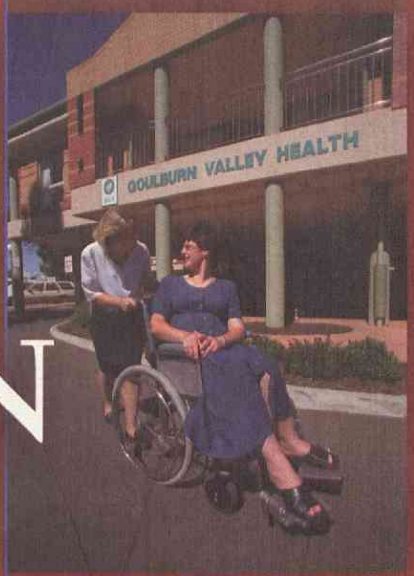

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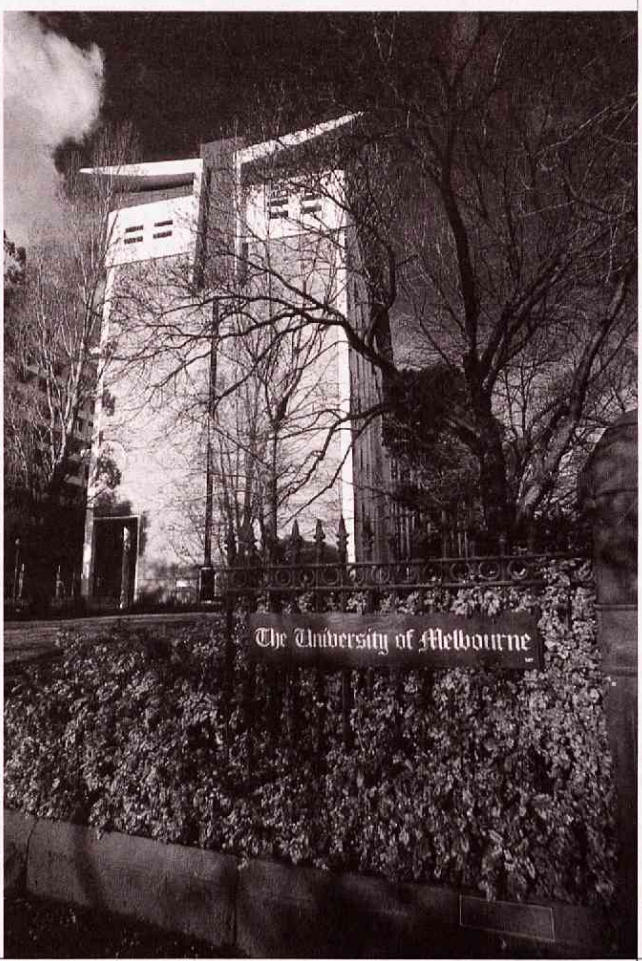

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CHIRON

CHIRON THE CENTAUR, TEACHER OF MUSIC, MEDICINE AND HUNTING

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Contents

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EDITORIAL

SOMETHING'S STIRRING IN THE VICTORIAN BUSH

Professor David Simmons, Foundation Chair in Rural Health,
Department of Rural Health, University of Melbourne, Shepparton

David Simmons

SHEPPARTON, A MEDIUM SIZED TOWN in Northern Victoria is the setting for the University's newly established Department: the Department of Rural Health. The town and the surrounding area provide examples of why rural health has become a major issue. The area generates over $1.4 billion of predominantly agricultural and food products. It is dynamic, innovative, self-sufficient and well populated, with about 100 000 living in the Goulburn Valley and another 140 000 in surrounding areas. The people are hospitable, generous and independent. The area hosts many national and international arts, tourism, sporting and industrial events.

A city of 240 000 would normally have all the major health services required easily at hand. However, when compared with metropolitan Victoria, the Goulburn Valley has about half the GPs and specialists. There are difficulties in accessing investigations, treatment and ongoing care in many sectors. It has a higher than average proportion of elderly, Koorie and people of non-English speaking origin and is the nineteenth most socially disadvantaged city out of 622 Victorian communities. Health outcomes in the area have not been widely quantified, although nationally, rural Australia has worse outcomes than metropolitan Australia; Koorie still have much poorer health outcomes than non-Koorie.

In 1996, the Commonwealth funded the establishment of a University Department of Rural Health in each state. This was a bold move: essentially, an injection of venture capital to provide intellectual and social capital to areas with major health needs. Shepparton was chosen as one such area. Funding was provided for operations and a major building program on a site next to the hospital. The State Government and the University of Melbourne have also contributed to the purpose-built construction including a 120 seat lecture theatre, offices for thirty academics, a physiology research room, conference facilities for sixty, and other tutorial and multimedia rooms. It is hoped that accommodation for over ninety people will be built adjacent to the academic block.

The University of Melbourne Department of Rural Health began its activities in February 1999 with the appointment of the Foundation Chair. Since this time, nineteen further staff, two PhD students and an Honours student have joined (although a vacancy still exists for a rural physician). Included are an evaluation team (sociology, economics, epidemiology), a Koorie team, academic general practitioners supported through the Department of General Practice and Public Health, academic nurses supported by Goulburn Valley Health, academic specialists (e.g. Obstetrics and Gynaecology), a clinical trials research unit and a health informatics and health promotion program. A number of local health staff have become honorary members of the Department.

The Department already has forty-five research projects underway covering health care interventions, audit, epidemiology, Koorie Health, clinical trials, workforce, rural issues and educational research. A household survey of health needs and undiagnosed disease commenced in May. The Department is involved in generating a long term response to the health workforce shortages through guiding rural school leavers (and others) into health jobs, enticing undergraduate students into the bush through new approaches to rural education (including the development of a new six week rural health module for fifth year medical students, a new nursing course and placements in the smaller rural towns), committing postgraduate health workers to rural practice (e.g. through regionalised GP and specialist training) and retaining rural practitioners through generating variety, interest and support (e.g. through research projects and upskilling programs).

The Department has a multi-disciplinary approach and has already had pharmacy, dental, medical, social work and other students visiting its temporary premises. It has become clear that the volumes of clinical, research and other students could grow rapidly over the next three to five years. One of the solutions to the limited resource and capacity in rural areas identified by the Department is a more intersectoral approach. To this end, the Department, the Institute of Land and Food Resources and the Faculty of Education are working together with others to generate a 'University Town' as a rural campus for the University of Melbourne. These three sectors are also working together on a combined approach to information and communications technology.

A similar approach to addressing capacity is underway within the health sector through close collaboration with local health care agencies. This includes a number of 'integrated care' projects. Such projects require the collection of quality information to help direct effort to areas where services can be enhanced. As different parts of the surrounding health care system embrace the approach, the environment for research and teaching will become even more stimulating.

Finally, the Department is privileged to be able to work with many of the local Koorie agencies with whom they have formed a partnership committee and begun to identify community priorities for research, service and education. Projects are now forming around these topics. The Rumbalara Football and Netball Club has worked with the Department from an early stage with its Healthy Lifestyles program. It is hoped that the information gained through the joint work will help develop further ways to improve the health of the local Koorie community.

After just fifteen months, the area is booming, the willingness of people to work together is growing, the grants and papers are accumulating and we have a superb team who are committed to promoting the benefits of rural health and finding solutions to the longstanding problems which are now increasingly soluble. Perhaps you would wish to join us?

COVER PHOTOGRAPHS

Front Top Left: Ursula Russell, general practitioner in Shepparton and Senior Lecturer, University Department of Rural Health, with a GoulburnValley farmer.

Front Top Right: Carole Maddison, Resident Nurse and Research Fellow in the University Department of Rural Health, with a patient at Goulburn Valley Health.

Front Bottom: The Health Service at Rumbalara Aboriginal Co-operative.

Back: Ursula Russell with a Goulburn Valley farmer and his daughters.

Photography by Michael Silver.

SEMINAR

30 JULY 1999

DEBATES IN HUMAN GENETICS
THE BRAVE NEW WORLD OF GENETIC TESTING

Convener

Professor Richard Smallwood
Professor of Medicine, Austin and Repatriation Medical Centre
The University of Melbourne

SHOULD EVERYONE BE TESTED FOR HAEMOCHROMATOSIS?

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Department of Gastroenterology
St Vincent's Hospital

Mrs Margaret Stone
Patient

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Medical Geneticist,
Victorian Clinical Genetics Service,
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Professor Lawrie Powell
Director,
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HEREDITARY DEMENTIAS: SHOULD TESTING BE ENCOURAGED? SHOULD TESTING OF CHILDREN BE ALLOWED?

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Professor Geoffrey Donnan
Director of Neurosciences,
The University of Melbourne,
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Ms Catherine Grasso
Patient

The Argument For

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Royal Children's Hospital and
Centre for the Study of Health and Society,
The University of Melbourne

The Argument Against

Associate Professor Loane Skene
Director of Studies,
Health and Medical Law,
Faculty of Law,
The University of Melbourne

Discussion

DEBATES IN HUMAN GENETICS
THE BRAVE NEW WORLD OF GENETIC TESTING

INTRODUCTION

Richard Smallwood


Richard Smallwood

AS MORE AND MORE genes are discovered, our ability to test for genetic disorders is rapidly increasing. But how should we use these tests?

Haemochromatosis is a common and serious disorder of iron metabolism affecting one in three hundred of the Australian population. The potentially fatal effects of this condition can be prevented if discovered early enough. Why don't we test everyone?

In contrast, the hereditary dementias, a group of conditions which develop relatively late in life, have no known treatment. To what extent should genetic testing be offered affected families? Should we encourage the testing of children?

These questions are debated here, not just by experts, but also by members of the families involved, who can give first-hand accounts of how genetic testing has affected their lives.

SHOULD EVERYONE BE TESTED FOR HAEMOCHROMATOSIS?

Setting the Scene

Katrina Watson


Katrina Watson

HAEMOCHROMATOSIS IN A nutshell, is an inherited disorder of excessive iron absorption, one of the most common genetic disorders in Australia, which affects about one in three hundred individuals. A significant number of these people are unaware that they have the disease.

HOW COMMON?

Haemochromatosis is an autosomal recessive disorder. The gene frequency in our population is approximately twelve per cent, and the frequency of homozygotes is 1 in 300. Thus, about 2.1 million Australians have one copy of the abnormal gene, and 64 000 have two. It should be noted that the haemochromatosis genetic mutation is extremely rare in some populations, for example, African, Asian and indigenous Australasian populations.

GENETICS

The gene for haemochromatosis, the HFE gene, was discovered in 1996. The most common mutation is a C282Y mutation (a cystine to tyrosine). Between sixty to ninety per cent of haemochromatotics (close to ninety per cent in Australia) are homozygous for this mutation. A less common mutation is the H63D (histidine to aspartate) mutation. Ten per cent of haemochromatotics have compound heterozygosity (i.e. one C282Y mutation and one H63D mutation). Rarely, a person with haemochromatosis may have no mutation of the HFE gene; and thus in this situation there must be another mutation involved.

HETEROZYGOTES

Heterozygotes (i.e. those with one copy of the C282Y mutation) may develop increased iron parameters, but do not develop iron storage disease. However, the iron can act as a co-factor to worsen other liver diseases e.g. those due to hepatitis B, hepatitis C, alcohol, or non-alcoholic steatohepatitis.

PATHOGENESIS–HYPOTHESIS

The current hypothesis for the pathogenesis of haemochromatosis derives from the fact that the HFE protein is present in the cells of the crypts of the small bowel, closely associated with the transferrin receptor. A mutant protein in this location may thus send an aberrant signal to the receptor regarding body iron stores, and paradoxically increase iron absorption, although body iron stores are normal or even increased.

CLINICAL CONSEQUENCES

Many people with haemochromatosis may have no symptoms, however tiredness is extremely common. Sometimes the fatigue can be overwhelming. Other serious consequences include cirrhosis, with subsequent development of liver cancer in thirty per cent of males with cirrhosis; arthralgia and arthritis; gonadal failure; diabetes; cardiac failure and arhythmias; and skin pigmentation.

DIAGNOSIS

The most sensitive test for increased body iron stores is the transferrin saturation blood test, which is more than ninety per cent sensitive for haemochromatosis. Serum ferritin can also be measured, but is less sensitive and less specific. The diagnosis can then be confirmed by detection of homozygosity for the mutant HFE gene. Automated testing is now available for this gene. Because the HFE gene test is an accurate way of confirming the diagnosis, liver biopsy is now needed only if blood tests or examination suggest the presence of cirrhosis.

WHO TO TEST?

Relatives of an index case with haemochromatosis should be tested both with serum iron parameters (transferrin saturation and ferritin) and the HFE gene test. People with symptoms or conditions suggestive of haemochromatosis (e.g. tiredness, liver disease, diabetes, arthralgia, heart failure, testicular failure) should be tested with iron parameters initially, and then the HFE gene test if the iron studies are abnormal. A controversial issue is whether or not the general population should be screened for haemochromatosis, and if so at what age and with which test?

WHAT IS THE PHENOTYPIC EXPRESSION?

A decision regarding population screening for haemochromatosis will be influenced considerably by the degree of clinical penetrance of the haemochromatosis genetic mutation. The exact phenotypic expression is currently

unknown, however the range appears to be between thirty to seventy per cent, and probably around fifty per cent in the Australian population i.e. fifty per cent of homozygotes will develop iron overload during their lifetime. Expression in females may occur later than in males, because of physiological blood loss in women. Co-factors e.g. alcohol intake, are important in determining development of liver disease.

TREATMENT

The treatment of haemochromatosis is simple i.e. lifelong venesection therapy to reduce iron stores. Venesections are typically performed weekly, until iron stores are in the low normal range, and then usually a maintenance program of three monthly venesections is instituted. People with haemochromatosis should also be advised to moderate their red meat intake to approximately 100g per day. They should avoid vitamin C supplements (which increase iron absorption), and iron supplements (of course!). Alcohol intake should be minimised to less than 20g per day.

PROGNOSIS

If a person with haemochromatosis is detected before the onset of cirrhosis, their life expectancy with treatment is *normal*. On the other hand if an individual is only detected after cirrhosis has ensued, life expectancy is shortened. Venesection will not reverse hepatic fibrosis. The development of hepatocellular carcinoma is a significant risk, occurring in thirty per cent of males with cirrhosis due to haemochromatosis. Thus, it is *crucial* to diagnose haemochromatosis before cirrhosis occurs. Other problems such as arthritis or diabetes may or may not improve with venesection. Fortunately, significant tiredness usually does improve with venesection, unless there is major end organ damage.

RESEARCH PRIORITIES

The USA Centres for Disease Control held a high level workshop on haemochromatosis in 1998. Areas for research were prioritised as follows.

1. The clinical penetrance of the gene needs to be characterised more accurately.
2. An optimal approach to screening needs to be developed.
3. The cost-effectiveness of screening needs to be assessed.
4. The ethical, legal and social implications of screening must be addressed.

I would like to add to this a further priority, which is to improve both community and professional awareness and education about haemochromatosis so that the large number of undiagnosed affected individuals in Australia have the opportunity to be tested and treated. The Australian Gastroenterology Institute has launched new guidelines on haemochromatosis, with information documents for both public and health professionals available. They can be obtained from the Australian Gastroenterology Institute, 145 Macquarie Street, Sydney 2000, Telephone (+61 2) 9256 5455, Fax (+61 2) 9241 4586, Website http://gesa.org.au/.

Margaret Stone

Margaret Stone

ABOUT SIX YEARS AGO, aged forty-nine, I was diagnosed with haemochromatosis.

For ten years before my diagnosis I was plagued by various aches and pains in the joints; I always seemed to be hurting somewhere but the pain moved around and was vague and hard to pinpoint. I went to chiropractors and physiotherapists and did all the exercises they prescribed but nothing helped.

Life seemed to be a continuous struggle, as though I was living under a heavy black cloud. I kept running out of steam. Why? I looked around for answers ... I was teaching full-time, on school council, had two teenagers. Maybe anyone in my position would feel the same? It didn't make sense. I enjoyed my work, my kids were doing okay, I had a good marriage, a comfortable home. Why did I feel so terrible? I worked hard to fulfil all my commitments and maintain a bright and cheerful facade, but at a price.

There came a time when I would cry for absolutely no reason–fortunately only at home. I was mortified. Why did I feel this way? I am not a depressive person and I felt ashamed that I seemed to be falling apart. Eventually I went to the doctor. He questioned me about my marriage. I said it was fine (through tears) and he wrote a prescription for Serapax as if it were quite normal. Join the other suburban neurotics! The tablets did actually help. I drifted into sleep: glorious sleep that I wanted to last for ever. I thought if I could just sleep long enough I'd wake up and everything would be all right. But of course, it doesn't work like that.

I tried everything I could think of to make myself better: acupuncture, Chinese medicine. I remember the doctor looking at me questioningly, 'Why you angry?' His suction cups to remove my 'anger' just bruised me all over. I went to a naturopath who put me on a cleansing diet with lots of Vitamin C. (Oh dear! I didn't know then that Vitamin C was an iron enhancer.)

Perhaps mental stimulation was what I needed. I completed a University course; two nights a week for two years. I passed the course but it failed to help.

Finally I decided long service leave would be the answer: drive around Australia; recapture the old days; freedom; sleep under the stars. I could hardly climb into the Land Rover, let alone put up a tent! It was motels all the way and still the holiday was like an endurance trial. Eating out in those little outback towns meant a steak every night in the local hotel. Somehow I just didn't feel any better. With the benefit of hindsight I guess it's no wonder!

I didn't go to my GP often, fearing I'd be thought a hypochondriac. Once I'd complained of feeling tired only to be told he did too! I had been tested twice for rheumatoid arthritis when I'd complained about my hands, but with negative results. So I had no expectation of anything except a patronising, 'Nothing wrong with you, dear' when I was sent to see a rheumatologist. I didn't even bother to ring for the results of blood tests, so imagine my surprise when the good doctor rang me at home and mentioned haemochromatosis. 'Haemo-what?'

I wasn't the only one who had never heard of it and there seemed to be such a dearth of information. Fortunately I was put on to the Haemochromatosis Society in Queensland which was a real lifeline for me, but it still took quite a long time for the information to sink in.

Tissue typing revealed that my only sister also has haemochromatosis. She was declared 'asymptomatic' but that's questionable. Our mother lives in England and was not interested in being tested. Her response was that we must have got it from our father!

Before the gene test was developed a liver biopsy was a pre-requisite for confirming the diagnosis. In the hospital I met a man who was waiting for a liver transplant. Seeing him was an eye opener to me–I'd never given a moment's thought to what a liver should do before! I quickly gained new respect for livers.

Now I knew what was wrong with me, that it wasn't all in my head, and that getting rid of the excess stored iron through venesection was the answer. I was so optimistic and impatient: I truly expected to feel better as soon as the blood started flowing. I didn't really grasp the full implications or realise how exhausted I was.

I decided to go part-time at work, have Fridays off for the venesection and the weekends to recover. I lasted one term before I had to give teaching away altogether. Excuse the pun, but it is a very draining experience to have weekly venesections and try to carry on as normal. I think I spent more time asleep than awake for the next eighteen months. Thank goodness I had

an understanding husband and caring family and friends. Not everyone is so lucky.

I had weekly venesections for close on two years, then fortnightly for a while and now every two to three months. It helps if you have good veins (which mine are not) but most of all it helps to have a skilful operator wielding that needle. I found it comforting to keep a record of my serum ferritin results. A little reassurance also went a long way when my SF seemed to be staying put in the 4000 range for weeks at a time. When the readings started to fall it was like a light at the end of the tunnel.

How much better it would have been if I'd known about and dealt with haemochromatosis early on rather than be ignorant for years and suffer the consequences. I spent about ten years, slowly rusting away, struggling with the unknown which slowly but surely was taking over my life, followed by an intensive venesection program with all that entailed, including the loss of my job.

I am one of the very lucky ones. Although I still haven't the stamina I'd like and I have the continuing legacy of osteoarthritis (including a hip replacement), I have no organ damage. What about the others, diagnosed too late, with heart problems, impotence, diabetes, cirrhosis and cancer?

There is a real need for a much greater awareness of haemochromatosis in medical and quasi-medical circles. It is horrifying that there is so much ignorance out there. Every GP should be made aware of information regarding iron studies. It is not just a haemoglobin test. Tiredness does not necessarily mean you are anaemic and need iron as so many people are told. Depression does not necessarily mean you are neurotic. Everyone knows about the need for iron thanks to the Meat Board advertisements. When is there going to be widespread information warning people of the dangers of *too much* iron?

So many people are out there suffering needlessly, through no fault of their own, when a simple blood test early in the piece could resolve many major medical problems before they even arise. Haemochromatosis only becomes life-threatening if you don't know you have it and the iron is allowed to accumulate and do its damage.

The Argument For

Katie Allen

Katie Allen

TRADITIONALLY, DISEASE DIAGNOSIS and management are initiated by the presentation of a patient with symptoms. A number of technologies now allow medical practitioners to identify an individual's propensity to a wide range of diseases and to act to prevent their onset. This shift in care from treatment to prevention embraces a whole range of predictive tests including biochemical, haematological, radiological and more recently, genetic tests. The combination of these newly available tests, the wider acceptance of public health screening programs and the imminent culmination of the Human Genome Project sets the scene for consideration of population-based genetic screening. Population-based genetic screening for haemochromatosis is an excellent example of a test that offers pre-symptomatic genetic identification of a common, preventable and treatable adult-onset disease.

Two essential issues need to be addressed before population-based screening should be accepted as an appropriate public health measure. The first is the *principle* of why we should test everyone for haemochromatosis. The test must be medically appropriate and ethically sound. The second issue is *practical*: if we should test everyone, then how and when should we test. The test must be easy to implement and financially cost-effective.

WHY SHOULD WE SCREEN EVERYONE?

To address the first issue we need to consider the perspective of both the affected individual and that of the public. Advantages for the affected individual are clear. Haemochromatosis is preventable and prevention through regular venesection is simple, effective and well tolerated. Conversely, if unidentified and therefore left untreated, disease progression can result in serious morbidity or mortality. Since disease manifestation can be protean, haemochromatosis may remain undiagnosed for a number of years. The conditions that may result from untreated haemochromatosis include liver disease, diabetes, cardiomyopathy, arthritis, infertility and chronic fatigue.

Presymptomatic diagnosis of individuals with the propensity to develop haemochromatosis can be of public benefit in three major ways. The incidence of haemochromatosis is estimated to affect one in three hundred individuals of Northern European descent. Prevention is thus highly likely to be an effective use of the public health dollar. Prevention of disease progression in affected individuals through regular venesection will result in a socially useful by-product by individuals with the genetic mutation for haemochromatosis once the routine screening procedures have been undertaken. Finally, since haemochromatosis is a low-profile disease, it has not been inappropriately stigmatised and therefore information about both haemochromatosis and the meaning of genetic propensity to develop disease can be disseminated easily and effectively. Furthermore, debate about medico-legal issues and the social ramifications for affected individuals can take place in a relatively non-emotive environment. Since the conclusion of the Human Genome Project will result in an exponential increase in genetic-based tests, it is important that a non-stigmatised and preventable disease such as haemochromatosis be used to clarify important issues about potential genetic discrimination.

HOW SHOULD WE SCREEN?

If we are to screen the population for haemochromatosis we can either screen phenotypically using transferrin saturation, or genetically for the most common genetic mutation, C282Y.

Phenotype screening

There are two theoretical advantages of phenotype-based screening. The first is that 'phenotype screening only identifies individuals who express the disease'. However, research has not demonstrated the increased effectiveness of phenotype testing over genotype screening in the early phase of the disease. There are concerns by some experts that genetic testing will identify individuals who are homozygous for the genetic mutation but who will not go on to develop symptoms of haemochromatosis. Although this is true, the vast majority of homozygote individuals will express some form of the disease and since the preventive management is simple and effective it seems unfair to abandon a screening program that would benefit many just because a few may unnecessarily become blood donors. It is important to note that the same possibility of false positives is true of phenotype testing based on elevated transferrin saturation levels since not all individuals with elevated transferrin saturation levels will develop haemochromatosis. Most predictive tests in medicine can only give risk profiles– they can not predict exactly who will and who won't develop disease. It must be noted that phenotype testing is clearly superior to genotype testing for establishment of disease expression in an individual presenting to a medical practitioner with suspicious symptoms.

The second advantage is that phenotype testing is currently cheaper than genotype testing. This is unlikely to remain so since new microarray (or gene chip) technology is rapidly evolving and will enable economical automated genetic testing.

Genotype screening

There are several practical advantages of genotype screening over phenotype screening for haemochromatosis. Most importantly testing can be undertaken pre-symptomatically. Since preventive management is not onerous (becoming a regular blood donor) and is effective (major sequelae of haemochromatosis such as liver disease, cardiomyopathy and diabetes are completely preventable), it is

likely that affected individuals will happily accept a preventive program. From a pragmatic perspective it is simpler to administer a genetic test than a phenotype-based test since all that is required is a mouthwash.

Finally, if a population-based test is to be offered it is easier to give information in two steps. The first step is to identify high-risk individuals (C282Y homozygotes) who have the propensity to accumulate iron. Education and consent at this level of screening can be simple which makes it easier to administer universally. The second step is to target more specific information at homozygote individuals about ongoing monitoring and assessment of disease expression. This level of education requires far more detailed information but would be focused at the appropriate beneficiaries. In this way such testing is not dissimilar to cholesterol screening in that individuals with high cholesterol are identified as being at high risk for heart disease and are targeted for appropriate intervention.

AT WHAT AGE SHOULD PEOPLE BE SCREENED?

There are three age groups that could be targeted for pre-symptomatic genetic screening for haemochromatosis–neonates, adolescents and young adults (18-25yo). There are distinct issues for each of these. Although neonatal screening is logistically easy to implement because the test could be added to the already existing Guthrie test at five days of age, an unnecessarily long lead-time between testing and prevention management would be created. Adolescents are closer to the age at which preventive management would be recommended and the test could be explained during health education classes but this group cannot give their own informed consent and can be susceptible to inappropriate stigmatisation by school peers.

In contrast, not only are young adults at the ideal age to implement regular venesection and still likely to be pre-symptomatic but they can give informed consent. The one disadvantage for this age group is that they can be difficult to access since they are unlikely to come in contact with the medical profession. One possible solution would be to implement a driver's licence program. This would capture the vast majority of the target population as well as provide an opportunity to disseminate information about genetic testing and public health advice such as minimising alcohol intake–important not only for those with a propensity to haemochromatosis but also by reducing the incidence of drink-driving in young adults. A follow-up program to assess whether homozygote individuals are adhering to medical advice with regard to regular venesection could be triggered at licence renewal every five to ten years. Such a public health program would of course be completely voluntary.

In conclusion, population-based genetic screening has the potential to make haemochromatosis a very rare disease. Screening will enable issues regarding predictive genetic testing to be clarified in a positive and non-emotive environment. The benefits of implementing such a program would be reaped by generations to come.

The Argument Against

Lawrie W Powell

BACKGROUND

THE DIAGNOSIS of established haemochromatosis requires a high index of clinical suspicion and careful clinicopathological correlation i.e. the demonstration of excess stainable iron in parenchymal cells in the liver, elevated hepatic iron content and clinical history that excludes other causes of iron overload such as thalassaemia. A careful clinical history and appropriate laboratory investigations can identify most causes of secondary iron over-load.Increasingly, however, the diagnosis of hereditary haemochroma-tosis is made less on the basis of the classical clinical features and more on the identical finding of an elevated serum transferrin saturation and/or serum ferritin level. However, the diagnosis should be considered in any patient with unexplained hepatomegaly, abnormal skin pigmentation, cardiomyopathy, diabetes, arthritis or hypogonadism.

Lawrie Powell

Increased body iron stores with primarily parenchymal cell deposition of iron has been the hallmark of hereditary haemochromatosis for diagnostic and therapeutic purposes. This is clearly strengthened by a family history of the disease and evidence of the HFE genetic mutation when present.

INHERITANCE AND GENETICS

Haemochromatosis is a common inherited disorder of Caucasians in whom the incidence of expressed disease is 1 in 200-400 while in other ethnic populations prevalence of haemochromatosis is very low. Incidence is highest in those populations with a Celtic origin. The high prevalence in these populations makes it one of the most common autosomal recessive disease traits. This disease is due, in most cases, to a single major missense mutation (C282Y) in the *HFE* gene. A second mutation (H63D) in the *HFE* gene plays a secondary and comparatively minor role in iron overload.

POPULATION STUDIES

With between two to five individuals per 1000 showing biochemical expression of the disorder haemochromatosis is a very common disorder in Caucasian populations. The identification of *HFE* and the mutations responsible for haemochromatosis has led to population studies to determine the frequency of these mutations in various ethnic populations. In one large study Merryweather-Clarke et al[1] screened DNA samples from 2978 individuals from a variety of ethnic backgrounds for the C282Y and H63D mutations. The worldwide carrier frequencies from this study were 1.9 per cent for C282Y and 8.1 per cent for H63D, but in most populations of northern European extraction the frequency of homozygosity for C282Y was 0.5 per cent. The C282Y mutation was absent in African, Asian and indigenous Australian populations consistent with the theory of Celtic or Nordic origin for the mutation. A recent study by Cullen et al[2] looked at the frequency of the *HFE* mutations and the ancestry of chromosomes carrying these mutations in a number of non-Caucasian populations comprising Australian Aborigines, Chinese and Pacific Islanders. The chromosomal ancestry was determined by HLA haplotyping. All the Australian Aboriginal subjects with the C282Y or H63D mutation also had a Caucasian HLA haplotype consistent with the mutation being introduced by Caucasian admixture.

POPULATION SCREENING

Modern molecular medicine allows us to screen for genetic disorders more than ever before. However, the early diagnosis of diseases such as *HFE*-associated haemochromatosis clearly has implications at an individual, family and population level. Haemochromatosis fulfils the criteria established by the World Health Organization for population screening for a medical condition and many believe that general population screening should be adopted in those countries with a high frequency of the C282Y mutation in the *HFE* gene. The present debate on whether screening for *HFE*-associated haemochromatosis really centres on whether screening should be done by genotype or phenotype.

There is no clear winner at this time and opposing views are expressed in scientific papers. In a recent editorial, the authors conclude that genetic testing should not form the basis of the

routine evaluation for hereditary haemochromatosis let alone population screening. Further evidence needs to be obtained, especially as regards variable expression of the *HFE* genotype and the frequency of non-*HFE* associated haemochromatosis. However, there is established evidence to support the use of the genetic test in the diagnosis of subjects with iron overload, particularly in family screening. In the case of a subject with iron overload who is C282Y homozygous, most believe that screening of the family should be by genotype and not phenotype.

The success of any population screening program is reliant on an extremely low failure rate, otherwise public confidence in and hence use of, the program is diminished. It is obvious that there needs to be far greater public awareness and understanding of haemochromatosis for any screening program, be it by phenotype or genotype, to succeed. It is over a hundred years since the term haemochromatosis was coined, yet few, even in the medical profession, appear aware of its significance at the turn of this century. Our message is simple–there should be general population screening for *HFE*-associated haemochromatosis and we would advocate that this screening should be by phenotype at present but by genotype in the future. We believe that screening should be introduced in three stages.

Stage 1: The profile of haemochromatosis needs to be raised in the medical community as a whole and we would advocate the inclusion of iron indices in general health assessments, very much along the lines of lipid profiles.

Stage 2: Once the profile of haemochromatosis has been raised in the medical community and, importantly, the general public, universal screening by phenotype at age thirty years should be introduced. The success of uptake could be aided by employment and unemployment agencies.

Stage 3: Ultimately, the future lies with screening by genotype. The Human Genome Project is ahead of schedule but knowledge of an individual's complete genetic make-up will only be useful if we can correct the faults identified. Once these technical and ethical problems have been solved, then screening by genotype can be recommended.

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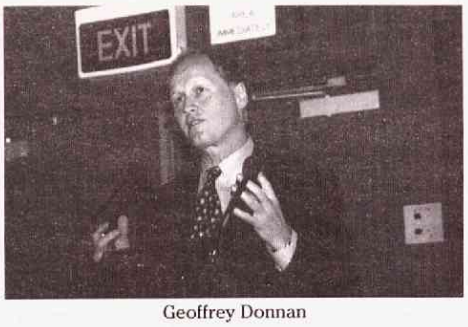
HEREDITARY DEMENTIAS: SHOULD TESTING BE ENCOURAGED? SHOULD TESTING OF CHILDREN BE ALLOWED?

Setting the Scene

Geoffrey A Donnan

IMPROVEMENTS IN MEDICAL care in recent decades have led to a gradual increase of community survival rates over the same period. Hence, for age sensitive conditions such as the dementias, there has been a parallel increase in incidence. The burden on the community in social and economic terms is, therefore, considerable.

Significant advances in clinical and genetic research have led to the identification of important familial subsets among the dementias. While these subsets are numerically less frequent than sporadic cases of dementia (for example, familial Alzheimer's disease forms less than ten per cent of all Alzheimer's disease cases), their identification has led to the development of genetic testing techniques which now form part of routine clinical management.



Geoffrey Donnan

There are numerous familial forms of dementia of which four deserve particular attention, either because of their prevalence or unique features. These are: familial Alzheimer's disease, Huntington's disease, Creutzfeldt-Jakob disease and the fronto-temporal dementias. These all share the common feature of having a mutation identified for a specific gene (or genes) which is responsible for the generation of a protein associated with the pathological and (ultimately) clinical features of the disease. The inheritance pattern is universally autosomal dominant with almost complete penetrance (with at least one exception for the latter). However, expressivity (timing and extent of clinical expression) is somewhat variable. I will describe the pertinent features of the four most common conditions.

Familial Alzheimer's disease is usually of onset at about forty to fifty years with, typically, cognitive decline involving memory and parietal lobe functions. The clinical course usually extends over seven to ten years post-diagnosis and gene mutations have been described on chromosomes 14,1 and 21. Gene mutations for Presenilin and APP have been identified with an autosomal dominant pattern of inheritance and near 100 per cent penetrance in described families but variable expressivity.

Huntington's disease is perhaps the best known familial dementia and the first to have the genetic chromosomal defect located. This is on chromosome 4 with production of the huntington protein, although its presence is of less certain significance. The clinical triad of progressive dementia, emotional disturbance and choreaform movements is well known with a mean course of about seventeen years after onset. The autosomal dominant pattern of inheritance with the almost 100 per cent penetrance and, again, variable expressivity enables the positive predictive value of genetic testing to approach unity.

Creutzfeldt-Jakob disease comes in a number of forms. They all have the common feature of the pathological change of spongioform encephalopathy. The responsible protein (Prion) has been shown to be transmissible in sporadic cases (corneal transplants and intra-cerebral electrodes) and recent attention has been drawn to the new variant 'mad cow disease'. The autosomal dominant familial form comprises less than ten per cent of all cases and presents with variable presentations of cognitive decline, cerebellar ataxia, visual, emotional disturbances and, later, myoclonic jerks. The onset is of variable age and duration of survival. The genetic defect is on chromosome 20 with mutation for the Prion (PrP) with near 100 per cent penetrance excepting for the variants of codon 200. This appears to have more variable penetrance and expressivity.

The frontal lobe dementias have been more recently described and consist of a heterogeneous group including fronto-temporal dementia with Parkinsonism on chromosome 17 (FTDP-17), Pick's disease, primary progressive aphasia and others. FTDP-17 is the most common of these with clinical presentation of gradual onset of cognitive change with frontal signs, extra-pyramidal features, apathy, mood and personality changes. The prognosis, while variable, usually runs a course of about eight years from onset. The genetic defect is on chromosome 17 with tau gene mutation. The penetrance probably approaches 100 per cent but further case accrual is required.

For all of the above syndromes it should be emphasised that the diagnosis is clinically derived, and that this process is, by its very nature, often imprecise. For example, fronto-temporal dementias and familial Alzheimer's disease may present in clinically similar ways. Since genetic testing is time and resource

consuming, specific testing is usually targeted at the most likely clinical category. In many instances there is a need to confirm previous familial cases pathologically (review of old pathology slides etc.) to be more certain of the diagnostic category which is being considered. If genetic testing is negative in an autosomal dominant pattern disease but the clinical category is less certain, counselling should be as for any autosomal dominant condition.

Catherine Grasso

FAMILY HISTORY

MY FAMILY IS AFFLICTED with Creutzfeldt-Jakob disease (CJD). Some twenty years ago an uncle died at age fifty-one from what was assumed to be sporadic CJD. His death, however, was followed years later by the death of another uncle and then, a year later, by the death of an aunt. They were both aged sixty-seven. A DNA sample from my aunt was subsequently sent to America, where a specific gene mutation for CJD was identified.

Catherine Grasso

At this time my father, having been in general practice for thirty-nine years, was toying with the notion of retirement. He was extremely concerned about the risk of inheritance for his children and grandchildren, and consequently underwent genetic testing in October 1996. We were shocked to learn that he possessed the mutation, and were devastated when, two months later, he manifested the initial physical symptoms of the disease. His deterioration was swift. In February 1997 he could no longer work, and, after a truly agonising ordeal, he died in May 1997 shortly after his sixty-seventh birthday. Thus, of my father and his seven siblings, half have succumbed to CJD.

Since my paternal grandparents both lived to the age of ninety-three with no hint of the disease, our genetic mutation is said to have incomplete penetrance.

GENETIC TESTING

Why test? The majority of people offered testing for fatal, adult-onset diseases choose not to be tested. I chose to know rather than spend a lifetime wondering anyway. After all, if I hadn't inherited the mutation, there would be no cause for concern. If, on the other hand, I had inherited the mutation, some contingency planning would be desirable.

Firstly, retirement age is a major consideration in such planning. If there is the possibility of an early death, I wish to organise my finances accordingly, and retire sooner rather than later.

Secondly, I wish to construct a living will. My father knew death was imminent, but we did not discuss it. It was simply too painful. Consequently, there will always be an element of uncertainty, even guilt, about the decisions we made for him in his final weeks. A living will would spare my family and friends such discomfort.

Finally, I wish to choose a hospice where staff are familiar with the disease and would hopefully be sympathetic to my needs.

Reproductive choices have no place in these plans, since I'm an independent 'career woman' having neither spouse nor children and no plans to change the status quo.

TESTING PROCEDURE

I was not apprehensive about genetic testing, as I had accompanied my parents to Dad's initial consultation and was familiar with the procedure. I had helped Dad research the disease, and knew that my risk of inheriting the mutation was fifty/fifty. I also knew if I did have the mutation, there would be a substantial probability–but not absolute–that I would later develop CJD.

Having read about the significance of dreams and believing in the 'wisdom of the body', I decided to question my body and dream the test result. Although a little far-fetched, I thought it was worth a try, as I had a fifty per cent chance of getting it right! I subsequently had a dream which led me to believe that I did possess the mutation.

Thus, I presented for testing, which included extensive discussion of my probable reactions to either a positive or negative result. This seemed superfluous as my aim was simply to get the result. I didn't see the need for further counselling, and said as much. My opinion was respected, and a blood sample was subsequently taken that day.

ON GETTING THE RESULT

I was a little anxious about getting the test result, but eager to know whether my dream was correct. The counsellor confirmed that I had, indeed, inherited the mutation. She also said clients often intuit the result.

I experienced a wonderful sense of euphoria. It seemed as though my life suddenly clicked into place, and all was as it should be. In retrospect, this was perhaps an over-reaction to days of persistent low-level anxiety. However, I was thrilled that my dream was realised, and felt I could trust my body, whatever happened. My inheritance forged a strong bond between Dad and me that, like love, transcends even death. The textbooks say that being at risk can make you feel 'special'. I've always known I'm special, but this confirms just how special I am–possibly one in five-to-ten million!

TESTING OF SIBLINGS

Of my four brothers, one has chosen not to be tested. Of the three who have undertaken testing, one brother has tested positive and one negative. The other, concerned about privacy and the stigma of disease, has declined the test result. He has subsequently become a committed vegetarian, and is convinced a healthy diet will reduce the risk of CJD. Although I think he's living in a fool's paradise, I can appreciate his need to maintain hope and some semblance of control in the face of uncertainty.

FOLLOW-UP

It has now been two years since I was tested, and, at age forty, little has changed. My retirement fund is non-existent, but I am more discriminating in my spending. I have discussed my final wishes with family and friends, but there is nothing in writing. I don't obsess about CJD, but am possibly more attuned to my physical and mental condition. If, for example, I experience episodes of unexplained dizziness or increased forgetfulness, I fleetingly wonder whether this is the beginning of CJD. Common sense, however quickly prevails.

FINAL WORDS

In *Cannibals, Cows & the CJD Catastrophe* Cooke asserts: 'An individual stands more chance of winning lotto than dying of familial CJD'.

Perhaps she's right. For years now I've bought Tattslotto tickets. Although I sometimes fantasise about how I'll spend my winnings, I'm not in the habit of waiting with bated breath for my numbers to come up. I've got better things to do.

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Arguments For

Martin Delatycki

Martin Delatycki

THE GENETICS community has great experience with the practicalities of predictive testing for inherited adult-onset neurological disorders. Predictive testing is defined as a test done for a person who has no disease symptoms, to predict whether or not they will develop symptoms of that disease in future. The condition for which most experience exists is Huntington's disease. Professor Donnan has covered the clinical features and genetic aspects of Huntington's disease so I will not repeat this now.

