Europe, July 1949 to February 1950

As described in the previous chapter, Sir Howard Florey had made arrangements for the first three professors appointed to the John Curtin School of Medical Research to meet him in Oxford early in August 1949. Adrien Albert (Medical Chemistry) was working in the Wellcome Laboratories in London and Hugh Ennor (Biochemistry) had come over from Melbourne. Bobbie and I arrived in England on 2 August. She stayed with my friend Cecil Hackett and his wife Beattie at Northwood, just out of London. I went up to Oxford and spent a very busy four days talking about the future of the School with my new colleagues (it was the first time that we had met) and with Florey. With the help of Florey's colleague, Gordon Sanders (who later came out to Canberra for a few months to help us with the planning), among other things we decided on an H-shape for the JCSMR building, with the main laboratories on the south side of each wing, to avoid direct sunlight, and rooms for special facilities on the north side, with narrow passages, to make cluttering with equipment difficult. The spine of the H was reserved for School requirements, with the library on the top floor, a lecture theatre and seminar rooms, administrator's offices and a tea-room on the ground floor, and stores on the bottom floor. Since there were no laboratories in Canberra at the time, the ANU had arranged with Burnet to make available two laboratories at the Walter and Eliza Hall Institute until we were able to move into laboratories in Canberra.

Sir Howard Florey, 1898–1968

Howard Walter Florey, an Adelaide Rhodes Scholar and since 1935 Professor of Pathology at the University of Oxford, was invited to Australia by Prime Minister Curtin in 1943 to advise on the production of penicillin in Australia. He came out in August 1944 and spent six months here, during which he visited the mainland capitals. After commenting on the lack of adequate facilities for medical research in Australia, Curtin invited him to develop a plan for a national medical research institute. This was ultimately realized by the inclusion of the John Curtin School of Medical Research as one of the initial four research
institutes in the ANU (Foster and Varghese, 1996). In 1947, three Australians and one New Zealand expatriate were persuaded to meet as the Academic Advisory Committee for the new Australian National University, Florey being Advisor to the John Curtin School of Medical Research. He continued in this role until 1956, visiting Canberra several times. In the early days, I, and I presume other heads of the first four departments, corresponded regularly with him. I have a file containing 35 such letters in my Basser Library archives, the great majority written in 1951 and 1952, before Hugh Ennor had been installed as Dean. From 1960–65, Florey was President of The Royal Society of London and, from 1965 until his death in 1968, he was Chancellor of the ANU. He was not an imaginative scientist of the calibre of Burnet or Dubos, but he ‘got things done’ in relation to such matters, for example, as penicillin production, the John Curtin School of Medical Research and new buildings for The Royal Society. He had the English habit of addressing everyone except close personal friends by their surname. I found him very helpful whenever I looked for advice (see Fenner and Curtis, 2001).

The Act setting up the ANU was passed in August 1946, and with it came a statutory grant of £325,000. We discussed with Florey how best to spend this money, and decided to use our portion of it to buy back-sets of important journals, get equipment for our laboratories, and provide ANU scholarships to enable young Australian scientists to do a PhD degree in England (none of us wanted to take on PhD students until we had settled into our labs in Canberra).

I recommended three such students: J. H. Bennett to work with R. A. Fisher (he later became Professor of Genetics at the University of Adelaide), F. W. E Gibson to work with D. D. Woods on chemical microbiology (he became Professor of Biochemistry here in 1967 and Director of the JCSMR, 1977–79), and W. K. Joklik, who worked for 8 years in my department and then became Professor of Microbiology and Immunology at Duke University, in North Carolina.

---

Cecil John Hackett, 1905–95

I insert this note on Cecil Hackett because almost every time that I went to London, from 1949 to 1993, I stayed with Cecil and his wife Beattie, initially at his home in Northwood, then in Geneva, when he was working at the World Health Organization, and most often at their flat in Moscow Road, London, just north of Hyde Park. Born in Adelaide in 1905, Cecil graduated MB BS at the University of Adelaide in 1927 and MD in 1936. I met him when he lectured to me on physiology in 1936 and subsequently because of his involvement in the expeditions into Central Australia organized by the Board of Anthropological Studies (see Chapter 56 Nature, Nurture and Chance).
2). From 1937 to 1940, he worked in Uganda, investigating the bone lesions associated with the tropical disease yaws. During the War, he served as a medical officer in the Royal Air Force in West Africa, India and Burma, and from 1945 to 1954 he was Director of the Wellcome Museum of Medical Science in London. During the next decade he worked as a Senior Medical Officer at WHO Headquarters in Geneva, concentrating on yaws and its elimination from Indonesia. Back in London in 1965, he continued studies on lesions of syphilis and yaws in bones. In 1980–81 he was the prime mover in arranging for a stone recognizing the contributions of Lord Florey to Great Britain to be placed on the floor of Westminster Cathedral, where his wife, an avowed non-believer, worked so hard as a voluntary helper that she was awarded an MBE and a carving of her head was used as a gargoyle on the Cathedral (see Fenner, 1995).

From August to November Bobbie and I stayed with the Hacketts at Northwood, some 20 km west of London. Since no laboratories were available in Canberra, we took the opportunity to travel around Europe, in the process seeing as many microbiologists as I could. We bought a Ford Prefect car and drove first around England and Scotland (a total of some 3,000 miles) then through France, Belgium, Holland, Germany and Italy (a total of about 4,200 miles). In Germany we went through the Ruhr, still bearing most of the wounds of the War, to the peaceful countryside of Neidergrenzebach, where we met our closest relatives on the Fenner side in the house where my paternal grandfather was born and I saw my great-grandfather's grave. I also attended several national and international scientific conferences in England. Bobbie and I enjoyed learning about the countryside and looking through the great art galleries and museums of Europe. It was an unforgettable experience.

On 8 November, we moved into Nuffield House, in London, where we stayed until we left for home, embarking on the *Orontes* on 12 January, 1950, and arriving in Melbourne on 18 February. Such was the interest in The Australia National University in those days that there were items in the newspapers recording my arrival in Perth, in Adelaide on 15 February, and in Melbourne a journalist from *The Age* met the ship and interviewed me, with an article and photo in that newspaper next day.

