Medical Research in Australia – Part 1

1981
MEDICAL RESEARCH IN AUSTRALIA

A REPORT TO THE PRIME MINISTER
BY THE
AUSTRALIAN SCIENCE AND TECHNOLOGY COUNCIL
(ASTEC)

Part 1

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My dear Prime Minister,

We have the honour to present to you a report on 'Medical Research in Australia'. This results from an inquiry undertaken at ASTEC's own initiative.

The report is in two parts. The first provides a general discussion of medical research as performed by the different sectors, and of the various funding arrangements. Our inquiries indicate that the total annual expenditure on medical research in Australia is about $80million and that about $47million of this is provided by the Government. Only about one-quarter of the research is subject to stringent external review and assessment processes. The report makes a number of suggestions for the more efficient funding of medical research to ensure that national needs are identified and met, that research of acknowledged excellence is promoted, and that greater attention is given to the co-ordination and concentration of effort.

The second part of the report consists of four appendices which contain detailed information about the medical research laboratories in Australia.

Yours sincerely,

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1. SUMMARY AND RECOMMENDATIONS

RATIONALE FOR MEDICAL RESEARCH AND DEVELOPMENT IN AUSTRALIA

1.1 The cost of health care in Australia is approaching $9,000 million per annum. Infectious diseases are no longer the major cause of mortality in Australia, but significant problems remain; including cancer, heart disease, strokes, alcoholism and drug abuse, rheumatic disorders, allergies, diseases associated with ageing, and mental illness. Development of the most cost-effective methods of prevention and treatment depends on elucidation, through medical research, of the underlying causes and mechanisms of disease. It is ASTEC's view that a soundly-based and well-directed effort in medical research and development (R&D) is potentially an important means of achieving cost savings in the long-term, and of slowing the seemingly inexorable rise in the nation's health bill without incurring a lowering of the standard of community health.

1.2 Australia performs approximately two percent of the world's scientific research and the great majority of the discoveries in health sciences will clearly be made in overseas countries. It should be recognised, however, that the Australian community can benefit from overseas research only if there is an efficient mechanism for the transfer of new medical knowledge and medical technologies. An effective transfer mechanism requires the local presence of medical research workers who are able to assess the significance of overseas discoveries, determine their relevance to local conditions and, if appropriate, ensure their application in Australia. There is an additional justification for research into problems peculiar to Australia or of particular significance to the Australian community.

1.3 There is another important reason why medical R&D should be fostered in Australia: this is based on the interdependence of health research and health education. Future medical practitioners, during their training, need to be made aware of and be responsive to the role of research in providing improvements in medical knowledge, new technology, and more cost-effective health-care procedures.

1.4 Finally, Australia is one of the more affluent countries and as such we have a humanitarian responsibility to carry out a fair share of the world's medical R&D, and especially to help raise the standard of health in adjacent countries which are less well developed.

1.5 Australian medical research has made significant contributions to improvements in the health of the community. Examples include the greatly increased survival of patients with severe hypertension and of children with leukaemia, the prevention of early death from infantile diarrhoea, and the reduced incidence of abuse of analgesics. Many current research programs are of moderate cost in comparison with their potential benefits. There have been no thorough cost-benefit analyses of Australian medical research, and in any case such retrospective analyses are of limited value in forecasting the likely benefits
arising from current research; several major advances in clinical medicine, for example open-heart surgery, were made possible by earlier basic research which at the time could not have been justified on economic grounds. In addition, many would argue that the social benefits of improved health care are more important than the purely economic benefits.

CO-ORDINATION OF EFFORT AND EFFICIENT USE OF FUNDS

1.6 The total expenditure on medical R&D in Australia is estimated to be approximately $80 million in 1981. The Commonwealth Government's contribution amounted to about $47 million in 1979. In view of the size of medical R&D expenditure, and of the Government's contribution, it is reasonable to inquire whether there is any mechanism to ensure the efficient spending of funds so that:

- national needs in medical R&D are identified and funded adequately;
- co-ordination of effort occurs and duplication is reduced;
- funds are distributed wisely between the various fields of medical research; and
- the work supported is subject to periodic review and assessment.

1.7 There is at present no formal mechanism for the integration of effort, for the rational distribution of the majority of research funds, or for the long-term planning of medical research. The National Health and Medical Research Council (NH&MRC) recommends grants for medical research using a system of rigorous external assessment of applications; however, these grants constitute only one quarter of the total expenditure on medical R&D. It may therefore be asked whether the NH&MRC, and its Medical Research Advisory Committee (MRAC), are able to provide a suitable mechanism for overseeing the co-ordination and future development of all medical R&D in Australia.

1.8 The MRAC has a substantial measure of independence and is able to make recommendations on urgent matters through the Chairman of NH&MRC direct to the Minister for Health. Nevertheless, the paramount body is the NH&MRC which has a majority of members who have little direct involvement in, or knowledge of, medical R&D. The NH&MRC meets only twice a year and has neither the time nor the expertise to take on the task of co-ordinating an $80 million research effort. The MRAC is also a part-time body, with a part-time Chairman, and operates with the assistance of a variety of panels and sub-committees and with the help of a multitude of referees and assessors. The Secretariat for the MRAC, and for the NH&MRC, is provided by the Department of Health, and several of the officers concerned have additional departmental responsibilities.
ASTEC believes that medical R&D in Australia has reached a stage where its proper development, with adequate attention to co-ordination and to national and scientific accountability, is too onerous a task to be undertaken effectively by a part-time body with a part-time Secretariat. It requires the establishment of a full-time organisation, for which the name Medical Research Council (Australia) is proposed. The Chairman of the proposed Council needs to be a distinguished medical scientist who has the respect of the medical research community, and who is also able to achieve by persuasion the rational distribution of resources which may not be subject to direct control by the Council. The first appointment, at least, should be full-time (or almost full-time) to ensure the necessary commitment and leadership during the establishment of the Council.

This type of organisation might be established in one of two ways: either as a fully-independent 'outrider' of the Commonwealth Department of Health, or as a statutory authority. There are difficulties associated with 'outrider' status, and ASTEC favours the establishment of the Medical Research Council as a statutory authority, with its own small Secretariat. It is recognised that governments and parliaments have been concerned at the proliferation of statutory authorities, as these are considered to be less accountable than Westminster-style departments. However, the device of the statutory authority has proved extremely valuable in providing conditions for impartiality and independence of operation (especially for allocation of government funds to citizens and public groups), and to facilitate the performance of co-ordinating functions. Furthermore, it should not be difficult to draft a Bill for the Medical Research Council which gives adequate powers of Ministerial direction, provides for an annual report to the Parliament detailing the Council's activities, and which carefully spells out the functions and objectives of the Council so that its performance may be audited both internally and by the Government and the Parliament. The costs associated with the operation of the Medical Research Council as a statutory authority need not be much greater than the current administrative expenditure on the medical R&D activities of the NH&MRC and the MRAC, which are included in the administrative expenses of the Department of Health.

In concert with the establishment of an independent Medical Research Council steps need to be taken to form a National Health Council, to replace the NH&MRC, to concentrate on public health and health-care activities. The membership of the Medical Research Council and of the National Health Council will need to allow for the necessary liaison and communication between them and with the Department of Health. Indeed, the identification and support of national needs in medical R&D by the Medical Research Council will need to be preceded by full discussion with the National Health Council.

Recommendation 1

(i) That a Medical Research Council (Australia) be established to carry out the medical research advisory and funding functions currently undertaken by the National Health and Medical Research Council (NH&MRC) and to have responsibility for the development, co-ordination and optimal utilisation of the resources available for medical research and development in this country; and that a National Health Council, replacing the NH&MRC, be formed to have responsibility for matters relating to public health and health-care services.
(ii) That the Medical Research Council (Australia) be established as a statutory authority under Act of Parliament and that it report to the Minister for Health and be accountable to the Government and the Parliament through the Minister; that it comprise a full-time (or almost full-time) Chairman who is a distinguished medical scientist appointed on a seven-year renewable basis, and not more than nine other part-time members appointed for renewable overlapping terms of three years; and that it be serviced by its own small, separately identified Secretariat established under the Public Service Act.

(iii) That the objectives and functions of the Medical Research Council (Australia) include the following:

- periodic review of the resources directed to medical research and development, and formulation of forward plans for their development, co-ordination and most effective use;
- identification (after consultation with the National Health Council) of areas of medical research and development which need to be promoted to ensure that the nation's health needs are met, and of areas where support needs to be reduced or terminated;
- provision of advice to the Commonwealth Government on the optimal utilisation of the resources directed to medical research and development within the government sector, on national policies for medical research and development, on medical research initiatives that should be taken in the national interest, and on the level of research funds to be allocated to government institutes and laboratories;
- collaboration with State governments, hospitals, universities, industry and private research organisations and foundations to encourage rational utilisation of medical research staff and facilities at the national level;
- identification of research centres which need to be stimulated and selectively funded;
- allocation of Project, Program and Block Grants, and Fellowships and Scholarships.

CONCENTRATION OF RESEARCH EFFORT

1.12 Less than one-third of the funds allocated on the advice of the NH&MRC in 1981 was used to support teams of research workers as distinct from individual research projects. A similar situation exists in the distribution of the other main funds provided by the Commonwealth Government for medical R&D. There will always be a need to provide an adequate level of funds for individual research projects to enable young scientists to begin their research careers and to support researchers who wish to pursue their own ideas, especially when these do not accord with accepted dogma. Nevertheless, the present situation is that there is insufficient concentration of medical research.
1.13 An effective mechanism for encouraging the concentration of medical research is one which creates optimal conditions for the promotion of high-quality research, ensures the transfer of benefits derived from it to the community, and has a high degree of scientific, economic and social accountability. The most efficient way to achieve these goals is to create a series of first-class research Units, analogous to centres of excellence, throughout the country.

1.14 ASTEC believes that we need to move towards a situation where there is such a series of Units in medical R&D throughout the country: some small, some larger, but all located in institutes, universities or hospitals, or within laboratories of the Commonwealth and State governments. The individual Units will need to be established around investigators with recognised research ability, and it may prove necessary to create Units in specific areas of medicine where current research is inadequate, provided high-quality researchers can be recruited. The Units will need to be funded on a five-yearly renewable basis.

Recommendation 2

(i) That the Medical Research Council (Australia) stimulate and expand the activities of medical research centres of the highest quality and in order to do this take steps to establish a series of selectively-funded centres in medical research throughout the country, to be known as Units; (a) by examining the level of activity in the different fields of medical research in relation to national needs and, where a requirement for a new or greatly expanded field of research is identified, establishing, if appropriate, a new Unit around an outstanding individual scientist; and (b) by seeking proposals for Unit status from research groups within institutes, laboratories, and university and hospital departments, and subjecting all proposals to a system of objective review and assessment to determine those worthy of such support; and

(ii) that each Unit be funded on a five-yearly renewable basis, with continuation of support being dependent upon favourable assessment by an external review of the Unit’s work, and that whenever a Unit’s work is considered to have diminished in quality, or in relevance, support be reduced or terminated.

THE NEED FOR ADDITIONAL FUNDS

1.15 The basis for the required medical research effort in Australia is already present in the form of highly qualified research personnel who, collectively, have earned an enviable international reputation for the quality of their work. The difficulty is that many of the best scientists are not supported adequately and are unable to make the maximum contribution to improving health care. In 1981, over 100 research proposals (equivalent to about 25 percent) received by the NH&MRC, and which were judged after rigorous external review and assessment to be of such quality that they should be supported, were either not funded or only partially funded; many other first-class proposals could only be guaranteed support for one year.
1.16 ASTEC has argued similarly in earlier reports that the funds provided for medical R&D by the Commonwealth Government need to be gradually increased in real terms. That view has been reinforced by the present study. It is important that the additional funds be used in the most effective way, and to support research which is related to national health needs. The functions and procedures outlined for the Medical Research Council will enable it to achieve these objectives.

Recommendation 3

That the funds available to the Medical Research Council (Australia) for the support of research having exceptional merit and promise be steadily increased, in real terms, over the next five years.

ARRANGEMENTS FOR REVIEW OF MEDICAL R&D IN COMMONWEALTH GOVERNMENT LABORATORIES

1.17 The institutes and laboratories of the Commonwealth Department of Health are not within the jurisdiction or influence of the NH&MRC or the MRAC. In general, these institutes and laboratories have a substantial service function as well as a research function; but their research expenditures, which are significant, are not subject to external review and assessment nor are they placed in competition with other sectors of medical R&D for funds. However, the establishment of the Medical Research Council (Australia) offers an opportunity to bring the whole of the medical R&D budget of the Government under scrutiny.

1.18 The Commonwealth Institute of Health provides postgraduate training, and undertakes research, in various aspects of public health and preventive and tropical medicine. It also has a role in policy development and provides services to the Government through the Department of Health. The Institute should remain within the Department's responsibilities, but its research programs and level of research expenditure should be subject to review and assessment each three years by an independent, external committee appointed by the Medical Research Council. In this way the Institute's programs will be assessed in relation to other medical R&D, and independent advice can be provided to the Government on their quality and relevance and on the appropriate level of expenditure.

1.19 The National Acoustic Laboratories, the Australian Radiation Laboratory and the National Biological Standards Laboratory (incorporating the Australian Dental Standards Laboratory) each have a substantial service function, and should therefore remain within the responsibility of the Commonwealth Department of Health. However, their research programs and level of research expenditure should be reviewed each three years by an external committee appointed by the Medical Research Council. The Council should be asked to determine what proportion of the research and development activity is directly related to the service function, and to assess the scientific merit of the remainder so that it can provide advice on whether the research should continue to receive government support and at what level.
1.20 The research programs of the Commonwealth Serum Laboratories (CSL) which are directly related to its manufacturing activities are supported wholly by the Laboratories and should not be subject to external review since they are, properly, a matter for internal commercial decision. However, research and development undertaken under the CSL Act at Ministerial determination is being funded by the Government. In ASTEC's view the research which is not directly related to commercial activities should be subject to continuing, external review and assessment under the direction of the Medical Research Council.

1.21 The work of the Ultrasonics Institute has reached a stage where it would be better undertaken within a more commercial environment. ASTEC therefore suggests that steps be taken to transfer the staff and functions of the Ultrasonics Institute. A suitable mechanism to achieve this would be an initial five-year contract, provided by the Department of Health, which would ensure that the research team is not dispersed and that staff are transferred with no loss of existing rights.

1.22 The program of Health Services Research and Development Grants currently administered by the Department of Health should become the responsibility of the Medical Research Council. This would enable the Council to ensure that research results are carried through the development phase and introduced into clinical and medical practice and, conversely, that needs identified during the delivery of health care are taken up by medical scientists and are funded adequately. The Council will need to give particular attention to determining the economic benefits of health services R&D, and take steps to commission or to promote research which is likely to result in significant cost-containment or savings. Expenditure on health services R&D should be identified separately in the Council's annual report.

Recommendation 4

(i) That the Commonwealth Institute of Health, the National Acoustic Laboratories, the Australian Radiation Laboratory and the National Biological Standards Laboratory remain within the Commonwealth Department of Health; that their research programs and levels of research expenditure be reviewed every three years by an external committee appointed by the Medical Research Council (Australia); and that the Council determine what proportion of research activity is directly related to service functions and assess the scientific merit of the remainder in order to provide advice whether it should continue to receive government support and at what level.

(ii) That the research and development programs of the Commonwealth Serum Laboratories which are not directly related to its commercial activities be reviewed every three years by a committee appointed by the Medical Research Council (Australia), and that the Council assess and provide advice on the scientific merit of the programs and on the desirable level of government support.

(iii) That the staff and facilities of the Ultrasonics Institute be transferred from the Commonwealth Department of Health to a manufacturer of ultrasound diagnostic equipment, the transfer being effected through a fixed-term contract for five years let by the Department of Health, with provision made for cost recovery from commercial sales.
(iv) That the Health Services Research and Development Grants Program be transferred from the Commonwealth Department of Health to the Medical Research Council (Australia).

2. INTRODUCTION

2.1 This report is intended to provide a broad overview of the whole field of medical research and development (R&D) in Australia, and to consider and make recommendations on the most effective arrangements for fostering its development. The research activities of university medical schools are diverse and are briefly reviewed. The work of the independent and hospital research institutes and of the Commonwealth health laboratories is discussed, as are the operations of the National Health and Medical Research Council (NH&MRC) and its Medical Research Advisory Committee. The detailed descriptive material is contained within the Appendices and is summarised in Chapters 3 to 6. Chapters 7 and 8 contain ASTEC's views on the present situation of medical R&D, and the Council's recommendations for future action.

MEDICAL R&D IN AUSTRALIA

2.2 Medical research in Australia is of high quality and is so regarded in international circles. In some ways this is surprising. In the nineteenth century, and in the first half of the twentieth century, many of our medical schools paid little attention to research. In the years immediately following the Second World War, however, medical research began to accelerate. Universities greatly expanded their activities; independent and hospital research institutes were established or expanded; the John Curtin School of Medical Research was established within the Australian National University; and the Commonwealth Department of Health increased its involvement in research and development in the medical and dental sciences.

2.3 Young and enthusiastic researchers became available by virtue of the expansion in tertiary and postgraduate education which took place in the sixties and early seventies. The number of medical students graduating each year almost doubled between 1961 and 1971, for example, and there were even greater increases in the number of non-medical graduates specialising in the biomedical sciences. Many medical and non-medical graduates sought and obtained additional research experience in overseas laboratories and returned to Australia with new techniques and new fields of medical research and, even more important, with new ideas and an enthusiasm to test these ideas. A sizeable group of well-trained medical and biomedical researchers has been established and strong interactions with overseas groups have been maintained.

2.4 An estimate of total expenditure on health research in Australia is provided by Project SCORE, the biennial survey and comparison of research expenditures now carried out by the Australian Bureau of Statistics in collaboration with the Department of Science and Technology. The most recent figures available, which are for 1976-77, identify a total expenditure on health research and development (R&D) of $48 million. The sources and expenditure of these funds are shown in Table 2.1.

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TABLE 2.1
FUNDING OF HEALTH RESEARCH AND DEVELOPMENT
IN AUSTRALIA
(1976-77)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Funds Provided $million</th>
<th>Funds Expended $million</th>
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<tr>
<td>Commonwealth Government</td>
<td>31.8</td>
<td>7.6</td>
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<td>State governments</td>
<td>6.4</td>
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<tr>
<td>Business enterprise</td>
<td>3.9</td>
<td>3.9</td>
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<tr>
<td>Higher education</td>
<td>0.1</td>
<td>21.5</td>
</tr>
<tr>
<td>Private non-profit organisations</td>
<td>4.5</td>
<td>8.9</td>
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<tr>
<td>Overseas organisations</td>
<td>1.5</td>
<td>-</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>48.2</strong></td>
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Source: Project SCORE 1976-77, and revised figures provided by the Department of Science and Technology.

2.5 The Commonwealth Government provided about 66% of the total funds, State governments about 13%, and private non-profit organisations just under 10%. The higher education sector was by far the main performer of research, nearly 45%; private non-profit organisations accounted for 19%, and Commonwealth and State government sectors performed approximately 15% each. The Project SCORE estimate of manpower used in health R&D in 1976-77 was nearly 2,500 man-years, including 1,300 researcher man-years and 820 technician man-years.

2.6 The Government supports medical R&D by providing funds through the Tertiary Education Commission for research in university medical schools, and by giving grants-in-aid for research which are awarded on the advice of the National Health and Medical Research Council (NH&MRC). The Council has 24 part-time members, and advises the Commonwealth and State Governments on legislative and administrative matters related to public health and to medicine, as well as on medical R&D. Most of the Council's members are representatives of governments, medical associations or professional colleges. In practice, its role of advising on the disbursement of funds for medical R&D is passed to its Medical Research Advisory Committee. This Committee, which is also part-time, operates an extensive and rigorous system of external review and assessment of applications for grants and scholarships. In addition the Government supports a number of institutes operated by the Department of Health. Most of these institutes have a service function as well as a responsibility to undertake medical research and development.
2.7 It is difficult to obtain recent figures for health R&D expenditure, partly because of the large number of organisations involved. Within the Commonwealth Department of Health alone there are twelve areas with at least some R&D expenditure, and to this must be added other Commonwealth organisations, State government agencies, university faculties of medicine and dentistry, and private organisations. However, extrapolating from those recent reports of expenditure which are available, overall expenditure on health R&D in Australia in 1979-80 was of the order of $70million, made up as shown in Table 2.2. Figures for State government agencies, private enterprises and private non-profit organisations have been estimated by inflating the most recent data available, using a specific price inflator based on research costs. Table 2.2 should therefore be viewed as presenting an estimate of the level of expenditure rather than accurate figures.