Predictive testing for Huntington's disease began in 1986 with an indirect test called linkage analysis. Since the discovery of the causative gene in 1993, an exact test can now be offered to all people at risk. With a few exceptions these people can know with certainty whether or not they will develop symptoms of Huntington's disease. Since 1986 more than 5000 people worldwide have undergone predictive testing for Huntington's disease. In Melbourne more than 400 predictive testing results have been delivered.

An international protocol has been devised to deal with issues relating to predictive testing. Important features of this protocol are:

- that the decision of whether a person will or will not be tested rests with that person and not with any third party
- that testing should not be offered to minors
- that those considering having testing should participate in counselling so they can be fully informed about what the test means and consider what a positive or negative result will mean for them.

Most centres in the world including our own follow this protocol.

For those who choose to have testing, many positive effects may arise. Of course more than half will find out that they and their direct descendants are no longer at risk of Huntington's disease. For those who find that they will suffer from Huntington's disease in future there are also positive aspects; including the removal of doubt about their status and the ability to get on with life with that certain knowledge. It also allows people to make plans for their life, in particular, regarding their reproductive options, relationships and work.

Prior to testing becoming available, surveys suggested that seventy-five per cent of people at risk would take up predictive testing. Testing has been available for over ten years and the reality is that about twenty per cent of people at risk have undergone predictive testing. There is evidence that this is a self-selected group. That is, that those most likely to request testing are those who cope with anxiety and adverse life events best.

Whilst there are positive aspects to predictive testing there are also some potential negative effects including increased risk of self-harming behaviours, anxiety, depression and relationship breakdown. This is not only for those found to have inherited the faulty gene. It may be surprising to some that there can be adverse responses among those receiving a 'good' result also.

This is why the counselling protocol is so important: so people can be prepared for dealing with their result–positive or negative.

More and more genes for adult onset dementias are being found. The number of conditions for which predictive testing will be available will increase rapidly as technology makes finding the gene faults responsible for various conditions easier and faster.

It is my strongly held view that the current approach to predictive testing should be adapted and applied to the various genetic dementias. It has proven to be successful with much lower rates of adverse outcomes than were predicted prior to the ability to offer such testing.

The title of the program today is 'The brave new world of genetic testing'. Thirteen years experience and over 5000 predictive tests suggests that it is not such a brave new world. But should such testing be encouraged?

My opinion is that it should be neither encouraged nor discouraged. People must make their own informed decisions about whether to be tested or not: their autonomy must be respected above all else. By encouraging people who would not otherwise be tested to have predictive testing, the rate of adverse outcomes may well increase. This is because there is good evidence to suggest that people at risk of such diseases who do not have predictive testing, are less likely to cope with the anxiety of testing and a result that means they will get Huntington's disease. I also reiterate that the decision to be tested must be fully informed. The fact that prior to the availability of testing seventy-five per cent of people at risk believed that they would undertake such testing whereas with testing available only about twenty per cent actually have the test, is indicative of something we see regularly: that people often immediately wish to have testing when they find that they are at risk, but with time and information, many decide not to.

Although the world experience in testing for hereditary predisposition to dementias is relatively extensive, debates such as this one are invaluable in highlighting the many ethical issues that arise. We are constantly struck by different issues pertinent to different people undergoing predictive testing. This means that the approach taken to testing needs adapting to meet each individual's needs.

Arguments Against

Loane Skene

YOUNG CHILDREN

Ethical reasons for not allowing presymptomatic genetic tests for young children when no intervention or treatment is available


Loane Skene

THE NHMRC HAS DECLARED that '[P]resymptomatic testing of children for adult onset disorders for which there is no preventative strategy or treatment, such as Huntington's disease, myotonic dystrophy or familial early-onset Alzheimer's disease, is not considered ethical' (NHMRC, *Draft Guidance on Ethical Aspects of Human Genetic Testing*, 14 May 1999 para 3.3.5.2). It gave the following reasons.

- Testing before a child is old enough to be involved in the decision removes the child's future autonomy to decide whether and when to have a test. The child might decide that he or she does not wish to know or wishes to defer the knowledge.
- Testing infringes a child's privacy. Personal information is obtained and given to the parents that the child may not wish to reveal.
- If the test is positive, the child will grow up knowing that the disorder will develop.
- The child's parents may treat the child differently, especially if they know that he or she will develop the condition.
- The child's self esteem and interpersonal relationships may suffer from knowing that he or she will develop the condition (or even if that is not the case - 'survivor guilt').
- There may be insurance and employment implications.
- If the test is deferred, it could be undertaken later with the consent of the child.

The NHMRC compared cases where there is no effective intervention with cases where intervention is possible. Where 'there is a highly effective intervention for susceptible children which can prevent a serious future health problem which is very likely to occur', testing is ethical. Note the three conditions: 'highly effective'; 'serious health problem'; and 'very likely to occur'. This reasoning justifies the routine genetic testing of all newborn infants shortly after birth for PKU, cystic fibrosis and congenital hypothryoidism (see Loane Skene, 'Access to and ownership of blood samples for genetic tests: Guthrie spots' (1997) 5 *J of Law and Medicine* 137-142).

Legal reasons for not allowing genetic tests

Parents have a legal right to consent to medical procedures for their children under the age of eighteen. This arises from the Family Law Act 1975 (Cth) s 61C. However, the parents' right to decide about medical procedures is limited by a requirement that they must always act in the *best interests* of the child. As the High Court of Australia said:

> [T]he overriding criterion to be applied in the exercise of parental authority on behalf of a child is the welfare of the child objectively assessed. ... [T]he overriding criterion of the child's best interests is itself a limit on parental power'. (*Department of Health and Community Services (NT) v JWB (Marion's case)* (1992) 175 CLR 218 at 240 (Mason CJ *et al*).

This notion of the child's best interests underlies the policy document formulated by the Family Court of Australia, *Children and Special Medical Procedures* 1996. The document states as follows:

> You must get authorisation from the Family Court before a child can undergo a major medical procedure that may permanently affect their quality of life. These are known as Special Medical Procedures ... [and they include 'difficult ethical issues'].
>
> In Special Medical Procedure cases the Family Court acts as an objective, independent umpire to consider the rights and well-being of the child'.

The two overriding principles the Court will focus on when considering an application for a Special Medical Procedure are (1) the best interests of the child; and (2) whether the procedure is a 'step of last resort'.

OLDER CHILDREN (UNDER EIGHTEEN)

Ethical issues: NHMRC

The NHMRC considers that genetic tests can be undertaken in wider circumstances for older children where the child is involved in the decision making and the parents agree (NHMRC, *Draft Guidance on Ethical Aspects of Human Genetic Testing*, 14 May 1999, para 3.3.5.2). The test results would then usually be shared between the child and the parents but the child may seek confidentiality (*ibid*). Also an older child may apply independently of the parents and the test is then the legal test for competence (*ibid: semble* the 'mature minor' test noted below).

Legal issues

According to the common law, an older child who is still under eighteen can consent to a medical procedure without parental knowledge or involvement if the child is a 'mature minor': *Gillick v West Norfolk Area Health Authority* [1986] AC 112 (House of Lords); approved by the High Court of Australia in *Department of Health and Community Services (NT) v JWB (Marion's case)* (1992) 175 CLR 218. (Note that NSW and SA have legislation enabling older children to consent to medical procedures: See Loane Skene, *Law and Medical Procedures: Rights, Duties, Claims and Defences*, Butterworths, 1998, Ch 4) . The test for the mature minor is whether the child has 'sufficient understanding and intelligence ... to understand fully what is proposed' (*Gillick, Marion's case*, supra). The assessment of competence in a particular case is a matter for the doctor. A mature minor can probably control his or her information, choosing to have it kept confidential if he or she so wishes.

CONCLUSION

Both ethics and law require that medical procedures should not be undertaken on a young child unless they are for the benefit of the child. As the child gets older, he or she may be involved in the decision making, either jointly with parents–in which case they will generally share the genetic results–or, in the case of a 'mature minor', the child may decide him or herself, also deciding whether the information should be revealed only to the child. These principles accord with the basic ethical imperative that the state should protect the interests of children (as of other vulnerable people–the *parens patriae* obligation of the law) and the general law on consent to medical procedures for children.

Arguments For

Julian Savulescu

Julian Savulescu

DENISE AND MARK have two children: Julie, aged ten, and Jane aged four. Mark's father and grandfather both died of Huntington's disease, a dominantly inherited degenerative brain disease for which there is no medical treatment. Mark and Denise decided not to have prenatal testing. Six years ago, Mark's behaviour began to change in subtle ways. Latterly abnormal movements and features of dementia have become more obvious. Recently a clinical diagnosis of Huntington's disease (HD) has been made and confirmed by a molecular genetic test. He is now hospitalised in a psychiatric institution. Julie asks 'Will I get sick like dad, uncle Joe and grandpa?'. Denise avoids answering. Julie looks on the internet for more information about HD. She tells her mother that there is a test that will tell her whether she will get the disease. She tells her it is now available in the post. Denise asks her local doctor to test her children.

Denise feels the anxiety over the uncertainty about whether they have the gene has become emotionally disabling; it is better for her to tell them, at the right time, in their own way and she wants a culture of openness in their family where Huntington's disease is an accepted part of their family. She says 'This way, they will have more time to adapt to the knowledge. Kids don't have plans for the distant future. It won't affect them in the same way as it would if they found out when they were thirty. Besides, if they have Huntington's disease, that is a part of their life. Why shouldn't they know the boundaries of their own lives? The sooner they know themselves, the sooner they can make decisions about themselves.'

The Clinical Genetics Society (CGS) in the United Kingdom and the American Society of Human Genetics (ASHG) have each published guidelines that address predictive genetic testing in children. Both position statements strongly advise against testing for a disease in which neither surveillance, pre-emptive nor definitive medical treatment is available in childhood. There are three arguments:

- failure to respect the child's later autonomy and ability to decide for itself at a later time,
- harm to the child, and
- breach of confidentiality (a part of the first argument).

THE ARGUMENTS IN DETAIL

Failure to respect the child's later autonomy

This is what Angus Clarke, author of the CGS guidelines, has in mind when he says 'testing in childhood removes the individual's right to make their own decisions about testing as an autonomous adult'. How might childhood testing breach a later adult's autonomy?

Reduced Options

The idea here is that the child who is tested has no choice over whether to know or not know his or her genetic status, whereas the child who is not tested, has a later choice: to know or not know. However, this is an incorrect formulation. The child who is not tested is denied the option of growing up and adapting to the knowledge of his or her genetic status during childhood and adolescence. Thus, the choice is not between two courses of action, one which simply has more choice for the later adult, but between two mutually exclusive futures: a future in which the child grows up with information about her future, has time to adapt to it and the opportunity to make life choices in that context, but has no choice about whether to have this information, or a future in which the child grows up in uncertainty or ignorance, but has the choice whether to have the information in the future.

However, more choice does not necessarily promote our autonomy or interests. For example, being given the option of donating a kidney or not may not promote autonomy or our interests. We may believe that it would be worse for us either if we did not donate the kidney or we did donate the kidney, than if we had never been given this choice at all. We may wish we had never faced the choice. More choice is only better if the options are good.

Being a parent involves making choices between mutually exclusive futures for one's child. Foreclosing some options is not necessarily a violation of the child's future autonomy in any significant way. When parents decide to send their child to a private school hoping to provide a better education, they necessarily prevent the child realising all the friendships she would have formed at her local state-funded school. Indeed, in virtue of that choice, the child's whole life trajectory will be fundamentally different; from friends, to knowledge, to career choice and most aspects of the child's life. The child's life might turn out for the worse. She might fall in with friends who encourage her to abuse drugs. However, her parents have not infringed her autonomy because they have denied her an alternative life path or even because her life happens to have turned out badly. If the parents provide a reasonable amount of knowledge and skills to the child in order for her to have a reasonable range of choices and to deliberate effectively about these, then they have created the conditions for an autonomous life, rather than limiting it. Parents can significantly infringe future autonomy when they limit the child's capacities which are necessary for autonomous action (e.g. by causing brain damage or severe physical disability) or by severely restricting the range of options open to that child. However, neither of these conditions is satisfied by predictive testing in children.

In short, predictive testing means that the options are different, but not less. If a child does not receive this information when she is young, she is denied the opportunity of being able to adapt to it before her plans and expectations have crystallised. This may be a significant harm.

Harm to the child

Little direct research on the psychological impact of predictive testing in children has been performed. Michie et al[1] reported one family in which a two-year-old and a four-year-old were tested for the presence of a mutant FAP gene and one was found to be positive. No psychosocial disturbance was detected within the family in the fifteen months after the tests were performed. There is very little empirical evidence concerning harms of such testing in children. There are, however, reasons to believe it would be beneficial.

The benefits of genetic knowledge: promoting autonomy

Autonomy is self-government or self-determination. Being autonomous involves freely and actively making one's own evaluative choices about how one's life should go. Evaluative choice requires holding true beliefs. True beliefs are important for evaluative choice in a fundamental way: we cannot form an idea of what we want without knowing what the options on offer are like. Consider a person with gangrene of the foot. She is offered an amputation. In evaluating 'having an amputation' she must evaluate a complete state of affairs: how much pain she will experience, whether she will be able to live by herself, visit her grandchildren, and so on. Holding true beliefs is thus important for autonomous choice. Consider a child at risk of Charcot Marie Tooth disease. He is trying to decide whether to enter technical college or pursue more sedentary careers. He either does or does not have the gene for Charcot Marie Tooth disease. If he is trying to imagine what it would be like to work in various professions, including that of a motor mechanic or clerk, it is relevant for him to know his physical capabilities. A person with weakness may choose to be a motor mechanic, but it promotes autonomy to make the choice in full knowledge. Such a person cannot complain, if things do not work, 'That's not what I expected' or 'That's not what I really wanted'. Knowledge allows us to see what is really on offer.

The word 'autonomy' comes from the Greek, *autos nomos*, meaning self-rule or self-government and was first used in connection with the Greek city states. Imagine that the ruler of such a state became aware of a fifty per cent chance that a massive flood would strike his state. The ruler can eliminate this uncertainty and find out from other states upstream what the condition of the river is, and whether the flood will occur or not. It plainly promotes the government of the state for the ruler to find out this critical piece of information. It would be an abdication of government if he did not find out this information. Personal autonomy as effective self-government involves a responsibility to do what is best for oneself. It involves using genetic information where this is available.

Often, the world is not how we want it. Being an autonomous and good person involves learning how the world is, and seeking to find one's place in it. If we are not prepared to find out the truth about ourselves and our own lives, how can we deal effectively with the truth about others' lives? Deception and ignorance about ourselves are impediments to our own self-development.

PRESUMPTION IN FAVOUR OF LIBERTY

In a liberal society, there should be a general presumption in favour of liberty. In this case, if there is no evidence of harm to children, if parents are competent and are motivated by concern for the best interests of the child (and not merely their own interests), then we should leave the decision to employ genetic tests to parents.

Personal Autonomy

One ethical basis for having a predictive testing program in adults is respect for autonomy. Autonomy is about determining how our own lives should go, without the interference of others. There are two reasons why autonomy is important.

Instrumental justification

Each person is best placed to know what his own talents, abilities, character, history are like. So person is best placed to decide which life is best for himself. John Stuart Mill called this 'privileged access.'

Intrinsic justification

The object of the decision is also its subject. It's John's own life whom his decisions about his life most affect. Since he will suffer the pain or pleasure of his decisions, he should ultimately be the one to make them.

Parental Autonomy

The principle of personal autonomy and liberty also extends to parental autonomy and liberty over their incompetent children. Parents should be able to make decisions and act on these about what is best for their children. The justifications for parental autonomy are the same as for personal autonomy.

Instrumental justification

Parents are best placed to know what their child's talents, abilities, character, history are like, and the circumstances of their own family. So parents are best placed to decide which life is best their child.

Intrinsic justification

Parents experience the impact of decisions about their child more than any other decision-maker. Since their welfare is intimately bound up with the welfare of their child, they should ultimately be the ones to make decisions about the child's future.

So in Western liberal societies there is a basic presumption in favour of liberty in favour of competent individuals and parents. If a predictive testing program is offered to competent adults on the basis of respect for that person's autonomy, why isn't it offered to parents to employ on behalf of their children?

There are three kinds of genetic testing that raise significant ethical issues:

- late onset conditions, especially where there is no treatment and especially in children,
- mass population genetic testing at birth, and
- testing for genes related to complex behaviours, personality, e.g. intelligence testing.

THE GENETIC REVOLUTION

Two of the most significant revolutions in human history have been the revolution of self-knowledge and the revolution in genetic engineering and enhancement. This revolution affords the significant potential benefits of enhanced autonomy and well-being.

We have a choice: to remain in the present world, haunted by the shadow of the apocalyptic mythology of the Brave New World of Aldous Huxley, or to go bravely into the new world of genetic knowledge.

NB: This paper derives from a paper written with Stephen Robertson and published in *Bioethics*.

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SOCIAL HEALTH AND THE SOCIAL BODY

PROFESSOR LENORE MANDERSON
DIRECTOR, KEY CENTRE FOR WOMEN'S HEALTH IN SOCIETY

IT IS BOTH TRUISM and heresy to remark on the social basis of health. People are both *in* and *of* society; well-being is identified, interpreted, and managed via the ideas of a given place and time, the physical circumstances of everyday living, and their social relations. These in turn are shaped by wider political and economic forces. Health is also defined subjectively against what is normative in a given place and time, and by what is possible technologically, diagnostically, and economically. The terms 'social health' and 'social body' are intended to capture the tensions, interactions and forces implied by these multiple factors.

In my current research, I pursue this idea by exploring the effects on individuals of deviations of the physical body. I am interested in how the apparatus of recovery and survival is read perversely as evidence of continued pathology. This influences two phenomena which affect the health outcomes of people who have been ill: patient 'non-compliance' with medical regimes and stigma against people who are 'survivors'.

Professor Lenore Manderson

CHANGES IN TECHNOLOGY

Changes in public health and advances in medical science have resulted in dramatic changes in the epidemiology and impact of disease. At the same time, biotechnological advances have led to changes in expectations of the experience of illness and notions of being 'in good health'. Aches and pains, tiredness, variations in eating, sleeping, energy and mood, once regarded as 'normal' signs of ageing, are increasingly regarded as signs of a pathological condition that can be diagnosed and treated. Medical interventions prevent or control these symptoms; improved diagnostic, surgical and chemical tools allow us to correct or halt pathological changes and alleviate physical suffering (i.e. pain). Increasingly, too, sophisticated interventions limit personal disruption and reduce the visible impact of poor health. Medical advances in recent years have led to what Renee Fox and Judith Swazey (1992: 6) regard as a 'new period of optimism' with a growing number of transplants, and a decrease in complications, multiple and repeat transplants. We live in a society where there is the expectation that these technologies will continue to be refined (*Fig 1*).

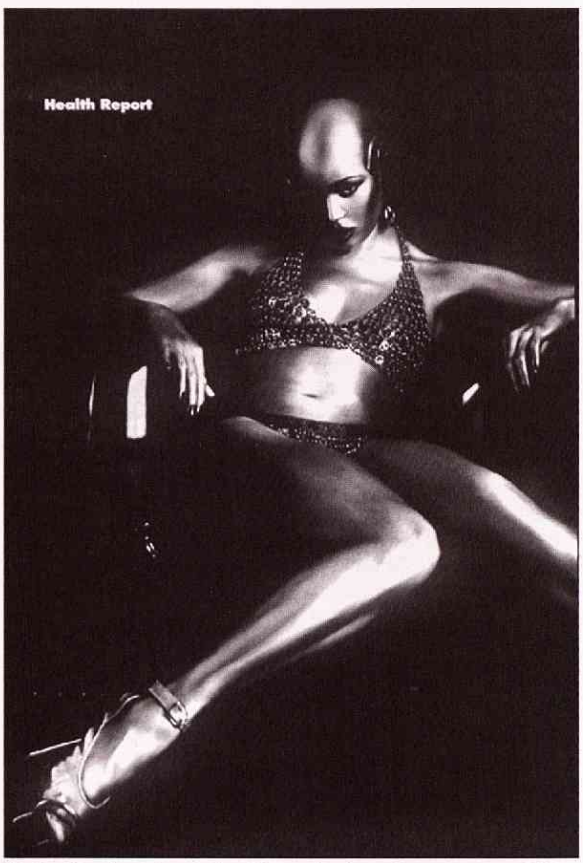

Fig 1 How long does it last? From the *Australian* magazine, 1997.

WORKING ON THE WELL BODY

The example of transplants relates to an intervention where lack of intervention would be fatal. Improvements in diagnosis and treatment of illness have shifted our expectations of being healthy, and we have come to expect the absence of even superficial signs of ageing. Any magazine or newspaper illustrates this. The suburban throw-away, *Inside Melbourne*, includes a range of advertisements for services to remove sagging flesh and excess fat under the chin; remove unwanted hair; improve dentition with 'aesthetic porcelain'; and offer all kinds of cosmetic surgery ('laser surgery', 'micro-current technology', electrolysis); aromatherapy; massage; dermabrasion; ionised gels; and other non-surgical treatments to tighten buttocks, carve off 'excess' stomach fat and stretched

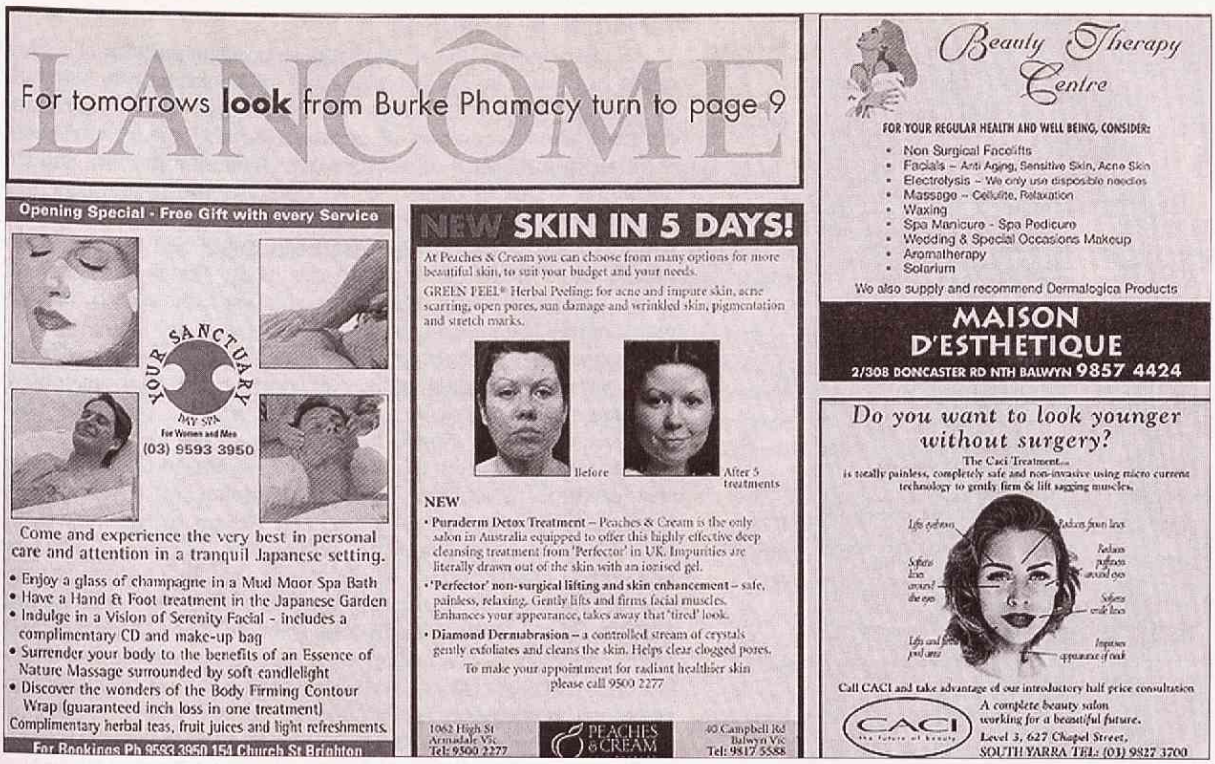

Fig 2
Inside Melbourne, 14 March 1999, p28

skin, slim down thighs, remove broken veins from the face, neck, and legs, remove freckles and what were 'normal' age spots from hands and face, reshape the jaw, and so on (*Fig 2*). Hence even graceful ageing is a sign of wilfulness or poverty. The increasing sophistication of medical techniques has led us to anticipate, if not immortality, then at least a long life with minimal physical disruption. This creates real problems–social and psychological –for people whose lives have been physically disrupted.

PUBLIC HEALTH AND THE MORAL RESPONSIBILITY TO BE WELL

A related change in science has been the increased capacity to diagnose, and an increasing emphasis from a public health standpoint of the value of reporting signs as a means of early diagnosis (hence prevention of mortality). In this context, the basic message to the 'public' is that signs of change are (or can be) signs of illness. A mole that darkens might be melanoma; a lump in the breast, cancer; a pain in the chest, heart disease. We are implored, in any public health campaign, to improve health outcomes by early intervention, to know our own bodies and to report changes in them to medical authorities. For this purpose, the body is separate from 'self'–it is an object for surveillance and control.

At the same time, individual signs of dysfunction or pathology are gathered together and translated algorithmically into syndromes that require further investigation and treatment. Consider, in this context, the emergence of syndromes which have a confusing presentation and unknown etiology: fibromyalgia and irritable bowel syndrome, for example. At least some of these are seen to be socially constructed. There remains a suspicion in the public imagination, if not in medicine, that some conditions are invented, their sufferers malingerers and their diagnosticians opportunists. The suspicion of imagined illness spills over to affect medical conditions hidden from public view. Consider, for example, the difficulties that face people with conditions such as ulcerative colitis and Crohn's disease, who are discrete about their health problems (constant diarrhoea is not a usual subject of polite conversation) and are therefore subject to suspicions of hypochondria. Days off work for chronic conditions are typically seen as evidence of moral turpitude. One of the women whom I interviewed was reminded, on the occasion of her retirement, that her workplace had 'carried her' for years.

THE DISABLED BODY

I referred above to advances in cosmetic surgery and the social values that sustain this industry. This emphasis makes negatively-valued changes to the body intensely problematic, and highlights how body image affects the adjustment of individuals to major surgery and bodily change. We interpret signs and symptoms of the body according to our own (cultural and societal) ideas of bodily function. The body, too, is socially produced. As implied in the market for cosmetic/vanity procedures, contemporary industrialised society is not tolerant of bodies that deviate, are smaller, fatter, differently proportioned, or function differently or look different to most–as if physiological function, the capacity for pleasure, life chances and personal worth were all associated with size and appearance.

Eating disorders provide an example of the power of normative values of the body over individual behaviour. One example from my own work was with a woman whose years of disturbed eating, anorexia and bulimia, and gross laxative abuse finally resulted in an ileostomy. She sees things this way:

> Dying is not as bad as living with an ileostomy. See dying, I wasn't scared of dying. Having a stoma is a constant reminder that I am bad. That I have done something to hurt myself. And I think more and more, I am realising that this is not going to go away, that this is not just a phase. You know, I am realising that when I am sixty or seventy, if I live that long, I will still have a bag, and it is not going to go away tomorrow. An operation is not going to fix it up. It's a constant reminder of how I have treated my body. I can't take away this sign of what I have done to my body. I was so bad that this is my punishment for the rest of my life, you know.

We expect to be healthy and able-bodied for most (or all) of our lives. People who have had major surgery or accident, and literally wear the results of this (e.g. they have an artificial limb, or prosthesis, or stoma), remain 'sick' in the public imagination. Claims of being 'normal' except for the ostomy bag, or the artificial limb, for example, are counter-intuitive for most people. Lorraine, who had lost a leg from cancer as a child, said: 'I'm normal. I'm just like you only I have a wooden leg.' Her insistence on normality is important; it illustrates her negotiation of self worth to accommodate changes to her body.

Elizabeth Grosz (1994) argues that the body is not only an object: it is the medium for expression, and our bodies act as vehicles of expression and the means of articulating thoughts,

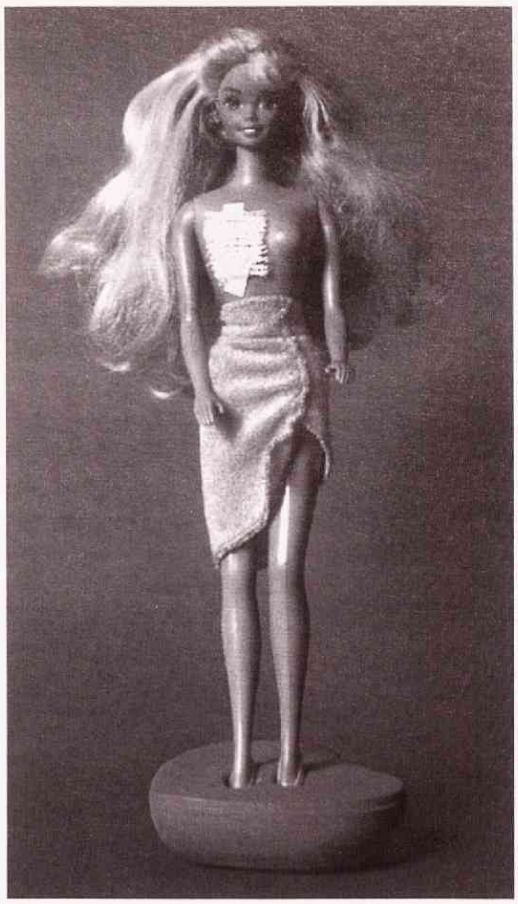

Fig 3. Ariela Shavid's Barbie post mastectomy, from Leah Dovev, ed. Beauty is a Promise of Happiness. Catalogue of a One Woman Exhibition by Arelia Shavid (Jersalem: The Israel Museum, 1996)

ideas and emotions. If this is so, they are so seen too by others with whom we interact. This makes sense of people's claims for being 'normal', since normality is understood as capturing the state of mind rather than the body. But it also helps us understand the nature of stigma–the fear that others must overcome to treat as 'normal' people whose corporeality is different; through a missing a leg or a breast or an anus, for example. Fear is a useful emotion for further research in this context, since if someone is normal *and* corporeally different at the same time, the possibility of the same experience happening to the other is made clear: you too could lose a breast or have a stoma.

Most social research on the body and health focuses, in fact, on illness and healing. Well-being is unexplored, a problematic undefined state of 'normality'. Little attention has been paid to accident, for example, or to the surgical or personal impact of treatment of some illnesses; the rehabilitative experience is largely unexplored. Further, the implications of the loss of control of the body following illness or accident (e.g. among stroke patients, or with those who have lost a limb and/or other muscle functions following spinal injury) have not been explored. The paradox is that social membership demands control over individual physical bodies, while constraints of the physical body create situations where individuals lose control. To be healthy is to be in control. Disruptions of the body through illness, accident and surgery are signs of bodily failure or decay, the body out of control. In consequence, also, the social body is in question: the mind may also be seen as out of control, and hence personhood, gender and sexuality are open to re-negotiation. In some respects, individuals lose both gender and sexuality with the loss of corporeal control, and to a degree, because of some loss of physical mobility and autonomy, lose public acknowledgement of their (continued) intellectual or mental autonomy, that is, their personhood. More immediately, people lose their adulthood with insults to the physical body.

TENSIONS OF AMBIGUITY

An issue in this research relates to control: individual control of the body and bodily function (and ideas of the body being out of control, hence the need for intentional surveillance and control), the association of personal bodily control and social membership, control of doctors over women and men, and the individual's lack of control in determining the trajectories that are imposed by birthright, accident or ageing. Individual responsibility is read into these trajectories and highlights the problematic of the person and the body, the breaches of the body metaphorically reflecting the way in which biology manipulates the social person.

People with embattled or ambiguous bodies–including for those who have to deal on an everyday basis with their body *as an object* (for example caring for a stoma, changing bags etc.)–must address a particular tension. Since the body has to be *managed*, it is important–for self-image and to maintain social relationships–to separate self from substance; me (the 'real' me) from the body-with-stoma, the object. The problem is also other people's difficulty in doing this. An individual's sense of *who I am* and *who others think I am* tends to be influenced by understandings of the physical body, and the relationship between the physical body and the self. For people whose gender identity is discordant with their corporeality, the desire for corrective surgery is to allow the 'real' self to inhabit an appropriate body (i.e., one of the opposite gender). For people with a disability, the challenge is to be recognised as self despite bodily non-conformity. In understanding the cognitive leaps that an individual post-surgery must make towards adapting, it is important (and not necessarily easy) to separate body and self; to insist, contrary to contemporary philosophical theorising, that the body and mind *are* separate, and that while the self is embodied, personal worth cannot be read on this basis. Hence the importance of understanding individuals' relationships to their bodies, in terms of social membership, and social and sexual identity.

The individual who is unable to control their wilful body looks for, or seeks to re-establish, what he or she understands to be the former relationship with their body, while seeking to solve the inconsistency between wanting control and being unable to achieve it. In many illness conditions that are highly disruptive, dissonance–and grief–are solved by searching for a way of conceptualising the illness that gives the person's life some meaning. At the same time, individuals seek to renegotiate meaning for their bodies, that is, with respect to their corporeal selves. Women who have had a mastectomy must redefine themselves as gendered and sexual both in the context of their history of cancer and the absence of a breast (or breasts) (*Fig 3*).

Values of the body, bodily processes and functions vary. Much of the contemporary social research on the body has been concerned with fatness, thin body ideals, and eating disorders, or with people who have re-structured their bodies surgically or physically (body-building), or in other ways manipulated the physical body (tattooing, piercing, and so on). These studies typically illustrate the relationships between bodily appearance, self-image and social identity. Some attention has been paid to how physical bodies are understood with respect to sex and gender, which anticipates new research questions with respect to the social construction of gender, gender identity and the physical body. This work suggests that bodily experience is influenced and interpreted culturally, and that the body and its state also determine and are subject to social relations. The purpose of my current research is to extend this work on the body theoretically. My aim is to develop an approach that is sufficiently robust to apply to a variety of conditions and experiences including those that derive from life crises of major illness and accident.

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2000 Dean's Lecture Series - Seminar

Who Owns Your Body?

An Ethics Committee in Action

2.00 – 5.00pm, Friday 21 July 2000
Sunderland Lecture Theatre, Ground Floor Medical Building, The University of Melbourne
RSVP 8344 5888

A neurologist wishes to develop a new screening test for a severe form of epilepsy and brain cancer. He seeks ethics committee approval to test stored brain tissue for the presence of a gene that may be associated with these conditions. The tissue comes from living adults and children and also from deceased people.
What issues arise when this proposal is put to an ethics committee? This seminar presents an 'inside view' of an ethics committee in action.

Members of the Ethics Committee Will Include:

Chair–**Professor Graham Brown**,
James Stewart Professor of Medicine and Head, Department of Medicine, RMH/WH.

Lawyer–**Professor Don Chalmers**, Faculty of Law, University of Tasmania.

Ethicists–**Dr Lynn Gillam**, Lecturer, Centre for the Study of Health and Society; Research Fellow, Ethics Unit, Murdoch Children's Research Institute and **Associate Professor Julian Savulescu**, Director, Ethics Program, Murdoch Children's Research Institute; Associate Professor, Centre for the Study of Health and Society.

Research Expert–**Professor Nancy Millis AC, MBE**, Chancellor, La Trobe University;
Professor Emeritus, The University of Melbourne.

Doctor–**Professor Arthur Clark AM**, Emeritus Professor, Monash University; Honorary Senior Paediatrician, Royal Children's Hospital.

Minister of Religion–**Rabbi Faitel Levin**.

Lay Woman–**Dr Janet McCalman**, Senior Lecturer and Deputy Director, Centre for the Study of Health and Society.

Lay Man–To be advised.

Expert Commentary Will Be Provided By:

Professor Loane Skene–Director of Studies, Health and Medical Law, Faculty of Law; Adjunct Associate Professor, Centre for the Study of Health and Society.

Associate Professor Agnes Bankier–Medical Geneticist, Murdoch Children's Research Institute, Royal Children's Hospital; President of the Human Genetics Society of Australia.

Dr Desirée du Sart–DNA Diagnostics Laboratory, Victorian Clinical Genetics Services.

The Research Will Be Presented By:

Professor Sam Berkovic–Director of the Comprehensive Epilepsy Program and the Epilepsy Research Institute.

Women in Medicine Forum

Female, Fairness, Favour and Family:

Perspectives on achieving success and balance in the working lives of medical women

2.00 – 5.00pm, Friday 18 August 2000
Sunderland Lecture Theatre, Ground Floor Medical Building, The University of Melbourne

This forum, jointly sponsored by the medical schools at Monash and Melbourne Universities and the Victorian Branch of the AMA will be in two parts.

The first segment will trace the journey of a young woman entering medicine–viewed through the eyes of three articulate colleagues: a student, a young working woman and an older practitioner. The second segment, a hypothetical moderated by Sally Cockburn (aka Dr Feelgood), will tease out key issues surrounding the forum's theme–female, fairness, favour and family.

Medical students and graduates and interested members of the public are welcome to attend.

Admission is free.

RSVP and further information: Development Office at the School of Medicine, The University of Melbourne on telephone (+61 3) 8344 5888.

Thank You for Your Support

Thank you to all who donated to areas of need in the School of Medicine this year when renewing your UMMS membership. Most people directed their donations to priority needs identified by the School of Medicine. This year these are: medical education, with further development of the new medical curriculum and the Faculty Education Unit; population health, with the establishment of a new School of Population Health; and rural health, with the continued development of the Department of Rural Health in the Goulburn/Murray region.

Donations to research will help to fund important new initiatives including research in epilepsy, cancer, osteoporosis, neurodegenerative disease (including Alzheimer's disease), schizophrenia, irritable bowel syndrome, treatment of high blood pressure, diabetes and arthritis.

Donations to medical student financial aid will help those students who without such assistance would be unable to complete their medical course.

Last year medical alumni contributed to the development of student facilities for the new medical curriculum. With these funds, the Medical Alumni Room was set up to support problem-based learning and clinical skills practice. The School of Medicine and the Committee of the University of Melbourne Medical Society thank members for their continued generous and important support.

FROM THE DEAN

Prof Richard Larkins

IT GIVES ME GREAT PLEASURE to report on a range of activities which are keeping everyone in the School of Medicine fully occupied and highly stimulated. It is certainly not a dull place to be at present .

The first year of the new curriculum has been completed and overall it has been a great success. Both staff and students found that problem based learning was very enjoyable and a great way to learn and the Introduction to Clinical Medicine sessions, with visits to hospitals and community settings and step-wise acquisition of clinical skills, helped the students to learn in a clinically relevant context. Computer-based learning modules developed by the Faculty complemented the other learning methods–they are sophisticated, interactive programs, not merely electronic text-books. The second year of the new program has commenced just as successfully. Introducing a totally new curriculum is a gigantic undertaking requiring a large amount of hard work and very positive interactions between staff from a wide variety of disciplines. Everyone is to be congratulated, but particularly the staff of the Faculty Education Unit led by Susan Elliott and the Information Technology Unit led by Peter Harris.

Plans are proceeding for the development of a research and commercial biotechnology precinct with major new buildings on the Western (Veterinary) Precinct site and on the Dental Hospital/Dental School site (the latter are relocating to the Royal Women's Hospital site). The first building will be an Institute of Molecular Science and Biotechnology involving the research and postgraduate parts of Biochemistry and Chemistry and research groups from other departments and faculties with an interest in biotechnology. There will also be space for high quality research groups from other institutions and incubator space for start-up companies. On-site expertise in intellectual property, technology transfer and access to venture capital will be available. Later developments will include expansion of the Walter and Eliza Hall Institute and the Ludwig Institute, which will be linked with the University facilities, and the development on the Dental Hospital site of conference facilities, a public and secondary school biotechnology and genetics information centre, and centres for bioinformatics, health informatics, population health and, most importantly, a clinical trials centre. These developments will be closely linked to the Royal Melbourne Hospital and, in addition and most importantly, will also involve Monash and other universities and the other teaching hospitals and research institutes. It should make Melbourne a significant world centre for biotechnology, an opportunity we have because of the excellence of our basic science and an outcome we can achieve with government and private support and cooperation between all the players. I see this development as very important for our School. Linking to the commercial part of the biotechnology industry is essential if our discoveries are to get out to the public.

The University Council has approved the establishment of a sixth School of the Faculty: a School of Population Health. This will incorporate the Department of Rural Health, based in Shepparton, and a new Department of Public Health. In addition to current members of the School of Medicine and associated University centres, the Schools of Dental Science, Behavioural Science, Postgraduate Nursing and Physiotherapy will be involved as well as groups within the teaching hospitals and centres associated with them. The Department of Human Services has contributed funding towards the School and we hope it will form a fruitful collaboration with the Department in training, research and public health programs. There is no doubt that public health will be a most important component of health care in the twenty-first century and it is essential that our Faculty strengthens its activity in this field and ensures that all health professionals are well equipped to deal with this important area.

