible application, in the setting of an Australian university or a public or private research and development organization, considered. Differences between the approach taken by a public research and development organization and that of a private research and development organization began to emerge.

It was noted that the initial purpose for which a public research and development organization was established incorporated certain special features, generally of national significance, which placed it apart from the purpose intended to be served by the private research and development organization.

These differences were noticeable, even though the two kinds of organizations exist primarily to undertake research and development work.

The differences of approach taken by these two types of complex organizations provide strong *prima facie* evidence that suggest it is reasonable to conclude that the method of resource allocation in each type of organization is different. The purpose of this Chapter will be to examine the approach of public and private organizations and test whether it is possible to isolate significant differences in allocating resources for research and development purposes. Furthermore, in pursuing such an examination, it is proposed to highlight the reasons which support a different approach.

It will be recalled from the outset that the intention of this dissertation is to confine itself to an Australian setting. To some extent this introduces a restriction, because Australia does not have a private organization which devotes its main effort to research and development at an annual level of expenditure, for example, of the magnitude outlayed by the Rand Corporation of the United States.

This shortcoming, however, is offset by those circumstances which can be identified readily with the Australian situation and are more relevant to the educational administrator engaged on the task of long-term planning in the Australian context. Although the manner in which problems have been solved could incorporate a local (Australian) flavour, the method used to define the problem, consider alternatives and reach a solution would have application elsewhere. Perhaps this is best illustrated by the following example. The extent of federal government involvement in the funding of activities deemed to be of national importance may be higher in Australia than overseas. The funding of education in Australia involves both federal and state governments. The position in the United Kingdom, the United States of America and Canada is not dissimilar, although the counterpart of an Australian state government in these countries may be a regional or provincial legislative body. Despite the variety of practices different countries follow, the essential point which emerges is that the methodology for allocating resources remains fundamentally the same.

If the funding of public organizations both in Australia and overseas is similar, it would seem logical to conclude that an overseas private organization would also be placed in a similar position to that of an Australian private organization. What affects the situation is the extent of federal government support each country can make available. The support can flow from a number of alternatives. The protection of an industry by imposing a limit on imports, granting subsidies - either in the form of taxation concessions or export incentives, the payment of bounties or access to government contracts - are notable examples. The extent of government support available will vary from country to country. The implication of this is that in some countries the private organization may have access to, or the opportunities are present for, earning income which frees other resources that can then be channelled into research and development activities.

Each private organization will also have its own policy to pursue. Although it is reasonable to assume that the profit motive will be the lynchpin of any private organization and will apply universally, how best this is to be achieved will depend on other factors. In recent years, for example, sections of the motor vehicle building industry of Great Britain have received large injections of public moneys, in the form of low interest loans from the British Government to maintain productions and avoid laying-off employees.⁽¹⁾ At present the Australian Federal Government is faced with a similar prospect, if it is to maintain the flagging coal and steel industries, and avoid the companies involved retrenching staff.⁽²⁾ The above are just some of the examples of the kind of factors which effect and influence the position of the private organization.

On the other hand the public organizations of different countries do have much in common. Four main elements associated with the public organization can be pin-pointed. Firstly, each organization is established to fulfil a particular purpose. Secondly, the source of funding - the taxpayer - introduces the need for acceptable "public accountability". Thirdly, the organizational structure tends to be both hierarchical and bureaucratic in nature. Finally, the continuation of the organization depends on maintaining government support.

What the above illustrates is that public organizations of different countries can be compared, because there is uniformity of approach and the method of operations is similar. The same conclusion cannot be drawn for private organizations. While the organizational structure and decision-making processes may share commonality, there are other factors, such as government incentives, which preclude any direct and meaningful comparison. The difficulty would be to quantify the benefits of government incentives in monetary terms, and then establish a means by which a weighted average could be struck that truly reflected the "profit" component.

It is now proposed to consider, in more detail, the aims, goals or objectives of the public and private research and development organizations.

AIMS, GOALS OR OBJECTIVES

In Chapter 2 attention was drawn to the problems associated with terminology. To avoid any unnecessary confusion a distinction was made

between the "goal" of an organization and what was regarded as its "function". The distinction decided on was that a "goal" is a task being pursued by a research and development organization. The term, "function", will be used to describe the purpose of research and development organizations, when considered as a collective group, and where the activity is of national significance.

Terms, such as "aims", "goals" and "objectives" are, for the purpose of this dissertation, synonymous, on the grounds that within an organization "goals" and "objectives" are regarded as those "aims" which have to be achieved at some subsequent stage.

When the position of an organization is viewed from without it takes on a larger dimension at the community or society level. In seeking to achieve a particular goal an organization can set in train a multiplying effect which incorporates such benefits as: job creation; the support of local enterprise and generating resource distribution. Viewing an organization as being a functional part of a nation's social system was the emphasis Weissenberg made in distinguishing between "goals" and "functions" that was discussed more fully in Chapter 2. The capacity an organization has to create a multiplying effect tends to strengthen the acceptance of Weissenberg's distinction.

Apart from being a functional part of a nation's social system, the public organization in Australia is created by governments to fulfil a government "function". At the federal level the public organization's "function" is to act for the federal government on matters of national significance. It will be recalled that one of the functional responsibilities accorded the A.A.E.C., of being empowered to purchase or sell uranium and allied minerals on behalf of the Commonwealth Government, was explained briefly in Chapter 2.

By vesting in a public organization a function the Australian Federal Government wishes undertaken, it provides the opportunity for government to exercise more direct control, and enhances the prospect of sustained and co-ordinated activity by those having the special skills and qualifications needed for a technical operation. Based on the definitions adopted in this dissertation to describe "goals" and "functions", there is a need to establish a clear distinction between the two and thereby avoid any possible confusion.

It is now proposed to test the capacity to establish this distinction in the C.S.I.R.O. and the A.A.E.C., two federal public research and development organizations. The approach decided on will be to examine the Acts of Parliament appropriate to each organization and relate aspects of these Acts to the most recent annual reports published by these organizations. In particular, the examination will concentrate on changes mentioned in these annual reports which reflect internal decision-making - the establishing of "goals" as part of the process of fulfilling national roles - the performance of the organization's "functions".

THE COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION

Earlier, mention was made of the fact that Section 9 of the Science and Industry Research Act, 1949, prescribes the powers and functions of the C.S.I.R.O. The two roles which can be drawn from Section 9 are that the Organization has the responsibility to: (1) initiate and carry out scientific research and investigations in the area of primary and secondary industries; and, (2) test and determine the standards for scientific apparatus and instruments used in industry. By applying the earlier definition adopted to describe a "function", both of these roles comply with the understanding of what is an activity of national significance. What is noticeable is that neither of the Acts indicate how these "functions" are to be undertaken. This establishes *prima facie* evidence that how either of these "functions" is to be undertaken is a matter for the Organization to determine.

The Annual Reports produced by the C.S.I.R.O. for the years 1979/80 and 1980/81 are of special significance. Each reflects the changes introduced by the restructured Executive following an independent inquiry of the Organization undertaken during 1978.⁽³⁾

The year 1978 also introduced certain amendments to the Organization's Act, which can be interpreted as a move on the part of the Commonwealth Government to widen the "public accountability" obligation. These amendments "... introduced a requirement to state in each annual report the policies relating to the Organization's research that were current at the beginning of the reporting year, together with a description of any developments in those policies occurring during the year."⁽⁴⁾

To shed itself of some of the detailed management tasks the Executive's restructuring plan involved the creation of five Institutes which, in the future, would attend to matters of detail.⁽⁵⁾ Prior to the formation of these five Institutes research had been pursued at Divisional level. Although there were overlapping areas of research interest, little incentive existed for Divisions to combine and pursue joint research programmes. The clustering together of Divisions having common interests under the umbrella of an Institute, accorded a broad research base and introduced a more efficient and rational approach. From the organization chart detailed in Figure 1, it is possible to relate the descriptions of each Division with the broad research interests determined for the five Institutes of: Animal and Food Sciences; Biological Resources; Earth Sciences; Industrial Technology and Physical Sciences.

The major structural changes introduced by the C.S.I.R.O. are significant for two reasons. Firstly, the change to the Organization's structure, of introducing an additional tier in the hierarchical structure at Institute level, was a deliberate decision taken by the Executive to improve efficiency through the process of management effectiveness. Secondly, the restructuring of the Organization helps dispel any fears that a public research and development organization, particularly those that are complex, are too inflexible to bring about "self-induced" change.

In effectuating changes which were designed primarily to aid future planning, the move towards a more structured and systematic approach was not without its problems. The Organization's national role added complexities when research priorities were being determined. It was this difficulty which discouraged the C.S.I.R.O. from adopting planning systems used elsewhere in Australian industry and commerce.⁽⁶⁾ The approach decided on was to broaden the base of the Organization's existing "strategic planning" application, by encouraging the participation of *"... people both within and outside the Organization who can (could) perceive research needs and opportunities, and this will (would) permit closer involvement by research workers and potential users of research in decision-making."*⁽⁷⁾

With input forthcoming from this broader base it proved possible to compile an outline of how the Organization's research effort was to be distributed over four main sectors: Community Interests; Rural Industries; Manufacturing Industries and Mineral, Energy and Water Resources (please refer to the chart at the back of the 1979/80 Annual Report). Once the

extent of research effort had been apportioned between the four sectors nominated it proved possible to allocate future commitments, over the five Institutes as a percentage of total research expenditure.⁽⁸⁾ What this established was the basis for allocating resources in the future but with an inbuilt capability for adding new research activities or shedding activities where the research had been completed or was no longer considered worthwhile pursuing.

The initial success of the C.S.I.R.O.'s restructuring programme⁽⁹⁾ continued to be evident in the Organization's 1980/81 Annual Report. The need for the Organization to enjoy maximum flexibility encouraged the Executive to formulate policies aimed at achieving this result. The policy determined by the Executive took into account three basic tenets:

- "1. *Whatever we do we must do well. If resources are reduced then we must reduce the number of our activities, not quality.*
2. *We must be selective in our fields of research and concentrate on nationally important and scientifically rewarding areas.*
3. *We must maintain our tradition of scientific excellence and remember that the maintenance of excellence depends on the performance of and the encouragement given to the individual. The needs for controlled objectives on the one hand and the scientist's freedom to follow his nose on the other must be carefully balanced.*"⁽¹⁰⁾

By adopting this approach the Executive was able to describe the 1980/81 year as "... the start of a new phase in our evolution: a deliberate policy to stop certain activities and switch the resources to new activities."⁽¹¹⁾

When reviewing the various definitions notable theorists had devised for describing an organization in Chapter 2, it will be recalled that Blau and Scott had underscored the need for clear lines of communication and authority operating within a formal status structure. The creation of Institutes in the C.S.I.R.O.'s organizational structure has brought about a situation where the lines of communication have been improved. In the 1979/80 Annual Report this new arrangement resulted with the observation that "... the restructuring of the Organization into Institutes has been

a marked success and the credit for this success goes to the Institute Directors and Chiefs of Divisions alike ... Yet Chiefs are now much less isolated. They meet frequently with their fellow Chiefs to discuss a variety of questions of common interest, including the co-ordination of inter-Divisional programs."⁽¹²⁾

The 1980/81 Annual Report expanded on the consultative process introduced during the previous year by noting that *"Consultation is an integral part of the Organization's resource allocation strategy and, in order to determine its research priorities on the basis of the best advice available, the Organization needs to consult extensively with Federal and State governments, sections of the community and other research workers."*⁽¹³⁾

In summarizing this section several important points emerge. Possibly the most important point is that the C.S.I.R.O., following an independent inquiry, restructured the Organization for the purpose of improving communication. This was regarded as an essential step if future research and development activities were to be pursued efficiently and effectively. Further, rather than relying on the expertise available within the Organization, State advisory committees were established to provide necessary input from commerce, industry and community interest groups. An approach of this kind assists with the justification of research activities under the "public accountability" obligation.

The Organization now has the mechanism for dividing research activity amongst the four main sectors of Community Interests; Rural Industries; Manufacturing Industries and Mineral, Energy and Water Resources. The phasing-in of new research activities and the phasing-out of old research activities is an integral part of the mechanism adopted. Resource allocation is based on research activity approved but, for control purposes, it is distributed amongst the five Institutes. The distribution of resources is based on a formula approach, where each Division or Unit of an Institute is accorded a percentage of the total research expenditure. The percentage agreed upon flows from the research activity nominated under the four main sectors of the Organization's approved research interests.

This new approach to resource allocation in the C.S.I.R.O. enjoys the advantage of satisfying the Commonwealth Government regarding the extent of public participation, through the State advisory committees, at the planning stage. Such an approach helps strengthen the Organization's

recommendations placed before the Commonwealth Government for the funds needed to undertake the programmes nominated for the ensuing financial year. Furthermore, the restructured C.S.I.R.O. offers the means by which "goals" arising from national role activity can be identified more readily and be pursued until fulfilled.

AUSTRALIAN ATOMIC ENERGY COMMISSION

The Australian Atomic Energy Commission is another example of a public research and development organization established by the Commonwealth Government to fulfil a particular purpose. In terms of funding, the Commission only receives from Parliament an annual recurrent grant which represents about one-fifth of that appropriated to the C.S.I.R.O.⁽¹⁴⁾ The main reason for the substantial variation in funding can be attributed to the more specific terms of reference determined for the Commission. Nevertheless, where the exploration, mining and treatment of uranium and allied minerals is concerned, the Commission enjoys a powerful position. This is strengthened by Sub-Section 18(1) of the Atomic Energy Act, 1953, which states:

"The Commission has power to do all things that are necessary or convenient to be done for or in connexion with the performance of its functions."

The Commission's approach is based mainly on collaborative effort and continuing consultation and communication with such bodies as "... international nuclear agencies, such as the International Atomic Energy Agency and the OECD Nuclear Energy Agency, national and international Government authorities, Australian State Government bodies and universities."⁽¹⁵⁾

Unlike the C.S.I.R.O., which has regional offices in Queensland, Victoria, Western Australia and New South Wales, the A.A.E.C. concentrates its research endeavour at its Lucas Heights Research Laboratories north of Sydney in New South Wales. Described simply as the Commission's Research Establishment, this is divided into seven Research Divisions and three Support Divisions. The seven research divisions are: Applied Mathematics and Computing; Applied Physics; Centrifuge Enrichment Project; Chemical Technology; Environmental Science; Isotope; and Materials and Nuclear Technology, while the three support divisions are: Engineering Services and Operations; Health and Safety; and Administration.⁽¹⁶⁾ The

organization chart detailed in Figure 3 provides an overview of the individual divisional components that need to be funded from the annual recurrent grant. During the 1980/81 financial year expenditure incurred on research amounted to 86% of the total income.⁽¹⁷⁾

Earlier in this section mention was made of the collaborative effort that the A.A.E.C. encourages with other organizations, both at the national and international level. One of the organizations which benefits in this way is the Australian Institute of Nuclear Science and Engineering (A.I.N.S.E.).

Through A.I.N.S.E. support is provided for "... research and training in areas related to nuclear science and engineering and to provide access to special facilities at Lucas Heights by staff and research students of universities and colleges of advanced education."⁽¹⁸⁾ The importance of encouraging Australian universities to attach their researchers to the Commission's Research Establishment can be measured by the reference in the 1980/81 Annual Report that, during 1980, "... more than 250 people from Australian universities were attached to the Commission's Research Establishment through AINSE, involving more than 2500 man-days of activity in a wide variety of fields including radiation biology, plasma physics, nuclear physics applications, materials research, radiation chemistry, engineering research and the use of techniques such as neutron diffraction in areas of biology, geology, physics and chemistry ...".⁽¹⁹⁾

The financing of this operation also proved a problem during 1980. Although an increase had been sought from the Commonwealth Government to raise the "Contribution for Research and Training" beyond the \$300000 per annum fixed two years earlier, no additional funding was forthcoming.⁽²⁰⁾ As a consequence, the 1980 operations incurred a deficit.

The 1980/81 financial year was one in which the Commission re-organized the former Divisions of Physics, Engineering Research and Instrumentation and Control into two new Divisions of Applied Physics and Nuclear Technology. An internal review of certain aspects of the Commission's administration was also commissioned. However, the changes resulting from the decision taken by the Commonwealth Government to locate sections of the C.S.I.R.O.'s Institute of Energy and Earth Resources at Lucas Heights, have resulted with the Commission foreshadowing that further consideration will need "... to be given to the overall organizational structure of the

Commission." (21)

In this examination of the A.A.E.C. one of the most notable points to emerge has been the considerable variation of approach evident between the Commission and the C.S.I.R.O. The approach is due mainly to the fact that the Commission's research activity is concentrated in one research establishment, rather than being dispersed and scattered throughout Australia, along the lines adopted by the C.S.I.R.O. The need to concentrate research effort in one place is dictated, to a large extent, by the type of equipment needed, and the safeguards necessary when operating potentially hazardous equipment. Nevertheless, despite the limitations produced by pursuing research at one site the Commission has embarked on programmes designed to attract scientists to Lucas Heights and pursue collaborative research. This scheme has the advantage of providing the opportunity for the exchange of knowledge and, yet, remain in contact with research activity being undertaken elsewhere. In some respects this kind of approach is a cheap, but effective means of maximising research capacity.

Similar to the C.S.I.R.O., the Commission undertakes periodic reviews of its operations and introduces changes where these are considered to be beneficial and able to improve efficiency. However, the present method of the Commission's operations has not warranted a major restructuring of the Organization of the magnitude introduced by the C.S.I.R.O. in 1979/80.

The setting of "goals", emerging from the Commission's national responsibilities, will also be similar to those experienced by the C.S.I.R.O., even though the operations of the Commission are not as widespread throughout the States of Australia.

What the foregoing examination of the C.S.I.R.O. and the A.A.E.C. has drawn attention to is that it is possible to separate the "functions" determined for a public research and development organization from its "goals". In each of the annual reports reviewed, the "functions" of the C.S.I.R.O. or the A.A.E.C. related to the national roles each Organization has been required to fulfil. Having determined the "functions", the Commonwealth Government left each organization with the task of establishing "goals" and determining how these were to be realised.

It has also proved possible to distinguish between the timespan associated with some "goals" as distinct from others. The newly structured

Executive of the C.S.I.R.O., for example, had set itself a number of "goals", two of these were the introduction of Institutes under which Divisions, having similar interests, could be clustered, and the adoption of a policy designed to bring about maximum flexibility of the Organization's operations. The introduction of Institutes was a "goal" achieved over a short period of time. The new policy adopted can be viewed as representing the attainment of a "goal" quickly, if considered in the context of "goal" achievement from the time it was decided to have a policy until the policy was formulated. Alternatively, this "goal" could be regarded as one that will be achieved over a longer term, if it proves necessary to modify the policy to permit even greater flexibility.

The decision taken by the A.A.E.C. to incur a deficit during 1980 on the amount of funds devoted to Research and Training under the A.I.N.S.E. programme was a deliberate choice on the part of the Organization, and was based on the need to sustain research support at an acceptable level, rather than suffer on financial grounds. This choice amounted to the Commission establishing a "goal" for 1980 and this was achieved subsequently in that year.

The "goals" that have been isolated by this examination of the C.S.I.R.O. and the A.A.E.C. can readily be identified with the description real goals used by Etzioni and considered more fully in Chapter 2.

The role of "goal" setting, appropriate to a private research and development organization, will now be explored.

THE PRIVATE RESEARCH AND DEVELOPMENT ORGANIZATION

Earlier in this Chapter mention was made of the fact that Australia does not have a private organization comparable with the Rand Corporation of the United States, which is able to direct a large part of its resources towards research and development. However, Australia does have a number of large private organizations where research and development work is incorporated into the organization's overall operations.

The main difference between a private organization and its counterpart in the public sector is that the former exists to make a profit. It is for this reason that decisions taken in a private organization are generally influenced by the extent of profit which will result. The main "goal" of a private organization, therefore, is to minimise the cost of production so

that this will result with the maximising of profits. As private organizations are in competition with one another, the extent of publicity a private organization will wish to generate about its research and development activities will vary between organizations. Not all organizations will be prepared to reveal details of their current research programmes, in case this should place them at a disadvantage with their competitors.

A "goal" as clear cut as making a profit suggests that everything else is supportive of achieving this result. Is it more appropriate to avoid stating "goals" in case these prove unattainable? One large Australian organization which has moved away from defining its "goals" is the Colonial Sugar Refining Co. Ltd. (C.S.R.), although the reason for this is not clear. To replace "goal" identification the C.S.R. has introduced what it describes as a "business philosophy". A synthesis of the "business philosophy" adopted by C.S.R. is as follows:

- (1) grow as an independent company and be predominantly owned by Australians;
- (2) be reputable, progressive and successful;
- (3) maximise the company's worth for its shareholders;
- (4) be a good corporate citizen, respecting and moving with community values;
- (5) profit to grow steadily with shareholders benefitting;
- (6) commitment to the concept that private enterprise and capital is essential for Australia's healthy mixed economy;
- (7) government and private enterprise to act and work together;
- (8) although a diversified industrial company, no wish to become a conglomerate;
- (9) the business of the company concerns the exploitation of natural resources and related industrial products and services;
- (10) while Australia is the principle area of activity the company has also extended its operations and investment to overseas countries; and

- (11) the company is and must be seen to be a good employer, just and responsible in its dealings with employees, concerned for their welfare and able to provide the opportunity for work satisfaction.⁽²²⁾

By adopting this approach C.S.R. avoids being as specific as the setting of "goals" would demand. Rather, the approach is designed more to inform shareholders and the employees of the organization of how the organization views itself, both internally and externally. At the same time the organization is using the philosophy it has developed to indicate what is its position on such issues as: the nation's economy; overseas investment and employee relations. To this extent the approach goes beyond isolating "goals", although any one of the "principles" stated could become an organizational "goal".

A somewhat similar approach is taken by the Broken Hill Pty. Co. Ltd. (B.H.P.), but the "philosophy" is not articulated as well as C.S.R., nor is it as comprehensive. The statement proffered by B.H.P. reads:

"BHP is committed to growth wherever profitable opportunities occur. Projects undertaken are characteristically large-scale and technically complex. Joint venture and other agreements link the Group to some of the World's largest enterprises. The Company acknowledges its responsibility to shareholders for maintenance of capital and generation of long-term earnings; to customers and suppliers for responsible conduct of its business; and to its workpeople for the provision of a safe, satisfying and productive work environment."⁽²³⁾

Whereas the statements prepared by C.S.R. and B.H.P. convey clearly what are their intentions, how these are to be achieved is left loose and fluid. As suggested earlier, it would seem reasonable to conclude that a "business philosophy" is designed more to provide a broad outline to the shareholders of the organization's achievements and future aspirations. Few shareholders are interested in the detail of the day-to-day administration of the organization in which they have invested, providing that dividends declared are received regularly and reflect a reasonable return on the investment. A further benefit accruing for an organization stating its "business philosophy" is that it provides employees with an understanding of what their employer is attempting to achieve.

There is also the possibility that the broad terms stated in an organization's "business philosophy" precludes competitors from learning of the "goals" the organization has determined. If a competitor became aware of an organization's "goals", it could use this knowledge to effect in planning its own future business strategy.

This points to a further distinction between a public and private organization. The "public accountability" obligation on the part of the public organization requires "goal" proposals and achievements to be fully documented in the organization's annual report. There is no competitive aspect to take into account. On the other hand, for the private organization the maximising of profit actively encourages competition.

Having isolated two factors - profit and competition - which distinguish a private organization from a public organization, what is becoming evident is that similar problems will arise with the allocation of resources in each of these types of organizations.

As a step towards examining resource allocation, it is first necessary to consider what obligations are imposed on both public and private organizations which influence the shaping of budget strategies.

STATUTORY OBLIGATIONS - THE PUBLIC ORGANIZATION

A public organization is established by a government to engage in some activity on behalf of that government. The C.S.I.R.O. is a public research and development organization and came into being when the Australian Parliament passed the Science and Industry Research Act in 1949. The Act which vests in an organization certain powers and responsibilities also fashions its main role. The C.S.I.R.O., for example, describes its main role as *"... to plan and execute a comprehensive program of general scientific research on behalf of the Commonwealth of Australia."*⁽²⁴⁾

In order that the Commonwealth Government is kept informed of what is occurring in the public organizations it has created, each organization's Act stipulates that an annual report is to be submitted to the responsible Commonwealth Minister. Section 57 of the Science and Industry Research Act, 1949, establishes this statutory obligation for the C.S.I.R.O., while Section 31 of the Atomic Energy Act, 1953, provides a similar obligation for the A.A.E.C.

Earlier in this Chapter, when discussing the "functions" of the C.S.I.R.O., as distinct from its "goals", it is evident from that Organization's Annual Reports for 1979/80 and 1980/81 that a restructuring had taken place to improve efficiency and effectiveness. However, the Executive of the C.S.I.R.O. had also formulated a policy for the Organization, designed mainly to assist with the implementation of this restructuring. There is an added benefit which flows from formulating a policy for a public organization, such as the one outlined above. A policy statement outlines the organization's intentions and is not much different from the initiative taken by the C.S.R. of developing a "business philosophy". For a public organization, such as the C.S.I.R.O., having a firm policy alerts the Commonwealth Government to the Organization's rationale in satisfying its statutory obligations. A policy which is publicised widely enjoys the advantage of proving more acceptable to the criteria of "public accountability". Establishing such a policy also provides useful guidelines for all areas of the Organization, because it is the blueprint on which the Executive wishes to build future development and research activity.

Public knowledge of the policy guidelines adopted by organizations, such as those mentioned above, permits a contrast to be made with the approach of other organizations engaged in research and development. An Australian university, for example, is not able to enjoy a situation where it can be as selective as the C.S.I.R.O. in determining what research is to be undertaken. While Departments or Faculties of an Australian university devise broad fields of research interest, the extent of actual research is limited by resources and the individual Departments' research preferences, where the subject matter is constrained by its relevance to the Department itself or by the course content approved for its under-graduate and post-graduate students. At post-graduate level the research programmes followed are generally those which have received departmental support through the process of consensus. Often access to available resources imposes limitations on the extent of research programmes that can be active at any one time. While limitations on resource allocation will also act as a constraining factor throughout the Institutes of the C.S.I.R.O., there is no requirement to pay regard to student needs.

The prime difference between the C.S.I.R.O. and an Australian university, in their individual approach to research and development,

appears to hinge mainly on role identification. In this regard the C.S.I.R.O. views its main role as one where it is obliged "... to plan and execute a comprehensive program of general scientific research on behalf of the Commonwealth of Australia."⁽²⁵⁾ This is the national function of the Organization. The fulfilment of this role or function is predicated on the grounds that "... research priorities must be established and sufficient resources allocated to enable the work to be carried out effectively."⁽²⁶⁾

Allocating resources in a university is not as clear cut. Even before the needs of teaching are separated from what is required for research, the teaching departments will vie with one another by seeking to secure additional resources based on arguments, such as student numbers or heavy post-graduate work loads.⁽²⁷⁾

The strong argument in favour of funding the public research and development organization is that having been established by government to perform certain functions, a government would be doing itself a disservice if it restricted the money supply to the extent that the organization could not fulfil its national role.

The Australian government has no such obligation to the funding of Australian universities. Since Federation (in 1901), the position of the Commonwealth Government has been to acknowledge that the control of education is a matter for State Governments.⁽²⁸⁾ Nevertheless, until the end of World War II, federal funds were directed towards the education area under various guises. Some of these guises have been: the financing of military and naval colleges; meeting the cost of ammunition used by participants in the Junior Cadet Training Scheme; the national fitness programme; the Soldiers' Children Education Scheme and the various repatriation schemes established for World War I veterans.⁽²⁹⁾ The manner in which the Commonwealth Government could channel this funding to education would be argued on the grounds of defence, health or social services. The extent of this financial support was increased significantly under the Commonwealth Reconstruction Training Scheme, which provided financial assistance to World War II ex-servicemen and women who enrolled in university courses after demobilisation.⁽³⁰⁾ From 1951 onwards national assistance to Australian universities was given by the Commonwealth Government on a regular basis⁽³¹⁾ despite the reluctance of the Commonwealth Government to accept responsibility for what it regarded as a State

preserve. The extent of this reluctance is evident from the 1964 legislation. The form of assistance provided centred around improving science and technical facilities in government and non-government secondary schools.⁽³²⁾

In reviewing the Commonwealth Government's involvement in education during the period 1964 to 1975 Smart has drawn the conclusion that at the commencement of the 1960s the then Commonwealth Government "... had repeatedly asserted that education was a state not a Commonwealth responsibility ..." and "... was directly involved only in the university sector."⁽³³⁾ While this may represent the Commonwealth Government's intention Smart goes on to point out that "... by 1975, federal involvement had been extended to include not only the creation of a federal Department of Education but also the assumption of broad responsibility for determining the national priorities and levels of funding in the college, school, technical and further education and pre-school sectors."⁽³⁴⁾

What needs to be taken into account is that increased involvement by the Commonwealth Government in funding education can equally be withdrawn or reduced substantially, if it wishes State Governments to provide funding commensurate with their expressed desires to be involved in the planning of future educational development within each State. The fact that the Commonwealth Government can phase out its financial support for education highlights the tenuous financial situation of tertiary educational institutions, when compared with the public research and development organizations, such as the C.S.I.R.O. In effect, this is the reverse side of the statutory obligations a public organization has to the government which created it. While a government wishes one of its public organizations to continue, it must provide the funding necessary to maintain the viability of the organization.

One of the statutory obligations of the A.A.E.C. is its collaboration with Australian tertiary institutions. The Commission's 1980/81 Annual Report drew attention to the extent of collaboration achieved during that year with Australian universities and colleges of advanced education through the A.I.N.S.E. Grants for Research and Training Scheme.⁽³⁵⁾ As indicated earlier, while this involved the Commission incurring a deficit in operating this Scheme during 1980, assistance of this kind can be viewed as an addition to the annual grants received by Australian universities and colleges. Why these grants are important to Australian universities and

colleges is that they are dedicated to research activity, without being subject to a teaching "discount".

A further point which needs to be made when considering the statutory obligations expected of a public organization is the capacity that a government has to make changes or to modify past practices.

A major decision taken by the Commonwealth Government in early 1981 was to transfer the Commission's interest in non-nuclear energy research to the C.S.I.R.O.⁽³⁶⁾ In future, research into non-nuclear energy, will be undertaken by the C.S.I.R.O.'s Institute of Energy and Earth Resources (please refer to Figure 1), but the staff involved will be relocated at the Lucas Heights research laboratories. This decision by the Commonwealth Government has invoked some criticism from the Commission on the grounds that:

"The co-location of Commission and CSIRO personnel at Lucas Heights raises some major practical problems, particularly in relation to security and access control, as well as complexities in servicing, maintaining and administering the site and its facilities under two managements. In terms of efficient use of resources consistent with safety and security, the Commission would have preferred an arrangement which continued its own single management of the site and the diversified program."⁽³⁷⁾

On the other hand the Commonwealth Government adopted the Commission's suggestions to make changes to Sections 30 and 41 of the Commission's Act. The change approved for Section 30 will "... permit the Commission to borrow funds by dealing in securities such as bills of exchange, promissory notes, or other similar instruments or documents ...".⁽³⁸⁾ The amendment to Section 41 was designed to remove any uncertainty about the ability of Energy Resources of Australia Ltd. (E.R.A.) to carry on the operations of the Ranger Uranium Project "... on behalf of the Commonwealth."⁽³⁹⁾

These decisions taken by the Commonwealth Government will effect the future operations of the A.A.E.C. Although the Commission has voiced misgivings about the arrangement, whereby its personnel, and those of the C.S.I.R.O., will work together at Lucas Heights, it is obliged to adopt federal government directives. To incorporate these directives into its operations, the public research and development organization may be forced to introduce change where, in so doing, it could lose some of its former

efficiency or, in the case in question, accept the situation that it can no longer provide a level of safety and security maintained hitherto.

What this highlights is a need on the part of governments to proceed with caution when varying the statutory responsibilities conferred on the public organization they have created. Forced change from outside the organization, and ones which lead to inefficiency, provides grounds for an organization to disclaim responsibility for the consequences. Government intervention of this kind can be used by a public organization to justify any additional expenditure incurred when reporting on the "public accountability" aspect of its operations.

PURPOSE BUDGETARY STRATEGIES TO SERVE

In examining the term "budget", undertaken in Chapter 3, it was possible to form the conclusion that it represented any plan for allocating scarce resources among competing wants and needs. The drawing up of the "budget" plan is the first step necessary in any organization, for it is the means by which wants and needs surface within the organization. The next step, and to identify this step readily it can be described as the "budgeting" process, is to reduce the "budget" plan into a series of attainable objectives.

What becomes apparent when initiating the "budgeting" process is that any selection made of attainable objectives involves decision-making. It will be recalled that the C.S.I.R.O. has adopted "strategic research planning" as a management tool in assisting with the decision-making process. From the C.S.I.R.O.'s experience, that Organization has concluded that: *"Strategic planning helps to determine the merits of various research alternatives in relation to the overall balance of research effort, and provides information about the timing of new initiatives which would be of benefit to the Community".*⁽⁴⁰⁾

The current practice followed by the C.S.I.R.O. in adopting "strategic research planning" goes somewhat further than what is necessary for developing a method for applying a "budgetary assessment" in selecting those wants and needs which deserve resource support. By instituting some form of "budgetary assessment" criteria it permits each want and need to be:

- (1) treated uniformly;

- (2) ranked in an order of priority;
- (3) analysed in detail, mainly for the purpose of comparing unit costs or distinguishing between the types of resources needed (i.e., human resources, equipment and space requirements); and
- (4) allotted time horizons, thereby enabling the extent of any continuing commitment to be measured.

In addition, the effectiveness of objectives, which have received funding support in the past, can be re-assessed. Some of these objectives will be nearing completion and the diminished resources needed will be reflected by the winding-down phase.

The selection of objectives from amongst the competing wants and needs can also be influenced by other factors which management may consider and which rate a degree of preference, even though these are unsupportable on the grounds of rationale and logic. An example of such a choice may arise where an organization wishes to support some activity of benefit to the local community where the organization is situated. Although the activity may not yield a reasonable return on investment, the extent of goodwill which will flow to the organization from the local community may outweigh the value of obtaining a higher profit margin. What this example illustrates is that decisions taken are those which management believes will realise the optimum benefit for the organization.

There is a presumption incorporated in this approach which suggests decision-making is based on pure rationality. However, notable theorists, such as Charles Lindblom and Aaron Wildavsky, would not share this view. When Incremental Budgeting was being considered in Chapter 3, six important characteristics Lindblom had been able to prize out of the incremental method of budgeting were highlighted. These characteristics are part of Lindblom's view of decision-making as representing the application of "incrementalism", or what he has referred to in popular idiom as "muddling through".⁽⁴¹⁾

Essentially, Lindblom argues that decision-making brings together a conflict of interests on the one hand, and a corresponding variation of information on the other; and results with the accommodation of diversified interests through the process of bargaining. What this implies is that the real decision-making is achieved only when there is sufficient interest and activism amongst those who wish to bring about change to the existing state.

Rather than decision-making being a conscious form of pure rationality, Lindblom suggests "disjointed incrementalism", or "... *the process of incrementally adjusting existing practices in order to establish or re-establish consensus among participants ...*",⁽⁴²⁾ is applied.

Decision-making, therefore, can be viewed from two stances. There are those who would view decision-making as a purely rational approach which attempts to allocate resources according to economic efficiency criteria. The incrementalists, on the other hand, would take the view that: "*Decisions represent a consensus on policy reached through a political power-oriented bargaining process.*"⁽⁴³⁾ Despite the clear distinction between these two views, the "budgeting" process can be concluded by combining the two approaches. The example outlined above, where the organization preferred to obtain the goodwill of the local community rather than act in accordance with pure rationality, suggests that the line of demarcation between the two viewpoints is not as clear as one would expect.

Thompson and Tuden, who have directed their efforts into researching organizational decision-making, have isolated three key elements. The elements they have concluded are involved in decision-making are:

- "(1) *alternative courses of action,*
- (2) *differential consequences of the several alternatives (means), and,*
- (3) *evaluation of the potential outcomes on some scale of desirability (ends).*"⁽⁴⁴⁾

These three elements can also be applied readily to the process of "budgeting". The "alternative course of action" represents the wants and needs which have surfaced when the "budget" plan is prepared. Each want and need is in competition because all cannot be satisfied. This situation can also be expressed as each want and need offers an alternative course of action. The "differential consequences of the several alternatives", i.e., the means, represents the extent of resources which are available. Finally, the "evaluation of the potential outcomes on some scale of desirability", i.e., the end result, represents the final choice or selection of those wants and needs that can be satisfied from the resources available. It is the end result which reflects the decisions taken by the organization.

Once an organization has decided on those objectives to be supported -

the "budgeting" process - the attainment of these objectives becomes a part of the "budgetary strategy" adopted by the organization. The "budgetary strategy" could be Incremental Budgeting, Formula Budgeting, Planning-Programming Budgeting (PPB) or Zero Base Budgeting (ZBB). The purpose "budgetary strategies" serve the public or private research and development organizations will now be examined.

THE PUBLIC RESEARCH AND DEVELOPMENT ORGANIZATION

The introduction of "strategic research planning" by the C.S.I.R.O. arose from one of the recommendations made by the Inquiry into that Organization of 1978.⁽⁴⁵⁾ As indicated earlier in this Chapter, the Organization decided that all of the research activity it pursued would be divided into four main sections: Community Interests; Rural Industries; Manufacturing Industries and Mineral, Energy and Water Resources. The advantage of this approach is that it prescribes the boundaries for initiating wants and needs. The approach introduces a measure of efficiency even before detailed proposals are sought for inclusion in the "budget" plan.

Within the four main sectors determined, the C.S.I.R.O. then allocates a percentage of total research expenditure to each sector. During the 1980/81 financial year the allocation of research expenditure between these four sectors was as follows:

<u>Sector</u>	<u>% Allocated</u>
Community Interests	24.8
Rural Industries	33.6
Manufacturing Industries	25.4
Mineral, Energy and Water Resources	16.2
	100.0 (46)

The next step taken by the C.S.I.R.O. is to apportion this research expenditure throughout the five Institutes. The position for the 1980/81 financial year resulted with the following distribution:

<u>Institute</u>	<u>% Allocated</u>
Animal and Food Services	18.6
Biological Resources	26.7

<u>Institute</u>	<u>% Allocated</u>
Earth Resources	19.6
Industrial Technology	16.8
Physical Sciences	18.3
	<u>100.0</u> (47)

In analysing these allocations it is not surprising to find that the sector receiving the largest percentage of the total research expenditure was the "Rural Industries", i.e., 33.6%. At first glance the extent of this allocation appears to be lost when distributed over the five Institutes. However, by referring to the C.S.I.R.O.'s organization chart outlined in Figure 1, it will be noticed that a number of Divisions, having a "rural industry" affiliation, can be detected in the Institutes of Animal and Food Sciences; Biological Resources and Earth Resources.