**Accommodation in Melbourne**

I thought that it might be as long as 5 years before we would be able to move from Melbourne to Canberra. Initially, therefore, we moved into the house of my wartime friend, pathologist Alan Jackson, who was going with his wife Mavis on his overseas trip, as arranged by Bill Keogh. They lived in a very nice house in 4 Turnbull Avenue, Toorak, close to a railway station. Bobbie looked
after their three children while I went to the Hall Institute each day. Later we looked after the three Burnet children in their house at 10 Belmont Avenue, Kew, while Mac and Linda spent nine months in England. Meanwhile, we looked for and bought a house in Blackburn, then on the outskirts of Melbourne but near the railway station, although I usually drove to work.

Our Children

Bobbie, in particular, was anxious to have children, ideally one boy and one girl. We had never used contraceptives but she had never become pregnant and, when we were in Melbourne just after the War, she and I had undergone medical investigations to ascertain whether there was some medical reason that could be corrected, but none could be found. Since she had had a hysterectomy in 1949, when we were in America, we decided to adopt a child. We were assisted in this choice by old army medical friends, notably Dr Stanley Williams. We adopted as a month-old baby, a girl who was born on 27 June, 1950, and named her Marilyn Aldus (Bobbie’s mother’s maiden name) Fenner. We never enquired about her biological parents, and she has never wished to do so. Some time later, while we were still in Melbourne, Stanley Williams came to see us again and told us that he thought we should adopt my niece, the daughter of my younger brother Tom and his first wife, Beverley (née Slaney). Beverley had died in tragic circumstances, while Tom was away with the Royal Australian Navy, but their only child (Victoria, Vicki, born 1 March, 1943) had been saved from the fire. Tom married Margaret Legge a few years later, but Stan told us that Margaret, who had two children by Tom, was treating Vicki very badly, and that we should adopt her. Tom had no objections to transferring Vicki to our care, so we followed his advice and formally adopted Vicki when she was eight years old.

Staff in Melbourne

With the limited space, only one academic appointment was made while we were in Melbourne. Stephen Fazekas de St Groth completed his term of appointment with Burnet in December 1951. Burnet did not wish to reappoint him, but I was impressed by his intelligence and dedication and offered him a Senior Research Fellowship. I obtained laboratory accommodation for him in the laboratories of the Children’s Hospital, where he continued studies on influenza virus. For assistance with my studies on mycobacteria, I appointed Ronald Leach as a research assistant in 1950. He stayed with me until the embryo Department moved to Canberra. In 1951, Gwen Woodroffe and Ian Marshall were appointed as research assistants to help me with work on myxomatosis.
The Move to Canberra, November 1952

The overall plan of the permanent building had been decided when the founding professors met Florey in Oxford in July 1949, and a foundation stone was laid by Prime Minister J. B. Chifley on 24 October, 1949, to honour the memory of John Curtin, Prime Minister of Australia 1941–45. However, in the early 1950s, Canberra was struggling out of war-time restrictions on buildings. University House had been started in 1950 and was opened in 1954, but in late 1951 construction of the permanent laboratories of the John Curtin School seemed so far off that Council feared that the dispersed ‘School’, with departments located in Melbourne, Dunedin and London, would wither away. With the concurrence of Florey, it therefore authorized the construction of temporary laboratories. The contract was let to a local builder, Karl Schreiner, and the laboratories consisted of prefabricated wooden buildings, two being built adjacent to each other, with the overlapping eaves constituting the roof to the corridor. These were started in 1951; those for Microbiology and Biochemistry were ready for occupation late in 1952 and another double laboratory was built for Eccles and the Physiology Department in 1953. George Mackaness and a small group that had been working in Florey’s department in Oxford came out as the embryo Department of Experimental Pathology to another double building in 1954. Two adjacent buildings temporarily housed the School Workshop. The permanent workshop was completed and occupied in September 1953, but it was to take another four years before the permanent laboratories would be completed.

Ian Marshall and Gwen Woodroofe moved from Melbourne to Canberra in early November 1952, to unpack and assemble the laboratory equipment that had been sent up by pantechnicon. One of my technicians, Kathleen Sutton, also moved to Canberra. Shortly after she arrived, she married Ian Marshall. Housing would have been much easier to arrange if they had married while still in Melbourne. Bobbie and I and the children moved up late in November 1952, in a Morris Minor and a Ford Prefect, to a University-owned house located at 3 Torres Street, Red Hill. Later, Bobbie’s mother, who was then confined to a wheelchair, came from Perth to live with us.

Our Permanent House, 8 Monaro Crescent, Red Hill

Before we had arrived in Canberra, Eccles, Ennor and I had been provided with a block of land on which to build our houses. In contrast to the very large blocks given to Eccles and Ennor, mine was a rather small block in Hotham Crescent, Deakin. I had asked a Melbourne architect, Robin Boyd, recommended to me by Professor Brian Lewis, the ANU architect, to design my house (Serle, 1995).
Figure 5.1. The temporary buildings of the John Curtin School of Medical Research

Figure 5.1a. Two prefabricated wooden buildings were juxtaposed and a passage constructed where the adjoining roofs touched. Laboratories or rooms for experimental animals opened on each side of this passage. Figure 5.1b. The laboratories of the Department of Microbiology are on the right; there was a similar double building for Biochemistry behind a double-width coffee and seminar room on the left.

When we called for tenders, the design was so revolutionary that only one builder submitted a proposal, at a price (£25,000) that I could not afford. After living in the house in Torres Street for a few months and getting to know and like our neighbours, I eyed with interest the empty block immediately to the east of our house, on the corner of Torres Street and Monaro Crescent. All land in Canberra was on leasehold, and the law at the time was that the lease-holder had to commence building within six months of being granted the lease. The responsible authority, the Department of the Interior, told me that this block had been leased for six years, and that if I immediately surrendered my existing lease, they would transfer this lease, for Block 1 Section 3, Red Hill, to me. That
done, Robin redesigned the plan for the new, much larger block, making it a single storey house, facing slightly east of north, with large windows and wide eaves to make the most of the winter sun while excluding the sun in summer. This time, Karl Schreiner, who was now constructing the permanent John Curtin School building, tendered for the building, without the heating system, at a reasonable £8,500. I signed the contract a few days before I went on my first study leave overseas, in May 1953, leaving Bobbie with any problems that might arise before I was back at the end of October.

Figure 5.2. The Fenner house at 8 Monaro Crescent

Figure 5.2a. Designed by Robin Boyd, in early 1955; the terrace at the front had been completed but the trees had not started to grow.