Another cross-Faculty activity is the formation of a Centre for Sports Medicine, Research and Education. This will be administratively centred in the Physiotherapy School but will involve the Department of General Practice, research groups in the Departments of Physiology, Medicine and Surgery, clinical links with the Olympic Park Sports Medicine Centre and important participation from the Schools of Behavioural Science, Postgraduate Nursing and Dental Science. Sports medicine is an increasingly important component of the practice of many health professionals and the new Centre will develop educational courses as well as having a strong and multidisciplinary research base.

At the time of writing we are awaiting the final report of the review of the Health Care Networks and the recommendations of the Steering Committees of the Austin Repatriation Medical Centre and the Mercy Hospital for Women redevelopments. The teaching hospitals have been going through very tough times, not helped by frequent changes in governance structures. They are crucial to our medical school and I have been participating actively in discussions relating to these important issues. It is important that we develop a broad range of settings in which our students can learn. In addition to using general practice and community and rural hospitals, we need to involve the private sector for specialist teaching and it is pleasing to report that two new Chairs of Psychiatry have been established in partnership with the private sector.

Research continues to be active and successful. We remain the most successful medical school in Australia with respect to research, no matter which parameter is used. We must ensure that our researchers receive adequate infrastructure to allow this to continue.

Finally, the Faculty was delighted to see one of its most distinguished emeritus professors, Sir Gustav Nossal, recognised as the Australian of the Year in the Australia Day Honours. This was most thoroughly deserved. We are all aware of his outstanding record as a scientist and as Director for three decades of the Walter and Eliza Hall Institute. His work since his 'retirement' has included roles as leader of the WHO Child Vaccine Program, Deputy Chair of the Council for Aboriginal Reconciliation and as an advocate for support of Australian science. We are proud that he remains closely associated with our Faculty. We also congratulate Professor Graeme Clark for the receipt of the Victoria Prize and for being one of three foundation laureate professors of the University. These are fitting recognition of Professor Clark's outstanding role in the development of the cochlear implant, one of Australia's greatest contributions to medical science.

Richard G Larkins
Dean, Faculty of Medicine, Dentistry and Health Sciences
Head, School of Medicine

Retirements

Professor Colin Ivor Johnston

COLIN JOHNSTON is a graduate of the University of Sydney. After early clinical training at the Royal Prince Alfred Hospital in Sydney, he undertook research training in circulatory physiology at the University of Sydney and later at the National Institutes of Health in Bethesda Maryland. He was recruited by Austin Doyle in 1968 to the newly formed University of Melbourne Department of Medicine at the Austin Hospital.

He was soon promoted to Reader, in 1971, and in 1973 was appointed as Professor of Medicine, Monash University at Prince Henry's Hospital in Melbourne. In 1986, after fourteen distinguished years as Professor of Medicine at Monash, he was appointed to succeed Austin Doyle as Professor of Medicine at the Austin Hospital, a position he has held until now.

By any criterion, Colin Johnston has had an outstanding career. His particular research interest has been hypertension and cardiovascular physiology. He has authored over 450 papers in leading international journals, supervised thirty-one doctoral students, been a member of the editorial boards of thirteen international journals and been an invited speaker at countless international conferences.

His research achievements and academic leadership have been recognised by many awards including the Franz Volhard Award of the International Society of Hypertension in 1992, the Richard Bright Distinguished Award of the American Society of Hypertension in 1995, the College Medal of the Royal Australasian College of Physicians in 1995, Life Membership of the Australian and New Zealand Society of Nephrology and in 1996 he was made an Officer in the General Division of the Order of Australia.

Colin Johnston's career has been one of outstanding achievement and has been particularly notable for the very major contributions he has made to his discipline and to the two hospitals and two universities which he served with such distinction as Professor of Medicine.

Professor Robert John Shedden Thomas

ROBERT THOMAS graduated from the University of Melbourne with the degrees of MB BS in 1965 and MS in 1990. His initial clinical training was undertaken at the Royal Melbourne Hospital and the Royal Children's Hospital after which he travelled overseas to gain experience, in Birmingham and London in 1971 and 1972, and the Harvard Medical School in 1973.

He returned to Melbourne in 1974 to the full-time post of Senior Lecturer in the University Department of Surgery at the Royal Melbourne Hospital and, in 1992, was appointed as Professor of Surgery in the new University Department of Surgery at the Western Hospital.

Robert Thomas' initial research interests lay in the metabolic and nutritional aspects of surgery and in the treatment of burns. In more recent times, his particular interests have revolved around clinical, epidemiological and, most recently, biological aspects of gastrointestinal cancer. His clinical research has concentrated particularly on the treatment of oesophageal cancer, focusing on the role of photodynamic and laser therapy. He has taken a leadership role in the development of clinical practice guidelines for the management of colorectal cancer, leading a large multidisciplinary group collaborating between the Australian Cancer Network and the NHMRC.

He has made major contributions to the Faculty of Medicine, Dentistry and Health Sciences as Chair of the Examinations Committee for Fourth Year MB BS, and more recently as Chair of the Final Year Examination Committee in Surgery. He has also played a prominent role in the development of the new curriculum for the medical school.

Robert Thomas will retain an active involvement with the University of Melbourne through his new appointment as Professorial Fellow and Director of Surgical Oncology at the Peter MacCallum Cancer Institute.

Experiences of a PBL Tutor in the New Curriculum

Neville Yeomans

Professor of Medicine, Western Hospital

PROBLEM BASED LEARNING (PBL) is one of the cornerstones of the new medical curriculum at Melbourne. In second semester last year, I had the pleasure of tutoring a group in the integrated subject we have called Nutrition, Digestion & Metabolism.

This was my first experience of PBL tutoring and, although I have always derived a lot of pleasure from my teaching, this was the best yet. Two of us (both clinicians) shared a first year group of ten delightful students during the semester's fourteen weeks and twenty-eight tutorials. For those readers who are not sure what is involved, let me take you through a typical week.

We would gather on a Monday at 9 am in one of the well laid out tutorial rooms in the Faculty's new Education Unit. After a few minutes of chat about their weekends (as we waited for all to assemble), the group would tackle the 'trigger' for the week's learning. The 'trigger' is usually a short clinical vignette that will act as the focus for all the learning needed to solve that week's problem. Most incorporate a colour image of the patient, which the group would display on the room's computer connected to the curriculum website. Later in the week, students and staff can access each problem from home via the internet if they wish. As a tutor, I had the luxury of a password that let me see the whole week's problem laid out in advance a few days early. The students had to wait till the week began, and were given access to about half the information on Monday, then the rest at the final tutorial on Friday. A lot of thought, time and expertise has gone into each week's problem–masterminded by Associate Professor Sue Elliott and her Education Unit, and the hard-working multidisciplinary writing teams who put them together.

During the two hours of the Monday tutorial, the students would go through a number of steps–some of which mimic the thought processes of even an experienced clinician faced with a new patient's history of presenting complaint, others of which

are designed to help them realise what they might need to know to solve the problem. They are encouraged to think what extra information–from the history, then physical examination, then special tests–might help them get to the answers. Information about each of these is then revealed after they have thought of what they might need.

For example, faced with a child whose parents came to a doctor worried he was yellow, my group speculated about what might make a baby look yellow, then fairly soon agreed that some at least had heard about something called jaundice. The group thought this arose because of a problem with the liver, and at least one member had heard of a molecule called bilirubin. As more information about the baby was revealed, the group closed in for the hunt. It was clear that the baby did have a high plasma bilirubin. Why might this be so? Where does the stuff come from? What is it chemically? What things might go wrong so that one has too much of it? If the liver has a lot to do with it, we had better learn about the structure of the liver–something we haven't tackled yet–and it's bound to be important. How does the bile normally leave the liver? This baby didn't have any bile in its urine. I thought people who were jaundiced usually do have dark urine (I think that might be due to bile). Why didn't this baby have that?

As more information was revealed on the Monday, it turned out that the parents were particularly concerned about the baby. Mother let drop that she had heard that being badly jaundiced could cause permanent brain damage. The group now had a clue to why the parents had seemed particularly anxious from the outset. One insightful eighteen-year-old said: 'Every parent's aspiration is to have a healthy baby ... they would be worried out of their brain!'. Of course we can see what the PBL designers were doing here–PBL is a tremendous medium for carrying multiple learning objectives, and this was an objective inserted by the planners from the Human Mind and Behaviour stream. Other objectives had come from Anatomy and Cell Biology, Biochemistry and Molecular Biology, Physiology, Pathology, Paediatrics, Obstetrics and Gynaecology, and Clinical Medicine and Surgery.

By 11 am on Monday morning, my group had negotiated a list of what they needed to learn over the rest of the week. The list was theirs. This week, as in other weeks, it showed an uncanny resemblance to the list of learning objectives that the writing team had set down, and which would be revealed to the students only at the very end of the week after they had completed the second and final tutorial. My part had been to 'sit on my hands' as much as possible, so long as they were making headway. It was occasionally to say 'Are we really sure that we know this? What evidence is there? Should we check up on that?' ... or to suggest that maybe we had spent long enough on that section and could we all agree to move on. These were not skills I had automatically, despite more than twenty years teaching in this Medical School. They had been imparted during my obligatory training at the hands of A/Professor Elliott and her team.

During the week, the students had a handful of lectures to give them some circumstantial help with the week's problem. As much as possible we aim for the lectures to deal with broad overviews or particularly difficult concepts–not to produce large amounts of factual information as we sometimes tended to do in the past.

At 11 am on Friday we reassembled. About the first three quarters of an hour was spent by students reporting what they had learned from their week's research on their learning objectives. This is not meant to be a hacking up of the work into ten bites, with different students tackling different parts. The main objectives should be tackled by everyone. They had learned a lot. They knew, in more detail than I remembered, how bilirubin was generated. They had a good conception of how it is normally transported to the liver, conjugated, then excreted in bile. They had discovered for themselves how the enterohepatic circulation works, and had figured out why there was no bile in the urine of this baby. They also had a good overall conception of the major pathologies that can lead to jaundice. More specifically, they had between them an insightful understanding of why this particular baby had been jaundiced at birth, had the jaundice resolve, then become jaundiced again a couple of weeks later. Along the way, they had acquired a fair working knowledge of the normal anatomy and histology of liver and biliary tree.

The educational literature abounds with evidence that something learned is remembered, while something taught is often forgotten. I am a total convert, and will find the time to tutor in Semester Two again.

Problem Based Learning in the new facilities at the medical school

AUSTIN AND REPATRIATION MEDICAL CENTRE AND NORTHERN HOSPITAL

EMMA MAGRATH was the Austin and Repatriation Medical Centre/Northern Hospital Clinical School's top student in 1999. She finished equal fifth in the year and was awarded a first class honours degree along with Deborah Amott. Other outstanding students were James Gledden who received a first class honour in medicine and Benjamin Miller who was awarded a first class honour in surgery. The Clinical School would like to congratulate all seventy graduates and wish them every success in the future.

The most significant issues faced by the Clinical School in 1999 were the introduction of the new undergraduate medical curriculum and the uncertainty surrounding the previous State Government's plan to privatise the Austin and Repatriation Medical Centre. Innovations included a new communication skills course for fourth year students and an improved system of tutor and student assessment. Dr Barbara Goss was awarded the title of Clinical Sub-Dean, a belated recognition of her contribution to undergraduate medical education at the Austin and Repatriation Medical Centre. Also, the Clinical School was inspected by the Australian Medical Council as part of the School of Medicine's successful application for re-accreditation of the remaining years of the old curriculum.

Last year was our first year of the new curriculum. During semester one approximately sixty first year students rotated through two placements at the Austin and Repatriation Medical Centre, Northern Hospital, Bundoora Extended Care Centre and consultants' private rooms. In semester two, two groups of thirty-five students attended the Austin and Repatriation Medical Centre and Northern for a total of six placements each over twelve weeks for tuition in history taking and physical examination. Clinical School staff played significant roles in the development and introduction of the new curriculum; as members of the Clinical Skills Task Group responsible for the subject 'Introduction to Clinical Medicine', the Professional Attitudes and Development Task Group, and the Principles of Biomedical Science Coordinating Group for semester two. In addition to these commitments we are accommodating another eighty-ninety students in semesters three and four for clinical placements this year.

The 'Introduction to Clinical Medicine' program for third year students in the old curriculum was scaled down this year; one third of the year attended the Austin and Repatriation Medical Centre for a three week program in the second half of the year. Each week the students attended a clinico-pathological conference, followed by a bedside tutorial. Next year will be the last year of this program.

The basic structure of the fourth year program has not changed, beginning with an introductory two week period followed by four medical and surgical terms, one based at Albury, Bendigo or Wangaratta Hospital. Students were attached to general medical units for two of these terms and to general surgical units for the remaining two terms. There were three review weeks during the year to help students to consolidate their knowledge and a number of trial exams to provide formative assessment.

Fourth year clinical teaching was based mainly in the wards of the medical centre with a lecture program complementing the clinical tutorials. Pathology, radiology and clinical pharmacology were integrated into the medical and surgical teaching program. The pathology examination was discontinued this year but pathology questions were included in the two written papers and in the OSCE (objective standardised clinical examination). All students completed an Advanced Study Unit. Each fourth year student was attached to the Accident and Emergency Department for two weeks and also received two weeks of geriatrics teaching, either at Bundoora Extended Care Centre or at the Repatriation campus of the Austin and Repatriation Medical Centre.

The major innovation in the fourth year program last year was a communication skills module developed by Clinical School staff with the assistance of the Centre for Cultural Studies in Health, the Centre for Communication Skills and English as a Second Language, and the Faculty Concurrent Support Team. The module comprised two video-based lectures, three tutorials, assessment of a videotaped patient interview and additional tutorials for students who were found to have language or other communication difficulties. Students took part in role plays of clinical situations which included significant barriers to communication or issues of confidentiality such as sexual preference and recreational drug use. A blinded assessment of students' communication skills during a trial OSCE examination demonstrated a statistically significant superiority for the students who had completed the tutorials. Invaluable additional language and communication support was provided by Mr Alan Roberts from the Centre for Cultural Studies in Health.

Fifth year students spent much of the academic year away from the Medical Centre on paediatrics and obstetrics & gynaecology rotations at the Royal Children's and Mercy Maternity Hospitals, and on a community medicine rotation, which is coordinated by the University of Melbourne Department of Community Medicine and General Practice. The remaining fifth year rotation, psychiatry, is partly based at the medical centre, attached to the Department of Psychiatry.

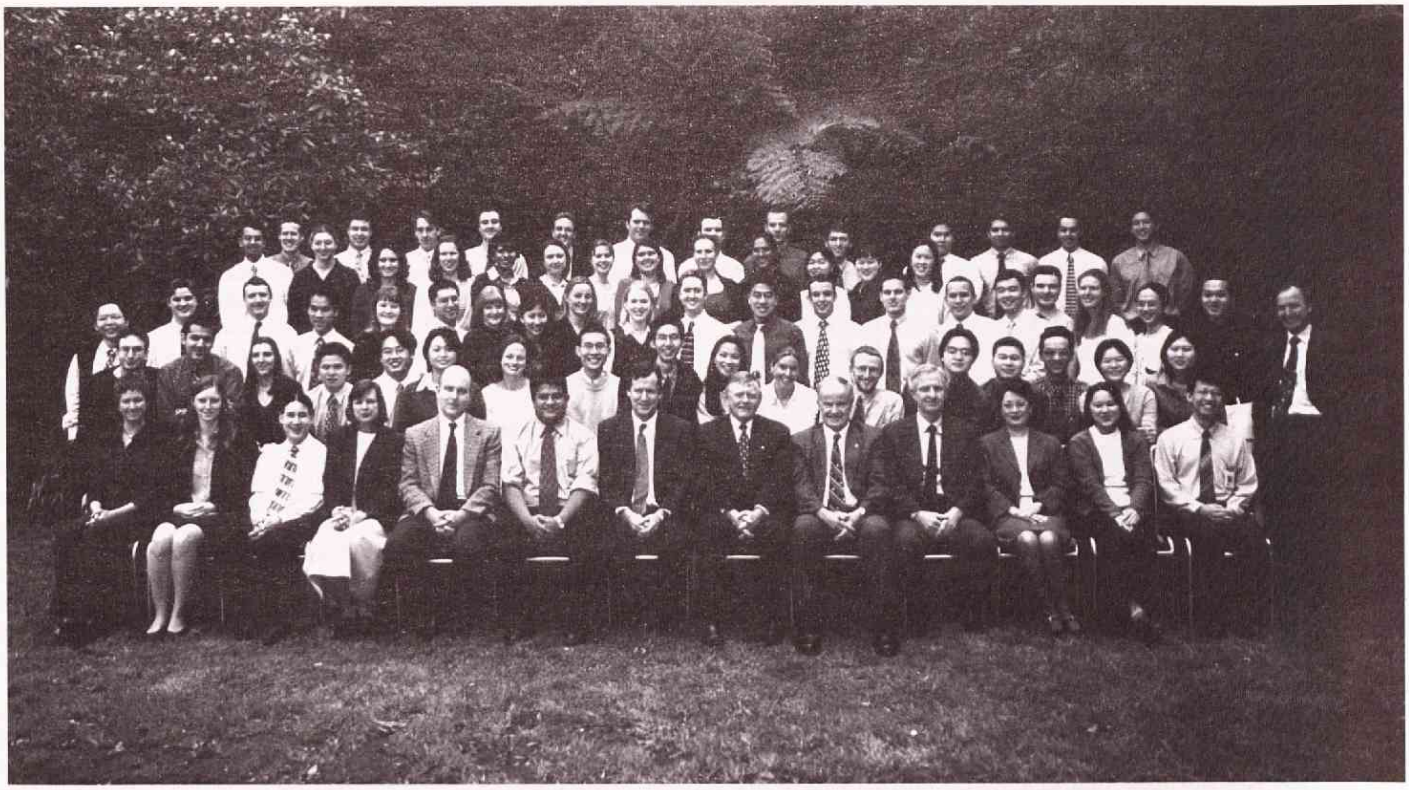
Austin and Repatriation Medical Centre/Northern Hospital Clinical School students ventured to most parts of the globe and were exposed to an enormous range of medical settings during the elective term between fifth and sixth year. A total of thirty-six students from Europe, Asia, North America and other parts of Australia were placed in departments at the Austin and Repatriation Medical Centre and at the Northern Hospital.

As in past years, final year was divided into four equal terms; general medicine, general surgery, medical specialties and surgical specialties. Students on general medical and general surgical rotations spent three days of each week at the Northern Hospital, with most of their lectures and seminars held at the Austin campus on the remaining two days. The medical and surgical specialty terms were based at the Austin and Repatriation Medical Centre. Anaesthetics and emergency department rotations were included in the surgical specialty term with some emergency medicine teaching based at the Northern Hospital. The most significant change to the sixth year program this year was a reorganisation of the medical specialties term which allowed students to be taught by the same tutors for the entire term. It is very pleasing that student feedback on this term was significantly better than in previous years. The final year program was coordinated by Dr Dharsh Fernando with significant help from Mr Bill Fleming and Associate Professors Hamish Ewing and Bruce Jackson. Final year students voted Associate Professor Ewing as the best teacher of their clinical years.

In response to requests for better feedback, tutors' end of term assessments were routinely passed on to fourth and sixth year students this year. A similar policy has been adopted for the students' assessments of lecturers and tutors, which will be submitted electronically this year and then forwarded anonymously to the teachers. To date responses to these changes have been very favourable, particularly from students.

Despite increasing difficulties faced by the Clinical School and its associated hospitals in providing adequate clinical exposure for all of our students, it is very gratifying that our teachers have retained their enthusiasm and commitment. The introduction of the new curriculum and the State government's decision to redevelop the Medical Centre as a public hospital have both contributed to a sense of optimism and renewal which I believe will be translated into tangible benefits for undergraduate education over the next few years.

Brendan Crotty
Clinical Dean



Austin and Repatriation Medical Centre and Northern Hospital Clinical School Final Year 1999

Back row L-R: Finn Romanes, Scott Baker, Piers Canty, Patrick Cooney, James Gledden, Ben Miller, Kristian Bulluss, Ben Campbell, David Shilson, Stephen Hur, Scott Chapman, Dean Trotter, Tim Goh. **Fourth row L-R**: Gautum Vaddadi, Deborah Niproski, Dorothy Kesarios, Karen Aarons, Sangeeta Dhara, Michelle Clonan, Sally Cockroft, Emma Magrath, Francesca O'Neill, Kasha Singh, Lea Foo, Ivy Poon, Chia-Ching Chang. **Third row L-R**: Edward Wong, Patrick Duane, Daniel Lane, Timothy Lee, Amy Jones, Senen Gonzalez, Helen Schultz, Sheena Gune, Sarah Condron, Bronwyn King, Luke Burchill, Eldon Mah, James McMahon, Scott Patterson, Justin Wong, Louis Lee, Max Kupershmidt, Kristine Gilbert, Pee Yau Tan, David Chiang, Professor W Louis. **Second row L-R**: Kerryn Rubin, Rishi Mehra, Inese Tucker, Hok Ming Lee, Kenneth Cheng, Keat Yee Low, Kathryn Roberts, Liang Kim Leow, Kok-Meng Liew, Michelle Chan, Kirsty Walsh, Tim McIver, Aloysius Law, Hong Neang, William Chen, Jamie Phang, Michele Seah. **Front row L-R**: Debbie Amott, Patricia Walker, James Pang, Mrs J McNeill, Dr D MacGregor, Dr D Fernando, Associate Professor B Crotty, Professor G Burrows, Professor R Smallwood, Professor K Hardy, Mrs R Poon, Emily Hii, Ivan Ngeow. **Absent**: Dr B Goss, Edmund Neoh, David Tickell.

The Royal Melbourne Hospital and Western Hospital

THE STRUCTURE OF THE COURSE at the RMH/WH Clinical School was similar in 1999 to that in previous years. Of their four terms the fourth year students spent two terms at the Royal Melbourne Hospital, one term at Western Hospital, and one in the country, either at Ballarat, Wimmera or Wangaratta. Each term involved the attachment of a group of students to a general medical or surgical unit, with most of the clinical instruction given by the membership of the unit. However, supplemental specialty teaching also occurred. This use of our clinical resources has worked well over the last few years, and we plan to continue this broad structure of the fourth year program in 2000. However, we are already planning for the introduction of the new curriculum to the clinical years in the second semester of 2002, and will implement some of the planned changes earlier than 2002 if possible.

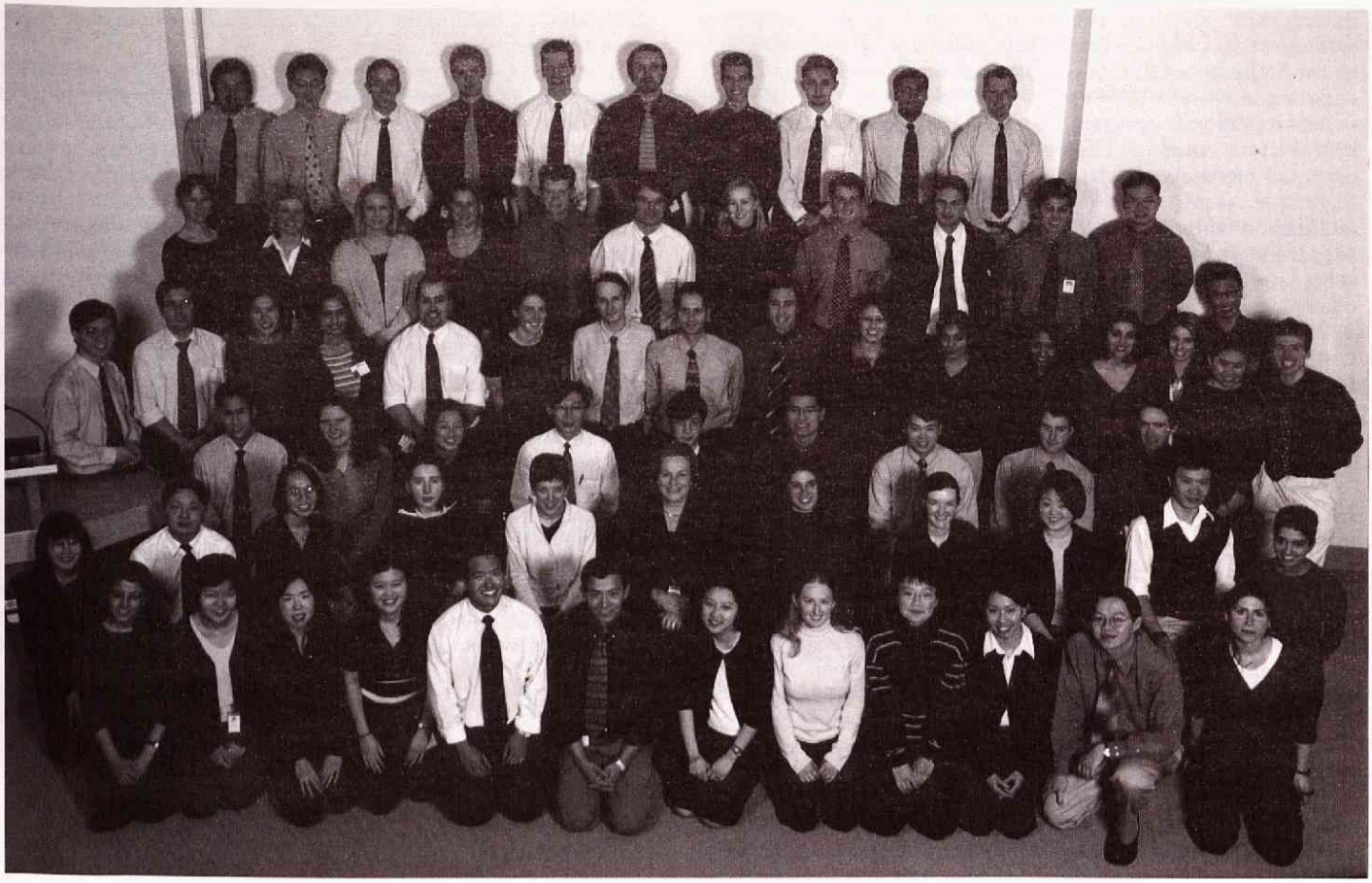
Our sixth year program has also been similar to that in previous years, with students spending roughly half their time in general medicine and surgery, and half their time in specialist medicine and surgery. Included in surgery is three weeks of anaesthetics and emergency medicine. The specialty terms are spent at the Royal Melbourne Hospital but the general medical and surgical terms are split between Royal Melbourne Hospital, Western Hospital, and Ballarat Hospital. In the general terms the students function as student interns within the general surgical and medical units. Again, this use of our clinical resources seems to work well, and it is planned for it to broadly continue in 2000.

The new curriculum was introduced to first year in 1999, and the clinical schools participated in the introduction of the new students to clinical method during both semesters, but particularly the second. Whilst this put an extra load on both the administrative and clinical resources of the Clinical School, it was immediately apparent that the students were gaining an enormous benefit from such early clinical exposure. We look forward to the implementation of the new curriculum into the second year of the course in 2000.

The uncertainties in the healthcare networks continues to make long term planning difficult, but as long as we in the clinical school are vigilant and ensure we know the changes that are occurring, we can ensure that our students still gain the best possible clinical experience.

Finally, I should note that I was absent for most of 1999, assisting in a project to develop postgraduate education at the Fiji School of Medicine. In my absence, Christine Penfold acted as Clinical Dean, and it is a great tribute to her and the other staff that the Clinical School continued to function extremely well.

Robert WF Moulds
Clinical Dean



The Royal Melbourne Hospital and Western Hospital Clinical School Final Year 1999

Front row L-R: Upasana Kapadia, Emily Tse Lin Ho, Cynthia Siu Wai Lau, Jean Shwu Chin Woo, Alex Hua Meng Tan, Quang Minh Long Phan, Theresa Phong Trinh, Kaye Bowers, Sze Yee Yang, Wai Yan Yip, Teik Beng Phung, Limor Theedar. **Second row L-R**: Kyra Yu Lin Chua, Andrew Kwan Ming Cheong, Grace Li Shan Kam, Amelia Le Page, Marina Demetrios, Dr Christine Penfold (Acting Clinical Dean), Linda Stiglitz, Robyn Turnbull, Nancy Hyun Soo Suh, Huu-Phuong Pham, Priya Sumithran. **Third row L-R**: Tsien-Fei Fua, Marylyn Varga, Tanya Yuen, Liang Yuan Ling, Kheng-Siang Ong, Raymond Tong, Francis Yuk Pang Ma, Graham Lethbridge, Philip Smart. **Fourth row L-R**: Yee Lin Chaung, Simon Bolch, Nghi Thi Tieu Le, Parvin Chaal, Mark Lavercombe, Tina Shattock, Michael Dodson, Michael Isaac, Doug Johnson, Winnie Wing-Wai Cheung, Niro John, Anita Skandarajah, Yalda Riazi, Debbie Apostoloudas (Administrative Assistant), Darren Hong Sing Lee, Sok King Ong, David Alexander. **Fifth row L-R**: Hannah Pringle, Molly House, Alina Yaremenko, Lucinda Smith, Ken Davey, William Wilson, Rebecca Telford, Luke Wilson, Wesley Thevathasan, Tee Joo Chua, Stephen Wai-Yip Chan. Sixth row L-R: Robert Veljanovski, Yu Jo Chua, Daniel Steinfort, Conrad Bishop, Toby Syme, Ronen Gurvitch, David Bramley, Bruce Garbutt, Ravindran Appu, Nicholas Simpson. **Absent**: Angela Catanzariti, Stuart McDonald, Mark Michalski, Justine Nielsen, Tri Nguyen, Jocelyn Shand.

St Vincent's Hospital and the Geelong Hospital

LAST YEAR SAW the implementation of the first major changes in the new MB BS curriculum, which has extended the role of the clinical schools, integrating clinical training into the curriculum throughout the course. While welcoming this innovation, adapting the facilities in terms of patient access, teaching resources and personnel proved challenging, particularly during this overlap period of the old and new curricula. Coupled with the problems caused by short stay of inpatients and day of surgery admission experienced by all teaching hospitals, our teaching resources have been fully stretched. However, the enthusiasm and commitment of our clinical teaching staff have enabled us to maintain our high standards and provide a comprehensive clinical education program for our students who had a satisfying and successful year.

In 1999, there were seventy-two students in the final year, which began with an eight week elective period. Students working away from their Melbourne base found their elective experience very rewarding, especially those who took the opportunity to undertake clinical work in third world countries.

Final year medical rotations were similar to previous years with students spending four weeks attached to a general medical unit at St Vincent's Hospital or at The Geelong Hospital and ten weeks rotating through the medical sub-specialties.

The final year teaching program in clinical pharmacology has been expanded to incorporate an increased interdisciplinary component. The infectious diseases program has been consolidated with the participation of an increased numbers of clinicians at St Vincent's Hospital as well as HIV clinical experience at the Alfred Hospital.

Small groups of final year students have, for the first time, had the opportunity to spend a four week term in general surgery at the Echuca Hospital, which has been a great success. Students particularly appreciated the excellence in teaching, clinical exposure and personal interest of their teachers. Students also rotated from Geelong to the Colac Hospital where they had a similar positive experience.

A significant change in the psychiatry teaching program has been the incorporation of clinical teaching at the Geelong campus which has been beneficial in broadening the spectrum of clinical experience for our students. Also, while they are at St Vincent's Hospital, students are rostered in pairs, to live in for on-call liaison experience during their psychiatry term. Because of localisation of units specialising in certain psychiatric

disorders at hospitals remote from our teaching campuses, arrangements have been made for students to attend units such as the Melbourne Clinic to supplement their general psychiatry experience.

The fourth year program began with an intensive three week introductory course in clinical method, which emphasised the essential elements of history taking and clinical examination technique. As part of the course, students undertook a series of lectures on communication skills and interview assignments to prepare them for patient clerking. The newly developed clinical skills area has been an invaluable resource during this intensive clinical training program.

After the introductory course, students were rotated through two medical and two surgical terms, which included tuition in sub-specialty areas.

The teaching of communication skills using student-patient video interviews was delivered throughout term one under the supervision of experienced clinicians.

Our clinical ethics program has again been a great success. An increase in our teaching staff enabled us to include more formalised introductory sessions and group discussions of an ethical issue in a clinical setting.

All students rotated to the Geelong Hospital for one term and they also had the opportunity to undertake a rural rotation at either the Goulburn Valley Base Hospital/Echuca Hospital or the Warrnambool and District Base Hospital. These rotations provide good patient access and experience in a wide variety of common, important disorders. The clinicians at these hospitals are enthusiastic and effective teachers and many have strong links with St Vincent's Hospital.

The University's Concurrent Support Unit has been invaluable in providing ongoing support for students from a non-English speaking background who sometimes experience difficulties in making the transition from the pre-clinical to the clinical patient-based setting.

The third year introductory clinical program was conducted along similar lines to previous years but was curtailed to three afternoon sessions, students rotating to different clinical schools on each occasion. Though useful for students as an aid in making their choice of clinical school, this system of rotating students was less satisfactory from the viewpoint of continuity.

The Clinical School has participated actively in the first year Introduction to Clinical Medicine during semesters one and two. We were impressed with the enthusiasm and rapid acquisition of communication skills in our students, who enjoyed their clinical experience enormously and contributed actively and effectively in their tutorial sessions.

We are delighted to report the excellent achievements of our final year students all of whom were successful in their examinations. Kathyrn Field was placed top of the year in the course aggregate and also gained first place in Medicine. Eight of our students were awarded first class honours in Medicine including Adam Testro who was also top in Surgery. Five students were awarded first class honours in Surgery, and six students were awarded Dean's Honours for excellence in their final year. Four of the five students awarded the MB BS degree with first class honours were from our Clinical School.

We congratulate all the 1999 graduates and wish them well in the future.

It is to the great credit of our enthusiastic teaching staff that we are able to maintain our high standard of clinical medical education. Their willingness to teach and their commitment to our students is most highly valued.

Wilma Beswick
Clinical Dean

St Vincent's Hospital and The Geelong Hospital Clinical School Final Year 1999

Back row L-R: Simon Mitchell, Michael Lim, Su-Wen Loh, Lyndon Siu, Johanna Lenaghan, Shuat Nee Ch'ng, Elaine Lui, Katherine Ong, Saar Gill, Patrick O'Brien, Nicholas Crump, Michael Borschmann, Adam Testro, Rachel Wong, Anita Phillips. **Fourth row L-R**: Ming Yann Lim, Jonathan Marriott, John Rophael, Simon Ling, Lucinda Thorley, Vicki Wang, Yi Shi Wang, Ching Sim Ng, Carmen Dang, Jo McCutcheon, Roslyn Newman, Saman Gardiya-Punchihewa, Suzi Nou, Jocelyn Snelleman-Howell, Hans Tu, Lee Hooi Lim, Jong Min Ong. **Third row L-R**: Weng Toon Ng, Peter Simm, Kok Ren Lim, Cameron Shaw, Suzanne Mahady, Catherine Oakman, Sam Mehr, Alex Tan, Shen Yang Lim, Luke Chen, Karen Donaldson, Kathryn Field, Caroline Sharpe, Choon Chieh Tan, Gavin Tang. **Second row L-R:** Ree Nee Tiam, Lynn Lim, Lyndal Peake, Hang Quach, Vanida Na Ranong, Caroline Jung, Lynn Hong, Bee Ngo Lau, Lorraine Ong, Joan San, Winnie Li, Jenny Hoang, Kathy Rush, May Lin Lee, Shu Fen Ho. **Front row L-R**: Ben Coghlan, Mark Dawson, Miriam Solomons, Dr Jacqueline Walters, Jason Harney, Associate Professor Wilma Beswick, Ben Cook, Matthew Matusik, Yi Yuen Wang, Anne Parsons, Belinda Campbell. **Absent**: Brett Coleman, Bobby Sundaralingam, Cung Tran.