A comparison of the research expenditure distributed throughout the Institutes for 1979/80 and 1980/81 only reveals some slight changes, but these are significant when related to the activity. The comparison is as follows:

<u>Institute</u>	<u>% Allocated</u>	<u>% Allocated</u>	<u>% Variation</u>	
	<u>1979/80</u>	<u>1980/81</u>	<u>+</u>	<u>-</u>
Animal and Food Services	18.9	18.6	-	0.3
Biological Resources	16.6	26.7	0.1	-
Earth Resources	18.3	19.6	1.3	-
Industrial Technology	15.7	16.8	1.1	-
Physical Sciences	20.5	18.3	-	2.2
	<u>100.0</u>	<u>100.0</u>	<u>2.5</u>	<u>2.5</u>

The conclusion which can be drawn from this is that in 1980/81 Animal and Food Services and Physical Sciences received less research funds to enable Biological Resources, Earth Resources and Industrial Technology to receive a modest injection of funding. The main beneficiary in the Institute of Earth Resources was the Minerals Research Laboratories, where additional resources were necessary to evaluate geological specimens associated with mineral exploration and mining activities.

The "budgetary strategy" introduced by the C.S.I.R.O. appears to be aimed at satisfying two main objectives. Firstly, the "budgetary strategy"

must be capable of accommodating the diverse national scientific research role accorded to the Organization by the Commonwealth Government. Secondly, the "budgetary strategy" has to be flexible enough to permit change. The types of change involved can range from the introduction of new activities, particularly those of interest to the Commonwealth Government; or represent either an increase or decrease of approved activities.

Having regard to those recognised "budgetary strategies" examined in Chapter 3, the current practice of allocating resources in the C.S.I.R.O. appears to represent a mosaic of three such strategies. By dividing research activity into four main sectors and distributing the proposed research expenditure throughout the five Institutes, the approach is sufficiently formula-based to satisfy the concept of **Formula Budgeting**.

The extent of investigation undertaken by the Organization's Planning and Evaluation Advisory Unit (P.E.A.U.),⁽⁴⁸⁾ in performing the task of "strategic research planning", where it is stated that the role of this unit provides "... an important source of information used by the Executive in determining research policy and priorities",⁽⁴⁹⁾ is in conformity with the approach used in Planning-Programming Budgeting (PPB).

Lastly, the method used by the Commonwealth Government to fund a public research and development organization, such as the C.S.I.R.O., is consistent with the gradual increase of funding inherent in the **Incremental Budgeting** approach. It was the continuation of this approach by the Commonwealth Government which encouraged the Chairman of the C.S.I.R.O. to observe in the 1980/81 Report that:

"Across-the-board cuts mean that each time the Government makes a staff ceiling cut in the Public Service, C.S.I.R.O. receives a cut of a similar magnitude to that imposed on Government departments. We believe a distinction should be made between an organization such as ours, on which the future growth and prospects of the nation vitally depend, and the administrative arms of government. It is the Executive's belief that the national interest requires a larger government commitment to science and technology rather than a reduction."⁽⁵⁰⁾

The relevance of this observation will become more apparent in the Chapters which follow. At this stage it is sufficient to register the

point that traditional forms of "budgetary strategies" do not address themselves to the allocation of resources peculiar to a public research and development organization and in a manner which satisfies government.

THE PRIVATE RESEARCH AND DEVELOPMENT ORGANIZATION

The aim of any private research and development organization is to adopt a "budgetary strategy" which will achieve a profit at the conclusion of the year's trading. External forces, in the form of inflation, a reduction in demand of the product or products being produced, the need to replace capital equipment, and, in respect to overseas sales, the variation in exchange rates, particularly the devaluation of the Australian dollar, can reverse a projected budgetary profit into an actual operating loss. The forward planning used in a private organization needs to be designed in such a way as to alert management in advance of the trends emerging.

Factors which can erode the profit margin, such as inflation and the replacement of capital equipment, are capable of being incorporated into any long-term planning contingency. In respect of inflation, the publication each quarter by the Australian Bureau of Census and Statistics of movements in the Consumer Price Index (the C.P.I.) provides trends which permit the public organization to anticipate what factors need to be built-in to the estimates for the forthcoming year. If capital equipment has been amortised correctly over the estimated life-span determined when the equipment was first acquired, then the organization should only be faced with the task of "topping-up" the difference between the provision lying in the equipment replacement reserve and the actual cost of replacement. These are factors which can be quantified in monetary terms and their effect taken into account when attempting to forecast the rate of profit anticipated.

The main problem for the private organization is forecasting, with any degree of accuracy, those matters which have a direct bearing on profit realisation, but fluctuate according to demand, or are affected in some way by government actions. A reduction in the money supply leads to a lessening in the demand for goods and services. If this occurs worldwide the process triggers off a recession. The problem is heightened if increased labour costs cannot be absorbed into the pricing structure.

Problems of this kind are reflected in B.H.P.'s Annual Report for 1982. In appraising the shareholders of the year's trading to 31 May, 1982, B.H.P. reported: *"... a considerable decline in profitability and the knowledge that the steel industry in Australia, largely represented by the Steel Division of the Group, is facing a very challenging period in its history. It is, of course, not alone among manufacturing industries in Australia and overseas in feeling the effects of world recession. Australia has been fortunate in that sound economic policies and natural wealth have enabled it to delay the impact of recession so long. It would be dangerously wrong, however, to assume that we could for all time remain insulated from world economics."*⁽⁵¹⁾

This overview was based on the Company's actual experience of the 1981/82 trading year where, it was noted, *"Opportunities to place the Group's products in overseas markets were limited as a result of the persistent recession in the world steel industry. At a time of rising costs in Australia, the strength of the Australian dollar, notwithstanding its gradual decline, did not reflect the loss of our trading competitiveness and this added to the difficulties of competing in export markets."*⁽⁵²⁾

The trading difficulties experienced were, in B.H.P.'s judgement, a reflection of the prevailing local (Australian) conditions for the Company drew attention to the fact that *"Within Australia market pressures, including a rise in steel imports, constrained prices to levels which did not recoup cost increases"*, and went on to single out, *"Rising labour costs particularly in the coal industry, and continuing disruption of production by strikes together with substantial under-utilisation of productive capacity, were major factors in this unsatisfactory situation."*⁽⁵³⁾

Somewhat similar problems were voiced by C.S.R. in its 1982 Annual Report. C.S.R.'s trading experience was summarised as one reflecting the nation's situation, when it proffered the view that: *"Within Australia, economic activity slackened with adverse consequences for some of our building and construction materials. Slower economic growth in most export markets seriously affected the demand for and prices of some commodities. Export prices for raw sugar fell steeply and profits from raw sugar milling were severely reduced. Lower export prices also affected adversely the distilleries ..."*⁽⁵⁴⁾

In looking to the immediate future C.S.R. was not optimistic. It

forecast that: "... the difficult trading conditions of the past year seem likely to continue." No improvement could be expected, according to C.S.R., "Until there is a significant increase in the economic growth of the major industrialised countries, of which there are presently few positive signs, widespread improvement in commodity prices cannot confidently be anticipated."⁽⁵⁵⁾

When considering the likely effect of market forces on the Organization's trading operation's, the C.S.R. relies on "strategic planning" for the development of future activities. The C.S.R. argues that: "A strategic planning process focuses on the goals so that their achievement is consistent with the Company's business philosophy. Through forecasting it also helps prepare the Company for change."⁽⁵⁶⁾ The application of "strategic planning" by the C.S.R. as an aid to goal achievement is almost identical with the use of this planning technique in the C.S.I.R.O. What this suggests is that the planning phase of a private organization is not dissimilar from its counterpart in the public sector. Allowing for the possibility that both the C.S.I.R.O. and C.S.R. share common ground, because their operations are principally technical in nature, each is faced with the need to implement and co-ordinate their planning so that the goals determined can be achieved.

The effectiveness of the C.S.R.'s "strategic planning" is assisted by the organization being divided into six divisions. The six divisions are: Sugar; Energy-Coal; Energy-Oil and Gas; Aluminium and Chemicals; Minerals and Building Materials.⁽⁵⁷⁾ This is a further example of where the similarity with the C.S.I.R.O. is most marked. By applying "strategic planning" to long range forecasting the C.S.R. has announced that for the years immediately ahead: "Expenditure on exploration and evaluation programs aimed at securing new resources will be substantially reduced."⁽⁵⁸⁾

The matters outlined above have permitted the opportunity to focus on certain planning procedures where the approach of the private organization is similar to that applying in the public organization. The main difference between these two types of organizations appears to rest on the motivating factor. With the private organization each goal determined is aimed at maximising profit. Whereas, in the public organization the prime purpose is to perform government nominated functions and provide a public service.

Where the private organization outlays expenditure on research it is usually written-off in the year incurred. The C.S.R. adopts this approach for research and product development expenditure.⁽⁵⁹⁾ On the other hand,

B.H.P. also distinguishes between established operations and new ventures. The approach of B.H.P. is that: *"Expenditure for research in respect of established operations is charged against earnings as and when incurred on the basis that continuing research is part of the overall cost of being in business. In the case of subsidiaries principally engaged in research activities, expenditure is initially capitalised in the accounts of the subsidiary for subsequent amortisation or write off when the success or otherwise of the venture is established."*⁽⁶⁰⁾ For the year 1981/82 the amount outlaid by B.H.P. on all its activities for exploration, evaluation and development expenditure, amounted to \$M86.2, as compared to \$M63.9 for 1980/81.⁽⁶¹⁾

Government incentives, in the form of mining and oil exploration concessions, depreciation allowances on capital equipment and export grants, encourage the writing-off of research expenditure in the year it is incurred. Any "budgetary strategy" adopted by a private organization needs to be capable of isolating those costs and, yet, reveal to management costs which are directly associated with production. The importance of separating these costs is that this information is needed to aid in fixing the selling price of the goods being manufactured. Formula Budgeting offers one means by which resources can be allocated throughout the organization, according to the anticipated cost of producing the goods. However, unless research and development support is fixed as a percentage of the cost of production, the formula approach is an inefficient means of financing research and development. This approach encompasses all the defects of "incrementalism", because it is not capable of channelling resources into those areas having the most need.

The adoption by C.S.R. of "strategic planning" suggests the "budgetary strategy" of Planning-Programming Budgeting (PPB) would prove more acceptable. The main advantage the PPB "budgetary strategy" has to offer the private organization is that the planning approach is management orientated. The tendency private organizations have to be more bureaucratic in the conduct of their operations, consistent with Weber's bureaucratic model theory, supports the use of a "budgetary strategy", where the planning undertaken is centralised at management level. PPB would also prove capable of incorporating a research and development component in each activity approved.

The reluctance of Australian private research and development

organizations to reveal their "budgetary strategies" adopted precludes any worthwhile in-depth comparative study and analysis. Despite this shortcoming, Australian private organizations are contributing significantly to research and development, and some of the notable achievements will be mentioned in Chapter 6.

In the meantime, rather than proceeding in a speculative mode, the remainder of this dissertation will concentrate on the budgetary application for allocating resources used in Australian universities and public research and development organizations.

SUMMARY

The purpose of this Chapter has been mainly to identify the prime differences between a public organization from its counterpart in the private sector. The first major difference noted was that a public organization is established by government to fulfil a particular purpose and service the needs of society within the parameters of the organization's expertise. On the other hand, the private organization is established to earn a profit, which is shared amongst the organization's shareholders in the form of dividends, or the consolidation of its sphere of operations. The difference between these two approaches determines an operational philosophy which is distinctive and quite separate.

It also became apparent that the public organization has certain responsibilities to the government which created it, e.g., "public accountability". Furthermore, the government can influence directly the operations of the public organization by varying its functions or the money supply. While the private organization enjoys the capacity to redirect its operations, the majority of changes made are, by and large, the result of external influences, e.g., world recession, dwindling overseas markets, increases in labour rates or variations to government incentive schemes.

Both types of organizations, it was noted, had to be flexible enough to cope with changed circumstances. Restructuring the organization, introducing proven planning techniques, redirecting effort into more profitable or rewarding activities and improving the communication flow, both within and outside the organization, were some of the methods described that have been introduced to combat the effect of changed circumstances.

When the allocation of resources in either a public or private research and development organization was examined, it became evident that there were some similarities. The immediate dichotomy noticeable, on the other hand, was the service versus profit motives existing between the two types of organizations. In addition, it has also been noted that the reluctance of private organizations to divulge details of their "budgetary strategies" has led to problems when trying to compare the resource allocation effectiveness of the two types of organizations concerned. Nevertheless, resource allocation principles used in either type of organization do share common ground if allowance is made for a service or profit situation.

In concentrating on resource allocation methods appropriate for a public organization, what began to emerge was the inability of traditional forms of "budgetary strategies" to satisfy the needs of the organization and the government which created it.

The problems associated with persuading private organizations to reveal their "budgetary strategies" encourages the remainder of this dissertation to concentrate on the approach to resource allocation practised in Australian universities and public research and development organizations established by the Commonwealth Government. Chapters 5 and 6, which follow, will be devoted to the problems encountered by these types of organizations in allocating resources amongst research and development activities. In particular, Chapter 6 will contain details of a budgetary model likely to prove of more relevance to the funding of research and development activity.

CHAPTER 4

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CHAPTER 5

BUDGETARY PROBLEMS ENCOUNTERED BY PUBLIC RESEARCH AND DEVELOPMENT ORGANIZATIONS

The focus of this Chapter is on some of the problems a public research and development organization encounters when developing the budget for the following accounting period, usually that period which concerns the next twelve months of the organization's operations.

In the previous Chapter the point was made that the "budget" plan amounts to a "shopping list" of the wants and needs which have surfaced throughout the organization. The wants and needs - the "bids" - are those activities that their initiators regard as warranting a share of resource allocation when a budgetary distribution is being formulated. Once the list of wants and needs is compiled the next step for the organization is to process and apply the "budgeting" process, whereby the "bids" received can be scheduled and placed in some order which emphasises those objectives considered to be attainable.

The fulfilment and the degree of sophistication exercised in performing the "budgetary" process of a public research and development organization can be influenced by a number of factors. Perhaps the two most important of these are: (1) the extent by which the "budgetary assessment" process is used to compare and rate competing "bids", and (2) the personal style and approach of those who are empowered to make decisions which commit the organization to some future course of action.

Of these two factors the matter of leadership appropriate to an Australian university situation warrants clarification. It will be recalled that in Chapter 2 the evidence submitted supported the conclusion that Australian universities are complex organizations where special features are embodied in a pluralistic operational system mode. What is also noticeable is that the approach to decision-making under the collegiate system is different from that applying in a public organization structured along more formal bureaucratic lines.

It is necessary, therefore, to clarify or enlarge on the influence these two factors can have on the "budgetary assessment" process because this will assist later in placing other budgetary matters associated with

an Australian university or public research and development organization into their proper perspective.

The task of undertaking the "budgeting" process can be assisted greatly by adopting some form of "budgetary assessment" process as an aid towards selecting those wants and needs which deserve resource support. It was noted that organizations, such as the C.S.I.R.O. and C.S.R., have expanded their "budgetary assessment" process by establishing a team that has been given the responsibility to engage in "strategic research planning". The C.S.I.R.O., for example, defends the application of strategic planning on the grounds that the merits of each research activity can be judged in the light of the organization's overall research effort, and time sequences can be forecast more accurately where new research activity is to be introduced.

There is a tendency to prejudge strategic planning as a further filter device during times of financial stringency. The argument in support of this conclusion is advanced on the assumption that resources available in a "no growth" situation will require severe pruning amongst many of the "bids" which have been nominated. An alternative approach in support of the place of strategic planning in the overall planning process emphasises the value of this technique as a management tool to aid the decision-making process.

Careful planning enjoys the advantage of looking more to future activities for the purpose of noting those which can be scaled down or phased out. In a "no growth" situation the scaling down or phasing out of an existing research activity provides the opportunity for a new research activity to be introduced. What is of importance to the public or private research and development organization is the establishment of adequate lead-time for the phasing in or the phasing out of research activity. Strategic planning, therefore, introduces a systematic and long-term approach to the "budgeting" process and provides a means of research activity surveillance which is more adept to cope with changing circumstances.

Unlike the private research and development organization, its counterpart in the public sector is not required to adopt a "budgetary strategy" aimed at achieving a profit at the conclusion of the year's trading. Nevertheless, the public research and development organization has to satisfy other forms of measuring goal attainment which are equally as crucial as achieving a profit. Perhaps the difference between measuring the results obtained by public and private organizations is best illustrated by

reference to the distinction made by Lee and Johnson. In respect to the private organization: *"Profit and loss measures provide the private sector with an index of the results of decisions and thus enable owners to hold managers accountable".*⁽¹⁾

On the other hand, for the public organization, as it represents an arm of government, the results achieved in expending public monies are sheeted home eventually to the budgeting application. As Lee and Johnson point out: *"Budgeting is one means by which government may be held accountable for its actions, and accountability is essential to the concept of limited government. Through budgets, the electorate can obtain information to assess the quality of decisions made by political leaders".*⁽²⁾ To a large extent the organizational character of a public organization, where a chairperson or executive projects the image of the organization to the public, reduces the need for political leaders to justify actions initially. Any criticism of a public organization would eventually have to be answered by the responsible minister; however, the amount of time which would have elapsed from when the criticism was first voiced until the minister responded would prove of vital importance in preparing an appropriate rebuttal. Later in this Chapter, the need for a public organization to practice "public accountability" will be discussed in more detail.

When viewed in the organizational context a university presents a number of difficulties and not least of all is the vexed problem of how to measure its goal attainment. It was this particular problem which encouraged Balderston to reach the conclusion that: *"The general goals of a university are shrouded in vagueness. By common consent, there are several goals, but there is not consensus among those concerned with universities about the relative importance of the goals, the interdependencies among them, or ways of measuring attainment of them."*⁽³⁾

The difficulties which arise in the operations of a complex university are magnified because the social structure of the university's organization is "pluralistic". In examining the pluralistic approach evident at most complex universities, the researches undertaken by Baldrige regarding the New York University (N.Y.U.) situation which existed towards the end of the 1960s provide strong *a priori* evidence that similar situations could exist at complex universities elsewhere. What caused concern at N.Y.U. was the philosophy of approach which encouraged that University to accept large

numbers of relatively poor students and then fail many of them. The professoriate of the liberal arts area objected to applying standards that lowered the University's student quality. By applying case study methodology Baldrige uncovered a number of features where each, in some form or other, contributed to the operational difficulties experienced.⁽⁴⁾ He found, for example, that N.Y.U. was fractured, divided and complicated by interlaced networks of authority, status, professional outlook and special interests.

The complex social framework had encouraged the emergence of loose and ambiguous power. This had permitted extreme specialisation, extreme fragmentation of values and extreme complexity in its structural arrangements. In short, Baldrige was able to conclude that "*... because the social structure of the university is loose, ambiguous, shifting, and poorly defined, the power structure of the university is also loose, ambiguous, shifting and poorly defined.*"⁽⁵⁾

At N.Y.U. the formal organizational structure encompasses a collection of colleges, schools, institutes and departments, many of which enjoy some degree of autonomy and independence. The extent of organizational diversity suggests difficulties were bound to emerge if an attempt was made to co-ordinate the structure as a whole system because the power conflict generated would assume different and varied dimensions. What Baldrige observed was extraordinary role conflicts arising from having a multi-layered bureaucracy, where certain faculty staff had to perform different roles at the same time. This led to the development of contradictory expectations. A further complication, which added to the widespread conflict, was having parallel authority structures in the University's bureaucracy - the bureaucratic network on the one hand, and the professional network on the other.

Contradictory expectations encouraged the establishment of a system of subcultures where the aim was the satisfaction of divergent goals. As Baldrige points out, values unify when people hold them in common but values fragment the social structure into small subcultures when there are many different competing goals.

The N.Y.U. experience provides a useful backdrop for considering the situation which has developed at Australian universities. In Australia, the chief executive officer of a university is the Vice-Chancellor. As the

operations of an Australian university become more complex it seems reasonable to postulate that the complexity of a vice-chancellor's duties will increase in sympathy. Past practice suggests appointees to a position of vice-chancellor are required to have a distinguished academic record, a deep understanding of teaching and research, some administrative experience and an ability to relate harmoniously with others. When these attributes are examined what becomes apparent is the extent of personal qualities necessary to fulfil the tasks expected of a vice-chancellor.

With emphasis being placed on personal traits or an individual's personality, appointments which rely on these characteristics encounter difficulties in satisfying the conclusions reached by Herzberg. Adopting the "human relations" approach of organizational theory, Herzberg has devoted much of his research to the study of job attitudes and staff selection techniques. From his researches Herzberg formed the view that: *"If one structures the jobs properly, one must also structure the selection process properly".*⁽⁶⁾ He came to the conclusion that it is necessary *"... to shift the emphasis from personality to the attempt to match an individual's work capacity with work he will be needed to do. This demands a continued close analysis of the actual kinds of abilities needed for each job and an equally close analysis of the potential abilities of applicants for work."*⁽⁷⁾

A different approach is taken by the theorist Alvin Gouldner. Gouldner would consider the appointment of a person to the position of vice-chancellor in terms of manifest and latent roles. In respect of manifest roles Gouldner would maintain the concept *"... focuses on the manner in which group norms yield prescribed similarities in the behaviour and beliefs of those performing the same role"*,⁽⁸⁾ but he would recognise *"... that latent identities and roles are important because they exert pressure upon the manifest roles, often impairing conformity with their requirements and endemically threatening the equilibrium of the manifest role system."*⁽⁹⁾

A person appointed to the position of vice-chancellor must, in Perrow's view, be appropriate to the circumstances. In this respect Perrow argues that: *"... leadership is specific to the circumstances and the tasks demanded of the leader"* and *"... in the formal organization is a highly relative process, with different combinations of supervisory-leadership skills and practices being required at different levels of supervision in the same organization and at different times in the life of an organization."*⁽¹⁰⁾

In selecting a vice-chancellor the selection committee will normally consist mainly of academic staff who would regard the matter of leadership necessary for an appointment of this kind as one which "... stems from the inter-action of the group members out of which group goal-seeking behavior emerges."⁽¹¹⁾ However, if this approach is interpreted along the lines that interest groups will endeavour to maintain their influence in a particular power base by ensuring one of their own kind is appointed to a position where that power is exercised, it is not inconsistent with Gouldner's theory of group tensions. Once an academic member of staff is elevated to the position of vice-chancellor a change in roles occurs, for each no longer "... share complimentary expectations about each other's role."⁽¹²⁾ Furthermore, for the appointee to the vice-chancellorship what may have been latent roles in the past may become manifest roles on assuming the duties of the new position. For the academic members of the selection committee Gouldner would reason "... that people playing different manifest roles may be performing similar latent roles and, conversely, that those performing the same manifest role may be playing different latent roles."⁽¹³⁾

Herzberg would not be convinced with this approach. Based on his premise that "... leadership is a characteristic of the individual who exercises it ...", he would go on to argue "... that a leader will be able to lead a given group only if the characteristics of this group are such that this kind of person can be its leader, and if the group accepts this leadership."⁽¹⁴⁾ In the case of a vice-chancellor the group involved is the university as a whole, that is, the students, the teachers, the researchers and the general staff.

There are several points that can be extracted from the theories advanced by Gouldner and Herzberg which are relevant to issues involving the process of decision-making in complex organizations, such as an Australian university or public organization. The pluralistic system, inherent in the organizational structure of a university, needs to be taken into consideration because of the special organizational problems a system of this kind generates.

The first point is associated with Gouldner's theory of group tensions. In Chapter 3, when the composition of the Executive of the C.S.I.R.O. was examined, attention was drawn to the requirement contained in Section 11(4) of that Organization's Act for five members out of the total Executive membership of eight to possess scientific qualifications. This requirement,

where a majority of the Executive are scientifically qualified, reinforces the thrust of Gouldner's argument in that interest groups will endeavour to maintain their influence in a particular power base. On the surface it seems logical and reasonable for decisions to be made in a scientific organization by those who are scientifically qualified and, by implication, are better suited to appreciate the relevance of research activity. However, despite this conclusion, it is equally logical and reasonable to conclude Gouldner's theory is being upheld by a particular interest group - the scientists.

The second point relates more to the process of decision-making necessary at an Australian university and lessons that can be learnt from the experience of overseas institutions, particularly those aspects which involve role influence and role attainment. The experience of overseas institutions can assist with the future planning of Australian universities and moreso today where Australian vice-chancellors are expected to perform exacting roles at a time when many are questioning the practicalities of a university education. Baldrige's case study of N.Y.U. highlights the problems encountered by an overseas complex university. His study can serve as a model of the circumstances Australian universities should take steps to avoid in the operations of their individual organizational structures.

During the course of undertaking his case study of N.Y.U. Baldrige detected that the "school of opportunity" ideal was being challenged from within that University and blamed as the root cause for the sustainment of a system where low admission standards led to high failure rates. On the external front N.Y.U. was having to compete with newly-emerging public educational institutions which charged small tuition fees. The future of N.Y.U. depended on adequate resources, students and social influence. To recover lost ground N.Y.U. had to devise a new image which would serve the educational needs of students and the organizational needs of the University. (15)

When James Hester was appointed President of N.Y.U. in 1962 he included the future of the University as one of his immediate priorities. Hester's appointment coincided with a request received from the Ford Foundation for N.Y.U. to seek a comprehensive development grant. The development of the proposal to place before the Ford Foundation involved the establishment of several committees where numerous faculty bodies were also invited to submit proposals. When each of the proposals were examined

what was noticeable was the different interpretations various sections of the University placed on N.Y.U.'s future educational role.⁽¹⁶⁾ The most notable divergence of opinion was the attitude of the members of the faculties towards the administration and vice versa. The faculties argued that decisions were taken by administrators without consulting the faculties, while the administrators counter-argued that faculty responses were too parochial and failed to adopt a university overview.

The proposal submitted eventually to the Ford Foundation secured the necessary support and: *"Ford responded generously, expressing strong confidence in the plans."*⁽¹⁷⁾ The critical decisions associated with the proposal had been taken by a small group of top administrators. These top administrators at N.Y.U. *"... felt ... they had a broader perspective from which to view the problem than most of the faculty, and therefore it was their duty to move into the situation as the key 'change agents'."*⁽¹⁸⁾ President Hester was advantaged because in seeking to achieve change he had the backing of a strong administration which, in itself, can be viewed as representing one of the critical elites then existing at N.Y.U.

The N.Y.U. case study provides a deep insight into the study of organizational change. External events created the need for change. While acknowledging that in any large organization groups of elites will have divergent goals and different perspectives of the organization's future image, the development at N.Y.U. enabled Baldrige to observe that: *"It is always critical to examine the issue of whose goals and images of the future are being used as a basis of action."*⁽¹⁹⁾

There are circumstances associated with the N.Y.U. experience which the Australian educational planner should heed. With financial allocations to Australian universities being co-ordinated by a Commonwealth Government agency, the situation does not arise in Australia where one university has to compete with another to the same extent as N.Y.U. had to compete with nearby public universities. The main point of relevance for Australian universities is to develop a philosophy of approach which crystallises the main roles an Australian university wishes to fulfil. Such an approach assumes greater importance where a university has a special commitment to research, as distinct from teaching.

By developing an organizational philosophy, somewhat similar to the "business philosophy" of the C.S.R., an Australian university would establish a statement of intentions recognised readily by all sections of a

campus community. The next step would be to improve the communication flow. If Gouldner's theory of group tensions is upheld as valid, then the complex organizations must recognise that tensions will increase where interest groups fail to interact frequently. When this rationale is superimposed on a university environment, the importance of fostering close interaction between faculty members and the administration assumes wider significance. Each of these groups needs to be aware of the other's attitudes and the reasons why these attitudes have emerged. A closer working relationship between faculty members and the administration must lead to the attainment of greater efficiency and effectiveness in fulfilling the goals determined by a university. Closer interaction between these two groups would go part of the way to change the social structure of an Australian university which, in Chapter 2 it was noted, Dufty had described as "loose, ambiguous, shifting and poorly defined". Similar terminology had been used by Baldrige to describe the situation at N.Y.U. (20)

The responsibility of bringing these two critical groups together in an Australian university setting rests with the vice-chancellor. A vice-chancellor needs to recognise that for rapport to be established amongst these two groups, trust and the mutual recognition and acknowledgement each group has for the other is the only approach the university's obligations can be fulfilled efficiently and effectively. Consequently, the role identification the campus community bestows on a Vice-Chancellor will play an important part in the acceptance of his or her leadership.

If anything, the N.Y.U. case study brought home an important paradox. What commenced as an exercise aimed at improving N.Y.U.'s external image and its ability to compete with adjoining public universities, ended up exposing the extent of bitterness which existed within the university itself because of the divergent attitudes of the elite groups. Although the circumstances are different, the buildup of general staff working in Australian universities since World War II provided a situation where the universities were slow to respond and the eventual outcome led to irreversible change. This development requires further explanation because the cost of general staff is one of the ingredients in preparing budgets of research activity undertaken at Australian universities.

When John Dedman, then Minister for Post-War Reconstruction and Minister in charge of the Council for Scientific and Industrial Research,

introduced the Australian National University bill into the House of Representatives on 26 July, 1945, he reminded Australians, in outlining the federal government's plans, that the country would have to rely more on producing its own academic teachers and researchers in the future.⁽²¹⁾ As the facilities for teaching and research increased so did the demand for the manpower to service these facilities. This led to a proportional buildup in the number of general staff an Australian university required to meet the expanded needs of teaching and research. By 1980 general staff represented 60% of the total staffing at Australian universities or $1\frac{1}{2}$ general staff for each academic researcher or teacher.⁽²²⁾

Until the 1970s general staff had been relatively passive on the campuses of Australian universities. Conditions of service and rates of pay had, in the past, been arranged usually along the lines of "gentlemen's agreements". It is likely that this practice would have continued unchallenged if university policy-makers had kept abreast of the times and introduced conditions of service and rates of pay more akin to those applying throughout the community. The management of Australian universities of the late 1960s ignored, or were ignorant of, external changes of inter-connecting factors. This parallels the conclusion Emery and Trist reached in the early 1960s following their study of a United Kingdom food-canning company, mentioned in Chapter 2.

The concessions gained by students during the latter half of the 1960s after they had sought greater representation on university decision-making committees⁽²³⁾ had not gone unnoticed by the general staff. The frustrations being experienced by the general staff also led to them demanding representation on the Councils or Senates of Australian universities.⁽²⁴⁾ Allied to this was the desire of general staff to become more involved in campus life and to seek improved conditions of service and rates of pay similar to contemporaries employed elsewhere in the public sector. All of these aims have now been achieved but it cost universities the freedom to operate independently. The activism of the general staff may also have encouraged the academic staff, represented by the Federation of Australian University Staff Associations (F.A.U.S.A.), to become more active on behalf of their members, particularly in presenting submissions to the Academic Salaries Tribunal.⁽²⁵⁾

What would interest theorists, such as Herzberg, is that the group (the campus community) had now become more diverse. The group aspirations had

been increased and these would add to the requirements a leader of such an organization (a vice-chancellor) would need to satisfy all segments of the group. Gouldner would also recognise that the manifest and latent roles perceived within the group had changed.

The demand for participation by all segments of a campus community and the growth of Australian universities since World War II diminishes the prospects of universities continuing as collegiates. Neither can universities be regarded as bureaucracies in the organizational sense because their policy formulation systems do not accord with the bureaucratic approach. Despite the difficulty of categorising a university in organizational theory terms this problem is not one which effects budgetary preparation. The selection of those wants and needs that the resources available can finance may need to be subjected to a wider filtration through the committee system than would apply in a private organization. Furthermore, the application of formulae, such as EFTS or WSU, when determining under-graduate teaching allocations, provides the means for calculating the level of funding needed in a university teaching area, based on the student intake for each course offered.

The factors outlined above have had both a direct and indirect impact on the budgetary planning undertaken at Australian universities over the past decade. They will continue to do so and, for this reason, a sound grasp of their long-term implications on the budgetary process is necessary. To some extent their effect will be masked, in cost terms, when a university is passing through a growth phase. At the other end of the spectrum, when financial stringencies are imposed on a university, the factors referred to will become more recognisable. At this stage the section which follows will concentrate on a growth situation where, it will be noticed, the budgetary problems appear to be minimised.

PROBLEMS MINIMISED IN A GROWTH SITUATION

At first glance the title selected for this section would appear to be a contradiction. A more reasonable and logical assumption would be that growth creates innumerable problems. However, when the growth of the Australian university system is reviewed it is possible to detect two distinct phases. The first phase is the slow rate of growth which occurred throughout the Australian university system up to the commencement of

World War II. The second phase, which followed in the wake of World War II, was one where an immediate acceleration of university activity was pronounced. It was the second phase which placed considerable strain on the resources Australian universities had to offer. Gradually, the rapid acceleration of growth in the immediate post-war period settled down to a steady rate of expansion.

The growth which took place during these two phases involved three essential elements: (1) students; (2) facilities, and (3) funding. Although this dissertation addresses itself more to the funding aspects of these two growth periods, "students" and "facilities" are the two key elements which have a bearing on how funds were apportioned throughout the Australian university system. To understand the funding aspect it is first necessary to be familiar with those components of university life that exerted pressure on the resources available.

This section will, therefore, be divided into two parts. The first part will consider those factors which affected the growth of Australian universities to a point reached by the mid-1960s. The second part will analyse how growth can discourage the effective use of available resources and mask inefficiencies. What will also be demonstrated is that during sustained periods of growth, expansionism is accepted as the norm and, when stringencies are imposed on resource allocation, the period of re-adjustment within the organization creates tensions which can lead to conflict.

It will be recalled that in Chapter 4 brief mention was made of the various guises the Commonwealth Government had used prior to World War II to channel some funding into activities of an educational nature. The Commonwealth Government's involvement in education, mainly at the tertiary level, will now be considered in more detail.

Prior to 1936 little financial assistance was provided by the Commonwealth Government to Australian universities. No provision exists under the Constitution of the Commonwealth of Australia for the federal government to act on matters which concern education *per se*. In his work on the Australian Constitution Sawyer points out that education is an issue which is subject to State regulative control.⁽²⁶⁾ However, neither of the States had made education an issue within a constitutional context. It was through matters which involved defence or repatriation benefits that the Commonwealth Government channelled funds into activities where education received a form

of spin-off. Several examples will help illustrate this point.

The establishment of training academies at Jervis Bay (Navy), Duntroon (Army), and Point Cook (Air Force) were debated in the Commonwealth Parliament on the grounds that they provided facilities for the training of cadet-officers and was part of an integrated scheme to achieve a state of preparedness for Australia's defence. Similarly, the cadet training corps, established at schools and colleges throughout Australia, were a feature of the various national fitness programmes approved by the Commonwealth Parliament, but Australia's defence was, obviously, one of the important considerations. This latter point is reinforced by the fact that the Commonwealth Government also met the cost of ammunition used on training exercises.⁽²⁷⁾

In late 1917, the Commonwealth and States agreed on an arrangement whereby the Commonwealth Government would meet the cost of salaries and running expenses the States were to incur in providing additional technical educational programmes as part of the plan to re-establish ex-servicemen when discharged at the end of World War I. A further initiative taken by the Commonwealth Government was the introduction of the Soldiers' Children Education Scheme in 1921. The aim of this scheme was to assist in the financing of children of ex-servicemen killed in action or incapacitated by war service to pursue an industrial, commercial, agricultural or professional occupation. The introduction of the scheme was argued on the grounds of the Commonwealth Government's obligation to provide repatriation benefits, rather than the educational advantage the scheme would generate.⁽²⁸⁾

The Commonwealth Government went much further in 1936. It decided to make an annual grant available to assist with research in the physical and biological sciences. However, with the advent of World War II, financial grants were offered by the Commonwealth Government to students at Australian universities because of the urgent need for technically trained people.⁽²⁹⁾

The position Australian universities had reached by 1939 was: six Australian State universities and two university colleges;⁽³⁰⁾ the employment of 1284 academic staff;⁽³¹⁾ and a total student enrolment of 14326.⁽³²⁾ By way of comparison, 41 years later (i.e., 1980), enrolments at Australia's 19 universities had increased to 162484.⁽³³⁾

Towards the end of World War II, the Commonwealth Reconstruction Training Scheme (C.R.T.S.) was introduced by the Commonwealth Government for

the purpose of permitting ex-servicemen and women to train at the tertiary level.⁽³⁴⁾ This arrangement enabled the Commonwealth Government to pay to Australian universities the fees of ex-service personnel who had taken advantage of the opportunity to enrol in degree or diploma courses. Furthermore, grants made available under Section 96 of the Constitution⁽³⁵⁾ were given to the States "... to assist with the greater recurrent and capital needs of the universities."⁽³⁶⁾ This serves as a further example of where the Commonwealth Government was, indirectly, able to increase its contribution to Australian tertiary education through the commitment it had made to ex-servicemen and women under the C.R.T.S.

At this point what becomes evident is that from the end of World War I until 1939 the growth of the Australian university system was steady but unremarkable. Some form of Commonwealth Government funding to the system was noticeable but, until 1936, insufficient to have had much impact.

The Commonwealth Education Act, 1945, apart from establishing the Commonwealth Office of Education, also envisaged greater participation by the Commonwealth Government in the field of education,⁽³⁷⁾ the Constitution notwithstanding. One of the consequences of this Act was the introduction of the Commonwealth Scholarship Scheme to benefit young matriculants. As mentioned briefly in Chapter 2, this financial inducement, coupled with intakes qualifying under the C.R.T.S., created a rapid expansion in university enrolments - 1946 was twice that of 1939 - and rose a further 25% by 1948.⁽³⁸⁾ The growth pattern in respect of student numbers alone, where 1948 represented an increase of 150% on the 1939 student enrolment, is sufficient to indicate that problems would arise in the Australian university system unless the increase of student numbers was not matched by an increase in funding and facilities available.

The upsurge of student enrolments at universities following the end of World War II is not peculiar to Australia. In the U.S.A, the G.I. Bill of Rights (Serviceman's Readjustment Act, 1944) was similar to Australia's C.R.T.S. Many American ex-servicemen and women also wished to obtain training at the tertiary level and, by 1946, student numbers in the U.S.A. had increased by 57% above the 1939 figure.⁽³⁹⁾ The strain placed on the university system by these exceptionally high enrolments is expressed vividly in an American account of the period where the observation was: *"Portable dorms mushroomed on the campuses in the form of Quonset huts, trailers, prefabricated houses, and hastily converted barracks."*⁽⁴⁰⁾

The American account goes on to indicate that few veterans were able to participate in the traditional extra-curricular activities universities had to offer. It would appear the allowances paid to veterans were minimal, hardly sufficient to meet accommodation and living expenses, with little or no money to meet the costs of non-essential activities. The aim of most veterans was to complete chosen courses in minimum time. Lee also goes on to point out that the attitude of many American veterans was that: *"Having just put up with the discomforts imposed upon him by military life, he was willing to put up with it for a little longer."*⁽⁴¹⁾

This period of American educational history would suggest that veterans, the forerunners of the present-day mature-age student, openly voiced criticism of lecturers who they believed failed to perform adequately. Sidney Borrell's observation, quoted in Lee's research, would lead a reader to conclude that: *"... the student veteran hated cant, wanted to understand what he heard, and fully expected his instructors to have things thought out carefully before stepping into a lecture room."*⁽⁴²⁾ This expectation could have been formed from the veteran's experience of briefing sessions prior to proceeding on a mission during the war years. Nevertheless, observations of the kind made by writers, such as Borrell, could also incorporate the application of current day thinking on the events of the late 1940s and, for this reason, may not be an accurate presentation of the true situation.