Figure 5.2b. The front wing of the house in 2004; the terrace is obscured by the sessile junipers, the trees are now quite large, and the garage of the extension built in 1982 can be seen on the right.
The house (Figure 5.2) was an outstanding success, both architecturally and as a place to live in. It was awarded the first Canberra Meritorious Award for Architecture in 1956 (Figure 5.3), and subsequently declared a Heritage house. There were long illustrated articles about the house in the November numbers of *The Australian Home Beautiful* and *Australian House and Garden*, and there are illustrations of it and a good description in Martin Myles (2002) website. An old school and university friend of mine, Lindsay Pryor, then Keeper of Parks and Gardens and later Professor of Botany in the ANU, designed the garden, which I still maintain, giving special attention to the large vegetable garden.

Figure 5.3. Viewing the Canberra Meritorious Award for Architecture, 1956

From left to right: Karl Schreiner (builder), Vicki Fenner, Mrs Schreiner, E. J. Scollay, (Canberra Chapter of the Royal Australian Institute of Architects). Frank Fenner, Marilyn Fenner and Bobbie Fenner.

**Vicki Fenner’s Death**

The most tragic episode that Bobbie and I ever experienced occurred on 30 March, 1958, just after I had been elected to The Royal Society. Our youngest daughter, Marilyn, had contracted rheumatic fever and, after Dr Lorimer Dods had seen her in Canberra, she was transferred under his care to the Royal Alexandra Hospital for Children at Camperdown, in Sydney. Bobbie had gone down there to be with her. I was left in charge of the house and Vicki. One day I came from the garden into the kitchen and surprised Vicki and Catherine (Kate) Webb, the daughter of Professor L. C. Webb (Professor of Political Science in the Research School of Pacific Studies in ANU), a girl of Vicki’s age who lived up Torres Street. They were handling two large kitchen knives. I thought this
odd, but dismissed it. Next weekend I was in the garden picking strawberries when Len Webb came running down Torres Street and said that something terrible had happened. We went together up the street, across Mugga Way and up a lane between two houses that led up Red Hill. There lay Vicki, a rifle she had borrowed from Kate Webb beside her. Vicki had placed the tip of the barrel in her mouth and shot herself. She had left a note in her bedroom saying that ‘Life is not worth living’. The only possible reason for this statement that I could think of was that she had read Neville Shute’s book, *On the Beach*, which tells of the destruction of the world by nuclear war and which I had just read. There was, of course, a coronial enquiry, but they could find no other motive. Kate later became an outstanding journalist, especially during the Vietnam War. Some years later, both Professor Webb and his wife were killed in a motor-car accident.

**Development of the Department in the Temporary Laboratories, 1953 to 1957**

Completed in late 1952, these buildings are still in use, as offices rather than laboratories. They were quickly got into running order and I proceeded to enrol Ian Marshall as a PhD student and persuade W. K. (Bill) Joklik, whom I had supported with ANU money as a PhD student in Oxford, to join the Department—he was our first expert on the biochemistry of viruses and worked on poxviruses. Bruce Holloway, an Australian who had just got his PhD at the California Institute of Technology, came out as a Research Fellows in 1953 and John Cairns, whom I had met when we were both at Burnet’s laboratory and again when I visited Entebbe, in Uganda, in 1953, was appointed as a Senior Research Fellow in 1955. Ian Marshall was appointed a Research Fellow when he graduated PhD in 1956, he and Gwen Woodroofe continued to work with me on myxomatosis. Cedric Mims, an Englishman who, like Cairns, had worked in Entebbe, joined the Department as a Research Fellow in 1956 and commenced his now classical work on the pathogenesis of infectious diseases. Fazekas continued to work on influenza virus, Holloway worked on the genetics of the bacterium *Pseudomonas aeruginosa* and Cairns on various aspects of virus multiplication. Another very important appointment made in 1956 was Alan Logie as my Senior Technician.

**Other Activities, 1953 to 1957**

**Planning the Permanent Building**

Besides getting on with our research, the three professors located in Canberra and Adrien Albert, when he came out from London, had to plan the details of their laboratories in the permanent building. In consultation with Florey, each of the existing departments had been allotted space: Microbiology was given three floor levels of the front West wing, plus a special animal house for infected animals; Experimental Pathology (Mackaness) was given the top floor of the
front East Wing; Neurophysiology (Eccles) and Biochemistry (Ennor) were given
one floor level each in the rear East Wing; and Medical Chemistry (Albert) was
given the four floors of the rear West Wing (the lower two as a tall space designed
to house production-size facilities). Other floors were left undeveloped until
new departments were established and their Heads appointed.

Figure 5.4. Staff of Department of Microbiology in the temporary laboratories,
June 1955
Middle row: D. Graham‘, G. Woodroofe‘, A. Logie (head technician), Mrs W. Joklik (secretary), E. Moore‘, W. Trusedale‘, A. Penkethman‘.
Front row: J. Cairns‘, F. Fenner‘, P. Gay‘, B. Renfree‘, B. Konowalow‘, F. Vagg‘, Mrs Scholes‘.
‘= technician, “= academic staff member, “= PhD student,”= visiting fellow

Study Leave, 1953
I took my first study leave in 1953, leaving Canberra on 23 May and returning
on 25 October. I travelled extensively in the USA, visiting many laboratories as
well as museums and art galleries, until 23 August, when I flew to London. This
was my first trip overseas since taking up my appointment in the ANU. On
arrival in San Francisco, I stopped for a few days with Bill Reeves, who had
visited Melbourne in 1951 to investigate the epidemiology of Murray Valley
encephalitis, and got his advice on which labs to visit in the USA. According to
my memory and my diary, I visited the labs of almost every virologist in the
United States, learning much and often giving seminars, usually about myxomatosis. I also attended a 4-week long course on bacterial viruses at Cold Spring Harbor, N.Y. My diary for that trip, of some 100 pages, is housed in the Basser Library archives.

I returned to Australia via South Africa, stopping off in Entebbe, in Uganda, on the way. When in Entebbe I met John Cairns again, and we went on a wonderful drive to the Ruenzorei Mountains (the ‘Mountains of the Moon’) and looked over the scarp of the Great Rift Valley at herds of elephants and buffalo far below. I also persuaded John to come out to Australia and join my department. He came in 1955 and stayed until 1963, when he went to the United States to become Director of the Cold Spring Harbor Laboratories.