Higher Degrees and Diplomas Conferred 1999

DOCTOR OF PHILOSOPHY (1948)

Wayne Lee Adcock, BAppSc *Swinburne UT* – Microbiology and Immunology

Susie Janet Allanson, MA – Women's Health

Jane Elizabeth Andrews, BSc *Q'ld & Melb* – Paediatrics

Daphne Helen Anthony, BSc *UK*, MHumNutr *Deakin* – Paediatrics

Maria Atlas-White, BSc – Obstetrics and Gynaecology

Jeffrey James Babon, BSc – Paediatrics

Emma Margaret Anne Ball, BSc – Medicine

Birgit Maria Beisner, BSc – Microbiology and Immunology

Sally Roberta Mckenzie Bennett, *BSc Monash* – Medical Biology

David Nicholas Bowser, BSc – Physiology

Warrick James Brewer, MA – Psychiatry

Caroline Mary Burge, MAppSc *Victoria UT* – Physiology

Meroe Madeleine Cahill, BSc – Anatomy and Cell Biology

Siun Patricia Campbell, BSc – Physiology

Sofia Celic, BSc *Monash* – Medicine

Linus Bu Foo Chang, MSc *Flin*, BSc *Tas* – Biochemistry and Molecular Biology

Kallayanee Chawengsaksophak, BSc *Thailand*, GradDipBiotech – Anatomy and Cell Biology

Yu-Yen Yvonne Chen, BSc *Taiwan* – Biochemistry and Molecular Biology

Amander Therese Clark, BSc – Anatomy and Cell Biology

Amanda Hilarie Clarke, BSc *LaT* – Medicine

Angela Joy Cosgriff, BSc – Microbiology and Immunology

Sarah Jane Dunstan, BSc *Monash* – Microbiology and Immunology

Darren John Fernandes, BSc – Pharmacology

Catherine Joy Fitzmaurice, BSc – Microbiology and Immunology

Samantha Flanders, BSc – Pharmacology

Geraldene Corrin Fleishman, BSc *Monash* – Obstetrics and Gynaecology

Jacqueline Marie Gad, BSc – Surgery

Timothy Gainsford, BSc *WAust* – Medical Biology

Katrina Anne Goodge, BSc – Medicine

Natalie Anne Hardie, BSc, GradDipAud – Otolaryngology

Darren William Harris, BAppSc *LaT*, BA *Swinburne* UT – Medicine

Catherine Jane Hearn, BSc – Paediatrics

Belinda Anne Henry, BSc, GradDipAudiol– Otolaryngology

Timothy David Hewitson, BSc *NZ* – Pathology

Rebecca Justine Heyes, BSc – Medicine

Christopher Martin Hovens – Surgery

Peter Iliades, BSc – Biochemistry and Molecular Biology

Bernard Infield, MB BS – Medicine

Ukwatte Liyanage Rajiv Jayasena, BSc *Monash* – Pathology

Poonam Jeetun BSc, MB BS, MS – Obstetrics and Gynaecology

Vicky Kartsogiannis, BSc – Medicine

David Wicher Keizer, BSc – Biochemistry and Molecular Biology

Kim Ronesta Kingston, BA *LaT*, BLitt – Psychiatry

Nectarios Klonis, BSc – Biochemistry and Molecular Biology

Simon Andrea Koblar, MB BS *Flin* – Medical Biology

Christina Koniaras, BSc – Medical Biology

Terry Kwok, BSc – Biochemistry and Molecular Biology

Marc Bernard Lanteri, MB BS – Pathology

Victoria Alice Lawson, BSc – Microbiology and Immunology

Catherine Elizabeth MacPhee, BSc – Biochemistry and Molecular Biology

Shehnaaz Sadrudin Mohamed Manji, BSc, *LaT* – Medicine

Joe Anthony Marinaro, BSc – Medicine

Kelly Fia Maxwell, BAppSc *Q'ld* – Pathology

Damian John McColl, BSc – Medical Biology

Julie Anne McKenzie, AssDipAppBiol, BSc *RMIT*, MSc *Syd* – Pathology

Merhi Merhi, BSc – Medicine

Ingrid Moeller, BSc – Medicine

Michael Montalto, MB BS – General Practice and Public Health

Carmelina Murone, BAppSc *RMIT* – Medicine

Harshal Nandurkar, MB BS *Bom* – Medical Biology

Amanda Jane Nicoll, MB BS – Medicine

Caroline Ojaimi, BSc – Biochemistry and Molecular Biology

Joseline Ojaimi, BSc – Pathology

Joseph Bernard O'Sullivan, BSc – Physiology

Roula Papadopoulos, BSc – Pathology

Steven Petratos, BSc – Pathology

Nikolai Petrovsky, BMedSc, MB BS *Tas* – Medical Biology

Normand Pouliot, BSc, MSc *Can* – Surgery

David Andrew Prentice, BMedSc, MB BS *Monash* – Medicine

Jeffrey John Presneill, MB BS *Q'ld* – Medicine

Janet Eleanor Pritchard, MSc *WAust*, BSc *Syd*, DipEd *Vic* – Medicine

Wayne Andrew Rankin, BAppSc *RMIT* – Medicine

Georgia Rekaris, BSc – Paediatrics

Kurt Laurence Rickard, BSc – Medicine

Steven Philip Rockman, BAppSc *RMIT*, MSc – Pathology

Evangelos Romas, MB BS – Medicine

Chrishan Surendran Samuel, BSc *Monash* – Paediatrics

Termboon Sangkabutra, MSc *Thailand* – Surgery

Ingrid Eileen Scheffer, MB BS *Monash* – Medicine

Cameron Paul Simmons – Microbiology and Immunology

Gino Rene Somers, MB BS, BMedSc *Monash* – Pathology

Petra Karin Staiger, BSc *Monash* – Psychiatry

Janette Tenne-Brown, BSc *Deakin* – Anatomy and Cell Biology

Mary Tolcos, BSc – Anatomy and Cell Biology

Ian Andrew Trounce, BSc – Medicine

Tran Trung Tran, BSc, GradDipCompSc – Medicine

Richard Johannus Mathildes Van Hoesel, BE *Monash* – Otolaryngology

Wendy Joan Vanselow, BEd *LaT*, MB BS – Psychiatry

Thanh Liem Vo, BA, BSc *Monash* – Pathology

Jason David White, BAppSc *CSturt* – Medicine

Sarah Louise White, BSc – Paediatrics

Andrew James Wilson, BSc – Medical Research - Gastroenterology

Kirilee Ann Wilson, BSc – Medicine

Feng Yan, MB BS, MMI *PRC* – Physiology

Jim Wancheng Zeng, MB BS, MMed *PRC* – Medicine

HONORARY DOCTOR OF MEDICINE

Alfred James Pittard, PhD *Yale*, DipPharm *VicCollPharm*, DSc, FAA

DOCTOR OF MEDICINE (1862)

Robert George Berkowitz, MB BS
Christopher Francis Bladin, MB BS *Flin*, BSc
Anne Elizabeth Buist, MB BS *Monash*, MMed
Christine Pamela Burren, MB BS
Catherine Seut Yhoke Choong, MB BS
Kerrie Clarke, MB BS *Monash*
Alexander Thomas Cohen, MSc *Lond*, MB BS
Anthony James Costello, MB BS
Peter David Danne, MB BS
Michael Ian Dorevitch, MB BS
Jennifer Roselind Dowd, BMedSc, MB BS
Yun-Bo Duan, MRadMed *PRC*
Anthony John Harling Hall, MB BS
Nerina Susan Harley, MB BS
Rodney John Hicks, MB BS *Monash*
Anne Maree Kelly, MClinEd *UNSW*, MB BS
Petrova Shai Ping Lee, MB BS
Catriona Anne McLean, BSc, MB BS
Jamal Merei
George Ostapowicz, BMedSc, BMed *N'cle (NSW)*
Patrick Joseph Robert Power, MB BCh, DCH *Dub*
Belinda Claire Smith, MB BS
Friederike Charlotte Maria Viet, MB BS
Melissa Anne Wake, MB ChB, DipObst *NZ*, DCH *Glas*, GradDipEpid&Bio
Xin Zhou Zhang, BMed, PhD *PRC*

MASTER OF SURGERY (1885)

Michael Yii Yang Yong, MB BS

MASTER OF MEDICINE (1983)

James Frank Bishop, MB BS, MD
Mark Gerard Johnson, BHB, MB ChB *Auck*
Richard Morris Knafelc, MB BS
Vahid Payman, MB BS
Geoff Thompson, MB BS
Denis Velakoulis, GradDipArts *Crim*, MB BS
Carolyn Mary Ward, MB BS, BSc

PAEDIATRICS

Najib Advani, MD *Indon*
Martha Fadziso Mherekumombe, MB BS *Z'bwe*
Dande Hikuulu Malawo

PSYCHIATRY

Laura Marie Cooney, MB BS

WOMEN'S HEALTH

Shastra Naidu, MB BS *Monash*, GradDipWomHlth
Tupou Waqaruakitoga Tebete Wata, MB BS *SPac*, GradDipWomHlth

MASTER OF WOMEN'S HEALTH (1995)

Jennifer Robyn Alden, BSc *Monash*
Jennifer Ruth Daddow, BA *LaT*
Karin Hammarberg, BSc *Swed*, GradDipWomHlth
Faye Janice Hector, GradDipWomHlth
Assunta Elena Margaret Hunter, BA *ANU*
Julia Margaret Newman, BSc
Jo-Anne Rayner-Smith, BNurs *RMIT*, GradDipWomHlth
Jocelyn Dianne Snow, PGradDipWomSt *VUT*, PGradDipMovDan
Vikki Sorelle White, BA *Monash*

MASTER OF AUDIOLOGY (1997)

Melissa Pasqualina Liburti, BSc *Monash*, GradDipAud
Jacinta Maree Pearce, BSc, GradDipAud
Christine Poulis, BSc, GradDipAud
Susan Margaret Quinn, BSc, GradDipAud

MASTER OF PUBLIC HEALTH (1997)

Francis Paul Arduca, DipVen *Monash*, MB BS
Monica Anne Bensberg, BAppSc *Deakin*
Mary Margaret Connellan, BAppSc *Deakin*
Helen Suzanne Cox, BSc
Michael Patrick Furey, BPharm *VicCollPharm*
Catherine Ellen Marjorie Harmer, GradDipBehHlthCare *LaT*, BA
Jane Simone Hocking, BAppSc *RMIT*
Maria Karvelas, BAppSc, AssocDipAppBio *RMIT*
Michelle Anna Kermode, BA *Macq*, MNurSt *LaT*
Lee Long Kit, BNurs *N'cle (NSW)*
James Hugh MacMillan, BSc *Qu*, MSc *McM&Car*
Kay Lynette Mills, BAppSc, GradDipHlthProm *LaT*
Traci Leung Po-Yan, BA *HK*
Robyn Ann Smith, BAppSc, GradDipGeron *LaT*
Christine Anne Stone, BAppSc *RMIT*, GradDipEpidBio
Qing Yi, BMed *PRC*
Jianyi Zhang, MD *PRC*, GradDIpMedLabTech *RMIT*
Yeqin Zuo, BMed *PRC*

GRADUATE DIPLOMA IN ADOLESCENT HEALTH AND WELFARE

Jamie Margaret Daly, Debora Maria de Hoogd, Michael David Freedman

HEALTH STUDIES

Narie Elizabeth Anderson, Jan Christine Backman, Karen Mary Butterworth, Rodney David Chisholm, Ian Charles Clark, Leanne Crome, Bronwyn Barbara Dixon, Janet Elizabeth Evans, Fiona Louise Fitzgerald, Heather Diane Hawkins, Anna Mary Hoskin, Sally Jamieson, Wendy Joy Jeffree, Mary Elizabeth Jenkins, Janet Leslie, Ron Mitrovski, Deshnee Moodley, Jacqueline Ann Morphy, Anne Christine Munro, Joan Juanita Rayner, Donna Richards, Geoffrey Campbell Scott, Phillip John Sherry, Angela Estelle Steele, Denise Elizabeth Stranger, Christine Vay, Sally Margaret Walker, Bruce Raymond Wilson

GRADUATE DIPLOMA IN AUDIOLOGY

Chris Ivanidis, Shin-Shin Lim

GRADUATE DIPLOMA IN AUDIOLOGICAL SCIENCE

Nihal Altintas, Emma Louise Cotterill, Leonie Maree Fewster, Alexander Gouralnik, Danielle Maree Hartland, Eric Henry Hodgens, Lisa Thy Hue, Mary-Ann Law, Caroline Jane Ling, Lisa Gaye McCormick, Katrina Frances McInnes, Nicholas Joseph Modrovich, Michelle Dominique Moreira, Fiona Jane Power, Linda Catherine Ronalds, Michelle Szlezynger, Sylvia Tari, Geraldine Marina Todd

GRADUATE DIPLOMA IN BIOTECHNOLOGY

Shilpa Agrawal, Wesley David Black, Elizabeth Anne McRobert, Dale Fergus Murphy, Brendan John Nugent, Marzena Walkiewicz, Angelo Michael Zaia

GRADUATE DIPLOMA IN DRUG EVALUATION AND PHARMACEUTICAL SCIENCES

Paul Angel, Virginia Helen Bear, Michelle Jane Dawson, Helena Wanda Dickenson, Heather Jocelyn Kidd, Leanne Nicole Thomas

GRADUATE DIPLOMA IN EPIDEMIOLOGY AND BIOSTATISTICS

Donna Rose Campbell, Fiona Jane Clay, Suzanne Douglas, Adrian John Dunlop, Sharon Ruth Goldfeld, Anne Frances Hope, Frances Lentini, Pamela Maud Mamers, Lis Junita Margiano, Irene Bee Khim Ng, Therese Ellen O'Loughlin, Marie Vera Pirotta, Franklin Pond, Michaela Riddell, Lynda Ann Ross, Karen Louise Smith, Jasmine Vendargon, Susan Philippa Walker

GRADUATE DIPLOMA IN GENETIC COUNSELLING

Tarli Leanne Bogtstra, Tanya Margaret Hagan, Nola Louise Horne, Eilis Marie Hughes, Elizabeth Kay Oke, Vicki Maree Petrou, Alison Judith Thornton, Margaret Kaye Trembath

GRADUATE DIPLOMA IN MENTAL HEALTH SCIENCES

Glen Charles Bevern, Doris Brett, Meddwyn Coleman, Anastasia Soula Contos, Irvin Christopher De Jong, Lauren Dwyer, Anne Estelle Fyffe, Robert Ernest Carter Holmes, Allison Keir, Peter Johannes Kremer, Sandra Jeanette Lorensini, Dianne McNamara, Jodi Power, Marcella Carmel McMahon Reiter, Anna Sfyris, Craigon Bruce Teague, Catherine Joy Wagner

INFANT AND PARENT MENTAL HEALTH

Helene Fitzmaurice Bell, Susan Jennifer Crook, Tricia Maree O'Neill, Diane Mildred Robinson, John Graham Rogers, Andrew Gordon O'Shea Stewart, Andrew Mark Walker, Robin Jean Wilson

POSTGRADUATE DIPLOMA IN PALLIATIVE MEDICINE

David Ashley Brown, Alexandra Leslie Burke, Raymond John Carne, Roberto Celada, Stephen Denton, Mark Jeffrey Deuble, John Francis Eather, David Leigh Ellis, Jorge Angel Gerzenstein, Stuart Bruce Haynes, Louisa Hope, Paul Vernon Jenkinson, Jurate Kantvilas, Vedantam Sampath Kumar, Philip George Lee, Peter Martin, Margaret Honor McGarrity, Joanne Maree McKeown, William Patrick Meagher, Paul Desmond O'Dwyer, Jennifer Anne Marshall Philip, Peter Poon, David Thomson Rogers, Gillian Rothwell, Simon Talbot Wertheimer, Michelle Ann White, Ross Ian White

GRADUATE DIPLOMA IN WOMEN'S HEALTH

Elizabeth Mary Dean, Karen Jansen Ditty, Noriko Fujimori, Lisa Naomi Johns, Hiroko Kimura, Hau Wai Grace Man, Heather Jean McKay, Maxine Jill Rosset, Masako Susai, Katsue Yoshioka

MB BS GRADUATES 1999

BACHELOR OF MEDICINE (1862) AND BACHELOR OF SURGERY (1879)

Karen Julia Aarons, David Nicholas Alexander, Ravindran Appu, Conrad Vickery Bishop, Michael Eric Borschmann, Kaye Amelia Bowers, David Edmund Piers Bramley, Kristian John Bulluss, Luke James Burchill, Belinda Anne Campbell, Piers Damien Vereker Canty, Angela Catanzariti, Shuat Nee Ch'Ng, Parvinder Kaur Chaal, Stephen Wai-Yip Chan, Chia Ching Chang, Scott Jeffrey Richard Chapman, Yee Lin Chaung, Jun Hua Chen, Kenneth Kin-Fai Cheng, Jun Hua Chen, Kenneth Kin-Fai Cheng, Andrew Kwan Ming Cheong, Winnie Wing-Wai Cheung, David Ting-Wei Chiang, Tee Joo Chua, Sally Anne Cockroft, Benjamin John Coghlan, Sarah Katherine Condron, Patrick James Cooney, Carmen Bao Gai Dang, Ken Stuart Davey, Marina Demetrios, Gauri Sangeeta Dhara, Karen Martha Donaldson, Patrick Leo Duane, Lea Lee Foo, Tsien-Fei Fua, Saman Champaka Gardiya Punchihewa, Kristine Ruth Gilbert, James Stanley Gledden, Timothy Goh Kai-Ti, Senen Gonzalez, Sheena May Gune, Ronen Gurvitch, Emily Ing Ing Hii, Weng Chin H'ng, Shu Fen Ho, Emily Ho Tse Lin, Lynn Pei Er Hong, Stephen Patrick Hur, Michael Mina Issac, Niroshini John, Amy Elizabeth Jones, Upasana Kiritkumar Kapadia, Dorothy Kesarios, Bronwyn Melissa Dunbar King, Maxim Kuperschmidt, Daniel Paul Lane, Bee Ngo Lau, Cynthia Siu Wai Lau, Mark David Lavercombe, Aloysius Che-Sen Law, Le Thi Tieu Nghi, Amelia Kate Le Page, Hok Ming Lee, Hou Tao Lee, May Lin Lee, Timothy Heung Wah Lee, Joanna Christine Lenaghan, Liang Kim Leow, Graham Duncan Lethbridge, Winnie Hoi Yan Li, Kok Meng Liew, Kok Ren Lim, Le Hooi Lim, Lim Ming Yann, Lim Shen-Yang, Soon Yien Lynn Lim, Liang Yuan Ling, Simon Robert Ling, Su-Wen Loh, Keat Yee Low, Francis Yuk Pang Ma, Eldon Mah, Jonathan Robert Marriott, Matthew Roman Matusik, Joanne Elise McCutcheon, Stuart Ross McDonald, Timothy Lachlan McIver, James Hamilton McMahon, Rishi Mehra, Mark Joseph Michalski, Benjamin Gerald Miller, Simon Andrew Mitchell, Vanida Kathryn na Ranong, Hong Ly Yev Neang, Edmund Seong-Chee Neoh, Roslyn Ainslie Newman, Ching Sim Ng, Ivan Ngeow Ko-Yen, Tri Nguyen, Justine Eliza Nielsen, Deborah Lyndal Niproski, Patrick Pierre O'Brien, Francesca O'Neill, Jong Min Ong, Katherine Susan Ong, Kheng-Siang Ong, Sok King Ong, Allistair James Pang, Lyndal Joy Peake, Huu-Phuong Pham, Quang Minh Long Phan, Chia May Phang, Phung Teik Beng, Ivy Min-Kan Poon, Hannah Frances Mackay Pringle, Yalda Riazi, Finn Romanes, Katherine Ilona Rush, Joan Chung-Chen San, Michele Yieng Yieng Seah, Jocelyn Maree Shand, Caroline Anne Sharpe, David Alan Shilson, Nicholas Brian Simpson, Lyndon Wai Lun Siu, Anita Rohini Skandarajah, Philip James Smart, Jocelyn Pamela Snelleman-

Howell, Linda Simonne Stiglitz, Nancy Hyun Soo Suh, Aravinthan Sundaralingam, Alex Yu Hong Tan, Alexander Hua Meng Tan, Tan Choon Chieh, Pee-Yau Tan, Gavin Tang Wen-Yu, Rebecca Kate Telford, Limor Theedar, Arthur Wesley Thevathasan, Lucinda Joy Thorley, Ree Nee Tiam, David Jonathon Tickell, Raymond Sze Kin Tong, Cung Hoang Vuong Tran, Phuong Trinh, Dean James Trotter, Hans Tsung Han Tu, Inese Kirsten Tucker, Robyn Jane Turnbull, Marylyn Antonia Varga, Robert Veljanovski, Kirsten Emma Walsh, Vicky Yu Ching Wang, Yi Shi Wang, Yi Yuen Wang, Luke Anthony Wilson, William McLeish Wilson, Edward Hann Ning Wong, Shwu Chin Woo, Sze Yee Yang, Alina Tatiana Yaremenko, Wai Yan Yip, Tanya Ilene Yuen

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY WITH HONOURS (1997)

Deborah Helen Amott, Luke Francis Chen, Kyra Yu Lin Chua, Yu Jo Chua, Michelle Anne Clonan, Kathryn Maree Field, Robert Bruce Brearley Garbutt, Saar Gill, Jenny Hoang, Douglas Forsyth Johnson, Caroline Jung, Grace Li Shan Kam, Michael Kew Lim, Elaine Ho-Yu Lui, Emma Suzanne Magrath, Weng Toon Ng, Catherine Angela Oakman, Lorraine Yulaine Ong, Anita Joy Phillips, Hang Ai Quach, John Alfonce Rophael, Helen Ann Schultz, Tina Louise Shattock, Cameron Peter Shaw, Peter Jefferson Simm, Lucinda Katherine Smith, Kalpana Priyadarsini Sumithran, Adam Gareth Testro, Rachel Wong

BACHELOR OF MEDICINE (1862) AND BACHELOR OF SURGERY (1879) AND BACHELOR OF MEDICAL SCIENCE

Scott Thomas Baker, Simon John Moore Bolch, Benjamin Evan Campbell, Michelle Yee Ling Chan, Brett Daniel Coleman, Benjamin Joel Cook, Nicholas Hardiman Crump, Jason Paul Harney, Molly Kathryn House, Darren Hong Sing Lee, Suzanne Elizabeth Mahady, Sam Sohiel Mehr, Suzi Ludy Hac Nou, Scott John Richard Patterson, Kathryn Victoria Roberts, Kerryn Rubin, Daniel Paul Steinfort, Gautam Vaddadi, Patricia Ann Walker, Justin Kar-Weng Wong

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY WITH HONOURS AND BACHELOR OF MEDICAL SCIENCE

Mark Agnel Dawson, Toby Colin York Syme

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY AND BACHELOR OF ARTS

Kasha Priya Singh

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY AND BACHELOR OF SCIENCE

Michael James Dodson

PRIZES AND AWARDS 1999

FINAL YEAR

Australian Medical Association Prize
Kathryn Field SVH/GH

The NOVARTIS Prize
Kathryn Field SVH/GH

Rowden White Prize
Kathryn Field SVH/GH

MEDICINE

Robert Gartley Healy Prize in Medicine
Kathryn Field SVH/GH

Keith Levi Memorial Scholarship in Medicine
Weng Toon Ng SVH/GH

Jamieson Prize in Clinical Medicine
Saar Gill SVH/GH

Upjohn Award in Clinical Pharmacology and Therapeutics
Alex Tan SVH/GH
Jocelyn Snelleman-Howell SVH/GH

Sir Albert Coates Prize in Infectious Diseases
Saar Gill SVH/GH

SURGERY

Beaney Scholarship in Surgery
Adam Testro SVH/GH

Robert Gartly Healy Prize in Surgery
Adam Testro SVH/GH

Proxime Accessit Prize in Surgery
Kew Michael Lim SVH/GH
Toby Syme RMH/WH

EH Embly Prize in Anaesthetics
Sam Mehr SVH/GH

AOA (Vic) Orthopaedic Prize
Kathryn Field SVH/GH

OBSTETRICS AND GYNAECOLOGY

Robert Gartly Healy Prize in Obstetrics
Toby Syme RMH/WH

Prize in Clinical Gynaecology
Kathryn Field SVH/GH

Alfred Edward Rowden White Prize in Clinical Obstetrics
Molly House RMH/WH

Edgar and Mabel Coles Prize in Obstetrics (RMH/WH, SVH/GH)
Carolyn Jung

PSYCHIATRY

John Cade Memorial Medal in Clinical Psychology
Helen Schultz ARMC/NH
Jenny Hoang SVH/GH

PAEDIATRICS

Howard E Williams Prize in Paediatrics
Michelle Clonan ARMC/NH

Child Growth & Development Study in Paediatrics
Lorraine Ong SVH/GH

Clara Myers Prize in Surgical Paediatrics
Michelle Clonan ARMC/NH

GENERAL PRACTICE AND COMMUNITY MEDICINE

RACGP Prize in Community Medicine
Jenny Hoang SVH/GH

FIFTH YEAR

General Practice and Community Medicine Prize
Randal Leung

Crawford Mollison Prize in Forensic Medicine
Natalie Yang

The Fulton Scholarship
Gillian Paulsen

The Kate Campbell Prize in Neo-Natal Paediatrics
Andrew Metz

The Max Kohane Prize
Gillian Paulsen

Ian Johnston Prize in Reproductive Medicine/Biology
Campbell McKellar

The Vernon Collins Prize in Paediatrics
Natalie Yang

The John Adey Prize in Psychiatry
Valerie Sung

Child Growth and Development Study Prize
Sarah Brennand

FOURTH YEAR

The Harold Attwood Prize in Pathology
Jillian Tomlinson

Geriatric Medicine Prize
Nina Zhang

Manu Thomas Prize
Andrew Weickhardt

THIRD YEAR

PHARMACOLOGY

Boots Prize
Wai Yin Tam

PATHOLOGY

Walter and Eliza Hall Exhibition
Yee Jen Tai

MICROBIOLOGY

Glaxo Microbiology and Immunology Prize
Stephen Chu-Sung Hu

SECOND YEAR

ANATOMY

Dwight Prize
Paul Paddle

Exhibition Prize
Paul Paddle

TF Ryan Prize
Paul Paddle

PHYSIOLOGY

Glaxo Wellcome Prize
David Pattison

PHYSIOLOGY/INTEGRATED BODY FUNCTION

RD Wright Prize
Alexander Incani

GENERAL BIOCHEMISTRY

Exhibition
Meena Mittal

FUNCTIONAL BIOCHEMISTRY

Exhibition
Anne Dawson

NEUROSCIENCE

Sunderland Prize
Alexander Incani

BEHAVIOURAL SCIENCE

NOVARTIS Prize
En-Ling Leung Ki

FIRST YEAR

Due to the introduction of the new undergraduate medical curriculum in 1999, prizes for First Year students were still under review at the time of printing. A full list of prizes will be published in the 2001 issue of *Chiron*.

STUDENTS VOTE FOR EXCELLENCE

The winners of the 1999 Excellence in Teaching Awards were: Dr David Ebert from the Department of Biochemistry and Molecular Biology (First Year); Associate Professor Tony Goodwin from the Department of Anatomy and Cell Biology (Second Year); and Associate Professor Steve Farish from the Department of General Practice and Public Health (Third Year).

Presenting the Awards at second and third year lectures, Professor Neville Yeomans, Associate Dean Academic Programs, noted the high quality of the University's teaching staff and that this award was one way for students to recognise some of their best teachers. Recipients received enthusiastic applause from the hundreds of students present. The Awards are based on a ballot in which students in the first three years of the medical course have an opportunity to nominate their best teachers. Students were told that excellence in teaching could be demonstrated in many ways but, whether as lecturers, tutors or demonstrators, good teaching should be directed to helping students learn.

L-R Dr David Ebert (1st yr), Associate Professor Tony Goodwin (2nd yr), Associate Professor Steven Farish (3rd yr), Professor Neville Yeomans, Associate Dean, Academic Programs

DEAN'S HONOUR'S 1999

FINAL YEAR
Deborah Amott
Kathryn Field
Jenny Hoang
Kew Michael Lim
Emma Magrath
Catherine Oakman
Cameron Shaw
Toby Syme
Adam Testro

FIFTH YEAR
Carol Pei-Wei Chong
Heather Marion Francis
Sue Yen Michelle Goh
Celia Mabel Kemp
Yuen Yie Ngeow
Gillian Ann Paulsen
Natalie Yang
Eppie Mildred Yiu

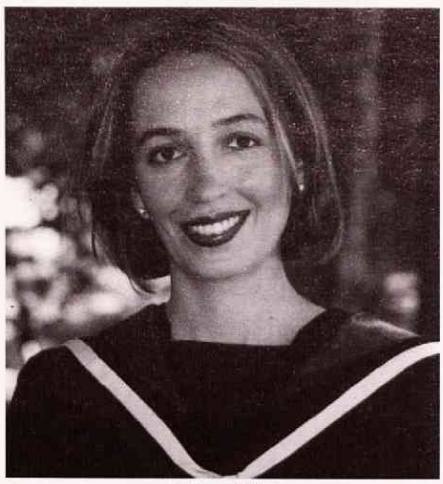
FOURTH YEAR
Amy Zigrida Gray
Neil Israelsohn
Darren Hiu Kwong Lee
Maree Elizabeth Micallef
Jonathan Chun Hong Ng
Sant-Rayn Singh Pasricha
Leonie Kathleen Ross
Gabriel Lee Snyder
Jillian Kaye Tomlinson
Carley Barbara Vuillermin
Andrew James Weickhardt

THIRD YEAR
Shalini Amukotuwa
Jonathan Golshevsky
Ingrid Horner
Raymond Hu
Stephen Chu-Sung Hu
Remi Kowalski
Daniel Lenaghan
Sarah Shau-Nga Leung
Yok Leng Michelle Ng
Yee Jen Tai
Wai Yin Tam
Ka Chun Tse
Tomos Walters

SECOND YEAR
Ju Pin Ang
Laurel Naomi Bennett
Chilton Yoon Loong Chong
Debra Pei Sonq Chong
Alexander Angus Cottle
Anne Christine Dawson
Andris Harald Ellims
Alexander Incani
James Gian-Chi Huang
En-Ling Leung Ki
Michelle S K Loh
Naseem Mirbagheri
Meena Mittal
Paul Martin Paddle
Hayden Luke Richards

FIRST YEAR
Melanie Chen
Harriet Gee
Emma Goeman
Jyotsna Jayarajan
Katherine Mendra
Shereen Pek Chuen Oon
Ie-Wen Sim
Elissa Stafford
Christine Tzu-Yuin Wong
Bernadette Young

Final Year Top Student 1999



Kathryn Field

KATHRYN MAREE FIELD was the top student in 1999, when she was awarded a first class honours MB BS degree, and the Australian Medical Association Prize, The Novartis Prize and the Rowden-White Prize. Kathryn also gained First Class Honours in Medicine, and won the Robert Gartley Healy Prize in Medicine, the Australian Orthopaedic Association (Vic) Orthopaedic Prize and the University Prize in Clinical Gynaecology, as well as the Margaret Ryan Scholarship in Medicine and the St Vincent's Institute of Medical Research Prize.

Kathryn's home is in northern country Victoria, where she was brought up in Tennyson, a tiny community between Bendigo and Echuca, from which she later attended Girton Grammar School in Bendigo. She was fortunate to come from a multi-gifted family, her father running a plant nursery and her teacher mother having a strong interest in ballet, and both Kathryn and her brother (who recently sang with Opera Australia) have inherited musical gifts. Her many talents manifested themselves at an early stage, when she completed Grade eight Piano examinations at age twelve and Grade eight Violin when only fourteen. During her later schooldays, she was awarded national and international prizes in public speaking, notably as Australian winner and International runner-up in the Zonta International 'Young Women in Public Affairs' Award. Kathryn's cultural and artistic talents were also recognised by State awards in Japanese speaking and in music, playing at recitals throughout Victoria as part of the Junior Team of Pianists. In spite of the wide range of career options open to her, a medical career beckoned, and Kathryn entered the MB BS course in 1994, and came to the St Vincent's Hospital and Geelong Hospital Clinical School in 1997, distinguishing herself throughout the course.

Kathryn has a strong appreciation of the vocational aspects of her career choice. She was a founder member and later treasurer of Outlook, and has been awarded a CURHEV Rural Health Scholarship for the past three years. Her interest in health in developing countries won her a Commonwealth Foundation Bursary, which took her to India for her elective term–the highlight of her final year, though it was a close tie with the surgical term she spent in Echuca–a stone's throw from home at last!

For a person of such high ability and achievement, Kathryn is exceptionally modest, and has continued to maintain her cultural and sporting pursuits during her medical studies. She enjoys squash and swimming, reading and travel, as well as the piano and violin, notably playing violin in the final year 'orchestra' accompanying the class choir at the valedictory service in the Clinical School. Kathryn will undertake her internship at St Vincent's Hospital, and at this stage she is keeping her future career path options open, though she would like to spend some time working in rural Australia and in developing countries overseas.

Wilma Beswick, Clinical Dean
St Vincent's Hospital and Geelong Hospital Clinical School

Peter G Jones Elective Essays

My Indian Elective

St John's Hospital, Bangalore, India

by Kasha Singh

AFTER TWENTY HOURS in the plastic environment of international air travel, it was a good thing to arrive in India by night.

In the taxi from Sahar Airport (Mumbai's international terminal) to our pre-booked hotel it was not only the windows between us and the hectic city outside that made our first encounter with India less overwhelming, but also the darkness that smoothed our transition from the leisurely pace of life at home into Mumbai's chaos. Shades of grey camouflaged the piles of rubbish lining the streets and hid the thick smog. The dark eyes that flashed at us from fragile cardboard shelters lining parts of the road seemed mysterious in the shadow of candlelight. In one street, men were frying bright orange *jelebi* in huge pots of oil. Firelight spun and shone from women's saris and children's hair. We were left ignorant of the sewage and cow dung that foul the streets and of the disease and poverty of some of the people who inhabit the massive slum areas in Mumbai.

Exhausted and too confused (mostly by horror stories on how to avoid coming home ridden with exotic diseases) to even brush our teeth, we finally got to bed in the early morning hours and fell asleep to the puzzling sounds of animals and people that were never quite absent from the city.

St John's Hospital is located in Bangalore, a large city which lies between the two coasts of India. To get there from Mumbai takes less than two hours by plane or twenty-four hours by 'express' train (we flew). It is a relatively modern city with plenty of tall buildings, neon lights, traffic and pollution. Young people commonly dress in Western-style clothing and are supposedly much less

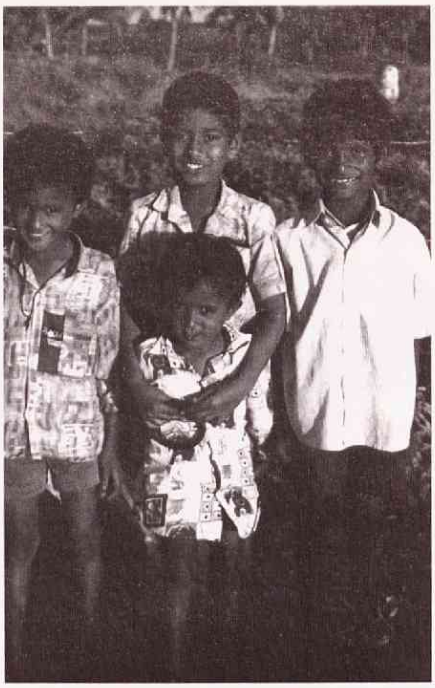
restricted than in other Indian cities, (although, as we were told by a very stern and large bouncer, dancing is nonetheless strictly forbidden in all nightclubs and bars). Business is dominated by the microchip and in private hospitals there are many technologically advanced medical tests and treatments available.

The medical school at St John's Hospital is a relatively new college run by the Catholic Church and one third of the female places in each class are reserved for nuns. The hospital has a strong ethic of provision of equitable health care and runs programs to provide care to rural areas. There is a great deal of emphasis on giving medical and nursing students a broad perspective on the health situation in India. The college believes it is important students appreciate the many factors that contribute to health–economic, social (including caste, family and gender issues) and political. Graduates are required to spend a year working in a rural area or pay a bond to the hospital. A notice-board in the hospital director's office lists those graduates who have not fulfilled one of these requirements, and prohibits them from ever being employed by the hospital.

In the context of this philosophy St John's has developed an innovative and exciting community health education program with an integral place in the medical course. Professor Amar (Head of the Department of Community Medicine at St John's) believes that medical education should be one of the major means of bringing about social transformation of a society.

My elective term in community health was spent mainly in Mugalur village. Mugalur is about thirty-six kilometres from Bangalore, and the journey takes nearly two hours by bus on what is supposedly a two lane road. In 1988 St John's established a Health and Development Centre in Mugalur. The Centre provides a twenty-four hour medical facility, and is a rotation for interns and community health registrars from St John's hospital, with occasional visits from specialists. Mugalur is used as a base for many community health programs, for research projects and trials in rural healthcare, and as a training centre for a range of health workers including medical students, doctors, nurses, community health workers and traditional/village birth attendants (*dais*).

My experiences in Mugalur gave me a fascinating view of life in rural India and of the challenge and possibilities for community healthcare. Life for those of us staying at the Centre was community-oriented with meals taken together



Children of Mugalur Village

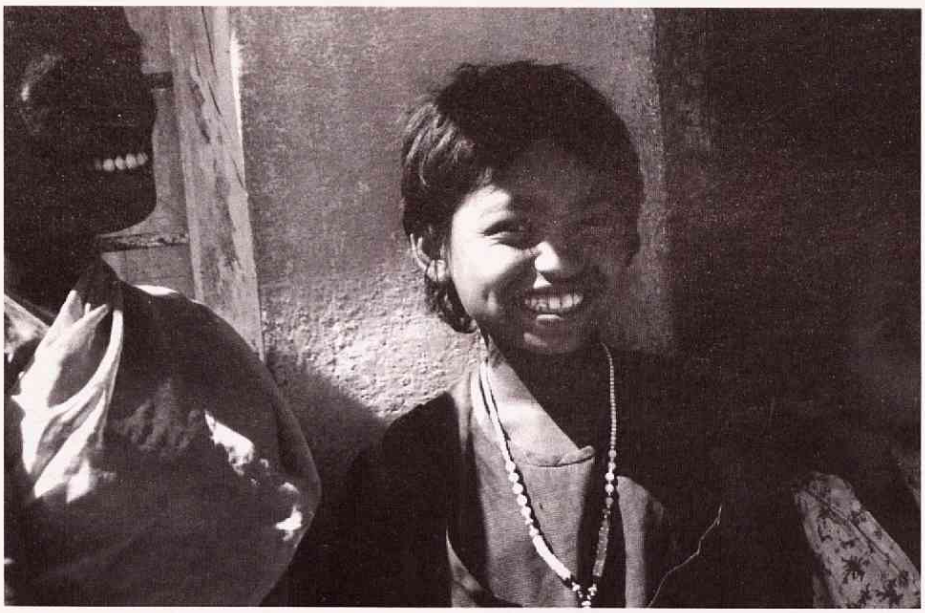
(on mats on the floor) and all facilities shared. This included a tiny immersion heater that could be used to have a hot 'bucket shower'. Although an extremely tedious process, this became a very tempting option when soaked in blood and amniotic fluid from a baby who gushed out a little ahead of expectations. It was also very welcome after we had spent hours attempting to pull maggots from the pemphigous blisters that oozed yellow and covered the body of a young man. The man had been placed outside a temple by his family after he developed bullous pemphigous and became ill and unsightly as his skin progressively blistered. He had lain there for three months before being brought in to the centre by pilgrims who had seen the maggots crawling beneath his skin. It was impossible to know whether his family had deposited him in disgust, or perhaps in the hope that the gods might cure him. Trying not to look into his blank eyes as we dressed and cleaned his skin, I hoped it was for the latter reason.

I was equally distressed by an evening I spent at Mugalur during which a woman came in unexpectedly during second stage labour with the village *dai* and her mother-in-law. At twenty-two, Seema was two years younger than me, although with only one child thus far she was quite old amongst village women. We monitored her carefully, watching her slowly rising blood pressure with much anxiety and deliberation about the anti-hypertensive properties of the miscellaneous box of drugs we had available, most of which seemed to be related to Paroxitene. During this time I began to seriously regret the third year pharmacology lectures that I skipped and most of which seemed to be related to Paroxetine. Finally, at 4:37am, in the blood spattered procedure room, Seema delivered a beautiful and healthy baby girl. However, as I proudly presented the child to her, I was surprised to see her mother-in-law (who had been scrutinising every stage of the procedure from a distance to that point) turn abruptly to leave the room. Seema herself refused to take the child, instead turning her face to the wall with a look of sadness that puzzled me. I was told that she already had a girl, a two-year-old, and had been desperately hoping for a boy with great pressure from her husband and his family.

I had read statistics on female births and infanticide in India but for some reason the tragedy of this situation still shocked and sickened me, both for the sake of the mother and especially for the future life of the perfect, unwanted daughter. I found myself similarly surprised when we visited a community of 'untouchables' during a community survey. Their crudely thatched or fibro-cement houses were located at a distance of a couple of kilometres from the main village area on a dry and dusty plain. Children in ragged clothing ran wild amongst the scrubby vegetation, faces still shining and eyes wide with curiosity despite the large sores over their skin. There was no school in this community and, due to the caste into which they had been born, the children could not attend the village school nearby.

Fortunately, these sobering times were more than balanced by enlightening episodes during my time in India. Highlights included animated discussions each night at the Centre in Mugalur and with teachers in the smaller villages. During these I could express some of my confusion and sadness at aspects of Indian life. In fact, these feelings were often shared by other students and doctors who were on the whole from well-off families in large towns and who had seen almost as little of this side of India as I had. I was inspired by the constructive and optimistic discussions that were held between those at the Centre (workers and students). Both at a practical and at a philosophical level, they covered different aspects of the enormous (and to my mind incredibly daunting) challenges involved in, and obstacles to, the provision of health care to a population of nearly a billion people, many of whom are illiterate and without reliable access to clean water.

Many of my friends at the Centre held the belief that economic development was the 'entrée into health'. Some had concerns with the question of whether



One of the children at the 'Untouchable' Village

WHO-devised definitions of 'health and well-being' were sufficiently universal and whether they were applicable through a range of circumstances. Of particular concern to Professor Amar was the importance to health and healthcare (in addition to basic human rights) of giving rural women in India, especially those from the lower castes, a sense of their own identity and the capacity for self definition. Without this, he believed, good levels of health care throughout India could not be realised.

I have lots of things to ponder over from my short time in India, and many happy memories to recall. The kindness, patience and generosity given me through all my Indian experiences still astounds me. So often feeling that I had little to give, it was amazing to experience the enthusiasm and good will with which we were greeted and the appreciation many people seemed to have that, with my Indian family heritage, I was interested to come to India and find out how things really were. Looking into the faces of village women of my own age, with three or four children, working in fields, cooking and seeing them smile at me. Watching them from a distance as they laughed and joked with one another as they beat dirty laundry against the rocks was humbling for me.

Perhaps my favourite memory is of going out with the mobile maternal and child health care clinic run from Mugalur to surrounding villages on Monday afternoons. We would arrive in our bus with the weighing scales, our sphygmanometer, our box of drug discards and cut-offs and 'set up' clinic on the stone ledge outside one of the village buildings. Slowly the people would appear to stare at us with curiosity, to explain their complaints and to be treated in whatever way we could. Some would come, it seemed, just to laugh at us. Before we left, someone would bring coffee and we would all sit down together for a while.

With journeys of the mind, heart and oh-so-slow journeys in the trains, my Indian elective provided me with innumerable new ideas and experiences to re-live during an intense and exam-oriented final year. After six years at university it renewed my interest in medicine and healthcare and gave me the inspiration and optimism to imagine programs and systems that might help in working toward equitable health care. More importantly, my experiences in India gave me an appreciation of the skills my medical degree will give me and of the range of things they will allow me to do.

IN THE EYE OF THE BEHOLDER

Kikuyu Eye Unit, Kenya

by Karen Donaldson

I AM SITTING on a wooden stool in a wooden hut, with a concrete floor and a corrugated iron roof that radiates heat, raising the temperature from the forty-five degrees in the shade outside. I'm wearing my boots, an extremely sack-like theatre dress and, unfortunately, the mandatory gown, cap, mask and gloves which are already soaked on the inside. In my twenty-three years thus far I've never produced so much sweat while sitting still. I can feel it beading on my forehead and running down the backs of my legs. A fan offers some relief, but I am not near enough to benefit. I shift uneasily on the stool, subconsciously seeking a cooler position, while concentrating on the tray of instruments before me.

It's my first time as a scrub nurse, and unfortunately I haven't even seen this operation before. A good scrub nurse (I have been told) anticipates the surgeon's next move. I'd like to, but I struggle. The generator and the fan, combined with the surgeon's mask, tend to muffle his requests–let alone the occasional Swahili phrase. It is frustrating and challenging, but not nearly so much as what will follow.

Peribulbar anaesthesia

I am with a team from the Kikuyu Eye Unit, Kenya. We've gone on a three-day 'safari' to Dadaab, a cross roads on the equator near the Somali border. There's a small town here in the desert, but there are also three refugee camps, housing 120 000 people from Somalia, Sudan and Ethiopia. We are here to perform mainly cataract surgery, and the camp hospital has found almost ninety patients for us to see and treat. Normally on such journeys the surgeons would work twelve to fourteen hour days, but security issues in Dadaab don't permit this: we need an armed UN convoy to escort us in and out of the camp during daylight. The other impediment to progress is being a staff member short and I'm glad to discover that I might be able to help, rather than merely observe. However, after the first day, we're behind schedule and it is clear that I'm not a very good scrub nurse. Dr Yorston, the ophthalmologist, decides I'd be of more use as the anaesthetist. I'm willing to try.

Consequently, the next day I find myself responsible for producing appropriately numb and paralysed

patients (hopefully only their eyes) at the rate at which two surgeons can operate. I've always had an aversion to sharp objects near eyeballs, but this is not the time to dwell on such squeamishness.

'See one, do one, teach one' is apparently how one should learn medical procedures. I've heard this often, and believe it would be much safer (especially for patients) if it were 'see a few, do several supervised, do lots alone, and maybe eventually teach one'. But time is precious: I watch Dr Yorston (writing down his instructions), I do one under supervision, and then, it's up to me. It seems straightforward enough as I run through it in my mind:

> *Lie the patient on the floor (negotiating the table takes too long, considering our blind patients). Check which eye is for operation and put in the eye drops: mydriatic, local anaesthetic, iodine and gentamicin. Draw up the local anaesthetic mixture. Inject some behind the eyeball from below, and some through the upper lid. Tape the eye closed with sticky tape. Put wet gauze over it and the ball on elastic that puts pressure on the orbit to aid local anaesthetic diffusion ...*

Voila!–a patient ready to have their cataract removed. I run through the process a few times, and appear to be having success. But as the morning progresses, a couple of comments filter through the hessian sacking separating me from 'theatre' ...