Regrettably, the writer's research has failed to locate any authoritative published work of the attitudes and experiences of C.R.T.S. students. From personal discussions with a number of former C.R.T.S. students, the writer has gained the impression single students were better situated financially than the married student with a young family. Furthermore, where the married student was the only income earner, the writer has been told that the allowances were insufficient to meet the costs of commuting to and from the university campus, purchase text books (if these were available, and more expensive for a student studying law or medicine), feed and clothe a family. Consequently, the married student in these circumstances was obliged to use savings (deferred pay was the usual source of funding), borrow from relatives or friends or simply go without. However, there appears to be no evidence amongst Australian veterans that they were critical of lecturers along the lines suggested was the American experience. Having been subjected to rigorous discipline for the past few years, it would seem reasonable to conclude the majority of veterans were reserved, but enjoyed

participating in Australia's university system of the time.

The strain placed on the Australian university system by the high influx of students during the immediate post-World War II period encouraged the Commonwealth Government to establish the Mills Committee in 1950 for the purpose of proposing a course of action aimed at assisting State universities overcome their funding and facilities problems.

One of the most important recommendations made by the Mills Committee was the method of future funding to Australian universities. Two levels of funding were proposed. The first level was "*... based on weighted student numbers to enable universities to meet existing commitments, and 'second level' grants to enable universities to develop their services and research and to raise academic standards.*"⁽⁴³⁾ However, the second level grants were geared to a formula that the Commonwealth Government would contribute £1 for every £3 a university received from fees and grants from its State government, after disallowing that income which was derived from first level grants.⁽⁴⁴⁾ These recommendations were later enshrined in the State Grants (Universities) Act, 1951, and continued to apply until the end of 1957.

A situation had now been reached where Australian universities were able to move towards erecting permanent buildings to replace the makeshift facilities of the late 1940s and early 1950s and increase their staffing complements more in keeping with student numbers. The establishment of the Australian Universities Commission (A.U.C.) in 1959 enabled that organization to act as the co-ordinator of resource distribution amongst Australian universities during this expansionary period and beyond.

An examination of the Australian university system for the period 1951 to 1965 indicates substantial growth. By 1965 a further eight universities had been founded,⁽⁴⁵⁾ student numbers had grown to 83349,⁽⁴⁶⁾ while Commonwealth Government financial support to Australian universities, in the form of grants, had increased to \$64537000.⁽⁴⁷⁾ Problems had arisen during this initial growth phase but the problems would have been much greater if the Commonwealth Government had not been sympathetic to the resources required by Australian universities. Transforming resources into tangible results inevitably involved time delays. To illustrate this point, the construction of new buildings to house libraries, laboratories and lecture rooms was subject to the time constraints imposed by the process of inviting tenders, negotiating contracts and proceeding with construction; a practice which is still followed today.

Annual recurrent grants received by Australian universities during this period permitted the engagement of additional teaching and research staff. The number of full-time staff engaged on teaching and research had risen to 5104 by 1965.⁽⁴⁸⁾ When this figure is compared with the 1939 level of 1284 the increase, expressed as a percentage, amounts to 297%. The new universities founded during this period also provided opportunities for academic staff to gain promotion at a rate which would not have been possible prior to World War II. Teaching and research programmes, once approved and supported by the relevant academic boards, could expect to receive some funding.

In reviewing this period, what surfaces is the apparent pre-occupation with growth and accommodating growth to the exclusion of evaluating the need and appropriateness of existing activities. Growth did not place any pressure on Australian universities to review the effectiveness of some of their programmes and where inefficiencies existed they escaped remedial action. While growth, particularly the rapid increase in student numbers, undermined the traditional collegiate system of Australian universities, discussed in Chapter 2, the financial support received from the Commonwealth Government brought about "... a closer association between universities and government."⁽⁴⁹⁾ In assisting universities with their funding problems the Commonwealth Government had made no secret of the fact that its perspective of the future place of Australian universities was to serve the nation. Prime Minister Menzies had made the point in late 1957 that "... the community is accepting heavy burdens (i.e., university financing) in order that, through the training of university graduates, the community may be served."⁽⁵⁰⁾

What had emerged was a situation Bessant has described as one where: *"The universities were encouraged by governments to expand their facilities to meet what these governments saw as State and national needs. This entailed the development of new training courses or research programmes, and the expansion of existing courses in those faculties where governments (rather than the universities) saw a need ... this led to a further emphasis in the universities on the more specifically vocational courses in the sciences and social sciences, rather than classical and literary studies."*⁽⁵¹⁾ The requirement for courses to be orientated more to the needs of society was also appearing in the literature from overseas. Clark Kerr, for example, was drawing attention to the structuring of courses more suited to

the requirements demanded in the work place. (52)

The encouragement Australian universities received from Commonwealth and State governments to expand their activities, and the enthusiasm the universities displayed, entered into this expansionary phase and enables the conclusion to be reached that towards the end of this growth period the problems emerging at Australian universities were minimal. Although the point needs to be made that the proportion of Australia's G.N.P. devoted to higher education is, and always has been, low by comparison with other Western countries. The sustained period of growth also contributed to a buildup of expectations amongst Australian universities which was later to prove difficult to contain. Having enjoyed a growth situation for so long some of the younger academic staff had no experience of operating in a frugal mode. Much of the blame for limiting expenditure at Australian universities was sheeted home to the administrations rather than recognising that the days of funding euphoria had come to an end. The stage was set for introducing competition into the allocation of resources amongst Australian universities. The funding shift which followed will be dealt with in more detail in the sections which follow.

COMPETING FOR RESOURCES

Where wants and needs exceed the resources available the situation created will lead to competition. In a public organization there are two sources from which wants and needs can be generated. The first source, and the most direct, is from within the organization, that is, those wants and needs which are nominated by the branches, departments or divisions that make up the organization's structure. The second source, and this often takes the form of indirect influence, is those wants and needs which have been suggested by government, either on its own behalf or as a consequence of pressure exerted by sections of the community. Governments can, and often do, ask one of their public organizations to incorporate a certain activity into their future operations. The distinction between organizations such as the C.S.I.R.O. and the A.A.E.C. and Australian universities was highlighted in Chapter 4. An example of the kind of influence a federal government can exert is the requirement of the A.A.E.C. to permit sections of the C.S.I.R.O. engaged on non-nuclear energy research to have access to the Lucas Heights Research Establishment which was also mentioned in

Chapter 4.

While public research and development organizations also have to compete for resources and, in turn, the extent of this competition is transmitted throughout each organization's structure, this section will concentrate on the situation experienced by Australian universities. The reason for selecting Australian universities for the purpose of this examination relates to the distinctions which separate an Australian university from other forms of public research and development organizations. The special position of an Australian university in the allocation of resources is dictated, to a large extent, by student and course requirements. Adopting formulae, such as WSU or EFTS, as a basis for distributing resources to Australian universities introduces a degree of inflexibility in the allocation of resources within each Australian university which is not a factor a public research and development organization has to take into account.

The crisis of growth facing Australian universities by the early 1950s had become so acute that the Australian Vice-Chancellors' Committee (A.V.C.C.), formally established in 1935,⁽⁵³⁾ published a pamphlet entitled: **A Crisis in the Finances and Development of the Australian Universities**, towards the end of 1952. From a resources point of view the proposals outlined in the pamphlet were: an improvement in funding the operations of Australian universities, and for grants to be made on a triennial or quinquennial basis to permit the introduction of long range or strategic planning. Another feature, highlighted in the pamphlet, was the need to focus on national, rather than on regional considerations when new universities were being planned.

Whether this pamphlet influenced the then thinking of the Commonwealth Government is difficult to assess. If time is used as a determinant, then the conclusion drawn must be that the pamphlet had minimal effect because four years were to elapse before Prime Minister Menzies decided to invite Sir Keith Murray, Chairman of the British University Grants Committee (U.G.C.), to head a committee of inquiry given the task of investigating the problems emerging at Australian universities. When the Murray Report was submitted in 1957 four important recommendations were included. Firstly, the Report recommended that Australia should establish an organization similar to the British U.G.C. Secondly, that government recurrent funding (both State and Commonwealth) operate on a triennial

system. Thirdly, the Commonwealth Government should increase substantially its financial support to Australian universities. Finally, the Report recommended an increase in both tuition fees and in the level of grants State Governments made to their State universities.

Two years later the Commonwealth Parliament passed the Australian Universities Commission Act. It was this Act which established the Australian Universities Commission (A.U.C.) and this Organization continued until 1977 when it was replaced by the Tertiary Education Commission (T.E.C.). The functions of the A.U.C. were detailed in Sections 13 and 14 of that Act and read:

"13. The functions of the Commission are to furnish information and advice to the Minister on matters in connection with the grant by the Commonwealth of financial assistance to universities established by the Commonwealth and of financial assistance to the States in relation to universities, including information and advice relevant to -

- (a) the necessity for financial assistance and the conditions upon which any financial assistance should be granted; and*
- (b) the amount and allocation of financial assistance.*

14. (1) The Commission shall perform its functions with a view to promoting the balanced development of universities so that their resources can be used to the greatest possible advantage of Australia."

It is sub-section 14(1) which gives some hint that regard had been given to one of the features contained in the A.V.C.C.'s pamphlet produced in 1952.

The creation of the A.U.C. appears to have fulfilled one important task. It has avoided Australian universities experiencing the problems encountered by the New York University in having to compete with adjourning sister institutions. Admittedly, the problems facing N.Y.U. were, in a geographical setting, more parochial. Until an Australian state capital secured more than one university, the distance between Australian universities precluded the N.Y.U.-type problems becoming manifest. Nevertheless, in Melbourne and its surrounding environs, for example, the

existence of four universities (Melbourne, La Trobe, Monash and Deakin) provide the opportunity for each of these universities to compete in attracting students.

The approach adopted by the A.U.C. was outlined in some detail in the Commission's Fifth Report of May, 1972. The point was made that: *"The Commission's task is to assess the financial assistance required by universities."*⁽⁵⁴⁾ Rather than simply presenting to the Commonwealth Government the needs indicated by Australian universities in their submissions, irrespective of the financial implications, the Commission argued that its role went beyond these tasks. In defence of its approach the Commission drew attention to two important issues which influenced its thinking:

"Indeed the universities themselves assess their needs at quite different standards, as a comparative examination of their submissions reveal. It is true that there is a level of support below which the universities could not function; however, above that point, the appropriate level is a matter of judgment ... the portion of the community's resources which is available for university education in any given triennium is not unlimited ... This may mean that in a given triennium, the Commission may refrain from recommending funds for developments which in themselves are highly desirable but which the Commission does not regard as essential."⁽⁵⁵⁾

Essentially, the A.U.C. was advocating that its main role was to promote balanced and co-ordinated development. This approach was again restated by the panel established to advise the Commonwealth Minister of Education on the functions to be accorded the proposed Tertiary Education Commission when it presented its report in August, 1975.⁽⁵⁶⁾

The balanced and co-ordinated development approach adopted by the A.U.C. did incorporate the monitoring and rationalisation of the use of resources. In this regard: *"The Commission has always sought to avoid unnecessary duplication resulting in inefficient use of resources"* and the Commission declared: *"It will also continue to examine critically any proposals for new academic programs to ensure that such programs are necessary in the light of activities in other institutions."*⁽⁵⁷⁾ The

T.E.C. has continued with this approach and, consistent with the concept of rationalisation, advocated recently that one possibility of achieving an optimum level of rationalisation would be a "... merger of a CAE (College of Advanced Education) with a neighbouring university."⁽⁵⁸⁾

The arrangement introduced by the A.U.C. (and continued by the T.E.C.) of asking each Australian university to complete a questionnaire which included such matters as statistical information on the size of departments or faculties in terms of staff and student numbers (although criticised by some universities at the time) has provided basic data needed by both Commissions. Each Australian university had to indicate what new levels of activity it wished to introduce for the triennium under consideration. When the Commission visited each university later the triennial plan could then be discussed in more detail. By adopting this method of approach both Commissions have enjoyed the advantage of being placed in a position where they can perceive areas of activity that are capable of being rationalised or action taken to avoid duplication. The conclusion which can be reached is that the practice adopted by the A.U.C., and continued by the T.E.C., has avoided a situation whereby Australian universities have to compete with one another for resources.

While Australian universities have escaped the problems of competing for resources amongst themselves, other difficulties have arisen which have, in turn, produced uncertainties. The Commonwealth Government, for example, has not always accepted the triennial reports submitted by the A.U.C. The financial recommendations contained in both the Third Report (1967-69) and the Sixth Report (1976-78) were rejected.⁽⁵⁹⁾

When the Australian Labor Party became the Commonwealth Government in late 1972 it "... honoured its platform pledge to abolish university and college fees and to introduce a system of student living allowances."⁽⁶⁰⁾ The A.L.P. Government also introduced index-based supplementary grants in 1974 to protect universities against sharp increases in costs which occurred throughout the time-span of a triennium.⁽⁶¹⁾ Uncertainties amongst Australian universities arose in 1975, when 1976 was declared an intercalary year, with recurrent expenditure being maintained in 1976 at 1975 levels. What added to the degree of uncertainty was the introduction of the concept of operating within a "rolling triennium".⁽⁶²⁾

Competing for resources, therefore, has become a matter which concerns

each Australian university differently. The experience at Stanford University follows the arrangement whereby each dean or head of department is required to develop a five-year projection of his or her activities so that the annual budget is in accord with the longer range expectations of the university.⁽⁶³⁾ It will be recalled that mention was made in Chapter 4 that the C.S.I.R.O. had, over the past two or three years, introduced long range or strategic planning as a management technique. With Australian universities having to plan their resource requirements on a triennial basis they have, to a large extent, been forced to analyse future development beyond a twelve months' time-scale. One of the advantages flowing from this is that it introduces an in-built slow gestation period which permits proposals for new development or new activities to be considered in more detail supported by comparative analysis.

Each faculty or department will be seeking to gain support of its university for the wants and needs nominated. As highlighted earlier in this dissertation, the resources made available to an Australian university will prove inadequate to fund all the proposals which have been received. From a study of university behaviour undertaken by Garvin, he concluded that "equity" was significant in the allocation process. In this respect Garvin was referring to "equity" as the *"... efforts by the administration to treat all departments as equally as possible in order to minimize internal conflict."*⁽⁶⁴⁾

If conflict is to be avoided in distributing resources throughout an Australian university, much will depend on the negotiating skills of the vice-chancellor. Earlier in this Chapter, the role identification of a vice-chancellor was considered in detail. In fulfilling the many roles expected of an Australian vice-chancellor, the most demanding will be that of exercising persuasion amongst his academic colleagues to adopt budgetary proposals that fall within the resources available and represent those activities on which the university has placed a high premium. The vice-chancellor's task will become more difficult where resources are curtailed or the funding allocation is not upgraded to reflect real purchasing power, generally the consequence of inflationary factors. This aspect, which has the effect of reducing resources available in real money terms, will now be examined.

REDIRECTING RESOURCES WHEN INCOME IS STATIC

While the rejection of the A.U.C.'s Third Report (1967-69) by the Commonwealth Government⁽⁶⁵⁾ caused Australian universities to curtail some of their proposed activities, the rejection of the Sixth Report (1976-78) had a more significant dilatory effect. The main reason the Sixth Report was rejected can be sheeted home to political decision-making. In late 1975 the A.L.P. Commonwealth Government had been defeated at the election which followed in the wake of the Governor-General's dismissal of Whitlam's Second Labor Ministry.⁽⁶⁶⁾ The Liberal-National Party coalition had become the new Commonwealth Government and part of its fiscal strategy was to maintain recurrent expenditure on education at "... the present real levels but capital expenditure would be limited to essential projects."⁽⁶⁷⁾

By declaring 1976 an intercalary year the Universities Commission was charged with the responsibility of producing a new triennial plan geared to the fiscal guidelines that had been determined by the Commonwealth Government for the years 1977-79. This was not to prove an easy task for the Universities Commission. The Commission's Report for 1977-79 included a number of observations which reflected the difficulties foreshadowed. For example:

"The sharp restriction in funds available for universities in 1976 and the maintenance of this stringency for the next triennium will stop university growth."⁽⁶⁸⁾

While the Commission recognised that the "... problem of no-growth relates to the difficulty of maintaining some flexibility and capacity to undertake new activities in the face of virtually static budgets",⁽⁶⁹⁾ it proposed: "... that the minimum rate of growth for the 1978-80 triennium should provide for levels of operating expenditure which will restore standards to the 1975 level and provide an element of flexibility for some new developments."⁽⁷⁰⁾

If the projected number of student enrolments expected for 1979 (as calculated in July, 1976) is compared with the level of general recurrent grants proposed by the Universities Commission for the same period the percentage increase is almost identical:

Grants⁽⁷¹⁾

<u>Activity</u>	<u>Year</u>	<u>Amount</u>	<u>% Increase</u>
General Recurrent Grants	1976	\$M494165.0 (a)	
Proposed 1979 Grant	1979	\$M522960.0 (b)	5.8

(a) includes \$M0.640 for Deakin University

(b) amount proposed includes \$M9500.0 for Deakin University

Student Enrolments⁽⁷²⁾

<u>Activity</u>	<u>Year</u>	<u>Amount</u>	<u>% Increase</u>
Actual student enrolments	1976	153465 (a)	
Projected student enrolment	1979	161900 (b)	5.6

(a) excludes Deakin University

(b) includes Deakin University

Although the above comparisons incorporate some skewness, on account of the establishment of Deakin University in 1977 and the enrolment of third year students at Griffith and Murdoch Universities,⁽⁷³⁾ the conclusion accords with Owens' observation that: *"Between 1975 and 1981 operating grants for universities, corrected for inflation, have on average only just kept pace with increases in enrolments ..."*.⁽⁷⁴⁾

The method used to finance Australian universities during this period did not allow for increased costs in the form of "incremental creep" (salary increases becoming due as an individual qualified for an increment within the salary range appropriate to the current classification), nor for increases arising from the supply of certain goods and services, e.g., air-fares, postage, telephones, electricity and heating oil. These increases had to be absorbed by universities from the financial allocations received. The impact of these types of costs in any one year were so significant that the Commission decided to maintain indices of broad areas of related expenditure. The T.E.C. was already obliged to grant salary supplementation and, in addition to the salary indices, the indices approach was extended to monitor upward price movements in such areas as: non-salary; equipment and building costs.⁽⁷⁵⁾

When considering the changes introduced by the Commonwealth Government in late 1975 to the future funding arrangements of Australian universities,

the only conclusion which can be reached is that scant regard was paid to the extent of leadtime needed by a university to appoint staff. The position is more critical where appointments have to be synchronised with the introduction of new teaching programmes at the beginning of first term. Apart from this aspect was the consequence of the rapid growth which had occurred at Australian universities in the immediate post-World War II years.

The growth of Australian universities during the 1950s and early 1960s had produced by the mid-1970s an academic staff mix where the majority of the academic staff were occupying senior classifications or enjoying the maximum of their salary ranges.⁽⁷⁶⁾ Table 5.3 of the Universities Commission's 1977-79 Report indicates that tenured academic posts filled in 1975 (7533) represent an increase of 87.4% over the 1965 (4019) position.⁽⁷⁷⁾ According to a study Ray Over undertook in 1980 he examined the age distribution of academic staff as at 1979. His results indicated that in 1979 93.3% of academic staff were 50 years of age or less.⁽⁷⁸⁾ Included in the figure of 93.3% was 5.6% representing academic staff who fell within the 45-49 age bracket (at 1979). The implication of this study is that if all of the academic staff employed by Australian universities in 1979 continue to hold their appointments until reaching the retiring age of 65 years 87.7% continue until 1999.

With many academic staff having reached the maximum of their salary ranges (when this is considered in financial terms), Owens has made the observation that: *"... through overcrowding at the top, universities are forced into a more costly method of operation at the very time when they can least afford it."*⁽⁷⁹⁾ While early retirement may offer one means of reducing the number of tenured staff to more tolerable levels, the leadtime needed to introduce changes of this kind can have an effect on planning the resources required for future triennia. With academic staff now qualifying for the payment of long service leave,⁽⁸⁰⁾ early retirement embodies a significant cost element. If many existing academic staff decided not to avail themselves of accrued long service leave until reaching retiring age then, based on Over's projections, Australian universities should be setting aside reserve funds to meet the substantial payouts which will fall due during 1999 and beyond.

Confronted with a steady state or no growth situation, the options available to a public organization are reduced. Gibberd suggests that

"... recruitment can only occur when there is a retirement, resignation or death."⁽⁸¹⁾ However, an organization can phase out some activities so that new ones can be introduced. Owens describes the position a little differently when he suggests that "... growth in one area is possible only by making a reduction in another",⁽⁸²⁾ but the thrust has the same overall effect. However, where staff enjoy tenure there is no guarantee the change-over will prove either effective to the organization or use the individual's talents in the most efficient manner.

If a steady state situation persists for too long then there is every possibility that in some departments of Australian universities stagnation will set in. To avoid stagnation becoming a reality Australian universities may need to encourage schemes such as: early retirement; fixed term appointments; secondments to the Australian Public Service, public research and development organizations (such as the C.S.I.R.O. or the A.A.E.C.) or other teaching institutions (e.g., colleges of advanced education); and the exclusion of academic staff above a certain age when appointments are being decided if more flexibility is to be introduced. The Williams Report of 1979 advocated measures of this kind.⁽⁸³⁾

The problem facing the Commonwealth Government in funding Australian universities borders on a paradox. On the one hand, the T.E.C. has, as one of its functions, the task of promoting, on behalf of the Commonwealth Government, balanced development across Australian universities. On the other hand, by limiting the amount of resources made available to Australian universities to a level where a steady state situation results, the Commonwealth Government has almost denied the T.E.C. opportunity to perform one of its prime functions. The steady state, or static income situation, is one which results from political decision-making. Usually, such decisions apply for short periods of time while government develops new strategies.

In Australia the position is similar to that of the United Kingdom: "... the government must decide how much of its total expenditure to devote to education and how to allocate this total to the various levels or sectors of education, including higher education."⁽⁸⁴⁾ As Australian universities have become so dependent on federal funding, their position is very similar to any other public organization established by the Commonwealth Government. Any changes these organizations introduce in an attempt to re-adjust to situations such as the steady state may, in the long run, have harmful

effects because expediency has replaced considered and reasoned judgement. Until the amount spent in any year by the Commonwealth Government on education represents a fixed percentage of Gross National Product (G.N.P.), the funding of Australian universities will be subject to the vagaries of political decision-making.

PUBLIC ACCOUNTABILITY

In the early 1960s, when Etzioni was developing his understanding of the decision-making processes followed by organizations he recognised the importance of evaluating decision-making strategies. While regular line structures operating within an organization provided the authority to enforce its operations, Etzioni saw merit in an organization being able to monitor the implementation of decisions. The type of monitoring mechanism Etzioni concluded would satisfy the purpose he had in mind was specialised control agencies. What Etzioni had in mind was that by *"Adding such special control units to regular line control increases the accountability of an organization ... Accountability is likely to increase efficiency ..."* (85)

Individuals who are part of an organizational structure are, in some way, accountable for their actions while performing those tasks the organization expects. Only their placement in the hierarchy of the organization will determine the extent of their accountability. The conclusions Etzioni had reached were based on the premise that where individuals, operating within an organization, were aware controls existed it was likely that their efficiency would improve. A conclusion of this kind would seem reasonable for situations where both inputs and outputs can be measured.

The accountability of a public organization to the government which created it is simply an extension of the accountability the individual has to the organization he or she is a part of. Where the public organization's accountability differs is that it has a legal obligation under its Act to submit an annual report to the responsible Minister. The obligation an individual has to an organization can be enforced by the imposition of sanctions.

In Chapter 3 it will be recalled civic agitation for reforms to fiscal procedures had led to the United States Government enacting the Budget and

Accounting Act of 1921. The main thrust of this legislation was to provide the U.S. Federal Government with the power to enforce federal government agencies to be accountable for the funds they were allocated.

The approach taken in Australia has followed a somewhat different path. Section 97 of the Australian Constitution, adopted in 1901, reads:

"Until the Parliament otherwise provides, the laws in force to any Colony which has become or becomes a State with respect to the receipt of revenue and the expenditure of money on account of the Government of the Colony, and the review and audit of such receipt and expenditure, shall apply to the receipt of revenue and the expenditure of money on account of the Commonwealth in the State in the same manner as if the Commonwealth, or the Government or an officer of the Commonwealth, were mentioned whenever the Colony, or the Government or an officer of the Colony, is mentioned."

One of the first pieces of legislation introduced by the Barton Government in 1901 was the Audit Act. As every public organization established by the Commonwealth Government is subject to audit by the Commonwealth Auditor-General, a uniform system of balances and checks has proved possible. However, the auditing role does no more than ensure that funds have been received and properly accounted for and that expenditure has been incurred which is authorized by proper authority. Similar state audit acts have operated with respect to state universities in each of the States.

In recent years, the term "public accountability" has taken on a wider connotation than simply implying that a public organization has to satisfy audit scrutiny at periodic intervals. Community awareness and interest in organizations funded by the Commonwealth appears to have been growing steadily since the early 1950s. The Australian political writer, David Solomon, has observed that the Commonwealth Parliament revived the Joint Committee on Public Accounts in 1952 and, in the same year, established the Joint Committee on Public Works.⁽⁸⁶⁾ Solomon has also noted that: *"The Joint Committee on Public Accounts tends to be more critical in practice of underspending by departments than it is of overspending. Overspending in a department is usually fairly closely controlled by the accountants and by the top executive."*⁽⁸⁷⁾ A further factor which is implied in Solomon's appraisal and contributes to the community's awareness of activity being

undertaken in the public sector is the involvement of pressure groups and media reporting, either through the newspapers or by television news or current affairs programmes.⁽⁸⁸⁾

Any political party in government is sensitive to community reaction which is critical of areas of expenditure being incurred in the public sector. If the Australian situation covering the last ten years is analysed, the evidence suggests that there is a correlation between community reaction to public spending and the rates of inflation and unemployment. For example, where inflation and unemployment are both running at high levels, community interest in exhorting the Commonwealth Government to effect cuts in public expenditure increases in proportion. By widening the "accountability" of public organizations the Commonwealth Government is better placed to respond to community viewpoints, whether the purpose is for justifying decisions taken or for political point scoring.

The relationship of Australian state universities to the Commonwealth Government, with the exception of the Australian National University (because this is the only Australian university established by a Commonwealth Act of Parliament), is not embodied in the legislation which grants state universities their corporate powers. This means that there are differences in the responsibility a federal public research and development organization has to the Commonwealth Government when compared to that of an Australian university. However, because the use of public funds is involved, it is necessary to consider each organization separately when applying "public accountability" tests.

UNIVERSITIES

A review of the literature which has been addressed to universities and written over the past one hundred years emphasises two main factors: the teaching requirement and the universality of knowledge. These requirements are apparent in the writings of such social scientists as: Newman; Maritain; Flexner; Gasset and Kerr, although each places different emphasis on the variables they are dealing with. Newman, for example, adopts a simplistic approach and defines a university simply as "... a place of teaching universal knowledge."⁽⁸⁹⁾ While this was not the only goal Newman had in mind for a university this particular view was concerned mainly with the well-educated, allround man who would provide society with leadership - a one-off vocational aim.

In the 1930s Flexner took a more dogmatic approach. While he was insistent of the need for a scholar to analyse the subject matter in a detached and impartial manner, Flexner was of the opinion that: *"The modern university must neither fear the World nor make itself responsible for its conduct."*⁽⁹⁰⁾ The need for a university to move closer to the community was one of the points Gasset made in 1944. Gasset was of the opinion that a *"... university must be open to the whole reality of its time. It must be in the midst of real life and saturated with it."*⁽⁹¹⁾

Until World War II Australian universities were small (in comparison with universities located in many Western countries), each enjoyed a modicum of isolation reinforced by geographical factors and the operational structure followed collegiate lines. In considering this period of Australian university evolution, Bessant has noted that: *"... Australian universities remained small, rather ineffectual institutions, almost solely concerned with providing training for the professions and some higher clerical positions. Fees were charged in all universities except the University of Western Australia so that students were invariably drawn from the homes of parents who could afford the fees, although there was a very limited scheme of scholarships."*⁽⁹²⁾ It was on account of being small and ineffectual institutions that Bessant reached the conclusion that in respect of pre-World War II Australian universities: *"Society demanded little of the universities. They were so remote from the ordinary man it was difficult for him to comprehend their relevance, and the universities were happy for that situation to continue. This isolation from society indirectly safeguarded the autonomy of the universities from the State governments which created and financed them."*⁽⁹³⁾

While Bessant's account provides an interesting insight, some of his conclusions are suspect. Prior to World War II Australia's population was small and six universities and two university colleges were sufficient to cope with the demand. Australian universities of this era produced the trained manpower the society required. In this respect Australian society of today imposes a similar requirement, so that this function of Australian universities has not changed. The only obvious change is that Australian universities of today are expected to undertake research of a magnitude that was not possible pre-World War II.

The rapid expansion of Australian universities after World War II was part of the political, social and economic changes which Australia

experienced. Both the Commonwealth and State Governments gave every encouragement for Australian universities to expand their facilities or establish new universities to accommodate the demand for new enrolments. Even though Prime Minister Menzies had pointed out in late 1957 that with the community accepting a heavier share of financing Australian universities, and it was reasonable for the community to expect some return on their "investment", the universities were virtually placed in a "Catch 22" situation. Australian universities could not expand without additional funding. The vast sums required were met by the Commonwealth Government. However, in this regard, other options were, and still are, available. For example, state governments could still contribute to the funding of Australian universities along the lines they contributed previously. Student fees could be reimposed, while the move to introduce privately funded universities in Australia needs to be explored.

The situation facing Australian universities at the time has been likened by Bishop with the old maxim that: *"He who pays the piper calls the tune."*⁽⁹⁴⁾ The type of tune played and the manner of the performance will be discussed more fully later. Before considering these points it is first necessary to determine what are the requirements that would be reasonable for the Commonwealth Government to attach to today's Australian universities. The most recent advice provided by the Commonwealth Government on the characteristics of Australian universities is contained in the T.E.C.'s Report for the 1982-84 Triennium and is as follows:

- " they are separate, distinctive and autonomous institutions, built around the notion of a self-governing community of scholars;*
- . they are dedicated to the pursuit of free enquiry, knowledge and scholarship; the understanding, preservation and enhancement of the cultural heritage of their own and other societies; and the passing on of that knowledge and those skills to new generations in the form of vocational and professional training as well as the provision of a general liberal education;*
- . the frame of reference of their work is international and the test of their standards is the judgment of the international scholarly community;*

they serve their local communities in teaching, research, the provision of creative inspiration and the application of knowledge to the solution of short and long-term social and other problems."⁽⁹⁵⁾

While the characteristics outlined above provide a comprehensive statement, what is noticeable is that the statement includes reference to the two main factors highlighted in the writings of social scientists who had earlier written on universities. Newman's succinct description of a university is as good today as it was in 1852; all that it lacks is resolving the piper's responsibility to his patron. What surfaces in the T.E.C.'s amplified statement is the importance of understanding, preserving and enhancing the cultural heritage of their own and other societies, their obligation to serve their local communities and the assistance they provide for the solution of short and long-term social and other problems. It is the responsibility for being a guardian of one's cultural heritage and helping to solve social problems that have been placed on Australian universities which have granted these institutions a particular custodial role of national significance.

This has brought about change for Australian universities but their role as the repository of the nation's cultural heritage has remained intact. As a consequence it is reasonable to conclude that changes occurring in Australian society have provided the grounds for the Commonwealth Government to increase funding support to Australian universities and, in so doing, acquired the right to have a say in their future operations.

If "public accountability" was the price Australian universities were to pay for the patronage of the Commonwealth Government, it was appropriate for observers, such as Bishop, to compare the arrangement with the old adage of "He who pays the piper calls the tune". However, when this adage is applied to a university setting Bishop was exposing two basic flaws in the rationale. Firstly, he observed that *"... the tune is ultimately in the hands and on the lips of the piper. Once the piper has been paid, he can, if he is courageous enough, play what he likes."*⁽⁹⁶⁾ The second observation Bishop made was that: *"He who pays the piper may well call for a particular tune; but the piper has complete freedom of performance ... nothing can make the piper play a tune that is unacceptable to him."*⁽⁹⁷⁾ While governments develop and implement policies they expect institutions, such as the T.E.C.,

to translate these into educational terms. In short, the Commonwealth Government generally accepts the recommendations of the T.E.C. and is willing to pay for the services Australian universities provide.

These two observations can be related directly to two fundamental aspects of a university's operations. Firstly, a university does not have to justify in detail (apart from financial audit) how it responds to its teaching and research activities. Indeed, it could be argued that teaching and research activity is one of the corner-stones of "academic freedom". Secondly, a university's dedication: "... to the pursuit of free enquiry, knowledge and scholarship ...", as described by the T.E.C., requires no justification. These two vital aspects of university activity lay bare the inappropriateness of attempting to gauge a university's efficiency and effectiveness in terms of inputs and outputs.

The T.E.C. appears to be in agreement with this conclusion. While not being as specific the Commission has acknowledged that:

"The creation, maintenance and administration of universities must be a matter of balance between the necessary accountability and equally necessary independence; between the need for a disciplined, rigorous testing of ideas, including those which may be initially unacceptable or unpalatable, and appropriate sensitivity to the prevailing sentiments of the community; between the need for basic curiosity-motivated research, and the need for effort in solving a host of practical problems; between emphasis on vocational and professional training and the notion of cultural enrichment and the joy of learning for its own sake; between the concept of universities as a social resource and recognition that the value of universities is not to be found solely in economics or the fulfillment of particular existing social purposes."⁽⁹⁸⁾

In their study of what accountability means for tertiary education Lindsay and O'Byrne came to the conclusion there was a link between the action being taken by the Commonwealth Government and community opinion. Based on the approach of the then Liberal-National Commonwealth Government Lindsay and O'Byrne considered: *"The present fiscal and monetary policies being pursued by the Federal Government appear to involve the cut back of*

expenditure in areas of tertiary education for which the Government believes there is a threshold of acceptance which will minimise public outcry."⁽⁹⁹⁾

All this observation does is reinforce the sensitivity governments have to public opinion.

If, at the time, public opinion was critical of certain aspects of the operations of Australian universities, then it is for universities to initiate action which will better inform the public of their activities. In today's society where a premium is placed on the dissemination of information, Australian universities cannot afford to allow their position to become isolated and insular. On the other hand, what is important for the future of Australian universities is to isolate the sources from which criticism of their operations originates. By tracing the source an effort can then be made to allay the criticism being expressed. There is, of course, a more cynical conclusion which can be drawn from recent experience. With today's Australian politics encouraging the use of point scoring, a deft Commonwealth Government can resort to maximising the effect of side issues in an attempt to avoid debate on the real issues involved.

Australian universities of the 1970s and the 1980s have become very dependent on the public purse. The current "static" state could encourage Australian universities to become more entrepreneurial, providing federal government funding to Australian universities is not reduced by an amount equivalent to "outside" income. In the meantime, while Australian universities are so dependent on the public purse, there are strong reasons why the "public accountability" of Australian universities should amount to exercises which are aimed at informing the public of what developments are taking place in the university system. To this end most Australian universities now conduct regular "Open Days", but there are no guarantees that the critics of universities will attend these sessions and gain, at first hand, a better understanding of what current teaching and research activities are being pursued. Another approach available to Australian universities is to make greater use of the media (newspapers, journals and television) as a means of appraising the public of their current endeavours.

PUBLIC RESEARCH AND DEVELOPMENT ORGANIZATIONS

Having created a public research and development organization the Commonwealth Government runs the risk of being criticised by the organization if obstacles are introduced which prevent it from fulfilling

goals that are associated with the functions it has been given.

During their examination of "accountability" Lindsay and O'Byrne isolated two of its main constituent parts. When considered in fiscal terms "accountability" was viewed as: *"... the analysis of the use of funds for the purpose or programme specified. This concept of accountability concentrates on inputs, not outcomes ..."*⁽¹⁰⁰⁾ Considered in this context the "accountability" of a public research and development organization can be gauged from the periodic audit checks made by the staff of the Auditor-General's Department. While the Auditor-General and his staff enjoy extensive powers in gaining access to information, their powers are limited where change to existing procedures is proposed. Spann, for example, has noted that:

"He (the Auditor-General) and his officers have extensive powers in such matters as access to departmental files, calling for explanations from officials, and imposing surcharges on officers responsible for loss of public monies. The Auditor-General cannot, however, compel departments to adopt a certain course of action. His duty is to criticize, make suggestions, and draw attention to any breach of law or regulation; it is then the Treasurer's responsibility to issue any necessary directions. If the Treasurer is not prepared to act on the suggestions made, the Auditor-General's remedy is to bring the matter to the notice of Parliament ... A large part of the work of the Auditor-General is concerned with regularity in spending, with ensuring that expenditures have been duly appropriated and incurred only on the purposes for which they were authorized ... there has been little development of the Auditor-General's role to include an 'efficiency audit' aimed at checking the desirability of expenditure and disclosing waste and extravagance as distinct from illegal or irregular financial practices."⁽¹⁰¹⁾

The conduct of an "efficiency audit" does pose difficulties, not least of all being the need for the audit staff involved to have a suitable background in the sphere of operations being examined if they are to make intelligent judgements. The complexity associated with the operations of an Australian university would tax the most experienced of auditors.

The second part Lindsay and O'Byrne isolated was where: *"Accountability in terms of effectiveness and efficiency concerns the evaluation of the processes, activities, and outcomes involved in the implementation of plans."*⁽¹⁰²⁾

The Annual Reports of the C.S.I.R.O.⁽¹⁰³⁾ and A.A.E.C.⁽¹⁰⁴⁾ for 1980-81 both refer to the need for these Organizations to abide with the staff ceilings imposed by the Commonwealth Government on the Australian Public Service. Each of these Organizations were critical of having their activities curtailed by the imposition of staff ceilings. The C.S.I.R.O. observed:

"Across-the-board cuts mean that each time the Government makes a staff ceiling cut in the Public Service, CSIRO receives a cut of a similar magnitude to that imposed on Government departments. We believe a distinction should be made between an organization such as ours, on which the future growth and prospects of the nation vitally depend, and the administrative arms of government. It is the Executive's belief that the national interest requires a larger government commitment to science and technology rather than a reduction."⁽¹⁰⁵⁾

A similar, but less emotional, protest was voiced by the A.A.E.C. when that Organization pointed out: *"The reduction in staff ceilings each year continued to impose strain on the operational and support service strength of the Commission."*⁽¹⁰⁶⁾

The Commonwealth Government's action to impose a staff ceiling on the Australian Public Service was an arbitrary one. There is no denying the right of the federal government to adopt such measures. In times of financial stringency, action of this kind can readily be defended on the grounds that by setting an example of curbing expenditure in the public sector, the federal government is encouraging the private sector to follow likewise. Nevertheless, whatever steps a federal government decides is essential for coping with economic downturns, a co-ordinated approach, embracing all facets of public expenditure, is preferable to randomly selected "band-aid" action.