2.8 In his report to the Medical Research Advisory Committee, Professor Eric Saint has made an independent estimate of the total funds being devoted to medical R&D in Australia [1]. His estimate for 1980 expenditure, which is detailed in Table 2.3, gave $70million as the 'very approximate total'. Both estimates are likely to be on the low side, and the figure of $80million has been adopted as a reasonable estimate of expenditure on medical R&D in Australia in 1981.

2.9 Figures have sometimes been presented to show a comparison of expenditures by funding agencies such as the National Health and Medical Research Council in Australia, the Medical Research Council in the United Kingdom and the National Institutes of Health in the United States. The figures suggest that per-capita expenditure on health research is relatively small in Australia; but the comparison is not strictly a valid one because the various funding agencies do not have the same role. The NH&MRc expenditure, for example, is a small proportion of total health R&D expenditure in Australia, less than one quarter, whereas the (US) National Institutes of Health are substantial performers of health research and are by far the largest funding agency for health research in the United States. It would be more useful to compare national expenditures on health R&D; but this is not possible because few countries, even those which are members of the Organisation for Economic Co-operation and Development (OECD), compile statistics on health R&D which allow direct comparison.

2.10 International comparisons are, in any case, of limited value. Volume 1A of the ASTEC report 'Science and Technology in Australia 1977-78' examined the gross expenditure on research and development in Australia compared with that of other OECD countries and concluded:

It is the Council's view that comparative expenditure figures provide only an approximate reference point, and that arguments which rely primarily on these data for increased expenditure for R&D are unconvincing. The Council believes that the size and distribution of R&D expenditure should be based on an examination of national requirements and priorities [2].
### Table 2.2

**Estimated Health R&D Expenditures in Australia (1979-80)**

<table>
<thead>
<tr>
<th>Performers of R&amp;D</th>
<th>Estimated Expenditure 1979-80 $million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commonwealth Government</td>
<td></td>
</tr>
<tr>
<td>Department of Health</td>
<td>7.4</td>
</tr>
<tr>
<td>Commonwealth Serum Laboratories</td>
<td>3.6(a)</td>
</tr>
<tr>
<td>CSIRO</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td><strong>14.9</strong></td>
</tr>
<tr>
<td>State government agencies</td>
<td>8.3</td>
</tr>
<tr>
<td>Private enterprise</td>
<td>5.0</td>
</tr>
<tr>
<td>Higher Education Sector (b) (c)</td>
<td>30.6</td>
</tr>
<tr>
<td>Private non-profit organisations (c)</td>
<td>11.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>70.3</strong></td>
</tr>
</tbody>
</table>

(a) of which $2.3 million was provided through the Department of Health, and $1.3 million from the Laboratories' own funds.

(b) Figure calculated by Commonwealth Department of Science and Technology.

(c) The NH&MRC makes substantial grants to these sectors.


: Figures provided in Project SCORE 1976-77, inflated to a 1979-80 level using a research-specific price inflator.
TABLE 2.3
ESTIMATED MEDICAL R&D EXPENDITURE
IN AUSTRALIA, 1980

<table>
<thead>
<tr>
<th>Source</th>
<th>$million</th>
</tr>
</thead>
<tbody>
<tr>
<td>University (government funds expenditure on health science research)</td>
<td>20.0</td>
</tr>
<tr>
<td>Australian National University (John Curtin School)</td>
<td>9.0</td>
</tr>
<tr>
<td>Bequests, endowments to universities for biomedical research</td>
<td>2.0</td>
</tr>
<tr>
<td>Public, incorporated foundations</td>
<td>9.0</td>
</tr>
<tr>
<td>Overseas foundations and organisations, say,</td>
<td>1.0</td>
</tr>
<tr>
<td>Commonwealth and State Government support other than through Medical Research Endowment Fund, possibly</td>
<td>8.0</td>
</tr>
<tr>
<td>Private gifts, donations, hospital research endowment funds, miscellaneous, say</td>
<td>2.0</td>
</tr>
<tr>
<td>Medical Research Endowment Fund (i.e. NH&amp;MRC)</td>
<td>19.0</td>
</tr>
<tr>
<td></td>
<td>70.0</td>
</tr>
</tbody>
</table>

Source:
E.G. Saint, report to Medical Research Advisory Committee of the NH&MRC, on the establishment of an evaluation and planning ("operations research") unit, April 1981, p.115.
2.11 This philosophy needs to be applied to health research expenditures. The figures for expenditure in different countries, although not strictly comparable, certainly suggest that, for example, the United States spends a lot more per capita on health R&D than does Australia. It does not necessarily follow, however, that Americans enjoy vastly superior health care, or indeed that they are healthier. In fact, there is evidence to suggest that the opposite is true.

2.12 This apparent paradox reflects the fact that many developed countries with relatively large per-capita expenditures on medical R&D have also generated life-styles which may be detrimental to health. In other words, there is not necessarily a direct relationship between expenditure on medical R&D and community health because many other factors also influence the general level of public health, factors such as life-style and environment, the incorporation of research findings into clinical practice and the type of health-care systems available.

2.13 Although medical research is only one of several factors contributing to improved health, it is a very important one, because there are many health problems in developed countries for which a definitive and cost-effective intervention is unlikely to be designed without an understanding of the disease process. Nevertheless, since its relationship with community health is not a direct one, the funding and management of medical research need not automatically be linked with the administration of public health.

2.14 A corollary of the argument that the benefits of medical research are not necessarily captured by the nation of origin, but instead have a universal significance, is that a smaller nation need not make provision for the management and funding of its own medical research effort. The question is sometimes asked: why do medical research in Australia?

2.15 ASTEC believes that there are good and strong reasons for ensuring that an active medical research community is maintained in Australia. These relate to the transfer of medical discoveries and technology, to Australia's international responsibilities as one of the more affluent countries, and to the training of research-and cost-conscious medical practitioners.

2.16 Australia performs approximately two percent of the world's scientific research and the great majority of the discoveries in health sciences will clearly be made in overseas countries. However, the Australian community can only benefit from overseas research if there is an efficient mechanism for the transfer of new medical knowledge and medical technology. An effective transfer mechanism requires the local presence of medical research workers who are able to assess the significance of overseas discoveries, determine their relevance to local conditions and ensure their application in Australia. As the ASTEC report on 'Science and Technology in Australia' pointed out:

To draw fully on the large international pool of endeavour, a nation must itself be an effective participant in the network of scholarship, technical advances and communication. In that sense, the health scientist is also the guardian of the quality and modernity, and to some extent the cost, of community health care...It was through the existence of a small but effective health science sector that Australia was able to capitalise rapidly on overseas discoveries in fields such as penicillin manufacture, poliomyelitis vaccination, and blood pressure treatment [3].

13
A further argument is that Australia must be able to carry out research work on problems which are peculiar to this country.

2.17 Nevertheless, the advantages which accrue from an effective mechanism of technology transfer should not be regarded as the only justification for carrying out medical research in Australia. Another important reason is that, as one of the more affluent societies, we have a real responsibility to carry out a fair share of the world’s research; and as we are adjacent to a number of countries which are less affluent Australia should be prepared to make an even greater research effort for the good of these communities.

2.18 There is a further strong argument for fostering medical research in Australia: this is based on the interdependence of health research and health education. The medical student needs to be exposed to the thinking of medical research workers. In this way the student can appreciate at first hand the changing nature of the various disciplines and the need continually to question established views and practices. The student needs to be aware of, and receptive to, improvements in medical knowledge and new technology. The educator who is engaged in research at the frontiers of present knowledge can transfer this important attitude of mind to the student. Indeed it would be an advantage if more practitioners could have some personal experience of research. This is likely to become more rather than less important for medical care services in the future as the revolution in biomedical knowledge and the advances in technology and treatment which derive therefrom influence the practice of medicine at an ever increasing rate.

3. MEDICAL SCHOOLS

3.1 There are ten medical schools in the State universities; in addition the John Curtin School of Medical Research is a research school at the Australian National University.

THE MEDICAL SCHOOLS IN THE STATE UNIVERSITIES

3.2 The Medical School at the University of Melbourne was established in 1862, and the most recent, at the University of Newcastle, in 1975. The medical schools and their dates of establishment are given in Table 3.1.
3.3 There are, in addition, five schools of dentistry or of dental science at the universities of Adelaide, Melbourne, Queensland, Sydney and Western Australia. However, the level of research undertaken within these schools is small in comparison with that of the medical schools. For example, of the 431 Project Grants awarded by the NH&MRC to universities in 1981, only three were given for research in dental science, and their total value was just under $48,000.

3.4 As the Report of the Committee on Medical Schools of the Australian Universities Commission pointed out:

Medical training may be divided into three parts. Pre-clinical departments are concerned with the teaching of basic medical sciences, an understanding of which is necessary before commencement of the study of patients and disease. Broadly they embrace the normal structure, function and chemistry of the human body. Para-clinical departments have both a science basis and an applied aspect; they relate to the cause and progress of disease in the body. Their study should begin before clinical studies and be continued in parallel with them. Clinical departments are directly concerned with the cause, diagnosis and treatment of medical disorders, and the effect of these disorders on the patient [4].

**TABLE 3.1**

MEDICAL SCHOOLS IN AUSTRALIA

<table>
<thead>
<tr>
<th>University</th>
<th>Foundation of University</th>
<th>Foundation of Medical School</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Sydney</td>
<td>1850</td>
<td>1883</td>
</tr>
<tr>
<td>University of Melbourne</td>
<td>1853</td>
<td>1862</td>
</tr>
<tr>
<td>University of Adelaide</td>
<td>1874</td>
<td>1885</td>
</tr>
<tr>
<td>University of Tasmania</td>
<td>1890</td>
<td>1965</td>
</tr>
<tr>
<td>University of Queensland</td>
<td>1909</td>
<td>1936</td>
</tr>
<tr>
<td>University of Western Australia</td>
<td>1911</td>
<td>1957</td>
</tr>
<tr>
<td>University of New South Wales</td>
<td>1949</td>
<td>1961</td>
</tr>
<tr>
<td>Monash University</td>
<td>1958</td>
<td>1961</td>
</tr>
<tr>
<td>Newcastle University</td>
<td>1965</td>
<td>1975</td>
</tr>
<tr>
<td>Flinders University of S.A.</td>
<td>1966</td>
<td>1970</td>
</tr>
</tbody>
</table>
3.5 Each medical school provides courses leading to the MB, BS degree; such graduates become registered medical practitioners after a further year in an approved hospital. In addition, each medical school carries out research in the preclinical, paraclinical and clinical disciplines. Medical graduates may proceed to Masters degrees and to the degrees of Doctor of Medicine and Doctor of Philosophy by research. Science graduates may proceed to the degree of Doctor of Philosophy or to Masters degrees by research, but not in clinical disciplines.

3.6 The medical schools also make a major contribution to research, both directly and by providing an essential continuum for the training of promising young investigators on graduation. In contrast to the more specialised research institutes, medical schools cover a wide range of topics and collectively possess a potential to develop innovations in fields not represented in the institutes. Some examples of first-class medical research in State universities are listed in Table 3.2. This Table is not intended to be complete, but it does provide an indication of the range of medical research within universities.

3.7 It is not possible to describe in this report the hundreds of research projects undertaken within medical schools. However, it is clear that many medical research scientists in Australian universities have established an excellent international reputation for their work, and that in some fields the progress made in this country leads the world. Endocrinology, neurophysiology and virology are fields in which Australian research is particularly well-developed, and this strength has resulted in practical advances in, for example, techniques of in vitro fertilisation and in the control of hepatitis.

3.8 The broad base of medical research in universities, and the large number of pursuits which are being followed, necessarily mean that the funds available for any particular pursuit are limited. In many instances medical research projects judged to be worthy of financial support through the external review and assessment processes of NH&MRC cannot be funded or can be funded only in part. This means that the research effort of university staff is impaired and must be less productive and less effective than it might otherwise be.

3.9 It is vital to maintain a high level of total activity in medical research within university departments, even while recognising that not all will achieve high international acclaim. The future practitioners of medicine must pass through departments in which research is in progress so that their attitudes to knowledge and to changes in understanding are appropriate for their future adaptation to advances in health care techniques. Moreover, it is from a broad base of relevant research that future useful advances will be made and it is from the broad base that pinnacles of future excellence will develop. The growth of some of the present group of world-class medical research endeavours has occurred from a background of less well-acknowledged research activity.

3.10 An illustration of the importance of the universities and their affiliated teaching hospitals in the training of future medical scientists is provided in Table 3.3. Less than ten percent of the training awards granted by the NH&MRC in 1979-81 were distributed outside the university sector.
<table>
<thead>
<tr>
<th>University</th>
<th>Fields of Medical Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelaide</td>
<td>Molecular biochemistry&lt;br&gt;Recombinant DNA technology&lt;br&gt;Psychiatry</td>
</tr>
<tr>
<td>Flinders</td>
<td>Neuroscience&lt;br&gt;Hypertension</td>
</tr>
<tr>
<td>Melbourne</td>
<td>Clinical Pharmacology&lt;br&gt;Hypertension&lt;br&gt;Immunogenetics (a)&lt;br&gt;Morphology of renal disease&lt;br&gt;Genetics of human disease&lt;br&gt;Microbiology/virology&lt;br&gt;Sensory neurophysiology</td>
</tr>
<tr>
<td>Monash</td>
<td>Reproduction and developmental physiology (a)&lt;br&gt;Neurophysiology (a)(b)&lt;br&gt;Endocrinology (a)&lt;br&gt;Neuropharmacology&lt;br&gt;Molecular biology&lt;br&gt;In vitro human fertilisation&lt;br&gt;Diabetes</td>
</tr>
<tr>
<td>Newcastle</td>
<td>Epidemiology</td>
</tr>
<tr>
<td>New South Wales</td>
<td>Neurology; headache&lt;br&gt;Biophysics of neuromuscular transmission&lt;br&gt;Psychophysics; sensation and movement&lt;br&gt;Vision&lt;br&gt;Cardio-thoracic medicine</td>
</tr>
<tr>
<td>Queensland</td>
<td>Gastroenterology&lt;br&gt;Neurology; pharmacokinetics</td>
</tr>
<tr>
<td>Sydney</td>
<td>Clinical neurology&lt;br&gt;Thoracic medicine&lt;br&gt;Immunology (a)&lt;br&gt;Developmental neuroscience</td>
</tr>
<tr>
<td>Western Australia</td>
<td>Epidemiology&lt;br&gt;Microbiology&lt;br&gt;Neuropathology&lt;br&gt;Audition&lt;br&gt;Fat absorption</td>
</tr>
</tbody>
</table>

(a) supported by NH&MRC Program Grant  
(b) now based at the Australian National University
TABLE 3.3

PERCENTAGE DISTRIBUTION OF NH&MRC TRAINING AWARDS 1979-81

<table>
<thead>
<tr>
<th>Award</th>
<th>Percentage distribution to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>universities</td>
</tr>
<tr>
<td>C.J. Martin Fellowships</td>
<td>70</td>
</tr>
<tr>
<td>Applied Health Sciences Fellowships</td>
<td>58</td>
</tr>
<tr>
<td>Research Scholarships</td>
<td>61</td>
</tr>
<tr>
<td>Australian Postdoctoral Fellowships*</td>
<td>67</td>
</tr>
<tr>
<td>Biomedical Postgraduate Scholarships*</td>
<td>88</td>
</tr>
</tbody>
</table>

* Awarded for the first time in 1981

THE JOHN CURTIN SCHOOL OF MEDICAL RESEARCH

3.11 In addition to the medical schools of the State universities there is the John Curtin School of Medical Research, which is one of the research schools of the Institute of Advanced Studies at the Australian National University. Its primary role is to carry out basic research in the sciences related to medicine, but it also has an important role in the training of graduates and to this end offers the degree of Doctor of Philosophy to appropriately qualified postgraduate research students.

3.12 The plans which led to the establishment of a national school of medical research took shape in 1944 during a visit to Australia by Sir Howard (later Lord) Florey. He commented on the unsatisfactory state of medical research in Australia, and developed ideas for an 'Australian National Institute for Medical Research'. Although Florey's views did not find unanimous support, they were accepted by the Commonwealth Government, and the Australian National University Act of 1946 contained specific provision for a medical research school, to be known as the John Curtin School of Medical Research.

3.13 In 1948-49 three professors were appointed to the School to head departments of Biochemistry, Microbiology and Medical Chemistry. At the time there was no accommodation available at the Canberra site, and the three began their work in space provided by, respectively, the Commonwealth Serum Laboratories, the Walter and Eliza Hall Institute, and the Wellcome Institution in London. By 1954 the School had a staff of 65 and temporary accommodation on the University campus. In 1957 the present permanent building was occupied.
3.14 The John Curtin School contains nine departments: Biochemistry; Clinical Science; Experimental Pathology; Human Biology; Immunology; Microbiology; Pharmacology; Physical Biochemistry; and Physiology. There is also a Medical Chemistry Group, and an Experimental Neurology Unit. In 1980 the total staff of the School was approximately 300, including 84 full-time research staff, 161 technical support staff, and 54 administrative and service staff; there were, in addition, 63 PhD students and 14 visiting scientists working at the School. The expenditure for 1980 was $8.6 million.

3.15 The school exists both for the conduct of medical research and for the training of graduates in medical research. Its training function needs to be emphasised because of the significant effect it has had and continues to have on the whole Australian medical research effort. For example, the Department of Physical Biochemistry has trained most of the physical biochemists who now hold senior positions in other Australian universities and the College of Pharmacy in Victoria. A new discipline of medical science, of particular relevance to clinical practice because it allows a clear understanding of the mechanisms of action of such important substances as insulin and haemoglobin, has developed in Australia from the training function of the School.

3.16 The objects of the John Curtin School were clearly defined by Florey when he held the position of adviser during its early years:

The objects of the School were (1) to establish an institution of the highest standards in which research would be done in the sciences which lie behind the practice of medicine and from which so much knowledge essential to medical progress is now coming, (2) to make the facilities as good as or better than those in the best laboratories of other countries, and for this purpose to construct a building and organization which would without additions meet the needs of a growing Australia for the next 25 years or so, (3) to establish an institution of such a size and excellence that those working in it would not feel scientifically isolated, and to make conditions such that a real interchange of working scientists could take place between Great Britain and the United States of America on the one hand and Australia on the other, (4) to endeavour to hold in Australia some of the many excellent scientists who would otherwise have made their careers overseas, and (5) to assist in raising the level of research in the State Universities by example and by assistance, and to train research workers who would go back to State Universities, into medical clinics, and into other research institutions [5].

3.17 In 1956 when Florey reviewed the progress made by the John Curtin School he wrote to the Council of the Australian National University:

The highest standards have been aimed at and the target has been hit [6].
This was also the view of an external committee of international scientists appointed by the University to review the operation of the School in 1976. The committee reported:

It is just over thirty years since The John Curtin School of Medical Research was established with the aim of providing a centre of research excellence and training in this field, which would compare with any in the world. Let us say at the outset that we have no doubts that this has been achieved and that the School has greatly enhanced both the development of Medical Science in Australia and given this country an enviable reputation in the medical sciences. Indeed several departments in the School are clearly world leaders in their fields [6].

3.18 The review committee also mentioned some of the difficulties facing the School. It stressed the importance of periodic review of research priorities and of uncovering new areas of research, and recognised the restraints placed on this process in an organisation with a high proportion of tenured academic staff. Following the appointment of a new Director of the School in 1980, some progress has been made in providing greater flexibility so that new programs of research can be initiated. The School is also developing its medical orientation through the appointment of a Professor of Clinical Science and by closer interaction with the Canberra medical community. A Director's Advisory Committee is being established; it will include several overseas medical scientists of international reputation, and will function as a board of directors for the School and provide advice on broad research priorities.

