1985 UUMS MEMBERSHIP
1 April 1985 - 31 March 1986

A membership application form has been circulated with this Newsletter together with the Notice of Annual General Meeting. To make sure that you are kept informed about the Society and the University, please register your membership as soon as possible. The 1985 membership donation fee is $25.00. Those who have been graduates for 50 years or more will become honorary members but need to register their names by completing the membership application form. A special fee of $10.00 for each of the first three years of membership will apply for first-year graduates who join in their internship year. Besides MB BS (Mediterranean) graduates, persons with a substantial association with the Faculty or the University’s affiliated institutions, for example, past and present academic staff members, may become members. In addition, legally qualified medical practitioners in the State of Victoria who do not qualify for automatic membership of UUMMS may be considered for membership on nomination by two members of the Society. We would like to urge members to propose membership of persons who would be interested in being associated with the Society. All that is required is a joint letter together with the consenting signature of the recommended person.

Never bored or boring

Peter Jones

At an editorial conference last year it was reassuring to learn that there was a good supply of serious and substantial material for this issue of Chiron. Perhaps it was the pre-Christmas spirit (non-alcoholic) which prompted a committee member to suggest that one section might have a lighter touch. So here it is.

Nowhere in the syllabus of this or any medical school will you find mention of “elementary clowning”, “clinical and applied joviality”, a workshop in “political hilarity”, or “the fundamentals of commonsense including a sense of humour”. Some doctors may be inclined to take themselves too seriously, perhaps persuaded by the weight of their placebo effect. On the other hand, “unsupervised electives” in Surgery and the Med Men have repeatedly shown the reverse side of the serious mien. Few authors of current medical text books would recommend that doctors have a responsibility, and numerous opportunities, to keep their patients merry and, if possible, laughing (thoracotomy or laparotomy permitting), but nearly five hundred years ago a remarkable Tudor physician did, and practised what he preached.

Andrew Boorde (1490-1549) was born at Boorde Hall near Cuckfield in Sussex, to a family with even older roots at Batcombe in Somerset where they were tenants of the Abbey of Glastonbury in 1189. Andrew Boorde graduated in medicine at Oxford, and entered the strict Carthusian order in 1521 in the prevailing but dwindling tradition of physicians in holy orders. He was appointed suffragen Bishop of Chichester, but was never inducted and eventually released from his vows in 1529. Like many physicians of his day, bred on Galen and Aristotle but with no practical knowledge of last year’s variety team.

Those of us with personal experience of what well-motivated (and often wealthy) alumni can do for a faculty or a university had no hesitation in joining UUMMS, and we would like to think that the good response to marshalling (not dragooning) our medical graduates may be one of the reasons that the University is about to follow the same course in creating an Alumni Association to embrace, or at least welcome with open arms, its graduates, in all faculties.

The details of the organization and the relationship to its component parts have yet to be worked out in detail, but the objectives are admirable and identical with ours: to encourage communication, and foster joint participation by uniting all present and past members of the University. Although a mere three-year-old toddler, we wisely entertain no sibling rivalry, and warmly welcome the birth of the Alumni Association, of which UUMMS will, clearly, become a not insubstantial and appropriately autonomous part.

Solve Alma Mater Rediviv. Semper Floreat.

"There's a porpoise close behind us"

To make sure that you are kept informed about the Society and the University, please register your membership as soon as possible. The 1985 membership donation fee is $25.00. Those who have been graduates for 50 years or more will become honorary members but need to register their names by completing the membership application form. A special fee of $10.00 for each of the first three years of membership will apply for first-year graduates who join in their internship year. Besides MB BS (Mediterranean) graduates, persons with a substantial association with the Faculty or the University’s affiliated institutions, for example, past and present academic staff members, may become members. In addition, legally qualified medical practitioners in the State of Victoria who do not qualify for automatic membership of UUMMS may be considered for membership on nomination by two members of the Society. We would like to urge members to propose membership of persons who would be interested in being associated with the Society. All that is required is a joint letter together with the consenting signature of the recommended person.

Ever bored or boring

Peter Jones

At an editorial conference last year it was reassuring to learn that there was a good supply of serious and substantial material for this issue of Chiron. Perhaps it was the pre-Christmas spirit (non-alcoholic) which prompted a committee member to suggest that one section might have a lighter touch. So here it is.

Nowhere in the syllabus of this or any medical school will you find mention of “elementary clowning”, “clinical and applied joviality”, a workshop in “political hilarity”, or “the fundamentals of commonsense including a sense of humour”. Some doctors may be inclined to take themselves too seriously, perhaps persuaded by the weight of their placebo effect. On the other hand, “unsupervised electives” in Surgery and the Med Men have repeatedly shown the reverse side of the serious mien. Few authors of current medical text books would recommend that doctors have a responsibility, and numerous opportunities, to keep their patients merry and, if possible, laughing (thoracotomy or laparotomy permitting), but nearly five hundred years ago a remarkable Tudor physician did, and practised what he preached.

Andrew Boorde (1490-1549) was born at Boorde Hall near Cuckfield in Sussex, to a family with even older roots at Batcombe in Somerset where they were tenants of the Abbey of Glastonbury in 1189. Andrew Boorde graduated in medicine at Oxford, and entered the strict Carthusian order in 1521 in the prevailing but dwindling tradition of physicians in holy orders. He was appointed suffragen Bishop of Chichester, but was never inducted and eventually released from his vows in 1529. Like many physicians of his day, bred on Galen and Aristotle but with no practical knowledge of last year’s variety team.

Those of us with personal experience of what well-motivated (and often wealthy) alumni can do for a faculty or a university had no hesitation in joining UUMMS, and we would like to think that the good response to marshalling (not dragooning) our medical graduates may be one of the reasons that the University is about to follow the same course in creating an Alumni Association to embrace, or at least welcome with open arms, its graduates, in all faculties.

The details of the organization and the relationship to its component parts have yet to be worked out in detail, but the objectives are admirable and identical with ours: to encourage communication, and foster joint participation by uniting all present and past members of the University. Although a mere three-year-old toddler, we wisely entertain no sibling rivalry, and warmly welcome the birth of the Alumni Association, of which UUMMS will, clearly, become a not insubstantial and appropriately autonomous part.

Solve Alma Mater Rediviv. Semper Floreat.
The Future of Private Practice in Public Hospitals

Professor David Penington

Professor David Penington is Dean, Faculty of Medicine, University of Melbourne, and Chairman, Committee of Inquiry into Rights of Private Practice in Public Hospitals. This is a shortened version of the public lecture given by Professor Penington at the University of Melbourne on 12 November 1984 under the auspices of the University of Melbourne Medical Society.

It is of some interest that late last year I was very busy with writing, with research commitments and some problems in the Hospital. I had made a deliberate decision to ignore the political activity over Medicare. I found, all of a sudden, that I had to learn a great deal about medical politics, public hospitals, private practice, government and how governments work, and of how to influence governments to make them work better. It was an instructive exercise but not one that I would enter into again if I knew what was involved.

I was particularly fortunate in the choice of people for the Committee which was set up. I was the independent chairman; there was a nominee of government and a nominee of the AMA. We worked extraordinarily harmoniously. My two colleagues were John Cashman, a radiologist from Sydney in private practice with some sessional commitment in hospital work and Brendon Kearney, the Government nominee, Director of the Institute of Medical and Veterinary Science in South Australia, now also the Chief Executive Officer of the Royal Adelaide Hospital. Held previously been Chief Medical Officer of the South Australian Health Commission, so he had experience of government administration.

It's one of my aphorisms that when faced with a difficult diagnostic problem as a third or fourth opinion, the answer nearly always lies in the history and facts which other
people have gathered. To get to the bottom of a difficult problem is not primarily a matter of intelligence, it’s a matter of carefully examining the information. Even before I realised I was going to be involved, it was clear to me that the controls proposed by government didn’t match with the realities of private practice in public hospitals; there were obvious problems, which I presumed to be due to the fact that the advisors to the Minister didn’t understand the public hospital system. Little did I know how far that was going to turn out to be true.

I’ll take you back to the start and then work our way through some of the issues touched on in the course of the Inquiry. I’ll have to pass over some quickly as there is a lot of ground to cover.

First of all, what are the public hospitals? In colonial days, we started with hospitals to look after convicts and the military; an example was the “Rum Hospital” in Sydney with all of its problems. The next stage was that of caring for the wider community as it grew and became settled. This applied particularly to the ‘indigents’, as wealthy people could generally be looked after at home. Medicine had very little to offer in the way of active treatment; surgery perhaps a little more, but most was conducted in the patient’s home if conditions were satisfactory. It was only those who couldn’t be looked after at home who needed hospital care.

In Victoria, private patients were first recognised as deserving of care in public hospitals not in Melbourne town, but in Sale; the Gippsland Hospital, from the time it opened in 1862, admitted patients as public patients, intermediate patients or as private patients, with the choice of their own doctor for the private and intermediate patients. The Melbourne Hospital didn’t countenance this sort of behaviour; they employed an inspector whose job it was to ensure that no people of affluent means were admitted to the hospital. However, the Alfred Hospital did admit paying patients quite early on. They attracted considerable approbrium by doing so. It was said that they were using a public facility for paying patients in order to make money for the Hospital. A Royal Commission was established in the year 1891 and recommended that they should not be permitted to have “pay beds”. Only two years later, however, in an economic recession, the Hospital like all others ran out of money and that policy was quickly reversed!

The growth of private practice in public hospitals came with the development of active treatment for various diseases and the growth of specialties. During the 1920s and 1930s full-time specialists were appointed in radiology and pathology. Anaesthetists were recruited as specialists; biochemistry and microbiology grew out of pathology, and then the specialist surgical services, such as neurosurgery and thoracic surgery were established as they could not be looked after at home who needed hospital care.

What are some of the problems that have beset the hospitals? The changing role of the profession has been a very important one. In earlier years, with an honorary service, doctors had a special status within the hospital; they provided their services without payment and were not employees. They were listened to attentively by hospital boards.

With the mid-1970s and the introduction of sessional payment into most hospitals, the visiting staff and the full-time salaried staff came to be on an equal footing as far as the hospitals were concerned. It led to big changes. Previously we had a situation of ‘gentlemen’ and ‘players’; in fact, in many hospitals the salaried staff were excluded from holding office in the senior staff structures of their hospital — only visiting staff were eligible. It is difficult to be sure that the visiting staff have a significant role in the decision-making processes, as the full-time staff are more available and hence play a larger part in those councils of the hospital. Much of the decision-making process in hospitals has passed from committees of staff to career administrators and this is again a factor in distancing the medical profession from the governing bodies of hospitals.

With growing public funding comes public accountability. This is one of the key issues which I’ll come back to in some detail. One essential requirement for getting our public hospitals back on course is a rediscovery of the fact that we are a team, not only the medical and other professional staff but the administrative group and the board of a hospital. The only way a public hospital can work effectively is to rediscover that collegial approach in dealing with problems which has somehow been lost in the confrontations and rapid changes of the past ten to fifteen years. We have to retain a capacity for innovation in health care, which is never quite in situations of restricted funding and we have to address together the difficult task of seeking excellence but within an inevitably limited budget.

We now move to the other part of the history — the story of government involvement. It came as a surprise to me to find that Earl Page in the Bruce ministry as early as 1928 had proposed a bill to introduce health services and insurance. In fact it was lost when the Bruce government fell and was not reactivated during the Depression. But Lord Casey, as he later was, introduced as Treasurer of a Conservative Government in 1938, a bill for a national health insurance scheme. This scheme was to include provision of medical services for all. It was to be based on contribution, in his words, ‘of only 2% of the wages of all of those in employment, to safeguard all those who needed medical care throughout the country.’ This was to be linked with a pension scheme and several other innovations. It sounded radical for the National Party but nonetheless after discussion with the British Medical Association of the day, the Federal Council of the Association agreed to the proposal and agreed even to a schedule of fees which might apply to the provision of medical services; the bill was introduced into Parliament and passed. However, some three months later, Mr Casey received a letter from the President of the BMA saying that the Association had changed its view after consultation with its State branches, and it would not go along with the bill. The government set from the National Health and Medical Research Council approximately 70% are held within the teaching hospitals and their University clinical academic departments. This is important not only in advancing knowledge but in creating a critical environment within the hospital where practice is tested and checked, where critical discussion occurs on all aspects of medical practice. Where technological development can be introduced and lastly, although this is as yet very poorly developed, where evaluation of health services can also be conducted.
Figure 1: Recurrent health care expenditure in Australia 1961 to 1982 by source of funds (current dollars)

Figure 2: Australian health care expenditure as percentage of gross domestic product (Financial Year ending 1961 to 1982)
Figure 3: International comparisons in growth of health care expenditure as a percentage of gross domestic product.

Figure 4: Relationship between national wealth and health care expenditure in Western nations.
up a Royal Commission to study medical remuneration; I'm
glad to say we departed from repeating history at this
point, as the Royal Commission on a journey from
Melbourne to Sydney flew into the side of the Dandenongs
and some of the members were killed; after that, with the
gathering clouds of war, nothing happened.

The next stages in government involvement in health care
are well known to most of you — the Pharmaceutical
Benefits Bill in 1944, the various confrontations at that time
including attempts to draft the profession into use of
particular prescription forms. The Constitutional Amendment
was a very important part of this history followed by the
National Health Services Act in 1948.

In 1953 the Earl Page scheme was introduced which
provided federal government subsidy to health insurance
across the country. This was under the Menzies
government. In 1968, Mr Justice Nimmo reviewed the Earl
Page scheme, and concluded that it was unsatisfactory,
with an enormous gap between the benefits and the actual
cost of services. He introduced the concept of a common
fee to which benefits would relate, and suggested that there
should be no more than $1.00 difference between the
benefit and the fee. This report was the basis of the
"Gorton Amendments" which were subsequently introduced
(again a Liberal government). The AMA took careful steps
to ensure that in establishing a scale of common fees, it
was doing no more than that — a statement of what fees
were ordinarily charged in different States for different
services. However, Gorton went to the country stating that
the scheme would guarantee that no Australian would have
to pay more than $5.00 for any service; in doing so, he was
assuming that that common fee was a scale of fees to be
charged, rather than a statement relating to benefits, the
basis of much of the present dispute.

We don't have to dwell on the changes that came with
Medibank in 1975 and the repeated revisions which
followed. The basis of the present Labor government's
concern in introducing the Section 17 proposals was, in
their own words, to provide accountability for the massive
involvement of public expenditure in the Australian health
care system. They said that controls had to be established.
If you look at Figure 1, you see the rapid escalation of
costs of health care, year by year, and the increasing
government expenditure in the lower cross hatched area.
There was a jump in the 1975-76 year with the introduction of
Medibank, but still, with the subsequent revisions, a high
proportion of federal government expenditure in health care.

On the face of it, this looks impressive; it might appear that
tings were out of hand, justifying strict controls. If,
however, expenditure is expressed as a fraction of gross
domestic product, the story is different (Figure 2). The
explosion in health care costs between 1973 and 1976 was
an important phase, but had little to do with Medibank. The
factors operating included the introduction of equal pay for
men and women in hospitals which have many female
employees, the introduction of much higher payments for
resident medical staff and registrars, the introduction of
sessional payments for doctors towards the end of that
period and a series of other cost elements. Since 1976 we
have, in fact, had relatively stable total health care
expenditure; the reduction during the last four to five years,
when adjusted for inflation, relates primarily to a squeeze
on hospital funding, with changes in the federal cost
sharing agreements.

If we look at the international picture (Figure 3) comparing
our own costs (the heavy line) with those of other countries,
the period of rapid growth is similar to that in West
Germany. We are more or less in the middle of the road.
Countries where it could be said health costs are out of
control are at the top and it's of interest that one of these,
the United States, is the bastion of private enterprise;
another, Sweden, has an almost completely nationalised
health care system. The need for controls does not bear
much relationship to whether one is dealing with private
enterprise or with governments — controls have to be there
and they have to be appropriate.

France, Germany and Canada are very close to us in terms of
total costs and I will go into those in a little greater detail.
The United Kingdom is low in terms of health costs; the
National Health Service is not a prolific waste of money, but
is a system where government control is tight. Governments
always wish to keep expenditure down and the service has
been starved of funds over a long period.

If we look at the cost of health care in relation to the wealth
of the country (Figure 4) in terms of gross domestic
product per capita, by and large the wealthier the country,
the more it spends on health. We are right on the
regression line and, compared with other countries, we
Don't spend unusually much or unusually little on health care.

It is of interest that over the last few years, during which
there has been a funding squeeze, there has been a very
striking downturn in renewal of equipment in hospitals.
Figure 5 is a picture from 1974, produced by a large
multinational company for marketing purposes; it sets out
the total market of the country for radiological equipment,
compared with the gross domestic product, in terms of
German marks. Australia was well below the line. Since that
time, we have moved closer to the line but almost all of that
has been for the installation of CT scanning equipment in
private radiological practices. This illustrates what happens
when we depend unduly on government expenditure. An
easy way to save money is in capital expenditure: "we won't
build new hospitals"; "we won't modernise hospitals"; "we
Don't spend a million here or a million there on a CT
scanner". Now we have a vicious circle of inadequate
facilities for training radiologists, a shortage in this specialty
and falling staffing levels further jeopardising training.

The submission from the Commonwealth to the Committee
stressed that the areas most out of control were pathology
and radiology. Compared with all services, the growth of
services in pathology was far greater: over 100% growth of
services per 1,000 population between 1975-76 and
1982-83. For radiology, the rise was greater than 50%
between those years. We raised a number of questions
which the Department of Health had difficulty in answering
and spent a great deal of time collecting evidence. The
Department's information systems were unable to dissect
either pathology or radiology in public hospitals from those
in the community at large.

We sought information from New South Wales where there
was said to have been a far greater growth than in other
parts of the country. Of course, in 1975-76 there was
practically no private in-patient service in pathology and
radiology, as these were provided as a public service
under Medibank even for private patients. We have good
documentation that a large segment of the growth was the
reintroduction of private practice which had been excluded
in that base year — the first year of Medibank. But there
are other elements in that also.

We sought information from the Commonwealth data bank
looking at diagnostic services per 100 consultations
(Figure 6). Granted, there has been some increase in the
total number of consultations over the period, but we felt
that relating diagnostic services to consultations would
reflect the pattern of medical practice; we found, in fact, a
strikingly different picture. The solid line shows that
although there was growth in the number of services in the
Figure 5: Comparison of X-ray equipment markets

Figure 6: Trends in utilization and cost of Pathology and Radiology services

Figure 7: Distribution of recurrent health expenditure in Australia (based on 1980/81 Financial Year)
last few years, this was far less than shown by the government figures. Much of the error in the government figures was due to that unusual base year of 1975-76 but there were also other problems.

Next we sought to isolate hospital diagnostic services. You may be aware that a special fee was introduced for the commonly used pathology services in public hospitals in 1979-80 after the work of the Pathology Services Working Party (the HP fee). We dissected this out as it relates only to work in public hospitals. We found over this period only a 22% increase in services. The SP fee, which applies only to specialist pathology services outside public hospitals, showed a far greater growth. The story, although not complete, clearly indicated that in public hospitals there was better control in the use of diagnostic services than in the community at large and a large part of the rapid growth in the total figures related to private practice outside hospitals. We needed, therefore, to re-examine the basis on which the controls were proposed.

If you look at the distribution of costs in health care (Figure 7) you’ll see that half the cost in this country, as in most others, relates to hospital services. Services provided by medical practitioners outside hospitals are a much smaller component. If we want to control the health care costs of a country, then we must look at controlling hospital expenditure more than the incomes of doctors. Nonetheless, as has been pointed out by successive ministers, including Liberal ministers, doctors are great determinants of costs by the services they order; there is a clear argument that to control hospital costs there is need for effective controls on the way we use services.

There were some strange stories about medical incomes. We all read in the newspapers about people who earn half-a-million or a million dollars a year in pathology or radiology. In fact, what were being referred to were gross incomes, not net income after genuine practice costs. It was said that pathologists and radiologists earn far too much and that therefore controls were necessary on the services they could provide, and thus the Section 17 proposals were developed. Obtaining objective evidence comparing incomes was a necessary but difficult task. The information was available only on a confidential basis, protected by law. With a great deal of sweat and toil and a lot of talking and negotiation, we collected information on all the major sources of income from a wide range of specialty groups in one State. It’s no real secret that the State was Victoria. We obtained the information on medical benefits income from the Commonwealth with the agreement of the Federal AMA, information from the Health Commission about hospital payments, information from the Motor Accidents Board about payments for motor accident purposes, and from two large insurance companies from which we could estimate income from workers’ compensation. (In fact, this was a small source of income.) We had information on the salary bonuses and additional payments which were available to the salaried staff and were able to construct a profile of incomes (Figure 8) for the two types of employment. These are not dollar figures of course.

<table>
<thead>
<tr>
<th>Broad Specialty Group</th>
<th>Full-Time Salaried Specialists</th>
<th>Private Specialists</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimated Average Taxable Income $x</td>
<td>Estimated Average Taxable Income (a) Income $y</td>
</tr>
<tr>
<td>General Physician</td>
<td>1.11</td>
<td>1.20</td>
</tr>
<tr>
<td>Other Spec. Phys.</td>
<td>1.35</td>
<td>1.10</td>
</tr>
<tr>
<td>Neurology</td>
<td>1.07</td>
<td>1.20</td>
</tr>
<tr>
<td>General Surgery</td>
<td>1.07</td>
<td>1.04</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>0.98</td>
<td>1.02</td>
</tr>
<tr>
<td>Other Surgery</td>
<td>1.49</td>
<td>1.52</td>
</tr>
<tr>
<td>Pathology</td>
<td>0.93</td>
<td>2.12</td>
</tr>
<tr>
<td>Orthopaedic Surgery</td>
<td>1.07</td>
<td>1.22</td>
</tr>
<tr>
<td>Plastic Surgery</td>
<td>1.93</td>
<td>1.40</td>
</tr>
<tr>
<td>Urology</td>
<td>1.93</td>
<td>1.50</td>
</tr>
<tr>
<td>Vascular Surgery</td>
<td>1.07</td>
<td>1.30</td>
</tr>
<tr>
<td>Radiology</td>
<td>1.24</td>
<td>2.06</td>
</tr>
<tr>
<td>Radiotherapy</td>
<td>1.82</td>
<td>5</td>
</tr>
<tr>
<td>Anaesthetics</td>
<td>1.54</td>
<td>10.10</td>
</tr>
<tr>
<td>Dermatology</td>
<td>1.10</td>
<td>1.28</td>
</tr>
<tr>
<td>O &amp; G</td>
<td>1.09</td>
<td>1.42</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>0.95</td>
<td>1.32</td>
</tr>
<tr>
<td>ENT</td>
<td>1.04</td>
<td>1.22</td>
</tr>
<tr>
<td>Paediatric Phys.</td>
<td>1.01</td>
<td>1.22</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>0.96</td>
<td>0.96</td>
</tr>
<tr>
<td>Physician unclass.</td>
<td>1.61</td>
<td>1.14</td>
</tr>
</tbody>
</table>

(a) Net of practice costs, before tax
(i) Fewer than 3 practitioners in the sample
(n) Not calculated (sample sizes too small)

Figure 8: Ratio of taxable income, private and full-time salaried specialist
The information was collected on the basis that we would not be publishing dollar figures. We set arbitrary parameters: it's a guessing game as to what 'X' represents, but it is the same figure as 'Y'; there are differences in the form of income and the way income is handled, depending on whether you're an independent private practitioner or whether you’re a full-time salaried specialist. To the income for the salaried specialist must be added benefits from superannuation and various other components which are not included in the salary. The figure here relates to salary with the “on call, recall”, together with the bonus from private practice. On the other side as a multiple of the same figure is net income, after applying the figure used by the Federal Government and the AMA in serial medical fees inquiries, to allow for practice costs. If you know what a full-time specialist earns in this State, you can make a pretty good guess as to what 'X' is and what 'Y' is; if you said it's between $40,000 and $60,000, you wouldn't be far wrong.