Recognising the importance of "public accountability", the C.S.I.R.O., for example, established an Advisory Council and six State Committees during

the 1979-80 financial year.⁽¹⁰⁷⁾ As membership of the Advisory Council and State Committees are drawn from industry, government agencies, tertiary institutions and the trade unions, the effect of this arrangement is that a wider cross-section of the community has a more informed understanding of the Organization's operations.

In attempting to describe the term "accountability", Sibley has placed emphasis on how the word is viewed throughout society when he qualified his definition by adding the point that "accountability" was "... *a discharging mechanism for venting various attitudinal stances and values.*"⁽¹⁰⁸⁾ Essentially, Sibley was making the point that "accountability" involves an evaluation process. According to Lindsay and O'Byrne the type of questions which are necessary in performing the evaluation task are:

- "*Are the goals being pursued legitimate and appropriate?*
- Is resource utilisation consistent with the purpose for which the resources were allocated?*
- Is the process effective; that is, are the outcomes congruent with the goals?*
- Is the process efficient; that is, were the outcomes produced at minimum cost?"*⁽¹⁰⁹⁾

Public research and development organizations, such as the C.S.I.R.O. and the A.A.E.C., may be able to satisfy the first two questions and possibly the third. However, what research and development work could be attested as having been produced at minimum cost? While there are aspects of a public research and development organization which lend themselves to being measured in terms of inputs and consequential outputs, some research outputs are only achieved through trial and error and, occasionally, as a result of some chance occurrence.

This suggests that where public research and development organizations are concerned, and similar to an Australian university, the generally accepted criteria for measuring "accountability" cannot be satisfied.

SUMMARY

The purpose of this Chapter has been to tease out the many variables which effect the development of a budget in an Australian university and a

public research and development organization.

The approach taken was to select issues which influence the preparation of a budget. This was complemented by referring to the work of some notable organizational theorists where, by drawing on the outcome of their researches, a wider focus on comparable Australian situations proved possible. Armed with an appreciation of these comparative studies, particular problem areas were isolated. By understanding the problems which can emerge or have a bearing on the development of an organization's budget, this background data is useful for future planning purposes.

Early in the Chapter it was noted that the budgetary process was initiated in Australian universities and public research and development organizations by areas of these organizations preparing a schedule of wants and needs. These "bids" were then subjected to some form of budgetary assessment. While the form of the budgetary assessment process could differ between organizations, a long-term or strategic planning approach was now favoured. The need for Australian universities to produce triennial estimates had encouraged some form of forward planning. The advantage of the long-term or strategic planning approach, it was noted, provides the means by which "bids" can be listed in an order of priority determined by the organization.

The complex nature of a university's operations posed difficulties because the organization is "pluralistic". Baldrige's well-documented account of the problems which arose at the New York University towards the end of the 1960s provided an insight into the many and varied facets of organizational activity that can generate conflict where the structure is complex. It was noted that contradictory expectations had arisen amongst a number of faculty staff because of the different roles they performed. Subcultures emerged where the aim was the satisfaction of divergent goals. All this did was limit the perspective of certain faculty staff so that they were unable to visualise N.Y.U. as a whole organization. In an endeavour to attract outside funding from the Ford Foundation senior officials of N.Y.U. became "change agents" in forcing that university to pursue a particular course. Much criticism was generated by some faculty staff on the grounds that their views had been disregarded. During this period of disturbance at N.Y.U. a forceful role was adopted by President Hester and this encouraged an examination of the role expected of a vice-chancellor at an Australian university.

With Australian universities becoming more complex it was recognised that a person appointed to the position of vice-chancellor would need to have special qualities. The process followed in selecting a vice-chancellor was assessed in accordance with Gouldner's role theory and Herzberg's research on job attitudes and staff selection. The application of Gouldner's theory of group tensions was applied to explain the emergence of the general staff as a viable campus group, reinforced by their desire to become more involved and be able to participate actively in university life.

Developments of this kind were the direct consequence of the rapid growth of Australian universities, triggered off by the Commonwealth Reconstruction Training Scheme (C.R.T.S.) at the conclusion of World War II. Similar growth was experienced in the United States of America during the same period. The Commonwealth Government provided the funds for C.R.T.S. and gradually the Commonwealth's role of funding Australian universities assumed the lion's share. This development contrasted sharply with the limited funding the Commonwealth Government had provided universities prior to World War II.

With the Commonwealth Government's increased involvement in funding Australian universities, this led to the establishment of the Australian Universities Commission (A.U.C.) in 1959 and its replacement in 1977 by the Tertiary Education Commission (T.E.C.). The advent of the A.U.C. provided the opportunity for the Commonwealth Government to co-ordinate the funding arrangements. Universities were in fact being encouraged by the Commonwealth Government to expand their facilities to meet State and national needs. Nevertheless, the A.U.C. and later the T.E.C. were accorded, as one of their functions, the task of promoting balanced development. One advantage of ensuring that balanced development occurred throughout Australian universities was that it helped avoid the problem N.Y.U. had experienced of having to compete with adjoining tertiary institutions.

By the mid-1970s uncertainties arose throughout Australian universities with the rejection by the Commonwealth Government of the T.E.C.'s Sixth Report (1976-78). Faced with a "steady state" situation Australian universities found that the degree of flexibility they had enjoyed in the past had been seriously curtailed. In addition, high inflation was adding additional costs which had to be contained within existing allocations. This added to the difficulties of preparing budgets which were meaningful.

Problems of this kind were also being experienced by such public research and development organizations as the C.S.I.R.O. and the A.A.E.C.

The "steady state" situation for Australian universities and the imposition of staff ceilings for the public research and development organizations has encouraged these Organizations to re-examine their positions with the view of introducing schemes which permit some flexibility. Appointments with limited tenure and encouraging staff to take early retirement are two possible courses which could provide the extent of flexibility required. Periodic reviews of segments of organizational activity and the justification of their continuance is forcing the adoption of measures which are more effective and efficient.

Financial stringencies, coupled with high unemployment have made Commonwealth Governments sensitive to public opinion and criticism. To counter criticism of waste and extravagance, Australian universities and public research and development organizations are now expected to render a fuller account of their spending and activities. This has heralded in the concept of "public accountability". However, arguments were presented which were designed to reveal the problems Australian universities would experience in matching inputs with outputs or the usual criteria used to measure "public accountability". A similar argument was made for public research and development organizations, but for different reasons. The difficulty for the public research and development organization to satisfy "public accountability" was argued on the grounds that research and developmental work may not have been produced at minimum cost.

The aim of this Chapter, therefore, was to isolate a number of variables which can influence the preparation of a budget and note how each enjoys a relationship with the others. A number of these variables will again feature in the two Chapters which follow and, in some cases, alternative courses of action will be proposed to minimise issues having the potential to cause conflict.

CHAPTER 5

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- (15) Baldridge (a), *op. cit.*, p.538.
- (16) *Ibid.*, p.539.
- (17) *Ibid.*, p.539.
- (18) *Ibid.*, p.541.
- (19) *Ibid.*, p.552.
- (20) Baldridge (b), *op. cit.*, p.107.
- (21) *Commonwealth Parliamentary Debates*. Session 1945, 9, Geo, VI, Vol. 184, p.4627. Part of Mr Dedman's speech stated:
"We hope that this University will not be a duplicate of other universities in the Commonwealth but will be a distinct type. The undergraduate University College will be continued as at present, and it is considered that we should set up, as a part of the Canberra University, post-graduate schools providing for research activities in fields of special importance to Australia ... The Government does consider that Australia should have, as soon as possible, a national university in the Australian Capital Territory."
For the second reading, in which the type of research was expanded, please refer to *Commonwealth Parliamentary Debates*. Session 1945-56, 10, Geo VI, Vol. 187, pp.1566-1569.
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- (28) *Ibid.*, pp.14-15.
- (29) *Ibid.*, p.17.
- (30) In chronological order of founding, the universities operating throughout Australia in 1939 were:
- 1850 - Sydney
 - 1853 - Melbourne
 - 1874 - Adelaide
 - 1890 - Tasmania (Hobart)
 - 1909 - Queensland (Brisbane)
 - 1911 - Western Australia (Perth)

The Canberra University College was established in 1929 and was affiliated with the University of Melbourne; whereas the Armidale University College came into being in 1938, being affiliated with the University of Sydney.

- (31) Commonwealth Bureau of Census and Statistics, *Official Year Book of the Commonwealth of Australia*. Commonwealth Government Printer, Canberra, No. 34, 1941, p.158. The distribution of university teaching staff for 1939 was: Professors - 163; Lecturers - 752; Demonstrators/Tutors - 234; Other - 135; Total - 1284.
- (32) *Ibid.*, p.158.
- (33) Tertiary Education Commission, *Report for the 1982-84 Triennium*, Vol. 1, Part 1. Australian Government Publishing Service, Canberra, 1981, p.34. Refer to Table 2.1.
- (34) Philp, H., Debus, R. L., Veidemanis, V., and Connell, W. F., *The University and its Community*. Ian Novak, Sydney, 1964, p.22.
- (35) Sawyer, *op. cit.*, p.58. Section 96 of the Australian Constitution reads:

"During a period of ten years after the establishment of the Commonwealth and thereafter until the Parliament otherwise provides, the Parliament may grant financial assistance to any State on such terms and conditions as the Parliament thinks fit."

- (36) Williams, B., "Universities and the Australian Universities Commission", in Birch, I. K. F., and Smart, D. (Eds.), *The Commonwealth Government and Education 1964-1976: Political Initiatives and Development*. Drummond, Richmond, Victoria, 1977, p.123.
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- (39) Lee, C. B. J., *The Campus Scene, 1900-1970: Changing Styles in Undergraduate Life*. David McKay Inc., New York, 1970, p.77.
- (40) *Ibid.*, p.77.
- (41) *Ibid.*, p.77.
- (42) *Ibid.*, p.84.
- (43) Williams, *op. cit.*, p.123.
- (44) *Ibid.*, p.124.
- (45) The eight universities founded during the period are:
 - 1946 - Australian National (Canberra) - Canberra University College continued with its affiliation with the University of Melbourne until 1960
 - 1949 - New South Wales (Sydney)
 - 1954 - New England (Armidale) - previously affiliated with the University of Sydney
 - 1958 - Monash (Melbourne)
 - 1961 - James Cook (Townsville)
 - 1964 - La Trobe (Melbourne)
Macquarie (Sydney)
 - 1965 - Newcastle - initially established as Newcastle University College in 1951 and was affiliated with the University of New South Wales
- (46) Commonwealth Bureau of Census and Statistics, *Official Year Book of the Commonwealth of Australia*. Commonwealth Government Printer, Canberra, No. 55, 1969, p.510.
- (47) *Ibid.*, p.520.
- (48) *Ibid.*, p.510.

- (49) Bessant, B., "The Erosion of University Autonomy in Australia", *Vestes*, Vol. 25, No. 1, 1982, p.27.
- (50) Australian Parliamentary Debates. House of Representatives, 28 November, 1957, Vol. 17, p.2701.
- (51) Bessant, *op. cit.*, p.27.
- (52) Kerr, C., *The Uses of the University*. Harvard University Press, Cambridge, Massachusetts, 1963, pp.106-112.
- (53) Prior to 1935 a Standing Advisory Committee had resulted following a conference of Australian universities held in Sydney in 1920. The terms of reference accorded the Standing Advisory Committee included the preparation of advisory reports and the promotion of common actions in any matter affecting the work and development of its constituent members.
- (54) Fifth Report of the Australian Universities Commission (1973-1975 Triennium), May, 1972, Australian Universities Commission. Australian Government Publishing Service, Canberra, 1972, p.19.
- (55) *Ibid.*, p.19.
- (56) Report of the Panel to Advise on Arrangements for Amalgamating the Universities Commission and the Commission of Advanced Education. Australian Government Publishing Service, Canberra, August, 1975. Refer to paragraph 1.6.
- (57) Fifth Report A.U.C., May, 1972, *op. cit.*, p.33.
- (58) Report for 1982-84 Triennium: Summary of Recommendations on Guidelines, February, 1981, Tertiary Education Commission. Australian Government Publishing Service, Canberra, 1981, p.269. Sub-paragraph 9.44.
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"The Commission will report annually, with recommendations for the following three years; each year of the triennium will roll forward one year and a new 'third' year will be added."

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- (66) Australian Government Weekly Digest, Vol. 1, No. 33, 10-16 November, 1975, pp.993-995.
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- (68) *Ibid.*, p.3.
- (69) *Ibid.*, p.11.
- (70) *Ibid.*, p.11.
- (71) *Ibid.*, p.145 - Appendix C; p.9 - Table 1.3.
- (72) *Ibid.*, p.37 - Table 3.1.
- (73) *Ibid.*, p.4 - Sub-paragraph 1.13.
- (74) Owens, J. A., "Staffing in a Steady State", *Journal of Tertiary Educational Administration*, Vol. 4, No. 1, May, 1982, p.83.
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- (76) *Ibid.*, p.66. Sub-paragraph 5.6 and Table 5.4.
- (77) *Ibid.*, p.64-65. Sub-paragraphs 5.3 and 5.4 and Table 5.3.
- (78) Over, R., "Age Distribution of Australian Academics", *Vestes*, Vol. 24, No. 2, 1981, p.15.
- (79) Owens, *op. cit.*, p.84.
- (80) Until 1973 not all Australian universities paid academic staff long service leave. Some States, e.g., New South Wales, Victoria,

Queensland, Western Australia, South Australia and Tasmania, had specific long service leave legislation which universities in these States were obliged to observe. (The University of Tasmania's exemption to observing Tasmania's State legislation expired on 9 November, 1970.) Circular No. 23/72 issued by the Australian Vice-Chancellors' Committee on 30 May, 1972.

Question No. 806, asked by Mr Clyde Cameron, on notice to the Prime Minister (Mr J. Gorton), contained, *inter alia*, the following answer:

"... In a number of Universities academic staff receive long service leave in addition and unrelated to their entitlement to receive sabbatical leave."

Answers to Questions, House of Representatives, 18 August, 1970, p.113.

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- (99) Lindsay, A., and O'Byrne, G., "Accountability of Teritary Education at the National Level: A Chimera", *Vestes*, Vol. 22, No. 2, 1979, p.28.
- (100) *Ibid.*, p.28.
- (101) Spann, R. N., *Public Administration in Australia*. Government Printer, New South Wales, 1975, p.408.
- (102) Lindsay and O'Byrne, *op. cit.*, p.28.
- (103) "Thirty-third Annual Report, 1980-81", *Commonwealth Scientific and Industrial Research Organization*. C.S.I.R.O., Melbourne, 1982, p.9.
- (104) "Twenty-ninth Annual Report, 1980-81", *Australian Atomic Energy Commission*. A.A.E.C., Lucas Heights, 1982, p.12.
- (105) Annual Report 1980-81, C.S.I.R.O., *op. cit.*, p.9.
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- (108) Sibley, W. M., "The transactional frame of accountability", in Bowen, H. R. (Ed.), *Evaluating Institutions for Accountability*, New Directions for Institutional Research, Vol. 1, No. 1. Jossey-Bass, San Francisco, 1974, p.96.
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CHAPTER 6

DEVELOPING AN ALTERNATIVE BUDGETARY MODEL FOR A PUBLIC RESEARCH ORGANIZATION

At this point, it is timely to review issues which have been considered in the earlier Chapters and which are relevant to the development of a budget suitable for a complex research and development organization.

It was noted that the essential difference separating a public research and development organization from its counterpart in the private sector was the "service" versus "profit" motive. With "profit" being the overriding factor governing the decision-making process used in a private organization, the approach taken in formulating a budgetary plan involved some differences and consequent changes of emphasis. An example cited of a particular difference was the reluctance of private organizations to publicise their research and development work-in-progress openly because this could prove of benefit to their competitors. It is also true that certain facets of research undertaken at Australian universities are not publicised openly, e.g., geology research in relation to mining and the laws of libel as they concern social science research. However, while recognising that differences existed the argument was advanced which advocated that these differences were not so marked as to preclude the private organization from adopting a budgetary model developed for application in a public organization.

Having established that such a budgetary model could serve both types of organizations and could also prove suitable for use in attending to the research activities of an Australian university, the next step taken was to highlight the importance for an organization to be aware of the "goals" it had set. In this regard attention was drawn to the fact that "goals" often represent certain facets of the functions determined for the organization. Further, the life of some goals can be longer than for others. Real goals were those more likely to attract resource allocation than stated goals, for in a research and development organization it is real goals which once identified represent work-in-progress or work planned for the future.

Once an organization is able to identify its goals it is then possible for the organization to subdivide a goal into a number of "activities". In

some situations a "goal" may be represented by one activity but, as a general rule, a goal usually comprises a number of individual activities which may be undertaken concurrently or in tandem. The subdivision of a "goal" into a number of "activities" also provided a convenient unit for budgetary preparation, assessment and measurement purposes.

A further benefit became evident which supported the adoption of an "activity" as the relevant budgetary unit. In a research and development organization an "activity" can be readily identified. The work associated with the activity can be perceived. This ready identification with the activity promotes better understanding and a greater awareness of the budgetary implications generated by the activity during its life span. The additional benefits flowing from the adoption of an "activity" as a budgetary unit will be enlarged on later in this section.

The factors which could generate problems during the budgetary process followed in a public organization were then examined. Some of the factors more likely to influence the preparation of the budget were:

- (a) changed circumstances;
- (b) leadership (the influence of the decision-maker);
- (c) decision-making;
- (d) organizational complexity, and
- (e) public accountability.

In considering these factors other issues emerged which also exerted some form of influence. Irrespective of whether the influence was direct or indirect these issues had the potential to create a degree of conflict within the organization. Issues which warranted special mention were:

- (a) real and perceived roles;
- (b) the pressures exerted by subcultures;
- (c) group tensions;
- (d) job selection, and
- (e) inadequate communication flow.

With these factors and issues in mind, a number of recognised budgetary strategies or techniques was considered. Each budgetary strategy or technique examined incorporated features which offered a degree of attractiveness. However, shortcomings were evident when each was considered in the context of a research and development organization. Two major shortcomings apparent were that no premium had been placed on the need for

optimum flexibility and that pure research could not be contained within fixed time frames.

One important aspect of research and development work which surfaced in the previous Chapters was the need to plan well ahead. Long-term or strategic planning of research and development work was isolated as being essential because the implementation of certain kinds of research activity require substantial leadtime. An example illustrating this requirement is where future research is dependent on special equipment that has to be imported from overseas. This exposed a further problem. Often what dictates the acquisition of expensive equipment imported from overseas is the availability of finance. The "steady state" situation imposed on the funding of a public research and development organization is an example where strategic planning difficulties can be encountered. Although the planning formulated indicates that orders should be placed for the equipment required well in advance, this is predicated on the grounds that funds will be available at that time to meet the cost. Operations within a "steady state" mode cannot guarantee that funds will be forthcoming.

Faced with financial stringencies, it was noted that public organizations and Australian universities had to turn to the examination of their own structures if they were to achieve a modicum of flexibility. Rationalisation and restructuring had achieved some economies of scale while other measures, such as fixed contracts, early retirement and the phasing out of certain activities, were capable of freeing resources for redirection into new enterprises which these organizations wished to introduce.

In summing up the position reached so far two conclusions can be made. Firstly, in planning the future operations of a complex research and development organization, there is a need for a budgetary technique or strategy which can adjust readily to the many and varied shifts of direction that arise during the course of pursuing goal achievement. Secondly, the budgetary technique or strategy adopted must gain the support of those who are to use it and, at the same time, pacify those who would otherwise be critical of the organization's operations.

The question that so far has not been addressed properly is why a complex research and development organization warrants any special budgetary technique or strategy. The simple answer is that there is no reason to treat an organization of this kind any differently from other organizations.

Earlier in this Chapter the point was made that in a research and development organization it was possible to identify readily "activities" being pursued. What is attractive to the budgetary planner is that the very nature of a research and development organization lends itself to regulating its operations in units of research activity. These units of operation are often described in such terms as "programmes", "projects" or "activities". The term "activity" has been selected for application in this dissertation to describe the basic research and development unit, primarily to avoid introducing any suggestion of time horizons usually associated with "programmes" or "projects". Having selected the term "activity", the next logical step is to adopt this as the budgetary unit against which change can be measured. By way of an analogy, an "activity" can be regarded as a building block. When the blocks are joined together a structure results. In the same manner by joining together particular "activities", it is possible to form "goals" and "functions". What this approach implies is that at any given point in time, the whole organization can be viewed in component parts permitting a wider understanding of the organization's structure and financial allocations throughout the organization. It will be recalled that in Chapter 4, based on the information contained in the C.S.I.R.O.'s Annual Reports for 1979-80 and 1980-81, it was shown to be possible to examine financial allocations on two bases. The first was to note the spread of the total resources "cake" over the four principal sectors of research: community interests; rural industries; manufacturing industries; and mineral, energy and water resources. The second method was to compare the financial allocations which had been made to the five Institutes incorporated in the C.S.I.R.O.'s organizational structure. When the 1980-81 financial year was compared with that of 1979-80, it was noted that the Institutes of Biological Resources, Earth Resources and Industrial Technology had improved their positions at the expense of the Institutes of Animal and Food Services and Physical Sciences.

"Activities", therefore, provide a simple approach for tracing and pin-pointing shifts made to financial allocations. In this respect the approach takes the form of a further means of communicating the organization's intentions. To some extent by adopting a communicator role the process adds a subtle dimension for satisfying a part of the "public accountability" obligation. The information provided avoids any intrusion into the freedom of operation, an aspect which universities would go to great lengths to defend.

While the adoption of "activities" as the basic budgetary unit has been extracted from the operational mode of a research and development organization, other types of organizations not engaged in research and development work could also use "activities" as their basic budgetary unit. The adoption of this approach may require an organization to make internal judgements on what work constitutes an activity. Nevertheless, it would seem that the main advantage for the private organization, such as a manufacturing complex, would be to move away from broad fields of activity and concentrate more on particular work areas. By reducing activity to smaller units, it would permit activities to be controlled to the extent Etzioni had proposed if organizations were to have an adequate monitory mechanism capable of measuring efficiency and effectiveness. The adoption of measurement by "activities" would also prove a suitable means of isolating "inputs" from "outputs".

THE OPERATIONAL NATURE OF A RESEARCH ORGANIZATION

Research and development activity is essentially undertaken to satisfy three main purposes: intellectual curiosity; problem solving, and profit motivation. In a university situation, where the importance of research stems initially from intellectual curiosity, a number of published works leads to a conclusion to this kind. An observation made by the A.U.C. in its Fifth Report (1973-75) was repeated in its Sixth Report (1976-78) when it stated that:

"Research is an essential activity of a university ... the extension of knowledge is at the very heart of university work; indeed learning can only be experienced at the higher levels if the minds of students are stretched at its frontiers. Accordingly there is little need to justify the role that research plays in universities or the allocation of funds for research purposes."⁽¹⁾

Universities have accepted over the centuries the responsibility for:

"The advancement of knowledge as well as its transmission to new generations ..."⁽²⁾

A conclusion of this kind is consistent with observations made elsewhere. For example, in the Murray Report of 1957, where the role of research was being considered in the context of a modern university, the observation made was that:

"... there is one kind of research which is, in general, best done in universities and the greater part of which in recent generations has, in fact, been done in universities. It is obvious that most of the basic secrets of nature have been unravelled by men who were moved simply by intellectual curiosity, who wanted to discover new knowledge for its own sake."⁽³⁾

A university provides the type of organization where the individual can devote time and effort to those issues which stimulate "intellectual curiosity". In its Report of 1979 the Federation of Australian University Staff Associations (F.A.U.S.A.) has summed up the responsibility that has become institutionalised in a university as follows: *"This reflects a commitment by the universities to the advancement of knowledge which serves to enhance the individual, institutional and national reputation in areas where international criteria of excellence are applied."*⁽⁴⁾

The description of "problem solving" has been selected to describe the research and development pursuits undertaken by large public research and development organizations, such as the C.S.I.R.O. and the A.A.E.C. The capacity for these organizations to undertake research is contained in their individual Acts. For the C.S.I.R.O., Sub-section 9(1)(a) of the Science and Industry Research Act, 1949, states: *"the initiation and carrying out of scientific researches and investigations in connexion with, or for the promotion of, primary or secondary industries in the Commonwealth ..."*. A similar authority is prescribed for the A.A.E.C. Sub-section 17(1)(g) of the Atomic Energy Act, 1953, obligates the Commission *"... to carry out research and investigations in connexion with matters associated with uranium or atomic energy, or in connexion with such other matters as the Minister determines."*

While both of these complex public research and development organizations have a responsibility to the Commonwealth Government to undertake research work required by the government, both Organizations place stress on the assistance they provide Australian industries, other organizations and individuals.^{(5) (6)} Collaborative effort and "problem solving" comprises the bulk of the interaction with Australian industries. What is meant by "problem solving", when used in this context, is for the organization to conduct an investigation into a particular problem that has arisen, collect relevant research data, analyse that data and then propose

a course of action aimed at solving the initial problem. Nevertheless, both the C.S.I.R.O. and the A.A.E.C. have obligations to meet in fulfilling their functional or national roles. The C.S.I.R.O., for example, introduced recently an extensive research programme to study Australia's energy situation. Six energy areas have been isolated: coal; petroleum; gas and oil shale; substitute liquid and gaseous fuels; renewable energy; energy storage and energy conservation.⁽⁷⁾ So far the research programme has explored such matters as transporting coal from the mine to nearby shipping outlets; liquefaction and gasification; delineating Australian oil deposits and the use of ion implantation techniques for second generation photo-voltaic devices.⁽⁸⁾ The nature of work of this kind undertaken by the C.S.I.R.O. goes further than the "applied" research usually associated with "problem solving". In the past some attempt has been made to categorise research into such compartments as "pure", "basic" or "applied". Professor George drew attention to this problem in a paper he presented at a symposium entitled "Research and Development in Australian Secondary Industry: Industry, Government and the Universities" held in Sydney on 28 October, 1971. Professor George's concern was that industry and organizations, such as the C.S.I.R.O., could regard themselves as apart from Australian universities "... if the interpretation placed on 'fundamental' research is that research associated with the "pure" sciences, as against that undertaken in the applied sciences and technological fields."⁽⁹⁾

Attempts to segregate research and development according to the kind of institution where it is undertaken are likely to be short-lived. The labelling of research effort establishes artificial barriers which are irrelevant to the end result. The removal of these barriers, according to Professor George, is due mainly to the advent of an era of mutual co-operation. In Professor George's opinion: *"The Australian Academy of Science with its Science and Industry Forum has brought together leading scientists, industrialists, government department heads and other community leaders to discuss obstacles and aids to innovation ..."*,⁽¹⁰⁾ and this initiative has focused on the importance of research to the nation's continuing well-being, rather than place research effort in distinctive compartments. Apart from this much development work has been undertaken at Australian universities in fields of medicine, dentistry, education, etc.

Furthermore, some Australian universities are now able to offer industry, commerce and the community an organized technical service.⁽¹¹⁾ The

University of New South Wales has established the subsidiary, Unisearch Ltd., while the Australian National University has recently set up the organization ANUTECH.⁽¹²⁾ Both of these organizations encourage work from outside service and industrial organizations. The advantage to those who avail themselves of the services offered is that access is gained to the special facilities housed and operated within these universities, while the fees charged for the services provided are competitive. If anything, the advent of these types of fee-for-service organizations associated with Australian universities is indicative of the importance most universities attached to "applied" research.

The third purpose associated with research and development activity was described as "profit motivation". A description of this kind has been selected for it is consistent with the underlying principle pursued by a private research and development organization that it exists to make a profit.

The former Australian Prime Minister, Mr Malcolm Fraser, acknowledged the contribution Australian industry had made to research and development when he observed: *"The economic development of Australia owes a great deal to Australian industrial researchers and to those companies which have established independent research organizations in this country. In a competitive environment they have created, introduced and improved technologies which are vital to our national productivity and to employment."*⁽¹³⁾

Nevertheless, Mr J. E. Kolm, Chairman, Southern Region, Australian Industrial Research Group, when commenting on industrial research emphasised that: *"The prime objective of the industrial researcher is the physical achievement, a new product, process or plant. Invariably, the criterion is economic viability, even survival - a new product must be able to compete."*⁽¹⁴⁾ Kolm went on to point out that: *"In the three decades since World War II, Australian technologists have created an integrated complex of primary and secondary industries. Industrial researchers have evaluated and modified existing technologies. From this basis they have built many indigenous advances and inventions. Importantly, they have also provided the bridge between relevant Australian science and the realities of the marketplace."*⁽¹⁵⁾

Three private organizations mentioned in Chapter 2 which have

introduced planning, research and development divisions within their organizational structure were B.H.P., C.S.R. and Comalco. It is possible to isolate the contribution these organizations have made as part of the glowing tribute an Australian Prime Minister made to the research and development work fostered by Australian industry. B.H.P., for example, developed the steel product "Xtraform" for use in producing lighter motor vehicles. "Xtraform" is a high strength steel but, in addition to this, permits the minimum thickness to be as low as 1.6mm.⁽¹⁶⁾ Furthermore, apart from being both weldable and malleable "Xtraform's" thinner gauge has contributed to energy conservation by reducing the overall weight of a sedan car. Current research-in-progress by B.H.P. includes the development of solar cooling systems.⁽¹⁷⁾

The C.S.R. is another private organization which has used its research laboratories to develop processes of benefit to Australia. The utilisation of "bagasse" for wall board manufacture, the production of ascorbic acid (Vitamin C) and the introduction of a wide range of plastic materials are the direct result of C.S.R. diversifying their research efforts by broadening the base beyond sugar processing.⁽¹⁸⁾ Each of these Organizations has conducted its own research activity over many years. The fact that Comalco has only established its Research Centre in recent years is an indication of the importance this private organization attaches to research and development. The step taken by Comalco, at a time when an economic downturn was beginning to have effect throughout Australia, warrants a closer examination.

Comalco's Research Centre, located at Thomastown, Victoria, was established in 1976 "... to provide a research and technical consultancy service to all sections of the Comalco group of companies."⁽¹⁹⁾ The Centre is divided into three distinct research groups: Extractive Metallurgy; Physical Metallurgy and Analytical Services. In addition, the Centre has workshop, library and administrative facilities. An organization chart, depicting the Centre's reporting structure, is illustrated in Figure 5. This chart has been included for the purpose of indicating how a private organization delineates its research establishment within the organizational structure. It is estimated by Comalco that: "About half of the Centre's work involves assistance to plants with day-to-day production problems and in the various marketing areas of the company. The remainder comprises applied research, some of which is in collaboration with C.S.I.R.O. and

**COMALCO RESEARCH CENTRE, THOMASTOWN
ORGANIZATION AND REPORTING STRUCTURE**

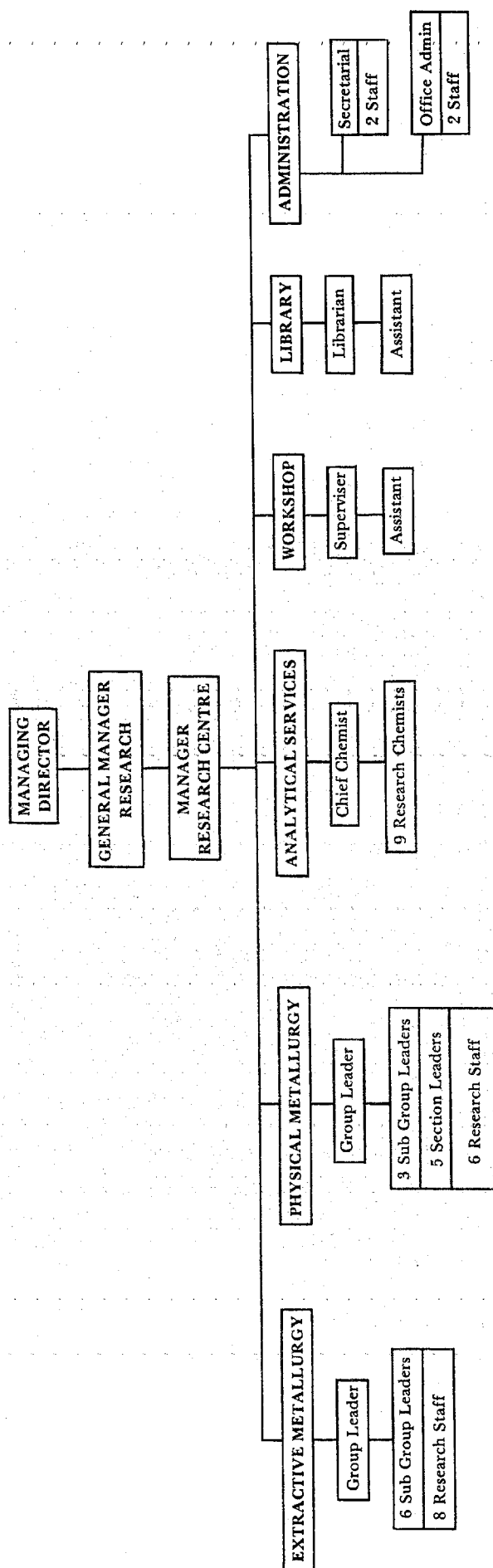


Figure 5 - Organization chart, Comalco Research Centre, Thomastown at 30 June 1983.

local and overseas universities."⁽²⁰⁾

The fact that an organization such as Comalco decided to establish its own Research Centre reinforces the point made earlier in this dissertation that sections of Australian industry wish to pursue their own research and development programmes. While this is to safeguard against industrial espionage, it is also a pointer to the future of how the private organization perceives its development. Large complex private organizations, it would seem, recognise the value of engaging their own scientists so that they can work unimpeded on the development of techniques, processes and products of long-term benefit to the company. The present difficulty graduates experience of entering the work-force in a time of high unemployment favours the private organization which can offer the challenge of research and development work.

The research undertaken at Comalco's Research Centre involves collaborative effort with the C.S.I.R.O. and Australian universities. It was through a co-operative venture with the University of Queensland that encouraged the introduction of strontium into alloy development work. This led to the emergence of stronger alloys for the automotive industry and, in particular, *"... to develop a better alloy for 'mag' wheels."*⁽²¹⁾ The diversification of Comalco's research and development work is illustrated by two further examples. The wider use of "Sisalation" as a home insulator is continuing to be explored as part of the nation's energy conservation programme.⁽²²⁾ The second example is the new aluminium bridge barrier rail that has been used on the F5 freeway in New South Wales.⁽²³⁾ Comalco's design minimises the potential damage to a vehicle and the barrier because *"... the rails project past the face of the posts by 78mm so that any vehicle colliding with the barrier will hit the rails and not the posts. Should a vehicle damage a section of the rail, it can be easily replaced because of the single installation and 'panel' fabrication method used."*⁽²⁴⁾ One benefit, possibly overlooked by Comalco, is that this type of barrier rail could prove invaluable in areas of North Australia where termites quickly infest wooden barrier rails, nullifying the safety protection these rails are expected to provide.

In Chapter 4 attention was drawn to the development of a "business philosophy" by such private organizations as C.S.R. and B.H.P. Comalco has, in effect, adopted a "research philosophy" when it advocates that: *"A strong research capability would improve Australia's ability to:*

- ... adapt to competition
- . serve new markets
- . increase productivity
- . introduce better environmental controls
- . develop processes and techniques that use less materials, energy and capital
- . present ourselves to overseas customers and others as being fully competent in our industries."⁽²⁵⁾

A philosophy of this kind is also consistent with the encouragement provided by the Commonwealth Government. Recently the Commonwealth Minister for Science and Technology, Mr B. Jones, announced a plan whereby the federal government "... will make it easier for companies to receive research and development grants by making funds available for a three-month period without the need for securities."⁽²⁶⁾ By adopting this approach Mr Jones believes the scheme will promote vigorous industrial research and development throughout industry. Nevertheless, as indicated in Chapter 2, several Australian private organizations prefer to avail themselves of the research and development facilities offered by public organizations such as the C.S.I.R.O. and thereby avoid any unnecessary duplication of research effort.

The organization chart of Comalco's Research Centre at Thomastown, featured in Figure 5, indicates that it proved necessary during the formative years of the Centre's operations to distinguish three research groups. Each of these research groups has the responsibility of performing the research and development work which is regulated by the degree of expertise available within the group. At any one time the group could be engaged on a number of projects or activities. It will be recalled that attention was drawn in Chapter 4 to the practice followed by most private organizations of writing-off expenditure spent on research during the year it was incurred. To achieve this end, what is necessary is a means by which costs and expenditure associated with each research activity can be identified.

The operational nature of any organization engaged on research and development work involves a need and use of laboratories or suitable accommodation to house their researchers, equipment, research and support

personnel and access to necessary goods and services. Apart from these requirements is the need to recognise that some research activities will require longer time sequences than others. It is on account of the potential dissimilarities amongst research activities that proper budgetary control favours treating each research activity as a separate budgetary unit. The arguments in support of this approach, and advanced earlier in this Chapter, are: for the Australian university and the public research and development organization, the ability to isolate costs associated with each research activity are easier to control and are more readily identifiable when considered within the context of "public accountability"; for the private research and development organization, the ability to identify expenditure assists with the writing-off of research costs each year and provides an accurate indication of what was the cost of producing a new marketable product or technique.

A further benefit accrues to an Australian university and a public research and development organization. Where funding is made available on the basis of applying "incremental increases" or allocations according to the imposition of a formula, a record of past performance and experience provides historical data on which future projections can be based. Further, additional costs, e.g., "incremental creep" and accrued long service leave need to be assessed. With the Commonwealth Government directing that, in future, its public organizations adopt accrual accounting methods in the preparation of annual accounts, there is now a need for contingent liabilities, such as accrued long service leave to be accorded a monetary value.

As special needs and requirements arise during the operational phase of a research organization's series of research programmes, the nature and effect of these will now be explored.

THE SPECIAL NEEDS AND REQUIREMENTS

In considering research and development work it is possible to divide the work into three categories. The first category is where the research and development is undertaken "by direction". For example, the Commonwealth Government may ask one of its public organizations to examine a particular problem and propose a solution. A private organization may give its research division the task of exploring alternate uses of one of its

products. The second category is where the research is part of an overall programme of on-going work. This category can be described as research and development "by extension". Whatever part of the organization is given the task of formulating a broad outline of the research work to be pursued, whether it is a centre, department, faculty, division or school, a number of research activities will be under way at any one time, with each activity being a part of an overall master plan. This approach relies heavily on the co-ordination and comparing of the results obtained by each research activity for its success. Research "by extension" is the method used mainly by Australian universities and public research and development organizations, such as the C.S.I.R.O. and the A.A.E.C., because it is best suited to small interconnected research groups where the results obtained can be discussed at seminars, thereby benefitting all participants. In this manner, all the researchers connected with the research programme gain knowledge of the work being performed by each research activity, even though they have not participated in the research effort beyond their own work. It is often the knowledge that a particular research programme is being offered at a university or public research organization which attracts individuals having a research background in one of the fields encompassed by the broad outline to join the organization. A similar incentive could be offered by a private organization if the research centre was large enough to permit the researchers the opportunity of exchanging research findings.