'Make sure you inject the correct eye' –oh dear. Not such a good start, but at least she had a cataract in the other eye.

'Can you check that the eye is paralysed about ten minutes after injection? If it's still moving, work out which muscle still functions, and put more local in the appropriate area'. My heart sinks. Memories flood back of confusing anatomy tutorials in which everyone seemed to differ in opinion regarding the insertions and actions of the extraocular muscles. As I check the patients I thought were ready, I find that all of them need a top-up... somewhere. There isn't anyone else in my half of the shed either fluent in English or with enough knowledge to help. I ask one of the nurses in theatre, but while she tries to reassure and advise, she's too busy to rescue me. What had begun as a big adventure is turning into a nightmare. I feel so hot, so inadequate, so alone. I want to cry tears of frustration and helplessness. I want to get away from the gaze of Somali refugees who maybe could be of assistance if we spoke the same language, but who seem to be laughing at my distress. Suddenly I realise that I have absolutely nowhere to run to.

At the same time, I want to stop wallowing in self-pity and get on with the job. The small remaining objective part of me realises that despite my feelings I am incredibly fortunate. What are a few hours of discomfort and challenge when compared with their lives? The patients are blind refugees, barely able to count fingers in front of them, and I know it is a privilege to be a part of restoring their sight.

It takes an hour or so before everything is under control. My self-confidence has been restored by a Danish (English speaking) nurse who dropped by for a visit. The nerve blocks are working, and only the heat remains to bother me. As a routine is established, the experience starts to become enjoyable. That afternoon and the next morning I can begin to observe my surroundings, and note some cultural differences.

The men with whom I am working laugh at me when I say it is hot and pause for a drink. In my turn, I am amused that they wear long trousers in such weather. They laugh at me sitting on the ground to inject (rather than squatting) because I am tired. In fact, I suspect I am a source of much curiosity and amusement–white people are rare in Dadaab, and not many women wear knee length dresses.

I am surprised at how much these men shout. In my eight weeks at Kikuyu hospital I have noticed how softly spoken the Kenyans are, and indeed have struggled to hear them at all. Not so the Somalis–they interact so noisily that it seems highly aggressive. When I ask a patient to look up (something I learn to do in Somali by the third day) and it is not followed by immediate obedience, all curious onlookers repeat it, shouting at the patient on the ground. This achieves the desired response, but I wonder if it is necessary. Is it just a part of Somali culture or is it a result of bitterness and anger regarding their circumstances?

But on our last morning in Dadaab I am somewhat reassured. We have completed all the operations on those who were completely blind and have started on 'second eye' operations. Fearing uproar should we have to turn patients away, I only allow patients into the waiting area slowly. The surgeons work faster than expected and it is pleasing to tell Aman (the refugee trained as an ophthalmologic assistant who has screened the patients) that we'd like two more. Aman, having told the remaining patients they would not be operated on this time, decides that a lottery is the only fair solution.

Twenty minutes later, I am becoming impatient to anaesthetise the lucky winners who have, as yet, not appeared, and I go looking for Aman. I find him in the middle of an excited, noisy crowd of around fifty people and realise that this is the climactic moment. The remaining two patients have just been selected, and I am surprised and encouraged by the cheers and applause as the tiny, toothless ladies are pushed towards me. Everyone concerned seems pleased, even those who will not receive the treatment during this visit.

I leave Dadaab in two minds. It is good to think of returning to the company of people I know, to cooler weather, and to the relative familiarity and civilisation of Nairobi. But at the same time, I don't know if I'll ever again have the opportunity to help give someone back his or her sight. I don't know if I'll ever see people surviving with good humour such conditions again, apart from on my television screen. I've barely begun to appreciate the Somali culture. I do know, however, that these three days at the end of my elective will stand out in my memory for the richness of their experience.

Patients ready for cataract removal

The Howard Florey Institute of Experimental Physiology and Medicine

From the Sheep Hilton to Unravelling the Mysteries of the Brain

by Frederick A O Mendelsohn

Professor Frederick Mendelsohn, the Director of the Howard Florey Institute, reviews past achievements and current research, and looks to the future.

THE HOWARD FLOREY INSTITUTE is undergoing major changes in its research direction, with a renewed focus on the brain and the cardiovascular system. The Institute has acquired state-of-the-art equipment for neuroimaging and has facilities and skills encompassing genomics, electro-physiology, cell biology, neural development and whole animal physiology, as well as functional brain imaging which enable it to participate in the exciting revolution underway in neuroscience.

HISTORY

The Howard Florey Institute grew out of the Department of Physiology at the University of Melbourne. In 1949, with the support of Professor RD 'Pansy' Wright, Head of the Department, Dr Derek Denton set up the Ionic Research Unit. The Unit was formed because of the clinical need for better understanding of the physiology of body fluid and electrolyte balance in patients. The Howard Florey Laboratories of Experimental Physiology were opened in 1963 and the Institute was incorporated under a Victorian Act of Parliament in 1971. The achievements of the group show that this venture was spectacularly successful.

The Florey group contributed enormously to our understanding of fluid and electrolyte physiology, an area of critical importance in all branches of medicine and surgery. Their success was based on the focus of the group, and the complementary skills of a highly innovative and energetic group of scientists. Pansy's and Dr Jim Goding's surgical skills were essential in setting up the adrenal cervical autotransplant which enabled direct collection of blood entering and leaving the gland. This innovation, combined with sensitive and precise hormone assays established by Dr John Coghlan (the double isotope derivative assay of adrenal steroids and the radioimmunoassay of angiotensin) enabled pioneering studies of the control of aldosterone secretion in the conscious undisturbed animal: work which made the Florey famous.

In parallel, Denton initiated studies on the control of ingestive behaviour, particularly thirst and salt appetite. Systematic work involving behaviour, metabolic balance measurements, the study of cerebral lesions, neural pathway tracing and mapping of immediate early gene expression in the brain to identify neuronal activation has continued under the direction of Dr Michael McKinley. Collectively, these studies provide one of the best understood examples of the mechanisms of a behavioural response to a particular chemical blood-borne stimulus.

In 1975, Drs Hugh Niall and Geoffrey Tregear moved from Harvard University to the Florey to set up the nation's then leading peptide and DNA chemistry laboratory. Here they succeeded in isolating, sequencing and synthesising the hormone relaxin, as well as characterising its gene. This work is only now coming to clinical application and commercial fruition.

The Institute's pre-eminence in molecular biology was boosted further by the development of hybridisation histochemistry using synthetic oligonucleotides, an elegant technique to localise gene expression in cells of tissue sections, by Dr John Coghlan and his team. This technique is now used worldwide for both research and diagnostic applications.

In 1990, because of increasing interest in the regulation of gene expression the Developmental Biology Group was established. The Group flourished under Professor Felix Beck and the successful establishment of our gene-targeting laboratory (gene knockout) was an important advance for developmental biology which has contributed to other programs in the Institute.

CURRENT ACTIVITIES

When I became Director in 1997, we decided to focus on two major areas: the brain and the cardiovascular system. The decision was based on the public health significance of these areas (heart disease being the major killer and brain disorders being the major cause of morbidity in our community) as well as our pre-existing strengths and the opportunities in these areas.

NEUROSCIENCE

Serious brain disorders have a tragic impact on individuals, their families, and the community. The best way to make progress in this difficult area of medicine will be to focus research towards understanding the chemistry and function of the normal and disordered brain.

Neuroimaging

Towards this aim, the Institute has acquired state-of-the-art neuroimaging facilities for both animal and human magnetic resonance imaging (MRI) and spectroscopy.

Animal MRI

An animal MRI camera was installed in late 1999 in the basement of the Institute at a cost of $1.9 million which was met, in part, by Federal Government funding plus contributions from a consortium of major Victorian universities and institutes. The Florey is housing and operating the equipment on behalf of this consortium with Dr Gary Egan as Director. The facility is open for use by scientists throughout Australia. *(Fig 1)*

Fig 1 The high field strength animal MRI facility housed at the Howard Florey Institute on behalf of the Victorian Universities Consortium

Human MRI

The Institute is also a partner in the development of a new human neuroimaging facility with the Brain Imaging Research Institute, under Associate Professor Graeme Jackson, at the Austin & Repatriation Medical Centre. The instrument is now fully operational and its performance has exceeded expectations. This facility will provide a focus for experimental functional neuroimaging which is unique in Australia. *(Fig 2)*

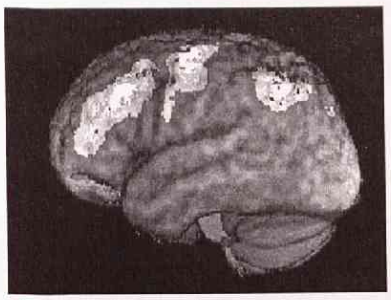


Fig 2 An MRI image of a human brain showing areas of activation relating to short-term memory and attention

Positron Emission Tomography (PET)

Functional neuroimaging by PET is also continuing, using the facilities at the Austin & Repatriation Medical Centre and at the University of Texas Neuroimaging Centre in San Antonio. A study conducted in collaboration with Dr John Watson of the Department of Medicine, Sydney University, has located the region of the human brain responsible for the mental rotation of images in the right parietal lobe. Drs Gary Egan and Dr Umberto Castiello of the University Department of Psychology have conducted a study which has mapped regions of the cerebral cortex involved in planning hand and arm movement. In Texas, a study of the generation and satiation of thirst has broken new ground in the study of emotions.

Neurobiology of Homeostasis

The Neurobiology Group, led by Dr Michael McKinley, focuses on brain mechanisms which control food and fluid intake, sodium homeostasis and autonomic nervous activity: areas in which they have a worldwide reputation.

Regulation of thirst and vasopressin secretion

Thirst and vasopressin have crucial roles in regulating body fluid balance. This group has shown that the lamina terminalis of the brain is critical in this process. Osmoreceptors located in the lamina terminalis and both circulating and locally formed angiotensin are important. Relaxin also potently stimulates neurons in this region suggesting that it may play an important role in maintaining fluid intake during pregnancy. *(Fig 3)*

Regulation of body temperature

The ability of mammals to maintain their body temperatures within a narrow range is essential for their survival. One important mechanism to achieve this is regulation of cutaneous blood vessels. Dr Robin McAllen's team has discovered a region of the brain in the midline of the medulla oblongata that regulates skin blood flow in response to changes in skin temperature. This newly discovered brain pathway is involved in the regulation of body temperature.

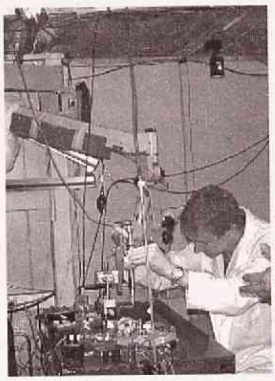


Fig 3
Mr Neil Owens working in the Neurophysiology Laboratory on the regulation of body temperature

Regulation of food intake

A number of neuropeptides are known to act in the brain to regulate body weight and food intake e.g. neuropeptide Y, leptin, CRF, MCH and urocortin. Dr Richard Weisinger has shown that urocortin inhibits appetite for both food and salt when administered into the cerebral ventricles of sheep and mice.

Dr Brian Oldfield's team is employing neurotrophic viruses for neural pathway tracing, in combination with immunohistochemistry for neuropeptides, in order to define the hypothalamic neurons which send projections to brown fat. They have identified an intricate pattern of neural connections in the hypothalamus involving multiple neuropeptide systems involved in the regulation of body energy intake and expenditure.

Developmental Neurobiology

Over millions of years of evolution the human brain has increased its surface area a thousand-fold–it contains up to ten billion neurons. Dr Seong Sen Tan's team is studying how these neurons are born and inserted into their correct places. Understanding brain development has two major implications. First, it will shed light on how the evolution of the brain has contributed to the uniqueness of humans. Second, it will provide information on the disease processes that give rise to mental illnesses such as epilepsy, schizophrenia and mental retardation. *(Fig 4)*

Dr Tan's team have set themselves a number of questions to explore further. How do individual neurons know where to go and what to become? What are the molecules that guide neurons to a particular migration pathway? Which genes are expressed in one part of the brain but not in another and how do these genes establish brain area identity?

The ancestry of brain neurons

To answer these questions, the team has traced the lineages of a small number of cells introduced into the developing mouse brain. In the neocortex, separate precursors give rise to different neuronal subclasses, with characteristic migration patterns and neurotransmitter phenotypes.

Transplantation of brain cells

Brain cell transplantation *in utero* is being used to study the ability of immature cells from one part of the brain to colonise another. The technique has wide-ranging implications for studying development and disease, particularly the use of transplanting genetically-altered cells into the embryonic brain.

Genetic profiling of normal and malignant glial cells

The SAGE method is being used to obtain rapid profiles of genes expressed by normal and malignant glial cells. This work is timely in view of the international effort to sequence the mammalian genome and will dovetail with the burgeoning genomic database.

Neurochemistry

The Neurochemistry Group, under my direction, is studying how neuropeptides affect classical neurotransmitter systems in the brain. We have isolated a hemorphin peptide which appears to interact with brain cholinergic systems to enhance memory. We are also investigating an unexpected action of ACE inhibitors to boost brain dopamine.

Role of angiotensin AT_4 receptors in the brain

We isolated a decapeptide (LVV-hemorphin 7) from sheep brain that binds strongly to the angiotensin AT_4 receptor. Activation of the AT_4 receptor with either angiotensin IV or LVV-hemorphin 7 leads to improvement of memory retrieval. We recently discovered AT_4 receptors in the human brain, particularly in the septum, neocortex, and hippocampus–areas relevant for memory. The distribution of the AT_4 receptors resembles that of acetylcholine which is known to modulate memory. Stimulation of the AT_4 receptor with LVV-hemorphin 7 increases acetylcholine release from nerve terminals in the hippocampus. Potentiation of acetylcholine release may underlie the memory-enhancing effects of the LVV-hemorphin 7.

Fig 4 Professor Bert Sakmann Nobel Laureate visiting Associate Professor Seong-Seng Tan, Development Neurobiology Team Leader, at the Howard Florey Institute

Angiotensin converting enzyme and dopamine

This Group also discovered that the class of antihypertensive drugs known as ACE inhibitors boost brain dopamine levels. Since low brain dopamine underlies the symptoms of Parkinson's Disease, a pilot trial of ACE inhibitors was undertaken in Parkinsonian patients. The results of this approach were very encouraging and a larger study will soon commence to determine if ACE inhibitor treatment can offer a novel way of treating this disease.

CARDIOVASCULAR DISEASE

Cardiovascular Pharmacology: Discovering New Drugs for Heart Attack and Stroke

Cardiovascular disease remains the principal cause of death in developed countries. The research team under Associate Professor Gregory Dusting is investigating factors that influence coronary artery disease. A key factor is nitric oxide produced by the vascular endothelium. Its major function is to dilate arteries and to prevent platelet and leucocyte adherence.

Atherosclerosis

Early in the progression of atherosclerosis, the endothelium loses its ability to produce nitric oxide, resulting in an increased tendency of the affected artery to constrict and for platelets and leucocytes to adhere. The group has identified new drugs and endogenous peptides that protect the endothelium in arterial disease. They have found that Heat Shock Proteins, formerly thought to be protective in the artery wall, may promote vasospasm in coronary arteries as well as suppressing pro-inflammatory genes in the longer term.

Associate Professor Dusting's team plan to identify gene targets that suppress the expression of pro-inflammatory enzymes and thereby reduce reactive radical formation, inhibit cholesterol accumulation and inhibit intimal hyperplasia.

Cardiac hypertrophy

Many cardiac diseases cause ventricular hypertrophy, which can severely impair cardiac function. Dr Rebecca Ritchie is investigating why individual cardiomyocytes grow and how ACE inhibitors prevent this. She finds that the release of nitric oxide from the endothelial cells is crucial for this action of ACE inhibition. In coronary heart disease and diabetes this effect is compromised.

Heart rate and heart failure

The heart functions as an endocrine organ, synthesising and releasing natriuretic peptides, (ANP and BNP). As well as promoting renal salt and water excretion, ANP and BNP have important cardiovascular actions, many of which Dr Robyn Woods was first to describe. Her group discovered that ANP and BNP enhance cardiac slowing in response to rapid increases in blood pressure. The ability of these hormones to improve baroreflex activity is linked to heart size and may have important therapeutic implications.

Fetal Physiology–the Fetal Origins of Adult Disease

In Western populations, at least one in five adults over the age of forty-five years develops hypertension. Although diet and 'life-style' factors contribute substantially to this, the environment of the unborn baby is also relevant. Babies of low birth weight for gestational age, have a tenfold risk of developing late onset hypertension, insulin resistance and dyslipaemia compared with babies of normal birthweight. The low birthweight suggests that their intra-uterine environment was suboptimal, possibly due to maternal malnutrition, placental insufficiency or fetal exposure to excess glucocorticoids.

Dr Marelyn Wintour's team has discovered an experimental model of animals (sheep) 'programmed' before birth to become hypertensive in later life. Ewes that had been exposed to excess glucocorticoids early in pregnancy produced hypertensive lambs. The hypertension results from increased cardiac output and the baroreflex is reset to higher blood pressures.

These lambs are now six years old, and though exhibiting insulin resistance, are more sensitive to the anti-lipolytic actions of insulin, making them more likely to store energy as adipose tissue. These experimental studies and epidemiological data show that early maternal under-nutrition probably alters the action of insulin in adipose tissue permanently, and resets the central regulation of blood pressure, as a result of fetal exposure to high levels of adrenal steroids.

PEPTIDE AND DNA CHEMISTRY

Relaxin

Clinical trials for scleroderma

The chemistry, molecular biology and physiology of the peptide hormone relaxin has been a major interest of Professor Geoffrey Tregear's group for many years. Relaxin degrades collagen and promotes connective tissue turnover by influences on collagenase and collagen synthesis. Through these actions, relaxin remodels the connective tissue of the pelvis and reproductive tract during pregnancy.

The Institute holds patents relating to the cloning and synthesis of relaxin which are licensed to Connetics Corporation in the USA. Connetics have just completed clinical testing of synthetic relaxin for scleroderma, a life-threatening connective tissue disorder characterised by accumulation of collagen in the skin and internal organs. The Phase III trials, initiated in February 1999 in fifteen clinical centres throughout the United States, are now completed. Analysis of the data is currently being undertaken. If successful, FDA approval in the USA could occur during late 2000 or early 2001.

Further trials for the use of relaxin in peripheral vascular disease have been initiated by Connetics. *(Fig 5)*

Fig 5 Dr John Wade (left) and Deputy Director Professor Geoffrey Tregear with a model of the peptide relaxin

The relaxin-knockout mouse

Professor Tregear's group has created a strain of mice which do not produce relaxin because they lack a functional relaxin gene. Mammary development is deficient and the nipples of the knockout animals fail to enlarge during pregnancy due to impaired collagen degradation and turnover in these relaxin-knockout animals thereby confirming the major role of relaxin in collagen degradation.

DNA Chemistry

Oligonucleotide-peptide hybrid molecules as delivery systems for DNA based therapeutics

DNA based therapeutics (Antisense and Antigene) are novel pharmacological agents which allow disruption of malfunctioning and deleterious genes. Their potential therapeutic applications may be immense. Some twenty Antisense molecules are now in clinical trial. Despite the significant developments in their chemistry, the greatest limitation is efficient delivery of the oligonucleotides to target organs and relevant cellular compartments. To address this general problem, the group headed by Professor Geoffrey Treagear and Dr Nancy Guzzo-Pernell are developing hybrid molecules,

comprising an oligonucleotide (the antisense drug) linked to a specific peptide sequence (the delivery system). The covalently linked peptide also protects the oligonucleotide from degradation. Several methods of preparation of oligonucleotide-peptide hybrids were developed, allowing preparation of hybrids of any orientation.

Gene targeting

The Florey group has achieved six different gene knockouts in mice since 1996. Deleted genes include parathyroid hormone-related protein (PTHrP), the H19 promoter region, the homeobox gene Cdx2 and relaxin. The Cdx2 knockout mouse exhibits the unexpected finding of spontaneously arising colonic tumours.

BIOINFORMATICS

An expansion of computer hardware and allocation of staff to the new Bioinformatics Group are supporting the increasing emphasis on molecular biology in the Institute. The Institute is the Victorian node of the Australian National Genomic Information Service (ANGIS).

POSTGRADUATE STUDENTS

Postgraduate students and post-doctoral research fellows deserve a special mention. They enrich research institutes with their energy, enthusiasm and bright ideas. They are also the lifeblood of our scientific future. It is therefore especially pleasing to report that this year the Institute attracted fifty-four graduate students. This is three times our previous number and close to our limit.

THE FUTURE

MEDICAL RESEARCH AND AUSTRALIA'S FUTURE

Australia has a great opportunity to build on our past excellence in biomedical research and to reap the benefits of the international biotechnology revolution, widely believed to be the burgeoning industry of the twenty-first century. However, we have a poor record for retaining our best and brightest scientists and managers and for commercialising our discoveries. The Health and Medical Research Strategic Review, commissioned by Health Minister Michael Wooldridge and chaired by Mr Peter Wills, on which I was privileged to serve, made 126 detailed recommendations. The great majority of the recommendations were accepted by the Federal Government, including the crucial recommendation to double NHMRC funding over the next five years. The Government is to be congratulated for this far-sighted move. However, the window of opportunity is narrow as many other countries invest in future biotechnology. Much remains to be done, including improved salaries and conditions for career scientists and the development of a vibrant biotechnology industry in order to widen employment opportunities and to develop and commercialise local discoveries. (*Fig 6*)

Fig 6 Dr Peter Doherty, Nobel Laureate with Howard Florey PhD students and Professors Frederick Mendelsohn at The Age Vision 21 Millennium Series Forum: Science, Technology and IT

A FOCUS ON THE BRAIN

The major focus of the Howard Florey Institute in the future will be on the brain. Although our knowledge of the brain is very incomplete, neuroscience is advancing rapidly. The major international research effort in neuroscience will undoubtedly lead to dramatic advances in the treatment and prevention of psychiatric and neurological disorders, which are major causes of chronic disability and suffering in our community. The Institute is leading some aspects of this revolution in neuroscience. Our existing programs cover the central regulation of body fluid and electrolyte homeostasis, the autonomic nervous system and control of ingestive behaviour, neural development, neuropeptide actions and functional neuroimaging.

This is a very exciting time in biomedical research with the unfolding of the human genome project and the neuroimaging revolution. These events are transforming medicine and are likely to have remarkable impacts on our ability to treat and prevent disease. Overall, the Institute has a broad set of research programs in place, which address neuroscience and cardiovascular disease, from the molecular level up to the whole animal or human, including the conscious processes in the brain. These activities and the acquisition of major new equipment make the Institute a significant international contributor in biomedical science with a strong focus on the brain.

SOME MAJOR RESEARCH HIGHLIGHTS (1992-1999)

1992 Cloning of murine homologues of the Drosophila son-of sevenless gene (mSOS-I) and demonstration of its role in cell signal transduction.

1993 Design and synthesis of novel oligonucleotide-peptide hybrid molecules for the disruption of gene expression.

1994 Elucidation of osmoregulatory pathways in the brain controlling renin secretion, sodium excretion, thirst and vasopressin release.

1995 Cloning and expression analysis of a cytochrome P450 (11β) cDNA in the sheep. Investigation of the effect of dietary salt excess on blood pressure in chimpanzees, the species closest to humans.

1996 Expression and control of erythropoeitin in the fetus and the description of the ontogenesis of aquaporins. Establishment of a physiological role of angiotensin II generated in the CNS. Neurophysiological demonstration that specific central nervous pathways control the sympathetic nervous supply to the vasculature of the different organs of the body. US patent granted for oligonucleotide-peptide hybridmolecules.

1997 Discovery that mice with inactivation of the Cdx-2 gene develop colonic tumours. Discovery of a hemorphin peptide, which is an endogenous ligand for the angiotensin AT_4 receptor in brain and has positive effects on memory. US patent granted for the use of oligonucleotides *in situ* hybridisation histochemistry.

1998 Lambs exposed *in utero* to glucocorticoids exhibit hypertension later in adult life.

1999 Relaxin gene knockout mouse created. Delineation of human brain areas subserving the sensation of thirst. Phase III clinical trial of relaxin in scleroderma completed. High field strength animal MRI camera installed on behalf of the Victorian Universities Consortium.

MILESTONES IN THE HISTORY OF THE HOWARD FLOREY INSTITUTE

1949 NHMRC begins support of Prof Derek Denton's work in the Ionic Research Unit of the Department of Physiology at the University of Melbourne.

1956 Development of the sheep adrenal cervical autotransplant for the study of aldosterone secretion.

1960 Award of the first NIH Grant and expansion of research programs.

1963 The Howard Florey Laboratories of Experimental Physiology building opened by Sir Robert Menzies, Prime Minister, in the presence of Sir Howard Florey. The Howard Florey Institute of Experimental Physiology and Medicine is incorporated under a Victorian State Act of Parliament. Professor Derek Denton appointed the first Director.

1963-present Major private donor support of the Laboratories from the Ian Potter Foundation, the Myer Foundation and Sidney Myer Trust and the Robert and Helen Kleberg Foundation of Texas.

1971 Kenneth Myer appointed Founding President.

1973 The Institute is awarded an NHMRC Institutional Block Grant.

1977 Extension of the Institute's building completed. Establishment of the Tooradin Field Station.

1982 Award of a special grant from the Federal Government for the development of gene synthesis.

1989 Professor John Coghlan appointed Director.

1995 Professor John Coghlan's contribution to the development of hybridization histochemistry is recognised with the award of the inaugural Ramaciotti Medal and Prize for Excellence in Biomedical Research. Emeritus Professor Derek Denton elected a Foreign Associate of the National Academy of Science of the United States.

1996 Extension of the Institute's building opened by the Hon Dr Michael Wooldridge, Federal Minister for Health and Family Services, in the presence of Dr James Watson, Nobel Laureate and co-discoverer of the DNA double-helix.

1997 Professor Frederick Mendelsohn appointed Director.

1998 National Celebrations of the centenary of the birth of Howard Florey, first of the 'Tall Poppy' celebrations.

1999 Japan Australia Gala Ball raises $825 037 towards functional neuroimaging equipment.

2000 Human 3.0 Tesla experimental MRI joint facility with the Brain Imaging Research Institute in operation at the Austin & Repatriation Medical Centre.

AN INTERVIEW WITH BERT SAKMANN, NOBEL LAUREATE EMINENT SCHOLAR

by Shalini Amukotuwa

BERT SAKMANN and Erwin Neher were awarded the 1991 Nobel Prize for Physiology and Medicine for developing the patch clamp technique, and hence describing the function of single ion channels.

After graduating in medicine from the University of Munich, Bert Sakmann undertook doctoral studies at the Kraepelin Institute in Munich where, while he was working on the neurophysiological basis of light adaptation in the cat's visual system, he realised the importance of understanding synaptic connections more clearly. In 1970 he moved to Nobel Laureate Bernard Katz's department at University College, London, as a British Council scholar studying biophysics, in particular synaptic transmission, during which time, the concept of ion channels was proposed.

Sakmann moved back to Germany where, while running his own laboratory at the Max-Planck-Institute for Biophysical Chemistry in Goettingen, he decided to tackle the challenge of elucidating the relation between

Professor Bert Sakmann

structure and function of ion channels and associated transmitter receptors. From here he and Neher proceeded to develop the patch clamp technique.

Bert Sakmann is currently Director of the Department of Cell Physiology at the Max-Planck-Institute for Medical Research in Heidelberg. He continues to make great contributions to the fields of biophysics, neurophysiology and electrophysiology. His contributions extend well beyond his direct work: the adoption and extension of the methods and instruments developed by him has enabled many others to make important discoveries. Indeed, the patch clamp technique is used extensively in our own Department of Physiology as well as Anatomy and Cell Biology and Pharmacology.

As part of the University's Eminent Scholar Scheme, Professor Sakmann has been appointed to the Department of Physiology as a Professorial Fellow for three years from September 1999. One of his major tasks is to help establish those groups in the Faculty which are new to patch clamping; but as the inventor of this technique, his presence and assistance will be a great boost to those groups already established in this field. It is anticipated that Professor Sakmann's direct involvement in research in the Faculty will bring enormous benefits to the research projects concerned, in relation to the direction of research, and the additional international perspective brought.

Professor Sakmann very kindly granted the *Gubernaculum* this interview despite his busy schedule when in Melbourne last September and we thank

the editors for their permission to publish this edited version.

SA How are you enjoying Australia so far?

BS Very much, I am exposed to college life at Trinity College, where I have been invited to stay: a very academic setting, with lots of young students. This makes me feel younger.

SA You studied medicine. How did you acquire the knowledge in physics and engineering necessary to make the technical breakthrough you did?

BS You do this on the side. When you are a research assistant, you are free to acquire the skills and knowledge which you need to do your work. I was also very interested in physics, so I did this on the side. Furthermore, I had a very good collaborator, Erwin Neher, who is a physicist. It comes naturally; you can do almost everything if you just study it.

SA So did you borrow books and study these disciplines in your free time?

BS Sure, and I also went to lectures. I enrolled in mathematics, chemistry and physics... medical training in Germany used to be such that we did not have compulsory classes, so we were free to choose what we wanted; we had a greater degree of academic freedom. You could enrol in medicine, but also do physics or chemistry. I think it has changed to a more school-like system. In the past you had more freedom to choose what you wanted to do.

SA Were you a brilliant student?

BS Let's say, it is not so difficult to do well in medicine; at least at that time, it was an exercise in storing a lot of information. I was very interested in the preclinical studies, which I liked a lot, and I did a lot of chemistry and physics on the side. As for the clinical training, I even thought sometimes that I would skip it. But I did it because I wanted to finish what I had started ... and also because in the middle of my medical studies, I met a very beautiful young lady.

SA When did you first have the idea of inventing the patch clamp apparatus?

BS When I went into physiology and biophysics, the question of how ions pass through a membrane, by a transporter or through a pore, seemed to me one of the central questions, and many labs wanted to answer this. So we thought of the factors which prevented us from looking at very tiny currents. Firstly, there had been some studies on artificial lipid bilayers and quite a bit of theoretical work showing, among other things, that the background noise interfering with the signal is dominated by the size of the area of the membrane you are measuring; so this had to be kept as low as possible. Fortunately, Erwin Neher had been using pipettes before then; although these had been large pipettes, of around fifty micrometers diameter, it was a method for isolating small patches of membrane. Another noise source is overcome by pressing the glass pipette very closely onto the membrane. When I was in Bernard Katz's department, I developed a method of getting rid of extracellular material, using proteolytic enzymes, so that you end up with a very clear membrane. So the stage was set to use a clean membrane and a glass pipette with an adequately small tip, to develop an instrument for measuring elementary events. We worked on this development, and it worked basically the first time ... not very well but it was encouraging enough to spend the next five years on improving every aspect of recording. The basic idea that ions are transported through membranes by channels was clear to me after our first recording. The rest of the time we spent on improving the method, which was important to understanding how electrical signals are generated in cells.

SA From measuring the current, how could you determine that the structure which transmitted the ions was a channel?

BS This could be done by measuring the number of ions that passed during what was called at the time an 'elementary event'. You can calculate that if you have a rate of ion passage which is in excess of 10^4 per second, this cannot be handled by a transporter. So, seeing elementary events where the passage of ions occurs with a rate of about one to ten million per second, it is quite clear that this cannot be done by an enzyme that turns over ions. The next question was whether these observations applied to just the particular type of channel we had first studied, the end-plate channel, or whether this was true for other types of channels, in particular voltage gated channels. It turns out that almost all elementary events that make up the signals by which our brains are operated have a flow in that order, meaning that they must be mediated by channels. So we proved that for most electrical signals, the underlying mechanism is the opening and closing of discrete ion channels, on the basis of the size of the elementary currents.

Fortunately we went on. I was looking at two basic properties of channels: the switching on and off, and how much ion was conducted. At the same time, maybe with a delay of about five years, molecular biology started to develop, and we were fortunate enough to collaborate with a Japanese scientist by the name of Shosaku Namu. He had cloned genes for channels and asked us whether we would collaborate to characterise at the level of the single molecule the structure of the channel, by getting point mutations and looking at the two properties (mentioned above), and seeing what changes had occurred in these.

SA Did you and Neher pioneer the use of pipettes for measuring currents?

BS It was in the literature already, but for other reasons. Pipettes had been used to look at different types of current in a large cell, for instance a muscle cell, to study regional differences in current.

SA There was such a thing as voltage clamping before. Was patch clamping an extension of this?

BS It is not quite voltage clamping, as we are not clamping voltage. The currents flowing through the patch of membrane are so small that they would not change the membrane potential, there is no need to clamp the voltage. In a way, it is a simplified version of the voltage clamp.

SA Did you anticipate that so much about cell function would be elucidated by this technique?

BS No. We were after identifying how the current was transported through a membrane, whether it is through a channel and, if so, what kind of channel. There had been long discussions on how channels open, whether this happened fast or slowly and, once open, did they decay to a closed state, or were the pulses square. After we had figured out the basic properties of channels, and what you can infer about the structure of channels, we made use of other recording configurations, which we became aware of by chance. We were initially only trying to see channels in muscle membranes, so the next thing was to see whether there were ion channels in nerve cells, and they were there as well. The next big excitement came when we found that almost every cell which we investigated had ion channels – cells we had never thought would, like red blood cells – every single cell we put under the pipette showed elementary currents. We had discovered a whole new world of ion channels in cells, which we had not been interested in in the beginning. We didn't pursue this much, but others did; they learnt about it and used it, and we were very lucky in this respect.

SA You spent a lot of time developing techniques. Do you think it is important that scientists do this and share their techniques with other scientists?

BS Yes, it was part of the fun. The more people who use it the more new things you find.

SA What projects are you doing at the moment?

BS Right now I am following three different lines of research. All of them are concerned with nerve cells. One is in collaboration with a molecular biologist in Heidelberg: we are trying to detect the mechanisms that underlie certain forms of plasticity, or learning, that is, how with repeated activation or repeated electrical signals the connections between cells in the cortex change. The next is concerned with the function of one cell compartment, called the dendrite: most of the grey matter is made of these, so if one wants to understand how cells communicate in the central nervous system, one must understand the biophysical properties of these dendrites. What we discovered recently, with a number of Australian post-docs, is that dendrites are electrically excitable, that is, they can generate and conduct action potentials, and this ability to

generate action potentials is vital to the aforementioned changes in synaptic connections. So we are attempting to understand brain function at the level of the individual cell. The third area of research is still connected with understanding synaptic transmission in the CNS, in a particularly large synapse in the auditory pathway, called the Calyx: there we are trying to understand the phenomenology of calcium-influx directed release of transmitter. This provides a challenge for developing new methods, which are needed to address this question.

SA Have you always found research rewarding, or have there been times when you have been so frustrated that you have wanted to give up?

BS Never. Everything is interesting.

SA No major obstacles?

BS You always have several projects running in parallel, so that if you do not get along well with one, you just put it to rest and keep your mind occupied all the time... I would say that most of the time, even if I'm walking or doing something else, I keep thinking about my experiments. So frustration does not come because one is not fixed to one project.

SA How about funding-wise?

BS No. I am very lucky to work for a pure research organisation, at the Max-Planck Society. You can't have it any better, so there is no excuse not to do good science. What we are lacking is contact with students.

SA In what sense do you see this as a drawback?

BS You can become a bit detached from reality.

SA What do you think of the research scene in Australia?

BS Part of the reason why I came here was that I have had over the years five or six very bright and dedicated Australian post-docs, and I was curious to see what the scientific scene here in Australia is ... I wanted to see where these people come from. I think it is too early to generalise, but from what I can see, there are fewer problems in Australia to worry about, so they can concentrate on their academic careers.

SA Fewer problems?

BS It seems to me that Australia is still a very relaxed country, with few internal and no external problems. In Europe there is a lot of conflict, both internal and external, and tension which comes from proximity. But here there is a peaceful atmosphere. In Europe and America, there is a lot of competition, but Australians are good sportsmen, and they carry this spirit through to their work. During my visit last year, I realised what a relaxed society this is ... it seemed to me like an 'English society in a Mediterranean environment'.

SA What would you like to see happening as a result of this visit?

BS I would like to establish scientific links, ... and also see what my former post-docs are doing. Also, on each visit one learns something new. Then there is what I can give to younger people here. I am advising them on combining biophysical and molecular biology techniques to interfere with particular cell functions, so that they not only interfere by genetic means but also measure the changes that occur as a result. In my opinion, this is very important. A lot of progress has been made in this field, but somehow, this has not really happened in Australia yet. You have perfect molecular biologists, good physiologists, but the integration is just starting.

SA How has winning the Nobel Prize impacted on your life?

BS The Nobel Prize was the reward for work which we had been doing in the 1970s and '80s, since then my interests have shifted more to cell function, in particular at the level of the single molecule, and signalling properties, and how this occurs when two or three cells interact with each other.

SA How about from a non-work perspective?

BS There was a lot of public relations, which as scientists we were not used to. Questions like what we were going to do with the money. I said the first thing I would do was I would buy a new bicycle

Also, one has a lot of additional commitments to fulfil to get the science enterprise as a whole going, to keep it respectable; like being on reviewing committees, deciding how money is spent and so on. We have to do this, as if we don't the bureaucrats do, and then it is out of our control. I have been doing this for ten years, and I am now retracting from it.

SA Are you often asked for your opinion on various issues, not relating to science?

BS Yes, but I refrain from giving my views. Very quickly you realise that you are being instrumentalised, and learn how to avoid answering the questions that the interviewer wants you to answer.

SA Are there any other negative aspects of prominence that you have encountered?

BS Yes, you are a target of people who want to get attention for various causes... constantly asked to sign all sorts of petitions, where it is not entirely clear what the objective is. Then you are quoted as having signed this and that, and you realise that you have been used. I am careful now not to sign any petitions or declarations.

SA Finally, what are your interests outside physiology?

BS Tennis, and music till the end of the last century, let's say classical. So I'm conservative.

Shalini Amukotuwa interviewed Bert Sakmann in 1999 during her third year of the medical course. She is currently studying for her BMedSc in Neuroscience.

THE PATCH CLAMP TECHNIQUE

Since its introduction in 1976, the patch clamp technique has revolutionised electrophysiology. Not only has it provided definitive evidence of the existence of ion channels, by enabling measurement of the single channel currents ('elementary events'), it has also allowed scientists to elucidate the structure and function of these ion channels, and investigate how they influence membrane voltage, and such processes as secretion and cell contraction.

Prior to the advent of patch clamping, conventional methods for measuring the current passing through a cell membrane did not have the resolution necessary to measure the elementary currents constituting the synaptic signal between nerves and muscles.

By placing the tip of a glass micropipette onto a small patch of cell membrane the current flowing through an individual ion channel was measurable.

By measuring the amplitude and duration of currents through single ion channels, how the ions interact with a channel protein, and the nature and dynamics of the interaction between transmitter, receptor and associated ion channel can be determined. In order to characterise the relationship between the functional properties and the three dimensional structure of the ion channel, molecular biology and patch clamping techniques are combined. By altering discrete amino acid sequences, then seeing how this altered the channel's function (using patch clamping), the significance of that sequence to the channel's function can be determined; for instance, this technique enabled the location of those amino acid sequences that line the pore of the channel.

The proliferating body of knowledge on ion channels, and the various processes (synaptic transmission, secretion, contraction) found to be reliant on these channels is testament to the significance of patch clamping.

MINUTES OF THE ANNUAL GENERAL MEETING 1999

The annual general meeting of the University of Melbourne Medical Society (UMMS) was held at 7.00 pm on Tuesday 13 July 1999, in the Sunderland Theatre, Medical Building, the University of Melbourne. The meeting followed the Dean's Lecture entitled *Drugs: health politicised? Drug policy in Australia and its impact on our current and future health*. This was delivered by Professor Margaret Hamilton, Director, Turning Point Alcohol and Drug Centre.

1. Minutes of the Annual General Meeting 1998

The minutes of the 1998 Annual General Meeting, previously published in the 1999 issue of *Chiron* and circulated to UMMS members, were adopted as a fair record of proceedings.

2. Chairperson's Report

The new medical curriculum was successfully introduced this year with first year students enjoying access to specially developed facilities to support problem-based learning and clinical skills experience. Particular acknowledgment is given to medical alumni who made donations to support the development of these facilities. These contributions total nearly $40 000.

Congratulations to Ms Liz Brentnall, Editor of *Chiron*, for an excellent 1999 edition. *Chiron* has set the standard around Australia for this type of publication and is one of the best around the world's medical schools. In 1999, we are delighted to welcome Dr Janet McCalman, from the Centre for the Study of Health and Society, to join Ms Brentnall in editing *Chiron*.