Study Leave, 1957

I took my second study leave between 7 September and 14 December, 1957, this time travelling to England first, with a stop-off in Athens for a couple of days to see the ancient sights and the museums. Christopher Andrewes, at Mill Hill, spoke to me about the vacant chair in Virology at St Mary’s Medical School, but I said that I was not interested. Besides visiting virologists in London, I had long talk with Florey, who told me that my department was the best one in the School and the only young one with a reputation in England (Eccles, of course, had a great reputation as a neurophysiologist). I spent some time with Allan Downie at Liverpool and met Keith Dumbell, later to be the world expert on variola virus. Then I attended a virology conference at Cambridge and visited the Porton biowarfare laboratories.

In Germany I visited Hannover, Tübingen, where the best virology lab in Germany was located, Paris, to see Lwoff at Institut Pasteur, and Jacotot, Vallée and Virat, all of whom were working on myxomatosis. One night I went to the Folies Bergère, which I thought were worth seeing once, but I wouldn't go again.

Next day I flew to New York and the Rockefeller Institute, where a substantial building program was in progress, with a Dome for lectures and accommodation for visitors (which I often used on subsequent visits). I had a long talk and dinner with René Dubos. He pressed me to keep up the study of myxomatosis since there was no other example of virus and host evolution in action. I then visited George Hirst, who was still working on influenza virus, and his colleagues, who were working on poliovirus and Newcastle disease virus. Over the next couple of days, I talked with colleagues of my early days at the Rockefeller: Rollin Hotchkiss, Cynthia Pierce, Dick Shope and Merrill Chase. I also spent an evening with friends Grogan and Janet O'Connell. The next day, I talked with Frank Horsfall and lunched with Jim Hirsch, then gave an Institute lecture on vaccinia genetics, which was followed by a good discussion. I enjoyed a talk with Max Theiler and his arbovirologists, then went over the road to the Sloan-Kettering.
That evening (17 October 1957), I dressed in a tuxedo to give the Harvey Lecture: ‘Myxomatosis in Australian Wild Rabbits: Evolutionary Changes in an Infectious Disease’. This was followed by a pleasant dinner with many friends. During weekends I revisited the New York art museums and the Natural History Museum, and went to Carnegie Hall with the Graces (an Australian doctor long resident in New York).

As in 1953, I saw almost every virologist in laboratories in Philadelphia, Washington, Fort Detrick, Baltimore (where I met wartime malarialogist Fred Bang again), Boston, Ottawa, Ann Arbor, Cincinnati (where I spent a day and evening with Albert Sabin), Urbana (where Salvador Luria, who received a Nobel Prize in 1969, advised me to use mutants of one virus for experiments on vaccinia genetics), Chicago (where Gwen Woodroffe, on study leave there, met me), Madison, Denver, Stanford University at Palo Alto (where I met David Regnery, who came out as a Visiting Fellow in 1962), San Francisco (University of California at Berkeley) and Los Angeles (where John Cairns was on study leave at Caltech, and I had long talks with him, Matt Meselson, Howard Temin and Harry Rubin). I stayed on at Caltech to attend an excellent conference on ‘Animal Cells and Viruses’, which was why I arrived back in Canberra just after staff had moved into the new building. At every place I stopped, I gave a lecture on myxomatosis, similar to the Harvey Lecture, except that at the University of California at Berkeley it lasted for three hours, with a ten-minute break each hour!

Travel to Indonesia, 26 July to 17 August 1956

The ANU was so small in those early days that the heads of departments in the four founding Research Schools got to know each other quite well. In particular, Bobbie and I had come to know Walter Crocke, who was the foundation Professor of International Relations in the Research School of Pacific Studies, partly because he was building a house almost opposite ours in Torres Street. However, early in 1952 he had taken leave of absence to accept an appointment as Australian High Commissioner to India and in 1954 he resigned from the University to join the diplomatic corps. In 1955 he was moved to Indonesia as Australian Ambassador, and between 1958 and 1962 he moved back to India. He published eight books, each replete with critical and penetrating comments about matters on which he had a vast international experience (Fenner, 2002).

Early in 1956, Walter Crocker invited me to lead a group of three Australian academics to examine the possibility of providing Australian assistance to establish a medical school in Sumatra. My colleagues were Sydney Sunderland, Dean of the Faculty of Medicine at the University of Melbourne, and Norrie Robson, Professor of Medicine at the University of Adelaide.
Figure 5.5. Team assembled in Indonesia at request of Ambassador Walter Crocker to investigate the establishment of a medical school in Sumatra, July–August 1956

Left to right: H. A. Nasution (Education Ministry), Prof. S. Sunderland, Prof H. N. Robson, Prof. F. Fenner, Mr S. Dimmick (Australian Embassy) and W. Tooy.

We travelled around Indonesia, visiting five of the six existing medical schools, all in Java, and travelling extensively through Sumatra and to Bali, long before it had been spoilt by hordes of tourists. It was a fascinating trip for each of us. We submitted our report on 6 September, 1956 (Fenner, Sunderland and Robson, 1956), recommending that Australia should assist with the establishment of a medical school in Bukittingi, inland in Sumatra, but this plan came to nothing when the students there supported an uprising against Soekarno. Eventually, Australia provided aid to establish a medical school in Penang, on the west coast of Sumatra. Sunderland took a leading role in this operation.

Travel to China, 8 April to 7 May 1957

On 31 December, 1956, I was asked by Dr Leonard Cox, a neurologist in Melbourne who had a great knowledge of Chinese ceramics and had recently visited China, to join a group of some 20 Australian doctors who were invited by the Chinese Medical Association. The trip was to last a month and was all expenses paid. Most of the doctors were clinicians from Melbourne and Sydney. The two I knew best were Ted Ford, from my Army days, and Syd Sunderland, from our trip to Indonesia. We left Sydney on 8 April, and spent one day in Hong Kong (still a British colony), where we were entertained by Dr L. T. Ride (father of my Canberra friend David Ride) before taking the train to Canton. There, as everywhere else in China, we saw virtually no motor cars except those we travelled in; there were vast numbers of bicycles and many buses. After three days in Canton, during which I talked at length to the heads of the
bacteriology and public health departments of the Canton Medical School, we caught the Shanghai Express but got off in Hangchow, where we went for a ride on the lake, with its many small temples, and in the evening saw the opera, ‘The Peacock Flies to the Southeast’. After a day at the Chekiang Medical College in Hangchow we took the train to Shanghai.