EXPENDITURE ON RESEARCH IN THE MEDICAL SCHOOLS

3.19 An estimate of expenditure on medical research in the tertiary education sector has been derived from information provided by the Tertiary Education Commission. The 'research-only' expenditure in faculties of medicine and dentistry for the calendar year is detailed in Table 3.4. The total expenditure was $24.417 million, of which 44 percent was provided through the Tertiary Education Commission in the form of recurrent, special research, and equipment grants, 30 percent by Commonwealth funding agencies including the NH&MRC and the Australian Research Grants Committee, two percent by State governments, and 23 percent through donations and non-government grants.

3.20 It is not certain that all expenditure included in Table 3.4 is related only to medical research. However, it is likely that any discrepancy would be more than balanced by expenditure on aspects of medical research in other faculties, particularly in departments of biochemistry, microbiology and physiology.

3.21 In addition to the 'research-only' expenditure, some proportion of 'teaching-and-research' expenditure should be accounted as support for medical research (it should be remembered that all expenditure by the John Curtin School of Medical Research is 'research-only' in contrast to medical schools of State
universities). Figures provided by the Tertiary Education Commission record a total 'teaching-and-research' expenditure of $60.7 million within faculties of medicine and dentistry in 1979. It is reasonable to assume that a minimum of ten percent of this expenditure should be accounted as being directed to medical research, making a total expenditure of $30.5 million on such research within the tertiary education sector. This estimate is close to the figure of $30.6 million provided by the Department of Science and Technology (see Table 2.2), although it is possible that both underestimate the true figure. If the importance of the medical schools in training future research staff is acknowledged, a much higher proportion of teaching-and-research expenditure might be accounted as support for medical research.

3.22 The medical schools were successful in 1979 in attracting approximately $5.8 million from the NH&MRC out of its total allocation of $13.4 million through a stringent system of external review and assessment, including two of the first three Program Grants to be awarded. This represents 35 percent of the schools' 'research-only' expenditure if the John Curtin School, which has not in the past sought NH&MRC grants, is excluded. In view of the reduction in tertiary education funding in real terms, increasing reliance is likely to be placed on the NH&MRC for the support of medical research in the tertiary education sector.

3.23 Some estimates of total expenditure and laboratory expenditure per principal investigator in Australian medical research are presented in Table 3.5. These figures should be contrasted with the average value of NH&MRC Project Grants awarded in the same year (1979), which was $16,827 (see Table 6.2). Even allowing for the fact that general university recurrent funds include a component for research, the emphasis on Project Grants as a means of supplying medical research must encourage its fragmentation (see paragraph 8.36).

**TABLE 3.5**

AVERAGE EXPENDITURES ASSOCIATED WITH MEDICAL RESEARCH IN AUSTRALIA, 1979

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Average expenditure per principal investigator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total expenditure</td>
</tr>
<tr>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Walter and Eliza Hall Institute</td>
<td>61,690</td>
</tr>
<tr>
<td>Howard Florey Institute</td>
<td>43,388</td>
</tr>
<tr>
<td>Queensland Institute of Medical Research</td>
<td>44,444</td>
</tr>
<tr>
<td>John Curtin School of Medical Research</td>
<td>50,722</td>
</tr>
<tr>
<td>Average</td>
<td>50,061</td>
</tr>
<tr>
<td>UNIVERSITY</td>
<td>INSTITUTION</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Sydney</td>
<td>Medicine</td>
</tr>
<tr>
<td></td>
<td>Dentistry</td>
</tr>
<tr>
<td>New South Wales</td>
<td>Medicine</td>
</tr>
<tr>
<td>Melbourne</td>
<td>Dental Science</td>
</tr>
<tr>
<td></td>
<td>Medicine</td>
</tr>
<tr>
<td>Monash</td>
<td>Medicine</td>
</tr>
<tr>
<td>Queensland</td>
<td>Dentistry</td>
</tr>
<tr>
<td></td>
<td>Medicine</td>
</tr>
<tr>
<td>Adelaide</td>
<td>Dentistry</td>
</tr>
<tr>
<td></td>
<td>Medicine</td>
</tr>
<tr>
<td>Flinders</td>
<td>Medicine</td>
</tr>
<tr>
<td>Western</td>
<td>Dentistry</td>
</tr>
<tr>
<td>Australia</td>
<td>Medicine</td>
</tr>
<tr>
<td>Tasmania</td>
<td>Medicine</td>
</tr>
<tr>
<td>ANU</td>
<td>John Curtin School</td>
</tr>
</tbody>
</table>

TOTAL 8.247 1.575 0.946 0.673 5.795 0.924 0.410 5.574 24.417

(a) ARGC - Australian Research Grants Committee
Source: Tertiary Education Commission
3.24 The figures presented in Table 3.4 demonstrate that the medical schools do attract substantial funds from non-government sources. Of the $5.574 million obtained in 1979, 80 percent was provided by foundations and private individuals, nine percent by Australian industry, and 11 percent by overseas sources.

4. INDEPENDENT AND HOSPITAL RESEARCH INSTITUTES

4.1 The independent and hospital research institutes make a major contribution to medical R&D in this country. Many were established as a result of bequests which nowadays make only a relatively minor contribution to the incomes of the institutes; most rely increasingly on grants from the Government through the National Health and Medical Research Council (NH&MRC). In general the institutes are affiliated with the adjacent university; certain staff members are given university titles and appropriately-qualified postgraduate students may carry out research leading to a higher degree. Again in general the institutes are affiliated with an adjacent hospital; but the extent of the interaction between an institute and its hospital varies greatly. Table 4.1 lists the major independent and hospital research institutes in Australia, their affiliations and their main fields of research.

4.2 The Walter and Eliza Hall Institute of Medical Research was established as a result of a decision of the Walter and Eliza Hall Trust to provide part of its income for the expenses associated with an independent medical research institute. The Institute began its operations in 1919 and rapidly expanded its work. It is now a major medical research establishment specialising in immunology, cancer, and molecular biology, and is affiliated with the University of Melbourne and with the Royal Melbourne Hospital.

4.3 The financial arrangements for the Institute have changed dramatically in the last fifty years. The income from the Walter and Eliza Hall Trust is little more than six thousand dollars per annum and represents an extremely small part of the total income of about $4 million per annum. Fifty-one percent of the income in 1979-80 was derived from the Commonwealth Government via the NH&MRC, nine percent from the Victorian Government, 10 percent from overseas sources and 30 percent from Australian non-government sources such as income from investments (12 percent), the Anti-Cancer Council of Victoria (three percent) and gifts and bequests.

4.4 The Howard Florey Institute of Experimental Physiology and Medicine was established as a result of initiatives by a group of leading citizens who wished to commemorate the work of Professor Lord Florey. The laboratories were built as a result of gifts and bequests from individuals and firms and of a grant-in-aid from the Commonwealth Government. The Institute was incorporated by Act of the Victorian Parliament in 1971, and is affiliated with the University of Melbourne. It specialises in endocrinology, behaviour, and hypertension.
<table>
<thead>
<tr>
<th>Institute</th>
<th>Affiliation</th>
<th>Specialisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walter &amp; Eliza Hall Institute of Medical Research</td>
<td>Royal Melbourne Hospital University of Melbourne</td>
<td>Immunology - cancer molecular biology</td>
</tr>
<tr>
<td>Howard Florey Institute of Experimental Physiology &amp; Medicine</td>
<td>University of Melbourne</td>
<td>Endocrinology - behaviour - hypertension</td>
</tr>
<tr>
<td>Baker Medical Research Institute</td>
<td>Alfred Hospital Royal Melbourne Monash University</td>
<td>Cardiovascular research - hypertension - artherosclerosis cardiovascular surgery</td>
</tr>
<tr>
<td>Prince Henry's Hospital Medical Research Centre</td>
<td>Prince Henry's Hospital Royal Melbourne Monash University</td>
<td>Reproductive Physiology - molecular biology</td>
</tr>
<tr>
<td>Royal Children's Hospital Research Foundation</td>
<td>Royal Children's Hospital University of Melbourne</td>
<td>Genetics - nutrition</td>
</tr>
<tr>
<td>Cancer Institute, Peter MacCallum Hospital</td>
<td>University of Melbourne Royal Melbourne Monash University</td>
<td>Cancer research</td>
</tr>
<tr>
<td>Queensland Institute of Medical Research</td>
<td>University of Queensland</td>
<td>Molecular biology - virology</td>
</tr>
<tr>
<td>Kanematsu Memorial Institute</td>
<td>Sydney Hospital University of Sydney</td>
<td>Cancer (leukaemia) research - hypertension</td>
</tr>
<tr>
<td>Garvan Institute of Medical Research</td>
<td>St Vincent's Hospital</td>
<td>Metabolic disorders - diabetes</td>
</tr>
<tr>
<td>Kolling Institute of Medical Research</td>
<td>Royal North Shore Hospital, University of Sydney</td>
<td>Immunology</td>
</tr>
<tr>
<td>Children's Medical Research Foundation</td>
<td>Royal Alexandra Hospital University of Sydney</td>
<td>Genetics - metabolic disorders - rubella</td>
</tr>
<tr>
<td>National Vision Research Institute of Australia</td>
<td>University of Melbourne</td>
<td>Visual Research</td>
</tr>
<tr>
<td>Dental Research Institute</td>
<td>Dental Hospital University of Sydney</td>
<td>Dental research</td>
</tr>
<tr>
<td>Ludwig Institute for Cancer Research - Sydney Cancer Therapy Branch</td>
<td>Royal Prince Alfred Hospital, University of Sydney</td>
<td>Cancer therapy</td>
</tr>
</tbody>
</table>
4.5 In 1980 the income of the Howard Florey Institute amounted to $2.25 million. Fifty-nine percent of this was provided by the Commonwealth Government via the NH&MRC, and seven percent by the Victorian Government. The University of Melbourne contributed five percent of the income. The remainder was received from private donors, foundations and associations, including seven percent from the US National Institute of Child Care and Human Development. The Institute has no hospital affiliation.

4.6 The Baker Medical Research Institute was established in 1926 as a biochemical research laboratory in association with the Alfred Hospital in Melbourne. It resulted from bequests from Thomas Baker and two of his family. The original Deed of Settlement provided for a minimum annual grant to be paid by the Trustees for the maintenance of the Institute; but the sums actually provided over the years have been much greater than the guaranteed minimum. The Institute is now an autonomous institution affiliated with Alfred Hospital and with Monash University. It specialises in cardiovascular research, hypertension, atherosclerosis, and cardiovascular surgery.

4.7 The annual grant from the Trustees of the Baker Benefactions is now of the order of $0.45 million or 24 percent of the total estimated income ($1.871 million) of the Institute in 1981. The Trustees are not, however, under any obligation to maintain the grant at this level. Approximately 30 percent of the Institute’s income is derived from the Commonwealth Government in the form of Program and Project Grants from the NH&MRC. The Victorian Government provides $0.16 million or about nine percent of the total income.

4.8 The Medical Research Centre of Prince Henry’s Hospital in Melbourne was established in the late fifties as a result of initiatives from the medical staff of the hospital and with the financial support of the community and the hospital itself. The Centre is an integral part of the Hospital and as such was automatically affiliated with Monash University in 1962. Its major function is the conduct of research but it does provide a number of laboratory services for the Hospital. Its research is concentrated in the areas of endocrinology, reproductive physiology and molecular biology.

4.9 The Centre has an income of about $1.0 million per annum. Approximately 44 percent of this comes from the Commonwealth Government as Project Grants and one Program Grant from the NH&MRC. The Victorian Government has been requested to increase its grant to $0.1 million and if this is agreed it will be 10 percent of the total income. The income also includes $0.2 million for services rendered (that is, laboratory services for the Hospital and practitioners); this would contribute about 19 percent but is largely offset by the cost of performing the services. The remainder of the income comes from investments, donations, small grants, and so on. It may also be noted that the Hospital provides the Centre with a hidden subsidy in the form of power, telephones, insurance, and other services.
The Research Foundation of the Royal Children's Hospital in Melbourne was established in 1960 to administer and to finance all research within the Hospital. The Foundation is registered under the Companies Act, and is affiliated with the University of Melbourne. The Foundation co-ordinates the work of several Hospital departments investigating diseases and respiratory, circulatory and hormonal disorders of children, but genetic research is now its main research activity, especially the biochemistry of inborn errors of metabolism.

The Research Foundation's main source of income is an annual transfer of funds from the Royal Children's Hospital amounting to 40 percent of its Good Friday Appeal. In 1981 the sum transferred was $0.64 million, equivalent to 54 percent of total income. Grants from the NH&MRC were nearly $0.19 million or 16 percent of income, and a special equipment grant from the Hospital of $0.1 million accounted for another eight percent. The remaining income was obtained in the form of smaller grants, bequests and donations.

The Cancer Institute was founded as a statutory body by an Act of the Victorian Parliament in 1948 as a result of proposals by the Anti-Cancer Council of Victoria for a specialist centre devoted to cancer treatment and research. The Institute is affiliated with the University of Melbourne and with Monash University, and its treatment centre, the Peter MacCallum Hospital, is undertaking several programs of research into the causes and treatment of various types of cancer. The Institute spent approximately $1.0 million on research in 1980-81, but it is not possible to determine the sources of these funds except for $0.15 million obtained from donations and bequests for research. The main sources of funds for the Institute's treatment activities are grants from the Commonwealth and Victorian Governments.

The Queensland Institute of Medical Research was established by Act of the Queensland Parliament in 1946. Its foundation followed representations by Dr E.H. Derrick on the need for a laboratory devoted to full-time research into problems of special importance in northern Australia. The Institute, which was originally funded almost entirely by the Queensland Government, has always had a close working relationship with the University of Queensland. Formal agreements have been concluded for closer affiliation with the University and with the North Brisbane Hospitals Board. The Institute specialises in cancer research, virology, parasitology, and molecular biology.

The Queensland Government continues to be the major source of income for the Institute; but its percentage contribution to the income has been gradually falling. In 1981 the Queensland Government is providing $1.61 million or about 66 percent of the total income of $2.45 million. In recent years the Commonwealth Government has been providing an increasing percentage of the Institute's income. This has occurred by the award of Project and Program Grants through the National Health and Medical Research Council. The Commonwealth now provides about 18 percent of the Institute's income, the remainder being from the Queensland Cancer Fund (four percent) and from donations and investments.
4.15 The Kanematsu Memorial Institute in Sydney was established with funds provided by the shareholders of F. Kanematsu (Australia) Limited as a memorial to the founder of the company and his wife. It was officially opened in 1933, and initially its main function was to supply the routine pathology services of Sydney Hospital. However, in 1935 the Board of Directors of Sydney Hospital decided that the Institute should also undertake research, and by 1958 several programs of clinical research had been developed and the Institute reorganised into departments of clinical pathology and medical research.

4.16 The Institute remains an integral part of Sydney Hospital and is thus affiliated with the University of Sydney. Within the medical research department there are seven units undertaking research, much of which is clinically oriented, in fields which include leukaemia, the circulation, renal malfunction and the immunology of tumour cells. The department continues to provide a range of clinical and diagnostic services to the hospital. In 1980-81, total expenditure by the department was $1.32 million, of which $0.75 million was directed to research. Of the research expenditure, 65 percent was provided through the Sydney Hospital, mostly in the form of salaries of scientific and technical staff who perform routine service work but also undertake research, and as the salaries of administrative staff and the cost of maintenance items. The Institute also received grants from the NH&MRC totalling 15 percent of research expenditure, and other grants amounting to 14 percent.

4.17 The Garvan Institute of Medical Research was established with funds raised during the centenary appeal of St Vincent's Hospital, Sydney, in 1957. It was officially opened in 1963, and functions as a largely autonomous division of the Hospital. The Institute's research programs are concerned primarily with various aspects of endocrinology, and there is a strong emphasis on the study of diabetes and its treatment. The Institute also provides diagnostic assays and services for patients at St Vincent's, and supplies hormone assays for 74 referring hospitals in New South Wales.

4.18 Total expenditure by the Garvan Institute in 1980 was $1.12 million, of which expenditure on research was $0.67 million. Of the research expenditure, $0.25 million equivalent to 37 percent, was obtained in the form of fees for assays and rent for assay facilities within the Institute. Project Grants awarded by the NH&MRC amounted to 29 percent of research expenditure, and fellowships and other research grants and contracts totalled 14 percent.

4.19 The Kolling Institute of Medical Research has no formal constitution but functions as a department of the Royal North Shore Hospital. The Institute's Director is responsible to the Hospital Board in administrative matters, and to the Hospital's Medical Research Council in research and scientific matters. The appointment of the first full-time Director in 1974 was accompanied by a reorganisation of the Institute so that instead of being multidisciplinary, its research activities had a central theme of immunology and related branches of medical science. It provides services in clinical immunology to the Royal North Shore Hospital and to the northern region of Sydney.
4.20 The Kolling Institute's expenditure on medical research in 1981 was approximately $0.38 million, of which $0.15 million or 40 percent was obtained through a Program Grant awarded by the NH&MRC. Fees for assay and other services accounted for 34 percent, a grant from the United States National Cancer Institute 16 percent, and the NSW State Cancer Council eight percent.

4.21 The Children’s Medical Research Foundation, Sydney, was established in 1958 at the initiative of the late Sir Lorimer Dods. A committee including prominent Sydney men and women was organised with a brief to establish a research foundation to support and conduct research into the disorders of infancy and childhood. An initial public appeal raised the equivalent of $0.42 million, and a small research facility was built in the grounds of the Royal Alexandra Hospital for Children.

4.22 For many years there has been a close relationship between the Children’s Medical Research Foundation and the Commonwealth Government’s Institute of Child Health. The latter functioned as the Department of Child Health of the University of Sydney, and is also situated in the grounds of the Royal Alexandra Hospital for Children. The Director of the Foundation is also Director of the Research Unit of the Institute of Child Health and it is proposed that the two research groups will merge into an integrated unit following the Government’s decision that direct support of the Institute will cease at the end of September 1981. The Foundation’s research programs are under review, but major research programs are planned in lymphocyte and developmental biology and in neurobiology.

4.23 The income available to the Children’s Medical Research Foundation for research in 1980-81 was $0.88 million, of which 73 percent was derived from interest and dividends on its capital fund of $6 million. Donations and contributions amounted to 25 percent and NH&MRC and other grants to two percent.

4.24 Financial information relating to the institutes described in the paragraphs above is summarised in Table 4.2
# TABLE 4.2
INDEPENDENT AND HOSPITAL RESEARCH INSTITUTES

<table>
<thead>
<tr>
<th>Institute</th>
<th>State</th>
<th>Most recent annual research income or expenditure $million</th>
<th>Contribution from Commonwealth Government* $million</th>
<th>Contribution from State Government $million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall</td>
<td>Vic</td>
<td>4.010</td>
<td>2.034</td>
<td>0.360</td>
</tr>
<tr>
<td>Florey</td>
<td>Vic</td>
<td>2.250</td>
<td>1.350</td>
<td>0.165</td>
</tr>
<tr>
<td>Baker</td>
<td>Vic</td>
<td>1.871</td>
<td>0.454</td>
<td>0.160(a)</td>
</tr>
<tr>
<td>MRC Prince Henry's</td>
<td>Vic</td>
<td>1.050</td>
<td>0.466</td>
<td>0.100(a)(b)</td>
</tr>
<tr>
<td>Royal Children's Hospital Research Foundation</td>
<td>Vic</td>
<td>1.192</td>
<td>0.189</td>
<td>nil(a)</td>
</tr>
<tr>
<td>Cancer Institute</td>
<td>Vic</td>
<td>1.000</td>
<td>not known</td>
<td>not known</td>
</tr>
<tr>
<td>Queensland Institute</td>
<td>Qld</td>
<td>2.445</td>
<td>0.434</td>
<td>1.610</td>
</tr>
<tr>
<td>Kanematsu</td>
<td>NSW</td>
<td>0.752</td>
<td>0.112</td>
<td>0.491(a)(c)</td>
</tr>
<tr>
<td>Garvan</td>
<td>NSW</td>
<td>0.674</td>
<td>0.194</td>
<td>0.248(c)</td>
</tr>
<tr>
<td>Kolling</td>
<td>NSW</td>
<td>0.384</td>
<td>0.153</td>
<td>0.130(a)(c)</td>
</tr>
<tr>
<td>Children's Medical Research Foundation</td>
<td>NSW</td>
<td>0.881</td>
<td>0.015</td>
<td>nil</td>
</tr>
</tbody>
</table>

* Via the National Health and Medical Research Council
(a) Plus significant benefits via the Hospital
(b) Amount requested
(c) Amounts raised as fees for diagnostic assays and other services
5. GOVERNMENT HEALTH LABORATORIES

5.1 The Commonwealth Government has established several laboratories to provide particular services in health or medicine, and some of these undertake medical R&D in association with their service or training functions. These laboratories, which are listed below, form part of the Commonwealth Department of Health and are responsible to the Director-General of Health and to the Minister for Health.