The School of Medicine and UMMS would like to record special appreciation and thanks to the Medical Defence Association of Victoria for their continued generous support of *Chiron*.

The UMMS newsletter *The Melbourne PostCard* is now well established thanks to the editorial team of Dr Sharon Keeling and Ms Caroline Gibson. Dr Keeling is now working in Wales and Dr Jenny Conn, from the Faculty Education Unit, will take her place.

The UMMS Bachelor of Medical Science Prize for 1997 was awarded to Andrew Steer for his study entitled *The Epidemiology of Rheumatic Heart Disease in Schoolchildren in Samoa*.

There were three recipients of the Peter G Jones Elective Essay Prize in 1998. Prizes went to: Dominic Wilkinson for his essay *Palamaner Accounts*, Kenneth Pang for his essay *Beast of Burden*, and Suzi Nou for her essay *Cyclones in Paradise*. All are published in the 1999 *Chiron*.

The Annual UMMS Lecture was delivered by Dr Janet McCalman, entitled *The Making of Doctors–Extern Midwifery in the Slums of Melbourne 1921-1931*. This was a most interesting and well attended lecture and has been published in this year's *Chiron*.

The Dean's Lecture Series continued successfully in 1998 and concluded with a hypothetical entitled *Too Young to Know? Too Young to Decide? Consent and Confidentiality in Adolescent Health* convened by Professor Richard Smallwood. A report on this is published in the 1999 *Chiron*.

Members were reminded of the final presentation in the Dean's Lecture Series for the year, the ethics seminar on Friday 30 July – *Debates in Human Genetics: the Brave New World of Genetic Testing*.

In August, Nobel Laureates, Professor Peter Doherty and Professor Bert Sakmann, will visit the Faculty. They have been invited as part of the University's Eminent Scholars Scheme which aims to attract outstanding scholars to the University and to provide inspiration to young people to undertake medical research. Professor Bert Sakmann, a distinguished physiologist, will give a public lecture on 16 August 1999.

The annual UMMS Lecture will be held later in the year and members will receive details of this in the October edition of *The Melbourne PostCard*.

Membership of UMMS at the end of 1998 was 3767.

3. Financial Report

The Financial Report, for the twelve months ending 31 December 1998 was circulated and it was noted that there was a surplus of $7075 compared to a deficit of $6360 in the previous year when 1611 survey respondents received complementary memberships. It was noted that UMMS was in a financially stable position with a budget balance at the end of 1998 of $76 058. A motion to accept the financial report was carried.

There being no further business, the meeting closed at 7.10 pm.

NOTICE OF ANNUAL GENERAL MEETING 2000

The Annual General Meeting of the University of Melbourne Medical Society (UMMS) will be held at 7.00 pm on Tuesday 13 June 2000, in the Sunderland Lecture Theatre, ground floor, Medical Building, the University of Melbourne, Parkville. The meeting will be preceded by the Dean's Lecture in which Professor Sidney Bloch, Professor of Psychiatry, St Vincent's Hospital and Adjunct Professor, Centre for the Study of Health and Society, will deliver a lecture entitled *Bridging psychiatry and the humanities*.

Business

- Minutes of 1999 Annual General Meeting
- Chairperson's Report
- 1999 Financial Report
- General Business

UMMS 1998 BMedSc Prize

Jason William Galanos

for his study entitled

FABRY'S DISEASE IN AUSTRALIAN PATIENTS

Medical Review, Cardiac, Peripheral, Neurologic and Ophthalmic Evaluation and Patterns of X-inactivation in Symptomatic and Asymptomatic Carriers

Fabry's disease is caused by an X-linked recessive mutation in the gene encoding the enzyme α-galactosidase A. The resultant defect in sphingolipid catabolism results in the insidious accumulation of glycolipid, and subsequently in protean clinical manifestations. Affected boys commonly suffer from bouts of severe neurological pain in their hands and feet, and clinical diagnosis is commonly delayed until presentation with renal impairment or premature cardiovascular disease. Prior to successful renal replacement therapy with dialysis or transplantation, affected males commonly died in the fourth decade of life from renal failure. Today substantial morbidity and mortality are caused by cardiovascular, cerebrovascular, neurological and other tissue involvement.

The aims of this research project were to:

1. Create a database of Australian Fabry's sufferers
2. Correlate genotype with biochemical and clinical phenotype
3. Review the ophthalmological manifestations of Fabry's disease in Australian patients
4. Assess peripheral nerve involvement using a novel technique known as quantitative sensory testing, supplemented by nerve conduction studies and full clinical neurological assessment
5. Study the pattern of X-chromosome inactivation in female carriers, to test the hypothesis that variable clinical manifestations in females relate to skewed X-inactivation patterns and functional enzyme deficiency.

This study involved twenty-nine male sufferers and thirty-eight female carriers from eighteen kindreds. In twelve of the eighteen families the causative genetic lesion is known, and all hemizygotes manifested severe classical Fabry's disease caused by a virtual or absolute absence of α-galactosidase A activity. Clinical features were typical of Fabry's disease – acroparaesthesiae were universal, anhydrosis and angiokeratoma each in ninety-three per cent. Renal involvement was common. It was not possible to correlate the pattern of disease expression with specific genotype in this study. In older males previously an undocumented pattern of clinical features was common, comprising generalised muscle weakness and progressive exercise intolerance.

More than half female sufferers were symptomatic, most commonly expressing peripheral paraesthesia. Eight carriers manifested proteinuria. Ninety-five per cent of hemizygotes and a few heterozygotes recorded abnormal neurological testing confirming small nerve fibre dysfunction.

The typical ocular manifestations of Fabry's disease, both vascular and corneal, were commonly present but did not correlate within or between individuals or kindreds with other clinical manifestations. Results suggest that skewed patterns of X-inactivation influenced disease expression in heterozygotes.

Evidently a combination of factors are responsible for given phenotype in patients with Fabry's disease – age, genotype and in heterozygotes patterns of X-inactivation are all relevant.

Phase II trials in enzyme replacement are currently under-way overseas and the next generation of studies in Fabry's disease will assess the influence of enzyme replacement on clinical manifestations. In Australian patients, this study has been pivotal in providing baseline information, preliminary to participation in phase III studies of enzyme replacement.

The University of Melbourne Medical Society Congratulates

AUSTRALIAN OF THE YEAR

Professor Emeritus Sir Gustav Nossal AC for a lifetime's work in medical research, specifically immunology.

MEMBERS OF THE ORDER OF AUSTRALIA (AM)

Mr William Ronald Beetham (MB BS 1949) for service to medicine, particularly in the field of orthopaedics, and in the development of training programs for overseas doctors, and to the community.

Professor Robin Marks (Director of Dermatology, St Vincent's Hospital and Skin and Cancer Foundation (Victoria)) for service to medicine in the field of dermatology, and to public health, particularly the promotion of skin cancer and melanoma awareness.

MEDAL OF THE ORDER OF AUSTRALIA (OAM)

Mr Barrie John Aarons (MB BS 1957) for service to the community of Hamilton and to medicine.

Dr Alwyn Gerald Davies (MB BS 1937) for service to Rotary International aid programs, particularly the Surplus Medicines and Medical Equipment Scheme and the Sight Restoration Program for Indonesia, and as a general practitioner.

Dr David Evan Price (MB BS 1964) for service to the community of Mornington, particularly through the Uniting Church in Australia and groups promoting social justice and local issues, and to the International Medical Mission.

PUBLIC SERVICE MEDAL (PSM)

Dr Michael Robert Jones (MB BS 1963) for outstanding public service through health care in Victoria, particularly the Alfred Hospital, and the Victorian Public Service.

1999 Reunions

MB BS 1933

Sixty-Six Years Reunion

16 September 1999
Lyceum Club, Melbourne

MB BS 1933 SIXTY-SIX YEARS REUNION

L-R: Norman Cust, Lorna Lloyd-Green, Reginald (Spot) Turnbull.

From Lorna Lloyd-Green CBE – A celebration lunch was held at the Lyceum Club by courtesy of Lorna Lloyd-Green on 16 September 1999. In attendance were Norman Cust, Lorna Lloyd-Green and Reginald (Spot) Turnbull.

The ambiance of the Club and the gourmet meal, including kangaroo steak produced by the chef, added much to the occasion.

We plan to hold the sixty-seventh celebration in September 2000. The years are passing very quickly and two of the three members who attended were octogenarians. Apologies were received from England as well as a number from interstate.

MB BS 1935

Sixty-Four Years Reunion

26 November 1999
Naval and Military Club

From Alan King – The graduates of 1935 had a successful reunion on 26 November 1999 at the Naval and Military Club. We hope to hold our 65th reunion at about the same time this year.

The reunion was attended by: *Mick Dunn, Bill Gayton, Alan Jackson, Alan King, Nancy Lewis, James Smibert, Boyard Taft and Vin Youngman.*

GradNet

The Email Bulletin For Alumni

GradNet is a free fortnightly email bulletin for University of Melbourne alumni. It contains news of the University, information on forthcoming lectures, conferences and career opportunities, details of cultural events, information on local, interstate and overseas alumni events and graduate profiles.

If you would like to receive GradNet send your request and email address to *umms@medicine.unimelb.edu.au* and we will arrange for you to be placed on the mailing list.

GradNet is also available on the University Website at: *http://wwwunimelb.edu.au/alumni*

MB BS 1939
SIXTY YEARS REUNION

April 1999
Graduate House

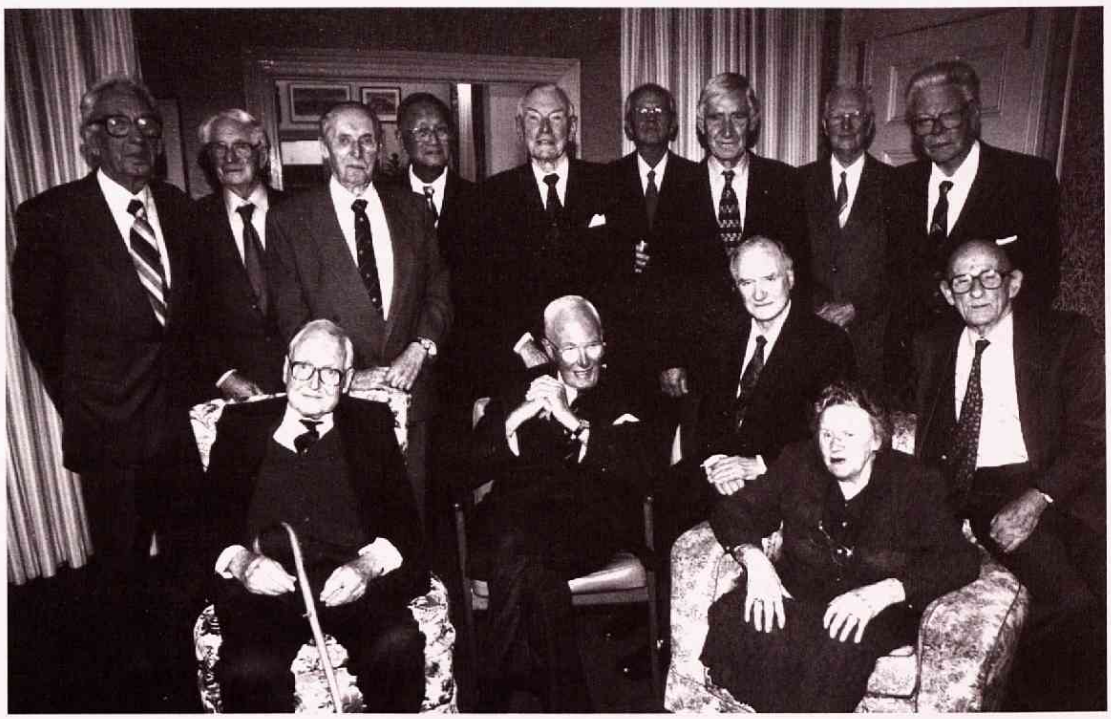
From Colin Laing – A reunion dinner to celebrate sixty years of practice since graduation in 1939 was held at Graduate House in April 1999.

Henry Clegg had made the arrangements for some six previous happy reunions and it was with deep sorrow we learnt of his death some months before the reunion.

I was asked to make the arrangements for this reunion, and Graduate House proved to be a very suitable venue for the fourteen who were able to attend.

Those present were: *David Alexander, Alfred Barnett, Colin Copland, Andrew Frazer, Douglas Gauld, Maurice Gooey, Frank Kenny, Gordon Keys Smith, Colin Laing, Una O'Day (née Shergold), Norman Rose, Graham Salter, Rod Strang and Blair Widmer.*

Apologies were unfortunately received from Vernon Hollyock and Alan Sanguinetti as they were not well enough to attend.



MB BS 1954
FORTY-FIVE YEARS REUNION

6 November 1999
Royal South Yarra Lawn Tennis Club

From Norman Beischer – We held this reception gathering and reunion dinner to celebrate forty-five years since graduating MB BS in 1954. Our year had 140 graduands and forty-eight of the 102 survivors attended this function at the ideal facilities of the South Yarra Tennis Club. The evening was judged a great success by those who attended. The pre-dinner reception was prolonged and important and allowed everybody to circulate and learn to recognise each other again! This was our eighth five-year reunion meeting. We had decided to have no formal speaker, which proved to be a good idea as much intermingling of groups was required to renew friendships – and to be updated on social, family and professional happenings of colleagues. We all move in different streams and it is salutary how little we know about what is happening to friends who live in the same city. The main topics of conversation covered various aspects of the ageing process and the joys of retirement, real or impending. Our year, happily, included a number of ex-servicemen who contributed much to our welfare during our course, and during this reception. We all agreed that

survival to and attendance at the fifty years reunion will be mandatory!

Graduates attending the reunion were: *Paul Adrian, Nick Antonas, Zyggy Atlas, John Bartram, Norman Beischer, Peter Bladin, Bill Blomfield, Frank Broderick, Alison Brooks, Ian Cameron, Sam Chani, Sam Chazan, Ruth Conron, David Danks and June McMullin (Danks), Allan Eagle, Harry Edhouse, Karla Fenton, David Gale, Peter Hardy-Smith, Geoff Harley, Donald Hossack, Bill Huffam, Lloyd Jago, Ian Johnston, Jack Jones, Brian Jordan, Max Kirwan, George Latham, Bob Leggatt, Peter MacCallum, John Macdonald, Tom Malios, Vernon Marshall, Hugh Millar, Alex Mitchell, David Nurse, Neil Oates, Ken Pettit, Paula Pitt, Hylon Poulier, Douglas Ritchie, Alan Rose, Laurence Simpson, Paul Steedman, Michael Symons, Robert Thompson, Ian Warner, John Yeatman.*

MB BS 1979

TWENTY YEARS REUNION

23 & 24 October 1999
Windsor Hotel & Albert Park Lake

From Lorraine Baker – Saturday 23 October 1999 dawned and those of us from the year of 1979 organising committee were in various stages of panic or calm depending on our level of involvement in the day's activities. Mark Buckland looked a worried man as he tried to trace all the speakers, Mark MacLennan looked dapper in a suit ready to proceed to Echuca for a friend's wedding and the rest of the reunionists looked either much the same or completely different for the passage of twenty years (hence the provision of name tags).

The lecture program proceeded and Tony Geddes refreshed our memories of his somnolence by nodding off during one talk (I won't reveal the name of the speaker) and Mike Harari appeared at the last minute having suffered a burglary during the preceding night with the theft of an enuresis alarm from his car (the mind boggles!). During Ian Millar's presentation and the preview of Geoff Campbell's archive of photographs many of us were reminded that we once had hair and/or slimmer physiques. As midday arrived and the lecture program finished a few moved on to lunch and more reminiscence, while others gathered strength for the evening event.

The Grand Dining Room at the Windsor Hotel proved a wonderful venue for the reunion dinner and some with more stamina than others were still there at 1.30 am. Congratulations to Paddy Dewan who won the door prize – a digital camera donated by Agfa.

Those with even more stamina, and children young enough to force them to awaken early, met at Albert Park Lake for a picnic the next day. Thank you to Worralls for providing a crowd-pleasing display of expensive cars which entertained our children (who currently consume the cash flow necessary to own one of these vehicles).

For those of us who had organised the reunion and at times wondered how we could afford the time and effort, it was gratifying that our efforts were appreciated. To Gabrielle Wiehle and Bill Kefalas – thank you for offering to help with the next reunion in 2004. Be prepared.

Thank yous went to: Dave Workman and Lorraine Baker for initiating the event, tracing the graduates and organising the mailouts; Margie Dawson, Gary Leber and Dave Workman for preparation of the reunion booklet; Mark Buckland for organising the lecture program; Paddy Dewan, Alan McNab, Mark MacLennan, Michael Harari, Mark Buckland and Ian Miller for presenting the lecture program; Mark MacLennan and Rob Beavis for organisation of the dinner; Barb Goss and Margie Dawson for the organisation of the picnic and Steve Ward for help with sponsorship.

UNIVERSITY OF MELBOURNE MEDICAL SOCIETY (UMMS)
FREE MEMBERSHIP

Members have responded enthusiastically to free membership of UMMS and the opportunity to donate to areas of need identified by the School of Medicine. After reviewing the increasing costs of administering fees for annual membership last year, the UMMS Committee decided to discontinue the fee and offer members greater opportunity to make voluntary donations which will be of benefit to students, teaching and research activities in the School of Medicine.

At the end of April this year membership of UMMS was 2096 and donations from members were $30 000.

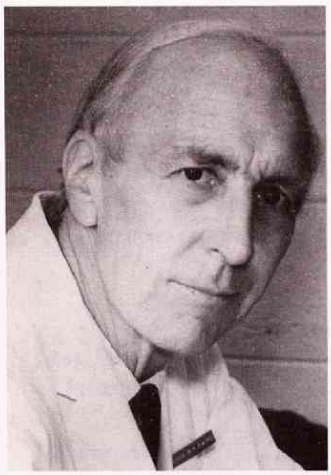
UMMS members still need to renew their membership annually and renewal forms are enclosed with this issue of Chiron for those who had not renewed their membership when this issue was mailed to members. Foundation Life Members and Honorary Members retain their membership benefits without the need to renew.

Enquiries about membership can be made to the UMMS office on telephone (+61 3) 8344 5888 or facsimile (+61 3) 9347 7084 or to the UMMS email address at: *umms@medicine.unimelb.edu.au*

MAURICE ROSSIE EWING CBE

MB ChB 1935, MSc 1956, MD (Hons) 1979, FRCS, FRACS, HonFACS

1912–1999



Maurice Ewing

MAURICE EWING was born in Edinburgh with a seafaring ancestry. His student career showed the brilliance and erudition that he maintained throughout his professional career. He was educated at Daniel Stewart's College in Edinburgh, where he obtained numerous prizes, was Captain of School and Dux of School. Maurice was awarded the Creighton Scholarship to Edinburgh University, where he read medicine from 1930 to 1935 obtaining gold medals for first place every year of the course–in chemistry, physics, anatomy, medicine, public health and surgery. He graduated at the head of his year as the Ettles First Scholar and as the Mouan Scholar in the Practice of Physic. Resident appointments at the Royal Infirmary in Edinburgh with Sir David Wilkie and at Leicester Royal Infirmary followed, and he soon gained his surgical qualifications: first the Edinburgh and later the London fellowships.

He returned to Edinburgh as anatomy and physiology demonstrator and surgeon to outpatients prior to the Second World War. During the war years he served as Surgeon Lieutenant-Commander in the Royal Navy in the United Kingdom and Malta. After the war he moved from Scotland to join Ian Aird at the Hammersmith Postgraduate Medical School. During his time at Hammersmith he was Aird's right hand and they formed a powerful duo. Maurice obtained a Hunterian Professorship, a Travelling Fellowship to Scandinavia and a British Empire Fellowship to the Memorial Hospital in New York with Hayes Martin. His appointment as Foundation Professor in Surgery at the University of Melbourne followed in 1955. He had previously met and married Phyllis, a Sassenach, and they came to Australia with two young sons: Hamish and Alastair. A daughter, Sarah, was born in Melbourne. Scotland is renowned for its exports, which range from whisky through to apparel. Most notable of all is the adventurous, enterprising and canny group of Scots who have spread around the globe. In Maurice Ewing Australia gained a prize; a transplant which endured. He was Professor of Surgery in Melbourne from 1955 until his retirement in 1977.

Maurice was the epitome of the best of Scottish character: droll and astute, kind as well as canny, with a gentle humour and a soft burr of a voice. His erudition, politeness and kindness, his personal warmth, modesty, charm and good humour rapidly became bywords. Linked with his great personal charm was his humour, which was unique and decidedly puckish. He had an idiosyncratic, whimsical, quirky, quizzical (sometimes a little obscure) nature which was always accompanied by a characteristic tilt of his head and twinkle in his eyes and that engagingly mischievous smile.

His humour extended to his teaching, which was a delight to observe and to receive; interrogatively Socratic, but with a distinctive personal touch. When asking a question, he would often parade the correct response, and then gently and smilingly discuss and deride and query it himself; until the correct answer seemed an unlikely (indeed impossible) contender in face of the series of apparently more plausible alternatives presented. At first a little disconcerting, this rapidly became familiar and was a superb learning exercise in problem-solving for alert students.

Professionally, in those early years during the 1950s, he straddled all the major Melbourne teaching hospitals, with departments based at the Alfred and Royal Melbourne Hospitals. He was the heartbeat of academic surgery across the State; as was his fellow Foundation Professor, Richard Lovell, for medicine. Maurice was so much more than just a technical surgeon – he was the true 'physician who operates' – his diagnostic skills, encyclopaedic knowledge of disease, and compassion and concern for patients were the stuff of legend.

Maurice was a superb speaker, lecturer and writer. He honed these attributes to their highest plane. He loved words – their origins, their precise meanings, their smooth roll and lilt – especially when delivered in his inimitable speaking style and voice and with flashes of humour illuminating all. He was deservedly and notably a popular choice for orations and memorial lectures.

His writings were an extension of his voice; if anything his papers were even more enjoyable than lectures, as one could linger over and re-read them. They delighted with alliteration and allusion, with analogy and metaphor, with the harmonious union of main and subsidiary clauses in sentences, and often an unexpected but apposite twist in the tail. Never a sting – his humorous touch was always gentle, urbane, ironic and self-deprecatory. His wide interests are reflected in the range of papers – each an individual gem – that he produced over this period. They ranged across ethics in surgery, kidney dialysis, organ transplantation, blood alcohol levels and road traffic accidents, sheep skins in nursing and wool in surgical masks. He pioneered notable advances in surgery and in public health in all these fields.

Maurice did the first ever Australian kidney transplant at the Royal Melbourne Hospital in 1956, after converting the mortuary into a temporary operating theatre, and followed with pioneering work in developing artificial organs and kidney dialysis in the later 1950s at the Alfred Hospital. This was heady stuff for the young students, residents and surgeons in his department. Again his humour would surface – when he and Dick Lovell had to send patients with complications of post-operative acute kidney failure to Sydney to be dialysed and cured, he noted it was 'inappropriate for our Victorian dirty linen to be publicly exposed and washed clean in New South Wales', and he promptly raised funds for the first artificial kidney in Victoria and installed it in his department.

He was on the interim council setting up Monash University, and lobbied tirelessly for a University Campus Hospital after the site at Clayton was chosen. He received many honorary degrees and fellowships from Melbourne and Monash Universities, and from around the world. He was Visiting Professor from Singapore to Seattle. He received the CBE in 1977 for services to surgery and to the University. Maurice and his senior professional colleagues in Australasia founded the Surgical Research Society of Australia and New Zealand soon after he arrived. He was its staunch patron.

After retirement from the University of Melbourne, Maurice spent six months in Kuala Lumpur developing the academic surgical unit of the University of Malaysia. As well as fostering a strong department, he and Phyllis enjoyed and

took part in the local environment as wonderful Australian ambassadors. They subsequently enjoyed a rural Victorian retirement.

His latter years were marred by disability; he is survived by his wife and children. One cannot discuss Maurice without speaking of Phyllis his wife, of her warmth, love and support; together with that of their children – Hamish, Alastair and Sarah – and their grandchildren.

Maurice inspired loyalty and immense affection from the juniors in his department; and from all his colleagues, friends and students. He was the apotheosis and paradigm of excellence in surgery, in medicine and in academe.

Vernon Marshall

Vernon Marshall was a student, academic surgical colleague and friend of Maurice Ewing.

JOHN ISAAC HAYWARD

MB BS 1933, MD 1936, MS 1937, FRCS, FRACS, FCCP
1910–1999

John Hayward

WHEN JOHN ISAAC Hayward died, on 14 July 1999, the Australian community and the surgical profession lost a favoured son. John Hayward was an outstanding figure in the establishment of cardiothoracic surgery and made great contributions to the specialty throughout his life.

Born in Brunswick on 16 July 1910, his early educational career was an indicator of the academic brilliance to follow. He was dux of University High School and obtained first class honours throughout his medical undergraduate course. At the conclusion of the medical course he came second in his year, obtained exhibitions in Medicine and Obstetrics and Gynaecology and was awarded the Jamieson Prize.

Residencies at the Royal Melbourne Hospital from 1933-4 began an association with the Hospital which lasted over fifty years. As a resident John Hayward became attracted to the emerging specialty of thoracic surgery. He went on to develop the combination of academic knowledge, original thought and practice which made him such a great teacher and surgeon. In 1935, very early in his career, he reported to the Royal Melbourne Hospital Clinical Report a system of drainage of the thoracic cavity he had devised and put into practice.

He became Resident Clinical Pathologist at the Royal Melbourne Hospital in 1935, at the same time as working at the Walter and Eliza Hall Research Institute. A Beaney Scholarship followed and an appointment as Junior Lecturer in the Pathology Department of the University of Melbourne through 1936-7. He obtained his Doctor of Medicine in 1936 and his Master of Surgery in 1937.

In 1938 he travelled to London and obtained Fellowship of the Royal College of Surgeons. He was appointed House Physician and subsequently Surgical House Officer at the Brompton Hospital, London in 1939 where he came under the influence of the great English cardiothoracic surgeons Lord Brock, JE Roberts and Tudor Edwards.

John Hayward's service to his country covered many years in the armed forces. He had joined the Militia at the age of nineteen and, after completing his training at the Brompton Hospital, he joined the British Emergency Medical Service. On his return to Australia in 1941 two great events occurred in his life: he joined the Australian Army Medical Corps and, more importantly, he married Ethel Auty – an ideal marriage that lasted fifty years. He served in the Second First Australian General Hospital and the Second First Australian Field Ambulances in war zones in the Middle East, Australia, Morotai and Papua New Guinea, and was discharged in 1946 with the rank of Major. His contributions on active service did much to reduce the mortality and morbidity of major chest wounds.

John Hayward's meticulous presentation and loyalty to institutions and friends bear witness to the long years he served in the armed services. Following discharge from the Army in 1946 he became the first Honorary Thoracic Surgeon appointed to the Royal Melbourne Hospital. By that time he already had appointments to the Repatriation Hospital and to the Austin Hospital where, together with Sir James Officer Brown, his surgical treatment of patients with pulmonary tuberculosis led to a significant reduction in the incidence of this condition and improvement in the quality of life for its unfortunate sufferers.

The Unit at the Royal Melbourne Hospital flourished under the leadership of John Hayward and his assistant and friend Ian McConchie. It was not an easy task, as the concept of specialist units in teaching hospitals was slow to be accepted. John Hayward pioneered the development of lung, cardiac, and oesophageal surgery. Most notable was his outstanding contribution to the surgery of mitral valve disease. His report on closed mitral valvotomy published in the *Medical Journal of Australia* in 1966 was a classic article – 284 cases ranging in age from sixteen to seventy-three with a five per cent mortality.

Although assisting John Hayward in theatre was demanding and exacting, he used inspired methods in difficult circumstances. One recalls a large tumour found, by accident, inside the heart, blocking the way to the treatment of the mitral valve. The successful removal of the tumour by a dessert spoon was associated with a lot of blood and a lot of excitement, but a successful outcome.

John Hayward's great leadership qualities and teaching abilities drew to him a large number of young surgeons who today form the backbone of delivery of this service in Australia. After establishing closed thoracic surgery and cardiac surgery he saw the need for an open heart unit and, in his usual methodical way, set about establishing the proper research and experimental methodology which were to herald the successful introduction of this form of surgery at a later date.

In addition to the Royal Melbourne Hospital, he also served as thoracic surgeon to the Repatriation Department, the Austin Hospital, the Royal Women's Hospital and the Preston and Northcote Community Hospital.

Never one to lose sight of the institutions he regarded as fundamental to his work, he was a member of Convocation of the University of Melbourne from 1971-9, and a member of University Council from 1979-83.

His loyalty to the Royal Australasian College of Surgeons extended over many years involving a great deal of work in the teaching and examination fields. He was a foundation member of the Thoracic Section and subsequently its Chairman, a member of the Library Committee from 1975-81 and a member of the Court of Examiners from 1967-76.

Following retirement from active surgical practice John Hayward devoted himself to his love of music, his hobby of gardening and, particularly, to his three daughters and their families. Ethel, his devoted wife, predeceased him in 1991. John Hayward will be sadly missed but not forgotten by those who knew him – more particularly those who benefited from his teaching, his counselling, his friendship and his devotion to the cause of bringing help to the sick. His later years were also devoted to the writing of his autobiography entitled *Sharing for Life* which was launched posthumously on 14th April 2000 at the Epworth Hospital.

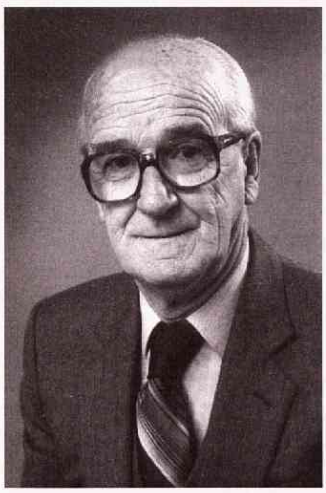
In the hospitals in which he worked, in the institutions he served so well, and in the memory of the many patients that he so devotedly helped, his name will be forever revered. To his surviving family go the best wishes and condolences of all those who benefited from the life of John Hayward.

Large was his bounty and his soul sincere,
Heaven did a recompense as largely send.
Thomas Gray

JK Clarebrough

DESMOND GARVAN HURLEY

MB BS 1945, FRCS, FRACS
1921–1999


Desmond Hurley

DESMOND GARVAN HURLEY died on 29 March 1999. He was born in Nhill on 24 June 1921, the third of four sons of Dr John and Mrs Greta Garvan Hurley. As there was no other medical practitioner in the town at the time the occasion was unusual in that his father was, of necessity, accoucheur.

Like his father and brothers, Desmond was educated at Xavier College, matriculating in the awesome year of 1939, and then studied medicine at the University of Melbourne. He graduated with honours in 1945, winning the Ryan Prize for Medicine at St Vincent's Hospital where he did his residency.

Desmond then spent two years working with his father in general practice in Corowa. This was a particularly rewarding period of his life and ever afterwards, with amazing recall, he would recount stories and anecdotes of his experiences as a country general practitioner.

The call of a surgical career proved too strong and at the end of 1949 he went to England to study surgery. Quickly obtaining the English Fellowship he had the very good fortune to become a protégé of Sir Gordon Gordon Taylor who had a significant influence on the formation of the Royal Australasian College of Surgeons. Under Sir Gordon's auspices Desmond became surgical registrar at the Essex County Hospital in Colchester and he was the first of many Australians to work in there. He then won a prestigious surgical fellowship to the Mayo Clinic in the United States of America which gave him the opportunity to observe and work with many famous surgeons. Before returning to England he toured various leading surgical centres in the North Eastern United States where again he was an avidly retentive but typically not uncritical observer. He also had the opportunity to observe the surgical expertise of Norman Tanner in London and Pietro Valdoni in Rome and always said they were the best surgical technicians he had seen. Desmond himself possessed great surgical expertise, reflected in an extremely low complication rate.

Desmond became senior surgical registrar at the Middlesex Hospital in London before he returned to Australia in 1954. He brought with him many new and modern concepts of surgery and surgical management – in particular, expertise in the theory and practice of intravenous therapy. He obtained the FRACS and was appointed to the surgical staff at St Vincent's where he was to work for the next thirty-two years. His relationship with that hospital cannot be better expressed than in the words of the obituary notice inserted by the Division of Surgery in the newspaper after his death: 'Surgeon, colleague and friend who devoted his life to patients and staff of St Vincent's Hospital Melbourne'. Desmond established a large and busy surgical practice both in Melbourne and in country Victoria and became a well-known, highly respected general surgeon, specialising i n abdominal surgery in all its varieties and in surgery of the thyroid and the breast. In 1966 he was leader of one of the St Vincent's Hospital Medical and Nursing Teams in South Vietnam.

In 1970 Desmond became Head of a Surgical Unit at St Vincent's Hospital. After retirement from the Hospital in 1986 he continued surgical practice for some years and was always available to give generous advice, help and assistance to the many who asked for it.

Desmond was a person of great integrity, honest to a fault and straightforward, without any meanness in his character. He possessed a particular charisma that made him a man one was always glad to see, wanted to meet. He possessed an enormous gift for friendship, a marvellous sense of humour, sympathy, empathy with and interest in other people. I never met a man who knew so many people or was known by so many, or a man who could remember so much about those he knew. A wise medical teacher once said that the difference between great doctors and the rest is the fact that the great doctors are human beings first and doctors second, the others are just doctors. That description aptly defined Desmond.

Desmond faced his final illness with fortitude and courage, sustained by his strong but undemonstrative faith, and a calm acceptance of the inevitable outcome. All who knew Desmond will take comfort that he will continue to live in the hearts of those who loved him and in that sense will never die.

John Doyle

RICHARD ROBERT HAYNES LOVELL AO

MD, MSc, FRCP, FRACP, FACP(Hon)
1918–2000


Richard Lovell
photograph courtesy 'The Age'

AS THE FIRST PROFESSOR of Medicine, Richard Lovell holds a special place in the history of the medical school of the University of Melbourne. He will be remembered particularly for his seminal roles in the establishment of the modern form of the discipline of epidemiology, including his leading role in one of the first multicentre clinical trials and the first recognisable use of what has become known as meta-analysis; the establishment of the Medical Research Ethics Committee of the National Health and Medical Research Council (NHMRC); and by medical students graduating over a span of more than thirty years for his superb and committed teaching. For those who had the good fortune to know him well he will equally be remembered for his charm, wit, loyalty and warmth.

Dick Lovell graduated in medicine from St Mary's Clinical School in London in 1941. After a brief period as a houseman, he enlisted in the Royal Navy and served as a naval surgeon with distinction until 1946. He then rejoined St Mary's, first as Lecturer and later as Senior Lecturer. In his time as student and teacher at St Mary's, he was particularly influenced by two physicians: Charles Wilson (later Lord Moran) and Sir George Pickering who first interested him in the determinants of hypertension. In 1955, he was appointed to the Foundation

James Stewart Chair of Medicine at the University of Melbourne, initially based at both the Royal Melbourne Hospital and the Alfred Hospital but a little later, at the Royal Melbourne Hospital alone. The creation of University Departments within the Hospital was a major change for the senior staff of the Hospital, a distinguished group who must have been somewhat intimidating for the young Englishman. The initial Department was small with early colleagues being the late Roger Melick and Bob Fraser. Priscilla Kincaid-Smith joined the Department in the early sixties and the Department was well and truly under way. Gradually, Lovell gained the confidence of the senior medical staff and created a culture of basing clinical practice on evidence, giving new rigour, enthusiasm and quality to undergraduate and postgraduate medical teaching. Lovell, together with Maurice Ewing and Priscilla Kincaid-Smith, successfully orchestrated the development of renal transplantation in Australia. He then played the major role in organising the Australian Hypertension Study, an early prototype multicentre study showing the efficacy of hypotensive therapy in reducing risk of stroke. His ingenuity led to the idea of combining the results of several studies to determine effectiveness of anticoagulant therapy and antiarrhythmic therapy in preventing death after acute myocardial infarction, a technique later known as meta-analysis. His epidemiological studies extended to looking at the prevalence of hypertension in individuals from the Highlands of Papua New Guinea who have a very low salt intake. He had a talent for enthusing his colleagues and inspiring them with curiosity and a love for clinical investigation. He influenced countless young doctors who now occupy leadership positions throughout Australia and overseas. He demonstrated enormous loyalty to those who worked for him and in turn elicited it from them.

On reaching sixty-five, he 'retired' from the James Stewart Chair and commenced the next phase of his career, working part-time for the Anti-Cancer Council of Victoria. He had always had a deep interest in medical ethics, particularly as they applied to research, and was the inaugural Chair of the Medical Research Ethics Committee of the NHMRC quickly establishing its exemplary standards which earned international respect. He was also appointed as the part-time Convener of Continuing Education for the Faculty of Medicine. He was active in the Anti-Cancer Council until a year before his death, remaining razor-sharp in intellect and youthful and energetic in attitude. He also found time in retirement to complete his biography of Lord Moran, 'Churchill's Doctor', a beautifully written and scholarly work.

Richard Lovell received many awards recognising his outstanding service to medicine, to the University and to the community. These included the Sir William Upjohn Medal in 1982, awarded only at five year intervals for outstanding services to medicine in Australia, and appointment as an Officer in the General Division of the Order of Australia.

Any description of the life of Dick Lovell would be incomplete without an attempt to chronicle his extraordinarily warm human qualities. He was a man who, underneath his somewhat patrician exterior, exuded both wit and charm. Legions of junior staff remember with great pleasure the Lovell's hospitality at dinner parties in Hawthorn where Dick the raconteur would hold court to the entertainment of all, even if they were a little disquieted by the ritual watering of the lemon tree as the ladies 'freshened themselves up'. He had old world values and manners with the laterality of thought to anticipate and enact the most modern of attitudes.

The extent of Dick Lovell's qualities of compassion and loyalty became apparent during the protracted, tragic and ultimately fatal illness with Parkinson's disease which caused initially physical disability, and ultimately dementia, in his beloved wife Diana. The Lovells had always been a very close couple, and Dick expended enormous physical and emotional energy caring superbly for Diana in the last ten years of her life. He enjoyed a close relationship with his five children and took great pleasure in his six grand-children. Despite his British origins, he grew to love Australia and particularly enjoyed bush-walking, painting and gardening as well as reading and writing.

We have lost a great Australian. He made a unique contribution to academic medicine in this country and his approach to medical science has proved to be remarkably prescient. He was also a wonderful human being.

Richard Larkins
Dean, Faculty of Medicine, Dentistry and Health Sciences

JOHN GIVAN MCMAHON

MB BS 1940, FRACP, FRSH
1910–2000


John McMahon

JOHN WAS BORN ON 22 September 1916, the son of the late Dr J J McMahon who first set up practice in Kew in 1910.

He was educated at Melbourne Grammar School between 1924-33, with extremely happy memories of many teachers who had a great influence on him. He was in the middle of the field scholastically, winning prizes in history, geography and English. His main sport was rowing and he finally rowed bow in the Second VIII.

John proceeded on to medicine, graduating MB BS in 1940. He rowed in several extra collegiate crews but never quite got anywhere near his objective – the University VIII. He turned to his second skill, rifle shooting, joined the Melbourne University Rifle Club and took part in four intervarsity contests. He won a Full Blue (MURC) in 1938 and captained the team in 1939 and 1940. The team won the Venour Nathan Shield and John won a 'combined Blue' awarded by the Australian University Sports Union (AUSU).

Following ten months as a junior resident in Launceston he enlisted in the 2nd AIF (October 1941) and was posted to the 1st Australian Armoured Division as a Section Commander in the 2/15 Light Field Ambulance. Early in 1943 the 2/15 was changed to an infantry type field ambulance and took part in the operation on the north side of New Guinea and SWPA for the remainder of the war.

John's father died in March 1945. He was brought back from New Guinea and discharged from the Army in order to carry on his father's medical practice. He also found himself acting *in loco parentis* to his brother Kit and sister Audrey.

John moved himself from the old family home in Princess St Kew to 85 High St Kew. He married Ethel Jackson in August 1946. Ethel's brother is Harry Jackson, also a doctor who graduated the same year as John. The medical practice grew and became a four man practice by 1955. Harry Jackson and John Wales were also part of the Kew Medical Group.

As well as being a medical practitioner in Kew, working seven days a week, day and night, John also took on other responsibilities. He was the Medical Health Officer of Kew for twenty-five years until 1983. He served on the Board of Management of St Georges Hospital in Kew for a similar period of time until he resigned and was made Life Governor in 1972.

It was John's activities in the broader issues of public health as distinct from the more formal pursuits of a family doctor that led to his being asked to accept nomination to the Board of Fairfield Infectious Diseases Hospital in 1971. He sat on the Board until February 1981 when the year long crisis between senior medical staff and the administration led to the suspension of the Board.

As well as medicine consuming his life, he was extremely interested in the law. For many years he was a member of the medico-legal society and rose to the position of president. He was the first non-specialist medico to hold this position.

John was a family doctor to so many – with an amazing bedside manner. He was concerned for all his patients – from the privileged through to the pensioners of Kew. He used to say he never made any money out of medicine because he treated patients 'as people' not 'as sheep in a dip'. He was a general practitioner, there being nearly sixty years of McMahon family doctors in Kew. In his early days of medical practice the Dean of the Clinical School of the Royal Melbourne Hospital started a senior attachment scheme. John was asked and agreed to take a final year medical student for a two week period. He found it a stimulating experience, sometimes learning almost as much as the student did from the teacher. Teaching these students was one of his great passions.