Here we spent six days and visited both the First and the Second Shanghai Medical Schools, the Serum and Vaccine Institute (of which there were eight in China), the public health centre and the Penicillin Production Plant. We also visited one of the four schools of traditional medicine, each of which graduated about 120 students annually. In contrast, the 35 Western style medical colleges each graduated about 600 students annually.

I was asked to give a lecture at the Second Shanghai Medical School, where the Professor of Bacteriology, Dr Yu Ho, had known Hugh Ward when both were at Harvard. I planned to talk, off the cuff, about *Mycobacterium ulcerans*. However, Dr Yu had to give the talk in Chinese, so I hurriedly wrote something and he translated it overnight. Next day, I gave my talk to an audience of about 150 (compulsory attendance of all staff) and my 19 colleagues with some difficulty, because the screen for my slides was a cotton sheet that swayed in the breeze. It was followed by a talk in Chinese by Dr Yu, but in contrast to my talk, he had his Chinese audience in fits of laughter, while my colleagues went to sleep.

We were on the train all day Tuesday and arrived in Peking at 8.30 pm. We were taken to the Hotel Peking, a very large and impressive building, where we spent ten days before returning to Hong Kong. I shared a room with Ted Ford and in our spare time we usually wandered around together. We were shown around all the wonderful sights of Peking, the Temple of Heaven, the Imperial Palace, the Forbidden City, the Summer Palace, the Great Wall, the Avenue of Animals and the Ming Tombs. We spent a morning at the Peking Medical College and another at the Chinese Union Medical College (CUMC), where the Rockefeller Foundation had played a major role from 1917 to 1941. The Peking Medical College was 45 years old. It had 403 students in 1948 and 3,285 in 1957. The organization followed the pattern recommended by the Soviet Union, with five faculties: medicine (40 per cent of students), public health (20 per cent of students), dentistry and pharmacy (4-year courses with 15 per cent of the students each) and paediatrics (7 per cent of students). The CUMC had become a postgraduate institution, with 350 postgraduate students and three Professors of Microbiology, specializing in immunology, bacteriology and virology; it had an excellent library.

In parallel with the medical colleges was an Academy of Medical Sciences, which controlled four research institutes and 10 research departments. These were well
funded but had difficulties in importing equipment from overseas. We were unable to visit the Academica Sinica.

May 1 was the great day of celebration for the People's Republic of China. Leading up to it, Chou En Lai hosted a cocktail party for all visitors from other countries. He gave an excellent speech and was a most impressive man. Next day there was a great celebratory May Day procession on Tienanmien Square. We had excellent seats in a grandstand just below the balcony on which Chairman Mao and his colleagues stood. For three hours there was a procession: first of children, with variegated costumes and different acts, releasing balloons or doves or waving flowers; then solid blocks of farmers and workers with floats, flowers and flags; then dancers and artists with elaborate dresses, jugglers and trick cyclists, mythical animals and Chinese dragons; and, finally, athletes in solid blocks of 600. They all gathered in Tienanmien Square and there was another great release of balloons, streamers and scrolls, and a barrage of rockets that bore parachutes with scrolls and streamers. In the evening we gathered again in the stand for a splendid display of fireworks. Altogether, this visit to China was a wonderful experience.

**Travel to Japan, 8–19 May, 1957**

When booking my trip to China, I arranged to take two weeks' study leave so that I could visit Japan to talk with colleagues there who were involved in aspects of virology on which I was working. I therefore stopped off in Hong Kong on the way back from China, left my heavy luggage there and flew to Tokyo. My first stop, for orientation as well as technical information, was the US 106 Medical General Laboratory, where I talked with the virologists and gave the staff a talk on medical education in China. On the evening of 10 May, I had dinner with two of the 106 lab staff and two Japanese scientists with whom I had corresponded, Dr Tamiya and Dr Kitaoka, and arranged a tentative program. The next day, Kitaoka picked me up and I went to the National Institutes of Health, where we discussed rickettsial diseases and several virus diseases, including vaccinia. On Sunday, I took the train up to Nikko, where there are some famous temples, and had a very interesting day there.

The next day, Kitaoka took me to Tokyo University, where I met relevant staff and gave a lecture on myxomatosis, with alternate paragraphs by myself, in English, and Dr Matsumoto, in Japanese. On Wednesday, I travelled to Kyoto on the rocket train. It was crowded, but the service was still very good. Kyoto has some marvellous temples, with superb gardens. Dr Dohi was working on ectromelia virus and had some interesting ideas on A-type inclusion bodies. I stayed in a Japanese style inn, which was quite different from the European style in relation to bed, bath and breakfast. My last working day was at Osaka, where I met Dr Kamahora, who also worked on ectromelia virus, at the Research Institute on Microbial Diseases. On Saturday, Kamahora (whose mother was
English) and Ishigami drove me to Nara, famous for its Great Buddha, temples and a fine museum. My Japanese hosts were very attentive with both entertainment and interesting meals, especially in the evenings. Very different from China, and a very interesting and useful two weeks.

**Occupation of the Permanent Building, November 1957**

By November 1957 the building at ANU was ready for occupation and each department moved into its allotted space. I had designed laboratories on the top floor with low benches, for ‘sit-down’ virologists, the middle (ground) floor with higher ‘stand-up’ benches for biochemical microbiologists, and the western end the lowest floor as a Wash-up and Media Preparation Facility for all departments in the School. Initially there was so much space that Bill Joklik occupied three labs on the ground floor.

A stone matching the Foundation Stone occupies a space on the right hand side of entrance; it commemorates the official opening of the building by then Chancellor Sir Howard Florey, in the presence of Prime Minister Robert Menzies, on 27 March 1958.

**Development of the School in the Permanent Building, 1958 to 1967**

With the increased space, several new Departments and Units were established during the next decade (Fenner and Curtis, 2001). Adrien Albert moved the Department of Medical Chemistry from London to his four-storey laboratories in Canberra; over the next decade his academic staff increased from seven to 15 and his PhD students from one to 12. A Department of Physical Biochemistry was established in 1959, with Alexander (Sandy) Ogston, from Oxford University, as Head; its academic staff grew from three in 1959 to a maximum of nine in 1965, and PhD students from one in 1959 to five in 1966. In 1964, David Catcheside, an Englishman who had been Professor of Genetics in the University of Adelaide from 1952 to 1954, and then returned to England, accepted the Chair of Human Genetics. In 1967, he became the Foundation Director of the newly established Research School of Biological Sciences in the ANU, but in the three years he was in the John Curtin School, the academic staff increased from two to six and the number of PhD students from one to nine. The establishment of a Department of Clinical Science was accepted by the University Council and the Canberra Hospital Board in 1964, but the Foundation Professor, Malcolm Whyte, was not appointed until 1966.