- Commonwealth Institute of Health
- Institute of Child Health
- National Acoustics Laboratories
- Ultrasonics Institute
- Australian Radiation Laboratory
- National Biological Standards Laboratory
- Australian Dental Standards Laboratory

In addition, the Department of Health has responsibility for a Health Services Research and Development Grants Program.

5.2 The Commonwealth Serum Laboratories is a statutory authority, responsible to the Minister for Health. Its primary function is to produce, buy, import, supply, sell or export prescribed pharmaceutical products (such as vaccines, antitoxins, insulin) for human or veterinary use. As prescribed by its Act the Commission undertakes medical and veterinary R&D in relation to pharmaceutical products of the type manufactured or produced, or as determined by the Minister for Health.

5.3 Several other Commonwealth laboratories undertake or support research in fields related to the medical sciences. The most important of these are:

- Research Establishment, Australian Atomic Energy Commission
- CSIRO Division of Human Nutrition
- CSIRO Molecular and Cellular Biology Unit
- CSIRO Division of Protein Chemistry
- Department of Veterans' Affairs
- Department of Defence Malaria Research Unit

Many other laboratories also have some research in progress which is of significance to medicine.

5.4 The Commonwealth Institute of Health is the Commonwealth's major agency for education, training and research in public health, occupational health, preventive medicine and tropical medicine. It was formed in 1980 from the School of Public Health and Tropical Medicine; this had been established in 1930 by the Department of Health and the University of Sydney.
5.5 The Institute continues to be closely associated with the University and is located on the campus. Many members of the staff hold joint appointments and use university titles. The Institute is responsible for the course-work leading to the Diploma in Tropical Health and for the course-work and research supervision leading to the degree of Master of Public Health. Teaching and research is organised within six sections: Epidemiology and Biostatistics; Human Nutrition; Occupational and Environmental Health; Preventive and Social Medicine; Public Health Biology; and Tropical Medicine.

5.6 The annual expenditure of the Institute was $3.12 million in 1980-81 of which approximately $1.1 million was directed to medical R&D; the remainder was associated with its educational and consulting functions.

INSTITUTE OF CHILD HEALTH

5.7 The Institute of Child Health was established within the University of Sydney in 1948 to meet a perceived need at that time to promote research and teaching in the problems associated with children. A clinical unit was established in the Royal Alexandra Hospital for Children and the Institute is now located in the grounds of the Hospital. Departments of Child Health have since been established in all medical schools and the need for special Commonwealth involvement has disappeared. The present arrangements for the Institute will cease at the end of 1981. Negotiations concerning the future of the Institute and its staff have been in progress for some time. The NH&MRC has recently agreed to provide support for the four members of the Research Unit of the Institute for the next two years, pending absorption of the Unit within the Children's Medical Research Foundation.

5.8 The Director of the Institute is also the Professor of Child Health and there is a close working relationship between the Institute and the University. The annual expenditure is of the order of $0.63 million, some $0.52 million of which is direct Commonwealth expenditure. Expenditure on R&D in 1980-81 was about $0.25 million, of which $0.04 million was provided in the form of Project Grants from the National Health and Medical Research Council (NH&MRC).

NATIONAL ACOUSTIC LABORATORIES

5.9 The Acoustic Testing Laboratory was established in 1943 by the NH&MRC to meet the perceived need at that time for the study of the problems of noise in relation to members of the armed forces. The terms of reference were later expanded and the laboratory became a branch of the Commonwealth Department of Health. It became the National Acoustic Laboratories in 1973.

5.10 The National Acoustic Laboratories undertake research and development into a range of noise and acoustic problems but their prime concern is audiological services, the design, testing, fitting and maintenance of hearing aid devices. Hearing Centres have been established at a number of cities and these maintain programs throughout Australia to evaluate hearing disorders and to monitor the effectiveness of the aids and of special rehabilitation procedures.
Expenditure on R&D by the National Acoustic Laboratories is of the order of $0.8 million per annum; but the service functions of the Laboratories account for the major part of the overall expenditure of $2 million.

5.11 Following the recent Review of Commonwealth Functions, the Government has decided that in the future the production of NAL hearing aids will be carried out by the private sector with Australian firms tendering for their manufacture and assembly. The National Acoustic Laboratories will continue to fit and repair aids for eligible persons.

ULTRASONICS INSTITUTE

5.12 The Ultrasonics Institute was established in 1975 although there had been an ultrasonics research section within the Acoustic Laboratories since 1959. The Institute, which is a branch of the Commonwealth Department of Health, was established to meet a perceived need at that time to develop instrumentation and techniques for the application of ultrasonic waves in medical diagnosis.

5.13 The Institute has attracted international recognition in developing the technology of ultrasonic diagnosis, which is now well established in clinical practice. Further developmental work is proceeding, aimed at expanding the range of diagnoses possible with ultrasound. The Institute's annual expenditure on ultrasonics R&D is of the order of $0.73 million, all obtained from the Commonwealth Government via the Department of Health. Royalties received over the last three years by the Government on equipment developed in the Institute total more than $0.8 million.

AUSTRALIAN RADIATION LABORATORY

5.14 In 1929 the Commonwealth Radium Laboratory was established within the University of Melbourne to ensure that the national supply of radium was properly and safely stored and to provide a radium and radon service to hospital clinicians for the treatment of patients with cancer. The functions have changed with the years and the Laboratory is now known as the Australian Radiation Laboratory. It is concerned with the public and occupational health implications of radiation, including alpha-rays, gamma-rays, x-rays, and microwave, laser and ultraviolet radiation. Much of its work is directed towards improving the understanding and practice of radiation protection in Australia.

5.15 The total annual expenditure by the Australian Radiation Laboratory is of the order of $2.75 million. Expenditure on R&D was $2.02 million in 1980-81, equivalent to 73 percent of the total.

NATIONAL BIOLOGICAL STANDARDS LABORATORY AND AUSTRALIAN DENTAL STANDARDS LABORATORY

5.16 The National Biological Standards Laboratory was established in 1958 to provide the scientific expertise necessary to ensure the safe and effective use of
therapeutic goods in Australia. The Australian Dental Standards Laboratory was formed in 1952 to ensure the safe and effective use of dental materials and implements. It became a Laboratory within the National Biological Standards Laboratory and under the same Director in 1979.

5.17 Total annual expenditure for the National Biological Standards Laboratory (including the Australian Dental Standards Laboratory) is of the order of $4.3 million; expenditure on research and development was $2.08 million in 1980-81.

5.18 Financial information relating to the laboratories described in the paragraphs above is summarised in Table 5.1.

<table>
<thead>
<tr>
<th>Laboratory</th>
<th>State</th>
<th>Annual Expenditure for 1980-81 Total $million</th>
<th>R&amp;D $million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commonwealth Institute of Health</td>
<td>NSW</td>
<td>3.124</td>
<td>1.100</td>
</tr>
<tr>
<td>Institute of Child Health</td>
<td>NSW</td>
<td>0.625</td>
<td>0.250</td>
</tr>
<tr>
<td>National Acoustic Laboratories</td>
<td>NSW</td>
<td>2.008</td>
<td>0.804</td>
</tr>
<tr>
<td>Ultrasound Institute</td>
<td>NSW</td>
<td>0.731</td>
<td>0.731</td>
</tr>
<tr>
<td>National Biological Standards Laboratory and Australian Dental Standards Laboratory</td>
<td></td>
<td>4.291</td>
<td>2.077</td>
</tr>
<tr>
<td>Australian Radiation Laboratory</td>
<td>Vic</td>
<td>2.750</td>
<td>2.015</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>13.529</td>
<td>6.977</td>
</tr>
</tbody>
</table>
HEALTH SERVICES RESEARCH AND DEVELOPMENT

5.19 The Hospitals and Health Services Commission, established in 1973, initiated a Health Services Planning and Research Program to support research into the planning, organisation, management and evaluation of health services. The aims of the research were to:

- provide a source of data on health costs and expenditures as well as on the quality of health services; and


5.20 Total funds made available for the Program were approximately $1 million per annum. About half of this was provided to State governments on a $2 for $1 basis to expand their health services planning agencies, and the remainder used to support research in universities on the evaluation of health services and other research contracted out by the Commission.

5.21 In 1978 the Hospitals and Health Services Commission was disbanded, and responsibility for the Commonwealth Government's involvement in health services research passed to the Department of Health. The current program includes the support of Health Services Research, involving some aspects of existing health services, and Health Services Development Projects, which are usually small-scale demonstration projects to test new or improved health services. Grant applications are sought by the Department from State health authorities, hospitals, educational institutions, companies and individuals, and are referred to external assessors as well as being subject to internal review within the Department; the assessment procedure allows for referral of comments to applicants and modification of projects. A small number of projects are commissioned by the Department.

5.22 In 1980-81, 42 research projects and 28 development projects were supported under the program at a total cost of $1.48 million. Further details are provided in Appendix A.

COMMONWEALTH SERUM LABORATORIES

5.23 The Commonwealth Serum Laboratories was established in 1916 to produce vaccines, antitoxins, sera and other biological materials for human use. Two years later the range of materials was extended to include some for veterinary use. The Laboratories further expanded and, in 1961, was reconstituted under a Commission as a statutory authority responsible to the Minister for Health. The Act was amended in 1980.
5.24 The Commonwealth Serum Laboratories has a statutory obligation under the Act:

(a) to conduct research in relation to prescribed pharmaceutical products;
(b) where the Minister so determines to conduct research in relation to other pharmaceutical products; and
(c) where the Minister so determines to operate 'Reference Centres' in collaboration with other organisations.

Research projects under (a) are concerned with products and have commercial implications; these are funded by the Commission. Research projects under (b) are product-related with commercial potential and the monies provided are subject to repayment to the Government from profits earned when commercially viable results ensue. Projects under (c) are of a service nature and are funded by the Government. In recent years the total R&D expenditure has been budgeted at approximately 10% of sales; in 1980-81 the total expenditure on R&D was $3.91 million.

OTHER COMMONWEALTH GOVERNMENT ORGANISATIONS

5.25 Medically-related R&D undertaken by other Commonwealth Government organisations is described in Appendix C. The most significant organisation in terms of expenditure is the CSIRO Division of Human Nutrition with an annual research budget of approximately $2.2 million. Annual expenditure on medically-related R&D by the other organisations listed in paragraph 5.3 is of the order of $2.5 million in total.

6. THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL

6.1 The Constitution agreed by the Australian States at the time of Federation did not provide for any powers to be vested in the Commonwealth Government in relation to public health or to health care. There was, however, a reference to Commonwealth powers over national quarantine measures, and the Quarantine Act of 1908 marks the first involvement of the Commonwealth Government in any aspect of the nation's health. This was soon followed in 1910 by the establishment of the Institute of Tropical Medicine in Townsville, the beginning of Commonwealth support for medical research. In 1914 the administration of the Institute passed from the University of Sydney to the Commonwealth Department of Home and Territories, and in 1916 the Commonwealth assumed further responsibility for medical research with the establishment of the Commonwealth Serum Laboratories to produce vaccines and therapeutic sera. The formation of the Commonwealth Department of Health in 1921 confirmed the Commonwealth Government's participation in matters of public health and in the funding of medical research.
6.2 By 1926 a Royal Commission on Health had recommended that a Federal Health Council be formed to act as a forum for communication and co-ordination between the Commonwealth and State departments of health. The Commission also recommended that a Medical Research Council, based on the British model, be established to fund and to undertake research on behalf of departments of health. In the event, only the Federal Health Council was formed. Ten years later, in 1936, the Government reviewed the Commission's recommendations, and the National Health and Medical Research Council (NH&MRC) came into being to combine the functions of co-ordinating health policies and providing advice on national health issues, with the function of promoting and providing funds for research in the medical sciences.

6.3 The present structure of the NH&MRC was determined by an Order in Council in 1975. The Council is chaired by the Commonwealth Director-General of Health. It has 24 members, including two representatives of the Commonwealth Department of Health, one representative of each State health department and of the Commonwealth Serum Laboratories Commission, ten members who are nominees of medical organisations or professional colleges, one nominee of the Australian Federation of Consumer Organisations, one of Australian universities with medical schools, and two eminent lay persons. There are also three co-opted members of the Council, representing the Northern Territory Department of Health, the nursing profession, and the Australian Academy of Science.

6.4 The NH&MRC provides advice to Commonwealth and State Governments on public health legislation and its administration, on matters related to public health, medical and dental care and medical research, and on the merits of new methods of treatment or cures for which recognition is sought. Advice may also be extended to medical organisations, educational institutions and industry. The NH&MRC's principal activities are undertaken by three standing advisory committees covering the fields of public health, medicine and medical research. The advisory committees, in turn, are supported by a network of sub-committees and working parties. At present some 400 people are serving on approximately 60 such groups. A committee structure is shown in Figure 6.1.

6.5 The NH&MRC meets, on average, twice each year to consider reports prepared by its main advisory committees and to make recommendations and prepare advice. It is serviced by a secretariat located within the Department of Health.

6.6 The functions of the NH&MRC related to medical R&D are carried out primarily by its Medical Research Advisory Committee (MRAC). This committee is composed of between eight and fourteen part-time members together with the Secretary of the NH&MRC. Its main business is to receive and consider applications for NH&MRC grants and fellowships and to make recommendations to the Council for the distribution of monies allocated to the Medical Research Endowment Fund. In practice, the recommendations of the MRAC, on urgent matters, are forwarded through the Chairman of the NH&MRC to the Minister for Health without reference to the Council, although the latter retains responsibility for determining general policy on the support of medical R&D.
FIGURE 6.1

Organisation of the National Health and Medical Research Council and its Committees

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL

Executive Committee

Publications Committee

Medical Research

Therapeutic Methods

Allergic Diseases Research

Public Health

Medicine

Epidemiology

Research

Forward Planning

Advisory Committees

Subcommittees of Advisory Committees

Committees

Executive

Research Fellowships

Ethics in Clinical Research

Epidemiology

Regional Grants

Co-ordination

(ARGC/NIHRMRC)

Subcommittees of Committees

Project Grants

Scholarships

Medical Research

Forward Planning

Research Institutions' Committees

Howard Florey Institute Board

Howard Florey Institute

Appointments Committee

Research and Ethics Board

Walter and Eliza Hall Institute Board

Walter and Eliza Hall Institute Appointments Committee

Regional Grants

Co-ordination

(ARGC/NIHRMRC)

Research

Applications

(Allocation)

Research

Institutions' Committees

Howard Florey Institute Board

Howard Florey Institute

Appointments Committee

Research and Ethics Board

Walter and Eliza Hall Institute Board

Walter and Eliza Hall Institute Appointments Committee

Regional Grants

Co-ordination

(ARGC/NIHRMRC)

Research

Applications

(Allocation)

Research

Institutions' Committees

Howard Florey Institute Board

Howard Florey Institute

Appointments Committee

Research and Ethics Board

Walter and Eliza Hall Institute Board

Walter and Eliza Hall Institute Appointments Committee

Regional Grants

Co-ordination

(ARGC/NIHRMRC)

Research

Applications

(Allocation)
6.7 The system of external review and assessment of Project Grant applications operated by the MRAC involves the assessment of each application by at least two appropriate, independent assessors, followed by a face-to-face interview of the applicant by one of the Regional Grants Interviewing Committees which visit each State capital and Newcastle. On the basis of the application itself, assessors' ratings, and performance at interview, the Interviewing Committee gives the application a scientific rating according to a standard scale, and recommends an appropriate budget. Available funds are allocated to those applications which achieve the highest ratings. The interview plays an important part in determining the scientific value of the project. It is also considered to be highly advantageous to successful applicants in assisting them to achieve the full potential of the project, and for unsuccessful applicants in drawing attention to, and discussing, shortcomings in hypotheses, research plans and proposed methodologies.

6.8 The MRAC is also charged with the responsibility of reviewing medical and dental research at least every three years, and reporting to the Council on trends and developments and on fields of research most in need of financial support. Two recent reports, entitled 'Case for the Future Development of Medical Research in Australia' and 'Case for Funds for Medical Research in 1982', have concentrated almost exclusively on medical R&D supported by the NH&MRC. Since this research represents only about one quarter of the total (see paragraph 6.30), the major part of Australia's medical R&D effort is not subject to review through the MRAC mechanism.

6.9 Furthermore, the requirement to assess each year the large number of applications, more than 750 in 1981, places an enormous burden on the MRAC and its secretariat. Although the assessment and interview procedures are carried out by medical scientists, the MRAC is responsible for the details of the organisation of the review and assessment system, and for the development of final decisions on the distribution of funds. Because of these responsibilities it is unlikely that a part-time MRAC will ever be in a position to overview the total Australian medical R&D effort and to formulate a long-term policy for its development.

6.10 An estimate has been made of the administrative costs of the operation of the MRAC. The cost of administering grants for medical R&D is estimated to be $0.17million in 1981-82, and the cost of the assessment procedures to be $0.26million. The total estimate of $0.43million includes a salary component for a proportion of the officers of the NH&MRC secretariat within the Department of Health, and the cost of travel by these officers and by members of the MRAC and its major sub-committees. It does not include indirect costs of administering the grants, which are borne by the Department, nor any estimate of the value of the voluntary contribution of time made by medical scientists. The estimated cost is equivalent to two percent of the research funds allocated to the Medical Research Endowment Fund in 1981.
NH&MRC SUPPORT FOR MEDICAL RESEARCH

6.11 At the time the NH&MRC was established, medical research in Australia relied heavily on public benefaction for its financial support and encouragement. Apart from the Commonwealth institutes, which had been formed to undertake specific tasks, the main centres for medical research were the Walter and Eliza Hall Institute in Melbourne, the Kolling Institute at the Royal North Shore Hospital in Sydney, and the Kanematsu Memorial Institute at Sydney Hospital. State governments did not undertake medical research themselves, and at that time they gave little direct support to research in the university schools of medicine. The founding of the NH&MRC, with its allotted function of assessing and selecting research for government support, placed medical research in a special position compared with other fields of science. There are now several Commonwealth funding schemes to promote and finance research in areas such as energy and the marine sciences, but for nearly 30 years, until the formation of the Australian Research Grants Scheme in 1965, the NH&MRC was the only mechanism by which individual investigators could receive direct government support for their research.

6.12 The NH&MRC based its funding policy on the need to support both the most promising research, much of which was undertaken in the 'private' research institutes, and the most able investigators, many of whom were located in these institutes or within university schools of medicine. A pattern was established of funding research projects of exceptional merit and providing a range of fellowships and postgraduate grants.

6.13 Project Grants are the Council's main avenue for the support of research projects in universities, medical schools, hospitals and research institutions. The Council's policy is that the duration of such support should not normally exceed three years: a single, clearly defined, project may be expected to have been completed in this time. A further question, leading to a new project proposal, may of course arise as a result of the completion of the preceding one.

6.14 A Project Grant is an award for the support of a scientific investigation proposed by one or more members of the staff of an institution. The grant may cover salaries, purchase of equipment, travel and the costs of experimental animals; administration and accounting are the responsibility of the institution. Applications for Project Grants are assessed through an external review and assessment process, and the Medical Research Advisory Committee maintains a large network of external referees.

6.15 A Program Grant, of which eight have been awarded since the scheme's inception in 1979, is designed to acknowledge scientific excellence by providing longer term more flexible support for a research team than is available through the Project Grant system. It is awarded to the principal investigator of a team for the purpose of achieving specified goals within the period of the grant, which is normally five years. The designated program of research may comprise separate but interrelated projects, and a Program Grant can be considered as a consolidated series of Project Grants which give researchers advantages in continuity and flexibility of funding. Unlike Project Grants, the NH&MRC does not advertise for Program Grant applications. Instead, it identifies potential Program Grant recipients at the time of the Regional Grants Interviews each year, and a personal invitation for the applicant to submit a detailed Program
Grant application is then forwarded. An NH&MRC site visit committee then visits the applicant to discuss the proposed research program, the facilities available, other sources of funds, and the budget requested.