In 1958 the Australian College of General Practitioners was formed and John joined almost immediately. It was a turning point in his life. He chaired and served on a number of their committees, attending their yearly seminars and worked hard at gaining the recognition that General Practice was a postgraduate discipline in its own right. He had helped the College receive funding through Sir Robert Menzies – a long-time friend and patient of himself and his father.

John was elected to the Fellowship of the College in 1971 and in the company of many others was officially awarded his FRACGP at the 5th World Conference on General Practice held in Melbourne in October 1972. Here the concept of teaching in general practice, which John had worked so hard for, was accepted. Students were offered general practice terms and the Family Medicine Program began.

John continued to take several Family Medicine Program students, but sadly for John there were other changes in his life. His wife died suddenly in 1970, his daughter married and moved away from home and the years began to take their toll on the Kew Medical Group. There were two retirements and by 1974 the situation was impossible and John realised he would have to close the practice. With great reluctance he took down his plate on New Year's Eve 1975 and spent the next nine months helping patients to make alternative arrangements. It was an arduous period in his life.

After a four month trip overseas to see his brother and sister, he returned to Melbourne and accepted a newly created position as Staff Medical Officer at Mount Royal Hospital. He now worked forty hours a week with an hour for lunch and no weekend commitments at all.

He formed a whole new set of medical friendships, including Professor Derek Prinsley, the first Professor of Geriatrics in Australia. It was Derek Prinsley who put his name forward for election to the Fellowship of the Royal Society of Health in 1984.

He retired in 1983, aged sixty-seven years and travelled to the Galapagos Islands for the trip of a lifetime. Over the last seventeen years he had given a lot of unofficial medical advice to ex-patients, friends, colleagues and, of course, the family. Together with this he also possessed a sense of humour and endless supply of stories, particularly medical and historical ones. These bore the fruits of his long, interesting and productive life. He lived the last four years of his life at Balwyn Manor – still within easy reach of his daughter and her family, and Kew where he had always resided. He often talked about his 'use by date expiring' and had prepared for it as best as possible. Fortunately, his death was quick and he passed away on 24 February 2000. Never in his wildest dreams did he expect to reach eighty-three years, after a long, happy and totally fulfilling life.

Sue Bradshaw (née McMahon)

DR SRBOLJUB (SERGE) PRERADOVIC

MB BS 1958

1921–1999

SERGE PRERADOVIC, one of Melbourne's general practitioners, died on 25 October 1999 aged seventy-eight. Serge Preradovic was an inspiration to many in having overcome difficulties to enable him to practice medicine, a vocation dear to him.

Born in Budapest, Hungary, in 1921 to a family whose father was in the Diplomatic Corps for Yugoslavia, there were many moves in his early years. His mother died when Serge was young, and when Serge was sixteen his father also died. His further youthful years were in the care of relatives. By the Second World War Serge had graduated from the Royal Military Academy as an officer, but his unit was captured and he endured four years forced labour in a German POW camp.

After the War Serge studied medicine at Bonn University, but before completing his degree he was given the choice as a displaced person to assume German citizenship or return to Yugoslavia. Instead, he migrated to Australia in 1949. His medical studies were not recognised in Australia, so Serge took up the challenge by taking labouring jobs until he could enrol at Melbourne University, to graduate MB BS in 1958. Those of us who simply had the transition from secondary school to university find it hard to imagine the difficulties of the occasional person such as Serge who overcame so many obstacles. His resident years were at the Alfred Hospital and he continued service at the Hospital as an honorary medical officer to outpatients until 1981.

His own practice was in Prahran where he served the community with dedication, skill and his personable humour. His decision to retire was only partly successful, as his love for medicine, and need to practise saw him continuing to care for some of his long-term patients as well as working as a locum at other clinics.

Another interest was soccer: he was the medical officer for the JUST team, and at one stage was President of the club. Other sporting activities included water skiing, ten-pin bowling and target shooting.

Hip surgery became necessary, but complications following this caused his death. He is survived by his second wife, Irene, a son and two daughters from his first marriage, a daughter-in-law and a step-son.

Serge will be remembered for his sincerity, his ability to see another's point of view, his care for others and his dogged determination to practise medicine. He was proud of his Australian citizenship and of his University.

Ralph H Lewis

REES JAMES RIDDELL

MB BS 1935, DTM&H, RCP&S

1912–1999

JIM RIDDELL WAS BORN IN Auburn, Victoria, on 12 May 1912 and died shortly after his eighty-seventh birthday at Brunswick, Victoria. He was the eldest child of Robina and James Rees Riddell, a well-known Melbourne valuator. Jim

Jim Riddell

received his secondary education at Scotch College, Melbourne, where he did exceptionally well in physics. After leaving Scotch he entered Ormond College in 1930 and commenced his medical training, graduating in 1935. After his residency at the Royal Melbourne Hospital in 1936 he became a medical officer in the Royal Australian Navy. On leaving the Navy in 1938, he travelled to the United Kingdom where he attended the course in London for the Graduate Diploma of Tropical Medicine and Hygiene. As a result of achieving first place in the examination, he was awarded the Duncan Medal of the University of London School of Hygiene and Tropical Medicine in July 1939. With the outbreak of the Second World War two months later, he hurried back to Australia and joined the Royal Australian Air Force. As a medical officer in the RAAF he saw service in Northern Australia, New Guinea, and other islands of the Pacific Ocean. When demobilised at the end of the War he had reached the rank of Squadron Leader.

During the course of his War service, Jim had been trained as a specialist pathologist. Consequently, after his military discharge he became a pathologist with the Australian Commonwealth Health Department. In this capacity he worked in all the eastern states. In 1954 he was appointed Pathologist at the Austin Hospital, Heidelberg. Shortly after his appointment the ground-breaking Spinal Unit of the Hospital was established and Jim became closely involved in its work. This involvement lead to a particular interest in the anatomy and pathology of the nervous system and to a further period of study in London, in 1956, at the National Hospital for Nervous Diseases, Queen Square. Jim took early retirement in 1972 in order to follow this interest and in 1974 he became a part-time senior demonstrator in the Department of Anatomy where he mainly devoted his time to the teaching of neuro-anatomy and the preparation of material for practical classes. He remained a member of the Department until the late 1980s.

Jim's contribution to the work of the Department of Anatomy was especially valued. A gifted and patient dissector, he made many valuable preparations, some of which are still used for teaching, and created a collection of pathological material which provided a link between basic neuro-anatomy and its clinical application. Moreover, he was keenly interested in the history of neurology and gathered portraits of the founders of neurology to acquaint students of the subject with the historical background to their study.

After leaving the Department of Anatomy, Jim enrolled in the Science Faculty as a mature age student and commenced to study for the Bachelor of Science degree. Unfortunately, he was unable to complete his degree due to the illness of Jean, his wife. However, he had the distinction of being asked to leave his Zoology practical book with the Department so that it could be shown to later students as a model to emulate.

Jim was 'a quiet achiever'. He was a man of broad interests and it took more than a little time to discover them all. As a medical undergraduate he had represented Ormond in Athletics and Rugby Union; in later life he was a keen golfer; throughout his life he was a devoted follower of cricket. He liked to use his hands and delighted in drawing and sketching, especially birds, and in woodwork, skilfully crafting a lectern still used regularly by the Department of Anatomy. He read extensively in areas of history, both natural and general, ancient and modern, and had a particular interest in maritime and military history; these interests provided a base for his travels. Professionally, his judgement was held in high regard. As a person, he is best summed up in the tribute paid by those who nursed him in his final illness: 'He was a gentleman of the old school'.

Jean predeceased him in 1997. He is survived by his sister, Ruby and brother, Tom.

Geoffrey Kenny

JOHN GRANTLEY SHELTON MBE, RFD

MB BS 1942, FRCOG, FAGO, FRACOG
1918–1999

JOHN GRANTLEY SHELTON was born into a medical family in Melbourne on 28 May 1918. He entered medical school after completing his secondary schooling at Xavier College and graduated in war-time. He became a medical officer to the Nos 11 and 20 Catalina (flying boat) Squadrons and the air-sea rescue crash boat serving with great distinction: he was awarded an MBE for two consecutive rescues.

After his war service John entered general practice, then pursued a career as a specialist obstetrician and gynaecologist in London, training at Queen Charlotte's Hospital. Upon his return to Melbourne, he set up in private practice and was appointed to the Royal Women's Hospital as specialist consultant obstetrician. In 1956 he was Fulbright Scholar at Harvard University and the Boston Lying-in Hospital.

At the time of his retirement in 1978 John was Chairman of obstetric staff at the Royal Women's Hospital. He was also the Thalia Roach Memorial Lecturer in clinical obstetrics at the University of Melbourne.

Outside his professional life, John's interests were sailing, raising Hereford cattle and his family. He celebrated his eighty-first birthday in his usual style with French champagne, and died one day later of metastatic bowel cancer. He is survived by his wife, daughter, son and five grandchildren.

Janet Duke

ELIZABETH KATHLEEN TURNER AO

MB BS 1940, MD 1948, Hon LLD1983, FRACP
1914–1999

Elizabeth Turner and Allan Coates in March 1994. Allan was the young patient to whom Elizabeth Turner first administred penicillin in 1944. The photograph is reproduced courtesy of the Herald and Weekly Times and the Royal Children's Hospital archives.

ELIZABETH TURNER, the eldest of three girls of the late Henry and Irene Turner, was educated at St Duthus Girl's School and subsequently at Presbyterian Ladies College, Melbourne. She graduated MB BS in 1940 (one of ten women in a class of 110) and in 1948 the degree of Doctor of Medicine by thesis was conferred on her. Her thesis, Meningitis in Infancy and Childhood, documented this illness in 790 children, 420 of whose treatment she had personally supervised.

In 1980 Turner was elected a Fellow of the Royal Australasian College of Physicians. In 1983 she was awarded the degree LLD (Honoris Causa) by the University of Melbourne and in 1989 she

received the Order of Australia for her services to the community, in particular for the promotion of child health.

Following graduation, Elizabeth Turner spent one year at the Alfred Hospital then joined the staff of the Children's Hospital in Melbourne, where she continued to work until her retirement. Even after retirement she kept up her interest in paediatrics – she attended medical meetings regularly and was President of the Royal Children's Medical Alumni Association for two years.

Resident positions that Turner held at the Royal Children's Hospital include, in sequence: Junior RMO, Senior RMO and between 1943-46 Medical Superintendent. She was the only female to have held this latter position in the history of the Hospital. As medical superintendent, she was responsible for medical administration, she was a consultant physician and an emergency surgeon–an extraordinary work load and huge responsibility!

Turner subsequently held the following senior positions at the Royal Children's Hospital: Physician to Outpatients, Physician to Inpatients and Physician, Head of Unit. In 1969 she was elected President and Chairman of the Senior Medical Staff of the RCH – again the only female in the history of the hospital to have been so honoured. She also held appointments in the Departments of Neonatal Paediatrics and Paediatrics at the Queen Victoria Hospital where in 1979-80 she was elected President of the Medical Staff. Added to all this she conducted a busy and successful private practice.

Although primarily a physician, Turner was a competent paediatric surgeon and for several years was neo-natal surgeon at the Queen Victoria Hospital, these skills having been honed during 1943-46, her term as Medical Superintendent during the Second World War, when few appointed consultants were available.

During her fifty year career in paediatrics, Turner published over forty scientific papers in local and overseas journals. She was a particularly fine observer and totally dedicated to her profession and to her patients. One can mention only a few of the many highlights in her medical career. These include:

- Being the first Australian to administer penicillin to a paediatric patient and thereby curing an overwhelming septicaemia – previously fatal. She personally obtained the penicillin from the US Army Medical Corps stationed in Melbourne at the time.
- Being the first Australian to perform an exchange transfusion for severe Rh compatibility.
- Recognising the first case of Turner's Syndrome (not named after her!) in this country.
- Describing the effects of alcohol on the developing foetus many years before it was recognised or published elsewhere in the world.

Apart from her paediatric commitments, Elizabeth Turner had many other interests and contributed to a number of community activities. She was a competent musician and painted both in watercolours and oils. She took a keen interest in native flora and fauna and was dedicated to their conservation. She was very interested in Indigenous people and lived for a time with an Aboriginal group at the mouth of the Archer River. The breadth of her interests may be summarised from her club and society memberships which include: Field Naturalists Club of Victoria, Victorian Conservation Society, Native Flora Preservation Society, National Trust of Victoria National Parks Association of Victoria and, Member and ex-President, Melbourne Soroptimist Club.

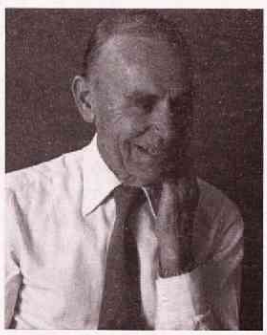
There can be very few individuals who have possessed the drive and dedication for the betterment of children in particular and society in general than Elizabeth Kathleen Turner. She will long be remembered by her colleagues as an extraordinary talent and a delightful friend, and by the many thousands of infants and children and their parents who were fortunate to come under her care.

Max Robinson

HOWARD ERNEST WILLIAMS AO

MB BS 1935, DM

1910–1999



Howard Williams

HOWARD WILLIAMS was one of the most outstanding and influential paediatricians Australia has produced. His clinical skills were remarkable, his ability as a teacher was recognised throughout the country, and he played a key role in establishing paediatric research both through his own work and his influence of others, especially those who trained with him. Above all, he was a wise man in the fullest sense of that word.

He grew up in a deeply religious family: his father an Anglican missionary and his mother a very committed member of the Kew Baptist Church. In his teenage years, his Sunday School teacher, who had a deep love of learning and an extensive library, had a great influence on Howard. During his childhood he was restricted to bed for almost twelve months after an episode of scarlet fever and spent much of his time listening to and learning to love classical music on the radio. Literature, especially history, and classical music were enduring interests throughout his life.

His secondary education was at Scotch College as a scholarship holder. He did not feel comfortable at the school, probably because his home life was somewhat restricted. However, he did demonstrate considerable sporting prowess in cricket and tennis. In later life he was no mean golfer and he maintained his tennis skills. Over many years, Saturday afternoon tennis at his home in Balwyn was a very enjoyable experience for colleagues and residents.

After graduating in medicine in 1935, he was an intern at the Melbourne Hospital but failed to be reappointed to that hospital for a second year – a decision which, he said, was one of the best for him in his life. He went to the Children's Hospital which was the centre of his professional life from then on except for a period of War service with the Royal Australian Air Force, mainly in Papua and New Guinea, and a short period overseas.

During the pre-war years at the Children's, Howard demonstrated both his clinical and research skills. His first scientific paper, published in about 1939, reported his experience with the use of saline infusion in infants with pyloric stenosis. He demonstrated a dramatic fall in mortality.

When he returned to the Children's after the War, Lady Ella Latham, President of the Committee of Management, was setting about establishing the hospital as a major academic centre in teaching, research and clinical care. The Committee of Management invited Howard to become the Director of Clinical Research and he was fortunate to win a Nuffield Scholarship to undertake further study in the United Kingdom to fit him for this new appointment. After a short period at the Hospital for Sick Children, Great Ormond Street, London, which he did not find particularly rewarding, he went to Newcastle-upon-Tyne where the Department of Child Health was headed by James Spence, another outstanding paediatric clinician and researcher. Spence had a particular interest in the impact of family and social factors on child health and was a great influence on Howard.

Back in Melbourne, he established the Clinical Research Unit. It undertook both basic but mainly clinical research, much of which followed the example of Spence in examining family and social factors in disease. As well 'HEW' as he was now affectionately called, was responsible for a general medical inpatient unit. He attracted a series of outstanding research fellows, many of whom went on to hold Paediatric/Child Health Chairs. They included Bill McDonald (Foundation Professor of

Child Health, University of Western Australia), Charlotte Anderson (University of Birmingham), David Danks (Foundation Professor, Murdoch Institute), Louis Landau (University of Western Australia), Allan Carmichael (University of Tasmania) and Craig Mellis (University of Sydney). The most senior academic recognition Howard received from his own University was that of Professorial Associate in the Department of Paediatrics.

Howard's own clinical and research interests were mainly in respiratory medicine and he established paediatric respiratory medicine as an independent specialty in Australia and greatly influenced its development internationally. His early research was in tuberculosis, then he moved to bronchiectasis but his major contribution was from his studies of epidemiology and natural history of asthma for which he received much international acclaim. His last research paper, published in 1995, was also on tuberculosis. He is the only paediatrician to have been a President of the Thoracic Society of Australia.

As a clinician he was without equal. To observe HEW taking a history from distressed parents and then eliciting physical signs from a frightened, tearful child was an extraordinary learning experience. Generations of medical students, residents, registrars and consultants benefited from this. One of his important clinical principles was: 'if you are uncertain what to do, it is better to wait and observe'. He could be extremely patient and tenacious, and always very thoughtful and inquiring, when trying to sort out a complex clinical problem. Not surprisingly, he attracted many referrals of difficult paediatric problems from interstate, not only in his special area of interest, respiratory medicine.

Howard was a great teacher. He was always enthusiastic about what he was teaching and transmitted this to his students. He encouraged his students to seek their own knowledge so that they had some ownership of it and would question them about their new found information to help them get it into perspective and gain some wisdom. He was critical of the over use of laboratory investigations as a substitute for clinical skills. There were two questions he would frequently ask his residents about investigations they had ordered: 'how will the results of that test alter management and if they will not, don't do it' and 'have you written down the result you expect from the test so that you will learn whether it was really necessary?'. His children say he encouraged their learning at home in just the same way as he did for his students at work.

Because of his broad interests and his abiding concern about the social impact on disease, he was widely involved in broader child health issues. He played an important part in establishing the Department of Child Health in the University of Papua-New Guinea. He was President of the Australian College of Paediatrics 1980-82. He was made an Officer of the Order of Australia for his outstanding contribution to paediatrics and child health.

He is survived by his wife of nearly sixty years, Frieda and his children, Anne, Jo and Ian, and his much loved grandchildren. His influence lives on in them and in the many students, residents and research fellows who had the opportunity to work with him and to benefit from his teaching and wisdom.

Peter Phelan

ERRATUM

In the 1999 issue of *Chiron* the obituary of Dr Ronald Lowe was incorrectly attributed to Miss Quilter. The obituary was in fact written by Dr Taylor. Our apologies to Dr Taylor and to Miss Quilter. *Eds*

Reunion Announcements

Think Ahead

When did you graduate? Is next year your fifth or fifty-fifth since graduation? Reunions are best planned well ahead of time. Your classmates who are living overseas or interstate will travel to Melbourne for reunions if they have enough advance notice. Venues also need to be booked well ahead.

Please let us know of your plans–we like to publish information about reunions in *Chiron* and in the *Melbourne PostCard*. We can obtain, on your behalf, a list of graduates from your year and sets of address labels from the Alumni Office and advise you on alternatives you may wish to explore regarding University venues.

We are also able to help you publish a reunion booklet containing details of graduates' activities since graduation. Reunion booklets give those who attend the reunion something to remind them of the event and those unable to attend a means of catching up with old friends and colleagues.

MB BS Graduate Anniversaries in 2001

10th year class of '91
15th year class of '86
20th year class of '81
25th year class of '76
30th year class of '61
35th year class of '66
40th year class of '61
45th year class of '56
50th year class of '51
55th year class of '46
60th year class of '41
65th year class of '36

UMMS Office c/- School of Medicine
University of Melbourne
Vic 3010
Telephone: (+61 3) 8344 5888
Facsimile: (+61 3) 9347 7084
Email:
umms@medicine.unimelb.edu.au

2000 Reunions

60TH YEAR OF 1940
22 November 2000
Melbourne Club
Norman Wettenhall
(+61 3) 9827 6734

59TH YEAR OF 1941
22 September 2000
University House
James Guest
(+61 3) 9347 3852

58TH YEAR OF 1942
2 June 2000
Leonda
John Tucker
(+61 3) 5251 3468

55TH YEAR OF 1945
24 February 2000
Melbourne Cricket Club
Nate Myer
(+61 3) 9576 2176

50TH YEAR OF 1950
21 October 2000
The Melbourne Club
Mary Morland
(+61 3) 9817 4837

45TH YEAR OF 1955
24 November 2000
University House
John O'Brien
(+61 3) 9347 6160

40TH YEAR OF 1960
12-13 August 2000
Peninsula Country Golf Club
Jack Martin
(+61 3) 9817 5188
Rod Abud
(+61 3) 9881 1888
Mick Bourke
(+61 3) 5662 2484
George Mikolajunas
(+61 3) 9787 1482

35TH YEAR OF 1965
9 December 2000
Rippon Lea
Peter Habersberger
(+61 3) 9576 0021

30TH YEAR OF 1970
18 November 2000
University House
Gavin Fabinyi
(+61 3) 9428 9066

20TH YEAR OF 1980
October 2000
Rod Sitlington
(+61 3) 9836 1777 bh
(+61 3) 9836 0330 ah

Bequests and Memorial Gifts

Memorial for a Distinguished Microbiologist


The 'Flying Capital' sculpture

Professor Sydney Rubbo, Head of the Department of Microbiology for twenty-four years, had an enormous influence on Australian microbiology and was regarded with great esteem and affection by colleagues around the world. The son of the artist Dattilo Rubbo and his wife, Mildred Russell Jobson, he was born in Sydney in 1911. After completing a Science Pharmacy degree at the University of Sydney, he obtained a Diploma of Bacteriology and a PhD in London. On his return in 1937 he was appointed a senior lecturer in Bacteriology (later Microbiology) and a professor in 1945 at the age of thirty-three.

While lecturing, he was also studying for a degree in medicine which he completed in 1943, followed by an MD in 1955. Renowned as a brilliant and provocative lecturer, he inspired generations of students. As Head, he built up a strong department, planning the expansion required with the post-war influx of students. He recruited a number of outstanding staff, and with his emphasis on first-class teaching and research, his staff and students were greatly sought after. In an era when there was more opportunity for heads of department to debate the allocation of funds, Syd Rubbo parried with the formidable trio of Sydney Sunderland, Victor Trikojus, and Pansy Wright and ensured that Microbiology received its share of finance, especially for equipment and for staff members to further their education overseas.

During the Second World War, Syd Rubbo led a group of bacteriologists whose research resulted in the discovery of monacrin, a drug used to treat wounds before the advent of penicillin.

In addition to microbiology, Rubbo was committed to a wide range of cultural activities, including the Dante Alighieri Society, the Sydney chapter of which his father had helped to found in 1924.

Following his untimely death in 1969, friends and colleagues from academe, industry, medicine and cultural circles established a memorial to record their appreciation of his life and work. Part of the funds went towards the cost of the casting and transportation from Milan of a bronze sculpture, *Flying Capital*, by the leading sculptor, Norma Redpath. Mounted on a tubular steel column, the work stands beside the Microbiology Building in the forecourt of the medical precinct in the south-west corner of the University, an appropriate memorial to a man who was a lifelong supporter of the arts.

The remaining funds were used to endow the Sydney Rubbo Memorial Trust. Interest from the capital finances the Rubbo Oration given at the annual scientific meeting of the Australian Society for Microbiology, which also assists with expenses. Syd Rubbo was one of the founders of the Society and was its second president from 1960-61. Orators are selected by the Trust and the list of speakers represents a roll of the most eminent Australian and international microbiologists. Included among them are three Nobel Prize laureates, Sir Macfarlane Burnet, Professor Carlton Gajdusek, and Professor Peter Doherty.

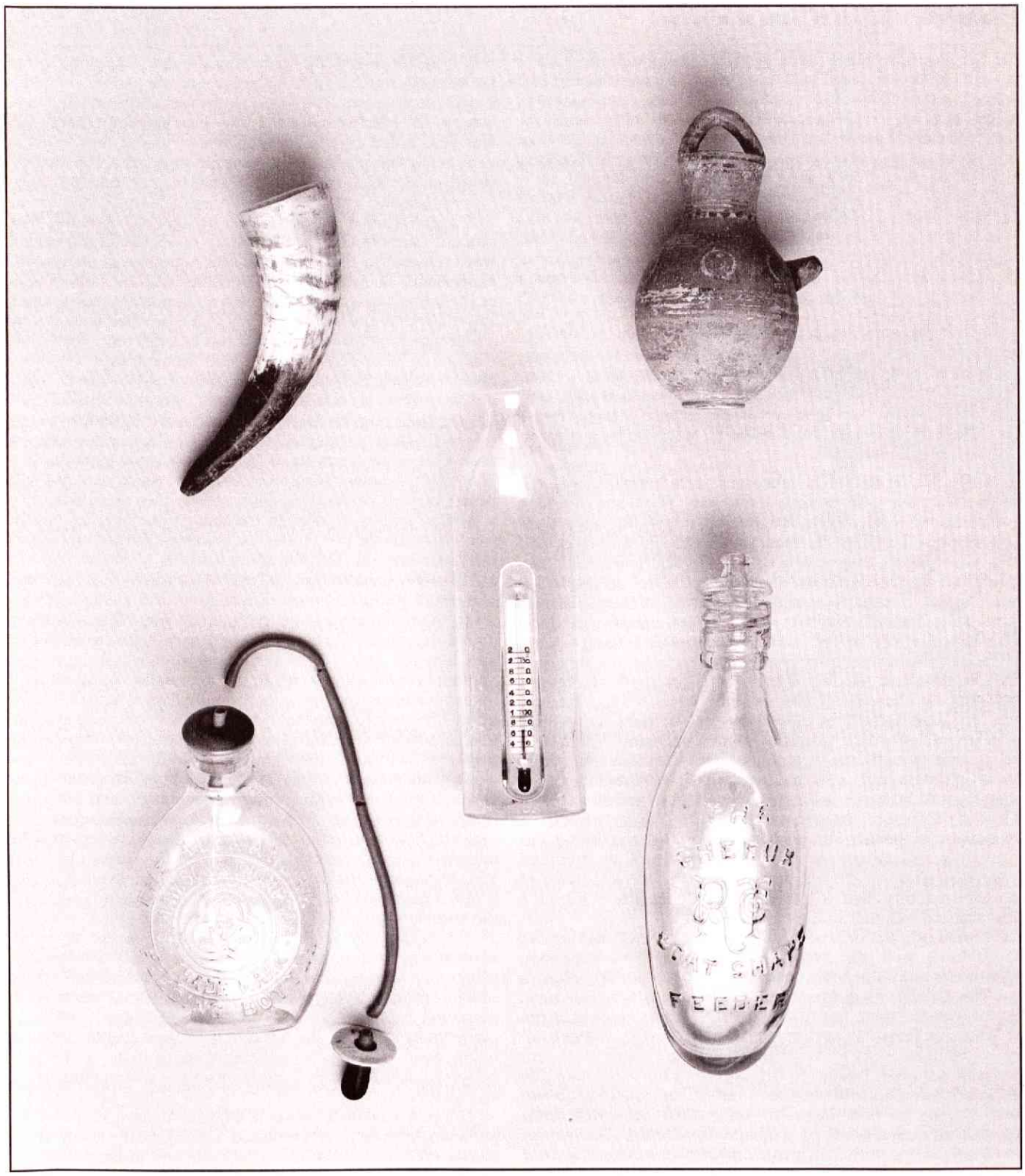
Professor Rubbo had a strong interest in the science and medical aspects of microbiology, his special field being disinfection and sterilisation on which he co-authored a book with Joan Gardner. However his interests were extremely broad and are well represented by the wide spectrum of the orations whose subjects have included immunology, chemotherapy, bacterial ecology, genetics and physiology, virology, industrial and marine microbiology, and molecular biology.

The Rubbo Oration this year will be given by Dr Barry Marshall, Sir Charles Gairdner Hospital, WA. He will address the subject Helicobacter pylori infection. The annual meeting of the Australian Society for Microbiology will be held from 8-13 July 2000 in Cairns, Queensland. For further information please contact the ASM Secretariat, telephone (+61 3) 9867 8699, facsimile (+61 3) 9867 8722; email admin@theasm.com.au

If you would like further information about establishing a memorial gift or making a bequest to the University, please contact Marcus Godhino at the Development Office, The University of Melbourne, Victoria 3010. Telephone (+61 3) 8344 7804; email m.godinho@alumni.unimelb.edu.au. All enquiries are treated in strict confidence.

UMMS *records with regret the passing of*

Elsie Louisa Abrahams, MB BS 1934, BSc 1939
Ernest William Bate, MB BS 1943
Allan Gordon Bignell, MB BS 1945
Louis Lancelot Oxley Bevan, MB BS 1936
John Strahan Bothroyd, MB BS 1927, MD 1931, MS 1937
Felicia Brunton (Dunn), MB BS 1957
Cyril Gavin Burt, MB BS 1956
Douglas Alan Coats, MD 1966
Basil Michael Conlon, MB BS 1940
Arthur Roderick Eden, MB BS 1953
William Brian Essex, MB BS 1959
Phillip Goodman, MB BS 1925
Georgie Chappell Hodges, MB BS 1931, MS 1939
Leslie Douglas Hurley, MB BS 1948
Alan Vaughan Jackson MB BS 1935, MD 1939
Peter King, MB BS 1963
Lewis Harold Lanyon, BComm 1942, MB BS 1949
Braham Ralph Lewis, MB BS 1942
Kevin William Longton, MB BS 1952
Christopher John Louis, MB BS 1954, PhD 1959
John Francis Mainland, BSc 1951, MB BS 1957
Joan Overend Maxwell (Eggleston), MB BS 1948
Peter Andrew McCallum, DPM 1972
Gordon Graham Calder McKenzie, MB BS 1940, MS 1947
Peter Dominic Meese, MB BS 1973
Justin Edward Murphy, MB BS 1951, GradDipOphth 1954
Roland Hodgson Nattrass, MB BS 1929
John George Hamilton Refshauge AM, OBE, MB BS 1951
Colin Stuart Reid, MB BS 1949
George David Robinson, MB BS 1944
Muriel Denise Sturtevant, MB BS 1970
Harry Reed Taylor, MB BS 1956
Phillip John Tiernan, MB BS 1945
Trevor James Williamson, MB BS 1963
Robert Yee, MB BS 1969



A selection of baby feeding bottles through the ages. From top left: cow horn with pierced tip, possibly medieval period, C 1100s to 1200s; terracotta feeding bottle, Greek design with bulbous body, flared neck and small feeding spout, C 700BC to 475BC; 'Cherub' boat shape feeding bottle with screw stopper, C 1840; 'Kuwa' glass feeding bottle with integrated thermometer, C 1880 to 1910 (centre); and 'Alexandra' feeding bottle in lie-down format with long rubber tube, rubber and ivory teat, C 1890 to 1910. From the collection of the Medical History Museum.

Medical Students' Experiences of Obstetrics

By Ruth Little, DipArts (Pol Sci), BMedSc
Medical Student, St Vincent's Hospital

Access to delivering mothers for obstetric experience is one part of the medical student's life which has changed dramatically since many of our alumni were students. Ruth Little, fourth year medical student, interviewed some of her fellow medical students in sixth year about their experiences in the labour room.

The first time I saw a baby being born I had great expectations of a spiritual experience. I was sure that I would be overwhelmed with emotion as I witnessed new life in its rawest form. However, I must confess that my first experience fell short of the mark. When the expectant mother's waters broke, they burst forth in a literal tidal wave that just missed me and crashed to the ground, inconveniently coming to lap at my feet. (I have never worn sandals in a hospital again, whether in the tropics, as was the case, or not). When the baby emerged it looked ... well ... red and covered in gunk and was still hooked up to its mother by a thick cord. This incredibly fragile little baby was not at all like the cute and cuddly ones I had seen with their mothers at the supermarket. (But considering the baby had just travelled from a cosy warm womb into the cold world what did I really expect?!?) Where was the beauty?

I found the beauty in the faces of the baby's parents.

The labouring woman had a partner who looked at her with love, concern and excitement. Half an hour later when they gazed at their child for the first time, a look of love and adoration diffused across their faces. Whilst the newborn child was not the epitome of beauty for me and childbirth was not what I had expected, I had found the beauty that I had been looking for.

ALL MEDICAL STUDENTS observe and participate in childbirth as part of their undergraduate training. The ways in which students respond to childbirth are diverse; depending upon their own background and expectations, the individual midwives and patients with whom they share the birth experience, and any complications or issues relevant to each experience. Childbirth is a unique area of medicine and student experience. This is fundamentally because the 'patients' are not usually admitted because they are sick or diseased, but rather because they are undergoing a natural process which has the potential to cause illness. One medical student commented on such differences stating that in obstetrics, the patients were 'young healthy women'. She also noted that even in the face of 'pain and yelling' obstetric medicine was a 'primarily joyous occasion'. Childbirth is also an area of medicine in which students witness humans in all their shades and colours. A colleague described his experiences of childbirth as a medical student and his stories were full of contradictions and paradoxes. He viewed childbirth with a mixture of 'beauty and disgust', noting that the 'blood and guts...and visceral nature' of childbirth could not be divorced from 'extreme emotion'. He felt that to share in such a moment of human vulnerability was a 'privilege' and 'not the right of a medical student to be intimately involved'.

Whilst students are in a position of privilege, they also attend births to learn and gain practical experience. This education includes observation in some cases, and active participation in others. The number of deliveries students attend has decreased compared with the past. For example, in 1924, one student at the Royal Women's Hospital performed a total of sixty deliveries.[1] Today, students are lucky to do seven. The current levels of student involvement are often related to the degree of initiative taken by individuals. Participation in childbirth varies from stitching up and assisted forceps in rare cases, to supervised deliveries. Even though students are supervised, a number mentioned their fears of failure and of making mistakes. In one case, a student described her feelings of fear when a multiparous woman gave birth particularly quickly. This student was the first on the scene and had just put on her gloves when the baby emerged. The student became scared that during the overly fast delivery, the cord would get stuck. However, the delivery was successful during this first time she flew solo.

The relationship between the birth mother and medical student also affects the student experience. A number of students particularly enjoyed sharing the mother's experience and developing a relationship with her. One male student maintained that if he witnessed the birth from the start of labour to the finish, he 'felt very much a part of it...closer to the patient'. In comparison, he felt more distant if he was only present at the end and 'caught the baby in the last five minutes'. The response of mothers to students was also noted by this individual who stated that 'most mothers were really warm to me [and] saw me as a part of the medical team'. However, not all stories were so positive. One female student spoke of a woman she had attended who, upon learning that her newborn was a girl refused to touch, feed or look at her child. Whilst this student understood the complexity of socio-cultural issues which were relevant in this case, she was nonetheless distressed by the experience. The students' relationships with the fathers or partners of the labouring women were also an important part in the student experience. In one instance, a student described an encounter with a first-time father whose partner was unexpectedly rushed off for an emergency caesarean section. The student said 'the father was beside himself...no-one really explained what was occurring so I did...at 3.30am he was like a ghost...'. Another student noted that fathers 'get pretty emotional, you can see it in their eyes...[they're] worried if their partner is in pain...'. However, yet another student described some partners as 'wimps' who 'can't handle it'. Such a diversity of student responses is again reflective of the individual nature of each student and each patient-case experienced.

Whilst medical students are training to be doctors, doctors were rarely present in the stories of students. Rather, the relationship between students and midwives featured strongly. The history of conflict between doctors and midwives filtered into the narratives of medical students, however, a number of students appeared to be aware of the need for sensitivity in this area. One student actually stated that their student group had been pre-warned of this issue, and felt that in cases of poor doctor-midwife relations, medical students could become caught in the crossfire. Another felt that the midwife-student relationship depended on whether 'one showed interest' or 'approached midwives in a nice way', and also felt that it was important to acknowledge and respect the knowledge of the midwives as that was their 'dominant field'. This student viewed the work of midwives as 'physical...long hours...stressful...dirty work' and felt that from this context, one 'can understand if they [midwives] get shitty with smart-arse medical students'. It is also important to note that the relationship between students and midwives not only includes education of the student by the midwife and sharing the intimate experience of childbirth emotionally. There is also a physical interaction–as the midwife's hands encase those of the student's which in turn cradle the baby's emerging crown.

The reality of being a student also impacted upon obstetric experience. One individual commented on the sheer bodily exhaustion she felt, after being up night after night and studying and seeing patients during the day. Another felt that the need to study detracted from the amount of time which she could devote to practical experience. She felt that it was not practically possible to follow every woman through their entire delivery, because each delivery could take half the day or longer and waiting for the birth was also tiring.

The vast majority of medical students undertaking obstetrics will not have given birth or witnessed a birth. The privilege of partaking in this event is liked or loved by some and disliked by others. It is worth concluding on the words of one student who described his obstetrics term as 'one of the highlights of medical school':

> *the first delivery was incredible...at sunrise...after being up all night...light was spilling into the room...she was a single mother with a lot of family...she didn't want the post-partum haemorrhage injection...she bled a bit but then stabilised...but it was all a bit dramatic...*

[1] McCalman, J. *Sex and Suffering*, Melbourne, Melbourne University Press, 1998, p189.

'Pansy'

Roy Douglas Wright (1907 – 1990)

Professor Peter McPhee, MA, PhD, DipEd
Department of History
The University of Melbourne

My biography of Roy Douglas Wright is dedicated to my colleague and dear friend Jan Bassett. Jan was an outstanding historian of Australia, chiefly known for her standard work on army nurses, Guns and Brooches: Australian Army Nursing from the Boer War to the Gulf War *(1992). Jan died of cancer several weeks ago, aged forty-five. Given that today is the anniversary of Armistice Day 1918 it is the more fitting that I also dedicate this Medical Society Lecture to her, a historian of war and medicine.*

ON ONE LEVEL my biography is about an extraordinarily successful, ambitious, energetic man, one of the great Australians of this century. In 1925 Roy Douglas Wright took up scholarships to the University of Melbourne and Queen's College to enrol in the Faculty of Medicine. After graduating top of his class he was appointed to a lectureship and his research in Pathology won him the David Syme Prize in 1937. He was then invited by Howard Florey to work with him at Oxford University, whence in 1939, aged thirty-two, he was appointed Professor of Physiology in the University of Melbourne, a position he held until 1971. During this time he also established the Howard Florey Institute of Experimental Physiology and Medicine and its new building in 1963. With Sydney Sunderland he was also the driving force behind the completion in 1968 of the Medical School building. Following his retirement, he was appointed Deputy Chancellor and, from 1980 to 1989, Chancellor of the University of Melbourne. He was knighted in 1983.

However, Wright was a remarkably active fellow, managing to combine his heavy administrative responsibilities and a productive teaching and research career with an active role outside the University. For example, during the Second World War he spent three years as a colonel in the Army Research Directorate in Canberra. After the War he retained close links with Canberra. He campaigned to the Chifley Government for the establishment of a national university in Canberra and was for thirty years a member of the council of the Australian National University. In Melbourne, he was instrumental in the establishment of the Cancer Institute in 1948 (and was its executive chairman 1948-71) and of the Peter MacCallum Cancer Clinic, of which he was medical director 1971-75.

He was an ambitious man, not simply in personal terms but as one of the post-War reconstruction generation, like 'Nugget' Coombs driven by a fierce desire to make a new Australia. Wright's achievements were contested by colleagues in rival institutions outside academia, some of whom have criticised his role in ensuring the pre-eminence of medical research and in 'empire-building'. At the same time, Wright himself was sharply critical of non-teaching research institutions such as Macfarlane Burnet's Walter and Eliza Hall Institute.

Wright was always a controversial figure. His pedagogy and vision of a medical education sharply polarised students, but was highly influential and led to his involvement in the establishment of departments of Psychology and History and Philosophy of Science. Fundamental to his vision, too, was a desire to democratise entry to tertiary education (leading to an angry debate with medical students in the early 1950s), and to broaden the basis of collegiate decision-making (evident in his active support for the establishment in 1974 of the University of Melbourne Assembly of academics and students).

Wright was also an influential contributor to debates about the desirable nature of universities in a more general sense. From his involvement in the foundation of the ANU and the findings of the Murray Committee in 1957 through the period of his chancellorship in the 1980s, Wright articulated and defended a particular vision of the appropriate structures and values of tertiary institutions. This was, in his own words, 'a vision of a way of enquiry which is the special vocation of Universities, because freedom of enquiry is necessary if the truth of any matter is to be preserved, extended and pursued'.

In August 1926 'Pansy' was persuaded to stand as Queen's College's candidate in the University's 'Ugly Man' competition; his friends produced this promotional flyer, complete with flower in his button-hole. (Source: Bruce Dowse)

For many people, Wright's most endearing characteristic was the way he reconciled his attachment to the traditions of his University with his engagement with civil liberties: in Geoffrey Serle's words, he was 'a stirrer and shaker ... a boat-rocker and a confounded nuisance'. His legendary, often ribald wit was used to puncture pomposity, just as his institutional position was used to advocate change in wider society. 'As a champion of freedom and human rights he was unsurpassed', recalled Sir Ninian Stephen in 1990. Some of his activities today seem either admirable (such as his concerns about police powers and the use of pesticides) or anachronistic (such as his opposition to compulsory seat-belts in cars or random breath-testing of car-drivers).