When you compare these totals, there isn't much difference. There are certainly advantages from taxation arrangements for private practitioners who may have assistance from a receptionist or in the family working at home, or advantages in motoring and various other expenses, but these are not large when notice is taken of the leave, insurance or superannuation benefits for the full-time staff, together with security of employment. This was a surprise to some people within the medical community, as it was to government advisers in the States and in the Commonwealth. In fact, there is a wide scatter within each specialty. Some earn little and some earn a great deal. One of the bases of jealousy and antipathy and of statements in the newspapers is the tendency to look only at the high earners, an exceptional group who often work much longer hours than most. It's of interest that in the visiting staff side, the high earner as a group are in pathology and radiology. That was indeed relevant to the Inquiry, but problems lies with the Medicare Benefits Schedule and a review of this Schedule needs to address it, rather than imposing artificial controls on a small part of the operation of private pathology or radiology, that fraction of it which is in the public hospitals.

It is of interest that the general surgeons are not, as a group, high earners; although widely believed to be, only a small number are in that class. There's a cryptic heading “Other Surgery” who are higher earners and this is composed of two groups which are not very similar. The paediatric surgeons are close to the general surgeons in income whilst the cardiac surgeons are well above; in fact, the cardiac surgeons would be closer to '2Y'. The anaesthetists are amongst the high earners in the full-time staff. This is because they are generally senior and also put in long hours on call and are recorded. The only anomalous group of full-time staff are the radiotherapists, to whom the normal limitations on full-time earnings, applicable in this State to all other full-time specialists, do not apply. The radiotherapy arrangements at one hospital, where most work, are quite different from those in the rest of the State.

Collecting these facts involved a lot of work, but it was valuable data. When discussed with the government it challenged the basis of the proposed restrictions on earnings. They were then willing to look more broadly at the issues in dispute.

Well, what about the proposition of controls for the sake of controls? Obviously it's not a good thing to just say that there should be controls; clearly we would all like to be free. However, if we have extensive public funding of public hospitals, there is no way politicians or the community will accept cries of "leave us alone, we'll spend as we see fit"; whichever party is in power. In fact, Ralph Hunt in 1976 gave the profession three years to introduce peer review systems which would govern the way services were provided and the cost of those services, and stated that if the profession did not do it, they might be imposed upon them. In 1978, Michael McKeller established FODS which is continuing to give problems throughout the country. In 1980, Jim Carlton called for a report from the Parliamentary Committee of Inquiry looking at under-use and over-servicing in the medical profession. Every government of whatever political persuasion will try to save money. We took the view that if the profession fails to address the problems at this stage to get some sense into things, in a workable way, we will have controls imposed upon us from outside which will be far more onerous.

We looked at what was happening overseas. I was appalled at some of the things that I found. In France there have been annual contracts, which every practitioner must sign in order to attract benefits; these were introduced by Charles de Gaulle in 1960. The right to exceed the fee schedule is a privilege granted to a small number of distinguished practitioners by special professional committees of inquiry. There are now a small number of non-participating doctors who gain not only much lower benefits for their patients but also face social penalties for non-participation. There is a phasing out of private practice for full-time salaried staff and a system of senior professional inspectors appointed to authorize prolonged stay in hospital, use of certain diagnostic services and items of that kind. There is computerized surveillance of billing and fees which puts our FODS to shame.

West Germany is a country which is very similar to us in the pattern of expenditure. A federal Cost Containment Act was introduced in 1977, and severely limits medical earnings; there is discounting of fees where people exceed certain limits. Fees are set according to relative value units and varying fees are allowed between States and between country and metropolitan regions in some areas, depending on the pattern of expenditure. There is a major role for professional organizations including review of prescribing habits, the imposition of fines for people who don't conform to those prescribing "norms", "economic monitoring committees" and so on.

We've heard much of the problem of controls in Canada. The system is uniformly fee-for-service in public hospitals and outside. Cost control is partly through hospital budgets which have been tight. There is restriction on private diagnostic services which are almost exclusively provided through the hospital system; fees for services are from set budgets by provinces and, if the budget is exceeded, it has the choice either to cut medical payments or to provide extra funds from its "own pocket". The federal contribution is limited to growth in keeping with the gross domestic product. There is very strong pressure for bulk billing; in Quebec it's almost impossible not to bulk bill because of financial penalties; there is tapering of incomes above certain levels — all the things considered as part of the system for Section 17. Computerized surveillance of services is highly developed and the one good thing is that there is a major professional role in surveillance of the billing patterns.

What about the United States, that bastion of free enterprise? In fact, the controls which are currently in the phase of development will be very much more disruptive to medical practice than anything contemplated in this country. The Professional Standards Review Organisations (PSROs) provided the model for the statement to us by Hunt in 1976, to which I have referred earlier. They are not considered to have been very effective. Health Maintenance
Organisations now cover some thirty million people and are staffed primarily by salaried doctors. There are a number of problems with these but, nonetheless, they seem to have an important place in providing lower cost health care. However, the big change in this area is the development of Preferred Provider Organisations related to large business corporations, to public services and other employer bodies, where fees are controlled and the patient has a guarantee of service of a given standard. The very big change, however, is the introduction of the Diagnostic Related Groups concept with standard payments for categories of disease. This has put a very tight screw indeed on hospitals which receive Federal funding; the large private insurance bodies, Blue Cross, Blue Shield and other organisations of that kind are also linking into the DRG pattern. There is a request from Congress for the Department of Health and Human Services to come forward by 1985 with legislation to regulate medical fees, also, through Diagnostic Related Groups. Comments from colleagues in the United States make it clear that this will impose enormous changes. For example, a comment from the Mayo Clinic, where it is pointed out that the Radiology Department, instead of being a major source of income for the Clinic, will become a major cost centre to be held in check. This trap will be repeated again and again. Profit for the Clinic or even its viability will depend on keeping strict curbs on expenditure. Medical practitioners will increasingly become controlled in decision-making by the total budget of the hospital.

We see controls developing in every western country at which we look. They are going to come in Australia in any event. Our view was that we must steer the development of controls in such a way as to improve the quality of care and to assist the medical profession, to ensure that they are of a kind we could live with and work with.

In a recent symposium mounted by the World Health Organisation in Belgium a list of principles was developed to show how to control health care costs. Obviously, gross cuts in government funding of hospital systems has been tried in this country over the last seven years; the pipes are squeaking already and there are problems we cannot ignore in terms of waiting lists and of facilities. Reorganisation of hospital services could lead to some savings but new methods are needed for the evaluation of health services, new means for consultation and negotiation with the providers of the services, principally the medical profession; incentive systems are needed to make the system work well so that if savings are made in one area they can be used in other areas. Those proposed at the WHO symposium matched many of the thoughts of the Committee.

The major prerequisites for effective control of costs included, in our view, greater participation by the medical profession in hospital management rather than the alienation which is prevalent in many hospitals in the last fifteen years. We saw a need for better information systems on utilization of services in individual public hospitals, not only those funded through medical benefits but services to hospital patients. The information systems are very poor; the Commonwealth had poor knowledge of what happens in public hospitals, and the States, in some instances, appeared to have just as poor a knowledge. Lastly, we believe it is necessary to bring to the attention of all doctors in public hospitals the cost of the services commonly used, both at the point of ordering and as a feature of utilization review. The resident, as he sits with his pen in the morning and checks a list of investigations may be authorizing very high costs for both the hospital and the patient. We have to learn to curb costs where they can be curbed so that money can be redirected to do the things we all wish to see done. We have to preach this message to the politicians as well as to the profession, not leaving it to governments to say what is to be done.

The recommendations ended up as forty and cover a great deal of detailed material. I will quickly skate over a few of the highlights. We believe that there is need for the States particularly and for all hospitals to address the question of an effective interrelationship with medical staff. On the question of billing for services where they use heavily the facilities of a public hospital, such as in pathology, radiology or radiotherapy, we saw it as appropriate that billing be through a hospital system, as long as it works efficiently, so that the hospital knows what is going on. We were of the view that the requirement that all hospitals bill for all diagnostic services simply would not work if there were hospitals that didn’t have the capacity to do it efficiently, and there are many in this country in that category. The Minister agreed to accept our view that the information should be available for the hospital, either through hospital billing, or through a copy of any account being forwarded to the hospital, if raised by the pathologist, radiologist, or radiotherapist.

What about the vexed question of fees? We pointed to some problems in relation to the Medicare Benefits Schedule if this is to be any relationship to fees. We accepted the Government’s argument that in reality those services which include very major components from facilities of public hospitals — pathology, radiology and radiotherapy — are billed in almost every instance at the scheduled fee when provided in public hospitals. We accepted that this is appropriate with certain safeguards even though contrary to AMA policy. If the fees are to be tied to the Schedule, the Schedule has to move with inflation and with changes in costs year by year, otherwise it could be committing people to provide uneconomic services. This argument has been accepted by the Government with a commitment to a regular review of fees.

What about the question of other services? There are four States in this country which made it clear to us that they believe that all services provided in public hospitals, regardless of what they were, should be at the scheduled fee and no more. These were New South Wales, Victoria, South Australia and Western Australia. It was clear that fee control would be imposed on the profession anyway, and we therefore had to address the problem. For services other than those discussed above, we took the view that if they are provided in a public hospital, the community has some right to expect that reasonable fees will be charged. If the profession believes that the fees charged are reasonable, then they should not fear their being subject to some form of peer review. We’ve put up a package which provides that alternative. If some fees are unreasonable and we don’t regulate them, the politicians will. People practising in public hospitals should elect either to charge the scheduled fee, or if they elect to the right to charge above the scheduled fee, they should be subject to peer review; furthermore, the patient ought to know that they’re going to be charged more, so that they’re not hit with unexpected bills. The purpose of this compromise is to preserve the independence of the profession and to retain controls in the profession’s hands.

The proposal for limitation of total earnings was another matter of importance in the confrontation earlier this year. Because of its figures on pathology and radiology, the Government believed that there ought to be limits imposed on visiting staff; in fact if you looked at the limits proposed, they were nowhere near what we have proposed, and we accepted that this is appropriate with certain safeguards. For services other than those discussed above, we took the view that if fees were total earnings were not allowed to earn more than 175% of a full-time salary from any one hospital, but might visit two or three different hospitals and be allowed to earn huge sums of money! On our evidence, there was not a disparity between the full-time salaried staff and the visiting staff in total incomes. Some earned more, because they worked harder, some earned less but on average the earnings were comparable. When this was discussed with the Federal Minister, he agreed that the recommendations
for limits on earnings by the visiting staff may not have been appropriate, providing the work was in their own time. Full-time staff do private practice in time in which they are paid by their hospital as full-time employees. It is not unreasonable for these that the figure 25% be set as a limit to additional earnings as has applied in this State for many years. However, if sessional payments to visiting staff are for their public work, and private work is done in their own time, there is no reason for limitations on earnings. This was a part of the package which has now been accepted by the Federal Government.

I am going to pass quickly over a number of the other recommendations. We pointed to particular problems in country practice and also problems of renewal of radiological equipment which are leading us into a vicious spiral of inadequate numbers of radiologists by any Western standard. An odd point is that surgical prostheses for private patients have to be provided under present arrangements through public funds and, with the squeeze on hospital budgets, many hospitals have refused to allow private patients to have operations involving say, lens transplants or prostheses for hips, because of tight budgets even though the patient is willing to pay.

A very important element in solving the dispute is providing machinery for on-going consultation between the profession and government over all arrangements to do with private practice in public hospitals. We received a submission from the joint working party of the AMA and the Government; most of their recommendations we adopted but some were modified. We have provided for consultation in the development of proposals. After they have been enacted, we have provided for appeals against administrative decisions by the Minister if they cannot be resolved through the consultative machinery. Lastly, we've recommended an Interim Consultative Committee which will have the carriage of implementation of these decisions. That Committee is to have an independent chairman, and I'm involved in that capacity for another nine months. It will comprise three nominees of the AMA on one side and three of the Government on the other. The Committee is to have the task of advising on translation of the recommendations into legislation and detailed administrative arrangements; the Interim Committee should be able to address any remaining problems.

Lastly, can I ask you to look at the problem in cartoon form (Figure 9). In the United Kingdom there is a large public sector and a small private one, almost entirely outside the public sector. In such a system, the private sector can more or less do what it wants because it's using private hospitals. People are paying directly, it doesn't involve the public purse. In Canada, on the other hand, the private sector and public sector are one and the same. This means that there are controls on the public sector which cover everything. We have in Australia a public sector and a private sector which overlap in the public hospitals. If we can accept controls of a reasonable kind with the profession having a major role in running things, we would have crossed a major watershed. That would lead, in my view, to a private sector outside, which could operate with reasonable confidence and independence and a public sector inside, which should operate with greater efficiency.

If, as some of our colleagues in New South Wales have pleaded for, all of the public patients were regarded as private patients in a fee-for-service arrangement under Medicare, we would have the Canadian system, and inevitably all the controls with it. It would remove the freedom we now have of private practice as we know it in the rest of Australia. The package of controls we have proposed may not be all that palatable for some people; however, they have been developed after a great deal of discussion and debate and have been accepted by the Government. This was not easy as they differ very substantially from what was proposed early in the year. They would leave the profession with a very important degree of freedom, to be independent and to shape the course of the public hospital system. It won't be easy — it will involve work — it does involve accepting controls; but my own view is that if we don't accept these reshaped controls, we will have much worse ones imposed on us very soon.

Figure 9: Interrelation of Public and Private Sectors
Questions

Professor Ryan: Thank you, Professor Penington. Before I call for questions, I'll permit myself one comment. I think that it is a pity that the Government did not have this report or the information in this report a year ago. I think we would have been in a much better situation than we are now.

Question: Perhaps that last slide with the overlapping sectors was one of the very important messages which you've given us and one way in which Australia is differently clearly a contrast both to the UK and from other places like Sweden and Canada. This has been an exercise in educating government as well as gathering data and educating the profession. At the beginning, it seemed to many of us that government didn't appreciate the advantages that the private sector brings to our teaching hospitals. It brings interesting and different patients in. It generates money for research and many other things. Do you feel that at this point that government has learned some of these attributes of private practice in our teaching hospitals?

Answer: Yes, I believe that they have. In the Progress Report we listed reasons why there should be private practice in public hospitals; that was perhaps the most telling set of arguments we produced to government in the whole exercise. We forget just how isolated governments are from the realities of the things that they administer. Governing a country is a complex matter. People start with preconceived notions. Views are put by people who are close to them and for a minister to make his own assessment of whether the advice is appropriate depends on a department able to give him the facts. The difficulties with the information from the Department arose from both the lack of systems to provide appropriate data and the lack of interplay between Commonwealth and State health authorities. But even then, there were problems. The information wasn't there. In a way, that was all of our fault collectively. We have allowed government to get too distant from us. After the confrontation which occurred, and the work that we did in our Committee, after the response to the evidence that we presented we believe governments will listen. We have a commitment from the Government to accept the core recommendations and if they are acceptable to the profession, I believe we've bought peace for a good many years. That's important.

Question: I have two questions: the first about Recommendation 1 which I concur with entirely and I'm sure that most people do, but in this State the State Minister of Health seems to have an unhealthy interest in controlling new appointments to hospital boards. Do you see this as a problem in this State? My other question relates to Recommendation 2 to the fellowships — what will happen to the trainees after they have done their training; could you amplify your ideas on what should happen to these people after they've learnt their skills?

Answer: The first one is difficult in that I can't see very clearly in the crystal ball in respect of Victoria; however, changes in hospital boards were inevitable. If you look through the Jamieson Committee report for 1979-80, you will see it was observed again and again that hospital boards were not representative of the community they served. There was a good case for change which was accepted by the Liberal government of the day. Changes have occurred, however, which I think can be politely described as 'politicisation' of hospital boards and I think this is very retrogressive. Within a week of our Progress Report being released, a health minister in another State, who had been going down exactly the same track, announced that he was going to have a doctor on every hospital board in his State because we'd said so. We hadn't in fact said that, but I was perfectly happy for him to interpret it that way. In New South Wales there are still very intense confrontations. If these can be resolved, then we will see changes in hospital boards. They have agreed that many are 'off course' and that is because of 'politicisation'. On the other question, health care evaluation is an area of applied research which is very poorly developed in Australia. At the moment we have health economists making decisions as to what should be done in health care, and many of them have little understanding of what health care is about. It is very important that we get able medical people trained in this area. If they can be trained, there will be enormous opportunities for them in public hospital administration, in State government administration and the Commonwealth government administration. I don't see any problem with the employment of such people.

Question: On the question of reduction of possible costs, it seems to me that one major avenue would be the reduction of stay of patients in hospitals. Is this feasible in Australia?

Answer: There are many difficulties with this. Savings should be possible in that major public hospitals have many patients in them who are not having active treatment. They have social problems and need hospital care of a much less intensive kind, but yet we don't have sufficient long-stay facilities. These people are in very expensive beds, occupying places needed for acute cases. However, if you increase turnover and reduce hospital stay, the need for intensive nursing increases, the cost of investigations goes up and the cost per day increases. Long-stay patients bring down the cost per day, so you don't save as much in a particular hospital as you otherwise would. There are differences in the proportion of beds per 1,000 population around Australia. Victoria is one of the states with a low proportion of beds and many are, of course, in country areas; a small country town needs a hospital, which may be poorly occupied, because it's there to deal with a crisis when there's a bad accident or epidemic. Victoria is less boded than many other States and I don't think we can say that we have a great capacity for savings through reducing bed numbers.

Question: You've repeatedly referred to the scheduled fee as an appropriate fee to be charged in private practice. I presume that you do mean that and not the rebate. Who pays the difference which is recognized as being substantial by some people in the community at the poorer end of the economic scale?

Answer: In ordinary private practice we've always reserved the right to charge a smaller fee if we felt that a patient was disadvantaged and a higher fee for a patient who could afford it. We have recommended that the scheduled fee be observed where a large part of the service is provided through public resources in public hospitals. That's the only part which in our recommendations is required to be billed at or below the scheduled fee. It does leave the community meeting a gap of 15%, unless they have a large number of bills from heavy usage when there is provision that the full fee is met by the Medicare system, so that the effects of the gap are limited. There is no doubt that the fact that the patient has to pay something for each medical service acts as a control. This is relevant when you've got people wanting to have things done just in case there is some benefit or you do want to pay for the sake of it; they may think twice if there has to be some payment. If people want to be private patients, but for it to cost them nothing at all, I'm not sure that we have private practice any longer in the way that we have known it.

Question: Professor Penington, the group I represent regards your document with some reservation. I represent orthopaedic surgeons, not the New South Wales lot, but we...
regard your document as a negotiable document and subject to discussion; maybe, it's a monumental work; you've done it in a remarkably short space of time. If you project yourself a few months down the track, do you think you might have got any of it wrong?

Answer: I have said already that there's no way that we have covered all of the problems in the Australian health care system, but we've got the measure of a number of them. I would be the first to admit that there might be need for some adjustment. We went into a situation of intense confrontation between the profession and the Government, confrontation which I believe was damaging to the profession and our standing in the community. To retrieve that we've got to be willing to compromise in some areas in order to have a base on which we can buy peace with the Government. The Government have swallowed a large pill. If we are not willing to play our part, they will go their own way as before.

Question: Professor Penington, in view of the massive demand that's been created by the uninsured population for the public hospital beds, is there now any room for the insured or the private patient within that system?

Answer: It's a fair question, but the figures show that there is room and that there are private patients in public hospitals. It's true that the numbers have decreased since February and they may continue to fall. I don't believe that private practice will disappear. It is true that there is a large demand for hospital services which is not being met in the community and that, in my view, is due to inadequate expenditure on public hospitals. This has to be redressed.

The main need will be for increased expenditure from general revenue, as the economy picks up, and I think we've got figures which justify that. We're going to have to work on ministers; we have to learn how to get close to them and to speak their language. We have to influence both the political and the administrative arms of government. But first of all, we've got to find a basis on which we can work together.

Professor Ryan: I think the hour has come. If I might call on a person who's been particularly involved in various aspects of this topic during this year: Peter Jones has agreed to give the vote of thanks.

Mr Peter Jones: Professor Ryan, ladies and gentlemen, Professor Penington. For those of you who are bound to have read the recommendations, and I urge you to obtain the full report, you will see there much of the detail that lies behind the statements and the thoughts expressed here tonight. You'll find much more than recommendations. They are concentrated, informative histories of the development of the hospital system in our nation, the development of health care systems and health legislation. The report has been described here and elsewhere as monumental and I think that's probably true and it can be given at least two meanings. First of all, monumental in the sense of the reflection of the mountain of work, an astonishing amount of data to be collected, analysed and made productive in less than four months. The rumour from above stairs is that even Professor Penington's co-committee members stand in awe of his capacity to comprehend such an enormous mass of detail, to collect it comprehensively and to distil it into crisp statements and recommendations. The sheer volume and the hours of work required are daunting. Monumental also carries the meaning that it is a monument to what Professor Penington has aspired to achieve on behalf of the medical profession and for rationality as much as for the Government. It is regrettable that this Inquiry was not commenced well before February 1984. As it has emerged at a time when there are heightening suspicions, diminished goodwill and erosion of trust, circumstances which may well contribute very significantly to resistance or at least difficulties of implementation of the recommendations of the Report, however useful or rational. This year has been marked by a tragic depth of despair and heights of anger and militancy, such as the medical profession in Australia has never seen before and they are not yet passed. This evening we have heard the voice of reason, certainly it seemed so to us; yet I know that it will seem to others to be the voice of appeasement, of defeatism, of connivance, of surrender. It depends a lot on exactly what can be made of some of the recommendations in a context in which it will require goodwill and trust, which I believe are in very short supply. Nevertheless, we have reason to express our thanks to Professor Penington on two grounds, first for the enormous amount of work that he has done in the time on our behalf; and second to the masterly lucid account of it we've heard this evening. May I ask you to join me in expressing your appreciation in the traditional way in an audible form.

Continued from page 2

Boorde's second book, *A Compendium Regimen or a Dyetary of Helthe* was written in Montpellier and published in 1542. Unrepentant for writing in English, the dedication of his 'Dyetary' nevertheless asks the

"Masters of the exercious and arcane science of Physicke of your urbanity exasperate not yourselves against mee for making of this little volume".