The third category is best described as research and development "by experimentation". To some extent this kind of research and development work is similar to that undertaken "by extension". What distinguishes the two is the chance outcome resulting from a piece of experimental work-in-progress which yields a find different from what was the intention or discoveries made by researchers applying their "intellectual curiosity". It will be recalled that it is this latter yardstick which the Murray Report of 1957 used to describe the role of research in a modern university.

Irrespective of how the research and development work is categorised, special needs and requirements can arise during the course of research which have to be resolved. Earlier in this Chapter when a review was made of the issues considered so far, two points emerged as being integral to research and development work. The first was the need for a situation where optimum flexibility prevailed. The second point was a recognition that some research could not be constrained within fixed time frames. The degree of

flexibility associated with research work is usually one for the organization to determine. It would seem a reasonable assumption that management will permit that degree of flexibility which is commensurate with the confidence it has in the efficiency and effectiveness of its research operations. As to the duration of the research work, by adopting long range planning measures, e.g., strategic planning, it is possible to introduce a synchronised approach to the acquisition of equipment, materiel and human resources needed for the research programme.

However, while this approach caters for known resources required, it cannot anticipate those needs and requirements which can surface after the research programme has commenced. Some examples of these issues are: interruption to the supply of goods and services due to industrial unrest; loss of research personnel who are attracted to other organizations; industrial accidents which disrupt the research work-in-progress; inadequate basic data; similar research undertaken elsewhere being published and the rights patented; equipment failure, and the enactment of restrictive or limiting legislation. What becomes evident from some of the examples cited above is that factors beyond the control of the organization can have a direct effect on the progress of approved research programmes. This suggests that a series of contingency plans needs to be formulated which can be set in train should an emergency situation arise. Although an aspect of strategic planning concerns contingency arrangements, often the problems are such that those involved in a particular research activity are best equipped to deal with the emergency.

Allowing a group engaged on a research activity a degree of flexibility so that they can invoke necessary contingency measures poses a number of budgetary difficulties. Firstly, it is not possible to quantify in advance the extent of resources necessary to deal with any contingency which might arise. Secondly, the types of problems likely to arise cannot usually be identified until they occur. Thirdly, until the problems are identified and remedial action quantified, it is not known whether the size of the contingency will prove adequate. While it is possible to prepare a schedule of problems likely to arise during a research activity and quantify the cost of effecting remedial action, there is no guarantee the actual problems encountered will be those anticipated.

As the building-in of contingency measures involves additional cost the inclusion of this item in the budgeting of each research activity can

inflate estimates unnecessarily. An argument can be advanced that, overall, where a number of research activities is being undertaken concurrently, a self-balancing situation will result. This line of reasoning is based on the premise that some research activities would encounter few if any problems. The contingency resources of these research activities could, therefore, be used to alleviate the position of the remainder. The difficulty with this premise, apart from the budgeting and accounting transfers involved, is that estimates known to be inflated, tend to encourage inefficient methods of operation in the knowledge that additional cost will be covered from the contingency funds. Further, if research output is to be measured by research input, that is "*... the research activity of an institution can be measured by the number of research workers it employs, the value of its research equipment, the value of research grants it obtains, and so on*",⁽²⁷⁾ the building-in of a contingency factor will distort both real research inputs and outputs.

Nevertheless, the importance and relevance of having a contingency plan available, should special needs and requirements warrant action of this kind, cannot be overlooked. Later in this Chapter a case will be made for contingency plans to be an integral part of a "core" budget. The relevance of associating special needs and requirements with the "core" budget will be supported on the grounds that for both public and private organizations what is paramount is the organization's ability to control resources expended on each research activity unsullied by marginal, and what could prove to be hypothetical, costs. The main benefit of identifying actual research expenditure clearly is that reporting, either to shareholders or as part of an acceptable "public accountability" reporting system, is simplified because it does not require lengthy explanations to convey the true position.

Earlier in this section the need for an organization to enjoy maximum flexibility in its operations was touched on. One approach - the phasing in or phasing out of research and development programmes - was suggested as one means by which the degree of flexibility enjoyed by an organization could be optimised. Achieving flexibility and the application of the phasing in and phasing out approach will now be considered.

PHASING IN OR PHASING OUT RESEARCH OR DEVELOPMENT PROGRAMMES

Attention was drawn in Chapter 5 to the consequences of a steady state situation where this was imposed on Australian universities or a public research and development organization. The likelihood that a steady state situation could continue while the levels of inflation and unemployment remained high had encouraged these organizations to explore other means of redirecting existing resources.

This development is not new. The Williams Report of 1979 had drawn attention to the desirability for Australian universities to enjoy flexibility when it pointed out that: *"To cope with problems of change and innovation in the period ahead universities will need more flexible staff structures ... To a limited extent flexibility can be created by early retirements, provisions for retraining and the sharing of staff by different institutions."*⁽²⁸⁾ Consistent with this approach the Williams Committee made two associated recommendations:

"R 5.40 - that to provide for desirable flexibility and innovation universities prepare schemes for early retirement, retraining, secondments of staff; introduce more exacting criteria for the granting of tenure; increase the proportion of annual appointments; and also prepare schemes for redundancy in case such measures do not provide the desirable degree of flexibility,"

and

"R 5.41 - that arrangements be negotiated with the civil service, CSIRO, industry and other universities for exchanges and secondments of staff."⁽²⁹⁾

When these two recommendations are compared with those contained in the Report under the heading of "Research", an inconsistency becomes noticeable. For example, the Committee recommended in paragraph R 5.35 that:

"... support for the proposals on special research grants made by the Universities Council (and included in the costings from 1981) to build up post-graduate duties at universities, and also an increase in funds for the Australian Research

Grants Committee and the National Health and Medical Research Council as proposed by the Australian Science and Technology Council in its report to the Prime Minister."⁽³⁰⁾

This particular recommendation is further supported by that contained in paragraph R 5.37, where the Williams Committee recommended:

"... that inter-disciplinary research projects with a limited life should qualify for grants from the proposed research funds to develop concentrations of post-graduate training and research."⁽³¹⁾

The difficulty which arises from these recommendations is being able to reconcile, on the one hand, the need for Australian universities to achieve optimum flexibility through such schemes as early retirement, retraining, secondments and redundancy, with the suggestion, on the other hand, of the need to build up research endeavour. In the meantime, Australian universities have introduced the practice of examining their own internal structures as one means of achieving a degree of flexibility suppressed by a no growth situation.

What this demonstrates is that flexibility has become an integral part of the planning process. If flexibility is to be achieved, it requires careful and deliberate planning. However, the planning processes of a university are affected considerably by numerous interacting forces, some of which have an external origin over which the university can exercise little control. A pictorial presentation of the complex and interwoven network of some of the main forces a university must take into account is illustrated in Figure 6. It is forces of this kind which influence the decisions taken eventually.

In Figure 6 the following forces have been identified:

- . Funding
- . Student Mix
- . Technology
- . Administrative Structure
- . Emerging Professionalism
- . Community Involvement

A closer examination of these six forces permits a better understanding of how each interacts with the others:

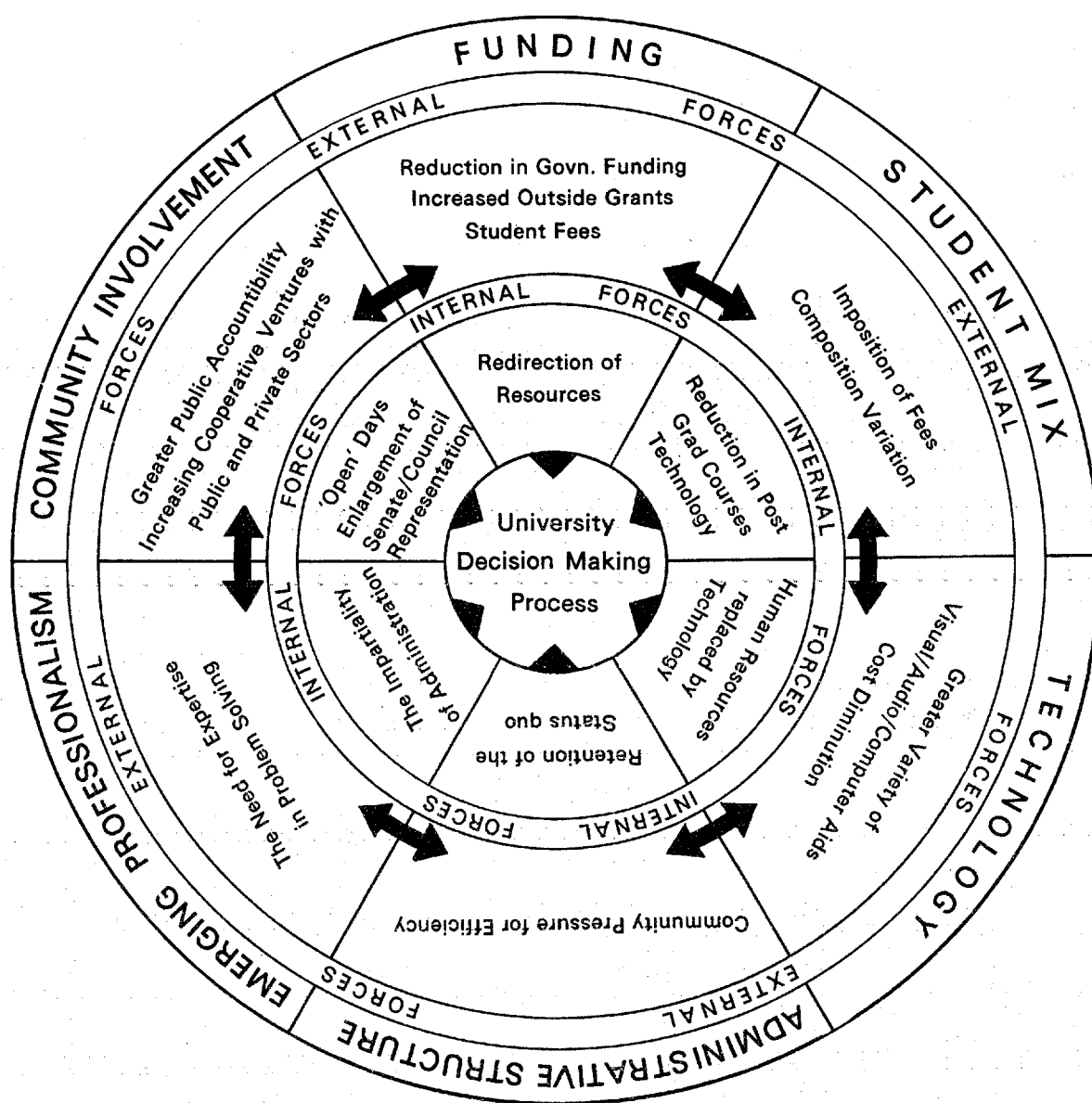


Figure 6: Interacting forces likely to affect future University planning

Funding: Basically determines what a university can do in any one year. Where annual recurrent grants are determined on a WSU or EFTS formula, student numbers are important. The supply of money also regulates the number of staff that can be appointed during the year and the ability to proceed with technology upgrades.

Student Mix: (i.e. in courses chosen) Student interest can prove a strong determinant in deciding which courses a university should offer. The push for universities to offer more professional and job orientated courses, commensurate with technological advancement, is becoming more apparent, despite the wide range of such courses being offered by the Colleges of Advanced Education. There is also evidence to suggest that if the present rate of high unemployment subsides, this could lead to a reduction in the number of students enrolling at Australian universities in the future.

Technology: New technology may reduce the amount of face-to-face contact lecturers have with their students. Already what is noticeable is a wider use, and acceptance, of visual and audio aids. Furthermore, students are already demonstrating an interest in having access to computer facilities, particularly word processing.

Administrative: Structure As Australian universities have become more complex and their structures have had to adapt to this change, the extent and scope of the type of administration necessary has placed emphasis on specialisation. Resorting to the use of specialists to deal with the special nature of a university's administration has stressed the requirement for co-ordination.

**Emerging:
Professionalism**

As Australian universities have engaged a wide variety of specialists, e.g., engineers, doctors, accountants, lawyers, industrial advocates, architects, etc., to attend to the day-to-day business affairs, this has led to the emergence of a professional group within the Australian university system. As professionals, these university staff have specialist skills and, by and large, acquire a form of power in that they have an understanding of the bureaucratic processes acquired from professional colleagues located in the institutions with which they deal. The advantage to an Australian university is that through the use of specialists the administrative processes become more efficient and effective. Nevertheless, the cost to the institution may be the transfer of power to the specialist. Having regard to the problems which emerged at N.Y.U. where the administration was described as having become a critical elite, Australian universities should encourage, if this is necessary, more compatible relationships between academic and professional staff.

**Community:
Involvement**

The influence the electorate can exert on the decision-making process of the federal government has already been noted from the examination of "public accountability" undertaken in Chapter 5. As Prime Minister Menzies had pointed out in 1957, interest in the operations of Australian universities has increased in proportion to the extent of funding made available to these organizations from the public purse.

While there are also other forces, e.g., specialised courses and the imposition of quotas on some student intakes which could be listed as

affecting the decision-making processes of Australian universities, those mentioned above serve as examples of how each force interacts with the other. Any group given the task of engaging in long-term or strategic planning must give due weight to the interaction of such forces if the correct perspective is to be achieved.

By far the most significant contributor to a situation of optimising flexibility in an Australian university or public research and development organization will be funding. The adoption of any budgetary plan will, in the end, be dependent on the resources available. From the examination undertaken earlier, what became evident was that in the steady state situation one of the opportunities of introducing a new activity rests on the ability of the organization to "hive off" or "phase out" an existing activity. The need to "phase out" a particular course could occur in the teaching area of an Australian university because the course conducted is no longer able to attract interested students. Alternatively, interest in a particular course may wane amongst members of a faculty, either through the retirement, departure or death of the staff member involved in organising and conducting the course. When circumstances of this kind arise the university concerned has the opportunity to "phase out" this course in order that a new course might be "phased in".

Organizations which concentrate their efforts more on research work are better equipped to adopt the "phasing in" and "phasing out" process because the nature of research is capable of observing time frames, even though the time frames selected can vary considerably depending on the type of research being undertaken. Research "by extension", mentioned earlier in this Chapter, is an example of where the "phasing out" and "phasing in" process is designed to create a minimum of interruption. The "phasing out" process can be organized so that it coincides with the decline of one or more research activities at a time when other research activities forming part of the overall research programme would be approaching full operational effectiveness.

The larger scale research activity - one which has a particular research task to perform - may require a longer "wind-down" time. In such circumstances, an important role that can be played by a long-term or strategic planning group is to organize the "phasing out" and "phasing in" process so that resources freed during the "phasing out" stage can be redirected without losing effectiveness. The "phasing out" process will

prove smoother if the human resources released can be placed in the new research activity being "phased in". Any major shift to pursue a new research activity requiring expertise different from what is already available in the organization is one argument which supports short-tenured or fixed-term appointments for research staff. Such staff appointments are geared to the duration of the research activity for which the staff were engaged originally to participate in.

The degree of "public accountability" being imposed on Australian universities and public research and development organizations today suggests the aim is to curb expenditure so that the funds released can be directed towards satisfying other priorities. The "phasing in" of new research activity to replace that being "phased out" should not be limited to periods where the funding received operates in a steady state mode. However, what has also become apparent from the early examinations undertaken in this dissertation is that time constraints imposed on research activity can become counter productive. A balance needs to be struck which permits research to be pursued efficiently and effectively but which, at the same time, can accommodate contingencies and residual elements of a "phasing out" process until the time when freed resources can be utilised elsewhere. Implicit in this approach is the idea that research endeavour includes elements of a "core" structure. The arguments to support the development of a budgetary plan whereby a "core" structure is identified will now be explored and a conclusion reached.

THE NEED FOR A CORE INFRASTRUCTURE

One of the observations made by the Carnegie Commission on Higher Education, in its report published in June, 1972, was that: *"In some European countries, university teaching suffers, because the best minds - and often those most involved in advancing the frontiers of knowledge - are in research institutes divorced from universities."*⁽³²⁾ At the same time this Commission also pointed out that: *"... research may suffer in some cases, because it does not become subjected to the questions of able students who, in this country (the U.S.A.), frequently uncover areas of weakness in the 'conventional wisdom' or help to open up new lines of research inquiry."*⁽³³⁾

Fortunately, this development has not occurred in Australia. Students

both at the under-graduate and post-graduate levels, interact with teaching staff who are pursuing their own researches. Hypotheses, developed by the teaching staff, are often subjected to the scrutiny of students since the process allows the communication and testing of ideas. Nevertheless, the teaching load a lecturer is expected to carry places a limit on the extent of research a lecturer can undertake. Sabbatical leave designed to overcome this restriction allows members of the teaching staff of Australian universities release from teaching duties for one year in seven to pursue their research interests. Under these circumstances, a difficulty which arises is that of including in the budget of a research activity that portion of a lecturer's time to be spent solely on the research work. The more sensible approach is to ignore costing the value of the lecturer's time spent on research as this will have been provided for elsewhere in the teaching component of the university's estimates.

A similar situation will occur in respect of scientists employed in a public or private research and development organization but the implication in budgetary terms is the reverse of the university position. The prime task of a scientist located in such organizations as the C.S.I.R.O. and A.A.E.C. is to undertake research and development tasks determined in accordance with the approved programme. The qualifications of these scientists, coupled with their participation in current research and a knowledge of published research results provide them with a unique combination of skills and expertise. Australian universities tap this reservoir of knowledge by approaching scientists working in the public and private sectors to supervise or examine students enrolled in honours or post-graduate courses. For the public and private organizations, the time spent by their scientists on examining and supervising makes inroads on operational research time. More importantly, however, their contribution is of national benefit and significance.

Both of these examples serve the purpose of pin-pointing the contribution to research which is made from three distinct and separate areas. Neither of these areas would be regarded as warranting inclusion in the "core" structure of a research programme that was peripheral to their main research work.

Research and development undertaken today is greatly dependent on support and back-up facilities. Where the research is part of a natural science programme the basic facilities required are: laboratory space;

equipment; access to a computer for processing data, and an administrative infrastructure. A social science research programme may require less basic facilities and can suffice on such necessities as office accommodation and access to data stored in libraries, archive repositories or in private collections. Access to computer facilities may also prove necessary to process the data collected and, as with natural science programmes, social scientists will require access to administrative support services.

Irrespective of what research activities are undertaken, there will be a need for basic facilities. This need can be projected through to a larger research unit such as a department, division, school or institute. What becomes distinguishable is that size does not feature as a determining factor in establishing basic needs. It will be recalled that when the question of "public accountability" was discussed in Chapter 5, one of the difficulties exposed was the problem of measuring research output against the cost of inputs.⁽³⁴⁾ One of the reasons Verry and Davies considered the measurement of output by input as an unsatisfactory approach was that if a *"... university is to be regarded as a true multi-product enterprise ... it is somewhat arbitrary to regard any one output as being more basic or fundamental than any other."*⁽³⁵⁾ Similarly, an arbitrary element would be introduced if each research activity had to be budgeted for on the basis of including a percentage of the support services the research activity was expected to draw on.

The only meaningful yardstick that could be used to introduce a support services component in a research activity budget would be one calculated as a percentage of the total estimated cost and there would still be no guarantee that a high cost research activity would draw on the support services available in proportion to the amount earmarked in the budget. In many cases a research activity with a small budget requirement can prove a heavy drain on the support facilities available because of the nature of the research being undertaken. An example of such a situation is where data collected from a survey needs to be computerised for the purpose of comparing the range of variables the answers to a questionnaire have generated.

The need to isolate the actual "research" component of a proposed research activity from the support services is argued by F.A.U.S.A. on different grounds. F.A.U.S.A. makes the case that, in a university context, those who have the task of approaching outside funding organizations to

finance research activity should not be disadvantaged amongst themselves. The concern F.A.U.S.A. has expressed relates to the varying practices which exist amongst Australian universities. To avoid having each university apply different principles in formulating their approach F.A.U.S.A. suggests that: *"Running costs and basic facilities must be provided across all departments to permit individuals within those departments to participate in competition for external grants. Possibly more even distribution of funds for maintenance of existing equipment and replacement of obsolete equipment will prove advantageous."*⁽³⁶⁾ Essentially what F.A.U.S.A. is advocating is that all university research staff should enjoy "level pegging" in their approach to outside donors, otherwise their funding proposals will be skewed or distorted by having to include items of expenditure the institution should be providing.

In considering "service" type expenditure Fitzgerald adopts a more pragmatic approach. He has observed that: *"There are persuasive arguments for treating the construction and maintenance of buildings, the development of grounds and central administrative services as being essential items, to be treated separately from the academic activities of the institution."*⁽³⁷⁾ Although Fitzgerald does suggest that: *"Electricity, rates, cleaning, insurance, etc., could be allocated on the basis of floor area occupied by the department. Telephone charges could be determined on a per staff member basis and computer services, printing, travel, food services and hospitality on the basis of recorded actual use."*⁽³⁸⁾ Nevertheless, the division of expenditure of this kind amongst each research activity would prove labour intensive and achieve no other purpose than satisfying accounting doctrines and conventions in the most pedantic manner. A more balanced approach would be to sheet this expenditure home to the institution having overall responsibility for each research activity, e.g., centre, faculty, school or institute.

The case for centralised institutional research and planning is covered by Stubbs in his brief evaluation of the "centralised" versus "de-centralised" approach. While his article concentrates more on the planning aspects appropriate to an Australian university, Stubbs acknowledges that: *"The advantages of a centralised (research and planning) unit are that the diverse skills of the various people can be utilised in different combinations depending upon the specific problems to be analysed and to arrive at suggested alternative solutions ... By being centralised and at the same*

time covering most of the university's planning activities and operations. . . . the unit as a whole is more acutely aware of what is going on throughout the university and what policy problems may or may not be arising."⁽³⁹⁾

From their different perspectives, both Fitzgerald and Stubbs are drawing attention to the fact that certain facilities are integral to any research activity but do not necessarily have a direct bearing on the outcome of the research work. What this does is reinforce the observation made earlier that while a research activity depends on having access to support facilities, the inclusion of the cost of these facilities in the budgetary plan of the research activity would distort the real cost of the research undertaken.

An alternative budgetary approach would be to regard all facilities associated with the furtherance of research as providing the "core" element. Adopting the "core" approach would involve determining the basic resources required to maintain the support and back-up facilities on which a research activity depends. The "core" would also encompass the minimum number of staff needed to provide the support facilities. When the staffing component and other expenses were expressed in financial terms the resulting amount would represent the minimum amount of funding required. This minimum funding would be the "core" element of the budgetary plan.

The application of the "core" budgetary concept does not have to be restricted to a university budgeting situation. Any organization, either public or private, could determine that part of its existing structure which represented the "core" element. Once the "core" element has been identified it would not have to be subject to the constant re-appraisal essential to the examination of the budgetary implications of research activities. To avoid the "core" elements from becoming too large a periodic review, possibly every five years, would seem desirable. The "core" element could also be subject to such criteria as the "phasing out" and "phasing in" principle. A further appeal for adopting the "core" concept is that because it distinguishes the "core" function of the overall research endeavour, it lends itself readily to the "formula" approach for funding allocations. Once the "core" element of the organization's budgetary plan is identified the remainder represents the research or project activity warranting resource allocations.

The budgetary technique beginning to emerge can be described as CRA

(Core + Research Activity). This budgetary technique will now be presented and evaluated as a budget model that offers research and development organizations an alternative better suited to their planning needs and for their obligatory reporting purposes.

BUDGET MODEL MAKING - THE CASE FOR CRA

It will be recalled that in Chapter 1 it was decided that the definition which would be used to describe a "budget" was: any statement of plans and expectations involving future activities where expenditure is compared against income received. From this definition it is possible to isolate three key elements: "plans and expectations", "future activities" and "comparing expenditure against income". Consequently, whatever budgetary application technique or strategy is developed, it must be capable of satisfying these three key elements. However, what also becomes evident when adopting this definition of the term "budget" is that the type of organization or the purpose the organization is designed to serve are not factors of prime consideration. These factors, although important, are of secondary significance.

Earlier in this Chapter the point was made that there is no reason to treat a research and development organization any differently from other organizations. This conclusion is valid and is reinforced by the fact that, in the past, a research and development organization has been forced to use budgetary strategies better suited to other types of organizations. What encourages the development of a particular budgetary strategy for application in a complex research and development organization is its capacity to provide a more effective and efficient means of allocating and controlling resource allocations.

The manner in which a research and development organization is structured offers a particular feature to the budget innovator. By structuring the organization so that the overall operational framework consists of a multiple series of research "activities", an operational unit - the research "activity" - is identified. A research "activity", therefore, can be singled out as providing the basic unit needed to develop a budgetary strategy. Having isolated a suitable budgetary unit, how does this compare with other budgetary strategies that have enjoyed some measure of popularity?

A number of popular budgetary strategies was discussed more fully in Chapter 3. Of the budgetary strategies selected, two - PPB and ZBB - were dependent on the need for a budgetary unit to be distinguishable.

Turning first to the PPB budgetary strategy. PPB requires various activities to be grouped into programme categories. For example, Else and Marshall have stressed that the PPB application depends for its future success on: *"... identifying objectives and the specific activities which contribute towards these objectives. Ideally, the types of work covered by the various contributing activities should be homogeneous so that all activities contributing to one objective can be classified as a 'programme'".*⁽⁴⁰⁾ Once programme categories have been determined the planning process is then able to proceed. During the planning process arguments supporting each programme are prepared and then submitted to the planning group for evaluation and consideration. Those programmes supported by the planning group are then either adopted in whole or in part by the management. Resources are allocated on the basis of the budgetary plan approved.

The effect of the PPB budgetary strategy approach has been summarised by Smithies as one which focuses on the process of comparison and co-ordination and permits the revision of objectives, programmes and budgets in the light of changed circumstances and experience.⁽⁴¹⁾ A more recent Australian experience warrants a mention because it demonstrates the confusion that can be caused when loose terminology is adopted. One of the budgetary strategies outlined in Chapter 3 was PPB (Planning-Programming Budgeting). Several years ago the South Australian Government commissioned a management consulting firm to work with its Program-Performance Budgeting Team for the purpose of improving that State's budgeting and financial management processes. The Report produced advocated the use by the State of PPB, but this abbreviation represented the budgetary strategy of Program-Performance Budgeting. This strategy concentrates on "inputs" and "outputs". The working definition of Program-Performance Budgeting adopted, and included in the Report, describes it as:

"A plan which relates input resources (for example, money, manpower and plant) to expected output results (service volume, performance indicators or measures) using a classification scheme which groups similar endeavours."⁽⁴²⁾

Despite this more recent analysis of the advantages of adopting Program-Performance Budgeting as a suitable budgetary strategy for government financial management, the grouping of activities into a programme means that the basic budgetary unit used in this application is a "programme".

Setting the basic budgetary unit at a level as high as a programme, it was argued in Chapter 3, suffers the disadvantage of not benefitting from the input lower levels of management can contribute. However, there is an observation contained in the South Australian Report which stated that: *"PPB must become an integral part of decision making, at all levels, if it is to fulfil its promise"*.⁽⁴³⁾ In view of the special features associated with the PPB budgetary strategy outlined in Chapter 3, principally the fact that it "is fundamentally bureaucratic in character", it would seem that the budgetary model adopted by the South Australian Government is a variation of the original PPB because greater stress is placed on the performance of the programme rather than the planning of the programme. With the South Australian model placing emphasis on including all levels of the organization in the decision-making process associated with the budget preparation, it would seem this budgetary technique moves closer to the CRA budgetary strategy being developed in this dissertation.

The essential point which emerges in respect of applying either of these PPB budgetary models is that each relies on the "programme" as the budgetary unit. It is the "programme" on which these budgetary models rely for the subsequent planning and resource allocation phases.

The second budgetary strategy to be considered in the context of identifying a budgetary unit is ZBB. When ZBB was examined in Chapter 3 one notable feature was the wide variety of terms writers on ZBB have used to describe the basic budgetary unit adopted for assessment purposes. Phyrre for example, has argued that it is necessary for *"all activities and operations (to) be identified in decision packages"*. Benveniste's description was more sweeping when he stressed *"that all programs have to be rejustified anew"*. By adopting the term "decision packages", Phyrre seems to be implying that it is immaterial whether the budgetary unit of ZBB represents a programme, an activity, a number of programmes or a cluster of activities. It is the package which becomes the basic budgetary unit so that it can be "evaluated and ranked in order of importance by systematic analysis".

While this is the first step necessary towards developing a budgetary strategy that can offer a workable mechanism, a more recent development noticeable in the area of financial management is the requirement for the approved budgetary plan to be interfaced with the accounting system. It will be recalled that when the disadvantages of ZBB were being reviewed in Chapter 3 attention was drawn to the drawback Anthony had exposed, in that ZBB could not be interfaced with an accounting system. This is understandable because the main thrust of ZBB concentrates on the planning rather than the financial accounting side of an organization's operations. Nevertheless, the ZBB budgetary strategy does have, as its budgetary unit, "decision packages".

A review of a selection of recent literature that deals with financial control in universities encourages the adoption, in one form or another, of the "unit" approach as the bases for measuring growth or isolating fixed costs. Writing in 1973, Barnes suggested that the financing of United Kingdom universities should move away from the system of "programme" financing to that of "formula" financing. In this way: *"Recurrent grants to universities would not be determined on the basis of what they proposed to teach or research. Instead they would be fixed by establishing a basic income unit - say, the annual cost of educating an undergraduate in the humanities. The cost for an undergraduate in other subjects and for post-graduates would be fixed as a multiple of the basic income unit."*⁽⁴⁴⁾ A system of this kind is almost identical with the WSU or EFTS method used to allocate funds to Australian universities for their teaching areas.

The approach taken by Verry and Davies is from a different direction. Their analysis concentrated on simple linear cost functions and the conclusion they reached was: *"... that each department has a certain fixed cost, or "set-up" cost, in terms of recurrent expenditure, which is independent of the scale of teaching and research, to which is added a constant cost per extra student or per extra unit of research output"*.⁽⁴⁵⁾ In this respect the recognition by researchers, such as Verry and Davies, that the operations of a department of a university entails certain fixed costs is tantamount to an admission of a "core" element present in any annual budgetary plan.

The deficiency inherent in the ZBB budgetary strategy that has again been emphasised in this section is its inability to be interfaced with an organization's accounting system. One of the questions posed in the

questionnaire circulated amongst Australian universities. (Question 7 of Appendices "B" and "C") asked if the budgetary technique or strategy in use was interfaced with the organization's accounting systems. The overwhelming reply was in the affirmative, although one suspects that the degree of sophistication applying amongst Australian universities varies in scale. Nevertheless, the conclusion which can be drawn from the response to this question is that Australian universities recognise the need for the budgetary and accounting systems to be interfaced.

Having established that a budgetary strategy which is based on an identifiable budgetary unit provides the basis for greater efficiency and control, the next step is to determine the relevance of a unit to an accounting system. In this regard cost accountancy provides the necessary link. Integral to efficient and effective cost control of an organization is the requirement to define its cost centres or units. When reviewing the cost systems applying in the teaching area of most Australian tertiary educational institutions, Fitzgerald observed that: *"The logical conclusion is that the subject departments should become the academic cost centres"*.⁽⁴⁶⁾ By singling out a department, Fitzgerald was using this as a suitable cost centre to allow accepted cost accounting methods to be applied. What is regarded as important is not the size of the cost centre but the identification the organization wishes to attach to a cost centre for the purpose of incorporating it into the accounting systems. In keeping with this rationale it would also be valid to adopt as suitable cost centres, a research activity, a school or an institute.

If the cost centre selected is small enough, e.g., a research activity, the benefit such an approach offers is that it permits easier monitoring of performance. In short, it makes possible the task of comparing actual expenditure against the budgetary provisions established at the commencement of the accounting period. This comparative capability is basic to adopting an integrated budgetary and accounting system. The prime advantage of having an integrated budgetary and accounting system is that it allows for budgetary adjustments to be made during the course of the financial year. Using a system of periodic budget reviews throughout the financial year, this process alerts management to likely over-runs of expenditure or reveals areas of underspending which can be redirected into other areas or reserved for a special purpose.

The points which have been made so far can now be summarised briefly.

In selecting a research "activity" as a suitable budgetary unit there is no impediment for such a unit to also serve as a cost centre. By adopting this dual role, a research "activity" can become the basic unit for measuring budgetary performance or collecting actual expenditure, with both functions being part of an integrated budgetary and accounting system. It is this capability which will provide the foundation needed for developing a system suitable for satisfying the standards associated with "public accountability".

It is now appropriate to return to the point which Verry and Davies had highlighted and that is "each department has a certain fixed cost". In the previous section the term "core" was used to describe the support and back-up facilities each research "activity" has to draw on during the course of its operational life. The facilities which could be regarded as being part and parcel of the "core" function are: the building housing the research "activity"; the secretarial, maintenance and cleaning staff; the provision of such services as electricity, heating, computing and transportation; and the fixed element of operating costs, such as telephones, postage, freight and stationery. The cost accountant purist would argue that annual recurrent expenditure of the kind mentioned should be apportioned over each research "activity". Fitzgerald, for example, suggests that general operating costs and the cost of special services can be apportioned amongst departments on a predetermined basis whereby: *"Electricity, rates, cleaning, maintenance, etc., could be allocated on the basis of floor area occupied by the department. Telephone charges could be determined on a per staff number basis and computer services, printing, travel, food services and hospitality on the basis of recorded actual use."*⁽⁴⁷⁾

The logic of sheeting home costs to the individual "activities" of an organization's operations are very persuasive. There are several reasons which challenge the necessity for resorting to this approach. Firstly, the spreading of costs over each "activity" on some predetermined basis is labour intensive. Although the accounting system can be programmed to apportion the costs on a formula basis, the approach assumes the situation will remain in a static mode. During the height of its operational life it is unlikely any research "activity" will maintain a preconceived pattern. The formula determined can be adjusted to reflect actual experience but all this does is reinforce the point highlighted earlier that clerical effort is necessary to process the adjustments required. Secondly, the question of whether the benefits associated with distributing costs over each centre and the human

resource effort involved is worthwhile needs to be asked. The matching of effort against cost, particularly in those sections of an organization which are considered "non-productive" as to "outputs", is a subjective judgement. It is the type of judgement modern organizations are having to re-assess against the back-drop of traditional practices. During periods of economic downturns when cost cutting exercises are practised more widely, those traditional practices which have little to offer for effective management will become casualties.

The position of an Australian university and a public research and development organization places these organizations in a different position to those research and development organizations located in the private sector, in that they are not in business to make a profit. With Australian universities and public research and development organizations so dependent on federal government funding, once the cost of new buildings has been met or special grants made available for the acquisition of expensive equipment, the future costs shift from the capital area of expenditure to the annual recurrent grants (i.e., maintenance of buildings and equipment). The taxation benefits which accrue to the private research and development organization because operating expenses incurred in earning income can be offset in determining that part of income against which tax is payable are an important consideration for these types of organizations. However, operating expenditure is capable of being isolated irrespective of whether it is spread over areas of "activity" according to some predetermined basis.

A compromise solution exists. While those service costs incurred by a research "activity" can be sheeted home to each "activity" in accordance with the concept of the "user pays", all other services and facilities provided could be more readily grouped together as forming the "core" budget of the organization's operations.

An Australian university or public research and development organization already embodies the organizational structure which would allow the "core" budgetary function to be identified. The "core" would represent a department, a school or an institute. This would have the effect of recognising the "core" as a cost centre but, because of the purpose it is to fulfil, it would be a cost centre of much larger dimension than a research "activity". Ancilliary to the "core" would be each research "activity". Each research "activity" would have the responsibility of preparing its own budgetary estimates for the forthcoming financial year.

In brief, a department, school or institute or whatever similar grouping is decided on by an organization would, in budgetary and accounting terms, be expressed as the "Core" + Research Activity (CRA). For example, if this approach is applied to one of the Institutes of the C.S.I.R.O., the "core" would represent those "core" elements of the Divisions and Units which are a part of the Institute. The research "activities" are represented by those individual research "activities" which are sponsored by the Divisions and Units. For cost accounting purposes the "core" element of each Division and Unit, together with each research "activity", could be identified as cost centres. Overall, the budgetary plan of an Institute would be represented by the "core" and the various research "activities". The pervasion of the "core" element throughout the organization's structure is illustrated in Figure 7. What becomes noticeable is that, similar to an apple, the "core" occupies a central position which is prominent from whatever level the organization is being considered. Research "activities", while individually discernible, are depicted as satellites owing their allegiance and existence to the central "core".