Of particular salience is his involvement in the case of Sydney Sparkes Orr, Professor of Philosophy at the University of Tasmania, sacked in 1956 for having allegedly seduced a student, Suzanne Kemp. Wright, who had played a leading role in the founding of the Melbourne University Staff Association

and the Federation of Australian University Staff Associations, was approached for assistance by Orr. Wright believed this to be a glaring case of wrongful dismissal and an infringement of academic freedom. He was also attracted to the case because of rivalry with his older brother, Senator Reginald Wright, senior counsel for the University of Tasmania in Orr's trial.

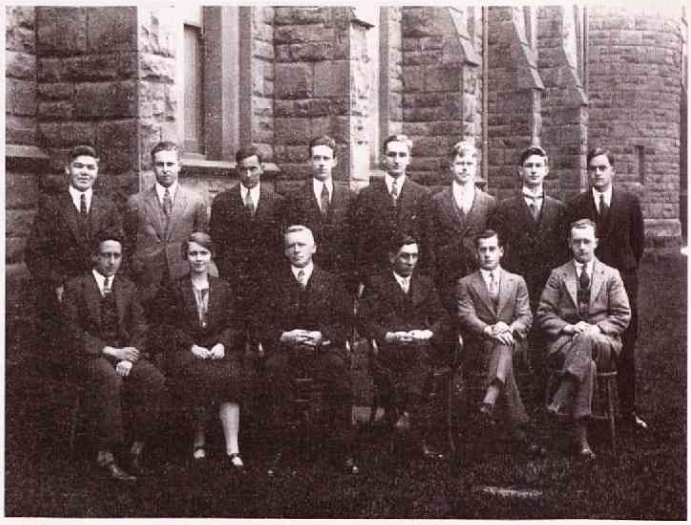
Despite Wright's involvement in academic politics, he never completely sacrificed his own scientific work. One of his mentors, Peter MacCallum, had admitted his astonishment at the 'kaleidoscopic' nature of Wright's research in the years from 1931 to 1937, and 'the range of ideas, technique and observation' that underlay work of an extraordinary 'intellectual range and quality'. By 1937 he had undertaken research and published on the movements and surgical problems of the wrist joint, femur, humerus and anal fistula; the radiotherapy of cancer; the reaction of tissues to injury, particularly as affected by blood supply to the liver and lung; and the effects of intra-cranial pressure on dogs and of nerve stimulation and drugs on secretions in cats.

Wright had been highly regarded by Florey during his time in Oxford in 1937-39, and Florey's recommendation was crucial in Wright's appointment as Professor of Physiology. Wright's tenure of the Chair coincided with remarkable developments in medical research in general and his own field of endocrinology in particular. Professor John Coghlan of the Florey Institute has described him as having 'the keenest native intelligence I have known and an impromptu scientific inventiveness second to none'.

Wright continued to be an active researcher: he published about 180 scientific papers, not to mention another twenty fascinating reflections on wider topics ranging from the history of medicine to civil liberties to how to guess the identity of people who give negative referees' reports on one's papers! After the War, however, his work was no longer that of the curiosity driven individual but rather as a leader of a research team. This reflects, of course, one of the great turning-points in the history of scientific research before and after the Second World War.

The immediate post-War years were to be a key moment in the history of Australian medical science. In July 1947 Wright's ears became infected with a severe streptococcal infection, and he was treated with penicillin, which produced a violent and dangerous reaction. He was taken to the Melbourne Hospital 'with my lungs full of fluid, my head blown up like a football, and so on'. Wright was always proud of being the first person in Melbourne, so he claimed, to be found allergic to penicillin; at the time, he was close to death. (Ironically, it was the intervention of Macfarlane Burnet which saved him.) Between bouts of delirium, one of his former students completing his residency year at the hospital, Dick Denton, appeared at his bedside to visit his friend and ask his advice. Denton was curious about the levels of chloride in the blood and urine which were varying in contrary ways to accepted wisdom in a young patient with a pancreatic fistula as a result of surgical complications.

Denton's work was advanced by Victor Wynn, who had been drawn to the study of human metabolism by distressing experiences treating wounded soldiers in Darwin during the War. Using a grant from the Rockefeller Foundation to purchase a flame spectrophotometer, Wynn enabled the work to become far more sophisticated. Hitherto, the time taken for chemical analyses of bodily fluids had been so time consuming as to be sometimes fatal in clinical situations. Now Wynn demonstrated the benefits of flame photometer analysis which enabled rapid and accurate analyses of sodium and potassium. Wright's enthusiasm and his expertise as a surgeon and endocrinologist was to prove crucial in facilitating this work. From the late 1940s, Wright encouraged a group – notably Denton and Wynn – and they launched the Ionic Research Unit in 1948. This was the forerunner of the Florey.



Students who received first-class honours in the first year of Physiology became 'Osborne's Apostles' in second year. Wright is pictured here in 1926 with the Professor and some of them, including Marjorie Reynolds, with whom he shared the Exhibition in that year. (Source: Judy Brady)

These were halcyon days for medical research within the Department of Physiology, and it is not an exaggeration to describe the group of highly talented young researchers who clustered round Wright as forming a brilliant team of genuine international quality. Others included Edward Trautner, Sam Rose, Ray Bradley, David Dewhurst and Ron Morris. Wright held court from the end of the staff table every morning-tea: 'He was very much the hub of the wheel', recalled a young colleague, 'he really had an enormous presence'. 'The environment was a council of wit, science, erudition, good fellowship, challenge, criticism, current affairs, politics, social questions and ribald humour', recalls another. It was an atmosphere in which Wright's experience with Florey and his obvious brilliance guaranteed the awe of his young colleagues, although, as he quipped to one of them, a professor bears much the same relation to his department as a lamp-post to a dog: 'everybody pisses on him'.

It would have been very easy to write a monumental biography of this energetic, successful figure. But who was he? And what did his background and personality have to do with his public life?

Like many successful men Wright compartmentalised his life, only very rarely making himself vulnerable by exposing his inner demons to friends and family. He was 'Roy' to his family, 'R Douglas' when institutional man, 'Pans' to his peers and pals, and 'Prof' to his juniors. My biography has been a search for the keys to unlock the doors between the rooms of his life.

Roy Douglas Wright was the ninth of ten children raised in a farming family in the countryside around Ulverstone, Tasmania. His parents had stood for values of achievement, service and ambition which he, too, personified. Perhaps because of a childhood he recalled as peppered with mockery and pressure from his siblings, he was guarded in his initial responses to people, sceptical and even suspicious until they convinced him to feel otherwise. He quickly decided that someone who wanted to become a friend and admirer 'must have no discernment or be malicious'.

His sibling rivalry with Reg was between two similar men, both 'rebel conservatives': they read their committee papers with the same assiduity and love of tripping up the unwary; they were men who savoured words and used as their respective theatres the University Council chamber and the Senate. Roy's repertoire of ribald songs was famous, Reg was presented with the 'Reg Wright Records Office Choir Book' when he retired from the Senate; Roy loved quoting passages from Mill or the Bible, while Reg turned to Robert Burns. They were both large, ebullient, funny men with a streak of obstinacy which drove

colleagues to despair; Reg unsettled Menzies and Fraser as Roy did Paton and Derham. The date of today's lecture – twenty-four years to the day after the dismissal of the Whitlam Government – is fitting because Reg was in the new Fraser government subsequently elected, another reason for Roy to mock a man he spurned as 'my yellow-bellied brother'. They were two ambitious, vain, restless men who were finally reconciled with each other only when their need for recognition had been quietened by honours.

Roy was not a tall boy, even for the 1920s: just five feet eight inches. But he was broad and formidably strong, so that his peers felt a massive presence. He was the sort of young man to whom others gravitated in Queen's or in the lecture theatre: the jokes were funnier, the conversation cleverer, it was a treat to be in his circle and acknowledged by him.

Not long after Wright's arrival at Queen's his fellow residents began to refer to him as 'Pansy'. One of his college friends has suggested that he was given the ironic nickname by Queen's boys impressed by his shock of unkempt hair and unshaven face. Wright's own account was that it came from a role he played in a student commencement revue in his first term:

> We used to run student reviews in order to get money to build a students union. At the time I came up to Melbourne – 1925 – there was a policeman allotted to the University grounds with a small basement room under the Registrar's office with no running water, etc. but in which the policeman lived. He was a useful fellow in those days of 6 o'clock closing of public houses for he would sell beer, etc. to students after closing time at a very reasonable mark up. Because he was a very masculine fellow and not very tidy in his dress he had come to be known as 'Pansy' Norris – just as red headed men here are known as Blue or Bluey. I was cast as the University Policeman in the review in my first year up, addressed as 'Pansy' in the performance and the name has stuck!

Whatever the case, there is no evidence supporting the crueller suggestion that it was a diminutive of chimpanzee, even though some people believed this was the case because of his broad frame and shambling deportment: as he put it, 'That the other spelling has some zoomorphic excuse may perhaps account for the sporadic revival of this variant'. Wright repeatedly – and surprisingly good-naturedly – insisted his name had 'nothing to do with the anthropoid' but throughout his life he had to cope with good-natured or hurtful references to his nickname as being derived from his looks.

Wright was a fine and decent man, dedicated to the good of his University and his country. He inspired deep affection and loyalty in most of those who knew him. Few people other than those who benefited were aware of his innumerable acts of kindness, financial generosity, and advice. Wright never lost his common touch nor his contempt for those he called 'silvertails'. As a self-styled 'boy from the bush', Wright was always mistrustful of established elites, but was adept at creating and deploying his own networks.

At the same time, he was a seriously ambitious man, capable of enjoying displays of ceremony, and perhaps rather vain. Wright was larger than life in every way, a man of excess. People were initially intimidated by his immense physical presence and deep drawl. But they loved him for his excess, too: he was funnier and more vulgar than other academics, more brilliant, more ambitious and politically skilled, and more passionate.

He was always a good hater. From early adulthood he became convinced that his immediate world was ruled by incompetents and even conspirators. The medical establishments of Britain and Melbourne, Freemasons, lawyers, industrialists, vice-chancellors and their acolytes, or those who simply disagreed with him, all were seen as maleficent. Conspiracy theories came quickly to him: to the end of his life he believed that the Orr case 'was all a *orr*ible conspiracy'.

He was also a man who was emotionally scarred and, until his late fifties, often unhappy. He had extreme difficulty in expressing affection, whether through making small talk with children or acquaintances or in verbalising deeper feelings. A passionate man, he nevertheless found anger and amusement the only strong emotions he could freely express. He had a deep love and respect for the important women in his life. However, he found it difficult to express these feelings except through acts of kindness, and difficult relationships immobilised him.

In 1930 his oldest sister Phyllis suffered what we would term a nervous collapse; Wright arranged a medical examination and she was confined to mental institutions in Victoria until her death in 1964. Wright avoided confronting this tragedy, but we may speculate about its influence on his interest in psychology. In his immediate family, the decision that he and his wife Judy would travel to Oxford without their young children in 1937 was to leave a painful legacy. It may have contributed, too, to the collapse of his relationship with Judy by 1955. Only with his marriage to Meriel Wilmot in 1964 could it be said that Wright had found happiness in his personal life.

Wright expressed a distinctive masculinity in some ways typical of his generation but it was made unique by the way he covered his insecurities. In his middle years, this was a masculinity of jocularity and hard drinking, of fierce loyalties and hatreds, of great kindnesses coupled with an aggressive fear of femininity.

He compensated for his inability to express and receive intimacy by prodigious work, by conversation which invariably focused on the external, and by making people laugh. His jocularity may well have been a defensive strategy learnt early in life. He developed his love of irony, repartee and ribaldry into a famous sense of humour. But though most of his peers treasured his company just as they admired his intellect, none were able to say they were his intimates. This contradiction – the gregarious, funny man who is also sensitive and often unhappy – is of course a common one.

Many of you will have known 'Pansy' Wright as the legendary teller of tall tales and ribald jokes. There is no doubt that he was a brilliant, quick wit. For example, in the 1960s a fellow professor had become seriously disturbed, finally to the point of walking around the campus with a loaded double-barrel shotgun. A colleague burst into Wright's room shouting that the professor 'is going to shoot the Vice-Chancellor and you', adding 'he must be mad'. 'No', retorted Wright, 'only half mad'.

Stories of Wright's wisecracks were flashed around the University. 'Pansy' was at his best with the quick aside and *double entendre*. When it was alleged that two of the United States Senator Joseph McCarthy's assistants during his communist witch-hunt, Roy Cohn and David Schine, were homosexuals, Wright quipped that 'They've just caught Cohn in the nick of Schine!'.

Many of his most remembered quips concerned reproductive organs. Occasionally, the hilarity men found in his rasping jocularity must have been lost on the butt of his jokes. On one occasion he asked a female student in a lecture 'Which male part swells to ten times in normal size when aroused?'. When the desperately embarrassed young woman finally blurted out 'The penis, Professor', he shook his head and turned to the rest of the theatre. Finally, a male student offered the iris as the answer; 'Correct', replied Wright, then, turning to the red-faced woman, 'and you're going to be very disappointed on your wedding night'.

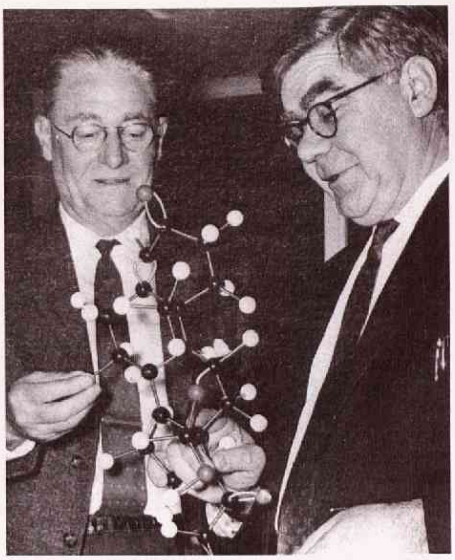
Of course, not everybody found such jokes amusing or even acceptable. And there is no doubt that Wright did not need to refer to genitalia to be amusing. In November 1948, for example, he gave the Eleventh Annual Pioneers' Memorial Oration in Wangaratta in central Victoria. It was a brilliant performance, erudite, imaginative and witty. Asked to speak on 'Medicine – then and now', however, Wright spent almost half the lecture talking about the history of Wangaratta he had taken the trouble to uncover. Wright no doubt had the good citizens of Wangaratta rocking in their seats with his stories of 'Wild' and 'Dumby'

Wright, but they may well have squirmed when he told them a long story 'not known to the Wangaratta folk', of the violent race relations of the 1830s. Wright then used a delightful strategy to take his audience into medical history, comparing portraits of the first councillors of Wangaratta with those of the scientists whom they resembled: Lister, Jamie Simpson, Claude Bernard, René Laennec, John Hunter and Aristotle.

> Now we come to our final councillor, Mr Dixon. I am no physiognomist, but I think I could have done business with Mr Dixon. There is a merry gleam, and I think you will agree there is a merry gleam, too, on the face of Ivan Petrovitch Pavlov.

Pavlov's name gave him the chance for a swipe at his opponents: 'the anti-vivisectionists hate him because he produced dogs with almost as severe obsessions as occur in anti-vivisectionists and, what is more, he cured them, and no anti-vivisectionist wants to be cured!'.

Wright was also capable of great acts of kindness, and his correspondence files bulge with moving letters of gratitude, respect and pleasure. The condolence book from his commemoration service at Queen's College is studded with remarks such as 'It is the immensity of the impish versatility that I shall miss' and 'What I owe him cannot be measured'. Outside the world of medicine, Joan Crawcour, who had encountered Wright in the early 1960s when teaching Asian history and in the late 1970s on the University Assembly, remembers him as 'one of the great encouragers of this world': someone who helped create 'a landscape of tolerance in which informed dissent was not only possible but to be encouraged'. Even those among his colleagues who felt Wright suffered from megalomania are quick to recognise why they also enjoyed his company. Frank Hird, for example, recalls him as 'one of the great people to go to if you needed advice. ... I have never met anybody with such a multi-faceted and interesting mind. He was the most significant man and character that I knew in the University'. Frank Hird was pretty Wright!



In 1963 Sir Howard Florey and Sir Robert Menzies opened the Howard Florey Laboratories, perhaps the pinnacle of Wright's scientific career. Florey was always Wright's most important mentor following the fifteen months Wright spent at Oxford in 1937-8. (Source: Melbourne University Archives, Wright papers, Misc.)

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A review of Peter Mc Phee's book Pansy: A Life of Roy Douglas Wright, *published by Melbourne University Press in 1999, appeared in the 1999 issue of* Chiron. *Peter McPhee's UMMS Lecture was given on 11 November 1999.*

Alumni Story

Squire on a Shoestring

John Farrer, MB BS 1945

Hall Garth, Clapham, Via Lancaster

John Farrer

I followed a fairly routine post-graduate tour of hospitals for experience. The (Royal) Alfred where I met my wife to be (Joan Brown) followed by a spell at the Kids' in Frankston where I collected my first part MD with much tuition. The Old Kids' at Carlton was my next port of call and then the Women's for a term of 'stets and gynae'.

By this time I was married with one child and rather strapped for cash. I quickly accepted the offer of a practice at Hamilton, but my father died after six months and I felt that I ought to be in Melbourne to be near his engineering factory. This led me to the Margaret St Clinic at Moonee Ponds with Monty Kent Hughes, Bruce Anderson, Ian Jones and Kurt Schwarz. Whilst there, an event occurred which changed the family's whole life: a telegram of an uncle's death and a following letter to say that I had inherited a rural estate in Yorkshire, England. What a decision had to be made!

Firstly, I needed to see what it was as I was only just considering postgraduate studies abroad and had not even seen that side of the world. The only way to describe the Yorkshire Dales is to recall the film *All Creatures Great and Small* for that is exactly how it was in 1953. Tuberculosis was just coming under control, only half the village of fifty-three houses had bathrooms and the village water supply went off when several troughs started leaking in the fields. The Hall had been sold to the local County Council and the Trustees warned me that the place may not be viable after death duties had been paid; with a mortgage.

However, youth does peculiar things and I decided it was a challenge, so, together with Joan and the family I migrated and took up residence in what was the agent's house.

It is almost impossible to describe the running of an Estate like this. No time for hunting, fishing or shooting, just a matter of learning the rules and regulations under many different authorities. Only two per cent of the 10 000 acres left from 30 000 acres before the war is not in some way 'designated', be it National Park; Area of Outstanding Beauty; Site of Special

Scientific Interest; Conservation Area; Limestone Pavement Order; Tree Preservation Orders; Listed Buildings and, lately, plenty from Brussels.

As the land includes the deepest underground waterfall in England (120 metres) and extensive passages and caves which potholers (speleologists) frequent, there is a booking system to reserve a pothole of anything up to eighteen months in advance!

Fortunately, medical work was never too far distant. A school medical appointment to some forty-three village schools in the Dales was a sheer delight; later replaced by the same type of work at Accrington, a mill town in Lancashire. General practice and locums played a small part and twenty-one years part-time accident and emergency at Lancaster helped the finances as well as being a great satisfaction. During this time I joined a team who were amongst the first to publish computer studies of hospital attendance, though the punch-card computer system of the time was rather tedious.

All in all the variety of activities seems to suit my temperament but they could not be tackled without my wife Joan's support and patience–including all the social activities she has tried to arrange, coordinate, plan and more often than not carry out herself. Far removed from the traditional 'lady bountiful' of Victorian and Edwardian times.

Hall Garth (built 1760) with Joan Farrer and friend, 1978

Further information is available on the website: www.yorkshirenet.co.uk/clapham/index/html

Books

Painting the Islands Vermilion

Archibald Watson and the Brig *Carl*

by Jennifer MT Carter

Melbourne University Press, 1999
Hbk, pp181, illustrated, appendices, notes, bibliography, index
rrp $45 (pre-GST price)

Archibald Watson (1849-1941), the first professor of anatomy at the University of Adelaide, grew up along the upper Murray and was educated in Melbourne, before undertaking medical studies at Göttingen and Paris. After some desultory anatomy teaching in London, Watson was appointed to the Adelaide chair at the age of thirty-five. His grasp of surgical anatomy was unchallenged, and he taught well, as one of his students, Sir Thomas Dunhill, has attested (p.10). But Watson also proved an irascible and emotionally isolated man, a blusterer and a bully, who set out to shock the Adelaide bourgeoisie. As an anatomist he wielded a careful scalpel; but as a controversialist he chose to slash and burn.

But was he also, as Jennifer Carter alleges, a kidnapper and a murderer? Carter labours hard to convince the reader that Watson as a youth took part in the crimes of the crew of the brig *Carl*, a notorious black-birding vessel under the command of James Murray (a medical doctor who happens to have worked at the Melbourne Hospital in 1863). Certainly Watson was a passenger on the *Carl* in 1872, long before he began his own medical career, but there is little evidence to implicate him directly in any evil deed, and in any case, the more egregious of the crimes were perpetrated on an earlier voyage. Carter piles up evidence, but not much of it adheres to Archie Watson. When the evidence proves insufficient to convict, Carter turns to supposition and spite. She clearly does not like Watson. 'The clown, the eccentric, the practical joker, all seem to me to hide something sinister,' she writes (p.160). 'Had it been a heady experience,' she wonders, 'to deal out death to the helpless worthless savage, and had the pistol-toting 'little cad' grown up into something far, far worse?' (p.161). After such speculation it is surprising to find the author criticising Hedley Marston's manuscript biography of Watson for giving her sinister anatomist 'a most fanciful treatment more suited to a novel than a biography' (p.178).

But Carter does not stop at claims of kidnapping and murder – along with, predictably, a conspiracy at the Royal Australasian College of Surgeons to hush things up. She also suggests that Watson's paternal grandmother may have been an Indian princess. Did this 'knowledge that he himself had coloured blood' (p.172) – this dirty little secret – drive him to murder and mayhem? Was 'the most obvious result of his Indian grandmother's heritage to be seen in his insatiable appetite for sex?' (p.169). At times it seems as if Carter can look no way but downwards, with a muckrake in her hands.

Watson was probably an unpleasant fellow, but there must have been something about him that inspired Dunhill and others. Carter gives little indication of a familiarity with contemporary medical research and practice that might have revealed Watson's distinguishing features. Those seeking to understand Watson as an anatomist and a surgeon will more profitably read the reflections of Marston and RG Elmslie. The culture of the Adelaide medical school is an unusual one, and still inadequately understood. Carter again offers no help here; but the work of AA Lendon and Bryan Gandevia (on Sir Edward Stirling) points out the major landmarks and offers some insights.

Carter has written a lively, if hyperbolic, tale, and the book is well produced. But it should be shelved with other novels, not with medical history.

Warwick Anderson
Centre for the Study of Health and Society and History and Philosophy of Science.

Reducing the Odds: A Manual for the Prevention of Cancer

by Gabriel Kune

Allen and Unwin, 1999
Sbk rrp $24.95 (pre-GST price)

This is an excellent manual transcribing what we know about the prevention of cancer into a systematic account that can connect the individual with his/her risk profile to a lifetime plan for protection. Professor Kune, a renowned cancer surgeon, has a deep understanding of the topics based on his first hand experience with case-control studies in cancer (particularly the Melbourne Colorectal Cancer Study), and his commitment to explore the topic with

investigators and authorities around the western world.

The book is set out in four sections. The first asks 'What is cancer?' 'What is cancer prevention?' and 'Who is at risk of cancer?'. These chapters describe cancer in lay terms, and distinguish primary (initial avoidance) and secondary (early detection) prevention. The chapter on risk delineates inheritable characteristics from environmental and personal risk factors, listing the latter in a systematic structure that emerges as common throughout the rest of the text. Amongst the latter are benign diseases and medical treatments that predispose to cancer, and lifestyle factors including diet, smoking, alcohol, sun exposure, physical inactivity and sexual behaviour.

The second part systematically examines each of these risk factors and the preventive action to take. Again this is divided between inheritable causes, and then goes into detail on each of the personal and environmental factors. The rare autosomal dominant familial cancer syndromes are described, and the reader introduced to the opportunities now available through familial cancer clinics, especially for families with exceptional histories of cancer. One criticism of the genetic chapters is that the author fails to inform the reader of the need to identify the family-specific mutation in an affected member of a family with a suspicious pedigree, before any predictive DNA testing can be done on other, as yet unaffected, members. For consenting persons, such predictive testing then enables accurate delineation of risk, which can be matched with a detailed surveillance plan. If that mutation is *not* identified in an unaffected member of a family whose specific mutation has been characterised, then that individual can be re-categorised as at average risk with huge reductions in costs of surveillance and anxiety. If *no mutation* is identified in the family, or if an individual refuses such DNA testing, or if they are positive, surveillance must be comprehensive and continue. Confusion on the place of genetic testing is engendered by the statement that after current mutational analysis '50% of those with HNPCC will be missed. To overcome this high number of false negatives...' without making it absolutely clear that this refers to our inability to detect mutations in about half the *families* with clinically defined HNPCC, and does not refer to the results of predictive testing in *individual members* of families where a mutation has been defined, in which case the result is 100 per cent reliable.

Excellent chapters on diet and cancer (Kune's forte) follow, culminating in dietary advice which in his own studies can *reduce the odds* twenty fold (for colorectal cancer) compared with the 'opposite' diet. The advice is direct and accurate. A variety of menus are provided for those having translational difficulties. However, in my view, advice to limit eating meat is unnecessary but selection of lean meat and avoidance of heavily browning and charring is certainly appropriate. Epidemiological studies separating the effects of fat from protein are not convincing with respect to risk for red meat, and where studied (for colorectal neoplasia) in the Australian Polyp Prevention Project in randomised trial format, fat was the villain. Also omitted is the evidence of protection (cohort studies) against prostate cancer afforded by lycopene-containing foods, especially tomatoes and tomato products.

After the disappointment of randomised controlled trials of betacarotene and other anti-oxidant vitamin interventions, Kune's emphasis is on *nutrients present in food* rather than isolated agents or drugs showing promise in pre-clinical trials. In this latter category, Kune's own extraordinarily valuable discovery that aspirin is likely to be a major agent for the prevention of several cancers, is given mention, but not undue prominence due to the uncertainties of dosage and risk versus benefit. His advice about supplemental vitamins and minerals is based more on lack of a known downside than an established upside in clinical trials, although there is certainly basic science support. Such advice carries the risk of being wrong as emerged with the statistically adverse outcomes reported in trials using betacarotene to prevent lung cancer in smokers. Most promising amongst these are selenium, fish oils and garlic preparations.

Tobacco and alcohol receive their due condemnation. One might be critical that the magnitude of difference in risk associated with smoking compared with dietary indiscretion is not punched out. However, even the least discerning smoker should understand the outlined facts, such as '*it has been shown beyond doubt that half of all regular smokers die prematurely from a smoking-related disease*'. Physical activity is given due prominence, following its appearance in a large number of epidemiological studies as being protective against a range of common cancers including colorectal, breast and prostate cancer. Whether physical activity is a surrogate for leanness is uncertain, but the message is the same. The book pulls together strands of information relating sexual activity (STDs, promiscuity etc) with cancer risk in a fashion not commonly encountered in medical or epidemiological texts.

The chapter on stress is provocative, and unconventional. Studies of stress as a risk factor for cancer are riddled with measurement, interpretative, and confounding difficulties. These are overridden by Kune for the sake of presentation of a message suggesting more strength of evidence than exists. Nevertheless, the likely relationship as a marker of other more damaging behaviours is outlined: for example, smoking, or drinking alcohol. Mechanisms relating stress to cancer development chronicled in the book (e.g. stress depresses some *in vitro* immune measures) leave too many intermediary, as yet not proven, steps to be compelling. The workplace (dangerous in some listed industries) and the home (really very safe) are covered, as is the possibility that electromagnetic radiation may induce risk.

The third section of the book deals with prevention and early detection. Here are the lifestyle recipes which need to be matched with the risk profiles built up in the earlier chapters. Anatomical descriptions are simple and informative, warning symptoms, incidence and prognosis are provided, and each of the inherited, personal medical and environmental factors are reiterated on a cancer by cancer basis. Tabulation of risk is provided, and the various screening modalities outlined and accurate advice provided on starting times, and frequency of each of the modalities. Distinction between advice for populations (mass screening) versus advice for the concerned individual approaching the health care system (case-finding), is provided. There is attention to the special circumstances applicable when there is a family history of each cancer. The controversial issue of what to do when there is one first degree relative affected with colorectal cancer at an older age (over fifty-five) is well handled, but the issue of relatives of people with adenomas is opened in the title of the section but not discussed in the text. Most authorities do not advise screening relatives of such people. This whole section is the 'action' part of the book which one hopes will be translated into behaviour by the reader.

The final section pulls the whole book together by walking the reader through the process of establishing his/her overall cancer risk profile and drawing up a table of personalised primary and secondary prevention strategy. *A finale that should be a life plan.*

I had some misgivings as I thought through Kune's approach and methodology. The book is entirely unreferenced, which is always a moot point in writing for lay audiences, but is acceptable given the style and target audience. Quantitation of risks is inadequately handled and does not allow the reader to separate the 'wood from the trees' in risk assessment. How important is smoking as a risk factor for lung cancer (very!!), compared with a personal history of breast or endometrial cancer for colorectal cancer (minimal)? More importantly, there is no real effort to educate the audience to distinguish between *levels of evidence* supporting various statements and advice, a process that is now central to the professional development of guidelines in this and many areas. The principles of volumes (one study or a multitude) and consistency of evidence, and

understanding the relative importance of evidence derived from mechanistic concepts without other supporting data, in vitro research, animal models of cancer, observational epidemiology (case-control and cohort studies) and ultimately, randomised controlled trials, are not so complicated that they should be avoided in a book such as this. Indeed, it is my belief that, unless the public is educated in such scientific methodology, we, as a community, will continue to leave wide open the opportunity for the unscrupulous to take advantage of us, and science will continue to be undifferentiated from quackery by the public. Even the concepts of *lead time bias* (merely advancing the time of diagnosis but not affecting the natural history to death), *length bias* (selection by screening, almost axiomatically, of slowly growing tumours with an inherently good prognosis) and *compliance* (the perfect screening test that no one will do is useless), are nowhere mentioned in the book. These concepts are essential to the underpinning of recommendations for mass screening, and are not so difficult for the reader, interested enough to engage in this book, to be informed about.

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The Royal Children's Hospital

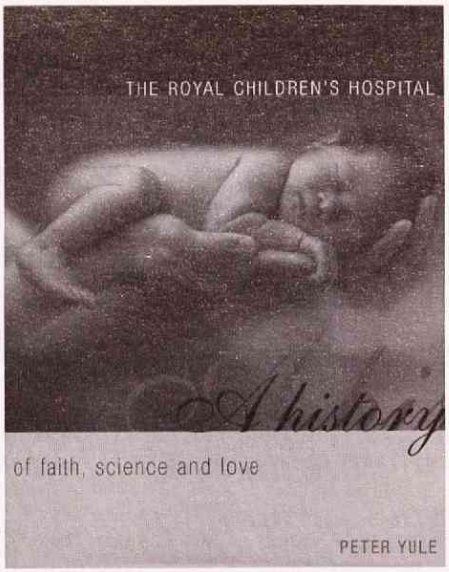
A history of faith, science and love

by Peter Yule

Halstead Press, 1999
Hbk, pp 595, illustrated, medical glossary, appendices, index.
Available from the Auxiliaries Gift Shop at the Royal Children's Hospital for $49.95 (pre-GST price) or contact the Public Affairs Office at the Hospital to order a copy on (+61 3) 9345 5130.

Writing a commissioned history of an internationally respected institution cannot be any easy task for a professional historian. Expectations are inevitably high, particularly when a previous endeavour has not been successful. The Royal Children's Hospital, its present and former patients, its staff and its many friends and supporters have every reason to be very well satisfied with the book written by Peter Yule.

The book covers in great detail the history of the Hospital from its founding in 1869-70 by Drs William Smith and John Singleton in what was then the 'red light district' of Melbourne–Romeo Lane between Bourke and Little Bourke Streets– to 1995. Yule was able to draw on much archival material held by the



Hospital and other public documents for information on the Hospital's early years and then recollections of staff (including this reviewer) and patients, as well as hospital records, for more recent times. Inevitably, these personal views often give one interpretation of complex events but it is difficult to see how the author could have completely eliminated this potential bias. If he had succeeded, the interest of the book would have been substantially lessened. However, it has the effect of creating some imbalance of emphasis on the role played by some departments and individuals in developments over the last thirty to forty years. Perhaps the author could have given more of his interpretation of the available material rather than simply being a recorder.

The inclusion of descriptions of patients and their illnesses and, for those who are still alive and contactable, personal reminiscences, adds substantially to the human interest of the history. The book is full of information and will be a major resource for future generations. Details of the medical staff are of particular interest and it was fascinating to read of the contributions made, in the Hospital's first seventy-five years, by many of Melbourne's leading physicians and surgeons until they were forced to leave paediatrics to make a living looking after adults. It is a great achievement that the author was able to obtain material from some of the key players about the change from what was essentially a 'cottage' hospital providing supportive care to children with chronic illness prior to the Second World War, to one of the leading international centres for clinical care, teaching and research in the health and illnesses of children and adolescents.

One theme that comes through repeatedly in the book is the dedication of many individuals to the success of the Hospital, often in a voluntary or honorary capacity, and the strong support it has received from the Victorian community. The Presidents of the Committee of Management (and latterly the Board of Directors) have been remarkable people. Ella Latham, Elisabeth Murdoch and Elizabeth Testar stand out for their exceptional contributions at critical times of the Hospital's history.

While it is not a book to be read from cover to cover in a few sittings, it should have great value to those interested in the Royal Children's Hospital, in the social and medical history of Victoria and in the health and social needs of children generally. It is well produced but regrettably there are a few mis-labelings of the many excellent photographs.

Peter Phelan

BOOKS RECEIVED

Drug Use in Australia
A Harm Minimisation Approach

Edited by Maragret Hamilton, Allan Kellehear & Greg Rumbold

Allan Kellehear & Greg Rumbold
Oxford University Press, 1998
Sbk, pp283, index, bibliography
rrp $37.95 (pre-GST price)

For the Love of Children
My Life and Medical Career

by David Buxton Pitt

Pitt Publishing, 1999
Available for $27.95 (incl postage & handling within Australia) from Pitt Publishing, 2/82 Westbrook Street, East Kew, Vic, 3101. (pre-GST price)

Health and History
Bulletin of the Australian Society of the History of Medicine

Edited by Warwick Anderson and Janet McCalman

Published twice yearly with the assistance of the ASHM and the Faculty of Arts of the University of Melbourne.
Orders can be addressed to the Secretary, ASHM, PO Box 1043, West Leederville, WA, 6091, Australia.

Exhibitions at the Medical History Museum

Not Gone but Forgotten: Poliomyelitis in Victoria

PHOTOGRAPHS AND OBJECTS exploring the rise and fall of poliomyelitis in Victoria in the last century were exhibited at the Medical History Museum from December 1999 until April this year.

Poliomyelitis viruses normally caused a transient bowel infection without symptoms. In less than one per cent of infections the virus enters the CNS causing viral meningitis, and may specifically damage or destroy anterior horn cells causing paralysis with little evidence of damage to other neurons.

Prior to the twentieth century poliomyelitis was a rare paralytic disease occurring in infants. Epidemics were small and rare. Notification of the disease in Victoria started in 1916 after the average age at onset rose and epidemics became more common. The following table illustrates the progression of that process.

	1908 (RCH only)	1937/8	1949	Mortality (40)
	135 cases*	2166 cases	760 cases	1949/50
Age	%	%	%	Number
0-4	70+	34	32	6
5-9		49	39	7
10-14		15	21	3
15+		2	8	24

*'2/3 under age 3 years'

In both epidemics a shift to older age groups occurred in less densely populated areas. Almost every year after 1945 there were over 200 cases until 1956–a total of 368.9 cases (almost half the total cases reported from 1916 to 1956). Mass Salk immunisation (injection with inactivated virus) commenced in 1956 and the subsequent decline in cases to virtually zero occurred over the next eight years with a total of 240 new cases.

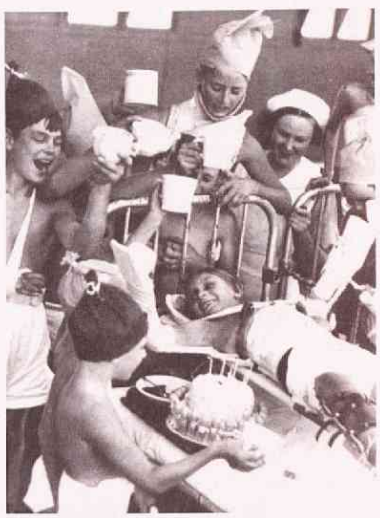
The introduction of Sabin (live) oral vaccine in 1968 and its wide use in children ensured that direct and second hand contact immunisation was almost universal in all age groups.

Prior to successful immunisation, coping with new cases and continued aftercare of others required the provision of state-wide inpatient facilities as well as itinerant medical and physiotherapy services. Polio clinics were held regularly throughout Victoria and physiotherapists visited families as often as required to supervise their home treatment programs. In 1950 the Royal Children's Hospital and the Victorian Health Department employed over thirty full-time physiotherapists for poliomyelitis aftercare. For the growing child, prevention of deformity (or at least limiting its severity) was a major aftercare issue. Severe adult paralysis had serious economic and social consequences for the family.

The future threat posed by the changes in poliomyelitis can hardly be exaggerated. Infection occurred long after the expiry of the infant's passively acquired maternal immunity due to better hygiene. The decreasing availability of such passive immunity meant that some newborn infants were also at risk. Risk factors identified in 1949 were pregnancy (almost half the adult females with paralysis were pregnant), and the ability of pertussis vaccine to provoke paralysis if given to a child just prior to the acute infection. As with other infectious diseases, social isolation could delay infection. The number of susceptible older people in whom the disease was more severe increased; paralysis was no longer 'infantile'.

Might there be other viruses that spread even more effectively, and whose day is yet to come?

Peter Colville



Royal Children's Hospital Orthopaedic Section, polio patient's birthday party c1950s. Photograph courtesy of the Royal Children's Hospital Archives.

Other Healers: 150 Years of Complementary Medicine in Victoria

Medical History Museum, Brownless Biomedical Library, University of Melbourne
18 May–3 November 2000, Open Mon–Fri 9am–5pm. Free entry
Enquiries Ph (+61 3) 8344 5719

An exhibition developed with the assistance of the Museum of Chinese Australian History and the Australian Complementary Health Association.

Australia has a rich tradition of complementary health care practice. Popular, scientific and medical interest in complementary health has grown tremendously in recent years. Many doctors now practise both conventional medicine and an alternative, and medical students are expressing more interest in other explanatory models of health and disease. This exhibition does not attempt to evaluate the scientific worth of complementary medicine, or to endorse any particular practice, but rather it explores the social dimensions and history of some of the more popular explanatory models.

The exhibition features artefacts, photographs and original documents which outline the threads of development of the main disciplines with long traditions in Victoria or recent popularity: British/European herbalism; naturopathy; traditional Chinese medicine; homoeopathy; chiropractic; osteopathy; massage; and Ayurvedic medicine.

Pelham House,
165 Bouverie Street, Carlton, Victoria 3053
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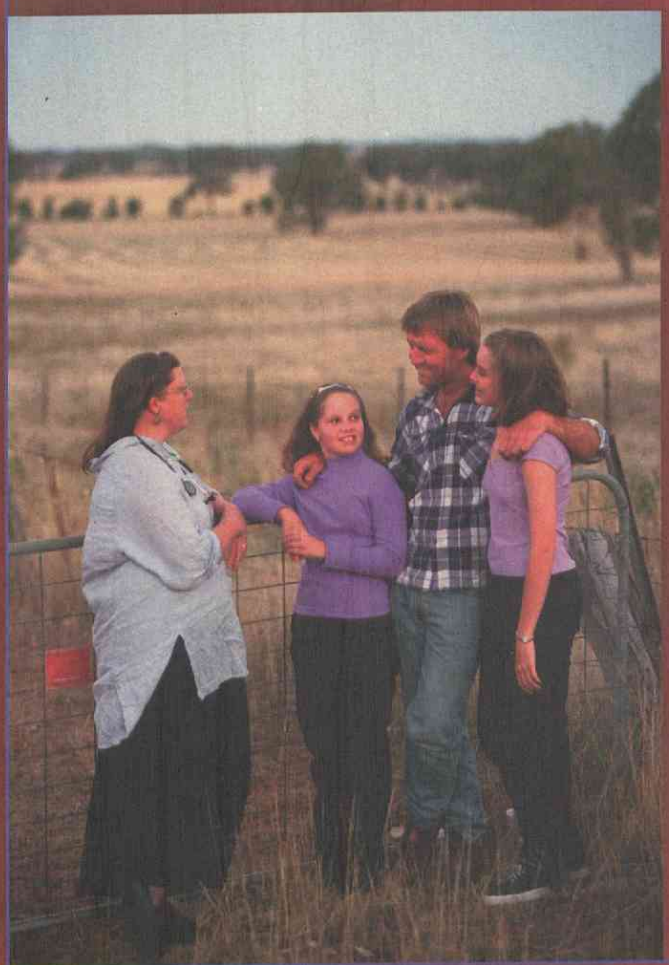

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