Back in London he practised his 'beloved Physicke' which, he said, was "gloriously re-arising after twelve centuries of swoon", and although his Montpellier MD was incorporated at Oxford (the usual preliminary to election as a 'candidate' of the College of Physicians), he was never admitted to the College. This did not prevent his advancement at court where the Duke of Norfolk and Thomas Cromwell were among his patients. Henry VIII employed him as an envoy to the courts of Europe, granted him a coat of arms, and appointed him as tutor to the future Edward VI, but when the king died, in 1547, Boorde retired to Winchester. There he lived as a Cistercian priest-chaplain, fasted regularly and wore a hair shirt, but fell out with the Bishop of Winchester who charged him with "keeping three loose wimmen in his chamber", and had him committed to the Fleet, where he died of "jail fever", probably typhus, the scourge of Tudor prisons.

In his writings, Andrew Boorde frequently drew attention to the value of 'myrthe' as 'one of the cheaste thynge of Physicke' for

"if anie man be splenitike let hym use mery companie, be jocunde and not study uppon any supernatural thynges."

His contemporaries were unimpressed by the nonconformist among them, dubbed him 'Dr Myrthe' and derided him as a "Mary Andrew", perhaps the first use of the epithet. His handsome coat of arms (Per fesse gules and azure an inescutcheon within an orle of marlins argent) had for a crest "a goat statant ermine horned or", probably a medical allusion, for goats were a source of gastric "bezoar stones", widely used in Tudor times in powdered form as a remedy, especially against poison. His books are full of simple homely advice:

"sweetneter healeth the bloode . . . rotteth the teethe and maketh them looke blacke", and

"A goode Cooke is already the halfe of a Physyon for the chefel physicke (the council of a physitian excepted) dothe come from the kyttchen, whereforthe the physyon and the Cooke for sick men must consult together for the preparation of meate."
1984 Halford Oration
How Cells Make Antibodies — Current Concepts and Future Challenges
Professor Sir Gustav Nossal, Director, The Walter and Eliza Hall Institute of Medical Research
30 July 1984 at the University of Melbourne

The Dean, Professor David Penington:

We welcome you tonight and it is a delight to see a full lecture theatre for a very important occasion for this Medical School. Tonight is the 31st Halford Oration. The name is a very important one in this Medical School, Halford being our first Professor, but I am not here to talk about Halford now, I am going to leave that to Professor McKenzie a little later in the evening.

To introduce tonight's speaker is to introduce a figure with whom we are all familiar. Sir Gustav Nossal is a graduate of Sydney University and early turned his talents to research. He came to Melbourne to work under Sir Macfarlane Burnet and at the early age of 30, was appointed Deputy Director (Immunology) of The Walter and Eliza Hall Institute of Medical Research. At the age of 34 he was appointed its Director, to succeed Sir Macfarlane Burnet. It was moving into shoes that were large ones indeed to fill. The Hall Institute had achieved international renown under Sir Macfarlane Burnet and as a young man committed to his own personal research, Nossal took on the responsibilities of further development of that Institute. For most, that would have been a daunting task, given a simultaneous commitment to achieve personally as a research worker. In fact, Gus Nossal took the Institute into a new era, a most exciting era of development, of broader interests and of achievement in all sorts of directions. This led to an international prominence that the Institute had never known before, and those achievements are still being unlocked in the form of a large new building which will allow the Institute to develop further and achieve new goals.

I think it is time I, as Dean, desisted at this point, because you have all come to hear Sir Gustav talk on his chosen field of research; but I think it is important for young people to see him as a person who was once a medical student like many in this audience, a person who saw medical research as an area in which he could personally achieve something and get fulfillment, enjoyment and pleasure, as well as making a contribution for other people and that has been part of the purpose of this series of Dean's lectures: for young people to see and identify with their elders and their teachers in this respect. It is with great pleasure that I welcome Sir Gustav Nossal to deliver the 31st Halford Oration.

Sir Gustav Nossal:
Professor Penington, Professor Ryan, distinguished members of the Faculty, ladies and gentlemen:

It is a tremendous thrill to be standing on this podium tonight. Our medical school boasts of a proud tradition, I speak not of my Alma Mater which is the University of Sydney, but as an adopted son, and though a part of me is still pained to admit it, I think few would dispute the fact that the University of Melbourne is, in terms of medical research, this country's premier medical school. Having listened to many Halford Orations during my quarter-century of working within this medical school, I also know that this is a premier event of its academic calendar. So it is with a sense of enormous pride but also due humility that I cast about in my mind as to how I might honour the memory of our first Professor. I thought it might be fitting to tell you a saga, which like our medical school also has a history of a little over one hundred years; a saga which is unique in the annals of preventive medicine; a saga which embodies, I think as well as anything else, the interaction between basic biomedical research (biochemistry, physiology and anatomy) and the more applied medical sciences; a saga which has won five Nobel prizes, but which, like the totality of research that is really worthwhile, is of course an unfinished symphony. That is the saga of antibodies and of the cells that make them. This saga really began with Louis Pasteur.

It is of course true that vaccination was the great triumph that Jenner brought into the medical arena a century before Pasteur, but Jenner's prevention of smallpox was really enlightened empiricism. It was Louis Pasteur, having discovered the microbial origin of infectious disease, who also patiently, painstakingly and thoughtfully tamed the bacteria, attenuated them and in 1880 produced his classical paper on fowl cholera: the first planned, thoughtful immunization against an infectious disease.

Pasteur himself didn't know that vaccination was due to antibodies, but ten years later Emil von Behring (and, as is so often the case, at almost exactly the same time Pasteur's own associate Dr Roux) discovered that immunity was due to molecules which moved in the bloodstream. These molecules were termed Antikörper (antibodies) and the name has stuck.

Von Behring was soon joined by Paul Ehrlich, both born in the same year 1854, born in fact on the same day of the same year! History was to prove Ehrlich a still greater man than von Behring, because it was really Ehrlich who introduced quantitative analytic methodology into immunology. It was really he who forged antibody research into a science, and Paul Ehrlich and the great Austrian scientist Karl Landsteiner sheeted home the fact (to an even greater extent than Pasteur had done) of the specificity of these antibodies. Pasteur had discovered that you had to attenuate a particular organism to protect against a particular disease. It was the early work of Ehrlich and Landsteiner that proved that this specificity resided in the specificity of the antibody molecule which has a combining site that can recognize the molecules we term antigens, specific to particular strains of viruses or bacteria. So antibodies specifically recognize antigen. Felix Haurowitz in the late 1930s discovered that these antibodies were proteins, which move in the bloodstream and were made after the antigen entered the body. The stage was then ripe (knowing that the antibody was specific, knowing that they occurred after intentional immunization) to ask where were these antibodies made. One could tell after the injection of living or killed bacteria that the local lymphatic draining tissue swelled up. In the 1910s and 1920s it was discovered that while antibodies were in fact made in a large number of sites in the body, because the cells that make them are mobile, the prime sources of antibody production were the lymph nodes and the spleen, the lymphatic system of the body. And in fact, if we look a little bit more closely into these tissues, we find that there is a particular area of the
A lymph node called the medulla and a parallel area of the spleen called the red pulp in which the bulk of antibodies are made.

Now I come to the late 1930s and the early 1940s when Brachet, amongst others, first dimly recognized that the formation of proteins had something to do with a special nucleic acid called RNA. Histological stains were developed that stained RNA specifically, and it was noted that the medullary regions of the lymphatic tissues contain cells that took up RNA-specific dyes very avidly, making them prime candidates as possible producers of antibodies.

Furthermore, a very thought-provoking study by Astrid Brachet, amongst others, first dimly recognized that the formation of proteins had something to do with a special nucleic acid called RNA. Histological stains were developed that stained RNA specifically, and it was noted that the medullary regions of the lymphatic tissues contain cells that took up RNA-specific dyes very avidly, making them prime candidates as possible producers of antibodies.

Fagraeus published in 1948 showed a sequence of these cells that appeared to be a maturation sequence, a very large, rapidly dividing one, popping up in the red pulp of the spleen and the medulla of the lymph node at about day 2 or 3 after antigen injection, later to give way to more mature-looking cells which still took up the RNA dyes. The sequence ended up at maybe day 5 or 6 with a cell that had a well developed Golgi apparatus, and above all, a look that stained RNA specifically, and it was noted that the sequence ended up at maybe day 5 or 6 with a cell that had a well developed Golgi apparatus, and above all, a look that

I am describing one half of a saga, because we will be talking tonight about the many millions of different antibodies to meet the different bacteria and foreign molecules in nature could possibly come into being. A man of genius addressed this problem. Niels K. Jerne was a Danish scientist and a deep-thinking, quantitative biologist. On pondering the Crick dogma, he concluded that somehow the antibodies must be coded for by DNA, and somehow there had to be genes for antibodies. He, of course, didn't know how many antibody genes there were in a human cell, but he postulated that antibody formation was not instructive at all, but selective. He argued that when an antigen enters, the body figures out some way of magnifying a synthetic potential for the corresponding antibody which is already there in latent form from the very beginning. His natural selection theory of antibody formation, published in 1955, was really a watershed in immunology. It did not make much impact at first because it in fact espoused a very clumsy secondary notion of just exactly how antigen would act as a magnifying device for particular specificities. And it was another great man of genius in 1957 who provided the real answer to the question of how cells make antibodies. As Jerne once put it: “I hit the nail, but Burnet hit the nail on the head”. Sir Macfarlane Burnet in 1957 had pondered this selective theory of Jerne’s and he said it had to be a selection not of molecules but of cells. He published his clonal selection theory of antibody formation which I shall now summarize.

There are in the body of a mouse some 10^9 cells called lymphocytes. We now know that it is the B lymphocytes that are operative in antibody formation. Let us postulate that each one of these bears on its surface a protein molecule which is an antibody, but each one a bit different. On the slide, here is one called A, shaped like a tuning fork; here’s one called C shaped like a Y; here’s one called Z shaped like a D. Every cell bears a different antibody receptor. Burnet said that when an antigen comes into the body, all an antigen has to do is to find that lymphocyte which possesses a corresponding pre-formed, presynthesized receptor capable of binding that antigen. Following the union, the cell begins a cascade of cellular division and accelerated antibody synthesis so that in fact the immune response is an amplification of that pre-existing potential, enshrined in the single, unique receptor on the cell surface.

As Burnet’s student in 1957, I said to myself this has got to be the craziest thing that anyone has ever heard of. In fact remember having been given Jerne’s paper to read in PNAS as one of the first bits of reading that I did in theoretical immunology. I thought it was highly fanciful and so, I think, did 99.9% of the other people who read it. Then after one weekend in 1957, Burnet came in saying: ‘I think I
that no two of these microdrops looked exactly the same. In one, there would be rapid immobilization but very little tendency for agglutination, or clump formation. In another drop the bacteria almost stopped, but not quite, they jiggled a bit and they formed dense clumps. In the third one, they formed loose clumps, in the fourth one there was very marginal antibody formation altogether, even though the cell looked just as healthy and it looked as though it could be a jolly good antibody producer. So no two droplets containing antibody looked exactly the same. In 1959, I was joined by a gifted post-doctoral fellow, Dr O Mäkelä. Some time after he had learned all my techniques, he went further and probed this apparent uniqueness of each antibody molecule secreted by the single cell. He took two different bacteriophage viruses which cross-reacted immunologically. With bacteriophages, he could quantitatively neutralize strain A and the cross-reacting strain A1. Mäkelä found that indeed each cell had a unique pattern of cross-reactivity. Some cross-reacted extremely, some hardly at all, and some even killed A1 better than A. Not only did one cell make one antibody, but each cell's product was exquisitely precise and specific and to a certain degree different from every other. Little did we know it in the late 50s and early 60s, but of course this was the finding which was one of the cornerstones on which monoclonal antibody technology has been based.

We worked very hard between 1957 and 1963 on antibody formation by single cells, and virtually had the field to ourselves. Then, Niels Jerne and his team developed what is called the 'hemolytic plaque technique' of detecting single antibody forming cells. This was much simpler and more elegant than our own cumbersome micromanipulation techniques. Now everybody in the world could play the one cell one antibody trick, and our fundamental finding was very quickly confirmed. So too was the fact that the detailed specificity and cross-reactivity pattern of cells was very different from cell to cell. Each antiserum in fact was seen to be a population of very different monoclonal antibodies; the properties of the whole serum were the result of the mixture of many single cell products.

Following the development of somatic cell hybridization, Kohler and Milstein fused single antibody-forming cells together with tumour cells and created the hybridomas which we now all know of as producers of monoclonal antibodies. These have vast potential in both immunodiagnosis and immunotherapy, as Professor Ian McKenzie so brilliantly described in a previous Dean's Lecture in this theatre.

Now that really was only the beginning of the story. It was one thing to have an antibody-forming cell making a unique product, but really if Burnet's theory were to be deeply true, you would have to prove that the receptors with the given specificity were actually on the surface of the ancestral cells, the B lymphocytes. It was found that when you took a whole population of B lymphocytes from a normal mouse and mixed them with a little bit of antigen marked with radioactive iodine, there was, as predicted, enormous heterogeneity in the capacity of these lymphocyte cells to bind that one antigen. Really only about one cell in ten thousand bound worthwhile amounts of the antigen, and of the ones that did bind, there was a great variance in the amount of binding. So that seemed to be very good for clonal selection; that was exactly what the clonal selection theory predicted: preadapted receptors, different lymphocyte from lymphocyte, no two exactly the same. Accordingly, my colleagues and I sought to obtain a formal proof of clonal selection. Drs B L Pike, W Haas and J Layton were prominently involved in this work. We took absolutely normal unimmunized B cells, B cells from a perfectly healthy mouse, or even B cells from a mouse that had just been born and thus not yet exposed to any antigen. We placed these cells onto an affinity layer of...
antigen that had been glued onto gelatin. Of $10^8$ cells, about $10^4$ would stick to the monolayer and could be recovered therefrom. There was no immunization in this, all the cells that stuck had preadapters. We put these putatively specific B lymphocytes, that were not forming any antibodies, but possessed specific receptors, into tissue culture. If the clonal selection theory is right, we ought to be able to stimulate each cell in tissue culture, one cell per culture, and we ought to be able to get them to make only antibody specific for the antigen on the monolayer. After years of struggle, we have succeeded in this experiment.

IgE is your "nuisance" antibody; an IgE that had been put on a monolayer. After years of struggle, we have succeeded in making only antibody specific for the antigen on the monolayer. How can this be explained when one gene always means one protein? It was a puzzle, and remained a puzzle for a long time.

The puzzle was finally solved by Tonegawa, Leder, Honjo, and I. I am proud to say, with very major contributions from Jerry Adams and Suzanne Cory in our own Institute. It turns out that the antibodies break the rule of one gene-one protein, and the antibody molecule is in fact the product of seven genes all combined to make your final antibody molecule. We now know the genetic map of the immunoglobulins, and I would like you to concentrate for the moment on the larger of the two chains, the heavy chain. There exists in every cell of all of our bodies about 200 genes which code what we will call V genes. These code for the variable part of the chain, which is the portion that gives the heavy chain its recognition specificity. So we will number them V1 to V200. We don't know the exact number, but 200 is not likely to be far wrong. This set of V genes sits in our genome as a tandemly repeating set. Then downstream from that in the genome, sit ten more genes called D. Then downstream from that again, sit four genes called J for junctional.

Finally, further along sit all of the genes for the different handle parts, that is, for the IgM heavy chain, the IgG heavy chain, the four different sorts of IgG heavy chain, and so forth. The same pattern is true for the light chains of antibodies, except that here there are no D genes. To actually make an antibody molecule with all this genetic information residing in the genome, these genes have all got to come together. There are in fact two separate rearrangements or translocations of these genes to generate, inside the antibody-forming cells, the compound gene which is transcribed and translated. At the time the B cells are being generated in the body, there is a movement of one specific V gene, one out of the set of 200 (together with all its friends to the left of it) to come up cheek by jowl with one of these D genes and with one of the J genes, and finally with the IgM heavy chain genes. So the first set of rearrangements occurs in the B cell lineage, putting a particular V gene into proximity of a particular D gene and J gene, and also the IgM heavy chain gene. The activation of that compound gene will then allow a nuclear RNA to be made that reads, for example, V73D4J3 and $\mu$ constant region. This nuclear RNA has to be processed before it is exported into the cytoplasm with certain portions spliced out (the intervening sequences or introns).

Following this first rearrangement, the cell can make IgM. When, later, it seeks to switch to IgG antibody production, as Suzanne Cory and Jerry Adams showed so brilliantly, it in fact decides to chop out and throw away the $\mu$ and $\delta$ genes and rearranges the whole V D J sequence next to one of the "downstream isotypes", as we call them. For instance, V D J sequence moves to the Y1 gene, and then we have a plasma cell that has switched from making "its" IgM to make "its" IgG. This was the true reason for my finding of 15 years earlier. The cell has preserved exactly the same specificity but has now put it into context where the handle has changed, same specificity, different handle. It is still, I think, the only example we know of in biology where a gene rather than being simply inactive is actually physically thrown out of the cell, physically deleted so that this cell will henceforth forever lack the gene for those heavy chains upstream to what is being secreted at the given time. If we have 200 V genes for each of light and heavy chains, and about ten D genes for the heavy chain, 4 J genes for each of heavy and light, a simple calculation shows that you can generate approximately 8,000 different sorts of heavy chains simply through recombining these minigenes. You can also make about 800 of each of 2 sorts of light chains. So, in IgG production, the genetic capacity is there to make 10^7 or 10 million different sorts of antibody. This is before mutation has had a chance to work on the system as the lymphocytes divide in the body. Such
somatic mutation is frequent in antibody genes, so the diversity generated is truly staggering.

We move now to the question of what is the trigger which gets the cells to respond. Certainly one of the early events is a cross-linking of the surface immunoglobulin receptors by antigens bridging two different receptor molecules. This cross-linking, in the case of the lymphocyte, is frequently followed by a phenomenon called "capping"; where motility of the surface of the cell sweeps all the immunoglobulin receptors into a sort of cap, after which they are endocytosed and shed. Patching, perhaps more than capping, appears to be a very important early event. The originally dispersed receptors create little patches, then a cap, then are phagocytosed and shed. But we have known also for quite a long time, really ever since the work of Miller and Mitchell in 1968, that the cross-linking event is not the only thing that takes place in lymphocyte activation. There has to be something else, which involves the T cell. There has to be a factor or factors made by T cells that underlies the clonal activation and proliferation of the B lymphocytes.

Now I am going to have to skip over a lot of work and compress much in these last five minutes to say that the thought has developed that there may in fact be two different sorts of factors made by T cells that underlie the cascade of division and differentiation from B lymphocytes to final plasma cells. As you pick up the literature on this, you will find it confusing, because none of these factors are pure yet. None of them have been cloned by recombinant DNA technology, and none of them have been available in large enough quantities for scientists to work with and to check each others' results. It is generally believed, however, that there are B cell growth factors, and a different set of molecules called B cell differentiation factors. Frequently the latter are referred to as TRF or T cell replacing factors. These purified molecules are supposed to do what the T lymphocyte itself as a living cell does in guiding antibody formation and isotype switching. The factors are supposed to replace what a living T cell physiologically does inside the lymph nodes and the spleen. Many immunologists believe that B cell proliferation works in a graded sequence. First, antigen and/or a T cell signal makes the small resting B cell go into the G1 growth phase. Then, as an early event, a receptor for a growth factor is popped out and this growth factor is itself a lymphocyte-derived lymphokine.

The growth factor is seen as responsible for the proliferation of the activated B cell into a proliferating B cell clone. Then along comes a second kind of T cell factor which drives that B blast into a differentiated non-dividing plasma cell as the end of the process. This model has dominated the literature for about four years.

In pondering the model, I was much influenced by the work of Don Metcalf and his many collaborators who study a different wave of division and differentiation, namely the formation of granulocytes and macrophages from a hematopoietic precursor cell. They too, for a brief period, thought that there might be growth factors and (separately from that) differentiation factors. But the further their work progressed, and the more factors that were available in pure form, the more they realised that every factor that promotes growth also to a greater or lesser degree promoted differentiation and, vice versa, every factor that promoted differentiation caused some growth. So I asked myself whether that also might be true in the case of the B cell. I am speaking again about work that involves a lot of collaborators, and particularly Beverley Pike, John Schrader, Ian Clark-Lewis and David Vaux. We asked ourselves, of all the factors that we know that T lymphocytes can produce, which ones can drive a single cell into growth and/or differentiation once that cell has been hit by antigen.

I recognize this to be a difficult area for the non-immunologist. First of all, we took a very crude mixture of T cell derived factors. We found it promoted division of the single cell and antibody production as well. We then went to a molecule which is one of the earliest ones of these molecules to be purified and "cloned"; called interleukin-2. Here we had to make use of the trick that the human molecule works on the murine species because only the human IL-2 was available. We were fortunate enough to get human interleukin-2 from the Cetus Corporation that had been made by recombinant DNA technology. We found it worked on B cells, though rather weakly. It is the lymphokine that is the chief growth factor for T cells, but it also significantly stimulated the B cells together with antigen. It helped both division and antibody production. We then went to a molecule which masquerades by a wide variety of names, including interleukin-3, multi-CSF and PSF. This molecule, which in our particular case we got from John Schrader and Ian Clark-Lewis, had no effect on B lymphocytes whatsoever. It caused neither division nor antibody production. The granulocyte-macrophage colony stimulating factor that Don Metcalf and Tony Burgess had purified from mouse lung caused no division and no antibody production — a hallmark of its specificity for the granulocyte lineage. Two alleged differentiation-promoting factors from two different Japanese groups, known as differentiation but not growth factors, caused division and differentiation in our system. In fact, if anything, they caused a little more division than differentiation. Certain mitotic molecules in the spleen of T cells or macrophages caused good division and antibody production when only one single cell was the target. So the main message (from this slide) is that my guess is probably correct. In fact, there does not exist a factor which causes either division or differentiation. All of the factors (at least so far investigated) cause both. So our current picture of antibody production goes something like this. We have a small resting B cell, which through its genetic endowment, is specific for one antigen, and has one unique heavy chain specificity on its surface, and one unique light chain
specificity, therefore one unique antibody as a receptor. It is activated either by a receptor cross-linking material in the presence of T cell factors or by certain mitogens that seem to by-pass the requirement for the factors. We believe that a T-cell derived factor is already necessary for this first step, the G0 to G1 transition. We then obtain an activated B blast and later an expanding and closely controlled wave of division and differentiation. Cional expansion, we believe, continues while antigen lasts until finally antigen is catalyzed or neutralized by antibodies. In the later portions of this cascade, there will obviously be a competition between antibody that is free in the serum, and cell-surface receptor for the diminishing amounts of antigen. This drives the system into ever higher affinity antibodies. We believe the whole of this cascade is due to the combined and continuing action of cross-linking antigen and T cell derived factors which promote growth and differentiation. We are now at the stage of asking some profound questions about the nature of this cross-linking, because we also know that certain cross-linkers do not initiate this cascade and we are following actively the hypothesis of Dinztis who believes that there has to be a critical number of receptors, perhaps 10 to 20, cross-linked, before the cascade will begin.