In addition, two small units were set up. The Biological Inorganic Chemistry Unit, headed by Francis Dwyer, was established in 1959 and continued until 1966, although Dwyer died in 1961. Although electron microscopy had been available in the School since 1955, an Electron Microscope Unit, headed by Edgar Mercer, was established in 1963 and greatly strengthened this service.
The other four existing Departments: Biochemistry, Experimental Pathology, Physiology and Microbiology, also increased their staffing, PhD student numbers and output of publications.

**Expansion of the Department of Microbiology, 1958 to 1967**

With the increased space and adequate block funding, there was a substantial increase in academic and general staff and PhD students. Bruce Holloway left before we moved, but all the others in the temporary laboratories moved across in November 1957. David Howes was appointed as a Research Fellow, December 1957 to April 1960; Graeme Laver, working on the biochemistry of influenza virus, Research Fellow in 1958, Fellow in 1962 and Senior Fellow in 1964; and Gwen Woodroffe, having graduated PhD, was appointed a Research Fellow in 1958 and promoted to Fellow in 1963. Two overseas scientists, Dennis Lowther and Fritz Lehmann-Grube, were appointed as Research Fellows for three year terms in 1960. Peter Cooper was appointed as a Senior Fellow in 1962 and carried out classical work on poliovirus genetics; on graduation as PhD in 1962, Kevin Lafferty was appointed as a Research Fellow, he transferred to the Department of Immunology in 1964; Alan Bellett, from England, and Ken Easterbrook, when he graduated PhD, were appointed Research Fellows in 1963; and Rob Webster and Joe Sambrook, on getting their PhDs in 1964 and 1965, respectively. In 1965, Stephen Boyden, then a Professorial Fellow in the Department of Experimental Pathology, transferred to my department because I was sympathetic to his wish to broaden his outlook from immunology to human biology. He carried out an important study of the ‘metabolism’ of Hong Kong and, in 1970, he transferred to the newly-established Department of Human Biology, after I had become Director of the School. He has remained a lifetime friend. In 1966 Nigel Dimmock, from England, was appointed Research Fellow for five years and in 1967 Adrian Gibbs, a plant virologist from England, joined the Department as a Research Fellow.

The other major change possible after moving to the new building was the possibility of bringing established scientists from overseas as Visiting Fellows for periods of a year or more. Some funds for travel costs were available from the ANU, and all departments, especially Microbiology and Physiology, profited from their presence. No fewer that 13 Visiting Fellows came to our Department for at least one year during the period 1958 to 1967, seven from the United States, two from Czechoslovakia, and one each from England, Finland and India. In addition, Alfred Gottschalk, FAA, a biochemist whom I had known from the Hall Institute, came to my department when he retired in 1958 and stayed, as an NHMRC Senior Research Fellow, for four years. He carried out important work on the neuraminidase of influenza virus.
The number of PhD students graduating also increased substantially, from one in 1956 and 1958 to three in 1960, 1961, 1962, 1963 and 1964, one in 1965, two in 1966 and one in 1967.

Figure 5.6. Academic staff, visiting fellows and students of the Department of Microbiology in 1962, on the roof of Infected Animal House, with Black Mountain in the background

Back row (from left to right): Mary McClain\(^{t}\), Rob Webster\(^{st}\), William Murphy\(^{st}\), Tom Grace\(^{st}\), John Roberts\(^{st}\), Alfred Gottschalk\(^{vf}\), Betty Ermacora (secretary), Frank Warburton\(^{st}\), Ric Davern\(^{vf}\), Stephen Fazekas\(^{ac}\), Royle Hawhes\(^{t}\), Allan Logie (head technician).

Front row: Ron Weir\(^{st}\), Rima Greenland\(^{vf}\), Brian McAuslan\(^{ac}\), Bill Joklik\(^{ac}\), Cedric Mims\(^{ac}\), Gwen Woodroofe\(^{ac}\), Frank Fenner\(^{ac}\), Fritz Lehmann-Grube\(^{ac}\), John Cairns\(^{ac}\), Ian Marshall\(^{ac}\), Dennis Lowther\(^{ac}\).

\(^{t}\)= technician, \(^{ac}\)= academic staff member, \(^{vf}\)= PhD student., \(^{st}\)= visiting fellow

School Governance

Since 1953, when staff moved to the temporary laboratories, Hugh Ennor had acted as chairman of a committee, comprising the heads of departments, which ran the School. As such, he acted as the primary channel of communication with Florey. In 1957, the University Council formally endorsed this 'School Committee', chaired by Ennor as Dean, as the governing body of the School. With minor concessions to other academic staff, this structure of governance continued until 1967, when a Committee of Council recommended that the John Curtin School should adopt the Faculty/Faculty Board structure that had been adopted as early as 1954 in two other Research Schools. The authors of the history of the first 50 years of the ANU (Foster and Varghese, 1996) comment on the early arrangements:

"the notion of God Professor had extended beyond Olympian heights...when there were rumblings among "other ranks" for regular "academic staff meetings"
and the creation of a faculty structure…Ennor, supported by most other members of the School Committee, firmly resisted [these suggestions].’

Other Activities, 1958 to 1967

This decade was the apogee of my career as a bench scientist. Details of my experimental studies during this period are summarized in Chapter 6 and the work of the Department of Microbiology during this decade is well described in a paper by Joklik (1996), which concludes with the comment, referring to the Department of Microbiology and the Laboratory of Cell Biology, US National Institutes of Health: ‘The two Departments I have chronicled could hardly be further apart on our globe. But both yielded an extraordinarily rich harvest in discoveries, on the one hand, and, on the other, in scientific alumni; groups that are highly diverse in national origin and culture, but all dedicated to the highest principles of the pursuit of knowledge.’

Travel to India, 2 December 1960 to 17 January 1961

Walter Crocker, who in 1958 had moved back from his position as Australian Ambassador to Indonesia to become, for the second time, Australian High Commissioner to India, arranged for me to go to India under the Colombo Plan. My mission was to visit virology laboratories throughout the country, meeting staff, giving lectures and attending the annual conference of the Indian Virological Society. I had a wonderful trip all around India, by car and plane. When in New Delhi I was the guest of Walter and Claire Crocker and attended several of their delightful dinners. One practice that I noticed was that as soon as the meal was finished, Walter would go to a side room with the various guests with whom he wished to have a serious talk and Claire would look after the other guests, male and female.