6.16 Development Grants provide bridging support between fundamental biomedical research and the application of research results to the community. Projects suitable for this type of grant are either identified at the time of the Project Grants Interview each year, or a separate application may be invited for areas of need identified by the Council from time to time. If an application attains a satisfactory level of scientific merit, the project is given short-term support to enable the applicant to develop procedures and/or equipment to a stage where it becomes useful in health care delivery or becomes commercially viable.

6.17 Support for Research Units and Special Fellows was introduced by the Council in the mid 1970s to encourage the development of research activities in selected areas where national needs were not being met. The support is usually provided for a fixed term to build up the research to a level where it is able to compete for other forms of NH&MRC funding. This category of grant has been used to promote research into renal diseases; social psychiatry; epidemiology; health economics; traffic accidents; rheumatology; and cardiology.

6.18 Full-time Research Fellowships are provided by the Council to offer some degree of security for high calibre research scientists, and are normally awarded for five years in the first instance. These posts are available in NH&MRC-supported research institutions, special research units, in association with Program and Project Grants and as special research fellowships in particular areas of research. The levels of appointment, which correspond to academic positions, are Senior Principal Research Fellow (Professor), Principal Research Fellow (Reader or Associate Professor), Senior Research Fellow (Senior Lecturer) and Research Fellow (Lecturer). Research Fellowships also play an important role in attracting world-renowned investigators to undertake a period of research at Australian institutions.

6.19 Special Investigations Grants enable the NH&MRC to support medical studies of considerable scientific importance but which do not necessarily involve laboratory research. The Council has, for example, supported important public health surveys to determine the amount of pesticide residues in marketed foods, and has recently sponsored the extension of monitoring to include mercury, cadmium and other heavy metals. It has also supported regular surveys into the microbiological status of foods. Funds provided under this category have supported a national study of blood pressure, an Australian trial of chemotherapy alone versus immunotherapy plus chemotherapy of adult leukaemia, a survey of per capita radiation doses arising from the use of radiation in medicine, and the establishment of a reference laboratory for strains of the bacterium Escherichia coli.

6.20 The NH&MRC also provides Block Grants to independent research institutes. At present, only two institutes are so funded. The Council agreed in 1968 to provide a grant to the Walter and Eliza Hall Institute of Medical Research on a triennial basis, and in 1972 the arrangement was changed to a Block Grant provided on a five-year basis. The Council also agreed to provide special support over a triennium to the Howard Florey Institute of Experimental Physiology and
Medicine, and this Institute now receives a five-year Block Grant. Each Institute is subject to a periodic review of its scientific work by a panel comprising Australian and overseas researchers whose international standing in the relevant fields is acknowledged. Each panel then reports to the NH&MRC, which decides whether the Institute's grant should be renewed, and at what level. The last quinquennial review of both Institutes took place in 1979.

6.21 In addition to the various categories of grants for research, the NH&MRC provides a range of fellowships and scholarships which are available to individual investigators or students. Generally, the fellowships are awarded to outstanding researchers to enable them to further their training or to travel overseas and expand their expertise in a particular field of study. The scholarships encourage gifted students to enter research in the medical sciences, and also provide the early stages of a career structure until a researcher's work is sufficiently developed to allow competition for a project or other research grant.

6.22 The C.J. Martin Research Fellowships, the most prestigious, are awarded to young investigators of outstanding ability for work on specified research projects in the biomedical sciences, often in the laboratory of a nominated adviser. They are normally awarded to candidates under 35 years of age, and are tenable for three years, the first two of which are usually spent overseas and the third in Australia.

6.23 The Applied Health Sciences Fellowships provide training in scientific research methods, including those of the social and behavioural sciences, which can be applied to clinical or community medicine. This might include research into, for example, allergic diseases, bio-statistics, clinical aspects of surgery, economics and evaluation of health care or health services, epidemiology, human genetics, nutrition, or psychiatry. The main requirements are that the applicant has an aptitude for and interest in applied research, a specific study plan, affiliation with an overseas investigator or institution for the study, and reasonable prospects of a responsible position in Australia on completion of the three-year Fellowship. Fellowships are not available for training in clinical techniques.

6.24 The Council's Australian Postdoctoral Fellowships are designed to provide a means for training research students in clinical and biomedical research within Australia and to encourage those of outstanding ability to make medical research a full-time career. The awards, tenable for up to three years, are for work under a nominated adviser and are often associated with research which is supported through an NH&MRC grant.

6.25 The Medical and Dental, and the Biomedical, Postgraduate Research Scholarships are awarded to enable graduates to undertake full-time research, including studies approved for higher degrees. The former are awarded to graduates in medicine and dentistry initially for one year with the possibility of annual renewal up to a maximum of three years, while the Biomedical Scholarships are awarded to non-medical graduates and are for three years' duration. The NH&MRC also provides a small number of undergraduate scholarships each year to enable medical students to undertake the additional degree of Bachelor of Medical Science.
6.26 Over the past three years the Council's policy for the distribution of funds has been approximately 85% for research grants, including support of the Walter and Eliza Hall Institute and the Howard Florey Institute; 10% for training programs and the remaining 5% for special activities such as surveys as determined by the Council from time to time.

6.27 The NH&MRC maintains a close liaison with the Australian Research Grants Committee (ARGC), which recommends grants-in-aid of research of exceptional merit in the natural and social sciences and the humanities. Representatives of the Council and the ARGC meet each year to determine which is the most appropriate body to consider certain applications. Although there is no rigid dividing line, biological research with direct application to medical problems or which involves human subjects is considered by the NH&MRC, while other biological research of no direct bearing on medicine is seen to be more appropriate to the ARGC.

LEVEL OF NH&MRC FUNDING

6.28 The NH&MRC's primary responsibility in medical research is to make recommendations to the Commonwealth Minister for Health on the disbursement of monies from the Medical Research Endowment Fund. The Fund was established by an Act of Parliament in 1937. An annual appropriation is made by the Commonwealth Government and gifts and bequests from the public are added to the Fund. The Government's allocation is made in the Budget each financial year, but expenditure from the fund is based upon the calendar year.

6.29 The initial allocation made to the Endowment Fund in 1937 was thirty thousand pounds. Ten years later this had been increased by 50 per cent to a little over forty-six thousand, and after another decade, in 1957, was one hundred and seventy thousand pounds. In more recent times, the annual appropriation increased from $4.0 million in 1973 to $23.27 million in the 1981-82 Budget.

6.30 The support provided through the NH&MRC represents only about one quarter of the total expenditure on medical R&D, estimated to be $80 million in 1981. Nevertheless, it can be argued that the importance of NH&MRC funds to the future of medical research in Australia is much greater than their size suggests since they are awarded only for research assessed to be of high quality and are largely used for 'topping up', that is, supporting research by a scientist whose salary is met from another source.

6.31 Calendar year allocations made to the Medical Research Endowment Fund from 1973 to 1980 are shown in Table 6.2, together with the value of the allocations in real terms using 1977 as the base year. The figures show that there was no real increase in the NH&MRC Budget over the first four years, and that apart from one major jump in 1977 there was no further real increase until 1981.
TABLE 6.2
COMMONWEALTH GOVERNMENT ALLOCATIONS FOR MEDICAL RESEARCH
THROUGH THE MEDICAL RESEARCH ENDOWMENT FUND, 1973-80

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>Allocation $million</th>
<th>Allocation in December 1977 values (b) $million</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>4.0</td>
<td>6.7</td>
</tr>
<tr>
<td>1974</td>
<td>6.4</td>
<td>9.3</td>
</tr>
<tr>
<td>1975</td>
<td>5.7</td>
<td>7.2</td>
</tr>
<tr>
<td>1976</td>
<td>5.8</td>
<td>6.5</td>
</tr>
<tr>
<td>1977(a)</td>
<td>11.2</td>
<td>11.2</td>
</tr>
<tr>
<td>1978(a)</td>
<td>12.2</td>
<td>11.7</td>
</tr>
<tr>
<td>1979</td>
<td>13.4</td>
<td>11.3</td>
</tr>
<tr>
<td>1980</td>
<td>14.2</td>
<td>11.3</td>
</tr>
<tr>
<td>1981(c)</td>
<td>20.8</td>
<td></td>
</tr>
</tbody>
</table>

(a) In this and subsequent years the additional block grants made to the Hall and Florey institutes were included in the Fund.

(b) Using a specific price deflator for research costs.

(c) Anticipated final allocation for 1981.

Source: Allocation figures from the Commonwealth Department of Health.

6.32 However, during the same period the number of applicants seeking support from the NH&MRC increased very substantially. This was largely the result of the expansion of tertiary education in the 1960s, when new medical schools were established at the universities of New South Wales, Western Australia, Tasmania and Newcastle, and at Monash and Flinders universities. Between 1961 and 1971, the number of students graduating in medicine rose from 500 to over 900 per annum, and there were even greater increases in the number of graduates specialising in the biomedical disciplines. Many chose a career in medical research, and after completing their research training turned to the NH&MRC for support.

6.33 Project grants make up the main category of NH&MRC support for medical research. The Council's present situation, after several years of little increase in funds but with steadily increasing numbers of applications, can be gauged by examining the proportion of applications for Project Grants which have been funded, and the change in average value of the grants. These figures are summarised in Table 6.3.
TABLE 6.3
ANALYSIS OF NH&MRC SUPPORT FOR PROJECT GRANTS 1974-81

<table>
<thead>
<tr>
<th>Year</th>
<th>New grant applications</th>
<th>Average value of grant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number received</td>
<td>Number supported</td>
</tr>
<tr>
<td>1974</td>
<td>281</td>
<td>160</td>
</tr>
<tr>
<td>1975</td>
<td>265</td>
<td>61</td>
</tr>
<tr>
<td>1976</td>
<td>461</td>
<td>166</td>
</tr>
<tr>
<td>1977</td>
<td>432</td>
<td>237</td>
</tr>
<tr>
<td>1978</td>
<td>515</td>
<td>235</td>
</tr>
<tr>
<td>1979</td>
<td>640</td>
<td>290</td>
</tr>
<tr>
<td>1980</td>
<td>746</td>
<td>238</td>
</tr>
<tr>
<td>1981</td>
<td>770</td>
<td>346</td>
</tr>
</tbody>
</table>

(a) : Adjusted using the consumer price index.

Source: 'Case for Funds for Medical Research in 1982',
National Health and Medical Research Council, 1980.

6.34 The figures show that the number of new applications for project grants has almost trebled since 1974 and continues to increase, but that the proportion of applications supported (prior to 1981) decreased. The increased real funding for the NH&MRC in 1981 enabled this latter trend to be reversed. The reduction in the proportion of applications supported has not been due to a falling-off in the quality of the projects. In fact, the number of applications judged worthy of support by the Council's intensive system of external review and assessment, but which could not be financed, has been increasing. Even in 1981, there were 89 applications recommended for support which the Council was unable to fund, and a further 22 applications received only partial support.

6.35 The average value of the Project Grants has increased considerably in actual dollars, but in real terms, taking account of inflation, the increase has been small. When it is remembered that research costs have generally risen more quickly than the consumer price index, and that the equipment required for research is increasingly complex and expensive, it can be seen that the value of the grants has remained constant or possibly even deteriorated.

6.36 Up to 1980 the situation with respect to the NH&MRC's Project Grants was reflected in its other areas of funding. The number of Program Grants, fellowships and scholarships had been severely restricted. However, in 1981 the increased allocation to the Council allowed a significant expansion and new initiatives in these grant and training areas.
6.37 The increase in funds available in 1981 has not overcome all of the problems associated with Project Grants. Because of forward commitment of funds and other considerations, a large number of Project Grants awarded by the NH&MRC were limited to one year's duration. This is an extremely unsatisfactory situation. Within weeks of the availability of the Grant, the researcher is required to be writing the request for the next year's application for renewal. Appropriate technical support may not have been recruited and necessary equipment may not have been delivered, so that there may be limited research results on which to base the application.

6.38 The conduct of effective medical research projects requires a planned activity extending over a longer period than one year if it is to make best use of the available resources, be productive, and lead to minimum fragmentation of effort and waste of resources. Intermittent real increases in funding are less effective in building a strong and well-structured research effort than commitment to a longer period of gradual but sustained increase.

6.39 One further matter to be considered is what constitutes an increase in 'real terms'. It is sometimes suggested that increases in monetary amounts for medical research funding are in real terms if the level of increase exceeds that of the Consumer Price Index (CPI). Such a statement, however, does not take into account the special nature of research and its associated costs.

6.40 The NH&MRC grants include sums for salary, salary related costs, equipment and maintenance, and in addition also carry with them a number of 'hidden' staff costs in respect of conference, study and long service leave, clinical loadings and superannuation. The CPI reacts to National Wage Case salary movements, but does not significantly reflect decisions of the Academic Salaries Tribunal; this can result in increases in medical research salaries being out of step with 'real' increases in research funds. Similarly, the CPI does not take into account increases in cost of research equipment and consumables which, over a twelve month period, commonly reach 25% and on occasion much higher figures; the increases are unavoidable in circumstances where the bulk of equipment and much of the consumables used by grantees come from overseas. Finally, there are the additional costs of increasing numbers and longer lengths of service of researchers on NH&MRC grants. Superannuation and long-service leave in particular are emerging as major consumers of research funds for which no special provision can be made. The decision to withdraw the ability of Council to have access to returned funds from earlier grants has exacerbated the problem.
7. DISCUSSION

THE UNIVERSITY SECTOR

7.1 The quality of medical research in the university sector is confirmed by the number and nature of the Project and Program Grants awarded by the NH&MRC to principal investigators who are working in universities. Five of the eight Program Grants operating in 1981 were awarded to assist teams of acknowledged excellence in universities; the three remaining Program Grants were awarded to principal investigators in independent or hospital research institutes. In 1981 the NH&MRC awarded 592 Project Grants of which 431, equivalent to 73 percent, are administered by universities (that is, were awarded for research carried out in universities or in university departments in their associated teaching hospitals). The value of the university sector Project Grants was nearly $9 million out of the total of $12 million allocated for this purpose.

7.2 This is not to suggest that all university research workers are of acknowledged excellence. Some certainly are, and some examples of research groups which are first-class by international standards are provided in Table 3.2. Other groups contribute to the broad base of medical research from which future advances and excellent research will arise, and which has the potential to shape the attitudes of future practitioners of medicine to new knowledge and technologies. Furthermore, the medical schools and the teaching hospitals have a special role to play in the application of new knowledge and training since they are situated at the interface between medical research and clinical practice.

7.3 An illustration of the importance of the universities and their affiliated teaching hospitals in the training of future medical scientists is provided in Table 3.3. Less than ten percent of the training awards granted by the NH&MRC in 1979-81 were distributed outside the university sector.

7.4 The John Curtin School of Medical Research, at the Australian National University, differs from the medical schools in the State universities. It was established with the object of creating a centre of excellence by international standards [7]. There is no doubt that this has been achieved. As the Report by Professor Eric Saint to the Medical Research Advisory Committee of the NH&MRC has pointed out:

The contributions made to world science by the John Curtin School have been of unsurpassed excellence in many areas, justifying the confidence and the money invested [8].

7.5 Funds for the support of the John Curtin School are provided by the Government through the Tertiary Education Commission to the Australian National University. Some additional funds (about five percent of the total in 1981) are provided by Foundations and by a variety of other research-funding organisations. Project Grants and Program Grants are not provided by the NH&MRC as the Research Schools of the University are ineligible to receive such grants. This means that the work of individual medical scientists in the John Curtin School is not subject to external review in the same way as research in the State universities and the independent and hospital research institutes for which NH&MRC funds are sought.
7.6 However, review of work in the John Curtin School is conducted with the assistance of external experts whenever senior tenured positions are to be filled or when the future of departments are being considered before the retirement of a Head of Department. In 1978, the work of the whole School was subjected to comprehensive review by an International Committee of Review, and it is intended that this will proceed quinquennially in a manner analogous to that which applies to the Hall and Florey Institutes in Melbourne. The School publishes an Annual Report in which an account is given of the medical research being conducted.

7.7 The university sector is the largest single group in terms of medical research expenditure (see Table 2.2); in 1979, 'research-only' expenditure alone was over $24million. Nevertheless, there are several obstacles to be overcome if universities are to continue to fulfil this important role in medical research.

7.8 First, the average age of the academic research staff in State universities is increasing, and there is generally little flexibility to appoint new staff because of the high proportion of tenured positions. Funds need to be provided to support projects by brilliant young investigators, if necessary at the expense of those whose work has begun to be less innovative, and consideration needs to be given to short-term appointments for 'research-only' staff. It is not always desirable for people engaged in research to be given academic tenure until aged 65; appointment for five years with the possibility of reappointment may be more appropriate.

7.9 Secondly, as pointed out in Chapter 3, it is likely that increasing reliance will be placed on NH&MRC funds for the support of medical research in the university sector because of reductions in general tertiary education funding. However, the value of the average Project Grant awarded by the NH&MRC hardly covers the laboratory expenditure associated with a full-time research scientist (see Tables 3.5 and 6.2). Therefore, if full-time medical research in universities is to continue, even at the present level, increased funds will need to be provided to the NH&MRC as general recurrent funds have been reduced in real terms. There is some advantage in this change of balance because whereas NH&MRC grants are awarded only after a process of rigorous external review and assessment, in which proposals are placed in competition with each other, the recurrent research funds provided through the Tertiary Education Commission are distributed within many universities without assessment of the quality of the work to be supported.

7.10 The third obstacle is fragmentation of research effort within the university sector, a factor which is exacerbated by the high proportion of NH&MRC funds used for Project Grants (nearly 60 percent in 1981). A degree of fragmentation might be expected since 'teaching-and-research' staff are able to devote only a proportion of their time to research. However, it is clear that there is also a great range and diversity in the work carried out by 'research-only' staff. Some of this may arise from the varied clinical activities of research staff, and in addition there are benefits in having a broad base of research experience available within the country; but there are also benefits to be obtained from collaborative research and especially on more substantial programs.
7.11 The NH&MRC Project Grants are an important mechanism for supporting the young research scientist beginning a research career and the scientist who wishes to pursue a particular idea. Some mechanism is also required, however, to support larger groups within universities and to provide longer-term support so that differing expertise can be brought to bear on particular health problems, and so that a medical school, or group within it, can specialise and concentrate its efforts in a particular field, perhaps one which should be developed in the national interest. A start has been made with the introduction of Program Grants by the NH&MRC; but these are few in number as yet. There is scope, within the university sector, for building up larger first-class research units which would be effective. This is discussed in more detail in paragraphs 8.35 to 8.50.

7.12 The very low level of research in dental science is a cause for concern. The Australian Dental Association, in a recent letter to ASTEC, has also expressed its concern at the lack of research activity, and has pointed out that there are few opportunities for graduates in dentistry or dental science to undertake postgraduate training. The Tertiary Education Commission should be asked to examine this matter in more detail.

INDEPENDENT AND HOSPITAL RESEARCH INSTITUTES

7.13 Many of the medical research institutes in Australia have been established following private benefactions or on the initiative of State governments. In this respect medical research is unique. Research in other areas of science and technology is generally carried out by industry or in laboratories or institutes which have been established by the Commonwealth Government and which continue to be supported by the Government. Research on topics of interest to primary and secondary industry, for example, is carried out by CSIRO. Research related to defence is carried out by laboratories associated with the Department of Defence. Research in geology and geophysics, and the study of our natural resources, is undertaken by the Bureau of Mineral Resources; and so on. The Department of Health has established several laboratories to meet perceived needs, but these generally have a training or service function in addition to research. Although matters of public health are, in the main, the responsibility of State governments, the Commonwealth Government has accepted de facto responsibility for the support of basic research in the medical sciences. It provides support primarily by allocating funds on the advice of the NH&MRC to first-class investigators in independent and hospital research institutes and in universities.

7.14 Medical research institutes have often been established by benefactors with an interest in one or more diseases. When this has occurred in the past, State governments have often been prepared to provide some financial support in recognition that health is a State responsibility, and, in general, such institutes have applied to the NH&MRC for support for specific research projects. One research institute, the Queensland Institute of Medical Research, was established
by the Queensland Government and is still predominantly funded by the State, but it now receives significant funds from the NH&MRC. Another institute, the Institute of Medical and Veterinary Science, was established by the South Australian Government to carry out research into the diseases of human beings and animals, and some service and training functions; the service functions now dominate this Institute. A mechanism for advice to benefactors on the most effective and efficient use of funds is necessary and the Commonwealth Government should not be provided with a fait accompli with a moral obligation to provide additional funds.