Mr Chairman, in closing you will ask where will this saga go from here. I think the most profound set of questions that remain to be answered relate to regulation. We know a little bit about how the events start, we know a little bit about how they unfold and we know that they are most critically regulated at every step of the game. If we knew more about the regulation we would fashion better vaccines. If we knew more about the regulation we would be able to prevent autoimmune disease. I think what we do not know, and what we now most critically need to know, is the molecular biology underlying these B cell activating phenomena. We don't even know what the cross-linking does; we do not know what links the signal transducer, namely the Ig receptor, to the genome. We do not know what binding of the growth factor does to the growth factor's receptor, and what the consequential events are for the cell. For me, the real continuation of this saga will be a continued collaboration between cell biologists and molecular biologists. This, we believe, is the centre point not only of this saga's future but also of the Hall Institute as a whole.

Psychiatry, Art and Artists (From the 1984 Dean's Lecture Series)

E Cunningham Dax, MB BS, BSc London, MD (Hon) Melbourne, LMSA, DPM, FRACP, FRANZCP

When Dr Eric Cunningham Dax arrived in Melbourne to take up an appointment as Chairman of the newly established Mental Health Authority of Victoria, he was already respected as a senior and innovative psychiatrist in Britain. In the seventeen years he was Chairman (1952-1969), Dr Dax successfully initiated a major expansion of psychiatric services throughout Victoria and attracted a number of able staff. The Authority and its services acquired a reputation which stimulated the development of similar improvements throughout Australia, as well as in Malaysia and the Philippines.

Dr Dax's interest in 'psychiatric art' dates from the end of the war, and in 1950 he took an English collection to the first International Exhibition in France. Dr Dax has written and lectured in USA, UK and in various European countries on the influence of mental disturbances on artistic portrayal, from the viewpoint of revelations of the mental state of artists and patients derived from analysis of their art forms.

Dr Dax was honoured with an Honorary Degree of Doctor of Medicine, conferred at the University of Melbourne on 15 December 1984.

Perhaps the nearest affiliation medicine now has to the 'Art of Healing' is to be found in the therapeutic use of the 'Arts' by psychiatry. This relationship has become even closer because modern art depends upon the exploration of the unconscious for its inspiration.

Psychiatry can use the arts as a universal language and as a means of illustrating varieties and degrees of emotional disturbances. Equally well, it can make a contribution to the arts, for it has been said that the artistic production of the abnormal provides a sort of laboratory for the analysis of artistic creation in the normal.

Additionally, to see the consequences of illness upon the productions of artists is a fruitful study for the analysis of the dynamics of artistic creation, though the effects vary considerably. For example, it has been said that illness may leave art unchanged, or it may be obliterated, altered or enhanced.
Artists have a sensitivity which allows them to express the meaning of current situations and it has been said that "Art is the ability to translate perception to visual form and to satisfy the needs of the viewers". However, in "satisfying the needs of the viewers" it does not follow that the material will be generally acceptable; for the foresight of the artists often means their emotional expression will appear in a form far in advance of the average train of conventional thought.

The history of art and artists is therefore littered with accounts of rejection and resentment. This has never been more sutenly perceived than in the past one hundred years, and most of all in the first twenty or thirty years of the century. Artists have a constant urge to production, but this is the outcome of the creative tensions which the artists themselves describe. To quote only two such statements: "Art is the struggle to relieve the tension of isolation"; or "Art is a soliloquy in a tragic environment"; whilst Michaelangelo himself said that his sculptures struggled to be free from the stone that confined them.

So artists may be subject to greater tensions than many, and this will result in their drive to expression; for this reason the effect of illness upon the artist is a useful study.

Perhaps the most difficult aspect of this subject is to explain the relationship between psychiatric conceptions, particularly those of the schizophrenics, and modern art. In fact the first question to ask is whether 'psychiatric art', which is a convenient term, is really a misnomer.

There are many artists of whom a few are psychotic and there are very many psychotics, a few of whom are natural artists. The products of modern artists differ from those of schizophrenics because they are deliberately trying to enter the unconscious to explore reality, whereas the schizophrenics are trying to escape from their unconscious fantasies into reality. In both, the material may be similar but the form will be different and the use of drawing skills, line, space, balance, light, shade and colour will accentuate the technical differences between the two. Specific distinctions have also been made; for example, it has been shown that psychotic painting lacks empathy, social meaning and a relationship to time.

The uses of the arts in psychiatry

Although art covers the various forms of creative expression, all of which have been used in psychiatric practice or in studies for experimental purposes, paintings and modelling are the simplest media with which to make comparisons. They are also the best means of preserving a permanent record of emotional disturbances.

Art can be used in many ways in psychiatric treatment, from being taught as a hobby at one end of the scale to being studied as dream material at the other. From one school to another there is some overlap in the methods used to encourage production, and in the functions of the therapists. Such forms of treatment are mentioned in order:

1 As occupational therapy to teach the arts as a pastime and to give a sense of positive achievement. At the same time the patients derive benefits from organized group support and the exploration of their artistic interests and abilities.

2 Art therapy aims to use a specific form of therapeutic treatment by the organization of classes, the provision of materials, the use of group activities and by giving the patients the opportunity for self-expression in a studied situation, so providing emotional release and therapeutic reconstruction.

An example of the needs of the psychotic to create is shown by the drawing of a patient in a long-stay mental hospital, using burnt match ends on a piece of toilet paper.

3 Autotherapeutic use is well-illustrated: given the opportunity a number will use the arts to discover for themselves the origins of their emotional disturbances. One young woman had acute claustrophobia after being shut in a lift. This led to recall of the fear of cages and finally of her childhood when she was terrified by an emu she thought would attack her.

Sympathetic magic may be employed to solve their emotional difficulties. A young man with a father whom he felt was like Mussolini conveniently eliminated him in his painting.

One of the most remarkable series of models was produced by a woman who had made a suicidal signal prior to admission. She had considerable problems with an interfering and domineering mother who had nearly wrecked her marriage. They show her emergence from her struggles with a new strength and the reuniting of her family.

4 The length of psychotherapy may be reduced by the use of various forms of modified verbal and non-verbal communication. Examples have been shown in two books by Ainslie Meares on painting and sculpture associated with hypnosis.

Art products are similarly used in the treatment of emotional disturbance in childhood.

5 Analytical art therapy has been popular in the United States since Margaret Naumberg's many publications described its use on various individual patients. The paintings can be employed as dream material though they often differ from other products because of the desire of the therapist to obtain specific information through the use of accepted symbols and the transference situation arising from the one-to-one relationship.

6 Diagnostic art is of particular value if the products are examined in conjunction with the clinical history. Although the patients are stimulated to produce art, they know their paintings will be used for therapeutic purposes by the psychiatrists and their professional associates.

During the course of treatment the progress being made can be shown clearly. Again, retrospective studies on series of paintings have considerable research value when examined in parallel with the clinical notes. There are at least a dozen series in our collection which are worthy of research monographs.

The material we have collected has some examples going back to the war-time years in England. Mostly it comes from Royal Park where it was rescued from destruction some ten years ago. Further specimens have been supplied from 'Larundel' by Dr Barlow's kindness; and a few from elsewhere. The majority of the paintings were executed during the 1960s, thereby illustrating psychiatric symptomatology before it was clouded by the general use of psychopharmacology.

A number of these paintings, about sixty in all, with some special artistic appeal, are held by the Australian National Gallery in Canberra. The Australian Institute of Criminology also has a small collection: these are products of patients with personality disorders, showing characteristic ways of expressing sociopathic disturbances.

I am very pleased that the large majority of the paintings have been accepted by Melbourne University and, it is hoped, will be available through the Medical Museum to
The paintings have been divided into examples of the neuroses, the affective psychoses, the personality disorders, head injuries and organic disorders, and schizophrenia. Additionally some have been classified to show the use of symbols as vehicles of expression. Trees, eyes, sex symbols and illustrations of fears and catastrophes such as shipwrecks, broken bridges, overhanging rocks, precipices and funerals are all commonly seen. A few examples illustrate these classifications. Also there are a number of particular subjects of interest available for study such as those relating to suicide, violence, disintegrated heads, body image disturbance and schizophrenic fears and fantasies.

Some of the series illustrate the therapeutic uses of painting, and are of great value in following the patient's progress: An artistic and intelligent schizophrenic girl became acutely psychotic and actively suicidal just after leaving school. Despite every treatment she remained ill for some years. She felt herself threatened by monsters who wanted to murder her and then dissect her, so she thought she had to kill herself first. However, she avoided suicide by committing the act on paper instead of in fact, and each time she saved her life in this way a happy picture soon followed. Whilst travelling overseas she had no money and was living in deplorable conditions. She sent a picture on scrap paper coloured with Dolly Dyes to the artist, without a stamp; no doubt this again saved her life. At other times after her discharge, she would sneak into hospital, cover a blackboard with the same sort of drawings and vanish again without contacting anyone. Eventually she improved enough to find work as an assistant librarian.
Psychiatry and artists

There is a long list of famous musicians and painters whose psychiatric illnesses eventually altered their artistic productions. The life histories of the artists Van der Goes, Piranesi, Goya, Blake, Hill, Josephson, Dadd and others have been fully recorded, but none more so than Van Gogh, Ensor and Munch who were most famous for those examples of their art constructed during their illnesses. These three are extremely interesting to contrast. They were contemporaries. Van Gogh was born in 1853, but was late in painting so his first products just coincided with those of Ensor born in 1860 and Munch in 1863.

It must, however, be recognized that it is nearly impossible to state from a single painting that a person has early psychosis. It can only be said that the picture is similar to others produced by people with one or another psychiatric disorder. Indeed, when collections of horror or fantasy paintings are examined (usually with a picture by Fuselli on the cover), none or all might equally well be unhealthily imaginative or obscenely psychotic.

However, in the studies of Van Gogh, Ensor and Munch there are not the same doubts, since much has been written about all three and therefore one might think their obvious psychotic histories could be compared accurately with the changes in their art. Yet discussions about the nature and progress of their psychiatric illnesses still persist and these are summarized briefly in the following sketches.

Vincent van Gogh was born in 1853, four years before his brother Theo to whom he was so closely attached. A brother after whom Vincent was named died before him, and his sister was in a mental institution all her life. From 12 to 16 Vincent went to a boarding school, and was subsequently apprenticed to an art dealer in The Hague and London for six years. Then, aged 23, he returned to London to train as a lay preacher, but after two years gave it up and went back to his family and thence to a theological welfare body in the poverty-stricken mining area of Borinage. At this stage he showed many depressive features: he was inferior, inadequate, unworthy, had a poor self-esteem and was dismissed as unsuitable. He lived as a tramp, neglected, sharing his life with the poorest, and in deep despair.

It was then in 1881 that he displayed his first interest in painting and spent two years studying in Brussels and The Hague. He lived with a wretched, pregnant, neglected prostitute and was some weeks in hospital with gonorrhoea. The date is important for should he have caught syphilis at the same time, the time lapse might have resulted in the development of General Paralysis to account for his final deterioration.

In the meantime his parents had moved to Neunen and in the two years he stayed with them there he painted 'The Potato Eaters' and 'The Weaver', amongst many other darker studies of peasants and the labouring poor. He went to Paris where his palette lightened and he made many friends and artistic acquaintances; however, towards the end of his stay his mood progressed to excitement. He was over-active, quarrelsome, irritable, lacking in restraint, and had a compulsion to organize groups of painters to work together where they could see even brighter light and colours.

So in February 1888 he left for Arles where most of his famous works were completed. In just over a year he produced 190 paintings as well as 108 catalogued drawings. In May 1889 he entered the Asylum at St Remy for the second time; the first was when he cut off his ear for Gaugin. In the year he stayed there, he produced a further 150 paintings. Finally in the last two months of his life when he had moved to Auvers he painted a further 70 canvasses. Then he suicided in July 1890.

In brief, first he painted depressive and sombre pictures, but after leaving Neunen for Paris his style and mood changed, so by the time he left for Arles he showed many features of excitement. These lasted some eighteen months, but in the second half of 1889 he made poor copies of old masters and he painted crooked buildings, twisted landscapes and whoried clouded skies. Finally, before his death, the contents became increasingly threatening, the famous 'Cornfield with Crows' is the best known of them. What, it can be asked, caused this rapid deterioration? Was it absinthe and malnutrition, General Paralysis of the Insane, or an iatrogenic condition arising from treatment with digitalis? To complicate the diagnosis, he had at least seven 'periodic attacks', so temporal lobe epilepsy has been a popular diagnosis, whilst a number of eminent European psychiatrists have argued that he suffered from schizophrenia. There could be no more interesting study of the relationship between paintings and history, especially since it was so fully annotated by his vast correspondence with his brother, Theo, whose death his predated by only six months.

James Ensor, the second of these painters is also extensively documented and there is a bibliography of a thousand references to him. Unfortunately the only psychiatric study is written in Flemish and I have been unable to obtain it in any of the Australian libraries or on loan. However, since Ensor was a national hero, and died only in 1949, descriptions of his insanity would have been unpopular.

He was the son of an alcoholic English father and a rigid, critical mother whose complaining sister lived with them. Ensor was a peculiar schizoid youth who had impulsive outbursts of temper and, with his father, he was teased around Ostend, where the family lived and kept curio shops. He went to the Brussels Academy of Fine Arts for training and after a disruptive studentship returned home and worked and lived in an attic, constructing attractive but sombre, dark pictures which were unsaleable and were rejected by the critics. In the next four years some peculiar changes can be noticed in his paintings. He began to use masked figures and showed what may have been hallucinatory faces peering out from the furniture. He also used puns and neologisms.

Then he practically ceased painting and turned to engravings because, he said, they would endure to posterity. Some of his best work was done in this medium. He was becoming paranoid about the critics and in the ten years from 1885 onwards many of his better-known paintings were interspersed with unpleasant, bizarre productions picturing himself as Christ being mocked by the critics. Quite suddenly in 1887 his style exploded into highly coloured creations embodying masses of masked figures and picturing his contempt for his fellow man. There is nothing more remarkable or dramatic than walking in the Antwerp Museum of Fine Arts from one room filled by his sombre paintings to the large adjacent gallery where his great visionary creations cover its walls in an explosion of colour. He painted himself on the cross at Cavary, and as Jesus in 'Hail Jesus, King of the Jews', followed by his best-known triumphant painting, 'The Entry of Christ into Brussels'. By this time the critics and his fellow artists reacted angrily to his supposed blasphemy.

Suddenly, just before the turn of the century, he was recognized: first in Paris and then with many successive exhibitions in Belgium, France and Germany. He later became Belgium's 'Grand Old Man'. He was created a
1 Depression

2 Schizophrenic inversion

3 Paranoid schizophrenia
Baron in 1929, awarded the Legion of Honour in 1933, visited by Royalty and by Einstein, and given a State funeral. A statue, a museum and an art gallery were founded in his memory.

The loss of his paranoid features seem to have coincided with the onset of mild and only slowly progressive secondary dementia. His skills declined; he hoarded, copied, re-signed and altered his previous paintings. He wrote the words and music and designed the scenery and costumes for a very bad ballet, then produced a number of poor, dull and inexperienced nudes, and wrote doggerel which he recited at banquets given in his honour, and he grew grandiose.

In summary, the first signs of his schizophrenic illness appeared in his early twenties and became acute some six years later. At the age of forty he was recognized and honoured; his paranoid state was suppressed and replaced by a childish grandiosity and it seems that he had nothing left to fight for or to express. So he lived the second half of his life in a mild state of self-satisfied dementia.

He did, however, have an early 'sombre period' and another occurred fifteen years later which has not previously been noted. It might be said that his acute psychotic period with the colour and grandiosity has also an excited flavour, so it may be supposed he could be diagnosed as having a schizoaffective psychosis with paranoid features.

The fascinating questions are what would his mental state have been like without his art, or how if at all, would his art have developed without his abnormal mental state? One wonders, too, what he might have done to the critics if he had not been able, by sympathetic magic, to crush them in his paintings and rise by his grandiosity to a plane above them.

Edward Munch was born in 1863 and, like Ensor, he lived to an old age, dying in 1944. His mother died when he was five, his favourite sister when he was 14, and he himself had a serious tubercular illness in his youth. He produced many paintings of sickness and death of which 'The Sick Child' is best known.

His religious, overbearing, moody and cruel father, a one-time army doctor, probably suffered from agitated melancholia. He brought up his children with the help of his sister-in-law and, Munch said: "disease and insanity were the black angels on guard at my cradle". "In my childhood I felt always that I was treated in an unjust way without a mother and with threatened punishment in hell hanging over my head".

He revolted against his home and became caught up with a Bohemian group in Oslo. He was seduced by an older woman and spent the next 25 years of his life extricating himself from complex and unsatisfactory female relationships, fleeing from the pangs of his melancholia, and rejected by the critics and the public. About 1890 he was already drinking heavily and seems to have had an alcoholic paranoid psychosis in about 1905 when he felt himself persecuted and spied upon.

In 1889 he left for Paris and the same year his father died, only increasing his guilt, depression and fears of death, and a series of depressive paintings date from that time. It was in this same year that his most famous series of pictures, The Frieze of Life, was started and he continued these paintings until 1905. By invitation he took 55 of his pictures to Berlin in 1902, but the exhibition only lasted a week before its compulsory closure. He spent the next years wandering round Europe and during this time he had 106 exhibitions. However, by 1908 his alcoholism was so bad that he was admitted to a mental hospital in Copenhagen under Dr Daniel Jacobson, and he stayed until the following year when he came out a cured but broken man. It has been said he lost his tension and his alcoholism, and was left with an unsatisifed depression which continued throughout his life. This could not be better shown than in his self-portraits of which there were 72 in all. He remained solitary, isolated and miserable. He had returned to Norway after his breakdown and he won the contest for the paintings in the Great Hall of the Oslo University. But his fire and originality had gone.

Although sometimes labelled a schizophrenic, it is doubtful if Munch was really other than a chronically depressed individual, tortured by his conscience and living in solitary anguish. This has been clearly depicted in his many paintings of conflict, rejection, suffering and death, and in his self portraits.

It is interesting that after Munch produced his most famous paintings in the early 1890s he turned to printmaking like Ensor, believing they would influence more people in this way. Engraving seems to have something of a disciplinary function limiting the productions to a definite compass and acting as a restraining factor to excessive emotion.

Thus, psychiatry can make an important contribution to the understanding of art in general, but in particular it is never better shown than in the examination of the Expressionists. In the three examples discussed, their most famous paintings were all produced in floridly psychotic periods. Each had childhood problems: Van Gogh a family loaded with psychopathology; Ensor an alcoholic father; and Munch, death around him and a mentally ill father. Whilst all three had a different diagnosis, each started with a 'sombre period' of dark painting, from which their most famous works exploded during a more acute period of psychosis.

Ultimately, all three deteriorated, but with different psychiatric disabilities: Van Gogh acutely between the ages of 36 and 37, and Ensor and Munch chronically from 40 to 89 and 46 to 81 respectively. In these two it might be worthwhile examining the possible preventive value of their continued artistic creation, inferior though it may have been, in retarding the dementing process.

Summary

In summary it may be said that psychiatry may use the arts for investigation, diagnosis, treatment, and research. They are an aid to psychotherapy and a useful means of monitoring patients' progress. They can relieve tension by providing an avenue for emotional expression, and can be used to re-channel primitive impulses into acceptable forms. Besides using the arts therapeutically, psychiatry can contribute towards the study of the unconscious, symbolism, and the interpretation of motivation. This contribution has become of even greater importance since there has been a remarkable parallel between the evolution of modern psychiatry, from the days of the alienists, and the development of the arts from Impressionism through to contemporary works. Moreover, some special interest has been created by the joint study of modern art and the creations of the schizophrenics. This is because the modern artist in exploring the depths of unreality, and the schizophrenic in escaping from the terrors of the unconscious, meet on common though overlapping ground, and come from different directions.

Lastly, psychiatric study should give a better knowledge of the sensitivity of artists and their creative foresight, thereby assisting in the interpretation of their work and so aiding the understanding, acceptance and appreciation of their artistic products.
Molecular Genetics in Medicine

Professor David Danks
Director, Royal Children's Hospital Research Foundation

Molecular genetics is one of several terms which are used somewhat interchangeably in general parlance today — genetic engineering and recombinant DNA genetics or technology are others.

Of course, genetics has always been molecular. It is just our understanding of medical genetics at the molecular level which is new. This detailed understanding came first in the genetics of micro-organisms and the term molecular genetics applied to these organisms has been around for two decades. When using any of these words we are really referring to the analysis of genetic phenomena at the level of DNA and of its direct products.

This all began back in the 1950s with the demonstration of the structure of DNA, of its mode of replication and of the way in which it specified the structure of proteins through the intervention of messenger RNA. The other great discovery of the 1950s was that a change in a single amino acid in a protein could explain all the features of a genetic disease. This led to the deduction that an alteration in a single nucleotide base in DNA must be the underlying mutation.

Recombinant DNA techniques have allowed scientists to convert these deductions into demonstrated facts. In the process many details of genes and genetic mechanisms have been worked out. Some of the new results have merely confirmed the deductions previously made, but there have been some very big surprises. No-one had even imagined that the coding sequence of the genes could be broken up by intervening non-coding sequences. Only one remarkable woman had dared to suggest that genes might move about within the genome and many had scoffed at her. Fortunately, Barbara McClintock lived long enough to see her remarkable deductions confirmed.

For a long time people have dreamed of diagnosing genetic diseases by analysing the genes themselves and of correcting defects in genes. Gene diagnosis has arrived and gene therapy may soon be with us.

**Gene action as it is now understood**

It was popular to claim that the discoveries of recombinant DNA technology have destroyed the “central dogma” of molecular genetics propounded by Crick and his colleagues after the discovery of the structure of DNA. This is a gross exaggeration — the new discoveries have merely shown the central dogma to be incomplete.

The central dogma in its original form is shown in Figure 1A and in Figure 1B it has been modified to take on its modern form:

```
DNA → TRANSCRIPTION → mRNA → TRANSLATION → protein → phenotype
```

Information was believed to flow “down” from DNA and never in the reverse direction. In fact, recombinant DNA techniques depend upon the ability to make DNA copies of RNA.

The important difference between the two series of events is the intervention of processing step before the messenger RNA is available in the cytoplasm for translation into a polypeptide chain (protein). This is necessary because the genes of higher organisms are broken up into coding sequence (exons) separated by non-coding sequences (introns) which are generally larger than the coding sequences. The initial RNA molecule produced is the same length as the entire gene — exons and introns are both transcribed. Then an editing process removes the introns to produce the final messenger RNA molecule which is just exactly as the central dogma had described. From there on the process is just as we have believed for the last 20 years.

The number and size of the introns varies very greatly from one gene to another. No particular pattern has been recognized to give any sense to this variation. Very few human genes have been found to lack introns — the histone genes and the interferon genes are rare examples. Some genes have only one or two introns (eg, the globin genes) whereas others have many (eg, 51 introns in a collagen gene). As a consequence the overall length of human genes varies from less than 1000 nucleotide bases (1kb) up to the present record of 187,000 bases (187kb) in the factor VIII gene.