Earlier in this dissertation the strength and weaknesses of some other popular budget models were discussed. The strengths of the CRA budget model can be summarised as follows:

- (a) expenditure incurred by a research and development organization can be separated readily and is categorised as "fixed" or "research" cost components;
- (b) the monitoring of costs is facilitated because the levels of the research operations are small enough to permit improved efficiency and effectiveness;
- (c) improved monitoring enables uncommitted resources to be regularly rechannelled into other activities requiring an injection of funds;
- (d) as the budgetary unit and the cost centre amount to the same unit of measurement, there is no restriction preventing the application of an integrated budgetary and accounting system;
- (e) the development of budgetary estimates at the research "activity" level permits participation by lower levels of management in the budgetary planning phase. Equally,

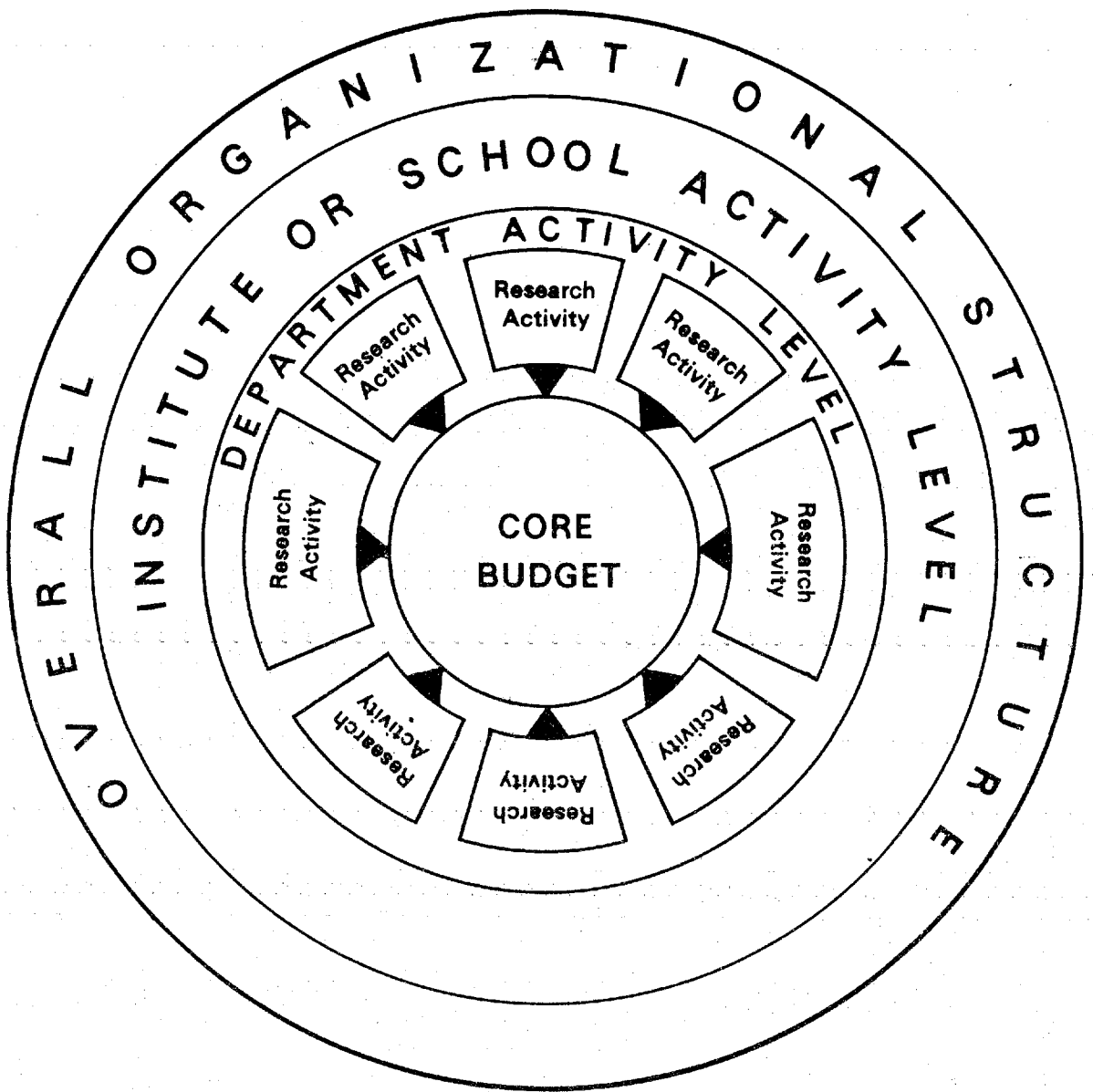


Figure 7: The central position of the 'Core' budget at whatever level the organization is being examined

lower levels of management are able to assist in the monitoring of actual expenditure. The insight gained by lower levels of management in measuring the actual expenditure experience against forecast expenditure represents a form of educational process which aids staff at this level of management with future budgetary estimating;

- (f) by separating the "core" functions from research "activities", any planning group established by the organization to produce an acceptable budgetary plan is assisted in the assessment process by having identifiable activities in a form which permits easy justification and comparison;
- (g) the emphasis placed on research "activities" as the budgetary unit of measurement enjoys sufficient distinctiveness which also allows performance and results to be appraised. This particular aspect is of wider significance when the obligations an Australian university and a public research and development organization have in satisfying "public accountability";
- (h) the "core" element of the organization's structure can be reviewed periodically and necessary adjustments made. Nevertheless, the "core" element is also capable of being assessed on a "stand alone" basis, contributing further to "public accountability" obligations;
- (i) long-term or corporate planning practices employed by the organization are enhanced because each research "activity" amounts to a forecast of future needs. The procurement of equipment or the provision of facilities can be planned well ahead, reducing the possibility of resources lying idle during a period of transition from one activity to another;
- (j) by concentrating on a research "activity" as the budgetary and planning unit, the "phasing out" of old research and the "phasing in" of new research can take place with a minimum of interruption. Further, the organization is

better equipped to accommodate early retirements or implement redundancy programmes during periods of economic downturns. In this respect the CRA budget model introduces a degree of flexibility which enables the organization to adjust to changed circumstances more quickly.

A criticism that could be levelled at the CRA budget model is the extent of cost centres generated. Some organizations would point out that if they were to adopt the CRA budget model it would result with a substantial increase in the number of cost centres that would need to be maintained.

This criticism can be countered on three principle grounds. As modern complex organizations move to a position of computerising their budgetary and accounting systems, the capacity exists for extending financial management control with minimum human resources outlay. Extending the number of cost centres so that each represents an identifiable operational area of activity will improve the financial management reporting system. Secondly, during the course of developing a computerised budgetary and accounting system there are long-term advantages for adopting a macro rather than a micro approach. Modifications to an established system which is all embracing is simpler to reprogramme than one having a limited configuration. Thirdly, whether the organization is part of the public or private sectors, governments or investors are demanding more detail on an organization's operational activity. This trend is strengthened by recent legislation which has been enacted for the purpose of extending the responsibility organizations have to disclose details of their operations. At the federal level the Trade Practices Act, 1974, the National Companies and Securities Commission Act, 1979, and the Companies (Acquisition of Shares) Act, 1981, are examples of legislation designed with this purpose in mind.

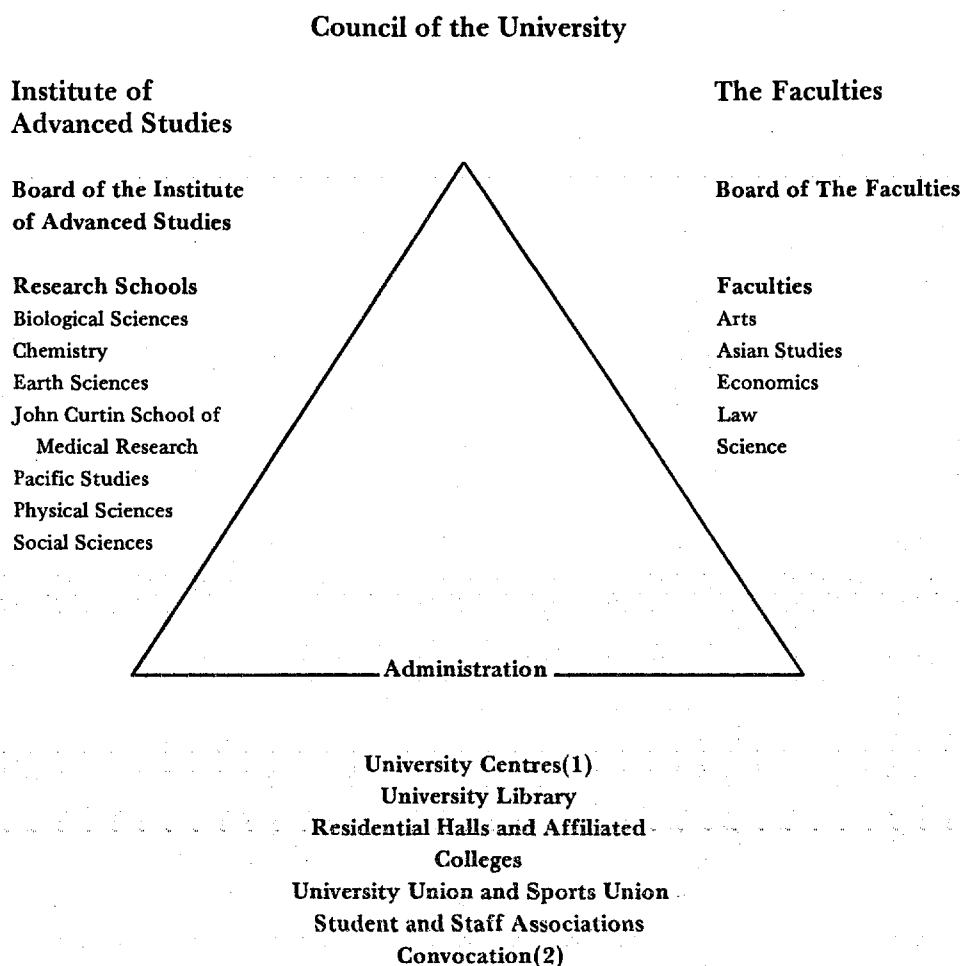
Having provided an outline of the CRA budget model and tendered arguments in support of its adoption, this is now an appropriate point to consider past budgetary practice which has encouraged the development of CRA. What will become apparent in the section which follows is that the CRA budget model owes its genesis to the variety of budgetary applications that have been used by the Institute of Advanced Studies of the Australian National University.

THE CASE OF THE INSTITUTE OF ADVANCED STUDIES, AUSTRALIAN NATIONAL UNIVERSITY

The unique character of the Australian National University (A.N.U.) was indicated from the outset. When the then Minister for Post-War Reconstruction and Minister in charge of the Council for Scientific and Industrial Research, Mr J. Dedman, introduced the Australian National University bill into the House of Representatives on 26 July, 1945, he stressed that: *"We hope that this university will not be a duplicate of other universities in the Commonwealth but will be a distinct type."*⁽⁴⁸⁾ The distinctive character of the A.N.U. was that, initially, it commenced operations as a post-graduate university. It was not until 30 September, 1960 that the Canberra University College, then affiliated with the University of Melbourne, would be incorporated into the A.N.U. although Section 9 of the original Act provided for such an incorporation at some stage in the future. The initial concentration by the A.N.U. on establishing post-graduate facilities also appears to be the course being taken by the newly emerging Northern Territory University.⁽⁴⁹⁾

The four Research Schools specifically referred to in the Australian National University Act, 1946,⁽⁵⁰⁾ were accorded the charter of having responsibility *"... to encourage, and provide facilities for, post-graduate research and study, both generally and in relation to subjects of national importance to Australia."*⁽⁵¹⁾

With the merger of the Canberra University College in late 1960, the four existing Research Schools became a part of the Institute of Advanced Studies, while the Canberra University College was redesignated the School of General Studies encompassing the Faculties of Law, Economics, Arts, Science and Oriental Studies (later renamed Asian Studies). The bringing together of an Institute responsible for post-graduate training and research, and a School, predominantly responsible for under-graduate teaching into one university structure, added complexity to an already unique organization. Since 1960 three Research Schools have been added to the Institute of Advanced Studies⁽⁵²⁾ and, in 1980, the School of General Studies was renamed the Faculties. By 1981: *"Two-thirds of the University's post-graduate training ... now centred on The Faculties."*⁽⁵³⁾ The structure adopted to organize and administer the University's Act is shown diagrammatically in Figure 8.



(1) University Centres include the Centre for Resource and Environmental Studies, Humanities Research Centre, Computer Services Centre, North Australia Research Unit, Centre for Economic Policy Research, Social Science Data Archive, NHMRC Social Psychiatry Research Unit, Australia-Japan Research Centre, Centre for Recombinant DNA Research, Contemporary China Centre, ASEAN-Australia Joint Research Project, Developmental Studies Centre, Strategic and Defence Studies Centre, ANU Press and NHMRC Health Economics Research Unit. Other centres and activities include the Division of Educational Services which embraced the Centre for Continuing Education, Instructional Resources Unit, Office for Research in Academic Methods, University Counselling Centre, and University Health Service.

(2) Convocation, which elects four of its members to the University Council, comprises academic staff, graduates of the University and others, who create community links for the University throughout Australia and in many other countries.

Figure 8 — Administrative structure of the Australian National University, Canberra.

Mention has already been made of the complex arrangements applying at the A.N.U. At the time of establishment the funding arrangements applying at the A.N.U. were also to differ from those of other Australian universities. For example, Section 30 of the Act specified an amount of up to £325000 for each of the first five years commencing on 1 July, 1946 and, thereafter, an amount of £325000 per annum. Fees collected by the A.N.U. could also be applied for the purposes of the University at the discretion of its Council. This section of the Act has never been changed despite the amalgamation of the Canberra University College in 1960 and the Institute of Advanced Studies now consisting of seven Research Schools.

On the last occasion the Universities Commission published details of higher degree research and coursework student load (the 1977-79 Report), the post-graduate students of the Institute were shown separately from those of the Faculties (described in this Report as the School of General Studies).⁽⁵⁴⁾ The fact that the A.N.U.'s Council allocates the funds it receives between the Institute of Advanced Studies and The Faculties as it determines has attracted some criticism in the past because the basis used is effectively hidden and not made available for public scrutiny.⁽⁵⁵⁾ In its Report for the 1982-84 Triennium the T.E.C. has proposed that the A.N.U. redress the imbalance of resource allocation between the Institute of Advanced Studies and The Faculties.⁽⁵⁶⁾

Although the Institute of Advanced Studies did not come into being until 1960, to help simplify the position the term Institute will be used to describe the budgetary practices observed by the four Research Schools prior to 1960.

In August, 1946 an Interim Council of the A.N.U. was appointed with a large part of the membership being drawn from the professoriate of other Australian universities. One of the first decisions taken by the Interim Council was to appoint an Academic Advisory Committee of four members. The members of this Committee had enjoyed senior academic appointments in the United Kingdom and were either Australians or persons well acquainted with academic matters peculiar to the Australian situation. This Committee operated during the years 1947-51 and it was able to advise the Interim Council on the basic plans and early development of the A.N.U.

The first academic appointments were made in 1948 but appointees continued to work elsewhere until suitable premises in Canberra could be

found. Towards the end of 1952 all but two departments had been established in Canberra, even though most were housed in temporary accommodation. Scholarships and research fellowships were made available to other Australian universities so that their bright scholars could study abroad, while leading overseas scholars were invited to Canberra for the purpose of conveying their knowledge and experience to Australian teachers and research staff. The structural organization of each of the four Research Schools was divided into departments, usually identified by the particular discipline, e.g., Law, History, Social Philosophy, Political Science, etc.⁽⁵⁷⁾ Each department was headed by a Professor who, for matters affecting the operations of his department, was responsible to the Research School's Director or Dean.⁽⁵⁸⁾

The proliferation of departmentalism was an issue which attracted comment by the A.U.C. in its First Report (1958-1963). A survey of Australian universities had been undertaken by Professor W. F. Connell in the late 1950s. One of the conclusions reached by Professor Connell was that the multiplication of departments embodied educational dangers.⁽⁵⁹⁾ The Commission concluded: *"Australian universities are notable for their emphasis upon training for the professions, and this has led inevitably to increasing departmentalism within faculties. This tendency has been encouraged by the extraordinary developments in science and technology during this century."*⁽⁶⁰⁾ Later in this section, it will be noted that two of the more recent Research Schools of the Institute of Advanced Studies have been structured differently than on departmental lines, adding further weight to the need to recognise a "core" element in their budgetary planning.

Working within a departmental framework the head of department, together with his departmental colleagues, devised an establishment suited to the research interests that were to be pursued. The academic staffing of each department is divided into two categories - tenured and non-tenured staff. Theoretically, this division of academic staff into two categories was originally designed with a number of purposes in mind. The offer of tenure was a form of incentive for attracting leading scholars from overseas to take up an appointment at the A.N.U. Furthermore, a proportion of tenured staff located in each department would ensure that there was continuity of the research endeavour being pursued. The ability to offer limited tenure appointments was designed primarily to enable the young scholar to undertake a particular piece of research work and then return to

a teaching position, enriched by the research experience.

At the time the A.U.C. submitted its First Report (in October, 1960), barely a month had elapsed since the Canberra University College (C.U.C.) had amalgamated with the A.N.U., although the Report noted that because *"... the University (A.N.U.) was designed to be concerned primarily with research and training in research ..."*⁽⁶¹⁾ modifications would be necessary to the A.N.U.'s administrative structure to cater for the needs of the School of General Studies. While the original A.N.U. Act had foreshadowed that such an amalgamation could occur at some stage in the future, it is also worthwhile recalling that in the Murray Report of 1957 the enjoining of the A.N.U. with C.U.C. was advocated on the grounds that such an arrangement allowed *"... common services to be organized and maintained without unnecessary duplication."*⁽⁶²⁾ Nevertheless, the A.U.C. went on to foreshadow that: *"... the School of General Studies will be exposed to pressures associated with the Australia-wide rise in student numbers, and it will be necessary for the Administration to devise policies which will protect the high standards identified with the University. Success in the new venture will add much to the strength of the Institute, which in the long run depends on an ever-growing stream of the finest young minds the nation can provide."*⁽⁶³⁾

What this indicates is that from the outset the A.U.C. was convinced that in relation to the A.N.U. it would be necessary to distinguish between the Institute of Advanced Studies (I.A.S.) and the School of General Studies (S.G.S.) when drawing-up guidelines for the federal government to allocate resources amongst Australian universities. The fact that the resources made available to the A.N.U. were left to that institution to determine the division between I.A.S. and S.G.S. resulted with a diffused "meshing" process, not immediately apparent to the outside observer. Consequently, the "meshing" of resource allocation practised by the A.N.U. attracted criticism of the kind voiced by Professor Williams, as highlighted earlier in this section. In defence of the A.N.U.'s approach, the administrative machinery necessary to separate resource allocations between the two major sections of the A.N.U.'s operations would have proved time consuming and cumbersome. The process necessary to separate the two operations would have established a claim for resource allocation support and, in so doing, could have attracted criticism on the grounds that an administrative bureaucracy was being maintained for no apparent teaching or

research benefit.

The approach taken by the A.U.C. in its First Report was to make a clear distinction between the I.A.S. and S.G.S. on matters of staffing and student numbers.⁽⁶⁴⁾ However, when the A.U.C. nominated the grants it was proposing for the 1961-63 Triennium, the grants recommended for the A.N.U. concerned the institution as a whole rather than show a division between the I.A.S. and S.G.S.⁽⁶⁵⁾ This practice was continued in subsequent triennia by the A.U.C. and, more recently, by the T.E.C.⁽⁶⁶⁾ The A.U.C.'s First Report, however, went to some lengths to reinforce the special needs of the I.A.S. for equipment. The following extract is indicative of the A.U.C.'s attitude at the time:

"The research character of the Institute of Advanced Studies in the Australian National University precludes the possibility of including the Australian National University (S.G.S.) within this framework. In order to pay for the Institute's existing commitments, to provide equipment for continuing and increasing research, and to meet the needs of the School of General Studies, the Commission recommends that an amount of £1,067,000 be made available for the Australian National University in the 1961-63 triennium. Major items of equipment include general and laboratory equipment for the John Curtin School of Medical Research, and equipment for research programmes in particle physics, nuclear physics, geophysics and astronomy in the Research School of Physical Sciences. An amount of £50,000 is included for the purchase of capital equipment items in the School of General Studies."⁽⁶⁷⁾

It is worth noting that at the time the A.U.C. was preparing the level of grants it was to recommend for Australian universities for the 1961-63 Triennium, it felt constrained because: *"The Commission, since its appointment, has been too occupied with the immediate financial problems of the universities to devote an adequate amount of time to the problems of future university design ..."*⁽⁶⁸⁾ Even so, the A.U.C. was able to alert the Commonwealth Government to some of the immediate problems it foresaw. While acknowledging that changes were occurring within Australian universities during the 1958-60 Triennium, the A.U.C. was quite specific when it noted that: *"... there still remains much to be done in making good the damage caused by years of comparative neglect."*⁽⁶⁹⁾

During the short time the A.U.C. had been in existence it had reached the conclusion that: *"The Australian community, while respecting university training, does not appear to have shown a great deal of interest during the ten of fifteen years in the real needs of universities, nor to have acquired an understanding of their complex problems."*⁽⁷⁰⁾ Consequently, the A.U.C. adopted the approach: *"... that restoration must proceed simultaneously with expansion"*,⁽⁷¹⁾ and went on to urge that the level of funding made available to Australian universities be lifted from £1.6 per annum per head of population, which applied to the 1958-60 Triennium, to £2.9 per annum per head of population for the 1961-63 Triennium or an increase of 81.25%.

It is with this background that the various budgetary strategies adopted by the I.A.S. can be considered. In considering the budgetary strategies used by the I.A.S. three phases are capable of being identified. These phases can be described as follows:

- (a) the establishment and formative phase;
- (b) the growth and consolidation phase, and
- (c) the static, ageing and experimental phase.

Although the Hon. J. J. Dedman, when introducing the second reading of the Australian National University Bill in 1946, said:

"The Government is particularly anxious that the national university shall be established in such a manner that it will bring credit to Australia, advance the course of learning and research in general, and take its rightful place among the great universities of the world."⁽⁷²⁾

the realisation of this grand design was to involve considerable planning and the application of "make-do" arrangements until the kind of facilities were available for research purposes.

The period from 1946 until 1960 can, therefore, be described as the establishment and formative phase of the I.A.S. In each of the four Research Schools staffing establishments were regulated along departmental lines, with an attempt being made to divide the staffing equally between tenured and non-tenured appointments. Every effort was made to attract scholars having international reputations to Canberra. An examination of the entries which appear in the early annual reports reveals that many academic staff held higher degrees from the same overseas university. What

this suggests is that prior research and common academic interests had encouraged a "resettlement" of academic endeavour by a particular homogeneous group in Canberra. Alternatively, the reason could be due to the fact that an appointee to the headship of a department encouraged his former students to join him at the A.N.U. The "bringing of credit to Australia", foreshadowed by the Hon. J. J. Dedman, is probably due in no small part to the fact that the movement of academic enclaves to Canberra where research could be pursued without teaching obligations, achieved research results well ahead of normal expectations.

The establishment and formative phase required very little forward planning. A head of department indicated what positions would be filled for the forthcoming financial year, either for a full year or part of a year. This enabled the salary and salary-related expenditure to be calculated with a reasonable degree of precision. A department's "other expenses", usually divided into such categories as research equipment, expendable research materials and field and survey, were gauged on the basis of known research work-in-progress, new research activity departmental staff wished to pursue and the academic interests expressed by new appointees who would be joining the department during the forthcoming financial year.

Each Research School budgeted for items of expenditure considered to fall within the province of a School, rather than a department. Typical items of expenditure regarded as a School's responsibility included: telephones, heating, electricity, postage, freight, appointment expenses and advertising. Scholarship stipends and associated expenses were also budgeted for by the School rather than be left to a department. In this way each School was better placed to monitor annual expenditure. Where expenditure fell below the budgeted amount, the main reasons for the shortfall were due either to appointees from overseas being unable to arrive on the date nominated originally or that the delivery of equipment had been delayed because manufacturers were unable to meet the dead-lines nominated or that industrial disputations had added to the manufacturing time.

The initial I.A.S. returns prepared for submission to the A.U.C. could be described as observing the Incremental Budgeting approach, supplemented by a component to cover growth. The estimates of each department were prepared on a line-by-line basis, i.e., each appointment, for example, was accorded a separate line enabling the effect of "incremental creep", where this applied, to be projected over the three year period. Departmental

budget estimates were then consolidated and expenditure peculiar to the School added. The resulting estimates represented the budgetary plan the Research School had developed for the following triennium. During this establishment and formative phase, there was little need for the I.A.S. to introduce an elaborate long range or strategic planning process to deal with resource allocation. The major planning necessary during this phase was associated with the design of buildings suitable for future research needs.

The establishment of the A.N.U. did achieve one important aim. A national university of the kind originally envisaged for the A.N.U. proved sufficiently attractive to entice academic doyens, such as Hancock and Oliphant, to return to their homeland. Both of these researchers, on taking up the Directorships of their respective Research Schools (Hancock as Director of the Research School of Social Sciences, and Oliphant as Director of the Research School of Physical Sciences), were able to bring to bear the experience they had gained from overseas research institutions. The input made by persons such as Hancock and Oliphant in planning the buildings now housing their Research Schools is still evident, although new technology and changes in community attitudes suggest different priorities would be determined if these buildings were being planned today.

The establishment and formative phase was also a period where the vice-chancellor was not subject to the vagaries of heads of departments on the matter of resource allocation. The prime task of the I.A.S. was to build up to a level of staffing that would allow the research aims of each Research School to be fulfilled, provide the facilities needed to train post-graduate students and engage in research of national importance. Consequently, the initial budgetary phase in the life of the I.A.S. can be summarised as one involving the establishment of the four Research Schools and devising the structure each would require for their operations.

The growth and consolidation phase can be used to describe the years 1961 to 1975. However, a "hiccup" did occur during this period. This was the rejection by the Commonwealth Government of the recommendations contained in the A.U.C.'s Third Report (1967-69). There is strong evidence to suggest that the non-acceptance by the Commonwealth Government was made on financial grounds associated with Commonwealth/State relations. Professor Williams' account of the rejection of the Third Report is phrased carefully, when he observes that:

"The financial recommendations of the Third Report of the Commission were not accepted by the Commonwealth or by the States. In August 1966, the Commission had delivered a draft of its report to Senator Gorton, after discussions with each state government. The report was received by the senator before he had completed his discussions with the Commonwealth Treasury and the State governments. In September, Senator Gorton announced support for a programme that was 5 per cent less for recurrent and 25 per cent less for capital grants than the programme recommended by the Commission.

Senator Gorton stated in the Senate on 21 September that the reductions, which varied in incidence from State to State, arose as a request from the Premiers at the conference in June 'that consultations in some detail should take place between the Commonwealth and each State concerning the recommendations of the Universities Commission'. Those discussions took place, 'with each State separately, at both the official and Ministerial level, and each State indicated the upper level of the programme which it felt it could support'. The Commonwealth adopted the upper limits suggested by the States, except in Western Australia and Tasmania, where on its own initiative it reduced the recommended recurrent grant by 5 per cent."⁽⁷³⁾

A reduction of 5% by the Commonwealth Government also meant a reduction of similar magnitude for the States. Based on the details provided in Table 6 of the A.U.C.'s Third Report, the saving to the States on recurrent expenditure alone amounted to \$11076000.⁽⁷⁴⁾ The financial dealings associated with Commonwealth/State relations were obviously one of the factors which contributed to the rejection of the A.U.C.'s Third Report. On the other hand, Professor Williams' summary of the events hints at the possibility that pressure had been exerted by the States on the Commonwealth at the June 1966 Premiers' Conference. In this event it would have been the first occasion, since the end of World War II, that the States had expressed openly their concern about the mounting cost of operating Australia's university sector.

During the growth and consolidation phase experienced by I.A.S., three

further Research Schools were added - the Research Schools of Chemistry and Biological Sciences in 1967 and the Research School of Earth Sciences in 1973. Why two of these Schools - the Research Schools of Chemistry and Earth Sciences - are of interest is on account of their rejection of the adoption of the traditional departmental framework. Instead each School is divided into broad areas of research activity (the Research School of Chemistry arrangement) or into a number of small, semi-autonomous research groups (the arrangement preferred by the Research School of Earth Sciences).

The consequence of this differing structure is that the development of a budgetary plan requires a different approach. The most significant difference is that a larger part of the budgetary plan becomes a School activity. In effect, the School assumes responsibility for the forward estimating of services and facilities on which the research areas or groups are dependent. Another way of visualising the arrangement is to recognise that the "core" aspects of the budgetary plan have been widened. The main argument supporting this type of organizational structure for use in a Research School is that it avoids the rigidity inherent in departmentalism. The rigidity referred to in a departmental arrangement is that departmental boundaries tend to discourage a researcher from extending his or her interests into other disciplines.

When reasoning of this kind is put to the test it will be found, as demonstrated later in this section, that it is without foundation. Departmentalism, on the other hand, can be readily defended on a number of grounds. Firstly, the arrangement identifies a particular group of researchers and tends to provide a unifying factor. Secondly, each academic member of a departmental team has a greater opportunity to influence the outcome of future research to be undertaken. Finally, from a budgetary viewpoint, vacant positions can be isolated readily and a decision reached on whether to fill the vacancy, defer making an appointment or dis-establish the position. Whatever action is decided on, the history of each position and what research activity was associated with it in the past proves simple to trace. The need for this kind of information may be relevant when "public accountability" investigations are in progress.

The growth and consolidation phase saw an extension of Incremental Budgeting within the I.A.S. but this budgetary strategy was now being supplemented by a combination of Formula and Planning-Programming Budgeting. Facets of Formula Budgeting were being applied to allocate support services

for academic research staff and for allocating PhD scholars over the various disciplines of a Research School where the ability to provide adequate supervision depended on staff availability. Elements of Planning-Programming Budgeting were surfacing in the non-departmentalised Research Schools. For example, in the Research School of Chemistry research had been organized around three topics: chemicals from micro-organisms; chemical reactions activated by light; and the chemistry of rare metals.⁽⁷⁵⁾ The annual estimates prepared by each Research School were in accord with the approved triennial plan. This arrangement enjoyed the advantage of prescribing for each Research School, in advance, the new areas of growth. From a strategic planning viewpoint, advanced knowledge of this kind permitted action to be initiated ahead of the event. For example, the advertising of new positions, so that when the financial year was entered which contained new posts, delays in filling the positions were minimised.

This phase of the I.A.S. can, therefore, be summarised as a period which consolidated the establishment and formative phase that preceded it. Some growth allowed modest expansion, as evidenced by the addition of the three new Research Schools to the Institute. Further, the research undertaken throughout the I.A.S. was now being acclaimed universally and continued to bring credit to Australia of the kind the Hon. J. J. Dedman had envisaged.

The last and current phase being experienced by the I.A.S. has been described as the static, ageing and experimental phase. This phase can be deemed to have commenced in 1976 and is currently in vogue. It will be recalled that included in the section entitled "Universities" in Chapter 3, mention was made of the suspension of triennial funding to Australian universities by the Commonwealth Government in 1976 and the introduction of the concept of the "rolling triennium".

The A.U.C.'s Sixth Report (1976-78) suffered the same fate as its Third Report in that it was rejected by the Commonwealth Government. This resulted with 1976 being declared an intercalary year and the Commission had to make "... new recommendations for that year, based on government instructions that new initiatives were to be deferred, that the proportion of the relevant age-group going to university and the standards of recurrent expenditure were to be kept at 1975 levels, and that expenditures on building and equipment were to be sharply curtailed."⁽⁷⁶⁾

The defeat of Whitlam's second ministry in late 1975 by the Liberal-National Party coalition heralded in a new Commonwealth Government which was determined to make the nation's economic state the lynchpin in any future government policy determined. The reason the new government adopted this *raison d'être* was that during the election campaign it had perceived throughout the electorate a deep concern with the cavalier and expansionist approach of the A.L.P. government to economic matters during the years 1972-75. There is no denying that during the years of A.L.P. government, salaries and wages had increased dramatically. It had been argued during the late 1975 election campaign that without a compensating increase in productivity the cost of Australian labour would lead eventually to a downturn in the nation's economy. The subsequent increase in unemployment to the present high level, approximately 10% of the work-force, lends support for the arguments that were presented at the time.

Nevertheless, two prime factors also need to be taken into account when reviewing Australia's economic position since 1976. The general downturn in the Western world's economy was influenced considerably by the substantial increases imposed by the O.P.E.C. countries on the price per barrel of crude oil. The mounting cost of oil began to intrude into secondary industries, particularly the steel industry, on which Australia's biggest company - B.H.P. - contributed significantly in earning income from overseas. Australia's financial planners had no control over external factors of this kind and the end result was to cause havoc to Australia's economy and its labour force. If the new Liberal-National Party government was to obtain the support of the private sector in helping to curb mounting inflation it was obliged to set an example.

The damper exerted by the Commonwealth Government was extended into the university sector. In accordance with the Commonwealth Government's wishes the Universities Commission adopted the following specific guidelines for developing the 1977-79 Triennium:

- "(a) *The universities to maintain their intake of students in the years 1977 to 1979 at a level comparable to that in 1976;*
- (b) *The total level of expenditure in 1977 to be \$555 million in December 1975 cost levels, consisting of \$525 million operating expenditure (In addition \$6.2 million for*

Deakin University is to be transferred in 1977 from the advanced education sector) and \$30 million building expenditure; this represents a 2 per cent growth in real terms over 1976, plus an additional \$2 million for buildings, (the anticipated cash flows in the 1976-77 financial year are \$525 million operating expenditure and \$32 million building expenditure);

- (c) All but essential construction, upgrading and replacement of buildings to be deferred for 1977;*
- (d) For 1978 and 1979, the Commission to plan on the basis of a minimum growth in expenditure of 2 per cent per annum in real terms."⁽⁷⁷⁾*

The Universities Commission acknowledged that in implementing these Commonwealth Government sponsored initiatives: *"The sharp restriction in funds available for universities in 1976 and the maintenance of this stringency for the next triennium will stop university growth."*⁽⁷⁸⁾ In addition to the "static" situation which was being imposed on the university sector was the uncertainty associated with applying the "rolling triennium" concept. In this planning aspect: *"The Commission's understanding of this system is that each year it will be given guidelines in real terms which will consist of firm expenditure figures for the following year and guaranteed minimum figures for the succeeding two years. The Commission will report annually, with recommendations for the following three years; each year the triennium will roll forward one year and a new 'third' year will be added."*⁽⁷⁹⁾

The application of the "rolling" triennium concept introduced to the long-term or strategic planning processes operating at Australian universities an element of instability because it placed in doubt the lengthy leadtime needed to introduce new teaching courses or embark on long-term research projects. The problems anticipated in coming to terms with the new arrangements were also encountered by the I.A.S. However, apart from having to adjust to operating within a "static" mode, the latter part of the 1970s was to witness reviews of three of the original Research Schools of the I.A.S. (Research School of Physical Sciences in 1976;⁽⁸⁰⁾ Research School of Social Sciences⁽⁸¹⁾ and the Research School of Pacific Studies⁽⁸²⁾ in 1978), the first in-depth reviews these Schools had experienced since

their foundation in 1946.

A periodic review of academic institutions was not new. In the early 1970s the University of Sussex had examined its structure and decided that, in future, the organization would be reviewed annually in a structured sequence.⁽⁸³⁾ The procedures adopted by the University of Sussex were well known to Professor D. A. Low who had taken up the Vice-Chancellorship at the A.N.U. in May, 1975 and had been at Sussex when the review arrangements were introduced. Subsequently, the Williams Report of 1979 recommended that the review system used at the A.N.U. should be adopted by other Australian universities.⁽⁸⁴⁾ However, it should be borne in mind that reviews of this kind, particularly where eminent overseas scholars are invited to serve on a review committee, impose a substantial cost element on the organization's resources.

In each case the review committees' recommendations were couched in such terms as: *"... that the vitality of research depends on a continuing shift from established to new lines of inquiry."*⁽⁸⁵⁾ Already, some of the older Research Schools had begun experimenting with programme-type research activity. The shift the review committees proposed to enable new lines of inquiry to be introduced accelerated the push towards programme research. While this approach was developing in the Research Schools, stimulated by the capacity programme research had to cross traditional departmental boundaries, Vice-Chancellor Low was formulating a plan to establish a pool of money to finance a "new initiatives" scheme for the I.A.S. To finance this scheme it was proposed that, commencing from 1977, a 1% cumulative amount be "skimmed-off" the top of each Research School's annual allocation. The operative word in this scheme was "cumulative" so that the financial effect was: 1977 - 1%; 1978 - 2% and 1979 - 3%.

Each Research School could lodge "bids" for consideration by the committee established to handle the "new initiatives" proposals. Theoretically, the scheme was designed to free some resources of the I.A.S. and redirect these towards new research endeavour. The concept was admirable and, at another time, it may have gained enthusiastic support. Where the scheme encountered difficulty was in applying the "cumulative" effect of "skimming-off" the top. Some Research Schools had already committed resources to financing "new initiative" proposals that had been developed in-house. A 1% "skimming-off" the top for each of the three years of the triennium could have been tolerated but the "cumulative" effect of 1% in

Year 1 increasing to 3% in Year 3 led to some Research Schools having to abandon programmes that had been devised earlier with due regard having been paid to the tight financial position before the "skimming-off" arrangement was implemented. The fears expressed by the social scientists that the scheme amounted to a ploy to redirect funds from their areas of interest to the natural science Research Schools were confirmed once the details of "bids" approved were made known.

In some respects, the experience at N.Y.U. can be cited as having provided the bench-mark against which the failure of the I.A.S.'s "new initiatives" scheme can be measured. The evidence available suggests that the University's top management failed to appreciate what "cumulative" implied in a financial sense. However, once the scheme was announced the University was committed to implementing the means of financing the scheme. Further, it is doubtful if the University had anticipated the extent of criticism Deans and Directors would level at the financing arrangements. The major difficulty facing the Deans and Directors of Research Schools was that the "new initiatives" that had been developed in their own Schools, either had to be severely curtailed, deferred or abandoned. A number of these "new initiatives" had, in fact, been devised by the Deans or Directors themselves. The scheme generated further extensive criticism at the academic boards of some Research Schools. Similar to the N.Y.U. experience, the reason for the scheme failing to gain general acclaim was that the concept planned had not been circulated for comment and opinion before it was implemented. If this step had been taken it would have alerted the University to in-house commitments entered into by some of the Research Schools. At least two Research Schools are still experiencing difficulty with their annual budgetary planning in overcoming funds lost as a consequence of the 1977-79 "skimming-off" the top exercise.

It will be recalled that during the establishment and formative phase of the I.A.S.'s development, mention was made of attracting young researchers from overseas. What had not been allowed for during the long-term or strategic planning of A.N.U. was that the young researchers of the early 1950s had become the "greying" researchers of the early 1980s. Ageing had already become apparent in the senior administrative ranks when a number of senior administrative staff were forced to retire on medical grounds during the mid-1970s and outside appointees were preferred as their replacements rather than promote existing middle-management staff who had extensive

experience in the A.N.U.'s operations.

As has already been mentioned earlier, the complexity of the A.N.U. is increased because of the differing administrative, financial and budgetary applications that are necessary in the operations of the I.A.S. as distinct from the S.G.S. While the I.A.S. is required to concentrate on research activity and provide post-graduate training, the S.G.S. has the additional task of allocating resources to under-graduate courses that have been made available on the basis of a formula, e.g., EFTS or WSU. The appointment of outsiders having little or no university experience created a vacuum in the kind of expertise necessary for long range or strategic planning peculiar to a university situation.

At the time the recruitment of outsiders to senior management positions was supported on the grounds that it benefitted the A.N.U. by introducing new talent having broader experience than existing staff had acquired. It was advocated by the association representing the middle-management staff on campus that justification of this kind would be found to be spurious if put to the test. The University declined to accept the challenge but these outside appointments occurred at a time when the A.N.U. could ill-afford to be denied the benefit of advice that was based on a deep understanding of the University's ethos. Furthermore, the approach taken by the University caused a rift in its relations with middle-management staff that still lingers today, based on the attitudes expressed by the A.N.U. Administrative and Allied Officers Association.

The vacuum was overcome partially by appointing additional committees to undertake set tasks. All this did was superimpose on the A.N.U.'s existing organizational structure an extended committee system which was costly to maintain and an inefficient means of utilising existing human resources. It will be recalled that in Chapter 2 the findings of Emery and Trist, following their study of a United Kingdom food-canning factory, disclosed that changing circumstances, involving connecting factors, had led to irreversible general change. The "ageing" situation becoming apparent at the A.N.U. since the early 1970s would have prompted researchers, such as Emery and Trist, to advocate the University should have introduced measures, e.g., in-service training, to have avoided any disruption to the smooth flow of the organization's operations.

The financial stringencies imposed on Australian universities from the mid-1970s encouraged widespread rethinking of the organizational structures

appropriate throughout the university sector. The Research Schools of the I.A.S., for example, have had to resort to experimentation if they were to establish new fields of research in a "static" financial mode situation. One experiment that offers a degree of flexibility is the introduction of project or programme research. The main advantage of project or programme research is that it is finite in duration. Resources freed from a "phasing out" operation can be redirected into new research activity. In addition, projects or programmes prove attractive to "greying" researchers who wish to complete a particular piece of research work in the twilight years of their appointments.

The circumstances described above which the I.A.S. has experienced since 1976 can, therefore, best be described as the static, ageing and experimental phase. The "static" state of funding received from the Commonwealth Government has led to the emergence of an "historical" budget base. For example, the intercalary year determined by the federal government for 1976 encouraged the adoption of this year as the base for projecting the resource allocations for future financial years. Variations to the "historical" base were only possible by introducing such schemes as the I.A.S.'s "new initiatives". Applying an "historical" base has the effect of projecting the "core" element of a Research School's budgetary plan to the forefront. In a "static" state the main factor affecting the preparation of the budgetary plan centres around staff appointments, retirements and resignations. It is the known commitments associated with the actual staff expected on the payroll for the forthcoming budgetary year which influence the outcome of the budgetary plan.