7.15 State governments differ significantly in the extent of their financial support for medical research (as opposed to health services). The Queensland Government allocated $1.6 million to the Queensland Institute of Medical Research for medical research in 1981. The Victorian Government provided a total of about $0.8 million for the support of the four major research institutes in Melbourne. In New South Wales the State Government provided about the same amount for medical R&D at three private medical research institutes, although the figure is difficult to determine accurately as they have a significant load of service work which is funded in other ways (in recent times by cost-sharing with the Commonwealth); the State Government’s total contribution to medical R&D was approximately $1.3 million. The governments of South Australia, Western Australia, and Tasmania make relatively minor contributions to medical R&D.

7.16 Once established, the staff of any medical research institute is entitled to seek funds from the NH&MRC to support research projects and research programs; but all such requests, from whatever quarter, are in open competition. Program Grants, which provide continuing support over a period of five years, are awarded only to principal investigators or groups who have demonstrated consistent ability to attract Project Grants, after a detailed review and assessment of the scientific work. Of the eight principal investigators receiving Program Grants from the NH&MRC at present, three work in independent or hospital research institutes.

7.17 Medical research institutes may be allocated funds from the NH&MRC in the form of a single Block Grant. Such support is only provided to institutes which have previously demonstrated an ability to attract substantial Project and Program Grant support, and after detailed international review and assessment of their research. The institute must also meet many other criteria which indicate the international acknowledgement of its work. At the time of writing only the Walter and Eliza Hall and Florey Institutes are supported in this way, but a committee established by the NH&MRC to review nine institutions nominated by the Council, and to determine if the Block Grant system should be expanded, has recently recommended that the Baker Institute also be funded by a Block Grant.

7.18 It cannot be denied that the majority of independent and hospital research institutions lead a precarious financial existence. Apart from the most senior staff members few research personnel have even a reasonable degree of job security. Some scientific staff are employed on five-year grants, but the majority are on one to three year grants with relatively little in the way of career prospects. This also applies to non-tenured personnel working on research grants in universities. The situation has become worse since the abolition of the triennial funding system for NH&MRC in 1974.
7.19 Despite their financial insecurity and perhaps, to some extent, because of it, several of the independent and hospital research institutes in Australia have produced and are producing first-class research work. The Hall, Florey and Baker Institutes are first-class by any international standard, and many of the individual projects and programs in other institutes are also of a first-class standard. The role of the institutes in providing research training is more varied. Some institutes, with formal university affiliations, do provide research training for a considerable number of graduates, but for many others the role is minimal. The figures presented in Table 3.3 suggest that, overall, the institutes have a much smaller role in research training than the university medical schools.

7.20 Several of the institutes are facing the problems encountered by the universities, including increasing average age of research staff and increasing reliance on NH&MR grants to support their research activities. The latter may be particularly important for institutes whose diagnostic and other services, which frequently provide indirect support for research in the form of personnel, consumables or maintenance, will be affected by changes to the Commonwealth-State cost-sharing arrangements for health services.

7.21 There is a need also for a mechanism to provide longer-term support for research groups within the independent and hospital institutes. The awarding of further Block Grants may not be an appropriate mechanism because in many instances it is a particular group within an institute whose work is of sufficient quality. This is discussed in more detail in paragraphs 8.35 to 8.50.

GOVERNMENT HEALTH LABORATORIES

7.22 The various laboratories operated by the Commonwealth Department of Health were established to meet perceived needs in relation to the health of the community. In many instances a primary factor was that no one else was carrying out the required work or was willing and able to do so.

7.23 The Commonwealth Institute of Health was established in 1930 as the School of Public Health and Tropical Medicine. Its primary object was to provide a mechanism for the training of public health officers and for education in the problems associated with tropical diseases. If the Tertiary Education Commission (or the Australian Universities Commission) had been in existence at that time it is likely that funds would have been provided through the Commission to a selected university to enable that university medical school to expand so that it could undertake the required educational and training program. In 1930 this procedure was not available, and the establishment of the School, and later of the Institute, was a wise one. It has worked well and the close relationship with the University of Sydney has been maintained. It must be recognised, however, that the research work of the medical scientists in the Commonwealth Institute of Health is not subjected to any significant degree of external review or assessment.

7.24 The establishment of the Institute of Child Health was similarly motivated by a perceived need to solve some of the medical problems of children. At that time there were no Chairs of Child Health at Australian medical schools and little inclination to establish such Chairs. Times have changed: many medical
schools now have Chairs of Child Health and the special arrangements entered into in 1948 with the University of Sydney are no longer necessary. The Government has decided to terminate its direct involvement, but the NH&MRC has been required to provide support for two years for staff of the Research Unit of the Institute to allow their staged assimilation into the Children's Medical Research Foundation.

7.25 The National Acoustic Laboratories were established during World War II to meet a need to study and alleviate the effects of noise on members of the armed forces. After the war the terms of reference were expanded to include the provision of audiological services to certain sections of the community in need of such services. Much of the Laboratories' work is of a service nature, but there is also a substantial program of research concerning the mechanisms of hearing and the causes of hearing disorders, the procedures for evaluating hearing disorders, and the experimental development of hearing aids to suit the individual needs of patients. Hearing aids are of course commercially available, but they are not manufactured in Australia except under contract to the Laboratories, and the cost of imported aids is several times the price charged by the Laboratories. It is a matter for judgement whether a government-funded organisation should undertake the further experimental development of hearing aids, and whether such aids should be provided free or made available at reasonable cost through the normal medical benefits insurance procedures.

7.26 The Ultrasonics Institute began as a Section within the National Acoustic Laboratories and continues to work closely with those Laboratories. In 1959, when the research on ultrasonics was initiated, ultrasound had been recognised as having potential for application in medical diagnosis; but no work in this field was being carried out anywhere in Australia. The Institute was an initiative of the Department of Health and there is no doubt that it has contributed significantly not only to the development of this technique but also to its introduction and continued use in medical diagnosis. Ultrasound has now become a standard diagnostic tool in developed countries, and instrument-manufacturing firms are engaged in large scale manufacture of a variety of models and are themselves developing improved imaging techniques and other aids.

7.27 In Australia there is only one company undertaking the manufacture and some development of ultrasonic imaging equipment. The major part of the developmental work continues to be carried out by the Ultrasonics Institute, and in some areas of imagery the Australian work is more advanced than that overseas. Here again it is a matter for judgement just how far a government laboratory should be engaged in the further experimental development of an accepted diagnostic technique. It is important that any Australian lead be turned into commercial advantage if at all possible and that this successful research team is not dispersed; but perhaps the time has come for the work and staff of the Institute to be transferred to a more commercial environment, perhaps by arranging an initial fixed period of contract from the Commonwealth Department of Health in order to minimise disruption.
7.28 The Australian Radiation Laboratory was established as the Commonwealth Radium Laboratory in 1929 to meet the need for the management and control of the radium and radon then being used in medical practice. It is now concerned with the public and occupational health implications of all forms of radiation. Such work certainly needs to be carried out and it is properly the responsibility of the Commonwealth Government.

7.29 The National Biological Standards Laboratory and the Australian Dental Standards Laboratory were formed to ensure the safe and effective use of therapeutic goods and of dental materials respectively. Here again there is no doubt that such work needs to be carried out and that it is properly the responsibility of the Commonwealth Government.

7.30 Finally there is the Commonwealth Serum Laboratories, which is primarily a manufacturing organisation for the preparation of vaccines and other products for use in medical and veterinary practice. It was established during the first World War when such products were impossible to obtain in Australia. Some of the required products are still impossible to obtain: commercial organisations in the private sector naturally concentrate on those which can be made in large quantity and sold for a profit. Other products required in medical or veterinary practice may be unprofitable and the private sector does not always meet these needs.

7.31 The Commonwealth Serum Laboratories (CSL) produces a wide range of products, some of them in competition with overseas laboratories in the private sector. It is required to return a reasonable profit to the Government. Good commercial and manufacturing practice therefore requires that it conduct applied research and development to improve processes, increase yields of products, improve the quality of products and generally to keep the costs of manufacture as low as possible. Research and development work of this nature is funded from the trading profit. In 1980-81 CSL spent $2.3 million on R&D associated with its manufacturing processes and products.

7.32 The Commonwealth Serum Laboratories is also required under its Act to undertake research on a wide variety of 'national interest' projects, not necessarily connected with manufacturing products and processes, following determination by the Minister for Health. This research is charged against the trading profit if this is possible; but if profits are not sufficient the cost of this research is reimbursed by the Government through the Department of Health. The financial contribution of the Commonwealth Serum Laboratories to this second type of research has steadily declined over the last five years, from over 70 percent to nil. In 1979-80, for example, the entire expenditure on this research was born by the Government, at a cost of $2.3 million.

7.33 There are some worries in this situation. There are programs of research on pharmaceuticals and related products which need to be undertaken in the national interest, but which are unlikely to be carried out by private enterprise because a commercial return is unlikely. CSL is therefore the most appropriate organisation to undertake the research, and it has a legislative responsibility to do so. Nevertheless, the funds required for the research are substantial, and the programs are not subject to external assessment and review.
7.34 In these circumstances it is essential to ensure that the funds reimbursed by the Government are spent in the best possible way. CSL has established an internal Research and Development Advisory Committee to examine and assess research proposals, including work to be undertaken at Ministerial determination. It is ASTEC's view that the research, excluding that directly related to CSL's commercial production, should be subject to external review. From July 1980 this research has been supported wholly by the Government, and there is no reason why it should not be subject to a process of review and assessment to ensure that the national interest is being met in the most efficient way.

7.35 It is appropriate also to consider here the Health Services Research and Development Grants Program, which is administered by the Commonwealth Department of Health rather than through the NH&MRC. ASTEC notes that applications for Grants are not only subject to internal departmental review, but are also assessed externally and are subject to review by the relevant health authority in the State or Territory in which projects are to be undertaken. The amount involved in the Program, $1.48 million in 1980-81, is significant when compared with present NH&MRC expenditure; it appears appropriate that all medical R&D projects should be administered by a single body, so that the quality of the applications can be compared.

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL (NH&MRC)

7.36 It is generally agreed that the National Health and Medical Research Council (NH&MRC) has been most successful in fulfilling its functions. Under its guidance there have been notable advances in the health of the community, and Australia's medical research effort has increased enormously and has achieved international renown.

7.37 Notwithstanding the NH&MRC's considerable past success, it has been argued that the resources devoted to medical research have expanded to such an extent that the present arrangements are no longer the most effective, and that the time has come to separate the public health and advisory functions, which relate to legislation and regulation, from those functions which are concerned with medical R&D.

7.38 Sir Macfarlane Burnet was an early advocate for the establishment of an independent Medical Research Council. In 1957 he appealed for the provision of additional funds for medical R&D and advocated the appointment of a Medical Research Council of 14 members, 10 of whom should have had experience and vital interest in medical research, one being qualified in dentistry. The other members of the independent Council should, it was suggested, be representatives of medical faculties and of the colleges of Physicians and Surgeons. The proposal was sent to the NH&MRC but came to nothing.

7.39 Nevertheless, advocates for the formation of an independent Medical Research Council have continued to press their views. In 1965 the Medical Research Advisory Committee (MRAC) called for a special meeting of the NH&MRC to discuss such a proposal. It was introduced by Sir Sydney Sunderland;
but the Council was not convinced. The NH&MRC did, however, move some distance in the direction favoured by the advocates for an independent Medical Research Council. At the subsequent ordinary meeting of the full Council, in May 1966, the MRAC was authorised to make urgent recommendations, through the Chairman of the NH&MRC, to the Minister for Health for and on behalf of the Council.

7.40 The Medical Research Advisory Committee therefore has a quasi-independent status. Its recommendations for the disbursement of funds for medical R&D are forwarded through the Chairman of the Council to the Minister for Health, without prior reference to the NH&MRC. Nevertheless, the Council retains ultimate responsibility for policy regarding medical R&D and, in the end, its views must prevail. For example, it has consistently voted against the establishment of a truly independent MRAC (or Medical Research Council) despite recommendations from its subordinate committee to separate the public health and research functions.

7.41 Similar recommendations have, however, continued to result from the examination of Australian medical R&D by other groups. In 1974 the Report of the OECD Examiners on Australia's national science policy included the comment:

> While medical research grants are at present distributed by the Medical Research Advisory Committee of the NH&MRC, we are inclined to think that the status and importance of the field should be recognised by the creation of a separate Medical Research Council, as is the case in most countries [9].

7.42 The Science Task Force of the Royal Commission on Australian Government Administration, which reported in 1975, recommended that:

> the medical research functions of the NH&MRC should pass to a new statutory National Medical Research Council with a full-time chairman appointed for a fixed term. The other functions of NH&MRC should pass to an appropriately constituted National Health Council. These bodies should have cross-representation, and both should report to the Minister for Health. The major tasks of the Medical Research Council would be to set priorities for, and to fund, research in health science and health delivery. It should be empowered to establish research groups with particular objectives, including the social aspects of medicine. The Council should be also responsible for periodic review of health science research in the Department of Health by outside experts [10].

7.43 Finally, ASTEC, in Volume 1A of its report 'Science and Technology in Australia 1977-78', recommended:

> That the Minister for Health examine the proposal that an Australian Health Council and an Australian Medical Research Council be established to take over the work of the National Health and Medical Research Council, and to expand it [11].

54
7.44 One purpose of the present study by ASTEC has been to assess whether the present arrangements are satisfactory for the distribution of NH&MRC funds which have grown from thirty thousand pounds in 1937 to $23 million in 1982, and whether there is a need for a new mechanism for the national oversight and co-ordination of a research enterprise whose total expenditure is estimated to be in the region of $80 million annually (see paragraph 2.8). It is ASTEC's conclusion that neither task is suited to a body which meets twice a year, primarily to discuss regulatory matters of public and environmental health, and the majority of whose members, it must be acknowledged, are health administrators and representatives of the professional colleges who have no special skill in and little experience of medical R&D.

7.45 It is ASTEC's belief that the tasks associated with ensuring that Australia's medical R&D is efficiently co-ordinated, and that funds are expended in the most advantageous way, are far too onerous to be undertaken effectively by either the NH&MRC or the MRAC as currently organised. The requirements for future arrangements for medical R&D, and ways in which they should be met, are discussed in the next Chapter.

8. CONCLUSIONS

8.1 Three main conclusions have emerged from this study of the present situation regarding medical R&D in Australia:

- there is little formal attempt at integration of effort or of expenditure between the various sectors and organisations which undertake medical R&D, but the size of the total medical R&D enterprise is such that co-ordination at the national level is required urgently to ensure that effort and funds continue to be expended in the most effective manner;

- there is insufficient concentration of funds to support laboratories or units which are of real and acknowledged excellence, and the development of such groups needs to be stimulated;

- only about one half of the medical R&D funded by the Commonwealth Government is at present subject to rigorous external review and assessment; the remainder is not reviewed, and a mechanism is needed to ensure that, where appropriate, all such research is subject to continuing, external, critical assessment.

8.2 The overall level of funding for medical R&D in Australia has been referred to in a number of reports. ASTEC's report on 'Science and Technology in Australia 1977-78', published in 1978, stated that the Council had:

received numerous submissions claiming the funding of health science research in Australia is inadequate by comparison both with funding of some other Australian research, and by comparison with the efforts being made in other reasonably comparable countries [12].
In this matter ASTEC confirmed and extended the comments, made in 1974, by the OECD Examiners in their 'Report on Science and Technology in Australia'. The Examiners expressed the view that 'It is doubtful if the level of funding is sufficiently high to provide a really vital role of research in the teaching hospitals' and added:

We feel that there is a need for a stronger and better sustained medical research effort in Australia for economic as well as humanitarian and welfare reasons [13].

8.3 More recently, in October 1979, in their report entitled 'Case for the future development of medical research in Australia', the NH&MRC stated:

The time is now appropriate for the Government to assist the Council by providing a sufficiently increased level of funds to consolidate the basis of medical research having regard to the high level of expertise currently available which in the view of the Council is not utilised to the full. It is also essential that the Council provide for initiatives which are essential for the proper development of health care and health services in the Australian community [14].

RATIONALE FOR MEDICAL R&D IN AUSTRALIA

8.4 The reasons for ensuring a strong and effective medical research community in Australia have been presented in Chapter 2. Briefly, they are: to fulfil Australia's humanitarian responsibilities, as a relatively affluent country, to carry out a fair share of the world's medical research and to help raise the standard of health in adjacent countries which are less developed; to investigate health problems peculiar to Australia; to promote the transfer and adoption of research findings and new or more effective health technologies from overseas; and to ensure that future medical practitioners, during their training, are made aware of and responsive to the role of research in providing improvements in medical knowledge, new technology, and more cost-effective health care procedures.

8.5 Ultimately, the total amount of funds to be provided for medical R&D is a matter for judgement. However, decisions on the level of funds to be provided by government should be based on the likely social or economic benefits to the community.

8.6 A substantial part of the improvement in community health which occurred in developed countries during the 19th and early-20th centuries can be attributed to public health measures such as better nutrition and housing, provision of uncontaminated drinking water, and so on. Nevertheless, the contribution of medical research to the health of the community, and especially to the control of infectious diseases, cannot be disputed. Infectious diseases are no longer the major cause of serious morbidity or mortality in Australia, but significant problems remain, including cancer, heart disease, strokes, alcoholism and drug abuse, rheumatic disorders, allergies, diseases associated with ageing and mental illness. Disciplines other than those of the medical sciences are likely to
contribute to the solution of these problems, but the underlying causes and mechanisms will need to be uncovered through medical research before it is possible to develop cost-effective methods of prevention and treatment. The Medical Research Advisory Committee of the NH&MRC has already funded important initiatives in research into alcoholism, drug addiction, allergies, heart-disease, and other matters of concern.

8.7 The annual cost of health care in Australia is approaching $9,000-million. It is ASTEC's view that a soundly-based and well-directed effort in medical research is potentially an important means of achieving cost savings in the long-term and of slowing the seemingly inexorable rise in the nation's health bill without incurring a lowering of the standard of community health. Expenditure on medical R&D should not be determined on the basis of a fixed proportion of the cost of health services, but it is worth noting that current expenditure is equivalent to less than one percent of the national health bill.

8.8 Many would argue that the social benefits of improved health care resulting from medical research are more important than the economic benefits. Nevertheless, the economic benefits have been considerable. Recent major work by Mushkin [15] shows that in America for the period 1900-1975 the net benefits of medical research have been between 10 and 16 times the cost of the research. Not only has the economic benefit to the community far outweighed the cost of the investment in medical research; but the rate of return on the investment in medical research has been extremely competitive with that on other possible investments.

8.9 There are several fields of medical research in which Australian scientists have made a major contribution to improving the health of the community. Some examples are:

- Severe hypertension (elevated blood pressure) in a patient thirty years ago generally resulted in a prognosis of about one year's survival. Today, advances in clinical pharmacology and therapeutics have led to greatly improved survival and lessened the risk of complications such as strokes, heart attack and kidney failure. The Australian contribution, which is internationally recognised, has involved basic research into the mechanisms of hypertension and clinical research aimed at achieving safe, effective control of high blood pressure.

- Infantile diarrhoea was the most common cause of mortality in normal babies as recently as the late 1960s. As a result of Australian research the causative virus was isolated, the mechanism of its pathogenic action determined, and effective regimes for treatment formulated. The financial benefit of saving hundreds of babies' lives in Australia is difficult to establish in dollar terms, as is the benefit of this local research in other areas of the world where the disease is a much more common occurrence. Nevertheless, the social benefits to the community are without question.
Leukaemia in children was equivalent to an early death sentence in 1960; today, the ten-year survival rate (the probable cure rate) is 50 percent. Australian research has made a significant contribution to this dramatic change.

Migraine represents a less lethal disease than infantile diarrhoea or leukaemia, but one whose dollar cost in terms of loss of productivity is substantial. Australian research has led to new insights into the way migraines occur, and, equally importantly, to new and internationally accepted advances in the prophylaxis and treatment of the disease.

Analgesic abuse, the indiscriminate use of pain-killing powders and tablets, has become increasingly recognised as a cause of renal failure and other problems, due largely to pioneering research carried out in Australia. The costs of treatment, through life-long dialysis or by renal transplantation, are enormous in comparison with the cost of the research, which has led to changes in marketing practice and to education programs resulting in a greatly reduced incidence of analgesic abuse.