The function of introns is not yet known. They do facilitate gene rearrangements in evolution and provide a simple way of making several related proteins from one region of DNA, eg, by putting together several different combinations from a series of exons.

The recognition of introns revealed an unsuspected class of mutation causing genetic disease — failure to produce a functional mRNA because introns are not removed. Many of the thalassaemias have proved to be the result of alterations in one of the bases which serve to identify the splicing site.

**Recombinant DNA techniques**

The essential elements of rDNA technology are quite simple:

1. Cutting DNA into pieces of desired size with specific “restriction enzymes”. The DNA may be genomic or “copy DNA” (cDNA) made from the mRNA molecules present in a particular tissue.
2. Inserting these pieces of DNA into a “vector” which can in turn carry the DNA into a bacterium which will be replicated very rapidly — 10⁷ copies in 24 hours.
3. Recognising the DNA fragment of interest present in a bacterial colony, retrieving the fragment and studying it in various ways.

Of course there are many variations on these simple themes and a veritable armoury of very elegant manipulations of DNA has been developed.

**Restriction enzymes**

These bacterial enzymes are properly called restriction endonucleases. Their discovery in the early 1970s made DNA cloning possible. Over 300 enzymes are now known.
Each cuts the DNA double helix only at a specific sequence of bases. Some enzymes recognize a series of four bases, some recognize six-bases or even larger sequences. Specific sequences of four bases occur more frequently than specific sequences of six bases. Consequently the fragments obtained with “six-base cutters” will be larger (average 4096 bases) than those obtained with “four-base cutters” (average 256 bases).

The scientist can choose an enzyme which will cut the DNA into pieces of the size that he wants. He also has a choice between enzymes which will produce “blunt ends” and those that will produce “sticky ends” (Figure 2). Sticky ended molecules will find other fragments with the same sticky end and join to them rather quickly and specifically. Joining together of blunt ended fragments is a slower and less predictable process.

**Vectors**

Small circular DNA molecules called plasmids exist in many bacteria, conveying properties such as antibiotic resistance. They replicate in phase with the bacterial genes and can pass from one bacterium to another. A piece of DNA up to 10kb can be inserted into a plasmid using a restriction enzyme and will enjoy the high replication rate of the parent bacterium. This is termed cloning the DNA fragment. *E. coli* is the organism used most often, but Salmonellae or *B. subtilis* are also used, as are certain yeasts. Bacteriophages, or artificially modified phages called cosmids, may be used as vectors. They can carry larger fragments of DNA than plasmids (40 kb or 10 kb respectively).

The DNA to be cloned and the vector are always cut with the same restriction enzymes so that the sticky ends generated will be complementary and will join readily. Vectors are organized to include antibiotic-resistant genes so that only bacteria which contain DNA inserts grow to form colonies.

**cDNA**

The discovery that certain tumour viruses (retroviruses) possess enzymes which make DNA complementary to a messenger RNA molecule was another important element in the development of recombinant DNA technology. cDNA differs from a gene in having no introns, and is more useful then genomic DNA for many purposes.

**Clone banks**

A **cDNA clone bank** is made by isolating as much mRNA as possible from the tissue of interest, and treating it with the retroviral enzyme, reverse transcriptase, to make complementary cDNAs. These are then cloned in a chosen vector and bacterium. The resultant clone bank contains thousands of bacterial colonies each carrying a cDNA fragment.

A **genomic clone bank** is made by extracting DNA from any nucleated cells (all of which contain the same DNA), cutting it with restriction enzymes and inserting it directly into the chosen vector and organism. Since genes are much bigger than cDNAs (because they include introns), phage or cosmids are usually preferred for genomic cloning.

Theoretically a genomic clone bank should include the whole genome with all genes equally frequent. A cDNA clone bank will include fragments corresponding to only those genes which are active in the tissue used and may fail to include cDNAs for genes which are expressed at very low levels. Genes transcribed at a high rate in the tissue will be represented many times over.

**Gene probes**

These are single strands of DNA labelled radioactively, generally with $^{32}$P. Whole cDNA molecules are generally used.

**DNA/DNA or RNA/DNA hybridisation**

Single strands of DNA which are complementary to one another, or strands of RNA complementary to single stranded DNA, will hybridize together in a highly specific fashion. A cDNA probe will hybridize to another cDNA that is complementary in a cDNA clone bank or to complementary genomic DNA in a genomic clone bank. Even a small fragment of radioactive DNA 15 or 20 bases long can be used in this way to locate the bacterial colony containing the cDNA or genomic DNA of interest.

**Cloning a gene**

The original method was to enrich the mRNA desired from the appropriate tissue and to make cDNA complementary to just this species of message (or this species plus a few contaminants). This method worked well for hormones like insulin or growth hormone which are made only in specific cells and constitute a large proportion of the protein of a particular size made in these cells. The message was enriched, using antibodies to the protein to extract those ribosomes on which the specific mRNA was being translated. This method is suitable for fairly abundant proteins.

Two more sensitive methods are now more widely used. If the amino acid sequence of even a small part of the protein is known it is possible to make a small synthetic DNA or RNA molecule which would code for this sequence, to label it radioactively, and use it to detect the relevant clone from a bank. Special vectors are now available which allow DNA fragments to produce their products in vitro, allowing the bacterial colony to be identified using an antibody to the protein.

**DNA sequencing**

Several very elegant methods have been developed for working out the sequence of nucleotide bases in a stretch of cloned DNA. Although this is still a rather tedious part of the whole procedure, it is very much more rapid than even the most modern methods of sequencing the amino acids in a polypeptide. One worker can sequence 300 bases in a single day’s work.

**New basic knowledge produced by DNA analysis**

Recombinant DNA techniques were initially applied to bacteria, and the gene structure revealed proved to be very similar to that predicted. There were long stretches of DNA which encoded the messenger RNA. There were initiation and termination signals at the ends of the coding sequence. Genes were separated by regions of non-coding DNA and these contained controlling signals. There were just a few surprises, especially the finding that some microorganisms had overlapping genes or genes within genes.
The biggest surprises came when the genes of higher organisms were sequenced, the discovery of intervening non-coding segments (introns) within the coding sequences being the greatest surprise of all. As in bacteria, a number of controlling signals have been found in the nucleotide sequences in front of (5' to) genes. Some special regions also exist in the flanking DNA beyond the ends of (3' to) genes, most notably a sequence which attaches a long string of adenine residues to the end of each mRNA molecule. This poly-A tail seems to confer some special stability on the messenger RNA molecule. Knowledge about the control signals surrounding mammalian genes is still accumulating.

The other big surprise came when it was realised that genes can occasionally move from one part of the genome to another and that such movements are quite a regular happening for some viruses. These "mobile elements" had been deduced from very elegant experiments in maize by Dr Barbara McClintock back in the 1950s. However, it took modern DNA sequencing to prove her right. This process has been studied in most detail in Drosophila, but there are hints of its existence in higher organisms including man. One particular family of genes regularly undergoes gene rearrangement — namely the immunoglobulin genes. The ability of the human lymphocyte to make an almost infinite range of specific antibodies resides in the ability of one of about 20 gene segments coding for the constant regions of an immunoglobulin chain to be physically rearranged to lie adjacent to any one of a very large number of gene segments coding for the variable regions of the immunoglobulin molecule. Further variations are introduced at the translation stage.

Reverse transcription — making DNA copies of RNA — is an essential component of recombinant DNA technology, using an enzyme found in certain tumour viruses (retroviruses). It was surprising to find that the human genome contains clear evidence that these viruses have acted on our genes during evolution. Our cells contain many "pseudogenes" which appear to be DNA copies of fully processed mRNA, lacking introns and other key elements of normal genes. They are inactive (ie, do not produce protein products) in their present form.

DNA analysis is also bringing us nearer to an understanding of cancer, revealing oncogenes which have close resemblance to genes of viruses which cause tumours in animals. Some results indicate that genes may play key roles in normal embryonic development, and then become inactive. Reactivation by chromosome rearrangements, or by mutations within the genes or their controlling elements, seem to reactivate them later in life and play a role in cancer.

New knowledge about mutations in genetic diseases

The new techniques have made it possible to define the mutation present in a large number of human genetic diseases. As predicted, most mutations are the result of single amino acid substitutions within a coding sequence of a gene, leading to production of a protein deficient in function because of a change in one amino acid, as in variant haemoglobins and many mutant enzymes.

The most interesting results have come in those genetic diseases characterized by reduced production of a structurally normal protein, as in the thalassaemias. Fifteen years ago geneticists and biochemists were predicting that thalassaemias were caused by alterations in the control systems regulating the globin genes. Many hypotheses were advanced about the types of control system which might exist. Many different mutations (25+) have been identified, and all affect the globin genes directly rather than indirectly. Some involve deletion of a whole globin gene. In others, a single based substitution in an early part of the coding sequence has converted a triplet coding for an amino acid into a triplet which codes for chain termination. In others a deletion of one or two nucleotides has changed the "triplet reading frame" of the whole gene. A number of the mutations alter the junctions between exons and introns and prevent excision of the introns. Others introduce a signal for splicing in the wrong place so that part of the coding sequence is edited out.

Use of recombinant DNA techniques for diagnosis of genetic diseases

Diagnosis by identification of the primary DNA alteration is the ultimate method of genetic diagnosis in terms of precision and reliability. This is easily achieved for some mutations, but very difficult for others. The new techniques are likely to be introduced into clinical practice quite rapidly for some diseases, and may never become of great practical use in other diseases.

Direct identification of the mutation

In genetic diseases which are caused by the deletion of a large part of the gene, total genomic DNA from any body cell is extracted and cut with a restriction enzyme. Separation of the fragment by electrophoresis (Southern gel) gives a continuous smear of bands of graded molecular size. Probing with a cDNA probe for a specific gene will light up with radioactivity only that band which contains the gene. If the gene is totally deleted there will be nothing in the Southern gel with which the probe will hybridize. If a large part of the gene has been deleted then the fragment with which the probe will hybridize will be much smaller than normal. Unfortunately, only a small number of diseases are due to deletions — alpha thalassaemia is an example.

Demonstration of a single nucleotide substitution is much more complicated. Most cDNA probes will still hybridize perfectly well. If a very small probe (15 to 20 bases long) is used, then the efficiency of hybridization is reduced to a detectable degree. The technique is not simple to use and a great deal of preliminary work is required to find the mutation and make the probe. This approach is likely to be limited to a small number of genetic diseases which are always due to the same nucleotide substitution and are quite frequent. The PiZZ form of alpha-l-antitrypsin deficiency is the only candidate at present.

The initial demonstrations of a single nucleotide substitution requires sequencing of the whole gene which is still a substantial labour. Most genetic diseases are both rare and heterogeneous, with different mutations in different families. For instance, over 25 different mutations have been found in the beta thalassaemias. Developing a separate strategy for each of these 25 is a big undertaking and may not be warranted even for a disease as frequent as thalassaemia.

It is likely that enzyme assays will continue to be used for diagnosis and prenatal diagnosis of most rare inborn errors of metabolism. DNA techniques will probably be reserved for diseases in which the protein produced by the gene is inaccessible in fetal life, and diseases in which the basic molecular defect is not known.

Diagnosis by linkage

The strategy which is being developed for both these situations makes use of linkage — the tendency for genes which are close together on the same chromosome to be passed on together to the progeny. The theory behind this approach is quite simple. If a gene A, that occurs in two different forms, A1 and A2, in normal individuals, happens
to reside very close to the gene causing a particular disease, then it should be possible to determine whether an offspring has received the normal or the mutant gene by determining whether that offspring received the A1 or the A2 gene.

Research workers have been trying to use this approach for many years, using blood groups and variant serum proteins as marker genes. The number of known genes was too small. It is now possible to find minor differences in DNA sequences between individuals in almost any segment of DNA that has been cloned. Most of those variations are found in non-coding regions. Some of these nucleotide base differences change the recognition sites for restriction enzymes, creating a new cleavage site or abolishing a cleavage site which is generally found. With a large amount of effort it is generally possible to find variation in the susceptibility to restriction enzymes around almost any gene that has been cloned. These cause variation in the lengths of the fragments to which the gene probe hybridizes (restriction fragment length polymorphism - RFLP). To be clinically useful, the frequencies of people with and without the cleavage site should be nearly equal.

Eight sites of variable restriction enzyme cleavage are now known around the beta globin gene. The linkage is so close that errors due to crossovers can be forgotten. However, this approach cannot be used in every family, because both parents must be heterozygous for at least one of the polymorphic sites. If only one polymorphic site is available, less than 25% of couples can use the test. With 8 loci, 85% of couples can be helped.

Application of this approach is fairly straightforward if the gene has already been cloned. It can also be applied when nothing is known about the gene causing the disease, but the amount of work involved is quite prodigious.

One starts by taking a piece of DNA and finding a polymorphism for a restriction enzyme. Then one does a family study looking for linkage between this variable piece of DNA and the disease of interest. Linkage studies are most easily performed in dominantly inherited conditions. They can be performed in X-linked conditions, provided that three generation pedigrees are available. They are most difficult to apply to recessively inherited conditions. In X-linked conditions one has the advantage of starting with pieces of DNA which are known to come from X chromosomes. Consequently good progress has been made with X-linked conditions, and tests for haemophilia and Duchenne muscular dystrophy will soon be in use.

Extreme good luck is needed, or else an enormous amount of work, to find linkage between some randomly chosen piece of DNA and some other autosomal gene. The odds against success with any one particular piece of DNA are about 1000:1. Dr Jim Gusella of Massachusetts General Hospital was fortunate enough to find a piece of DNA linked to the Huntington's disease gene locus amongst the first 10 DNA fragments he tested. His G6 probe is now being evaluated for diagnostic use. Once a linked probe has been found, it is relatively easy to find other pieces of DNA which are even closer to the gene causing the disease. Even so, these techniques are likely to have an inherent error rate of 1 or 2% due to crossovers between the marker gene and the disease producing gene. When a complete map of your human genome is available, all genetic diseases will be diagnosable by linkage. However, luck will still rule out these tests for some couples who are homozygous for the marker gene.

We are likely to see a gradual increase in the application of DNA techniques to prenatal diagnosis, and the same techniques will make pre-symptomatic diagnosis of late onset genetic diseases possible. Most families will regard these techniques as a great advance and will be pleased to know their precise situation. Most people find uncertainty more difficult to bear than definite knowledge of an unfortunate genetic situation. Some people in the community will feel that it is meddlesome to make this information available to family members. This might be true if the information were thrust upon them unwanted, but this view can hardly be sustained if family members come along seeking this information.

Application of recombinant techniques to treatment of genetic diseases

Making pharmaceuticals by genetic engineering

The enormous rate of replication of microbial organisms allows production of vast numbers of copies of genes and of very large quantities of a gene product, provided a method can be found to persuade the bacterium to make a protein which is normally made by a human gene. The signals surrounding human and bacterial genes are different and bacteria lack mechanisms for removing introns from human genes. A considerable amount of work is required to modify the gene before inserting it into a bacterium for production of the human protein. Methods of overcoming these difficulties have been developed and a number of companies are now producing and marketing insulin, growth hormone and other very valuable medicinal products made by genetic engineering.

Over the next few years we will see a great increase in the availability of genetically engineered pharmaceuticals. Some of these will be products which we have been using for many years, like insulin. Others will be products which have been used, but have been very scarce, like growth hormone. Others, like antithrombin factor, have been easily manufactured at low cost and with a hazard of contamination with infective agents such as hepatitis virus or the virus which causes AIDS. Still others have never been available for pharmaceutical use. All of these will be manufactured by genetic engineering, provided the market is big enough to carry the substantial development costs involved.

A second benefit of genetic engineering to mankind is also quite predictable — namely the improvement of plant and animal productivity by genetic engineering methods. The difficulties to be overcome here are greater than in the manufacturing of simple gene products, but nonetheless one can look forward with confidence to considerable improvements in productivity, especially if a plant crops. These benefits may be of greatest use to developing countries.

Gene therapy

People have dreamed of gene therapy for many years, but will we ever use it and will it be hazardous?

Gene therapy may be at one of three levels — insertion of the correct gene into a small number of body cells with in vivo production of a gene product, insertion of the correct gene into all body cells postnataally, or insertion of the corrected gene into the embryo at a one cell stage so as to completely correct the gene 'fault' in the whole individual.

The problems to be overcome for all of these forms of gene therapy are quite substantial. I believe that the first two forms of gene therapy will become available in the future, but that the third form of therapy will prove to have no practical application.

1. Thalassemia is a prime target for gene therapy to a limited numbers of body cells. To correct the deficiency in patients with beta-thalassemia, one needs only to persuade a considerable proportion of bone marrow cells to reactivate the gammaglobin gene which they
used so satisfactorily during foetal life to produce haemoglobin-F or else to insert a normal beta-globin gene into a large proportion of bone marrow cells and to have it expressed normally. These things are easier said than done, but may be achieved within the next decade. This type of genetic engineering is most likely to be achieved by taking a patient’s cells, cultivating them in vitro and doing the gene manipulations, before inserting these cells back into the patient to repopulate his bone marrow. The two main problems are how to change the bone marrow cells in the way desired, and how to give them a selective advantage over other bone marrow cells after reinsertion. Otherwise, the engineered cells will be overgrown by other cells. Large doses of irradiation could be used, but the side effects are not really acceptable when treating children who have 60 or 70 years ahead.

2 In most of the serious genetic diseases for which there is currently no treatment, large numbers of body cells are directly affected and important, inaccessible organs like the brain are often involved. It will be necessary to introduce the gene into all of the cells of the body which are suffering the ill effects of the mutation. Presumably a viral vector will be needed. There are many problems to overcome before this type of therapy will be a practical proposition. Although genes inserted into the nucleus of a cell are taken up into the DNA and do function almost regardless of their position in the chromosome, malpositioned genes can disrupt normal genes or may fail to function properly themselves. Most scientists believe that we will need to learn how to put the correct gene into the correct place in the genome before we will achieve a quality of treatment which is acceptable for human application. We must also develop vectors which do not themselves have any harmful effects.

3 Therapy to the fertilised zygote will never be of any use in my opinion. Couples who might wish to use this treatment have a one in two or a one in four risk of producing an offspring with the disease in question. This means that they have either one in two or a three out of four chance of producing fertilised zygotes which are normal. Therapy to the zygote would involve in vitro fertilization and manipulation. The scientist performing the in vitro fertilization would be fertilizing several eggs. Some of these would be capable of producing normal individuals and others would produce individuals with disease. I cannot believe that we will ever develop a method of gene therapy which is so harmless that we would be happy to just treat all of these eggs. It follows that gene therapy will be applied only after we have developed a method of distinguishing between an abnormal zygote and a normal one. If we can do this, then why not just implant the normal zygote and discard the abnormal one.

Biographical notes

Professor David Danks (53) has been Director of the Royal Children’s Hospital Research Foundation and Royal Children’s Hospital Research Foundation Professor of Paediatrics since January 1983, after holding the Stevenson Chair of Paediatrics from 1975 to 1982. He has led the work in human genetics in the Royal Children’s Hospital since its origins in 1962.

Educated at Camberwell Grammar School, he graduated MB BS from this University in 1954 and MD in 1957. Postgraduate training was undertaken at the Royal Melbourne Hospital (1955-1956) and the Royal Children’s Hospital (1957-1958), followed by further training in paediatrics in Newcastle-upon-Tyne and at the Hospital for Sick Children, Great Ormond Street, London. His interest in research began in Melbourne when he was Registrar to the Clinical Research Unit under Dr Howard Williams and continued as he began training in human genetics in the Medical Research Council Clinical Genetics Unit at the Hospital for Sick Children under Dr John Fraser Roberts and Dr Cedric Carter. His training was continued at Johns Hopkins Medical School in Baltimore under Professor Victor McKusick.

Returning to Melbourne in 1962 Dr Danks worked in general paediatrics at the Royal Children’s Hospital and began research on clinical genetic problems. Over the next 22 years the scale of his research has expanded, gradually at first and more rapidly in recent years. Career landmarks for Dr Danks personally were reached in 1967 when he withdrew from general paediatrics to become Reader in Human Genetics in the Department of Genetics at this University, and in 1975 when he was appointed to the Stevenson Chair of Paediatrics. Throughout this time he remained active in genetic research at the Royal Children’s Hospital. His laboratory work began at the Royal Children’s Hospital, moved to the Department of Genetics when their new building was completed and shifted back to the Royal Children’s Hospital again on completion of the new 9th and 10th Floors at the end of 1976.

Professor Danks’ personal research interests have been focussed most intensely upon neonatal liver disease, on phenylketonuria and other inborn errors of metabolism, and on genetic disorders of copper transport in the human body. In recent years he has become intensely interested in the application of modern molecular genetics to human diseases and in the use of genetic disorders of mice as models of human genetic diseases.

He played an active role in the development of the Paediatric Research Society of Australia and of the Human Genetics Society of Australasia. He is currently a member of the Scientific Sub-committee of the Recombinant DNA Monitoring Committee of the Department of Science and Technology. He has also been a strong advocate of rational development of genetic services in Victoria and throughout Australia, arguing that most of the specialised diagnostic tests required, both postnatally and prenatally, need to be set up in only one place in Australia. Success in obtaining the collaboration of all States in such a rational development has been limited, but within Victoria his efforts have been rewarded by a well-integrated development of genetic services under the guidance of the Expert Co-ordinating Committee on Genetic Services of the Health Commission which he chairs.
Mr Chancellor, Mr Vice Chancellor, Members of the
Academic Board, Ladies and Gentlemen:

My first job is to congratulate those who have just been
admitted to the rights and privileges of their several
degrees. I know that students blame themselves if they do
well and their examiners if they do badly, and that any
success they may have is nothing to do with their teachers.
It is nevertheless on behalf of this possibly redundant body
of people that I am here to congratulate you. We all take
great pride in your achievements.

Graduation is, for many, something of a family affair — the
outcome not only of hard work by the one who walks
across the platform, but of what can be a period of real
financial self-denial by parents and others. So we offer you,
the families, our most sincere congratulations too.

Ethics and professional practice

Most of those graduating today — certainly all who are
graduating in medicine — are becoming members of a
profession. It is a feature of the learned professions that
their members regulate to a large extent how they behave
towards each other and towards the society in which they
live.

All graduates have a grounding in the ethics of their
calling, and I can assure the new medical graduates that
on most days of their lives in practice they will make
decisions that embody ethical judgements. I would say to
them: You will make most of these decisions as individuals;
you will make them fearlessly; and you will be prepared to
defend them. Ethics committees concerned with the
practice of medicine have their place, but you cannot take
a committee on your rounds. And I cannot believe that you
will wish to have your decision-making taken over, as some
have suggested, by a duty ethicist on call with a beeper.

On this day, you must consciously accept the ethical code
of your calling and a series of very personal commitments.
At a time when the pattern of health care is being disputed,
In-house ethics committees
Perhaps the single most important job we have done is to move the Council to lay down what sort of people should be members of research ethics committees in hospitals and research institutions, and to lay down the procedures that they should follow in reviewing research proposals and in monitoring research programmes.