My first official visit was to Hyderabad, where over a period of five days I attended the annual meeting of the Indian Council for Medical Research (ICMR), gave a lecture on Genetics of Animal Viruses and talked at length with many medical scientists, including long sessions with Dr C. G. Pandit, Secretary of the ICMR. Then I went to Aurangabad, where I met up with an American couple, a Mexican and an Israeli woman and shared a taxi with them to the Ajanta Caves, 70 miles away. Next day we went to Ellora Caves. Two most enjoyable and interesting days. I then flew down to Trivandrum, in Kerala State, where after looking around the Art Gallery and some of the temples in the morning I went to the Medical College and looked specifically at the level of training of staff and quality of equipment, as matters on which the Colombo Plan might be able to help.

Throughout my travels, I was taken to see local museums, art galleries and temples, a wonderful experience for someone who had never been to India before. My official duties took me in turn to the Pasteur Institute of South India
in Coonoor, the Christian Medical College in Vellore, to Bombay, for three days, where I visited the Haffkine Institute, the Grant Medical College and the Indian Cancer Research Centre. I spent three days in Poona, then the major centre of virology in India, giving three different lectures at the Virus Research Centre, the Poona Medical College and the Armed Forces Medical College. In Calcutta I had the very interesting experience of staying with the renowned British scientist J. B. S. Haldane and the statistician P. C. Mahalanobis, as well as visiting and giving lectures at the Infectious Diseases Hospital, the Calcutta School of Tropical Medicine and the Institute of Postgraduate Medical Education and Research. By chance, Mac and Linda Burnet were just coming home from the Nobel Prize ceremonies in Stockholm and we met briefly in Calcutta. Then a week in New Delhi, where I stayed with the Crockers part of the time and lectured at the All India Institute of Medical Sciences, the Maulana Azad and the Lady Harding Medical Colleges and the Patel Chest Institute, at Delhi University. As well as talking with scientists at all of these institutions, I had long interviews with Drs Patel and B. D. Larcia, a member of the Indian University Grants Commission.

During the final week I went to the Institute for Postgraduate Medical Education and Research and Patiala Medical College in Chandigarh, the Central Research Institute in Kasauli, the Agra Medical College and Lucknow University, with side trips to the temples of Patipah Sikri and the sacred sites at Banaras. After I returned home, I wrote a formal report on the trip for the Department of External Affairs (Fenner 1961), the main headings being Medical Education and Research, Weaknesses in Medical Education and Research, Virus Research in India, Postgraduate Education of Indians in Australia and Organization of Visits by Medical Scientists.

While in India, I had arranged to spend a few days in Thailand and then go to Siemrep in Cambodia to look over Angkor Wat (20–23 January). There were very few tourists at Angkor Wat. I wandered around and sometimes used a hired motor tricycle. The whole place, especially the carvings on Angkor Wat and the delicate apsaras, were wonderful.

**Overseas Fellow, Churchill College, Cambridge, 3 November 1961 to 30 October 1962**

I was elected to The Royal Society of London in 1958, and in 1960 I was invited to give the Leeuwenhoek Lecture there. I decided to take a full year's study leave and to take Bobbie and Marilyn with me. It was the only full year's study leave that I ever took. At the time, Sir John Cockcroft, the first Master of Churchill College, was being considered as Chancellor of the ANU, a position in which he served from 1961 to 1965. Presumably because of this association, I applied for a Visiting Fellowship in Churchill College, then in its infancy. I found from the Churchill Review, Volume 37, 2000, that although a Visiting Fellow for only one year, I was nevertheless a Founding Fellow of Churchill College.
We put the car on blocks and rented our house to Joe and Sue Johnson (I ascertained that £35 a week was a ‘fair rent’). I stayed in University House from 9 September, 1961, and Bobbie and Marilyn went to Adelaide and stayed with my mother. I visited Sydney and Melbourne, saw many old friends and did practise runs of my Lecture in both places, before flying to the United States, arriving in San Francisco on 1 October, 1961. I spent about a month crossing the States, visiting Stanford and the University of California at Berkeley, Seattle for a few days, New York and Princeton, where I spent three days at a Macy Foundation Symposium, Johns Hopkins University, Chapel Hill in North Carolina, Cornell, Harvard and Yale Universities before flying to London on 31 October. Then, on 2 November, I attended a symposium at The Royal Society on Mechanisms of Viral Infection, at which I gave a short paper, and in the afternoon I was admitted as a Fellow and signed the ancient Charter Book. Next day I went to Cambridge and settled into our flat there, one of the very few permanent brick buildings in Churchill College at the time—George Steiner and his family was in the other. My first job was to buy a small car, we had decided on a blue VW Golf.

Bobbie and Marilyn flew to England in mid-November and I collected them from London airport in the new car. With advice from local women, we arranged for Marilyn to go to a small primary school close to Churchill College.

I went to the laboratories of the Department of Pathology but found them much inferior to my own labs in Canberra for work with cultured cells. I therefore decided to use most of my time investigating myxomatosis in Britain and in continental Europe. The story of this is set out in the next chapter, in the description of the production of the book *Myxomatosis* by Fenner and Ratcliffe (1965).

We enjoyed Cambridge, especially the walk from Churchill to the city in spring. We also drove all over England and Scotland. One notable trip was over the Christmas break, when, on a day when there was hardly any other car on the snow-covered road, I drove across to Birmingham, where David Catcheside was Professor of Microbiology. He was being considered for the Chair of Genetics in the John Curtin School. On behalf of the Vice-Chancellor, I discussed the idea of a Research School of Biological Sciences in the ANU with him. Subsequently, he accepted the Chair of Genetics and concurrently acted as Advisor for the Research School of Biological Sciences. In 1967 he became the first Director of this School.