Past successes, and highly favourable rates of return, are of course no predictor of the future. Mushkin's work indicates that the rate of return on medical research has been falling; though the recent rate of return is still a favourable one by investment standards. Since medical research does not lend itself to a prospective analysis of costs and benefits, it is not possible to predict the economic benefits to Australia of its current research effort. In the past, major advances in clinical practice have often been made possible by earlier basic research which, at the time it was undertaken, could not have been justified on economic grounds [16]; there is no reason to believe that this will not continue to be so in the future.

Although it is not possible to predict accurately the cost-benefit of medical R&D, it is possible to demonstrate that there are a number of lines of research in progress in Australia where the costs are moderate and the potential benefits are large.

Diabetes is a disease which affects about 2% of all Australians and many of these require twice-daily injections of insulin for decades. Consequently, the health-care costs are high, particularly in respect of the medical services involved. Some of these will be offset by the recent development of pumps for insulin perfusion which can be used by the patients at home and offer better blood-sugar controls. In this way the chronic and costly complications of blood vessel and kidney disease will be reduced, thereby lessening the risk of strokes, high blood pressure and blindness. In addition, other research is offering the hope of pancreatic cell transplants as an alternative to a life-time of insulin injections or perfusions.
Multiple sclerosis is a poorly understood disease of the nervous system which affects people in the prime of life and tends to run a relentless downhill course, sometimes for many years. Care of severely disabled patients is once again a major cost to society. A collaborative research venture is probing the question whether a white cell extract, called Transfer Factor, or a recently-isolated natural product, Interferon, can retard the progress of this debilitating disease or even arrest it.

Allergic disorders such as asthma, hay fever, eczema and milk intolerance affect 10 to 20 percent of the population at some stage in their lives. The basic cause of allergy is unknown. The current treatments are therefore directed towards the control of symptoms rather than at correcting the underlying abnormality, and often they need to be life-long. The recent development of new culture techniques as well as methods for purification of important allergens has paved the way for an attack on the cause of allergic disease itself, and enabled the introduction of quality control for allergen extracts used in diagnosis and therapy, which until now has been almost totally lacking.

Cancer is more feared than any other disease in western societies. The development of specialised centres here, means that the standard of cancer treatment available to the community has risen substantially during the past five years. In parallel with the improvements in cancer therapy, research is in progress which is directed towards a better understanding of the molecular regulation of cell growth for both normal and malignant cells. These studies are paving the way for the next generation of anti-cancer agents and more efficient therapies.

Malaria is uncommon in Australia but represents one of the most serious health problems in Papua New Guinea and many other developing countries. Currently research activities are being coordinated by the World Health Organisation. Research groups in Australia, and in the Institute of Medical Research at Goroka in Papua New Guinea, are making progress towards a malaria vaccine. If successful, this work has the potential to make malaria a preventable disease, the global benefits of which would be incalculable.

Drug dependence and addiction, including alcoholism, is a major social problem in Australia and is a high cost to the community. Pharmacological studies on the action of addictive drugs and the phenomena of tolerance and dependence could provide an understanding of the mechanism of addiction and lead to treatments and management based on scientific knowledge rather than expensive social rehabilitation programs.

8.12 Other research programs in Australia could provide many more examples of medical R&D likely to show a very favourable cost-benefit ratio. However, it might be argued that there is no pressing reason why Australia should support this research; after all, similar lines of work are being pursued overseas and there is little or no attempt to confine the benefits of government-funded medical R&D to the country of origin. Indeed, as pointed out in paragraph 2.13,
the general level of public health is influenced by many factors in addition to medical R&D. A policy of not supporting medical research might therefore not cause serious disadvantages in the short-term. In the longer-term, however, the impact would be serious. The quality of training received by medical practitioners would diminish, the transfer of improved and more efficient health technologies would be disrupted, and it is unlikely, therefore, that Australia would continue to enjoy the full benefit of overseas medical R&D. There are also moral and humanitarian considerations of Australia's role as one of the more affluent countries. It is ASTEC's strong belief that there is an overwhelming need for a well-developed and efficient medical R&D community in this country.

CO-ORDINATION OF EFFORT AND EFFICIENT USE OF FUNDS

8.13 The total expenditure on medical R&D in Australia is estimated to be approximately $80 million in 1981. The Commonwealth Government's contribution includes funds for the institutes and laboratories of the Department of Health and for part of the R&D undertaken by the Commonwealth Serum Laboratories, funds expended on research allied to medical science within CSIRO, funds provided through the NH&MRC, and funds allocated through the Tertiary Education Commission, the Australian Research Grants Scheme and by other agencies. In 1979 this 'direct' contribution amounted to $47 million, equivalent to 64 percent of the total. It can be argued that the actual contribution was larger if account is taken of funds provided indirectly through cost-sharing arrangements with the States for diagnostic services, and in the form of revenue foregone because of tax-deductible gifts and donations for medical R&D.

8.14 In view of the size of medical R&D expenditure, and of the Government's contribution, it is reasonable to inquire whether there is any mechanism to ensure that funds are spent efficiently, to make sure that national needs in medical R&D are identified and funded adequately, to achieve co-ordination and reduce duplication of effort, to ensure that funds are distributed wisely between the various fields of medical research, and that the work supported is subject to periodic assessment.

8.15 The short answer to this inquiry is that there is at present no formal mechanism for the integration of effort, for the rational distribution of the majority of research funds, or for the long-term planning of research. There is, of course, a degree of collaboration and co-ordination between individual scientists and research groups, and indeed the medical R&D community is relatively well-developed in this respect. Nevertheless, co-operation at this level is no substitute for a body able to overview the national effort.

8.16 The NH&MRC is one mechanism by which grants are awarded only for work which has been assessed as being of first-class quality, and the stringent review procedures ensure that funds are spent effectively and with a high degree of accountability. However, the funds allocated through this mechanism represent less than one quarter of the total, and only about one-half of those provided by the Commonwealth Government. Expenditure by the institutes and laboratories operated by the Department of Health is not subject to scrutiny and assessment by the NH&MRC.
8.17 Until recently there has been little or no attempt to identify the specific health needs of the Australian community and to ensure that they are encompassed within the national effort in medical R&D. In 1979 the NH&MRC drew attention to 17 areas of research where increased effort was considered necessary, and after further selection criteria were applied, chose two of these to be the subject of major new initiatives. The establishment by the NH&MRC of research centres and special fellowships in specific areas of research and development also represents a move to identify and satisfy national needs. However, when the expenditure on these initiatives is compared with the total expenditure on medical R&D, it is clear that the progress made, though valuable, is minor and that a great deal more is required.

A MEDICAL RESEARCH COUNCIL

8.18 Attention has already been drawn to the fact that the Medical Research Advisory Committee has a substantial measure of independence. Nevertheless, the fact remains that the paramount body is the NH&MRC, which has essentially the same style of membership as when it was created as the National Health Council in 1926: the majority of members are health-care administrators with little professional interest in, or knowledge of, medical R&D, and are some distance from the frontiers of medical knowledge and the potential for new discoveries. The NH&MRC meets twice a year and does not have the time or expertise to take on the task of co-ordinating an $80 million research effort, or even to determine broad policy guidelines for its development.

8.19 A part-time Medical Research Advisory Committee with a part-time Chairman can hardly be expected to keep under review the whole of Australia's medical R&D effort, to consider means of identifying medical research centres which should be built up by selective funding, or to determine the optimum level of support in the light of all the other medical research needs. Although the MRAC has made a valuable start in identifying areas of medical R&D which, in the interests of the health of the community, may need to be stimulated, a great deal more remains to be done, especially in the co-ordination of research which is not supported by NH&MRC funding and which is therefore outside the remit of the MRAC. Moreover the cost-effectiveness of medical research, and the scientific accountability of the investigators, may be expected to loom more importantly in future. All these and other factors will make an impossible burden for a part-time Committee and Chairman and Secretariat.

8.20 Then there is the question of future funding for the John Curtin School of Medical Research. This is a School within the Australian National University and is funded via the Tertiary Education Commission. It is outside the jurisdiction and influence of the NH&MRC and the MRAC. A review and assessment system is being devised and this will assist the reallocation of resources within the School as medical research advances. At some time, however, and especially if any expansion of the John Curtin School should ever be contemplated, the Government will need advice on the relative priority of such expansion and of any other initiatives in medical R&D. It would be a great advantage if there were a body able to keep the whole field of medical R&D under review and be in a good position to advise on relative priorities from a background of detailed knowledge.
8.21 The government health laboratories such as the Commonwealth Institute of Health, the National Acoustic Laboratories and the Australian Radiation Laboratory, were all established to meet needs which were not being met elsewhere and they are still required. It would be helpful, however, if the future research directions of these laboratories could be assessed in relation to the entire medical R&D scene (but bearing in mind also their service functions). This could well be done by the MRAC, but preferably by a more broadly-based successor. It would also be an advantage if some of the research projects in these institutes or laboratories could be financed directly by the MRAC or its successor. Such a procedure is not unknown in government-funded laboratories. CSIRO and the Bureau of Mineral Resources, for example, receive significant grants from the National Energy Research Development and Demonstration Council. The Commonwealth Serum Laboratories (CSL) should also be mentioned here as there is a need for new arrangements for periodic external assessment of the 'national interest' medical R&D carried out by CSL.

8.22 ASTEC believes that medical R&D in Australia has reached a stage where its proper development, with adequate attention to efficient use of funds, to co-ordination and to national and scientific accountability, is far too onerous a task to be undertaken effectively by a part-time body. It will require the establishment of a full-time organisation, for which the name Medical Research Council (Australia) is proposed. Furthermore, the Chairman of the Council will need to be a distinguished medical scientist who has the respect of the medical research community, and who is able to achieve by persuasion the rational distribution of resources which are not subject to direct control by the Council. The position of Chairman will require a substantial commitment of time and should be made a full-time (or almost full-time) appointment at least for the initial term during the establishment of the Council, both because of the nature of the task ahead and in order to attract a person of the calibre required. The Council will need its own designated, full-time Secretariat headed by a senior Second-Division officer.

8.23 It may be noted that medical research councils are operating successfully in several countries. The British Medical Research Council was established as an advisory committee in 1913. In 1920 it was incorporated under Royal Charter, a change which allowed it to receive monies voted by the Parliament and from other sources, to create special research Units when these were thought to be necessary, to employ tenured staff, and to provide laboratories when these could be obtained with the co-operation of universities or hospitals. The Council has 18 members, and its Chairman is, by tradition, a member of the House of Lords. The Secretary, who is the Chief Executive Officer and also the Deputy Chairman, has, over the years, always been a distinguished medical scientist recognised as such by the biomedical community. The Council has four Advisory Boards, each with the overview of a designated area of research, and served by one or more Grants Committees which recommend the allocation of funds for program and project grants. The function of the Medical Research Council is to promote the balanced development of medical and related biological research. It does this by employing staff in its own institutes and in the research Units it establishes, and by means of special grants, program grants and project grants to institutions, and by the award of fellowships and studentships.
8.24 The Council’s National Institute for Medical Research and its Clinical Research Centre are both major research establishments, employing 177 senior scientific staff and 224 senior staff respectively. There are 54 separate research Units funded by the Council, many of which are relatively small, with 3 to 10 senior scientific staff. The largest is the Laboratory in Molecular Biology in Cambridge; this has 87 senior scientific staff. All together, the Council employs 3974 staff of all categories in the Institute, the Centre, and the Units, and 70 percent of these are fully tenured. The Council’s income in 1980-81 was approximately 90 million pounds. In 1979-80 expenditure on institutes and Units was 42 million pounds, and 27 million pounds was used to provide grants and fellowships.

8.25 The Medical Research Council of Canada was established in 1969. In the absence of centralised health laboratories or Units, approximately 55 percent of the medical R&D supported by the Council is undertaken in universities and 45 percent in teaching and other hospitals. The Council’s policy is that federal funds should not be used for core-funding, and most of its support is in a form analogous to project grants. However, the Council does operate several programs under which it provides scientific salaries as well as other costs. The Development Grants Program is intended to alleviate geographic disparity in health research, and it is planned that the Special Development Grants will be increased to support research in areas of national need. Expenditure by the Council in 1980-81 was approximately $80 million.

8.26 The Medical Research Council of Sweden also provides funds mainly in the form of specific grants for individual research projects, but it does not have responsibility for all medical research. Support for cancer research is the province of the Swedish Cancer Society, a private organisation which functions as a research council and plans and assesses as well as finances research. In New Zealand, the Medical Research Council provides project and program grants, and supports several Units. Expenditure in 1979 was $NZ4.8 million, of which 72 percent was for grants, 15 percent for Units and services, eight percent for fellowships and scholarships, and five percent for administrative expenses.

8.27 The proposed Medical Research Council (Australia) should have the following characteristics if it is to operate successfully:

- it should report to the Minister for Health, and be accountable through him to the Government and the Parliament;
- it should operate independently of other government departments and agencies, subject to the usual controls of finance and staff;
- it should comprise a Chairman, preferably a full-time appointment, and not more than nine other part-time members serving for overlapping terms of three years;
- the membership of the Council, excluding the Chairman, should include three or four biomedical scientists who are actively engaged in research and who have extensive experience in a variety of medical research fields both clinical and non-clinical, two or three distinguished scientists from fields other than medical research, two or three eminent lay people, and the Commonwealth Director-General of Health or representative;
the Council's chief executive officer, the Chairman, should be a distinguished medical scientist appointed for a renewable term of seven-years under conditions determined by the Remuneration Tribunal; the Chairman should have the status of a First-Division Officer;

- the Council should have its own small, separately identified Secretariat, and be able to seek assistance from government departments and agencies (and especially from the Department of Health) when required.

8.28 This type of organisation might be established in one of two ways, either as a fully-independent 'outrider' of the Commonwealath Department of Health, or as a statutory authority. If the Medical Research Council (MRC) were to be established as an 'outrider', the appointment of the Council members outside the Public Service Act would help to ensure its autonomy; but care would be needed to assure, and to demonstrate, the independence of the Secretariat.

8.29 There are further difficulties associated with 'outrider' status. The independence of the Medical Research Council will be crucial to its success, not only because it must be seen to be completely impartial in its adjudication and allocation of funds to institutes, university groups and hospital departments in the different States, but also because it must be completely free of external direction or influence in its role of intermediary between the medical R&D community and the Government. In addition to providing funds for research and development, the MRC will also need to review and seek co-ordination of the national effort in medical R&D, and this can only be achieved with the willing co-operation and participation of universities, private institutes, industry and State governments, another reason why demonstrable autonomy is vital. Finally, if the Council is to shoulder the responsibility of providing long-term planning and guidance for Australia's medical R&D, it must be given some measure of security from short-term political pressures.

8.30 For these reasons ASTEC strongly favours the establishment of the Medical Research Council as a statutory authority, with its own small secretariat. It is recognised that governments and parliaments have been concerned at the proliferation of statutory authorities as these are considered to be less accountable than Westminster-style departments. However, the Commonwealth Government has used the device of the statutory authority virtually since Federation, primarily to provide conditions for impartiality and independence of operations (especially for allocation of government funds to citizens and public groups) and to facilitate the performance of co-ordinating functions. Furthermore, it should not be difficult to draft a Bill for the MRC which gives adequate powers of Ministerial direction, provides for an annual report to the Parliament detailing the Council's activities, and which carefully spells out the functions and objectives of the Council so that its performance may be audited both internally and by the Government and the Parliament.

8.31 The costs associated with the operation of the MRC as a statutory authority need not be much greater than the current administrative expenditure on the medical R&D activities of the NH&MRC and the MRAC (see paragraph 6.10). The MRC could expect continued, and perhaps increased, support from medical scientists willing to give their time and expertise for its review and assessment activities, and the main operational costs would be the remuneration
of the Chairman and members of the Council, and the salaries and administrative expenses of the Secretariat. The value of the benefit gained from greater rationalisation and integration of the research effort, even within the Commonwealth Government sector alone, would greatly outweigh any additional costs.

8.32 ASTEC believes that it would be appropriate for the MRC to establish a system of external review and assessment, similar to that currently in operation, for the allocation of research funds, fellowships and training grants. The main tasks of the Council would be to review periodically the resources available for medical R&D and determine whether they are being used in the most effective way, to identify national needs in medical R&D and ensure that those of highest priority are adequately supported, to draw up long-term plans for the efficient national use of resources, to identify research centres worthy of additional funding, to develop policy guidelines and give direction to the organisation of medical R&D, and to furnish advice to the Commonwealth Government on the optimal utilisation of the resources it provides for such R&D. It will need to collaborate with the Tertiary Education Commission and the Universities Council so that results of its overviews of the university sector can be translated into funding decisions. The Commission should be asked to seek the advice of the Medical Research Council before it recommends support for new initiatives in medical R&D in the university sector costing $0.25 million or more.

8.33 The MRC will be able to seek a greater degree of co-ordination in the use of funds for medical R&D provided by private and charitable foundations, such as the National Heart Foundation, the Life Insurance Medical Research Fund, and the Ramaciotti Foundation; it will also be able to comment on proposals for new, independent medical research institutes, and to give advice on how their planned fields of study relate to national needs and to the likelihood of obtaining funds from the Commonwealth Government via the Council. It is emphasised that the MRC's main role in medical R&D funded other than by the Commonwealth Government would be to achieve co-ordination and efficient use of resources by review, discussion and development of national policy guidelines; the Council is not intended to become a focus for centralising all decision-making in medical research.

8.34 In concert with the establishment of an independent Medical Research Council (Australia) steps need to be taken to form a National Health Council, replacing the NH&MRC, to concentrate on public health and health-care activities. It would also offer an opportunity for the Government to review the relevant functions and responsibilities currently undertaken by the NH&MRC, and to determine those appropriate to the National Health Council, together with its size and its membership.

8.35 This division will not result in medical R&D becoming divorced from public health issues. The current arrangements do not result in medical research grants being distributed on the basis of relevance to public health, especially since the MRAC now forwards its recommendations through the Chairman of the NH&MRC without prior reference to the Council itself. It will not be difficult to ensure that the membership of the Medical Research Council and the National Health Council allow for liaison and communication between them and with the Department of Health. Indeed, the identification and support of national needs in medical R&D by the Medical Research Council will need to be preceded by full discussion with the National Health Council.
The NH&MRC has, more than once, examined the desirability of dividing its functions but has always advised against this procedure. It must be recognised, however, that the members of the NH&MRC are expert in health-care administration rather than research.

ASTEC recommends:

(i) That a Medical Research Council (Australia) be established to carry out the medical research advisory and funding functions currently undertaken by the National Health and Medical Research Council (NH&MRC), and to have responsibility for the development, co-ordination and optimal utilisation of the resources available for medical research and development in this country; and that a National Health Council, replacing the NH&MRC, be formed to have responsibility for the national co-ordination of matters relating to public health and health-care services.

(ii) That the Medical Research Council (Australia) be established as a statutory authority under Act of Parliament and that it report to the Minister for Health and be accountable to the Government and the Parliament through the Minister; that it comprise a full-time (or almost full-time) Chairman who is a distinguished medical scientist appointed on a seven-year renewable basis, and not more than nine other part-time members appointed for renewable overlapping terms of three years; and that it be serviced by its own small, separately identified Secretariat established under the Public Service Act.

(iii) That the objectives and functions of the Medical Research Council (Australia) include the following:

- periodic review of the resources directed to medical research and development, and formulation of forward plans for their development, co-ordination and most effective use;

- identification (after consultation with the National Health Council) of areas of medical research and development which need to be promoted to ensure that the nation's health needs are met, and of areas where support needs to be reduced or terminated;

- provision of advice to the Commonwealth Government on the optimal utilisation of the resources directed to medical research and development within the government sector, on national policies for medical research and development, on medical research initiatives that should be taken in the national interest, and on the level of research funds to be allocated to government institutes and laboratories;

- collaboration with State governments, hospitals, universities, industry and private research organisations and foundations to encourage rational utilisation of medical research staff and facilities at the national level;

- identification of research centres which need to be stimulated and selectively funded;
CONCENTRATION OF RESEARCH EFFORT

8.37 The second main conclusion resulting from this review relates to the lack of concentration of research effort. The approximate distribution of the funds provided to the NH&MRC for 1981 is presented in Table 8.1

**TABLE 8.1**

**APPROXIMATE DISTRIBUTION OF NH&MRC FUNDS, 1981**

<table>
<thead>
<tr>
<th></th>
<th>$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Grants</td>
<td>12.2</td>
</tr>
<tr>
<td>Program Grants</td>
<td>1.5</td>
</tr>
<tr>
<td>Block Grants</td>
<td>4.0</td>
</tr>
<tr>
<td>NH&amp;MRC Units</td>
<td>0.7</td>
</tr>
<tr>
<td>Training Programs</td>
<td>2.1</td>
</tr>
<tr>
<td>Other Expenditure</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20.8</strong></td>
</tr>
</tbody>
</table>

Leaving aside the training programs, approximately $12.2 million was allocated for support of individual research projects and, at the most, only $6.2 million was made available for more concentrated research programs in institutes, in NH&MRC units, and through the award of eight Program Grants.