We were in no doubt that the primary detailed ethical decision-making should continue to be in the institutions in which research was undertaken, so that local cultural and social attitudes could be taken into account. But we were equally convinced that guidance was needed on the composition of ethics committees, and the tasks expected of them. We wanted to ensure among other things that they included lay members, and people from outside their own walls.

For the past two years these guidelines on in-house medical research ethics committees (so-called 'institutional ethics committees') have been operating, and we are now consulting in each State to see how they are working—we have had meetings with their members so far in Melbourne, Sydney and Perth. Next year, in the light of these consultations, we shall make such amendments as seem necessary to the guidelines.

The National Health and Medical Research Council, at its meeting a few weeks ago, resolved that the amended guidelines on Institutional Ethics Committees will become a set of conditions, and that in future all institutions seeking funds from the Council for research will have to comply with these conditions in order to qualify to receive funds.

The Council funds some one-quarter to one-third of medical research in Australia and experience has been that other grant-giving bodies have followed the Council's lead in these matters. I have no doubt this will continue, and I am sure that no research institution will wish to be identified as unqualified to receive NH&MRC funds.

Research at the growing edge
In parallel with this consideration of administrative matters the Medical Research Ethics Committee has developed statements to guide ethics committees and research workers on a number of matters and particularly on three "growing edge" fields: in vitro fertilization, the use of fetal tissue, and epidemiological research. In each of these three areas, evolving from hours of study and debate, we have today's ways of handling information, this is certainly a set of principles.

We have recently been asked to consider research involving in vivo fertilization with transfer of the embryo, so-called "womb flushing"; and we shall be seeking comment on this. We have also been asked to begin to consider ethical aspects of research related to the possible usefulness of correcting defective genes and comment will be sought on this too.

Looking back, I believe that fertility research got away from us in the sense that in vitro fertilization was off and running before appropriate national committees in the UK, where it started, and in Australia, where it developed, were established. With an active standing National Medical Research Ethics Committee in Australia, a control mechanism is now firmly in place. Evidence that it is being used is shown not only by the tasks originally given to it but also by the reference to it from outside bodies of subjects like "womb flushing" and gene therapy in advance of work being started on them—and this is what is needed. This should go some way to allaying the disquiet that IVF in particular engendered in many people's minds. It is the policy of the National Medical Research Ethics Committee that comments should be invited on the guidelines that it prepares and that the NH&MRC publishes, and that the guidelines should be reviewed from time to time, in the light of full and free discussion. They are not seen as the final word.

Legislation?
The implication of this is clear. The "growing edge" of biomedical science is rarely an appropriate field for legislation; it is a field in which experience shows that attitudes may change as people become informed and have time to think. The time needed to ponder the issues may be longer than many might suppose.

The variation between the several State committees in Australia and the several committees in the United Kingdom in some of the conclusions they have reached on fertility research, warn us against over-readiness to enshrine what might or might not be done in legislation. Medical scientists are not alone in having reservations about the intrusion of legislation into the growing edge of biomedical research.

There is real concern that legislation can be introduced when it is politically expedient, perhaps in response to sectional and parochial pressures or to exhibit paternalism—or maternalism. My personal belief is that most of the ethical questions arising at the growing edge of biomedical research will best be approached nationally and with interdisciplinary discussion. In this I am in full accord with the view expressed repeatedly by Mr Russell Scott who has done so much to bring the matter to public view in the course of his work with the Australian and the New South Wales law reform commissions.

Through the National Health and Medical Research Council's initiative, involving as it does members of the community outside medicine, I believe we are on the right track and that we should continue to frame guidelines in the light of informed debate and to review them critically. In this process it is clearly important to inform and involve law makers. But the services required of them, or that they feel impelled to offer, will I believe be found to be minimal.

Community involvement
One of the functions of the National Medical Research Ethics Committee is to relate to the community and to deal with questions that are brought forward. As a result, we...
Message from the Dean

1984 has been a highly successful year for the Medical Faculty with further consolidation of changes in the undergraduate teaching programme to emphasize to a greater extent the practical realities of patient care and the importance of problem solving. From a course which used to have many failures and exclusions, we have moved to a course with a 97% pass rate and an enthusiastic student body who manifestly enjoy their studies. In subject after subject in the pre-clinical years, changes have led to a much higher level of acceptance by the students and better application to their studies; their academic results as well as their achievements in sensitive patient care augur well for the future.

The year was a difficult one for me as Dean with heavy commitments in the "Inquiry into Private Practice" following the dispute between the profession and the Commonwealth Government over Section 17. Whilst this story has yet to reach a conclusion with the ongoing dispute in NSW, it is to be hoped that some sense of common purpose has been identified between the profession and governments, and that in future the Government will consult more widely and wisely before introducing any major changes to the health care system. During the year I was very loyally and ably supported by Professor Graeme Ryan as the Deputy Dean who carried a large workload because of my frequent absences, and I wish to take this opportunity to thank him and all of the others who kept the 'ship of Faculty' on course during the year. 1985 looks as though it will still be busy with problems associated with AIDS in addition to ongoing commitments from the earlier dispute, but it is pleasing that the government should turn to this Faculty for advice on matters of high concern to the community.

The research endeavours of Faculty continue to be marked by new achievements. The award of a programme grant to Professor Graeme Clark for his studies on the bionic ear is applauded, as is the prestigious award of a five-year project grant to Professor G.B. Ryan, our Deputy Dean. Our higher degree numbers continue to grow and we continue to outstrip all our competitors in attracting research funds of the most competitive kind through the National Health and Medical Research Council.

It has been a matter of great pleasure to me that the Dean's Lecture Series has continued to be supported so well during 1984 — indeed we have had the largest audiences to date. Although it is not possible to find a time which will suit everybody, we have had consistent support from many graduates in addition to attendance by members of staff and some students. This is an activity which binds the Faculty together at every level and gives a greater understanding of the work which is being undertaken with such vigour and success.

A number of difficulties during the year took up considerable time and energy. The loss of the Murray Black collection of aboriginal skeletons from the Department of Anatomy was a matter of considerable regret, but I am glad to report that these relics are still available for study in the Museum of Victoria and negotiations continue to safeguard their future. Discussions about admission process to universities in Victoria led to very strong pressure for us to change our curriculum in a radical way with all students being selected into year one of Science and only thereafter entering a five-year course for medical studies. This move was strongly resisted and detailed documentation produced to refute the arguments presented in support of the change. After a great deal of debate within the University, the proposal appears to have been put to rest, at least for the time being and the big improvements gained in our undergraduate programme have therefore not been jeopardised.

David Penington
Dean, Faculty of Medicine

Final Year 1984

The 1984 graduating class contained 226 students of whom 224 satisfied the examiners in November.

The top student was Soon Tin Lee from Malaysia who, while having consistently good results all through the course, excelled in his final year. He had impressed all his teachers with his knowledge and self-confidence. Despite the heavy work load of the course, Soon Tin Lee managed to continue his interest in bushwalking, and has explored many parts of the State which native Victorians are yet to see.

As we look back over the past 15 years and ponder over the changes which have occurred in our profession, it is valuable to reflect on the changing role of the medical educator. There have been considerable changes in the use of 'traditional' methods of medical education and the atmosphere in which it is delivered. Gone are the days when the Honorary Consultant followed by his entourage descended on a silenced ward to deliver a didactic lecture to a hushed, ever-attentive audience. No longer are students passive recipients of pearls of wisdom as they drop from the lips of the master. This scene has been replaced by one of active interaction and stimulating enquiry between student, tutor and patient. Medical education in the teaching-learning setting is a bi-directional happening. Students expect more, seek more, and are much more involved in their own educational processes than in yesteryear. We, as medical educators, must adapt to this changing and challenging role.

Students are also becoming more active in curriculum development. Skills, apart from those which relate primarily to medical knowledge, are receiving increasing emphasis in the medical course. The importance of communication, and the psychology of the interactions between patient and doctor and patient and disease receive increasing emphasis in the curriculum.

The last two decades have seen our profession become increasingly involved in technological developments. Technology has flowed on into our medical school and we can anticipate the future wide usage of videotape, computer facilities and the like in the educative process.

1984 has come and gone and we look forward with interest to the development that the next few decades may bring to our University.

However, in this 'high tech' age we must not forget that as medical educators it is our responsibility to impart to our students the need to nurture the humanitarian qualities of caring, understanding and respect for which our profession has been so well regarded in the past.

Greg Whelan
Associate Dean (Clinical)
St. Vincent's Hospital
Researchers at the University of Melbourne will receive a total of $4,731,834 from the National Health and Medical Research Council to support 84 research projects and programs in 1985. The University has received 26 new grants for 1985, including one program grant, worth a total of $1,296,495. A total of $33,533,939 was awarded for 54 continuing projects and four continuing program grants.

The new program grant went to Professor G M Clark, Chairman of the Department of Otology/Neurotology, who has been awarded $190,768 to study the development of sensory prostheses for deaf children and adults.

Topping the list of the new project grants are Professor G B Ryan, Chairman of the Department of Anatomy and Dr D G Alcorn, Lecturer in Anatomy who are studying the peripolar cell function and glomerular proteinuria. Professor Ryan and Dr Alcorn will receive $143,488.

The NH&MRC awarded a total of $26,377,000 for project grants and $5,494,000 for program grants to Australian researchers for 1985.

Program Grants

Professor G M Clark — Studies to develop sensory prostheses for deaf children and adults ($190,768).
Professor W J Louis, Dr B Jarrott — Biochemical pharmacology of anti-hypertensive and other cardiovascular drugs ($143,427).
Professor T J Martin — Role of prostaglandins in the control of bone metabolism ($214,757).
Professor I F C McKenzie — Studies of cell antigens by hybridoma and other techniques ($222,118).
Professor M Ranci, Dr F P Story — Modulation of synaptic transmission by prejunctional receptor mechanisms ($205,461).

Project Grants

New Awards

Dr F P Alford, Dr J Best — Insulin action in man in vivo and in vitro metabolic effects of hyperinsulinaemia ($26,563).
Dr W Boyle — Studies related to human macrophages ($30,702).
Dr W Boyle — Cellular interactions in immune responses to alloantigens ($72,334).
Professor I F C McKenzie — Studies of cell antigens by hybridoma and other techniques ($222,118).
Professor M Ranci, Dr F P Story — Modulation of synaptic transmission by prejunctional receptor mechanisms ($205,461).

Renewed Projects

Dr W R Adams — Control of potassium excretion in renal failure ($24,758).
Dr R C Augustin — Possible mechanisms of senile nuclear cataract formation ($31,630).
Dr R C Augustin — The structures and properties of human and bovine lens protein ($36,399).
Dr D B Bell — Dopaminergic neurones in the sympathetic nervous system ($27,137).
Dr J B Brown — PSH thresholds during folicular maturation in the human and rhesus monkey ($31,702).
Professor R C Bignell — Ontogeny of lymphocytes in foetal sheep and neonatal lambs ($37,629).
Dr G R Campbell — Identification of cells in athrosclerotic plaques ($47,775).
Dr C Cheeseman — In vivo analysis of lymphocyte/macrophage interactions in lissomyositis ($24,470).
Dr R I Chieux — Control of pyrimidine biosynthesis in tumour cells by inhibitors of dihydroorotase ($41,714).
Dr B J Clarks — Synthetic function and their control on synovial macrophages ($75,340).
Professor R C Clarks — Tissue distribution and renal vascular resistance in experimental hypertension ($18,504).
Dr D P Crankshaw — Evaluation of pre-programmed thioptouline infusion as a primary anaesthetic agent ($30,702).
Professor R C Clarks — Tissue distribution and renal vascular resistance in experimental hypertension ($18,504).
Dr R C Clarks — Tissue distribution and renal vascular resistance in experimental hypertension ($18,504).
Professor R C Clarks — Tissue distribution and renal vascular resistance in experimental hypertension ($18,504).
Professor I F C McKenzie — Studies of cell antigens by hybridoma and other techniques ($222,118).
Professor M Ranci, Dr F P Story — Modulation of synaptic transmission by prejunctional receptor mechanisms ($205,461).
Continuing Medical Education

Some twenty-three years ago I was asked by the Editor of the British Postgraduate Medical Journal to write a description of postgraduate medical education in Australia. The article was for an issue in which activity in this field in various countries was to be described.

Not at that time having any sense of historical perspective of medicine in Australia, I sought a co-author. In Victoria the choice was easy for postgraduate medical education. With the name of Bill Johnston — W W S Johnston MC MC MD(Melb) FRACP to give him a formal citation — then retired from the honorary staff of the Royal Melbourne Hospital, a legendary figure in both world wars, a member of the Council of the University of Melbourne, Chairman of the free-standing Melbourne Postgraduate Committee and a great citizen.

It was typical of Bill, whose modesty concealed his inner strengths, that he demurred, saying that in recent years the major contribution to all forms of postgraduate activity in Australia had been that of Mr M C Coppleston FRCS, Honorary Director of the Postgraduate Committee in Medicine in the University of Sydney.

Of course he was right. The University of Melbourne had not really wanted to know about clinical medical education for postgraduates; and Sydney University which, unlike Melbourne University, had long since invested in professors of Medicine and Surgery, was making the running. However, on the basis that we would give credit where credit was due, that is, to "Copp" as he was known, Bill agreed to be co-author.

We described how organized postgraduate medical education in Australia began after the First World War when the return of many doctors from active service made necessary some organization for refreshing their knowledge of civilian medicine. The first Postgraduate Committee was formed for this purpose in Victoria in 1920, and being made up largely by honorary members of the staffs of the teaching hospitals, for years concentrated on refresher courses for general practitioners. For those in metropolitan areas, courses up to one week were organized at teaching hospitals, for country GPs, the Committee kept a list of consultants and specialists who were willing to visit country areas. Each year groups of practitioners in country districts chose two or three people from the list and these groups would go out, generally for a weekend, often travelling originally by train, to lecture dine and talk shop. The country gatherings usually involved about twenty doctors, some of whom would travel over a hundred miles each way for the occasion. As the years went by the Committee made recorded talks by overseas medical visitors, with accompanying slides, available on loan to individual doctors or country centres.

After the Second World War the medical visiting firemen from overseas figured prominently as once-off postgraduate lecturers in Melbourne. Their visits were funded from various sources, but their programmes in Melbourne were generally arranged through the Postgraduate Committee. Right through until the 1960s it was A4.4.0 (Pounds). Charges were collected for specially arranged courses, was A4.4.0 (Pounds). Charges were collected for specially arranged courses, was A4.4.0 (Pounds). Charges were collected for specially arranged courses, was A4.4.0 (Pounds). Charges were collected for specially arranged courses, was A4.4.0 (Pounds). Charges were collected for specially arranged courses, was A4.4.0 (Pounds). Charges were collected for specially arranged courses.

Notwithstanding that prophecy is often the most gratuitous form of error, Bill Johnston and I had a shot at it and I think we got it right:

"With the growing reputations of the MRACP and FRACS diplomas and the establishment of clinical professorial departments with full-time staffs in all Australian medical schools, postgraduates will increasingly tend to travel having already attained a postgraduate qualification, and many of them will also already have gained some years' experience in investigational work and teaching. Their primary object will be to gain special practical and research experience which they cannot get in Australia, rather than to pass a postgraduate examination."

We ended by posing questions arising from the creation of second universities with medical schools in two States, Monash University in Victoria, and the University of New South Wales. It seemed likely, we thought, that with the introduction of Federal funding through the then recently formed Australian Universities Commission, university based postgraduate committees would benefit, as compared with an independent committee such as that existing in Victoria. If the argument for postgraduate committees being university bodies were accepted, should, we asked, each university in a particular State have its own committee? In the event, the Melbourne Medical Postgraduate Committee remained independent of both universities. It assumed new functions, including the running of a matching service for the appointment of RMOS and Registrars and the organisation of training programmes, and it became the Victorian Medical Postgraduate Foundation. Monash set up its own standing committee on postgraduate affairs.

The Melbourne University Medical Board in the 1960s and 1970s was preoccupied with expanding the University's presence in its teaching hospitals by establishing more clinical chairs, and then with substantial reviews of the undergraduate curriculum. It was not until 1978 that the Faculty formally reviewed its activities in postgraduate education. It had as a background the 1974 Report on Continuing Medical Education prepared by the Health Services Commission. In this, continuing education was said to be an area in which university medical schools should play a major role. This was recognized as something over and above the university's traditional role in training postgraduates for research degrees and in playing a part in training for professional diplomas.

In November 1978 the Faculty received the report of its Committee on Postgraduate Education. It noted the distinction between the proposed courses in continuing education, which were not oriented towards examinations, the courses it was also developing for masters degrees, which were orientated towards examinations in specialist fields, and activities in continuing education of the royal colleges related to their diplomas. Accepting that courses in continuing education would vary in duration from one day to one week, that fees would have to be charged for them and that they would need time and effort to organize, Faculty established the Office of Co-ordinator of Postgraduate Education, later called the Office of Continuing Medical Education, with a staff member as convenor.

Sir Lance Townsend, on relinquishing the deanship, became the first Co-ordinator and the first programme was launched in 1979. I succeeded him in 1984 when I retired from the James Stewart Chair of Medicine. The Convenor of Continuing Medical Education responds to the Committee on Continuing Education which is a standing committee of Faculty chaired by the Dean.

Looking back over the past six years there are several points worth making. The Office of Continuing Medical Education has played a facilitating role, not a directive one. Each year it solicits proposals for courses from the heads of university clinical departments, and these are submitted to the standing committee for comment and approval. The full programme for 1985 is set out on page 48 of this newsletter. There have been between six and fifteen courses a year, and the optimal number is probably about ten, but it is too soon to know whether this is optimal so far as potential attenders are concerned. The majority of courses (seven out of nine in 1985) are directly relevant to the continuing education of general practitioners, and in recent years the number of registrants has varied from 17 to 177.

An attempt has been made to review each course by inviting participants to comment, and these have been helpful in guiding the organization of succeeding courses. The registration fee has varied from $30 to $200, determined by the need to "break event,"
Following the retirement of the Medical Librarian, Anne Harrison, in April 1983, the newly created position of Life Sciences Librarian was filled by Joan Martin. Mrs Martin has responsibility for the Medical Library and for the other five Life Sciences branch libraries.

The Life Sciences Librarian is an experienced medical librarian who, after ten years of nursing, was for many years in charge of the Royal Children's Hospital Medical Library. More recently, she was Librarian of the College of Nursing, Australia, and prior to her present appointment was for five years Chief Librarian of Lincoln Institute of Health Sciences. She has an Arts degree, and qualifications in education and librarianship.

Staff of the Brownless Medical Library are pleased to provide help to graduates of the University of Melbourne, particularly those of the Medical School. Brochures are available in the Medical Library which describe the services available, and will help the new or returning patron to deal with new electronic systems, and to find his way about. The Information Desk, to the rear of the ground floor, is manned, usually by professional librarians, from 9 am to 6 pm on weekdays, and can be reached by telephone on 341-5718. The Librarians are pleased to provide refresher sessions on the use of specialized reference and resource material and to give guidance in retrieving information from the Library. Evening sessions can be arranged. During term and term vacations, Brownless Medical Library is open from 8.30 am to 10 pm Monday — Friday, and from 8.45 am to 12 noon on Saturdays. Long vacation hours are reduced and the Library is not normally open in the evening except on Wednesdays (until 9 pm). Signs on the doors, or a call to the Information Desk, will provide up-to-date information on vacation hours.

The University Library extends borrowing privileges to graduates and retired staff of the University of Melbourne. Those wishing to be enrolled as Approved Borrowers should apply to the Information Desk at Brownless Medical Library (or to the Loans Desk in the Baillieu Library) with documentary evidence to support their requests. After approval of an application, an Approved Borrower card will be issued from the Loans Desk in Baillieu Library. Cards expire on 31 December each year, and re-application must be made for card renewal.

Graduates who produce Approved Borrower cards may borrow books for up to seven days from any library within the University of Melbourne library system. Certain categories of material are not available for borrowing, and the Library must, of course, retain the right to withhold from lending to Approved Borrowers, any materials which are in high demand by University of Melbourne staff and students. If this occurs, library staff will help to identify alternative resources which may be borrowed.

Periodicals are not lent, but photocopiers are available. The only restriction placed on their use being the necessity to adhere to the provisions of the Copyright Act (the salient points are displayed in the vicinity of the photocopiers).

From early 1985, it will no longer be necessary to carry 10c coins for photocopying. Magnetically charged 'smart' cards, which are dispensed from note-accepting vending machines on campus, will activate the copying machines. Credit is discharged from the cards as copies are made, and cards can be re-charged when credit is exhausted (up to a value of $98).

The Brownless Medical Library has a strong collection of medical periodicals. Library staff are pleased to suggest alternative locations if materials are not held locally. The collection of reference materials also is comprehensive, and is being reviewed at present. Suggestions from patrons for purchase of new materials for the collection are welcomed. Those who are not recent graduates may not be aware that the Medical Library now has an excellent collection of audiovisual materials in medicine and allied health fields. There are comfortable facilities for viewing of videotapes and slide-tape programmes, and audio-cassettes may be borrowed for home use.

Graduates are warmly invited to make themselves known to Mrs Martin and the Medical Library Staff.
Medical History Unit

The University of Melbourne Faculty of Medicine is unique in Australia in having a Medical History Unit. Created through the efforts of Professor Emeritus K F Russell with funds from the Wellcome Foundation, its reading room, rare book room and museum grace the second floor of the Brownless Medical Library. At present there are five honorary staff and a part-time curator. There is no full-time member of staff, which suggests that this is a quiet backwater of little importance to the faculty's main turbulent stream. Let me correct this impression as this has been a busy year.

Teaching: Lectures in the history of anatomy and pathology have been given, and an Advanced Study Unit in the history of pathology held in the Unit office. The ASU has been generally enjoyed by students “it’s such a change to talk about people than just diseases”.

Honours Science students in pharmacology also enjoy a conducted tour of the Savory & Moore Pharmacy and are surprised by the longevity of many patent medicines. They are also surprised that palliatives could be important.

Museum displays: Members of faculty visited the museum after their first meeting of the year and viewed a display on the ancient therapeutic arts of bleeding, cupping and purging. One member of faculty admitted to having been cupped, but refused to show the scar.

Currently a small display does honour to Ding Dyason who retires at the end of this year as Reader in the History and Philosophy of Science.

The Collection of Archives and Instruments: The Unit has a valuable collection of archives and instruments only a small part of which is at any time on display. During the year important additions come from Dr R S A Marshman, former Director of Tuberculosis, Victoria, who donated autopsy records from Gresswell Sanatorium, a boxed artificial pneumothesorax machine with instructions and needles and a fascinating series of glass projection slides illustrating hitherto therapy in Switzerland for tuberculosis of bone.

Dr Vera Krieger, former biochemist and serologist at the Royal Women’s Hospital gave a magnificent photographic portrait by Julian Smith of W J Young, the first Professor of Biochemistry in this University. The portrait is appropriately labelled The Card.