There are certain special factors which influence the development of the budgetary plan devised for the I.A.S. It is proposed to examine briefly two of these factors. The first that will be considered concerns the need for Research Schools of the I.A.S. to maintain flexibility. This will be followed by reasoning which supports the need to separate operating expenditure from that of equipment.

MAINTAINING RESEARCH FLEXIBILITY

Much of the success of a particular budgetary plan will be dependent on its ability to adjust to change in the light of actual experience. This in-built feature assumes greater importance when the funding received contains no growth element. Earlier in this Chapter, compelling arguments were advanced to support a situation where the unit for performance measurement

was both the budgetary and cost centre. The main argument favouring this arrangement is that actual expenditure incurred can be compared with the initial budgetary provision. This ready comparison enables adjustments to be made to the original budgetary plan to either increase the budgetary provision needed to accommodate actual expenditure, or vary the original budgetary plan by transferring uncommitted funds to areas of need.

While the actual percentage varies between each Australian university the Universities Commission acknowledged that: *"... some four-fifths of the operating expenditure of universities is committed to wage and salary payments ..."*⁽⁸⁶⁾ Further, the Universities Commission had concluded "incremental creep" even after allowing for some staff turnover added to salary and salary-related expenditure at the rate of three-quarters of 1% in any one year.⁽⁸⁷⁾ Although the "ageing" process noticeable in Research Schools of the I.A.S. suggests that most staff falling within this category would have attained the maximum salary of their salary ranges and, therefore, "incremental creep" no longer presents the same problems as experienced in earlier years. Nevertheless, where the annual recurrent grant of a Research School requires an amount of approximately 80% to be earmarked for salary and salary-related expenditure, this will become the prime area for achieving flexibility by redirecting resources released from one position to another requiring an injection of funds.

The case for Australian universities to enjoy some degree of flexibility was made by the Universities Commission in its Report for the 1977-79 Triennium, when it pointed out that: *"... because of unavoidable cost increases and the need to retain some flexibility in budgeting, universities require some growth in real expenditure to maintain a constant effective standard of operation"* and went on to propose: *"... a minimum of 1½ per cent per annum is required."*⁽⁸⁸⁾

The T.E.C.'s Report of February, 1981 on the 1982-84 Triennium took a slightly different course when it outlined a number of proposals aimed at optimising the extent of flexibility enjoyed by Australian universities. Some of the proposals suggested were:

- (a) increasing the use of non-tenured appointments;
- (b) encouraging early retirements;
- (c) introducing fractional appointments;
- (d) the wider use of job rotation schemes;
- (e) extending the period of probation.⁽⁸⁹⁾

Increasing the number of non-tenured positions and introducing fractional appointments are two of the T.E.C.'s proposals that have been attempted in the Research Schools of the I.A.S. with varying degrees of success. The matter of early retirement is one issue under active consideration. However, early retirement contains an additional cost element in the form of accrued long service leave. Apart from this is the present uncertainty associated with superannuation. The unsatisfactory nature of existing superannuation schemes applying at Australian universities is already well known to the T.E.C.⁽⁹⁰⁾ Until staff can be made aware of the benefits flowing from joining any new national superannuation scheme established for university staff, they are unlikely to exercise an early retirement option.⁽⁹¹⁾

While proposals of the kind outlined above are all designed to provide Research Schools with the extent of flexibility necessary, when faced with a no-growth situation there is a limit to which measures of this kind can be applied. Perhaps the most telling arrangement for ensuring a Research School builds-in a degree of flexibility into its organizational structure is to pursue research along project or programme lines. This ensures that the research undertaken remains subject to constant review and justification. There is also no reason why research, structured on project or programme lines, cannot be pursued within existing departmental frameworks, even though some research may intrude into other departmental disciplines.

SEGREGATING RECURRENT FROM EQUIPMENT EXPENDITURE

The term "equipment", as applied in this section, refers to equipment of a substantial nature. In the A.U.C.'s First Report (the 1961-63 Triennium) the description used was "capital equipment".⁽⁹²⁾

The lack of equipment needed for quality research at Australian universities was one of the reasons that had led to the A.U.C. describing the position as "the damage caused by years of comparative neglect". To some extent it can be argued that the student "explosion" following World War II and the extraordinary growth of the university sector benefitted Australian universities because it enabled them to receive funding for expensive items of equipment which, otherwise, they would have been denied. The establishment of the A.N.U., initially as a research university by a federal government desirous of having an institution of world standing, may have also contributed towards the upgrade of equipment used at other Australian universities.

The fact that the equipment purchased for use in Australian universities would have a life span extending for a number of years encouraged the adoption of the description "capital equipment". Apart from the need for Australian universities to "catch up" on their equipment holdings, two other factors have exerted pressure on the demands placed before the federal government by the university sector for regular equipment upgrades. Probably the foundation of rapid technological change can be traced to the super-human efforts industry made towards meeting the demands of war production during World War II. New technology also flowed from space research which could be channelled into other industrial applications. The second factor, and probably the one which made the most significant contribution, was the advent of the commercial computer and the subsequent refinements in the size and capacity of the hardware available. For Australian universities computer technology introduced wider diversity to teaching and research and enabled research data to be processed and analysed at a rate hitherto unknown.

The developments in the equipment field provide a further example of a changing circumstance which warrants separate and special consideration. This has been recognised by Australian universities for each has submitted to the T.E.C. claims for funding equipment purchases, argued on a number of grounds. The reasons given have been summarised by the T.E.C. as follows:

- " the replacement of technologically obsolete or worn-out and unserviceable equipment - all universities claimed that keeping pace with the rapid increase in technological sophistication in almost all areas of academic activity was placing severe burdens on their existing equipment budgets;
- the upgrading or replacement of existing computer equipment - universities generally continue to stress that substantial additional funds are required for the purchase of computing equipment; and
- the purchase of major items of equipment - a number of universities claimed that the level of grant available in recent years had been insufficient to permit the purchase of large and costly items of equipment which were particularly necessary for their research activities."⁽⁹³⁾

Equipment of the kind necessary for conducting sophisticated research is expensive. For this reason public research and development organizations

such as the C.S.I.R.O. and the A.A.E.C. make available their facilities to tertiary institutions. A good illustration of sharing expensive research facilities concerns the development of SYNROC. This substance, developed jointly by the A.A.E.C. and the Research School of Earth Sciences, is designed to enclose radioactive waste in a non-deteriorating skin. Samples of SYNROC have been subjected to accelerated radiation damage testing by the A.A.E.C.'s HIFAR reactor located at Lucas Heights.⁽⁹⁴⁾ Mutual co-operation of this kind between public funded research institutions avoids duplication and is a more efficient use of taxpayers' money.

The uneven spread of funding required for equipment acquisition becomes apparent in examining Table 8.2 of the Universities Commission's Report for the 1977-79 Triennium.⁽⁹⁵⁾ While the overall grants to Australian universities rose from \$20.155 million in 1977 to \$22.415 million in 1979, an increase of 11.2%, a number of universities received a larger grant for the year 1978 than for 1977 and 1979 (Australian universities affected in this way were: Newcastle; Macquarie and Flinders). Other universities received a larger grant in 1977 than for the years 1978 and 1979; or more in 1979 than they received in the years 1977 and 1978. With this extent of unevenness, it reinforces the conclusion that grants are recommended by the T.E.C. on the grounds of needs that have been justified. A further conclusion which can be drawn is that if "equipment" grants were amalgamated with recurrent grants each Australian university's grant position would be distorted.

In the I.A.S. of the A.N.U., the allocation of equipment monies has been subjected to rigorous evaluation by a committee appointed for the purpose of determining a fair and equitable disbursement of the funds made available. The nature of the research undertaken by the natural science Research Schools makes them heavy users of expensive equipment items, when compared to the social science Research Schools. Since the early 1970s the equipment grant has been divided into two parts. The first part is applied to acquiring equipment associated with research activities. The second part is directed towards purchasing computer hardware or upgrading existing hardware configurations. The division of the equipment grant into these two distinct categories has ensured that optimum benefit has been achieved, both in terms of cost and capability.

As highlighted earlier in this Chapter, the effect of the "rolling" triennium, i.e., each year of the triennium will roll forward one year and a

new "third" year added, is not an efficient means of acquiring equipment. The T.E.C. has acknowledged the arguments presented to it from Australian universities when it observed:

"Universities also strongly support a return to triennial funding for equipment, arguing that equipment expenditure is similar to recurrent expenditure in that replacement is a recurring commitment which may be postponed for a time but which is ultimately unavoidable. Triennial funding is also seen as a means of overcoming difficulties in arranging procurement programs for the more complex and costly items which require lengthy lead times for specification, manufacture and delivery."⁽⁹⁶⁾

In conclusion, what emerges in respect of the need to separate equipment from recurrent grants is that at the level of a Research School in the I.A.S., "capital equipment" is regarded as a School responsibility when it comes to nominating the "bid" for the equipment required, meeting the cost of maintaining the equipment and the eventual disposal of the equipment when it is no longer economic to repair. This approach highlights the role of the Research School and reinforces the advantage of placing "capital equipment" within the "core" element of the School.

SUMMARY

The opportunity was taken at the commencement of this Chapter to focus on those issues which affect the development of a budget suitable for a complex research and development organization. Factors such as: changed circumstances; leadership; decision-making; organizational complexity and public accountability, it was argued, each contribute to the development of a budgetary plan whether directly or indirectly.

On the evidence presented it was possible to form the conclusion that whatever budgetary strategy is developed for a complex research and development organization it had to be capable of accommodating the many and varied shifts of direction that arise in achieving goal attainment and be supported by those who will be required to use the strategy.

The manner in which research is undertaken, i.e., according to research "activities" provides a budgetary unit that offers the extent of control

Etzioni had proposed was necessary in measuring an organization's efficiency and effectiveness. This prompted an examination of how a research organization conducts its operations. What became apparent was that while the type of research undertaken at an Australian university is along different lines to that pursued at a public research and development organization, there is little difference in the budgetary arrangements that apply to each of these organizations. Furthermore, Australian universities and public research and development organizations often collaborate on research work of mutual interest. Private organizations were also making a significant contribution to research. The confidence that private organizations had for the future of research had been confirmed in recent years with Comalco establishing its Research Centre at Thomastown in Victoria.

It was suggested that research and development work could be divided into three classes: "by direction"; "by extension", and "by experimentation". Although the class of research work undertaken may depend on whether it is at an Australian university, public or private organization, what emerged was that research work generates special needs.

As a number of services and facilities are used in common by a group of research activities, it proved possible to identify a "core" of support functions. Having identified this "core" element, the postulation was made that a "core" budget for a research organization is possible. In support of identifying the "core" elements the next task was to consider the advantages of "phasing out" old research activity to permit the "phasing in" of new activity.

The need to explore further the "phasing out" and "phasing in" techniques proved of particular relevance to an Australian university; made more so in recent years with funding being granted on a "static" basis. During the course of this exploration, the interacting forces which affect the development of a budgetary plan for an Australian university were examined in more detail. To this end Figure 6 was designed to present, in pictorial form, the extensiveness of the interacting forces at play.

The interaction apparent added further weight for recognising a "core" element pervading the entire structure of an Australian university. The "core" element became more apparent where a section of a university's operations is devoted to research activities. Argument was then presented

in developing the budgetary strategy of Core + Research Activity (CRA).

During the course of explaining the CRA budgetary technique the benefit of having an integrated budgetary and financial accounting system was traversed. No obstacle appeared to exist which would prevent a research "activity" from being treated as both a budgetary unit of measurement and as a cost centre for cost accounting purposes. By isolating the "core" element the CRA budgetary strategy is able to provide the means of measuring the efficiency and effectiveness of each research "activity". The Core + Research Activity budgetary strategy, it was argued, also allows an easier understanding of the overall budgetary plan, an important factor in satisfying "public accountability" obligations.

An outline was then presented of the manner in which the Institute of Advanced Studies at the Australian National University had received funding support in the past. By drawing on historical accounts and references contained in the reports of the A.U.C. and, more recently, the T.E.C., it proved possible to trace the I.A.S.'s development. For ease of reference, three phases were identified. The phases involved were: the establishment and formative phase (1946-1960); the growth and consolidation phase (1961-1975), and the static, ageing and experimental phase (1976 to present). From the original four Research Schools included in the A.N.U. Act of 1946, the I.A.S. now incorporates seven Research Schools. Initially, the budgetary approach had observed aspects of Incremental Budgeting. During the growth and consolidation phase this budgetary approach had been extended with the supplementation of features of Formula and Planning-Programming Budgeting. With the no-growth situation imposed on Australian universities since 1976, this year had been used to establish an "historical" base upon which future budgetary projections had been made.

It was the "static" state of funding received and the realisation of an ageing cohort arising amongst the research staff that has led to the Research Schools of the I.A.S. experimenting. By far the most successful experiment tried so far has been the introduction of research projects or programmes of finite duration. However, the introduction of research projects and programmes has only proved possible by "phasing out" old research activities. The initial concern that research projects would not be able to transcend departmental boundaries has proved ill-founded. In fact, what has become noticeable is that research projects of a multi-disciplinary character are being enriched because of the wider perception that can be

Brought to bear on the research analysis.

To conclude this Chapter two notes of caution were introduced. The first stressed the need for the I.A.S. to maintain flexibility. Each reduction in federal funding has the effect of curtailing the flexibility a Research School can enjoy. The first cautionary note, therefore, is that there is a limit to which a "static" state can continue to be applied to a research institution if the quality of the research being pursued is not to suffer.

The second word of caution is that "capital equipment" monies should continue to be kept separate from recurrent grants. The unevenness of monies required to purchase or upgrade "capital equipment" will distort the levels of recurrent grants made available and prove difficult for the outside scrutineer to reconcile.

In summarising this Chapter it is contended that the arguments advanced have established a case for introducing the budgetary strategy Core + Research Activity (CRA). Not only is the CRA budgetary strategy of particular relevance to a research and development organization, it also has the capacity for being applied in other organizations where "activities" need to be measured for the purpose of providing efficient and effective control.

CHAPTER 6

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- (89) "Report for 1982-84 Triennium", Advice of Universities Council, Tertiary Education Commission, Vol. 1, Part 2. Australian Government Publishing Service, Canberra, 1981, pp.54-56. Sub-paragraph 4.36.
- (90) *Ibid.*, p.56. Sub-paragraph 4.37.
- (91) The new Superannuation Scheme for Australian Universities (S.S.A.U.) has the potential of providing a suitable national superannuation scheme for staff employed at Australian universities.
- (92) A.U.C. Report, 1958-1963, *op. cit.*, p.54. Please refer to Table 48.
- (93) "Report for 1982-84 Triennium", T.E.C., Vol. 1, Part 2, *op. cit.*, p.87. Sub-paragraph 7.58.
- (94) "Thirtieth Annual Report, 1981-82", Australian Atomic Energy Commission. A.A.E.C., Lucas Heights, 1983, p.29.
- (95) "Report for 1977-79 Triennium", Universities Commission, *op. cit.*, p.106. Table 8.2.
- (96) "Report for 1982-84 Triennium", T.E.C., Vol. 1, Part 2, *op. cit.*, p.87. Sub-paragraph 7.60.

CHAPTER 7

BUDGETING FOR PUBLIC RESEARCH AND DEVELOPMENT ORGANIZATIONS

It will be recalled that in Chapter 2, after considering a number of definitions theorists had proposed for describing an organization, it was decided the one developed by Blau and Scott provided a suitable description of a large scale research and development organization. Blau and Scott's definition had stressed that for an organization to achieve certain goals it required a formal status structure wherein authority and the lines of communication were clearly marked.

If the points stressed by Blau and Scott are expanded, it is not unreasonable to conclude that implicit in their definition is a recognition of the importance of establishing the means whereby decisions taken by management can be communicated throughout the organization. By extending these points further, if an organization is to achieve the goals it has prescribed, the decisions taken by management to attain these goals need to be communicated throughout the organization's structure so that the employees can translate the decisions into actual outcomes. It is the process of planning leading up to the decisions taken by management which requires further consideration because considerable planning is involved in applying any acceptable budgetary strategy.

In the preceding Chapters, the examination of recent annual reports published by the public and private organizations cited revealed that planning techniques of one kind or another were being adopted as a tool to aid management in the decision-making process. For example, it was noted that both the C.S.I.R.O. and C.S.R. had incorporated strategic planning into their management tool assemblages.

Two of the definitions developed by Kohler to describe a budget and referred to in Chapter 3 were "a financial plan serving as a pattern for and a control over future operations" or "a systematic plan for the utilization of man power, material or other resources". While both of these definitions emphasise the planning aspect, they also refer to the control aspects of the budget once the budgetary plan is approved and adopted. However, when certain recognised budgetary techniques were examined in Chapter 3 it was

noted that both PPB and ZBB concentrated heavily on the planning side of the budgetary preparation and did not offer an adequate control mechanism during the actual cycle of the budgetary application phase. It also became evident that these two budgetary techniques had limitations because they were designed primarily as a planning technique presenting difficulties for their immediate integration with an organization's accounting system.

In this regard, the shortcomings of PPB and ZBB suggest that separating "strategic planning" from the budgetary technique in use avoids introducing unnecessary complications. There is sufficient evidence contained in the recent annual reports of the C.S.I.R.O. to conclude that strategic planning can be assisted by the details of actual operating results achieved through the use of a budgetary technique which compares actual expenditure against budgetary provisions. At this stage it is worth considering what is meant by the term "strategic planning".

Robert Anthony has described "strategic planning" as the process of determining organizational objectives, changes in these objectives, resources used to attain them, and policies that govern the acquisition, use and disposition of these resources.⁽¹⁾ What becomes evident from Anthony's description is that the approach recognises objectives pursued by an organization, whether new or redefined, and relies for success on being granted the necessary resources. From Anthony's description it is possible to gauge the benefits that accrue to an organization's operations by introducing "strategic planning" as a tool to aid management.

Strategic planning, however, does involve a number of phases. Recently, three writers, Gluck, Kaufman and Walleck, provided details of a four-phase model they had evolved to evaluate corporate planning systems (an alternative way of describing "strategic planning") and processes. The four-phases they highlighted can be summarised as follows:

- (a) **Basic financial planning (Meet budget):** this involves the annual budgeting process where procedures are developed to forecast revenue, costs and capital needs, and to identify limits for expense budgets on an annual basis. Associated with this phase is the determination of the selling price of the goods being manufactured and an appreciation of the marketing strategies to be pursued;
- (b) **Forecast-based planning (Predict the future):** while this

planning differs from annual budgeting only in the length of its time frame, the information necessary concerns the number of products and markets served, the degree of technological sophistication required, and the complex economic systems involved. Planning in this phase is assisted by trend analysis, regression and computer simulation models. This phase also achieves more effective resource allocation because the pressure of long-term resource constraints encourages the establishment of a circulatory flow of capital and other resources among business units;

- (c) **Externally oriented planning (Think strategically):** this encourages examining alternative uses of the organization's products, plant and equipment. Related work is grouped into strategic business units (SBUs) or organizational entities large and homogeneous enough to exercise effective control over most factors affecting their businesses. Strategic planning is thus packaged in pieces relevant to individual decision-makers, and strategy development is linked to strategy implementation as the explicit responsibility of operating management. Management is presented with a number of alternatives with each choice usually characterised by a different risk/reward profile, or attaches priority to a different objective.
- (d) **Strategic management (Create the future):** this brings together strategic planning and management and is aimed at giving an organization an advantage by creating a flexible planning process that stimulates entrepreneurial thinking, but is reinforced by a corporate values system which aids management to fulfil the organization's strategy.⁽²⁾

While this four-phase model for evaluating "strategic planning" may appear, at first glance, better suited to a private organization, it can be applied to an Australian university and a public research and development organization. The basic financial and forecast-based planning associated with phases 1 and 2 can be related to the annual budgetary plan developed by an Australian university or public organization. Although these

organizations are not involved in sales or market capacity and potential, in the case of a university it needs to be aware of and be responsive to short and long-term student interest in particular courses or staff commitments to present and future research projects. A public research and development organization, such as the C.S.I.R.O., would also have to take into account research in progress, augmented by future research into topics suggested by the Commonwealth Government or from approaches made to it by industry.

The externally oriented planning represented by phase 3 is of vital concern to an Australian university and public research and development organization because it amounts to the forward planning of future research activity for the purpose of ensuring resources in the form of essential human resources and equipment are available when required. By planning ahead new research activity can be phased-in without creating the under utilisation of scarce resources. However, what is particularly significant with the externally oriented planning phase proposed by Gluck, Kaufman and Walleck is the value they see in grouping related work into SBUs. It is this grouping which can be viewed as being similar in approach to the adoption of a "core" budgetary unit having a number of research activities clustered around it which has been proposed in this dissertation. Based on the model advocated by Gluck, Kaufman and Walleck, the budgetary strategy of Core + Research Activity (CRA) presents a package of integral pieces which can assist decision-makers in the strategic planning process.

The phase 4, or strategic management process, can be related to the advantages reported in the more recent annual reports of the C.S.I.R.O. The only difference is that the establishment of the C.S.I.R.O.'s PEAU (Planning and Evaluation Advisory Unit) which conducts that Organization's "strategic research planning" was an initiative taken by the Executive. Rather than the Executive of the C.S.I.R.O. having their entrepreneurial thinking stimulated, their forward thinking introduced to the Organization the concept of "strategic planning".

There are aspects of "strategic planning" which can avoid an organization from committing itself to a particular course of action which could prove disastrous. For example, Mechlin and Berg, adopting the premise that: *"For business, a commitment to research is first and foremost an investment,"*⁽³⁾ they go on to point out: *"Another limitation of ROI (Return on Investment) has to do with the unpredictable nature of industrial*

research. A project may be a resounding technological success - it may even reveal profound new relationships among natural phenomena - but still fall far short of commercial success."⁽⁴⁾

Technology can also influence "strategic planning". Drawing on Richard Rosenbloom's earlier work on technological innovation, Kantrow makes the point that "... a technological strategy brings together significant aspects of the organizational and environmental contexts of innovation, thus directing attention toward the interaction of all relevant factors - including goals, structure, and leadership."⁽⁵⁾

If Kohler's description of a budget, quoted in Chapter 3, as representing "a financial plan serving as a pattern for and a control over future operations" is accepted as a reasonable definition, then the plan will be improved substantially if it can be assisted with other forms of analysis and planning. From a management viewpoint, resorting to the use of the "strategic planning" technique aids the decision-making process because it takes into account factors which go beyond the immediate future or the budgetary period under consideration. In this respect "strategic planning" can be viewed as an approach which "looks down the track" and by taking into account all the evidence available, it enables the formulation of a variety of scenarios which dictate what would be the effect on the organization if it proceeded to accept any one particular scenario or a combination of scenarios.

What becomes evident is that "strategic planning" extends well into the future. It is for this reason that "strategic planning" needs to be kept separate and distinct from the budgetary plan. One of the observations made by The Carnegie Commission on Higher Education in 1972 was that: "*When budgetary stringency develops, flexibility is much more difficult to achieve.*"⁽⁶⁾ The financial stringencies imposed on Australian public research and development organizations, e.g., the C.S.I.R.O. and the A.A.E.C. and Australian universities since 1976 favour the use of long-term or strategic planning. Organizations of this kind need to be aware of projected developments that extend beyond the immediate budgetary year. By adopting "strategic planning" as a tool to aid management decision-making, Gluck et.al.'s phase 3, or externally oriented planning approach, enables alternatives to be considered which deal with maximising flexibility in a situation of little growth. For the private organization, such as the C.S.R., the application of "strategic planning" is used principally to

maximise profit-making by deciding on long-term strategies likely to achieve this given end.

While the Research Schools of the Institute of Advanced Studies at the Australian National University have not included terminology such as "strategic planning" in the naming of their planning committees, e.g., Futures Committee, Planning and Policy Committee, the terms of reference accord with those which would be given to a strategic planning committee. What is noticeable in some of the Research Schools' planning committees is the inclusion in the membership of younger researchers or the mature researchers of the periods the planning committees are considering. The primary role of these committees is to consider the nature of future research and whether it can be undertaken by redirecting existing resources. In addition, given the emphasis on pursuing research of national significance, greater care is being given to selecting projects which broaden the number of disciplines involved. A concentrated approach along these lines avoids duplication. For example, a national survey of public attitudes could incorporate political, social and economic viewpoints, rather than concentrate solely on aspects affecting one particular discipline. To some extent, an approach of this kind would prove more acceptable when measured in terms of "public accountability".

The aim of the foregoing has been to highlight the importance of planning in developing a budget. No longer are budgets the result of a few simple calculations on the back of an envelope. Planning and budgeting at an Australian university and a public research and development organization have been forced to raise the level of sophistication needed to prepare a plan of annual expenditure as their operations have become more complex. The need to satisfy "public accountability" criteria would have encouraged these organizations to introduce a more responsible attitude. However, it would also seem reasonable to conclude that in respect of Australian universities, the advent of the A.U.C. and its subsequent replacement by the T.E.C., has introduced a degree of uniformity and established reporting guidelines which has engendered self-discipline and responsibility. At the other end of the spectrum, while the past reports of the A.U.C. and T.E.C. have been designed to recommend to the federal government appropriate levels of funding for Australian universities, the reports include an element of forward planning. The First Report of the A.U.C. (1958-1963) foreshadowed the examination and reporting on the various facets of the problems

associated with future university design.⁽⁷⁾ More recently, in the T.E.C.'s Report on the 1982-84 Triennium, a number of references can be cited where the Commission indicated it would carry out further investigations. For example, the review of external studies⁽⁸⁾ and the greater sharing of resources and collaboration between the University of Western Australia and Murdoch University.⁽⁹⁾

It will be recalled that in Chapter 5 mention was made of a pamphlet published by the A.V.C.C. in 1952. One of the proposals contained in that pamphlet was for grants received from the federal government to be made available on a triennial or quinquennial basis to permit the introduction of long range or strategic planning. The establishment of the A.U.C. in 1959 witnessed triennial planning as the basis to be used for allocating resources to Australian universities. Despite the acquiescence shared amongst Australian vice-chancellors for a system whereby resource allocation extended beyond a 12 months period, the introduction of triennial planning forced Australian universities to articulate their long-term strategies.

The likelihood of having to continue to operate in a "static state" has encouraged Australian universities to further extend their planning processes well beyond the parameters of the current triennium in vogue. However, what emerges from this approach is the separateness of the long-term planning involved from the budgetary applications. The only relevance the approved budgetary plan has to the "strategic planning" considerations is the establishment of a firm base upon which future predictions can be projected with any degree of accuracy.

The elements affecting the budgetary process necessary for a public research and development organization, with particular reference to an Australian university and dealt with in the preceding Chapters, will now be summarised.

SUMMARY OF THEORETICAL ANALYSIS

While adopting Blau and Scott's definition of an organization as suitable for applying to a public research and development organization, a review of the literature reveals problems of applying this description to a university. Cohen and March, it was noted in Chapter 2, reached the conclusion that a university is a prototype organized anarchy, not knowing

what they are doing and with goals that are either vague or in dispute. . . . Adopting the conclusion Baldrige reached after his research into the problems of N.Y.U. in the early 1970s, Dufty sees a university as a pluralistic system, often fractured by conflict along lines of disciplines, groups of academic staff and administrators and rifts between professional Schools. From this Dufty concludes a university has a social and power structure which is loose, ambiguous, shifting and poorly defined.

A more recent article by Dufty indicates that he favours loosely coupled structures for academic organizations, when he advocates that: *"Loose coupling should therefore be encouraged. Decision-making of all types, both academic and non-academic should be decentralised as far as possible. In other words, schools, faculties and departments should allocate resources according to their own wishes and make their own academic decisions unless there is a very good reason why they should not do so."*⁽¹⁰⁾

The loose coupling Dufty is referring to moves away from the rigidly structured centralised system having a formal status structure wherein authority and the lines of communication are marked clearly along the lines Blau and Scott had in mind. Drawing from earlier research into what is functionally efficient for universities, Dufty suggests that in a university situation loose coupling is: *"... essential if the organization is to absorb people from widely divergent cultural backgrounds and deal with diverse sub-environments."*⁽¹¹⁾ What Dufty appears to be suggesting is that where a university decentralises the decision-making process to schools, faculties and departments, goals become more identifiable. A conclusion of this kind is reinforced by the arguments advanced in Chapter 5 where, it will be recalled, research activities were shown to be subservient to the "core" budget.

The problem for a university in goal definition can be viewed in the terms Etzioni argued, in that goals justify the existence and activities the organization pursues. However, by adapting Etzioni's further approach of relating stated goals to the broad goals a university determines and associating real goals with those goals established by a school, faculty or department, the distinction becomes clearer in organizational terms. Work-in-progress, or research planned for the future are capable, therefore, of being viewed as real or perceived goals. An approach along these lines is not confined to a university situation. It would apply equally to public research and development organizations of the C.S.I.R.O. or the A.A.E.C.

kind. Decentralisation of decision-making within a university along the loose coupling lines Dufty suggests also enjoys the advantage of being capable of constant re-appraisal on the basis of performance and achievement. At a Research School level in the Institute of Advanced Studies of the Australian National University, real goals could be restated at periodic intervals or varied (i.e., old goals removed and new goals introduced).

Nevertheless, the important element which emerged from the examination of goals was the need for these to be identified, whether they are regarded as stated goals or real goals. In a research and development environment goals provide the same impetus for achievement that they do in any other kind of organization. Goal identification can also be regarded as providing the means which encourage the staff of the organization to work towards achieving a tangible result. For a university, whether it is a prototype organized anarchy or a pluralistic system or not, it is possible to tease out goals. Admittedly, these goals become easier to identify if the unit of activity is capable of being isolated and does not become blurred within a larger and monolithic structure.

The next element singled out as having some impact on the budgetary process was changed circumstances. It was noted that changed circumstances could result from a number of factors. For example, the broad description of a changing environment can relate to events which have overtaken accepted past practice, a change in a society's attitudes, a wish to participate in activities previously denied certain groups, changes in policies being pursued by a federal government or the imposition of some form of sanctions. Other changes affecting an organization can be as a consequence of outside dictums (e.g., industrial settlements or action), be voluntarily induced, be self-determined or simply occur because of the lack of any positive action to the contrary.

These factors, whether operating singularly or in concert, prevent an organization from remaining static. However, changes of the kind mentioned above can influence the budgetary process, mainly in connection with the planning phase. In respect of the staffing component of an annual budgetary plan some examples mentioned earlier which have financial implications are: early retirement; "incremental creep"; long service leave and superannuation. In addition, industrial award variations, decisions of the Academic Salaries Tribunal, national wage case decisions and variations to the premium rates for Workers Compensation insurance are factors which have budgetary

connotations and cannot be overlooked. The recruitment of staff from outside the organization and the time that has to be spent training these staff in the ways of the organization also include a cost element which may prove difficult to quantify in precise terms.

For organizations engaged on research and development work heed must be taken of society's attitude towards such matters as: worker participation; rigorous safety precautions (particularly where nuclear material or toxic chemicals are involved); the use of animals in experimental work, and equal rights, for these are issues which are capable of becoming potential budgetary cost elements. The rapid advancement in new technology is now emerging as a factor which embodies a capacity to cause change. For example, phototypesetting facilities linked to a main frame computer dispense with the need to employ proof-readers.

Many of the difficulties encountered in the past which arose from changed circumstances can be reduced considerably if the communication flow existing within an organization is improved. Whether the organization is a university, a public research and development organization or its counterpart in the private sector, those charged with the responsibility of making decisions need to be alerted to changes or perceived changes. Equally, where there exists in an organization a group responsible for "strategic planning", this group needs to be appraised of shifts which are likely to have an impact on the planning process.

During the course of considering the effect changed circumstances can have on an organization, the importance of the element - decision-making - became apparent. It was noted that throughout any organization the degree of decision-making exercised is proportional to the level of responsibility accorded the decision-maker involved. However, closely associated with decision-making is the question of leadership. Based on the leadership implications which emerged from Baldrige's study of N.Y.U. and in acknowledgement of the complex issues a chief executive officer of an Australian university is required to address, the opportunity was taken in Chapter 5 to consider those aspects of leadership which some theorists had studied. Herzberg, for example, would favour an approach that involved applying "human relations" methodology. Rather than rely on personality, Herzberg's view is that the most important task is to match the individual's work capacity with the job requirement. Gouldner, on the other hand, would adopt a different stance. Applying his theory of group tensions, Gouldner

would see in the appointment of a vice-chancellor an interest group wishing to retain power by having one of their own associates appointed to the position. An appointment of an individual from an interest group would experience a role change of the kind Gouldner has described as moving from a latent role to that of a manifest role.

While this analysis was able to provide an insight into the discrete forces at play with the appointment of an organization's leaders, it helped focus on the special qualities needed by the leader of an organization engaged in research and development work. For a university this revealed a problem. In an examination of university decision-making, Pollay, Taylor and Thompson have drawn attention to the situation applying in most organizations where the decision-making is "... characterized by vertical power sharing (i.e., power is held by persons in upper levels of the organizational structure, but may be shared with subordinates)." ⁽¹²⁾ However, when a university is studied they noted that: "Even a university with many characteristics of a vertical organization (i.e., highly bureaucratic) is essentially horizontal." ⁽¹³⁾ In this respect "horizontal power" was defined as "the use of influence among co-acting peers to obtain benefits for their own interests".

The various descriptions cited in the earlier Chapters allow the conclusion to be reached that universities, as organizations, are complex and bureaucratic (in the manner in which they attend to day-to-day administration), but each resorts to voluntaristic and consultative processes characteristic of a pluralistic system. By operating within such a mode it encourages the proliferation of those wishing to participate in the decision-making process. Balderston has described this aspect of a university's operations as a situation where: "Decision-makers strive for effective participation and are activated by their identification with the organization, as well as by the desire for pay and status." ⁽¹⁴⁾ Nevertheless, Balderston, taking into account Herbert Simon's early work on the concept of "bounded rationality", suggests these groups function despite the situation where the "... decision-makers are limited by incomplete information and by difficulties of calculating how to be rational." ⁽¹⁵⁾

It is the complexity of the organizational structure of a university which adds to the multiplicity of tasks expected of its chief executive officer. The problems encountered, it was argued earlier, are magnified in a situation where the funds received by the organization include little if

any growth component. The view was also advanced in the earlier Chapters that based on the analysis of the N.Y.U. experience where funding is reduced to a "static state" or parts of a university are in competition with one another, the situation encourages the emergence of what was described as sub-cultures. In this context a "sub-culture" can be viewed as any minority group within the organization which seeks to retain certain privileges, secure influence or effect the decision-making process for a mutual benefit.

To some extent an organization which has evolved from a tradition of operating along collegial lines encourages contradictory expectations to arise, leading to the emergence of sub-cultures where the aim is to satisfy divergent goals. By and large these sub-cultures come into being because of a genuine belief in the correctness of their cause. For example, in the I.A.S. of the A.N.U., the natural science Research Schools may believe firmly that their research should be funded at the expense of the social science Research Schools because natural science research is more visible and can be readily identified with the needs of humanity. At first glance, it would be reasonable to expect a taxpayer is likely to be more supportive of financing research which will lead to finding a cure for cancer than research which attempts to highlight if there is any inconsistency in the writings of Karl Marx.

In Chapter 5 it will be recalled one of the characteristics the T.E.C. had ascribed to an Australian university in its 1982-84 triennial Report was that: *"they are dedicated to the pursuit of free enquiry, knowledge and scholarship; the understanding, preservation and enhancement of the cultural heritage of their own and other societies; and the passing on of that knowledge and those skills to new generations in the form of vocational and professional training as well as the provision of a general liberal education."* The emphasis placed on "understanding, preservation and enhancement of the cultural heritage of their own and other societies", it was noted earlier, is one of the characteristics of an Australian university which separates it from public research and development organizations such as the C.S.I.R.O. and the A.A.E.C.

A university's involvement in understanding, preserving and enhancing its own and other societies assists with providing a fertile area for sub-cultures to flourish. The on-going nature of teaching and research offered by a university often determines the life-span of a particular sub-culture. For example, in a "static state" situation a group seeking funds

for a specific research project will exist as long as it is denied the necessary funding. General staff attempting to secure representation on the Council or Senate of an Australian university can be viewed as the activism of a sub-culture group. Once the aim of this sub-cultural group has been achieved there is no longer a need for it to act as the cohesive force in presenting a point of view or securing a given end.

Nevertheless, the complex and pluralistic nature of a university's operations, reinforced by Baldrige's N.Y.U. study, permit some sub-cultures to be isolated where, although loose and shifting they continue to exist because they represent an operational character rather than a set of circumstances individuals within the organization wish to achieve. By projecting Baldrige's findings, examples of sub-cultures which represent an operational character can be accorded "the administration", on the one hand, and the "academics" on the other. In some respects sub-cultures of this kind reflect the traditional rivalry of a university's academic body towards the administration. Although this rivalry can be viewed as an extension of the right to exercise "academic freedom" by members of the academic body, the arguments advanced earlier support a conclusion that what helps sustain this rivalry stems from the manner in which resources are allocated.

The need to achieve a balance in allocating resources throughout an Australian university is not a relatively new task a vice-chancellor has been asked to accept. Where the task becomes more difficult today is in respect of the complex nature of the organization's operations. In today's situation Balderston has described it as one where: *"A university contains a great array of processes and activities, each of which produces one or more types of results or outputs."*⁽¹⁶⁾ However, what adds to the administrative burden is the multiple sources and types of funding associated with a university's operations. In short an Australian vice-chancellor *"... must give equal attention to processes, mechanisms, and consequences. The crucial - and the most puzzling and mysterious - of the processes are those of learning, seasoning of character, creative new work at the edges of knowledge and imagination, and responsible advocacy of values."*⁽¹⁷⁾

The conclusion which can be drawn from this summary on the elements of decision-making and leadership is that for an Australian university the selection of a vice-chancellor is of particular significance. Firstly, the

mode in which an Australian university operates confers on a vice-chancellor extensive decision-making powers, despite the voluntaristic and consultative processes. Secondly, the decision-making tasks assume critical proportions where they are made in a situation of no growth. In a climate of financial stringency the consultative process becomes more extensive in achieving a proper balance between bids competing for scarce resources. Finally, a vice-chancellor is required to give attention to appeasing the many and varied sub-cultures which exist on a university campus, without compromising his or her own position as the university's chief executive officer.

A public research and development organization of the C.S.I.R.O. pattern is not confronted with the operational diversity experienced at an Australian university. The C.S.I.R.O.'s organizational structure is more in keeping with Weber's **bureaucratic model** as it is a complex organization, hierarchical in structure and relies on **rational legal authority**. Further, the C.S.I.R.O.'s prime function is to initiate and carry out scientific research and investigations in the area of Australia's primary and secondary industries. Although within this Organization sub-cultures will emerge, their effectiveness and influence are prescribed by the hierarchical structure where sanctions can, if necessary, be imposed consistent with the application of **rational legal authority**. In many respects this pinpoints the difference in the operations of an Australian university when compared with an Australian public research and development organization.