I visited many laboratories all around Britain. One memorable visit was to the Laboratories of the Chester Beatty Research Institute at Pollard Woods, where Sydney graduate Jacques Miller was in the process of discovering the immunological function of the thymus gland, by delicate operations on newborn mice.
Visiting Fellow, Moscow State University, 27 February to 28 March 1964

In May 1963 Ross Hohnen, the ANU registrar, made arrangements with Pro-Rector K. I. Ivanovic of Moscow State University (MSU) for selected ANU senior staff to go to there as Visiting Fellows for a period of six weeks. He told me that the Pro-Rector had issued an invitation for me to go this year. I had already arranged to spend most of February on study leave at conferences in USA, and felt that I could not spend six weeks in Moscow, but agreed to go for a month. I spent a week in London and then flew to Moscow on February 27 and was met by Dr V. Agol, head of animal virology at MSU and Miss Galya Lipskaya, a recent graduate in biochemistry who acted as my guide and interpreter. I realized why they had invited me when I was introduced to Academician Belozersky, Professor of Plant Biochemistry, who was in charge of the development of a new Institute of Molecular Biology at MSU; a new building was almost completed in the grounds of MSU and the Department of Virology was to be part of this Institute.

All expenses were covered by MSU, which also arranged visits to museums and art galleries and evenings at the opera and ballet, in both Moscow and Leningrad. I stayed at the Budapest Hotel in Moscow and the Hotel Europe in Leningrad. Both were centrally situated, comfortable and quiet, and in both of them service in the restaurant was unbelievably slow and the food mediocre. I maintained correspondence with Agol and Lipskaya for several years. My intention of meeting them again at the International Virology Congress in Moscow in 1966 was frustrated, because I had an attack of appendicitis. However, I was able to meet Agol several times on later trips to Moscow.

There were several Research Institutes of the USSR Academy of Medical Sciences on the outskirts of Moscow. I visited several of these and usually gave a lecture in each and two in MSU. I could talk with the younger scientists directly in English, which they spoke remarkably well considering none had ever been outside the USSR. Lectures had to be spoken in paragraphs that were translated, and usually took over two hours, but I found that by speaking without a text and talking slowly and clearly, many members of the audience understood what I was saying and the task of the translator was simplified. Facilities for slide projection were often poor and some of the ‘blackboards’ and ‘chalk’ (lumps of stone) impossible.

Galya and I went up to Leningrad by train, in the same sleeping cabin (‘equality of the sexes’, she said). I remember clearly the seemingly endless birch forests. We went to the ballet the evening after we arrived: Prokoviev, Romeo and Juliet, very good. Two excellent art galleries, the Winter Palace with a great collection of classic paintings, Rembrandt, Titian, Rubens and a host of others, and next day to The Hermitage, a marvellous collection of French impressionists up to
about 1914. Ballet again that evening: *Spartacus*, music by Katchuchurian. I don't think that it is commonly on display outside Russia. The opera next evening, Rimsky-Korsakov’s *Skopsve Maiden*, about the time of Ivan the Terrible, was splendid.

Back in Moscow, I had lunch with the Australian Ambassador and his wife, Mr and Mrs Jamieson. The next day I went to the Institute of Experimental and Clinical Oncology, which has a Laboratory of Virology, with George Svet-Moldavsky in charge. After a splendid lunch with caviar and sturgeon, we had a long conversation on Burnet's character, not so much as a scientist but more generally (he was a local ‘god’). Dinner the last evening was with Academician Belozersky and a large number of guests, in a large flat in a large palace of MSU. Much vodka and wine was imbibed, but as I found after I had got back to Canberra, also a dose of *Giardia*. I had an interesting trip back, over the Himalayas from north to south, to arrive in New Delhi.

I produced a ten-page report on my visit, comprising a general overview of the arrangements, an outline of visits to scientific institutions and lectures, comments on the structure of their medical course and the virology institutes operated by the Academy of Medical Sciences, research facilities and availability of modern equipment, their problems in getting chemicals used for tissue culture, and the potential for continuing exchanges of staff, both ways.

**Prehistorians’ Pilgrimage, 15–30 January 1971**

The Pan-Pacific Science Congress was held in Canberra over the 1970–71 Christmas–New Year break. Because of my interest in environmental problems, I attended that congress. Another interested group that held their meeting at the same time was the Far-Eastern Prehistory Association. Because of my early interest in Aboriginal prehistory, I was invited to take part in an archaeological tour of south-eastern Australia. A group of some 40 prehistorians, including all those knowledgeable about Aboriginal prehistory, embarked on a bus tour that included most of the sites of interest in southeastern Australia, including northern Tasmania. On the bus trip down from Canberra to Melbourne, John Mulvaney spoke at length and explained the background, and at each site that we stopped an expert explained the special features of anthropological sites of interest. I found it a most fascinating experience, especially seeing sites in Tasmania, as well as Kow Swamp, Lake Mungo and the rock shelters at Devon Downs, on the River Murray, which I had visited as a university student.

**Papua New Guinea, 1962 to 1973**

Sir Macfarlane Burnet had a special interest in Papua New Guinea, because his son, Ian, had been a patrol officer there. In 1962, he responded to a request from the Australian Government to act as Chairman of a new committee, the Papua–New Guinea Medical Research Advisory Committee. He asked my close
friend, Bob Walsh, to be Secretary, and me to be a member of this committee. In 1966, it was replaced by Council of the Institute of Human Biology, and we all continued to serve on this until an indigenous committee took over in 1973. These meetings involved two annual trips to Papua New Guinea. Sometimes we met in Port Moresby, but usually, when the Institute was set up, in Goroka, where the Institute (later named the Papua New Guinea Institute of Medical Research) was located. Sometimes we travelled to the Highlands. One memorable visit was when Lord De Lisle, Governor-General of Australia, visited Mount Hagen. He travelled around standing in an open car, a tall figure dressed in a white uniform and with a large feather in his hat. Around the show ground danced myriads of New Guineans, short in stature, naked except for skirts, body and face brightly painted and with magnificent bird of paradise plumes on their heads.

Honours and Awards, 1954 to 1967

1954 The Australian Academy of Science was granted its Royal Charter in February 1954; Eccles was a Founding Fellow and Ennor and I were in the first group of elected Fellows.
1957 Harvey Lecturer, Harvey Society of New York.
1958 Fellow of The Royal Society of London.
Listerian Oration, South Australian Branch of the British Medical Association.
1959 Fellow of the Royal Australasian College of Physicians.
Walter Burfitt Medal, Royal Society of New South Wales.
1961 Leeuwenhoek Lecturer, The Royal Society of London.
1964 Mueller Medal, Australian and New Zealand Association for the Advancement of Science.
Honorary MD, Monash University.
1967 Matthew Flinders Medal and Lecture, Australian Academy of Science.

References


Chapter 5. Professor of Microbiology, John Curtin School of Medical Research