The valuable patients’ record cards which John Cade made of his patients when he first used Lithium in the treatment of mania have been recorded on microfiche. Through the courtesy of the Ministry for the Arts, expert cataloguers worked for some eight weeks laying a foundation for a catalogue of the Unit’s collection. Funds are badly needed to complete this catalogue.

Mrs Nancye Kent Perry, a well-known artist and formerly an entomologist with The Walter and Eliza Hall Institute has donated fascinating memorabilia of research work in 1952 to find the vector of Murray Valley Encephalitis. She, amongst other scientists, went to gather mosquitoes from the Murray Valley district. Using a simple suction tube (filtered of course) and a muslin bag, they collected over 30,000 mosquitoes. Illustrations from the Australasian Woman’s Weekly (January 1952) shows them busily at work at the end of short and short-sleeved shirts — Ted Ford would have court-martialled any of his troops so dressed in New Guinea. Surprisingly, none of the research workers came down with encephalitis!

Link with Medical History Society AMA (Victorian Branch): This link is strong, of long standing and of considerable importance. The meetings of the Society are held in the reading room of the Unit and in recent years the average audience has been between 50 and 60. Medical History Australia, a newsletter of the Unit and the Society, was started in August 1981 and now goes to many readers in Australia and abroad. It received its first citation in the Wellcome Current Work in the History of Medicine this year and has also been cited in the AAMH Newsletter.

This year following Dr John Pearse’s and Sister O’Carrrigan’s initiative (1980) in convening in Sydney a First National Conference on the History of Medicine and Health in Australia, the Unit and the Society combined with the Department of History and Philosophy of Science to hold the second conference here. This second conference (29 November to 1 December 1984) attracted some 130 registrants from all over Australia, was recognized as part of Victorian’s 150th anniversary celebrations and was devoted a day to honour Ding Dyason. Professor Emeritus Sir Douglas Wright opened the conference and on Ding’s day spoke on the origin of the teaching of History and Philosophy of Science at the University of Melbourne — his talk and his answers to questions thereafter are best described as “vintage Panz”.

On Saturday, 1 December 1984, at Werribee Park it was agreed to establish a Medical History Society of Australia. A steering committee was appointed with representatives from all States. Initially the secretariat will be based in the Unit. This is a major step forward.

A SERIES OF ENGRAVINGS, ACCOMPANIED WITH EXPLANATIONS, WHICH ARE INTENDED TO ILLUSTRATE THE MORBID ANATOMY OF SOME OF THE MOST IMPORTANT PARTS OF THE HUMAN BODY.

The Chief Morbid Appearances of the Heart, and of the Arteries near its Origin.

By Matthew Ballieux, M. D. F. R. S.
Fellow of the Royal College of Physicians, and Physician to St. George’s Hospital.

Publications: Melbourne University Press has agreed to produce, in facsimile, a limited edition of Matthew Ballieux’s Atlas “intended to illustrate the Morbid Anatomy of some of the most important parts of the Human Body” using an almost complete set of the coloured drawings by William Clift, from which the engravings were made. The Atlas, issued between 1799-1803, is an important one and the drawings have never before been reproduced in colour.

What can you do?

A sense of history is growing in Australia which is about to celebrate the 200th anniversary after the settlement at Sydney Cove. This is the oldest Medical School in Australia and is renowned for its graduates. The University has been wise enough to garner archival material, house it properly and catalogue it for use. The Medical School is the only one in Australia with a Medical History Unit, but the staffing of the Unit and the cataloguing of its collection is unsatisfactory. In America, alumni regularly make generous donations to their universities or medical schools, thereby making them less vulnerable to budgetary manipulations by government or ravishment by academic buccaneers; thus units such as the Medical History Unit, which cannot be funded by research grants given only for so called ‘hard science’, can be nurtured.

The quality of life is very dependent on the Humanities and medical practice is greatly influenced by social attitudes and social pressures. The study of medical history fosters the traditions of a proud profession and adds perspective to science when it is dazzled by detail. Alumni of this University should consider seriously their debt to their foster mother for their growth in mental stature, nurture its Medical History Unit and make it the centre for Medical History in Australia. Incidentally, the museum is recognized under the Taxation Incentives for the Arts.

Harold Atwood
Medical History Curator
Notice of Annual General Meeting 1985

The Annual General Meeting of the University of Melbourne Medical Society (UMMS) will be held at 6.45 pm in Lecture Theatre 1, Ground Level, Medical Centre Building, Grattan Street, on Tuesday, 2 April 1985. This follows the "Dearie's Lecture" by Mr Peter Jones, Royal Children's Hospital, entitled "In Search of a Sixteenth Century Physician: A Paper Chase" commencing at 5.30 pm.

Annual General Meeting 1984

The Annual General Meeting of the University of Melbourne Medical Society (UMMS) was held at 6.45 pm on Monday, 2 April 1984 in Lecture Theatre 1, Level 2 of the Medical Centre Building. The Chairman of UMMS, Professor D G Penington, chaired the meeting and opened by welcoming those present.

1 The minutes of the 1983 Annual General Meeting were approved, after accepting the amendment which recorded correctly that the Executive Committee had been elected until the 1986 Annual General Meeting.

2 Chairman's Report

Professor Penington reported that a number of apologies had been received including those of Mr John Hayward who could not be present because of illness. It was announced that the current membership of UMMS was 950 and that this number was increasing all the time. The attendances at the Dean's Lecture series had increased greatly since the creation of UMMS and this was felt to be very satisfactory. Mention was made of the excellent talk given prior to this meeting by Dr E Cunningham-Dax, former Chairman of the Mental Health Authority of Victoria, entitled "Psychiatry, Art and Artists". This had been a most interesting and stimulating lecture with superb illustrations of the work of the various artists.

The Executive Committee had decided that the subscription for UMMS would have to be raised to $25.00 to cover the costs of administering the Society, postage and publication of our magazine, Chiron. This money would also assist in helping enthusiastic members of each year to run their various reunion functions. Professor Penington pointed out that 50 years after graduation, all members automatically became honorary members of the Society.

Mention was made of the "Medicare 1984 and Beyond" symposium held in October 1983 at which a large audience heard Dr John Deeble, Dr Gad Trevaks and Mr Brian Collopy speak on various aspects of patient care and how it would be affected by the new Medicare scheme.

A number of graduation classes had been helped with their reunion arrangements and at the 50 year dinner a very generous donation had been made to the Research Fund of the Faculty of Medicine. It was hoped that this interest in supporting University research would continue.

3 Financial Report 1983/4

The financial report was presented by the Honorary Treasurer, Dr John MacDonald. This showed, at 29 February 1984, an income of $13,861.00 in the UMMS account with expenditure of $7,505.00 and outstanding debts of $12,132.00. The report was received after noting that the deficit would be financed by the Faculty's Continuing Education account until further donations had been received.

4 General Business

4.1 Newsletter

The second edition of the UMMS newsletter, Chiron, had been published under the Honorary Editorship of Mr Peter Jones and was an even better newsletter than the first one which was received so enthusiastically last year. Many people have expressed fervently their interest in the magazine and how informative it was. Special thanks were again extended to Mr Jones, Professor Graeme Ryan and Ms Maggie Mackie for their work in editing and collating the material in the magazine.

4.2 Future Activities

The Executive will meet and plan a series of activities for the 1984-85 period.

The Meeting closed at 7.00 pm.

Forty Years On — The Class of '45

In Chiron last year (March, 1984 p12) John Hayward reported a successful reunion of the Class of '33, and the welcome assistance received from the Graduate Secretariat. The editors of Chiron believe that news of reunions will interest other medical graduates, and hope to include a report of one or two in each issue.

On 22 February, 1985 the class of '45 will hold its fortieth anniversary reunion, and we are fortunate in having Donald Cordner as our archivist, rapporteur and organizer as indeed he was in masterminding our reunions in 1956, 1958, 1960, 1965, 1970, 1975 and 1980.

In every graduating class there is a feeling of some degree of fellowship. Some classmates become partners in marriage, and we have three: Jenny Paschoeve and Jim Gardner, Dorothy Hurley and Stewart Menzies, Shirley Francis and Norman Dalton. Others become partners in practice and there are at least three pairings among our contemporaries. As years pass we take vicarious pleasure in achievements of those we see frequently, from time to time or only at reunions. Even in the latter, friendships tend to take up instantly from where they stood the last time we met — on such occasions we hear of, and miss, those no longer with us, and we have lost twelve of our eighty-six so far.

Each class has, as well as a measure of camaraderie, a communal link with our faculty and university, and it is no coincidence that our reunion this year will be only a week or so from the actual date of our finals in mid-February 1945. And why, some may ask, did we have our 'swot vac' and finals at the hottest time of the year, and in the 'long vac'? The answer, though simple, may be news to the
The years, and the practice of medicine, have taken their toll; grey
number have retired, and the rest of us have but three years `to go:
of age. and the late Stewa rt Were.

At the time we graduated there was no medical school in Pe rt h, and
of Pathology at the Brooklyn Women's and Unity Hospitals in New

or our residencies, and one of them Gwen Pinner has recently

and with a beaming smile, he was, and is, a Dickensian reality who
could stand in for one of the Cheryble brothers, perhaps even for
both of them!

Every year is a `good' year, some like ours, are `pretty good' years,
and while we are open to persuasion that some of our `very good'
years, modesty forbids making that claim. Probably none should
aspire to being a 'vintage' year, which requires being put down for
quite a long time to mature and acquiring a 'round' body and a `big'

The editors hope that news of an imminent class reunion will interest
other years, and stimulate each of them to arrange their own.

Reunions can be organised more easily now with the assistance of
the Graduate Secretariat, which keeps a register of all medical
graduates and their current addresses. Their services are naturally
limited by out of date addresses, and it would be most helpful if all
medical graduates notify changes of address to the Secretariat. It
would be even better if you sent in your subscription and joined
UMMS and we will then pass on your current address.

1945 Graduates

Charlo Anderson, Tom Antonie, Henry Barbour, Paddy Barrett,
Mary Bennett, Allen Bignell, Nancy Brown, Phil Brown, Alan
Burman, Bob Callander, Barry Christophers, Howard Coats, Donald
Cordenr, John Critchley, Norman Dalton, Jim De Crespigny, Jim
Edwards, Bill Etheridge, John Farrer, Dermot Foster, Mark Fowler,
Shirley Frances, Jim Gardiner, Harold Grinbi, George Gunter, John
Harpen, Ross Hayes, Donald Hewson, Desmond Hurley, Dorothy
Hurley, Paul Jeffrey, Adrian Jones, Peter Jones, George Katchor,
Arth Kech, Jim Keipert, Bill Knight, Iris Leber, Ian Leembruggen,
John Little, Walter Lozen, Ian Macay, Bert McCloskey, Greg
McMcKee, Jim Madigan, Doug Marshall, Stuart Menzies, Donald
Mitchell, Walter Moon, Murray Mountjoy, Joan Mowland, Luke Murphy,
Arch Murray, Nate Myers, David Nathan, Dick Neving, Darrell
O'Donnell, Len Paris, Jenny Pascheove, George Pestell, Jack
Piercey, Chan Piercey, Gwen Pinner, Des Prentice, Donal Rush,
Ismail Rahman, Kurt Schwar, Michael Shoobridge, Westy Stephens,
King Stevenson, Geoff Stillwell, John Story, Jack Swann, Eric Tift,
Phil Tieman, Keith Toone, Gordon Trinc, Jim Troup, Joan Walker,
Tom Walsh, Rowan Webb, Gerry Westminster, Bill Wilkinson, Beauty
Wilmut, Stathy Zavetchanos.

Graduated after 1945

Charlie Batten, Harry Cummimg, Kevin Cullen, Ron Kingston, Cecily
Statham, Sam Troski, Stuart Were.

Analysis of 1945

General Practice — 32
Surgery — 15
General 8, Plastic 2, Orthopaedic 2, Paediatric 2, Oral 1
Pathology — 7
Consultant Physicians — 33
General 3, Allergy 1, Cardiology 1, Poediatrics 1, Part-time
Practice 6, Public Health 3, Anaesthesia 3, Radiology 3,
Dermatology 3, Oncology 2, Administration 2, Psychiatry 1,
Ophthalmology 1, Occupational Medicine 1, Politics 1,
Radiotherapy 1

Postgraduate Degrees and Qualifications:
MD 13, MCP 6, FACS 2, DCH 2, FRCS 12, MS 4, MSc 3, DA
2, FACA 2, FRCS 11, MRAC 3, DDM 2, FRAC 7, DPH
3, DCP 2, MRACG 2, MRC 6, BSc 3, MCPA 2, MRACGP 2.

One each of: FAAP, FACP, FASA, FRCP, MHIE, DFM, DTR,
MRCP, MS, MD (Ed) DO, FRCP (Ed), FCR, AnScc, DFR
D.rad, FRCS (Ed), FFR, MCRA, DGO, DTMH, FCRA, FCP,
MACD, DPH, BA, FRANZCP, LM(Rotunda), DRDCG,
DAFCG&S, MPH.

Peter Jones
Editor, Chiron
UMMS Membership as at 1 February 1985

This listing was assembled from UMMS membership forms. Corrections to spelling and year of graduation will be gratefully received.

University of Melbourne Graduates (MBBS)

1921
Dr R L Fulton
Dr R Southby

1922
Dr K Campbell
Dr W R D Griffiths

1923
Dr G B Bearham
Dr M Blair
Dr J Blewitt

1924
Dr A Horton
Dr A Liebert

1925
Dr P Goodman

1926
Dr W D Counsell
Dr R J Long
Dr J A McLean
Sir Thomas Travers
Dr L J Westacott

1928
Dr R J Farnbach
Dr J Heath
Dr P B Houghton
Dr R N Howard
Dr E Sandner
Dr W E Williams

1929
Dr W W Lempriere
Dr G H Van Nooten
Dr S Williams
Prof Em Sir Douglas Wright

1930
Dr T D Haiget
Dr M Perl
Dr A Rowland
Dr H T Tisdall

1931
Dr R J Cats
Dr E H Green
Dr F J Hayden
Dr P T Wedlick

1932
Dr T E Love
Mr D Niel
Dr E P Robinson

1933
Dr D M Gepp
Dr J Hayward
Dr A R Kelly
Dr A R Kidd
Dr L Lloyd-Green
Dr S R Peters
Dr A J Sinclair
Dr R J D Turnbull

1934
Dr W T Agar
Sir Edward Dunlop

1935
Prof Em R R Andrew
Dr J L Freed
Dr J H Hurt
Prof Em K F Russell
Prof Em Sir Sydney Sunderland
Dr J Glynn White

1936
Dr C K Churches
Lady Fitte

1937
Dr A R Hughes
Dr J A Hutchings
Dr D Leslie
Dr N F Percott
Dr C F H Pyman

1938
Dr V G Bristow
Dr J O Lavrask
Dr H B Kay
Dr P J Parsons
Sir William Refshauge

1939
Dr A J Barnett
Dr A Fraser

1940
Mr J L Bignell
Dr J T Cahill
Dr J R F England
Dr I Galtraith
Dr F M Moore
Dr E D M Ryan
Dr L Turner
Dr L M Verso
Dr H N B Wettenhall

1941
Dr W M Barrett.
Dr M S Bensen
Dr J S Guess
Dr I H McConnochie
Dr H S Moroney
Dr I M Seward
Dr W L Stakes
Dr T V Waapole
Dr H L Wilson
Dr A Worcester

1942
Dr E P Corder
Dr R J Fleming
Dr R Hill
Dr J Kremer
Dr R R Parkin
Dr P Zerman

1943
Dr G Bennett
Dr P R Bull
Dr R M Charters
Dr M Cookbill
Dr D C Cowling
Sir Edward Hughes
Dr W S Richards
Dr A O Rosenhall

1944
Dr C J Craig
Dr R T J Geobally
Dr A R Gilchrist
Dr J L Howqua
Prof J V Hurley
Dr L L Morgenstern
Dr N B Pinkus
Dr E L Ryan
Dr J Vaughan
Dr J F Williams

1945
Mr T E Antoine
Dr A G Bignell
Dr J V Champion de Crespigny
Mr W Etheridge
Dr D C Foster
Dr G S Gunther
Dr P G Jones
Dr J A Kaspert
Dr G P McKoys
Dr G S Pestel
Dr T P Rowan
Dr R K Stevenson
Dr R G Webb

1946
Drs J K K & L J Fulgarr
Dr J K Henderson
Dr H Luke
Dr D W Magirr
Dr J A McDonald
Dr B Ungar
Dr E M Williams

1947
Dr J K Clarebrough
Dr A M Cuthbertson
Dr T H Hurley
Dr T Lavick
Dr M Maxwell
Dr B W Neat
Dr P Robertson
Dr W R Rogerson
Prof R W Webster
Dr S Wiener

1948
Dr H D Breidahl
Dr G W Coocer
Dr B C Edwards
Dr F C Forster
Dr K Kelly
Dr K B Layton
Dr R D Marshall
Dr J Maxwell
Dr W T Richards
Dr J N Santamaria
Dr C W E Wilson
Dr G L Christie

1949
Dr N P Bell
Dr A G Bond
Dr N Cass
Dr J B Fethers
Dr J R E Fraser
Dr J A Henton
Dr W H Kitchen
Dr A D MacLean
Dr A F L Neat
Dr C J K Pawsey

1950
Dr R M Atkinson
Dr J M Appleford
Dr R Bennett
Dr E B Collins
Dr T Farrell
Dr B J Feery
Dr R Fowler
Dr J F Grant
Dr R Harbison
Dr H D Irish
Dr J James
Dr E E Mackay
Dr J M Melville
Dr M H Morland
Dr H C Newman
Dr B M O'Brien
Dr P Stanbury
Dr B F Stratford
Dr L I Taft
Dr A R Waterhouse

1951
Dr V G Balmer
Dr F I Bishop
Dr G W Briggs
Dr P R Cleary
Dr J G Churchman
Dr A C L Clark
Dr P H Cohen
Dr M W Deboner
Dr O M Garsdon
Dr D N M Fearon
Prof W S C Hare
Dr A F Hargrave
Dr S C Johnston
Dr M de Leat
Dr J H S Marrin
Dr N H Matthews
Dr J Q McCubbin
Dr H K I McLachlan
Dr J M McLeod
Dr J W D Middleton
Dr K W Mills
Dr G Paterson
Dr J S Pennington
Dr J G H Refshauge
Dr R H Saunders
Dr P Shill
Dr B S Vanrenen
Dr R C Webb
Dr A S Wood

1952
Dr L. Baird
Dr D Campbell
Dr P Forsell
Dr R N Mellor
Dr A J Murphy
Dr M I Nissen
Dr D O'Shaughnessy
Dr H M Parrake
Dr I F Robertson
Dr W A Syme
Dr B W Washam
Dr B W Walklate
Dr J F Wiseman

1953
Dr P E Campbell
Dr O Mck Cottman
Dr F Corry
Prof G W Crook
Dr J A Fuller
Dr J S Galbraith
Dr R G Gutter
Dr G S Hale
Dr J S Hamilton
Dr W C Heath
Dr J W Hill
Dr W C Lawrence
Dr A Marshall
Dr F H Martin
Dr B R K McKeon
Dr M A McKenzie
Dr D M O'Sullivan
Dr H E Peddon
Dr R G Shaw
Dr D J Shuter
Dr S G Sorman
Dr V K Spowart
Dr J Upjohn
Dr J G Webb

1954
Dr P Adrian
Dr J L Barten
Dr O H D Blomfield
Dr A J Caro
Dr S H Chiari
Dr E M Craig
Dr W M Crosby
Prof D M Danes
Dr D Galan
Dr W H Koschade
Dr J F Macdonald
Dr G R McEachen
Dr P Mecca
Dr P Pitt
Dr L Simpson
Dr F Wright
Dr L Ee Woe Kt

1955
Dr R Bentley
Dr G L Buckwell
Dr W C Fabo
Dr D Gee
Dr R D Glass
Dr R L Godfrey
Dr K J Green
Dr R P Gunter
Dr J A Horgan
Dr P Jashut
Dr A K Lowe
Dr M T Mulcahy
Dr A Awes
Dr F J Rourke
Dr B Sawyer
Dr G O Smith
Dr C A Tav
Dr M J West
Dr M E Wisman

1956
Dr G J Bishop
Dr B Booth
Dr W Chin
Dr J K Dawborno
Dr P Eisen
Dr G Freed
Dr F Galles
Dr P F Hart
Dr D C Hodge
Dr R W Howard
Dr F J Irines
Dr E J Keogh
Mr I C Roos
Dr J M Shaw
Dr E Xipell
Dr E P H Chu
Dr J Igra
Continued from page 14

Though he died childless (despite the Bishop's allegations), one of Andrew's relatives, probably a nephew, carried on the family line, and one of his descendants, Sir William Boord, served as a Governor of St Bartholomew's Hospital, and was created a baronet and one of his descendants, Sir William Boord, served as a Governor of St Bartholomew's Hospital, and was created a baronet and one of his descendants, Sir William Boord, served as a Governor of St Bartholomew's Hospital, and was created a baronet

42

References

Burkes Peerage and Baronetage (10th ed. p302.

More, Sir Thomas, 'Compliment against Tribulation' in Collected Works, ii, "The arms of Boorde le Docter" B.L. Harleian Ms 5844, and College of Arms Ms Miscellaneous Grants, c1600.

No-one would concide levity at inappropriate times, but a mournful countenance is hardly reassuring and a good laugh, particularly at ourselves, can be therapeutic for all concerned. Sir Thomas More wondered if there was a case when "menne in tribulation ... may not lawfully coumforte themselfe with some honest mirth" (1534); few would disagree.

Miscellaneous Grants,

References

Burkes Peerage and Baronetage (10th ed. p302.

More, Sir Thomas, 'Compliment against Tribulation' in Collected Works, ii, "The arms of Boorde le Docter" B.L. Harleian Ms 5844, and College of Arms Ms Miscellaneous Grants, c1600.
Department of Physiology

In 1973 Professor R D Wright resigned from his chair after an occupancy of 34 years and transferred to Medical Directorship of the Cancer Institute. This occurred five years after the department had moved from the old building on the opposite side of the campus and when we were well-established in six floors of the north wing of the new tri-radicate Medical Centre building situated opposite the Royal Melbourne Hospital.

Older graduates would undoubtedly see these events as signaling the end of an era, but for the nostalgic there still remains a flavor of those earlier times. As Chancellor, Professor Emeritus Sir Douglas Wright remains very apparent, still conducting research, now in the Howard Florey Institute that lies adjacent to the department. Other familiar faces amongst the teaching staff that continue from the 1950s and 1960s, include Mr Kenneth Shankly (1948), Dr Mary Chennells (1960), Dr John McKenzie (1963), Professor Allan Day (1967) and Dr Marilyn Wintour-Coghlan (1960). Many UMMS members will remember Miss Patricia Keogh (now Mrs Malcolm McColl) with warmth and respect. She retired early, two years ago, in excellent health, and continues to assist with teaching and practical classes whenever a very experienced hand is necessary. Both Pat Keogh and Everton Trethewie were legendary figures for thousands of medical students, and it will shock many readers, as it did his colleagues, to know that Treh was suddenly last June. He was aged 71, having retired six years previously, and was as physically and mentally agile as ever. He continued to research and publish in retirement, using the Physiology Department as his base.