The final element to be reviewed in this summary of theoretical analysis is the matter of "public accountability". Throughout this dissertation the need for Australian universities and public research and development organizations to observe "public accountability" obligations has been stressed. The reason for emphasising a responsible attitude to "public accountability" has been predicated on two main grounds. Firstly, the financing of Australian universities and public research and development organizations depends largely on federal government funding, where the bulk of the monies originate from the Australian taxpayer. Secondly, the economic downturn experienced throughout Australia, together with high unemployment, has encouraged federal governments to demonstrate to the electorate that they are pursuing policies designed to avoid waste or extravagance. As highlighted in Chapter 5, the imposition of more stringent "public accountability" obligations on Australian universities can be seen to be a flow on of the view expressed by Prime Minister Menzies in 1957

when he pointed out that *"the community is accepting heavy burdens (i.e., university financing) in order that, through the training of university graduates, the community may be served"*.

In having to satisfy "public accountability" obligations, Australian universities and public research and development organizations are having to direct a part of the resources they receive towards planning and budgetary control if they are to avoid being criticised for acting irresponsibly. Nevertheless, by recognising the responsibility attaching to "public accountability", this has encouraged these organizations to work towards achieving a more effective and efficient use of the resources allocated to them. For the Australian university the peer scrutiny made possible initially by the A.U.C., and more recently by the T.E.C., has contributed significantly towards minimising any public criticism of those activities pursued by Australian universities which could be considered questionable. A public research and development organization, such as the C.S.I.R.O., has moved to a position of establishing state advisory committees, with the membership being drawn from a wide variety of backgrounds in an attempt to involve the local community in the planning process. Apart from the benefits that flow from participation of this kind, the approach can be seen as one means of promoting a good public relations image throughout the community, thereby reducing the possibility of attracting criticism.

In summarising the theoretical analysis presented in this dissertation the elements effecting the budgetary process, either directly or indirectly, can be identified as follows:

- . Goal definition - the need to differentiate between stated and real goals. Loose coupling can offer Australian universities the means by which goals generated at the research activity level are easier to identify.
- . Changed circumstances - as organizations need to be dynamic if they are to survive, it is necessary for them to be alert to the variety of circumstances which can bring about change. The recognition of circumstances likely to involve change is linked to a need for the organization to have developed an extensive communication network operating throughout the organization. The communication flow involves lateral

and longitudinal movement, both upwards and downwards.

- . **Decision-making** - this process will be strengthened where management has access to, or introduces, such management tools as "strategic planning". Matters likely to effect an organization in the future are as important as those requiring immediate action.
- . **Leadership** - the quality of the organization's decision-making is reflected in the quality of the organization's leaders. It is for this reason that organizations undertaking research and development work can be strengthened or weakened by the leaders they appoint. For Australian universities the matter of choosing a chief executive officer with care becomes more crucial. The powers of decision-making accorded a vice-chancellor means that the organization may require many years to correct a situation resulting from poor decision-making.
- . **Organizational complexity** - depending on the type of research and development organization being considered, the degree of complexity will be enlarged where sub-cultures influence the decision-making process. What is also noticeable is that in times of financial stringency the activism of sub-cultures becomes more pronounced.
- . **Public accountability** - the need for public organizations engaged on research and development work to account and report to the federal government on their activities has become more elaborate in recent years. This development is consistent with the desire demonstrated by federal governments of satisfying electors that funds provided from federal sources are being spent responsibly. While an Australian university continues to depend on the federal government for the bulk of annual recurrent funding the "public accountability" obligation will continue.

The main points associated with the thrust of this dissertation will now be evaluated to support the conclusions reached.

EVALUATION

The arguments advanced in this dissertation have been based on four basic tenets. The first tenet adopted was the Blau and Scott definition of a formal organization. Guided by the Blau and Scott definition it proved possible to conclude that a large scale research and development organization is one with a formal status structure where the lines of communication are clearly defined and is established for the explicit purpose of defining and achieving certain goals.

However, this definition did not appear to describe adequately the organizational mode of an Australian university. The second tenet introduced was designed to overcome this shortcoming. Drawing on the observations made by writers such as Baldrige, Dufty and Balderston a more apt description emerged. It seems reasonable, therefore, to describe an Australian university as a complex and bureaucratic organization, complemented by a pluralistic system which has resulted from the voluntaristic and consultative processes characteristic of an environment that incorporates a "community of scholars". When the operations of a university were compared with an organization structured on more formal lines a number of analogies came to mind. Perhaps the most vivid means of comparing the operations of the two types of organizations is to visualise the formal organization as a sedan car travelling along the freeway. The operations of a university, on the other hand, can be likened to a "moon buggy" because it is often required to traverse complicated and uncharted terrain.

The third tenet was to adopt a suitable description for the term "budget". It was decided that the preferred description was the one developed by Kohler which describes a budget as "a financial plan serving as a pattern for and a control over future operations". Although the first and second tenets drew attention to the operational differences between a formal organization and a university, the third tenet indicated that each organization encountered the same problems when having to address the budgetary process.

The fourth and final tenet was to acknowledge that a budgetary plan amounts to making a selection between a number of competing choices. A premise contained in this tenet is that the need nominated will exceed the resources available for distribution. Whatever choices are selected by an organization, in effect, become the budgetary plan for the period under

consideration.

With these tenets established it then proved possible to consider a number of aspects which can influence the formulation of a budgetary plan. One aspect concerned the influence of sub-cultures. While this could prove to be an influence in a university situation the public and private research and development organizations, with their more formal organizational structures, presented a framework that was less likely to be affected in this way. Another aspect was the service versus profit motive which separates a public organization from its counterpart in the private sector. However, it was noted that this major difference was not one which required a distinctive approach to the development of a budgetary plan. A difference was discernible in respect of the kind of input needed for the planning phase. This was due to the varying goals and functions of the public organization when compared with the private organization. For example, whereas the public research and development organization had to concentrate on research activity of benefit to industry and the nation, its counterpart in the private sector was motivated by maximising profits. Some of the elements cited earlier that a private organization required for planning purposes involved such issues as: customer demand; export incentives; interest rates; labour relations and industry protection. The public organization's planning, it was noted, is more orientated to the development of research programmes and the resources, both in terms of equipment and manpower that are needed to meet the demands expected from industry or those generated by the federal government.

The importance of planning had been recognised by the C.S.I.R.O., a complex public research and development organization. That Organization had established a Planning and Evaluation Advisory Unit (PEAU) which had been assigned the task of strategic planning. The PEAU, in conformity with Anthony's definition of "strategic planning" presented earlier in this Chapter, involves itself in considering the C.S.I.R.O.'s objectives, any plan to vary or change those objectives, the resources necessary, and how these resources are to be obtained, allocated and used. What became evident is the value of strategic planning for analysing the variety of options available to an organization so that, whatever choices are selected represent the objectives the organization wishes to work towards. This example added support to the conclusion that the main benefit of strategic planning is associated with the future aspects of organizational development.

To incorporate strategic planning in the budgetary strategy being used by an organization, it was argued, would confine the overview role to the financial period under consideration and thereby defeat the purpose long-term planning is designed to achieve.

While supporting the inclusion of strategic planning in the organization's management tool assemblage to provide vital input, the arguments advanced supported an approach where the budgetary plan is incorporated into a budgetary strategy that is integrated with the organization's accounting system. However, an approach of this kind requires a unit of measurement to be selected which is capable of being used as both a budgetary unit and a cost centre. By selecting a suitable unit able to fulfil both of these requirements it provides the capacity for interfacing the budgetary and accounting systems.

One of the advantages flowing from an interfaced system is that it permits periodic adjustments to be made during the active budgetary period. When the material on this aspect was presented in the earlier Chapters stress was placed on the need for an organization to enjoy the ability to adjust its budgetary provisions in the light of actual expenditure experience. It was recognised that at the time a budgetary plan is produced it represents the best position the organization can predict.

However, during the course of the active budget period (usually the current financial year), actual results achieved may move away from the approved budgetary plan. In this event the organization is forced to make adjustments to its budgetary plan. It may require the redirection of funding from one area of the budget to another. Actual experience of this kind helped reinforce the need for the organization to conduct periodic budget reviews during the financial operating period for the purpose of comparing performance against budgetary provisions. Periodic reviews of the kind suggested are assisted by an integrated budgetary and accounting system because the task of comparing actual expenditure with the budgetary provisions is simplified.

It was argued that the periodic budget reviews undertaken by an organization can be enhanced further if the organizational structure is broken down into easily identifiable budgetary and accounting units. The nature of research and development work supported an approach where each research activity could be identified. Nevertheless, each research activity

was seen to be dependent on a "core" unit for support and service facilities. With this mode of operation a prominent feature, reinforced by the public organization's need to isolate performance and achievement as part of the process of satisfying "public accountability" obligations, this encouraged the development of a budgetary strategy more in keeping with the requirements of a public research and development organization.

The special requirements of a public research and development organization led to the development of a budgetary strategy described as CRA (Core + Research Activity). Although this budgetary strategy has been devised initially for application in a public research and development organization, it also became evident that it could be used in other organizations where the organizational structure incorporated activities or similar units of output or production.

A special feature offered by the CRA budgetary strategy is its ability to render a more comprehensive and meaningful assessment of the organization's operations and allow greater accuracy in projecting actual performance achieved for strategic planning purposes. While fuller disclosure could prove disarming for a private organization's management, it was suggested that the trend presently noticeable in private enterprise is to move closer to conforming with the accounting doctrine of disclosure. This conclusion is strengthened by recent concern the federal government and the Australian business community have expressed on "bottom of the harbour" tax evasion schemes which have used poor documentation about the companies involved to advantage.

Some specific matters associated with this evaluation will now be considered separately.

THE PLACE OF ON-GOING RESEARCH AND DEVELOPMENT

It will be recalled that in Chapter 6 a number of observations was made which placed emphasis on the on-going nature of research and development work. In both its Fifth (1973/75) and Sixth (1976/78) Reports, the A.U.C. had stated that "research is an essential activity of a university". Support for a statement as unequivocal as this was based on the premise that "the extension of knowledge is at the very heart of university work" and this meant that "learning can only be experienced at the higher levels if the minds of students are stretched at its frontiers". For the public

research and development organization the need to participation in on-going research is enshrined in the Commonwealth Act which establishes the organization. In this regard the C.S.I.R.O. has such power conferred on it under Sub-section 9(1)(a) of the Science and Industry Research Act, 1949, while a somewhat similar power is accorded the A.A.E.C. under Sub-section 17(1)(g) of the Atomic Energy Act, 1953.

Generally, no such formal intention to engage in research and development work is included in the memorandum or articles of association of a private organization. The point made in the preceding Chapters was that on-going research pursued by a private organization is motivated by the benefits which will result and be reflected in the stated goals the organization has to maximise profits.

On-going research and development can be viewed as one of the functions associated with the public organization or as a profit motivator for the private organization. Whatever type of organization is being considered, elements associated with the on-going nature of research and development work will affect the preparation of a budgetary plan and will need to be taken into account when devising long-term strategies in the planning process. The extent of leadtime necessary for introducing new research activities heavily dependent for success on using the latest technology available or attracting staff with the special skills required highlighted the diversity of the long-term planning involved.

The commitment organizations in both the public and private sectors have to on-going research and development can also be affected by the degree of flexibility the organization has to redirect its resources. It is now appropriate to analyse this aspect in more detail.

INTRODUCING NEW ACTIVITIES

In the earlier Chapters two distinct situations were referred to when considering the introduction of new activities. The first situation was where a growth element is reflected in the recurrent grants provided a public organization. Funding of this kind permits new research and development activities to be introduced. On the other hand, it also masks inefficiencies which already exist within the organization because no pressure is exerted to review the efficiency and effectiveness of the programmes or activities that are current.

The second situation, described earlier as the "static state" or a period where no growth element is included in the recurrent grants received, implies that if an organization is to introduce new research and development activities it can only do so at the expense of some existing activities. The practice necessary to achieve this result was expressed as the "phasing out" of old research activity to allow the "phasing in" of new research.

While these two distinct situations (i.e., "growth" and the "static state") have influenced the application of the "phasing out" and "phasing in" processes of the past, this practice is unlikely to re-establish itself in the future should a "growth" situation return. The reason for this is that with public research and development organizations having been forced to review their internal structures so minutely during the present period of having to cope with a "static state" situation, procedures have been developed which enable reviews to be held regularly. To some extent these review procedures can be regarded as a sub-system or the extension of a specific part of strategic planning.

More importantly the review procedure should concentrate on resource management. In this context resource management can be described as the process which enables an organization to plan and control the use of resources necessary to fulfil its objectives. Because planning and control are inseparable elements of resource management, what becomes noticeable is that resource management provides a "half-way house" between the execution phase of the budgetary plan and the strategic planning process. The resource management process is illustrated in Figure 9. From this diagram it will be noticed that the plan's effectiveness is monitored for control purposes through the budgetary and accounting systems. New developments, in the form of data, technology and techniques can be introduced as the plan is reviewed and revised goals or activities established. If this review procedure is undertaken by a resources management committee, the advantages and disadvantages evident in implementing the plan can be communicated to the strategic planning committee for future analysis and incorporation in the long-term planning phase.

The introduction of resource management into the overall planning operation of a complex research and development organization amounts to a widening of planning sophistication. Planning sophistication enables an organization to be better equipped to cope with changing circumstances. While the need to cope with changing circumstances is an important planning

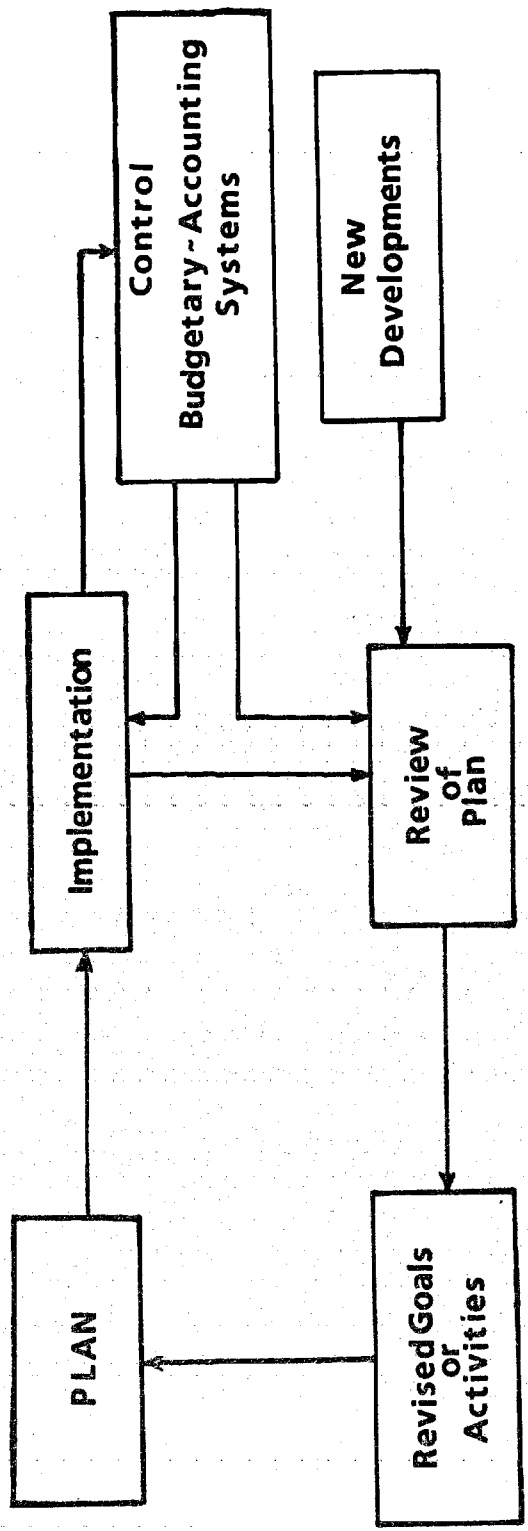


Figure 9: Cycle of the Resource Management Process.

consideration, it was also noted in the earlier Chapters an essential feature associated with today's complex research and development organization is its ability to enjoy maximum flexibility. With a planning ensemble that ranges from a budgetary and accounting strategy, resource management to strategic planning, an organization can achieve greater flexibility where it is able to identify more readily those areas which can surrender some of their resources to permit other areas to expand or new work to be introduced. The redirection of resources within the organization can also lead to satisfying a larger number of choices because more effective control enables efficiencies to be applied.

Of those Australian universities which responded to the questionnaire circulated, the majority indicated the budgetary strategy in use was one that contained elements of Incremental and Formula budgeting techniques. Nevertheless, experimentation is taking place such as applying a form of PPB coupled with an historical approach. Two universities mentioned they are continuing their efforts to develop a suitable budgetary strategy which will allow more flexibility in the allocation of resources.

It would seem there still exists in the minds of many financial controllers the hope of incorporating a comprehensive planning component in whatever budgetary strategy is adopted as extensive as the planning part of ZBB. The evidence presented in this dissertation has revealed many of the problems associated with a budgetary strategy that attempts to do too much by incorporating budgetary, accounting, resource management and strategic planning capabilities. The alternative advocated is to group the budgetary and accounting systems together and thereby establish an effective form of financial monitoring and control mechanism. Having such a mechanism would permit the analysis of accounting media processed to establish appropriate reference points. In addition the monitoring part of the mechanism provides the basic detail necessary for the periodic budget reviews. Actual performance enables adjustments to be made of the original approved budgetary plan.

The resource management and strategic planning processes can be similarly linked together as a group because each has matters in common which can be strengthened by interaction. Planning has the capacity to deal with short-term or long-term considerations. While the planning process would rely on performance data reflected by the budgetary and accounting system, it can act independently of this type of input. For

example, in an Australian university or public research and development organization, the proposals to introduce new activities could be investigated. This would entail satisfying the resource management or planning groups of the need to introduce the new activities proposed. Once the justification is established each activity can be costed in terms of equipment, manpower, accommodation and support facilities. Action of this kind is able to proceed without relying on data made available from the budgetary and accounting system. The accuracy of the costing would be enhanced if historical data collected from the budgetary and accounting system is used but this information is not essential for the planning to commence.

Nevertheless, the budgetary and accounting system would still be subject to adjustments in the light of approved short-term planning decisions proposed by either the resource management and strategic planning groups and approved by the organization's management. The situation outlined above reinforces the independence of each of the two groups, but recognises the extent of interaction that would occur between the two. By adopting this approach management at all levels of the organization is able to participate actively in the budgetary and accounting application. Where necessary the resource management and strategic planning processes can still remain a management prerogative, thereby satisfying a number of the drawbacks that are inherent in the PPB and ZBB budgetary strategies.

The conclusion which can be reached in this section from the foregoing analysis is that the introduction of new activities within an organization is dependent on the extent of flexibility generated. Identifying areas of "slack" within an organization is primarily a planning task, supplemented by the performance achieved through the regular monitoring and control devices built into the budgetary and accounting system. Planning, therefore, is an aspect of an organization's operations which needs to be kept apart from actual achievements attained. At the same time those responsible for an organization's planning need to be aware of these achievements because they can provide the base on which future plans are built.

POSSIBLE FUTURE DEVELOPMENTS

With annual recurrent grants being made available to Australian universities and public research and development organizations barely able to maintain a "static state", these organizations have been encouraged to

re-examine their internal structures. These reviews are usually designed to serve a twofold purpose. Firstly, procedures that have been followed for many years are examined for the purpose of justifying whether they should continue unchanged. Secondly, existing activities being pursued can be scrutinised and a decision taken on their relevance and effectiveness. Whatever approach is taken the prime aim of these reviews is to free existing resources for use elsewhere. The review process adopted adds further weight to the proposition that an organization requires its own internal planning group. Care may need to be exercised in the method adopted to select the membership of the planning group. Each member is required to act in a detached manner, uninfluenced by individual professional interests. To overcome the problem of the emergence of sub-cultures the membership of a planning group can be organised on a rotating basis where no one activity, discipline, school or faculty enjoys continuity.

One of the points highlighted in the preceding Chapters was the influence the A.U.C., and more recently the T.E.C., have had on fashioning the future developments that have occurred at Australian universities. It was noted that the T.E.C. in recent years has adopted as one of its roles the guardianship of unnecessary duplication amongst Australian universities. While some Australian universities would have wished to expand their teaching facilities by being able to offer courses in the disciplines of medicine, engineering or veterinary science, the T.E.C. has discouraged expansion in these directions until a real need has been demonstrated.

At first glance the control exercised by the T.E.C. could be regarded as pre-empting the planning a number of Australian universities have devoted to the development of their long-term strategies. Arguments of this kind can be countered on the grounds that the T.E.C. has a responsibility to the federal government to ensure the resources made available to the university sector are being used effectively and efficiently. Unless needs proposed are supported by demand the peer group assigned the task of recommending to government how the resources are to be allocated will remain unpersuaded. The difficulty for a university is that it can seldom collect the evidence necessary to justify demand. The imposition by some Australian universities of a quota on the number of students wishing to enrol in such disciplines as law and medicine appears to provide *prima facie* evidence that these courses are in high demand. While there are non-financial reasons which support the application of a quota system in some disciplines the main

considerations affecting the recommendations of the T.E.C. are cost dependent.

The scrutineering and watchdog roles the T.E.C. is able to fulfil in the development of the Australian university sector (as distinct from its role in Australia's overall tertiary educational sector) come as close as possible to balanced development. However, while the T.E.C. has standardised the form of reporting it requires from Australian universities on which projections affecting the future are made, it could have contributed more time and effort towards developing or co-ordinating the development of budgetary and accounting strategies for use in Australian universities.

The main argument against this kind of involvement is that each Australian university is responsible for the conduct and operations of the financial systems adopted. While the need to retain autonomy is an important corner-stone of a university's operations, the retention of autonomy by each Australian university could be maintained even though the same budgetary and accounting system had wide universal application. It would be naive to assume no waste had occurred at Australian universities in their efforts to develop financial reporting systems appropriate to their needs. Acting in the role of co-ordinator the T.E.C. could have encouraged Australian universities to work together to develop budgetary and accounting reporting systems peculiar to the Australian university sector. A co-ordinated approach would have avoided "duplication" and contained the overall cost of this form of systems development. An approach of this kind would also have been consistent with the considerable effort the T.E.C. has made towards standardising the statistical returns of basic data required for projection purposes.

An indicator which supports a conclusion of this kind is contained in the questionnaire distributed amongst Australian universities which inquired whether a uniform Chart of Accounts was favoured (please see Question 8, Appendices "B" and "C"). Other universities, however, approached the answering of this question with caution. A number responded with such cautionary remarks as: *"... there are differences between universities";* *"... no two universities have the same accounting policies"* or *"... each university has special features which warrant distinctive treatment"*. While these points touch on issues of fundamental importance and warrant special consideration, the accumulated knowledge and practical experience of financial managers at Australian universities is sufficiently extensive

for a suitable budgetary and accounting system to be designed which is capable of catering for parochial requirements. In the future governments could be persuaded that for streamlining purposes aimed at reducing costs, there is no case for universities to have different accounting policies.

Public research and development organizations such as the C.S.I.R.O. and the A.A.E.C. are not handicapped in this respect. While having to conform with the policy determinants established by the Commonwealth Departments of the Treasury and Finance, public organizations enjoy a wider degree of freedom in selecting those financial reporting systems which are considered best suited to their planning practices and needs.

If events of the past few years can act as indicators it would seem that the approach to research and development work undertaken at Australian universities will continue unchanged while the main source of funding is provided by the federal government. In turn this prescribes the "public accountability" obligations these organizations have to fulfil. Events that have occurred over the past 12 months substantiate the conclusion that both federal and state governments are moving towards achieving a situation where public sector organizations are more accountable. (18)

If "public accountability" obligations are to be satisfied adequately, the need to upgrade budgetary and accounting systems which are able to respond effectively to independent scrutiny assumes a position of greater significance. For the research and development organization the ability to trace expenditure and achievement through a convenient unit of measurement becomes more attractive. Further, if the unit of measurement can also contribute to the resource management and strategic planning processes the duality of purpose attained enhances the management effectiveness of the organization. One of the prime advantages, it was noted earlier, of being able to identify units of activity within an organization's structure is that these aid computerised simulation model-making which can provide any organization's planning group with a wider range of projections adjusted to allow for variations in input that widen the choice of options.

The arguments presented in this dissertation support the budgetary strategy Core + Research Activity (CRA) because it can accommodate the requirements an organization has for an integrated budgetary and accounting system. The budgetary strategy CRA is also capable of contributing to the basic data needed for effective and rational resource management and strategic planning.

THE ALTERNATIVES

One of the issues considered in Chapter 6 was the capacity to compare the outputs of an organization against inputs. It will be recalled that in respect of a university situation Verry and Davies were unconvinced that it was possible to measure research output against the cost of inputs. The main difficulty turned on the arbitrary method that would need to be applied to decide if any one output was more basic or fundamental than another.

A similar difficulty is faced by the public research and development organization. Classifying outputs in terms of benefit and value would prove an impossible task. For example, the results of a piece of research may be regarded today as being of only minor importance. At some stage in the future the same result could prove of immense importance in establishing a technique or assisting with the solution of a more complex research problem.

Any organization involved in research and development work is placed in a dilemma. On the one hand the organization has a responsibility to pursue current work-in-progress. The results of this research and development work can be disseminated at such gatherings as conferences, workshops or seminars or as published papers. On the other hand, the nature of research and development work is on-going. As has been demonstrated earlier in this dissertation the on-going nature of research and development work requires the organization involved in such activities to be constantly looking towards the future. What this does is to re-affirm the need for public research and development organizations to engage in long-term planning.

Obtaining the resources necessary to conduct research and development requires justification. Where long-term commitments are involved, and this applies particularly to the large and complex organizations needing sophisticated research equipment, a comprehensive outline of the buildup of the resources required is an essential part of the justification. To some extent the justification of resources needed by a research and development organization follows a cyclical pattern. The steps in chronological sequence are: develop the plan; secure resources; carry out the research task; report results. The process then recommences with a new plan. It is the second step - the securing of resources - which underscores the major contribution planning makes to this cyclical operation.

With planning representing such an important part of the operations of a research and development organization it would seem logical to conclude that those organizations which limit their planning effort will be disadvantaged in the long run. Apart from this conclusion is the noticeable trend the federal and state governments have made no secret of to have public organizations more accountable. By extending the push for greater "public accountability" a public organization will be forced to justify expenditure incurred as well as provide the justification for government support of activities planned for the future. Although pressure of this kind is being generated from external sources the push from this direction has also encouraged the top management of public organizations to be more circumspect in the submission for resources they place before governments. The proliferation of internal reviews has obviously included a measure of "cleaning up one's own backyard" to reduce external criticism of inefficiencies.

It would seem that with public research and development organizations being subject to both internal and external scrutiny the future of their operations is dependent on streamlining procedures and the organization having the capacity to provide information which is supportive of planned development.

The alternatives facing a public research and development organization, therefore, appear limited. No longer can it be assumed that governments will be prepared to provide resources with a minimum of support detail. The revival of the Commonwealth Parliament's Joint Committee on Public Accounts in 1952, mentioned in Chapter 5 that Solomon had noted, is a form of watchdog role which has appeal to the Commonwealth Parliament because, irrespective of political party ideology, it represents a means of demonstrating to the Australian electorate that proper scrutiny of expenditure incurred in the public sector is being monitored and controlled.

The public research and development organization in the future cannot rely solely on the submission it places before its Minister for the resources it needs. In addition to the annual report it is required to submit to Parliament (Commonwealth or State), it must look to other ways and means of informing the public about the activities it is performing. Public interest and support for research and development organizations can be secured by resorting to a number of inexpensive public relations exercises. For example, the issuing of brochures providing details of specific research

activities, producing documentary films, the holding of "open days" or conducting guided tours are some of the specific courses a public research and development organization can introduce to create larger public awareness of its functions and goals.

In summarising this section the conclusion that can be reached is that all present indications point to fuller disclosure by public research and development organizations of their operations in the future. With research activity being so dependent on the resources provided by governments financial disclosure is as important as disclosing what research activities are being pursued. Consequently, the extent of financial disclosure will depend on the sophistication of the budgetary and accounting system, augmented by the planning processes.

THE NEED FOR FURTHER INVESTIGATION AND RESEARCH

The main aim of this dissertation has been to review budgetary strategies currently applying in large and complex research and development organizations and the testing of their relevance and suitability. The evidence presented demonstrated that of those popular budgetary strategies selected there were shortcomings which reduced their effectiveness or introduced factors that complicated the real purpose the strategy was designed to serve.

The shortcomings evident in existing budgetary strategies were also shown to be inhibiting in providing the extent of reporting to the federal or state governments which financed the on-going research and development work of a public organization. What also became noticeable was the special position of Australian universities in the furtherance of research and development work. In this regard the experience encountered by the Institute of Advanced Studies of the Australian National University highlighted special problems associated with budgeting in a research institution.

It was the special problems of budgeting and financial reporting experienced in the I.A.S. which has encouraged the separate and distinctive budgetary approach proposed in this dissertation. After considering the experience of the I.A.S. carefully one of the options open was to develop a budgetary strategy better equipped to address the special problems involved. The CRA (Core + Research Activity) budgetary strategy, therefore,

offers a means of overcoming the deficiencies for a research and development organization which has emerged from attempts to apply other popular budgetary strategies to this kind of activity.

However, the CRA budgetary strategy is only one solution. Undoubtedly, other forms of budgetary strategies could be developed which could equally prove suitable for adoption in large and complex research and development organizations. The hope of the writer is that this dissertation will stimulate and encourage others to study the problems of budgetary strategies for large and complex research and development organizations and pursue further research on the topic.

In this regard the arguments presented in this dissertation have concentrated more on the reliance Australian universities and public research and development organizations have placed on securing their funding resources from governments. The reason for choosing this course is that it is consistent with present practice and, as far as Australian universities are concerned, appropriate in view of the total funding dedicated to the Australian university sector. For example, the T.E.C. Report for the 1982-84 Triennium indicates that grants made available to the Australian university sector for 1982 comprising recurrent, equipment, capital and special earmarked grants totalled \$1030705000.⁽¹⁹⁾ A figure of this size places the Australian university sector in the category of representing a billion dollar "industry". If other income generated on Australian university campuses, e.g., halls of residence, bookshops, concession areas, etc., are added to the total of the grants received it provides some idea of the magnitude of the money involved. Huge expenditures of this kind associated with a particular Australian sector of activity cannot be ignored.

When considering research and development activities there are other alternative methods of financing work of this kind. To conclude this section the following examples associated with the Australian university sector are nominated as factors which may need to be considered by those who research budgetary strategies for large and complex research and development organizations in the future.

At this stage Australia does not have a privately endowed university. To some extent this is surprising because at the secondary level of education the government secondary schooling system is complemented by

private schools, generally denominational, that enjoy a high scholastic reputation. The establishment in Australia of a private university would amount to an extension of Australia's duplicate stream of secondary education. The experience in the United States of America of privately funded universities exposes the extent of entrepreneurial skills involved (e.g., Stanford and Harvard) but, it would seem, there is every likelihood that in the not too distant future Australian industry and members of the public could be persuaded to fund Australia's first private university. The method of funding a private university could introduce new forms of budgeting skills, e.g., operating off investment income.

Another aspect to consider is the re-introduction of course fees for under-graduate and post-graduate courses. Despite the benefits which flow from providing training at the tertiary level it is reasonable for the question to be asked whether a nation such as Australia, with a population that has not yet reached 16 million, can continue to subsidise the cost of conducting university courses without the beneficiary contributing financially. Although the argument of equal opportunity for all is very persuasive the cost to the nation is considerable indeed. While income received from tuition fees would not effect the budgetary and accounting system used in an Australian university, a glance at Figure 6 provides some idea of the interaction that would need to be taken into account in the future planning phase.

A further possibility that may affect future research on this topic is the avenues Australian universities could explore in seeking funds from other than T.E.C.-recommended sources. The "static state" situation has already encouraged Australian universities to look to alternative sources of funding.

Funds received from outside sources do involve additional accounting and financial reporting services. Firstly, the outside donor usually requires an accounting of the funds disbursed for audit purposes. Secondly, the existing accounting procedures applying at an Australian university encourage each earmarked outside grant to be treated as a separate accounting entity, mainly for collecting income and expenditure associated with the grant, but also as a means of satisfying the reporting obligation to the donor. The computerisation of university accounting systems facilitates these operating and reporting services. However, the computerisation of any system involves a "learning cost" and often this is

overlooked when feasibility studies associated with the computerising of manual systems is undertaken.

Every encouragement should be given to those who wish to pursue further research and investigation into budgetary strategies for large and complex research and development organizations. On account of the special requirements of Australian universities there would be much to be gained if the T.E.C. co-ordinated the research proposed.

CHAPTER 7

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Recurrent	\$ 961600000
Equipment	45700000
Capital grants	7100000
Earmarked grants	3980000
Grants Student residences	4400000
Earmarked Equipment grants	425000
Design, Major buildings	200000
Minor building	7300000

1982 Total \$1030705000

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APPENDIX "A"



The Australian National University

From the Business Manager

P.J. Grimshaw, M.B.E.

Reference

The Research Schools of Social Sciences
and Pacific Studies

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27 June 1983

Dear

I am enrolled at the University of New England as a candidate leading to the award of a Master of Educational Administration.

Drs R. McCaig and W. Hannah are my supervisors, and the topic approved for my thesis is "Budgeting Strategies for Large Scale Research and Development Organizations: With special reference to the Institute of Advanced Studies, Australian National University".

During the course of my researches I have examined the Annual Reports for 1981 and 1982 of most Australian universities. You will appreciate, however, that the material, particularly that associated with funds received, is presented in a variety of different ways.

I wish to avoid drawing any wrong conclusions and, for this reason, I have prepared the attached questionnaire, which has received the blessing of my supervisors.

In designing the questionnaire I have attempted to make it simple so that its completion does not require too much time and effort, yet, at the same time, the information sought is meaningful. The format is also designed for the details to be processed by computer.

Would it be possible for you to complete this questionnaire for the years 1981 and 1982 and return to me in the stamped-addressed envelope.

You may consider that some of your answers should not be made public. To preserve confidentiality could you indicate which answers you would wish to be treated in this manner.

During the course of completing this questionnaire if you believe there are additional points that should be incorporated in your response I would welcome these.

May I indicate, in advance, my appreciation for your time and assistance.

Yours sincerely,

(P. J. GRIMSHAW)
Business Manager

Encs.

APPENDIX "B"

QUESTIONNAIRE

ALLOCATION OF RESOURCES - 1981

1. University

2. Student Enrolment

- | | | |
|-----|------------------------|-------|
| 2.1 | Undergraduate Fulltime | |
| 2.2 | Undergraduate Parttime | |
| 2.3 | Postgraduate Fulltime | |
| 2.4 | Postgraduate Parttime | |

3. Funding Received

(Express in \$'000 - exclude funding of a capital nature)

- | | | |
|-----|---|----------|
| 3.1 | Annual Recurrent Grant - Running Expenses | \$ |
| 3.2 | - Equipment | \$ |
| 3.3 | Outside Grants - Research | \$ |
| 3.4 | - Teaching Research | \$ |
| 3.5 | Total | \$ |

4. Approximate Division of Resources (Express in \$'000)

- | | | |
|-----|--|----------|
| 4.1 | Teaching (including proportion of admin.
and library facilities provided) | \$ |
| 4.2 | Research (including proportion of admin.
and library facilities provided) | \$ |

5. Does your University use any particular budgetary technique or strategy?

5.1 ☐ Yes

5.2 ☐ No

If answer is YES, do any of the following budgetary techniques/
strategies describe your practice?

5.1.1 ☐ Incremental Budgeting

5.1.2 ☐ Formula Budgeting

5.1.3 ☐ Planning-Programming Budgeting

5.1.4 ☐ Zero-base Budgeting

5.1.5 ☐ Other (please specify)

.....

6. Are you satisfied your budgetary technique/strategy is appropriate for research and development activities?

6.1 ☐ Yes

6.2 ☐ No

6.3 Any additional comment you wish to make?

7. Is your budgetary technique/strategy interfaced with your accounting systems?

7.1 ☐ Yes

7.2 ☐ No

7.3 Any additional comment you wish to make?

8. Would you favour a uniform Chart of Accounts for use throughout Australian universities?

8.1 ☐ Yes

8.2 ☐ No

8.3 Any additional comment you wish to make?

9. How frequently are reports issued, where actual expenditure is compared with the budgetary provision, and to what level are these reports issued, e.g. Head of Department?

9.1 Frequency

9.1.1 ☐ Weekly

9.1.2 ☐ Fortnightly

9.1.3 ☐ Monthly

9.1.4 ☐ Quarterly

9.1.5 ☐ Bi-annually

9. 9.2 Level

9.2.1 ☐ Deans of Faculties

9.2.2 ☐ Heads of Departments

9.2.3 ☐ Other (please specify)
.....

Thank you for your co-operation and assistance

APPENDIX "C"

QUESTIONNAIRE

ALLOCATION OF RESOURCES - 1982

1. University

2. Student Enrolment

2.1 Undergraduate Fulltime

2.2 Undergraduate Parttime

2.3 Postgraduate Fulltime

2.4 Postgraduate Parttime

3. Funding Received

(Express in \$'000 - exclude funding of a capital nature)

3.1 Annual Recurrent Grant - Running Expenses \$

3.2 - Equipment \$

3.3 Outside Grants - Research \$

3.4 - Teaching Research \$

3.5 Total \$

4. Approximate Division of Resources (Express in \$'000)

4.1 Teaching (including proportion of admin.
and library facilities provided) \$

4.2 Research (including proportion of admin.
and library facilities provided) \$

5. Does your University use any particular budgetary technique or strategy?

5.1 ☐ Yes

5.2 ☐ No

If answer is YES, do any of the following budgetary techniques/
strategies describe your practice?

5.1.1 ☐ Incremental Budgeting

5.1.2 ☐ Formula Budgeting

5.1.3 ☐ Planning-Programming Budgeting

5.1.4 ☐ Zero-base Budgeting

5.1.5 ☐ Other (please specify)

.....

.../2

6. Are you satisfied your budgetary technique/strategy is appropriate for research and development activities?

6.1 ☐ Yes

6.2 ☐ No

6.3 Any additional comment you wish to make?
.....
.....

7. Is your budgetary technique/strategy interfaced with your accounting systems?

7.1 ☐ Yes

7.2 ☐ No

7.3 Any additional comment you wish to make?
.....
.....

8. Would you favour a uniform Chart of Accounts for use throughout Australian universities?

8.1 ☐ Yes

8.2 ☐ No

8.3 Any additional comment you wish to make?
.....
.....

9. How frequently are reports issued, where actual expenditure is compared with the budgetary provision, and to what level are these reports issued, e.g. Head of Department?

9.1 Frequency

9.1.1 ☐ Weekly

9.1.2 ☐ Fortnightly

9.1.3 ☐ Monthly

9.1.4 ☐ Quarterly

9.1.5 ☐ Bi-annually

9. 9.2 Level

- 9.2.1 ☐ Deans of Faculties
- 9.2.2 ☐ Heads of Departments
- 9.2.3 ☐ Other (please specify)

Thank you for your co-operation and assistance