8.38 A similar situation exists in the distribution of the other main funds provided by the Commonwealth Government for medical R&D, that is, those allocated by the Tertiary Education Commission. With the exception of the funds provided to the John Curtin School of Medical Research, the monies allocated as recurrent funds, or as special or equipment grants, are for the most part used to support individual research projects rather than larger collaborative programs.

8.39 In contrast, the Government's recently announced decision to establish Research Centres of Excellence within universities and affiliated organisations can be seen as a commitment to the support of more concentrated research programs. An amount of $16 million has been allocated to this new initiative up to 1984, and it is quite possible that one or more Centres will be established in the field of medical R&D. This may help to begin to reduce the present fragmentation of medical R&D, but it will not solve the overall problem. Separate arrangements are required, which are specific to medical R&D and which can be applied over the whole range of organisations involved, including medical schools, teaching hospitals, private and hospital institutes and government laboratories.
8.40 There will always be a need to provide an adequate level of funds for individual research projects to enable young scientists to begin their research careers and to support researchers who wish to pursue their own ideas, especially when these do not accord with accepted dogma. Provision must be made for young, and not so young, individuals to carry out medical R&D, to achieve excellence, and to be recognised. It should be emphasised that ASTEC does not equate 'excellence' with the mature and distinguished medical scientists; excellence is found at least equally in younger medical scientists.

8.41 Nevertheless, the present situation is that there is insufficient concentration of medical R&D. There is a danger that progress on important health problems, whose solution will require the bringing together of research teams and the application of expertise from different fields of medical R&D, will be slowed if steps are not taken to reduce the fragmentation of effort. It may be noted that the recently-published report of the committee established by the Medical Research Advisory Committee 'To Review Medical Research Institutes in Australia' [17] also referred to the need for mechanisms which would provide for an increased concentration of the medical research effort. ASTEC believes, however, that increased funding of larger groups should not be at the expense of grants to younger scientists beginning their career or to those who wish to pursue their own ideas, but that the majority of any additional funds provided for medical R&D will need to be applied to stimulate a concentration of effort by first-class researchers.

8.42 An effective mechanism for encouraging the concentration of medical R&D is one which creates optimal conditions for the promotion of high-quality research, ensures the transfer of benefits derived from it to the community, and has a high degree of scientific, economic and social accountability. It needs to be a system of sufficient flexibility to promote interactions between basic and applied research, and to permit the incorporation of areas of need within it. It should aim to provide a pool of fundamental knowledge and expertise of sufficient depth and scope to ensure that:

- Australia maintains its place in the international scientific community;
- effective technology transfer can take place from overseas to Australia and between centres in Australia; and
- there is a suitable career structure for able medical scientists during training, and subsequently.

8.43 The most efficient way to achieve these goals is to create a series of first-class research centres, analogous to centres of excellence, throughout the country. Such centres would need to be built around individual scientists who are first-class researchers, and would not all have to be large. The question arises whether it would be better to support more centres of the size of the Hall and Florey Institutes, or whether a series of smaller centres of varying size would be preferable. Although the two institutes mentioned attest to the value of concentration of effort, large institutions are often more difficult to dismantle should they become unproductive. Furthermore, infrastructural costs may be higher and the overall scope of research endeavours more limited.
8.44 By contrast, creation of a larger number of smaller centres, which might be located in universities and teaching hospitals as well as institutes, has a number of advantages when accountability is of prime importance. First, they can encompass a wide range of research fields while still providing a mechanism for decreasing fragmentation of research activities. Secondly, they can serve, by virtue of their location, as a means for bridging the gap between basic research and clinical practice and as foci for training. Thirdly, their overhead costs are likely to be moderate, and reasonable mechanisms can be devised for terminating their activities should this be necessary. Finally, their creation not only represents a logical extension to the current NH&MRC Program Grant system but, in addition, is a well-tried system which in other countries such as the United Kingdom has been highly successful and cost-effective.

8.45 It is important to foster the development of centres of research throughout the country, that is in all the States. However, as Professor Paul Korner has remarked:

This is sometimes easier talked about than done since, in general, centres of excellence develop around particularly talented individuals. Once developed they tend to exercise a magnetic effect on other talented individuals and for potential research trainees [18].

8.46 The proposed centres would have the additional advantages of combining a higher degree of accountability than exists at present with sufficient flexibility of funding to ensure that research workers retain their autonomy. Overlap of research is likely to become less, and the fragmentation which is characteristic of university-based research reduced. This type of structure therefore meets the two essential requirements of a funding mechanism for medical R&D: the need to preserve the independence of the research scientist to plan his work and, at the same time, to provide an appropriate level of accountability to ensure that funds are spent in the most efficient way.

8.47 The medical research institutes have already been discussed. Two of the largest, the Walter and Eliza Hall Institute and the Florey Institute, receive Block Grants from the NH&MRC and must therefore be regarded as established centres of excellence in medical R&D. They have made, and are making, a substantial contribution to the all-important pool of fundamental research in Australia and to more applied investigations of health problems, assisted to a significant degree by the freedom and security they have enjoyed in the selection of research programs and key personnel. ASTEC has noted that the Committee established 'To review Medical Research Institutes in Australia' [17] has recommended that the Baker Institute also receive a Block Grant.

8.48 The remaining medical research institutes are heterogeneous in interests, quality and structure. Some consist of a selection of departments with unrelated interests and with varied success records for attracting grants from the NH&MRC. Some also have a significant service function. In these circumstances it may be that a majority of the proposed centres will be identified outside the institutes; but there are certainly potential centres in several institutes.
8.49 Many of the proposed centres are likely to be identified in the university medical schools and teaching hospitals. Reference has already been made to some university research of acknowledged excellence, and to the special nature of the John Curtin School of Medical Research.

8.50 To summarise, ASTEC believes that we need to move towards a situation where there is a series of first-class research centres in medical R&D throughout the country: some small, some larger, but all located in institutes, universities or hospitals, or within laboratories of the Commonwealth and State governments. For want of a better term the word 'Unit' could be used, as in the United Kingdom. The individual Units will need to be established around investigators with recognised research ability, and would need to be funded on a five-yearly renewable basis.

8.51 It may prove necessary to create Units in specific areas of medical science where current research is inadequate, and in such instances optimal results are more likely to be achieved by building the Units around individuals of high quality. First-class investigators may need to be encouraged or persuaded to undertake research in the area requiring development, and distinguished scientists invited from overseas to lecture and to work for a time in Australia. Able young investigators should be funded to work overseas in the field requiring expansion, and workshops organised to stimulate discussion and research activity.

8.52 The advantages of a series of Units in terms of the goals of medical research may be summarised as follows:

- provision of a mechanism for ensuring close links between basic and applied (clinical) research, and improvement in technology transfer;
- provision of a system with sufficient stability and flexibility to allow incorporation of areas of need and, where relevant, a contract research component;
- better utilisation of university and hospital facilities and staff to ensure optimal flow of discoveries to medical practice;
- provision of a system for funding one or more Units in institutes which have departments of variable quality and interests;
- maximal utilisation of existing expertise;
- creation of a better system for training promising young scientists in both basic and applied aspects of medical research;
- provision of a suitable career structure for good scientists trained in basic and applied medical research;
- control of high overhead costs associated with any expanded 'block' granting system restricted to institutes.
8.53 Proposals for the creation of Units, whether from universities, hospitals or institutes, would all need to be considered within the same objective system of stringent external review and assessment of past productivity and future potential, with recognition of the need for a high degree of public accountability. The recent introduction of the system of Program Grants and the creation by the NH&MRC of several small research units in defined areas of need has paved the way, and the proposed Units can be regarded as the logical extension of the existing funding system. The selection processes, and the administrative procedures necessary for the establishment, operation, monitoring and, when required, termination of Units are beyond the capability of the present part-time bodies, but are properly a function of the Medical Research Council (Australia).

ASTEC recommends:

(i) That the Medical Research Council (Australia) stimulate and expand the activities of medical research centres of the highest quality and in order to do this take steps to establish a series of selectively funded centres in medical research throughout the country, to be known as Units; (a) by examining the level of activity in the different fields of medical research in relation to national needs and, where a requirement for a new or greatly expanded field of research is identified, establishing, if appropriate, a new Unit around an outstanding individual scientist; and (b) by seeking proposals for Unit status from research groups within institutes, laboratories, and university and hospital departments, and subjecting all proposals to a system of objective review and assessment to determine those worthy of such support; and

(ii) that each Unit be funded on a five-yearly renewable basis, with continuation of support being dependent upon favourable assessment by an external review of the Unit's work, and that whenever a Unit's work is considered to have diminished in quality, or in relevance, support be reduced or terminated.

THE NEED FOR ADDITIONAL FUNDS

8.54 The basis for the required medical research effort in Australia is already present in the form of highly-qualified research personnel who, collectively, have earned an enviable international reputation for the quality of their work. The difficulty is, as described in paragraphs 6.34 to 6.37, that many of the best scientists are not supported adequately. In 1981, over 100 research proposals received by the NH&MRC, and which were judged after rigorous external review and assessment to be of such quality that they should be supported, were either not funded or only partially funded; many other first-class proposals could only be guaranteed support for one year. With greater reliance likely to be placed on this source of funds for medical R&D (see paragraphs 7.9 and 7.20), the situation can only deteriorate unless more funds are provided.

8.55 ASTEC has argued in earlier reports that the funds provided for medical R&D by the Commonwealth Government need to be gradually increased in real terms, and that view has been reinforced by the present study. It is important that the additional funds be used in the most effective way, and to support research which is related to national health needs. The functions and procedures outlined for the Medical Research Council will enable it to achieve both of these objectives.
ASTEC recommends:

That the funds available to the Medical Research Council (Australia) for the support of research having exceptional merit and promise be steadily increased, in real terms, over the next five years.

8.56 Additional funds were provided in the 1980 and 1981 Budgets, and this was a significant start in placing medical research on an assured basis so that it can make the maximum contribution to improving community health and to containing costs. Further increases will be required to support the establishment of the proposed Units. The amounts necessary will depend upon the progress made by the Medical Research Council in identifying fields of medicine where a concentrated program of research is necessary to fulfil national needs, and groups whose research is of such quality that it warrants additional support. Bearing in mind the anticipated size of the Units and assuming that no more than three will be established in any one year, additional funds of the order of $1.5 to 2.0 million each year in real terms over the next five years will be required. The total cost of this program, $7.5 to $10.0 million, is equivalent to about 20 percent of the Commonwealth Government's current annual expenditure on medical R&D.

ARRANGEMENTS FOR REVIEW OF MEDICAL R&D IN COMMONWEALTH GOVERNMENT LABORATORIES

8.57 The institutes and laboratories of the Commonwealth Department of Health are not within the jurisdiction or influence of the NH&MRC or its Medical Research Advisory Council; the same applies to the Health Services Research and Development Grants Program administered by the Commonwealth Department of Health. In general, these institutes and laboratories have a substantial service function as well as a research function, but their research expenditures, which are significant, are not subject to external review and assessment, nor are they placed in competition with other sectors of medical R&D for funds. However, the establishment of the Medical Research Council (Australia) provides an opportunity to bring the whole of the medical R&D budget of the Commonwealth Government under scrutiny, including the Health Services Research and Development Grants Program.

8.58 The Commonwealth Institute of Health provides postgraduate training, and undertakes research, in various aspects of public health and preventive and tropical medicine. It also has a role in policy development and provides services to the Government through the Department of Health. The Institute should remain within the Department's responsibilities, but its research programs and level of research expenditure should be subject to review and assessment each three years by an independent, external committee appointed by the Medical Research Council. In this way the Institute's programs will be assessed in relation to other medical R&D, and independent advice can be provided to the Government on their quality and relevance and on the appropriate level of expenditure.
8.59 Arrangements are being finalised for the transfer of staff of the Commonwealth Institute of Child Health (see paragraph 7.24) and the MRC could undertake the same part as has been agreed by the NH&MRC.

8.60 The National Acoustic Laboratories, the Australian Radiation Laboratory and the National Biological Standards Laboratory (incorporating the Australian Dental Standards Laboratory) each have a very substantial service function, and should therefore remain within the responsibility of the Commonwealth Department of Health. However, their research programs and level of research expenditure should be reviewed each three years by an external committee under the auspices of the MRC. The Medical Research Council should be asked to determine what proportion of the research and development activity is directly related to the service function, and to assess the scientific merit of the remainder so that it can provide advice on whether it should continue to receive government support and at what level.

8.61 The work of the Ultrasonics Institute, in ASTEC's view, has reached a stage where it would be better undertaken within a more commercial environment (see paragraphs 7.26 and 7.27). ASTEC therefore believes that steps need to be taken to transfer the staff and functions of the Ultrasonics Institute. A suitable mechanism to achieve this would be an initial five-year contract provided by the Commonwealth Department of Health, with provision for requirements for basic research to be contracted to the university sector. Care will be needed to ensure that the existing successful research team is not dispersed, and that the transfer of staff, who are all public servants, is effected with no net loss of rights in leave and superannuation.

8.62 The research programs of the Commonwealth Serum Laboratories which are directly related to its manufacturing activities are supported wholly by the Laboratories and should not be subject to external review since they are, properly, a matter for internal, commercial decision. However, research and development undertaken under Section 19(1)(b) of the Act, at Ministerial determination, is now funded completely by the Government. In ASTEC's view the research which is not directly related to commercial activities should be subject to continuing, external review under the direction of the MRC.

8.63 The program of Health Services Research and Development Grants currently administered by the Department of Health should become the responsibility of the Medical Research Council. This would enable the Council to ensure that research results are carried through the development phase and introduced into clinical and medical practice and, conversely, that needs identified during the delivery of health care are taken up by medical scientists and are funded adequately. The Council needs to give particular attention to determining the economic benefits of health services R&D, and should take steps to commission or to promote such research which is likely to result in significant cost-containment or savings. Expenditure on health services R&D should be identified separately in the Council's annual report.

8.64 The Department of Health may, from time to time, need to commission health services research which is required in relation to its regulatory or policy responsibilities. This might be done by arrangement with the Medical Research Council or, if more appropriate, by contract by the Department.
ASTEC recommends:

(i) That the Commonwealth Institute of Health, the National Acoustic Laboratories, the Australian Radiation Laboratory and the National Biological Standards Laboratory remain within the Commonwealth Department of Health; that their research programs and levels of research expenditure be reviewed every three years by an external committee appointed by the Medical Research Council (Australia); and that the Council determine what proportion of research activity is directly related to service functions and assess the scientific merit of the remainder in order to provide advice whether it should continue to receive government support and at what level.

(ii) That the research and development programs of the Commonwealth Serum Laboratories which are not directly related to its commercial activities be reviewed every three years by a committee appointed by the Medical Research Council (Australia), and that the Council assess and provide advice on the scientific merit of the programs and on the desirable level of government support.

(iii) That the staff and facilities of the Ultrasonics Institute be transferred from the Commonwealth Department of Health to a manufacturer of ultrasound diagnostic equipment, the transfer being effected through a fixed-term contract for five years let by the Department of Health, with provision made for cost recovery from commercial sales.

(iv) That the Health Services Research and Development Grants Program be transferred from the Commonwealth Department of Health to the Medical Research Council (Australia).

8.65 Consideration has also been given to the employment powers required by the Medical Research Council (Australia). When the MRC decides to create a Unit the staff could be employed under the Public Service Act; but it must be recognised that the Public Service science classifications are not necessarily suitable for a highly research-oriented career structure. A preferable alternative available to the Council would be to reach agreement with an appropriate body, perhaps a university or hospital board, for the establishment and funding of the Unit whose staff would then be employed under academic or medical classifications. This is the present situation with staff employed under Program Grants.

8.66 In general, the MRC should continue to allocate Project, Program, Unit and Block Grants without affecting current employment arrangements. In other words, the Council should be able to achieve its objectives through the allocation of funds, and need not itself be a major employer of medical R&D staff. This arrangement has three important advantages: it obviates the need for a large statutory authority; it gives adequate power for the gradual development and co-ordination of resources, without imposing administrative decisions made by a single, central body; and it enables medical R&D organisations, particularly the institutes and university medical schools, to continue to obtain funds for research from other sources such as industry, foundations and public appeals.

8.67 There will, however, be some occasions when it will be advantageous for the Medical Research Council to employ medical scientists. This would, for example, be a useful mechanism for arranging working visits by overseas scientists to more than one institution or short-term secondments between research groups.
within Australia. Further, when the MRC decides to reduce or terminate support to a Program, Unit or Institute, there could be an obligation for it to employ, for a fixed term, staff who are not able quickly to obtain other employment or whose research needs to be continued for only a short period to allow its completion. Under these conditions the Council could arrange employment either under contract within the Public Service Act, or through the award of fixed-term fellowships.
REFERENCES

1. E.G. Saint, Report to the Medical Research Advisory Committee of the National Health and Medical Research Council on the establishment of an evaluation and planning ("operations research") unit, April 1981, pp.105-121.

2. 'Science and Technology in Australia 1977-78', Volume 1A, p.35.


7. For the history of the John Curtin School of Medical Research see: F. Fenner, Medical Journal of Australia, 1971, pp.178-186.


11. 'Science and Technology in Australia 1977-78', Volume 1A, p.144.

12. 'Science and Technology in Australia 1977-78', Volume 1A, p.140.


14. Case for the Future Development of Medical Research in Australia, National Health and Medical Research Council, October, 1979, p.27.


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ASTEC appointed a Working Party to gather information on medical research and development, and to prepare a draft report for consideration by the Council. The membership of the Working Party was:

- Professor Sir Geoffrey Badger (Convenor), Chairman of ASTEC;
- Professor A. Basten, Professor of Clinical Immunology, Faculty of Medicine, University of Sydney;
- Dr D. de Souza, First Assistant Director-General, Commonwealth Department of Health;
- Mr A.W. Hamer, Company Director, and formerly a member of ASTEC;
- Mr K.H. McLeod, Federal Secretary, Australian Insurance Employees Union, and a member of ASTEC;
- Sir Gustav Nossal, Director, Walter and Eliza Hall Institute of Medical Research, and a member of ASTEC; and
- Professor R. Porter, Director, The John Curtin School of Medical Research, Australian National University.

Dr P. Price of the ASTEC Secretariat acted as Secretary to the Working Party.

The Working Party sought information from a wide range of groups and organisations which undertake medical research and development. Approximately 30 independent research institutes and government laboratories were contacted for information about their activities, and the Chairman and other members (as available) of the working Party visited and had discussions with the staff of the following:

- Walter and Eliza Hall Institute of Medical Research;
- Baker Medical Research Institute;
- Commonwealth Institute of Health;
- National Acoustic Laboratories;
- Ultrasonics Institute;
- Queensland Institute of Medical Research;
- Garvan Institute of Medical Research;
Kanematsu Memorial Institute;
Medical Research Centre, Prince Henry's Hospital;
Commonwealth Serum Laboratories; and
John Curtin School of Medical Research.

In addition, the Working Party held discussions with:

- Professor D.A. Denton, Director, Howard Florey Institute of Experimental Physiology and Medicine;
- Dr T. Hurley, Chairman, Medical Research Advisory Committee of the National Health and Medical Research Council;
- Dr R.C. Webb, Director, Victorian Division, Commonwealth Department of Health;
- Dr G. Howells, Director-General of Health, Commonwealth Department of Health.

The Working Party submitted a draft Report to the Council on 8 September. This was revised in the light of the discussion at the Council meeting, and the new version came to the Council on 10 November. The Report was further amended to give the final version.