In 1973 Professor Ian Darian-Smith was appointed to the vacant chair and he rapidly established a large, well-organized group concentrating on neurophysiological research concentrating on sensory mechanisms, and at the same time, as Deputy Dean, he played a major part in bringing about extensive changes to the medical course. These included the introduction of professional subjects into first year (Anatomy, Physiology and Behavioural Science), the completion of physiology in second year, and the establishment of a unit called Neurophysiology, integrating the teaching of neurophysiology and neuroanatomy. In 1981 when the opportunity arose, he switched to a Chair of Medicine in this Faculty, where he continues his research and integrative teaching.

Biophysics has always been well represented in the Physiology Department, but suffered a setback when Dr David Dewhurst transferred to the Department of Electrical Engineering in 1974. David has continued to make excellent contributions from that department, and retires this year having developed and patented a system for the extraction of information from human speech and having made major contributions to the development of the bionic ear.

Other former members of the department who have been notably successful include, Miss Diana (Ding) Dyason, retiring this year as Reader in the Department of History and Philosophy of Science; Mrs Delys Sargent, Director of the Social Biology Resources Centre; Dr Bertram Wainer, notable reformer; Phyllis Fry, Head of Biological Sciences in the Lincoln Institute, and recently appointed Principal of Janet Clark Hall; Mark Wahlqvist, a former student of Professor Allan Day and now Professor of Human Nutrition at Deakin University; Professor Trevor Redgrave, Professor of Physiology, University of Western Australia; Ray Bradley, Deputy Director, Biological Research, Cancer Institute; Derek Denton and John Coghlan, respectively Director and Deputy Director of the Howard Florey Institute; Dr John Davis, Research Scientist, Munich, Germany. An earlier generation of Melbourne physiologists has achieved success in more distant places: Professor Henry Harris is Regius Professor of Medicine at Oxford, Dr Victor Wynn is Head of the Metabolic Chemistry Unit at St. Mary’s Hospital, London, and his brother Alan is active in the cause of international dissidents and freedom of speech.

Extensive changes are presently occurring in the department. There has been a large expansion in the area of exercise physiology and sports science following closure of the Department of Human Movement Studies. Staff, students and equipment have been assimilated into the Physiology Department and now constitute a formidable research, teaching and resource group in the broad discipline of Sports Medicine.

The appointment of Professor Trefor O Morgan (1984) to the Chair vacated by Ian Darian-Smith is another major development. Professor Morgan, previously Head of Physiology at the Repatriation General Hospital, Heidelberg, will be well known to many UMMS members and will be a major development. Professor Morgan, previously Head of Physiology at the Repatriation General Hospital, Heidelberg, will be well known to many UMMS members and recent graduates as a renal physician and physiologist, previously Head of Medicine at the Repatriation General Hospital, Heidelberg. His appointment strengthens the department’s research in electrolyte physiology, renal function and blood pressure, fields of considerable interest to both the department and the Howard Florey Institute.

Finally, a warm invitation is extended to any graduate interested in the history and affairs of this department, to visit and to renew past associations.

Sandford Skinner
Chairman, Department of Physiology
Department of Paediatrics

Undergraduate teaching in paediatrics commenced in 1867 when the first lecturer in diseases of women and children was appointed to the ‘Melbourne Lying in Hospital’ (later the Royal Women's Hospital). This was only five years after the founding of the Medical School. Students began attending the Hospital for Sick Children (later the Royal Children's Hospital) soon after it was founded in 1870, but it was not until 1911 that such attendance became a compulsory part of the medical course. Since then, the Royal Children's Hospital has remained the focus for teaching in child health. A major advance in undergraduate teaching came in 1959 when the late Vernon Collins was appointed the Foundation Professor of Paediatrics. His Chair had been generously endowed by Hilda Stevenson, the daughter of H V McKay of Sunshine Harvester fame. Professor Collins established a very effective teaching programme. He was succeeded in the Chair in 1975 by Professor David Danks who achieved a major development in the research activities of the department, particularly in his own area of interest, congenital defects and inherited disease.

In 1982 Professor Danks was appointed Director of the Royal Children's Hospital Research Foundation and the Royal Children's Hospital Research Foundation Professor of Paediatrics. The Research Foundation is affiliated with the University and its activities are closely associated with that of the Department of Paediatrics. Professor Danks' own research group within the Research Foundation has recently been very generously endowed, mainly by the family of Dame Elisabeth Murdoch, and it holds an NH&MRC programme grant. It is now called the Murdoch Birth Defects Research Institute and has already established an international reputation for its work. Professor Danks and his colleagues are responsible for the teaching of genetics to pre-clinical students in Years 1, 2 and 3.

Professor Peter Phelan took up appointment as Stevenson Professor in 1983. His research and clinical interests are in respiratory disease and respiratory physiology. He is continuing an active research programme in these fields, particularly the epidemiology of asthma and cystic fibrosis. The department also has research interests in wider aspects of the epidemiology of childhood illnesses, particularly the impact of social factors on illness and in health delivery systems for children (Dr Allan Carmichael).

Members of the department are very actively involved with staff of the Royal Children's Hospital in a variety of research areas including immunology (Dr Don Roberton), renal disease (Dr David McCredie), defects of collagen (Mr W Cole) and the outcome of small premature infants (Dr W H Kitchen). The Royal Women's Hospital (Dr W H Kitchen). This close collaboration is very fruitful and, it is hoped, will continue to contribute to better understanding and management of major health problems in children.

Over the last 10-15 years, the nature of the Royal Children's Hospital has gradually changed with increased specialisation. In the same period, there has been a major development of paediatric units in district general hospitals in the metropolitan area and in provincial cities. While these changes have been very helpful in developing academic and research activities at the Royal Children's Hospital, there are now fewer children in its wards with common paediatric problems which are important for comprehensive undergraduate teaching.

To ensure that students during their paediatric term are exposed to the whole spectrum of childhood illness, the department has arranged for some students to spend two weeks of their paediatric term working with paediatricians in paediatric units in general hospitals. By 1986 all students should have an opportunity for this type of experience. In this way it is hoped to give students a balanced picture of childhood illnesses. The mixture of high academic standards in a major teaching hospital plus the variety of common paediatric problems seen in a district general hospital should provide excellent undergraduate training.

In 1985 Professor Robert Adler will take up appointment of Foundation Professor/Director of Child and Family Psychiatry at the Royal Children's Hospital. His appointment should stimulate undergraduate and postgraduate teaching and research in this important part of paediatrics.

Postgraduate work should be an essential part of a university department. Paediatrics is fortunate in attracting a considerable number of medical and science graduates who wish to undertake research towards higher university degrees. The facilities and the personnel at the Royal Children's Hospital Research Foundation, the hospital itself and the Department of Paediatrics provide a great variety of opportunities for postgraduate research. Members of the department are also actively involved in postgraduate paediatric training. Professor Phelan is a member of the Royal Australasian College of Physicians Committee for Examinations (the old Board of Censors).

While Victoria has one of the lowest infant and childhood mortality rates in the world, childhood illness continues to result in much morbidity. The Department of Paediatrics aims with its undergraduate and postgraduate teaching programme and its research to continue to contribute to further improvement in child health.

Peter Phelan
Professor of Paediatrics
New Head of NH&MRC Grants Committee

A member of UMMS, Professor Graeme Ryan, has been appointed Chairman of the National Health and Medical Research Council's Grants Committee. This Committee is responsible for the administration of the major source of funds for medical research in Australia.

According to Professor Ryan, the major problem faced by the Grants Committee is the limited funding provided for medical research in this country. "There were 860 applications to the NH&MRC for project grant support in 1985. Following rigorous peer review, with reports from outside assessors and interviews in each State, strong recommendations were made that more than 450 of these projects deserved funding. Unfortunately, despite extensive pruning of budgets, money was available to fund fewer than 300 of these highly rated projects. This is very disappointing to everyone involved in the NH&MRC system, and of course is very discouraging to those who were unsuccessful in obtaining a grant."

"It is crucial for medical graduates and medical researchers to convince politicians and the community of the benefits of medical research, the significance of our past achievements, the priority of our current research aims, and how we will be left further behind the rest of the world if adequate funds do not become available. To do this, it is important that we work hard at making our aims and achievements more intelligible and more immediately relevant to the decision-makers in government."

Howard E Williams Prize

The Howard E Williams Prize, honouring an outstanding paediatric clinician, will be awarded annually to the final year student with the highest marks in paediatrics in the fifth and sixth years in Medicine. The prize will comprise income from contributions, held in trust, from colleagues of Dr Howard Williams.

Dr Williams is an outstanding paediatric clinician, teacher and researcher. He graduated from the University of Melbourne and did his paediatric training at the Royal Children's Hospital. After his war service with the Royal Australian Air Force, he was awarded a Nuffield Scholarship and had further paediatric training in Britain.

He was the first physician to be appointed to the full-time staff of the Royal Children's Hospital and established its clinical research in about 1949. From then he made an outstanding contribution to the Hospital until his formal retirement in 1975. He is generally regarded as the best paediatric clinician to have worked in Australia in the post-war period. Seven paediatricians who trained with him have been appointed to Chairs of Paediatrics or Child Health in Australia, New Zealand and the United Kingdom.

Appointment of Professor/Director of Child and Family Psychiatry at the Royal Children's Hospital

Professor Robert Adler, or Bob as he prefers to be known, was born in Budapest, Hungary in 1945. His family migrated to Australia in 1950 and he was educated at Sydney Boys' High School and Sydney University. His career in psychiatry had an inauspicious beginning when he graduated with honours, receiving the prize for clinical surgery and short-listing psychiatry amongst other specialties that he would not pursue. This somewhat rash decision was revised during his residency at the Royal Prince Alfred Hospital, where he had taken up a position as a medical registrar. In 1972, he began his training as a psychiatrist at that hospital, and in the same year became a member of the Royal Australasian College of Physicians. Membership of the Royal Australian and New Zealand College of Psychiatrists and a move to the Royal Alexandra Hospital for Children followed in 1975. There, he trained in child psychiatry under the supervision of Associate Professor Julian Katz, the first full-time academic appointee in Child Psychiatry in the British Commonwealth. Having completed his child psychiatry training, he took up a post as staff psychiatrist at the Royal Alexandra Hospital for Children for a period of three years.

Following the opening of the Newcastle University Medical School in 1976, he accepted a position as Senior Lecturer in Child Psychiatry in 1980. Over the next four and a half years he was actively involved in developing the child psychiatry component of that curriculum and also in the postgraduate training of general psychiatrists and child psychiatrists. His long standing interest in child abuse continued through his involvement in the local child abuse programme. During that period he also carried out research on mothers and babies, in the hope of identifying those women who may have subsequent problems in handling their babies. The long term aim of this project is the establishment of preventative programmes for at-risk parents.

The move to Melbourne represents a major change and involves substantial acclimatization, both physical and metaphysical, the current Melbourne summer coming as something of a shock to an expatriate New South Welshman. In due course, he will be accompanied by his wife and two sons.

He sees his appointment as Professor/Director of Child and Family Psychiatry at the Royal Children's Hospital as a most exciting challenge. He hopes to stimulate and encourage the development of academic child psychiatry within the University and aims to continue the excellent tradition of service and postgraduate training in child psychiatry which have been characteristics of the Royal Children's Hospital Department. One of his goals is to try to use some of the skills gained in Newcastle, with its emphasis on integration, collaboration and student initiated learning, in a more traditional medical school. He feels that the multi-disciplinary origins of child psychiatry provide an important model for students in working with their allied health professionals. A multi-disciplinary approach to health care is increasingly being recognized as the most appropriate to the challenges of modern medicine.

His non-medical interests include poor bridge playing, worse skiing and a somewhat slothful attitude towards getting fit. While enjoying both good wine and good music, he lays no claim to being an expert on either.
Professor Clark wins BHP Excellence Award

The Chairman of the Department of Otolaryngology, Professor Graeme Clark, last year won the BHP Award for the Pursuit of Excellence in Science and Technology for his development of the bionic ear or cochlear implant. Professor Clark was one of six recipients of the BHP Awards, judged from a field of more than three thousand entrants in six different categories. Each of the finalists received a cheque of $40,000 and a trophy.

About ten thousand Australians suffer severe to profound deafness which cannot be adequately treated with conventional hearing aids. The idea of the cochlear implant is to directly stimulate the nerves of hearing inside the inner ear or cochlea, with minute electric currents. A multi-channel implant has several stimulation sites within the cochlea to allow more information to be presented than is possible with a single electrode.

Professor Clark was appointed Professor of Otolaryngology at the University, based at the Royal Victorian Eye and Ear Hospital, in 1970. His fund-raising for research in cochlear implants received a great boost in 1973 when the Channel O Nerve Deafness Fund was established and two telethons raised about $100,000.

By 1978 the implant was ready, the surgery had been rehearsed and the enormous logistic task of organizing histories, anaesthetics, operating theatres and standby equipment had been completed. After the surgery came the anxious months of testing, further development and experimentation to develop the best way to stimulate the implant to provide the best sounds, before tests with speech could begin. Much is owed to the first three patients, without whom the research would have been impossible.

The Federal Government made more than $4 million available for a Public Interest Project for further development of the “Melbourne Cochlear Implant”. The Australian company, Nucleus Limited, won the right to do the development and with the Department of Otolaryngology as the chief sub-contractor, the first Nucleus Multi-Channel Implantable Hearing Prosthesis was implanted by Professor Clark’s team in 1982. The device has now been implanted in more than thirty people around the world and the numbers are growing rapidly, making Australia a world leader in the treatment of a disease for which, only a decade ago, there was no treatment.

University’s First Professor of Cancer Medicine Appointed

One of Australia’s most distinguished cancer specialists and research workers, Dr Brian Hillcoat, has been appointed Professor and Director of the University’s Department of Cancer Medicine at the Cancer Institute-Peter MacCallum Hospital.

The new Department — the first Department of Cancer Medicine in a Victorian University — will provide teaching for the University’s undergraduate and postgraduate medical students at the Peter MacCallum Hospital. It will also provide a specialist cancer service and basic laboratory research activities at the Cancer Institute.

Professor Hillcoat was previously Consultant Medical Oncologist at the Cancer Institute-Peter MacCallum Hospital and Head of the Institute’s Experimental Chemotherapy Unit.

A medical graduate from Queensland University, Professor Hillcoat has a Doctorate of Philosophy in Biochemistry and the higher degree of Doctor of Medicine. From 1965 to 1957, he was Postdoctoral Fellow in Pharmacology at Yale University, and from 1967 to 1978, he held a number of professional appointments in the United States and Canada. He was also a designated Cancer Expert with America’s prestigious National Cancer Institute in Washington.

Retirement of James Boyer Brown

From the Minute of Appreciation, University of Melbourne Academic Board, November 1984.

Professor James Brown who was appointed to a Personal Chair in Obstetrics and Gynaecology in 1972 was born in New Zealand on 7 October 1919 and graduated B Sc in 1940 and M Sc in 1941. He then joined the Department of Pathology at the Auckland Hospital and was promoted to the post of Chief Clinical Biochemist within four years of commencing work there. During the nine years in which he worked at the Auckland Hospital he was actively involved in important developments with the application of biochemical methods to medical problems. An interest in endocrinology commenced at that time but became all consuming following his appointment as Research Biochemist in the Clinical Endocrinology Research Unit (Medical Research Council), University of Edinburgh in 1952. In 1962 he was awarded the Ph D degree in the Faculty of Medicine of the University of Edinburgh for his thesis which was entitled “The Chemical Estimation of Oestrogens in Urine”. Since that time, through his studies in the Department of Obstetrics and Gynaecology of this University, he has developed techniques of measurement of a variety of hormones in such a way that quick answers could be obtained in addressing important clinical problems. As a result, the hormone assays that he has developed have revolutionized not only the treatment of disorders of ovulation but also our understanding of the normal menstrual cycle in the human female.

In addition to pioneering work in the field of infertility, he also developed hormone analyses which have made possible the assessment of the hormonal status of the fetus in utero, thereby contributing significantly to the improved perinatal survival figures of the 1960s and early 1970s.

Stop Press

Professor Richard Mark Fox, formerly Professor of Cancer Medicine at the University of Sydney has taken up his appointment as Director of Haematology, Royal Melbourne Hospital and Professorial Associate (with the title of Professor) in the University’s Department of Medicine at the Hospital.
Professor V M Trikojus

Professor V M Trikojus died on Sunday 27 January 1985. This obituary was written by Professor F J R Hird, Department of Biochemistry, University of Melbourne.

Born in Sydney in 1902, Professor Victor Martin Trikojus was educated in Science in the University of Sydney. As an 1851 Scholar, he completed his D Phil at Oxford. After a further year at Munich, he returned to Sydney to become a Lecturer in Organic Chemistry and later a Lecturer in Medical Organic Chemistry. His research interests were in the organic chemistry of natural products and with insight he chose to tread the intimidating path leading into biochemistry. A period of sabbatical leave in Freiburg established him in the field of the biochemistry of the thyroid gland. This was to remain his major scientific interest. During the war he became Chairman of the Drugs Sub-committee of the Australian Association of Scientific Workers. This was a voluntary group which offered its services to the Government during the war. His contribution to the war effort was multiple and substantial and was performed day and night in his laboratory in the Medical School at the University of Sydney. He was awarded the OBE in 1943, he accepted the Chair of Biochemistry in the University of Melbourne. He was appointed Professor of an inadequate department poorly equipped to do anything but emerge. A combination of University goodwill and a vigorous display of initiative led him to the establishment and expansion of a department very active in research. He made sure that no able person was ever without the means to do modern research work. When opportunities arose for expansion, he either made or took them. He was more important than any other person in leading Australia into modern biochemistry and his department was a source of staff for the developing departments of biochemistry in our country.

Professor Trikojus was a man able to develop many different enterprises at the same time. He played very active roles in major Government and University committees; making substantial contributions. It could also be said that, with some assistance from architects, he planned and designed the present Russell Grimpwade School of Biochemistry. It is his major monument. For his services to the country and to the University he was created CBE in 1971. As a person, he was more private than public and his quick intelligence, when coupled with an authoritative personality and unpredictability, made him a formidable man to deal with. It could not be said that he was a man of consensus. We in the department were never short of leadership. Coupled with his strengths was an alleviating character of gallantry and proper professional behaviour. For the good of the institution, he could work with people who were otherwise his rivals. Protocol was a grace for him. Overseas visitors were always introduced to the staff and he and his family generously and frequently entertained them and colleagues. There was no sounder man to turn to if one was in difficulty. His advice and actions were of innumerable personal value. In his later years of office, he opened more of his mind to his friends and transferred many rich anecdotes and humorous quips. I can remember with great pleasure some hilarious dinner parties. There are many anecdotes about this man; all are descriptive of this temporarily variable and rich personality. He always left a mark; a man to be respected for his continuing contribution to the welfare of the University of Melbourne.
1985 Continuing Medical Education

The Faculty also offers continuing education training programmes in Anatomy for Surgeons (in conjunction with the Royal Australasian College of Surgeons), Diagnostic Radiology, and Industrial Screening Audiology. Throughout the year further information will be available on each course: details of venue, programme, fee, etc. and registration forms. For information contact the Faculty of Medicine Office for Continuing Medical Education, University of Melbourne, Parkville, Vic. 3052. Tel. (03) 341 5889.

February
— 22-23 (Friday-Saturday)
Psychiatry for Non-Psychiatrists
Course Director: Professor Graham D Burrows
Venue: John Lindell Lecture Theatre, Austin Hospital

April
— 19-20 (Friday-Saturday)
Recent Advances in Diabetes
Course Directors: Professor R G Larkins and Dr A J Nankervis
Venue: Lecture Theatre N10, Royal Melbourne Hospital
— 26 (Friday)
Recent Advances in Geriatric Medicine
Course Director: Professor D M Prinsley
Venue: Lecture Theatre N10, Royal Melbourne Hospital

May
— 24 (Friday)
Anorexia and Obesity
Course Director: Dr J Tiller
Venue: Hercus Lecture Theatre, University of Melbourne

July
— 19-20 (Friday-Saturday)
Update on Medicine for Physicians and General Practitioners
Course Directors: Professor P Kincaid-Smith with G J Becker and S M Davis
Venue: Lecture Theatre N10, Royal Melbourne Hospital

August
— 27-31 (Wednesday-Saturday)
Cochlear Implant Symposium and Workshop
Course Director: Professor Graeme Clark
Venue: Medical Centre and Ormond College, University of Melbourne

September
— 20-21 (Friday-Saturday)
Paediatrics for the General Practitioner
Course Director: Dr M J Robinson
Venue: Royal Children’s Hospital

October
— 25-26 (Friday-Saturday)
Infusion Anaesthesia and Analgesia
Course Director: Dr D P Crankshaw
Venue: Yvonne Bowden Auditorium, Royal Women's Hospital

November
— 1-2 (Friday-Saturday)
Radiography for General Practitioners
Course Director: Professor W S C Hare
Venue: Lecture Theatre N10, Royal Melbourne Hospital

1985 Dean's Lecture Series

Tuesdays at 5.30 pm, Theatre 1, Medical Centre Building.
The Dean’s Lecture Series is designed to illustrate current research activities in the Faculty of Medicine. All medical students, medical graduates and interested biological scientists are invited to attend.

Term 1
— 2 April
Mr Peter Jones, Surgeon, Royal Children’s Hospital
In Search of a Sixteenth Century Physician: A Paper Chase
This will be followed at 6.45 pm by the 1985 Annual General Meeting of the University of Melbourne Medical Society

— 9 April
Easter Tuesday — no lecture

— 16 April
Dr Frederick Mendelsohn, Reader, Department of Medicine, Austin Hospital
Cell Surface Receptors: From Concept to Visualisation

— 23 April
51st Beattie-Smith Lecture
Professor George Singer, Foundation Professor of Psychology, La Trobe University
Alcohol and Drug Abuse

— 30 April
Dr Geoffrey Tregear, Principal Research Fellow, The Howard Florey Institute of Experimental Physiology and Medicine
New Developments in the Synthesis of Peptide Hormones

— 7 May
Professor Trevor Morgan, Department of Physiology, University of Melbourne
Why Does Salt Cause High Blood Pressure?

Term 2
— 2 July
Professor Brian Hilcoat, Professor/Director, Department of Cancer Medicine, Cancer Institute
Recent Trends in the Drug Treatment of Cancer

— 9 July
Professor Robert Adler, Professor-Director, Department of Child and Family Psychiatry, Royal Children’s Hospital
Children's Protection: Whose Responsibility?

— 16 July
Professor Ken Hardy, Department of Surgery, Austin Hospital
Development of Gastrointestinal Hormone Systems

— 23 July
Dr Graham Mitchell, Head, Immunoparasitology Unit, The Walter and Eliza Hall Institute of Medical Research
Towards Parasite Vaccines

— 30 July
1985 Mathison Lecture
Professor David Danks, Director, Murdoch Institute for Research into Birth Defects, Royal Children’s Hospital
Double Helix Unravelled: Double Joy or Double Trouble?