

# Chapter 11. Visiting Fellow, John Curtin School of Medical Research, From 1980

## Introduction

This is the longest chapter in the autobiography, because it extends for a longer time—26 years—than I spent in any other position. In 1979, the rule in Australian universities was that staff had to retire (from paid positions) at the end of the year during which they reached the age of 65. For me, that meant 31 December, 1979, because I was born on 21 December, 1914. Fortunately, the ANU was willing to provide office space and access to all facilities except the laboratory (unless the retiree had an independent grant to cover laboratory expenses) if he/she wanted to write up work. Space was at a premium in the CRES building and, in any case, I did not want to get in the way of my successor, so I arranged to retire in the John Curtin School. This had the advantage that I would be able to use the Eccles Library for much of the work that I planned to carry out. The School was very generous, providing me with professorial offices that happened to be unoccupied at the time, and I am still here, in such an office, in 2006. Further, University Fellowships for retirees, granting \$10,000 annually for three years, had just been introduced and I was awarded one of these.

Clearly, the work of the Smallpox Eradication Unit and its need of support from personnel outside WHO did not stop with the declaration of eradication at the World Health Assembly in May 1980. Over the next few years, a number of committees were set up and I served on most of these. As mentioned on the last page of the previous chapter, one of the recommendations of the Global Commission for the Certification of Smallpox Eradication was that an appropriate book should be produced describing the campaign. Fulfilling this requirement kept me fairly busy for the first eight years of my retirement; *Smallpox and its Eradication* was published in 1988. It was followed by two specialist books dealing with topics which could not be adequately covered in that book, namely a book on the orthopoxviruses generally and one on monkeypox virus in particular.

Another book I worked on during the 1980s was a companion book to *Medical Virology* for veterinary students; with the help of veterinary co-authors the first edition of *Veterinary Virology* was published in 1987 and a second edition in 1993. David White and I also published a fourth edition of *Medical Virology* in 1994.

In 1987, David White persuaded me to produce, with contributions from 320 other microbiologists, a *History of Microbiology in Australia*; it was published,

a book of 610 pages, in 1990. This whetted my appetite for the history of science and I edited two books on the history of the Australian Academy of Science, published in 1994 and 2005, with Bernardino Fantini as co-author, *The History of Myxomatosis*, in 1999, and with David Curtis, *The John Curtin School of Medical Research, the First Fifty Years*, published in 2001.

I have been involved in many other activities during the last 26 years, some arising from the threat of smallpox as a bioterrorism weapon, contributing chapters in books on virology, lectures and addresses to conferences, many trips overseas, often at a more leisurely pace than before 1980, and of course my home life and overseas trips with my wife Bobbie and the experience of her death, in 1995. Also, in 1984, Bobbie and I decided that we could spare money for donations of various kinds, and initiated these by establishing annual conferences on medical research in the John Curtin School and on environmental problems in the Academy of Science.

## **The Committee on Orthopoxvirus Infections**

Concurrently with the declaration of the global eradication of smallpox in May 1980, the Global Commission was dissolved and, in 1981, a new six-member committee—the Committee on Orthopoxvirus Infections—was established by the Director-General of WHO. Its membership was drawn from the Global Commission, and I was appointed chairman of the Committee. Except in 1985, this Committee met annually in Geneva from 1981 to 1986, critically reviewed the progress made in the post-smallpox-eradication program, and advised WHO on the implementation of the Global Committee's recommendations. The Committee was serviced by a reduced Smallpox Eradication Unit, with Arita as Chief, two and later one other medical officer, an operations officer and support staff, all of whom had had extensive experience in the eradication program.

### **First Meeting, 3–5 March 1982**

The meeting reviewed the implementation of WHO's post-smallpox eradication policy under seven groups of topics: vaccination policy, reserve stocks of vaccine, investigation of suspected cases of smallpox, laboratories retaining variola virus, human monkeypox, laboratory investigations of orthopoxviruses, and archives and publications. The results of the meeting were published (Arita and Gromyko, 1982), some of the more important of which are outlined below. Although vaccination had been discontinued in 149 of the 158 Member States, it was still being used for military personnel in some countries. The Committee advised that this practice should be discontinued. Since eradication, there had been 63 rumours of new smallpox cases in 1979, 31 rumours in 1980, and 30 in 1981. All were carefully investigated; none had been smallpox. The Committee endorsed a plan for continued monkeypox surveillance in four countries in West and Central Africa, and it noted with satisfaction that the records of the eradication

program had been established in archival mode and that there was a comprehensive inventory and guide indicating what was in each of the files. It also endorsed the establishment of a five-person editorial group to prepare for the proposed book on the eradication program (see below).

### Second Meeting, 15–17 March 1983

The Committee highly commended WHO for diligently implementing the recommendations of the 33rd World Health Assembly regarding activities to be undertaken in the post-smallpox eradication era. Matters for note were: (1) that WHO had established two refrigerated depots for vaccine storage, in Geneva and New Delhi, with a reserve sufficient for vaccinating 200 million persons; (2) that there were now only three laboratories retaining stocks of variola virus and that it was possible that the stocks held in South Africa would be destroyed before the next meeting; (3) that continuance of surveillance of monkeypox should be continued in Zaire beyond 1985; and (4) that DNA fragments from three strains of variola virus had been cloned into recombinant plasmids and that these materials were available through WHO for more detailed analysis of the variola virus genome, which could be safely conducted outside maximum containment laboratories.

### Third Meeting, 28–30 March 1984

The Committee again commended WHO for effectively implementing the recommendations of the 33rd World Health Assembly regarding post-smallpox activities. It noted that 160 of the 162 Member States had now discontinued routine vaccination. However, because problems had arisen with storage facilities in New Delhi, the stocks of vaccine stored there had been transferred to Lausanne. I had visited South Africa in September 1983, in the hope of persuading the authorities there to destroy their stocks of variola virus while I was there. The scientists were willing, but the Minister for Health would not bow to outside pressure. However, they did destroy their stocks in the presence of Keith Dumbell, a member of the Committee, in December 1983. The only remaining stocks of variola virus were those in the WHO Collaborating Centres in Moscow and the Center for Disease Control, Atlanta, Georgia. A WHO team had visited the high containment laboratories in each of these centres and found that they fulfilled WHO requirements for such laboratories. Surveillance for human monkeypox in Zaire had been greatly intensified and more cases had been discovered. The Committee recommended that surveillance there should be intensified and continued until 1989. A summary of the current situation was published by the Committee in 1984 (WHO, 1984). In addition, it saw the investigation of smallpox rumours and the maintenance of smallpox vaccine reserves as major activities that would need to be continued beyond 1985.

## Fourth Meeting, 24–26 March 1986

This was an important meeting, because the Committee had been established with the intention of operating for no more than five years after its establishment in 1981. The principal problem it tackled was whether all stocks of variola virus should be destroyed. In preparation for this, Keith Dumbell, on behalf of the Committee, had consulted some 60 virologists in 21 countries, only five of whom thought that stocks should be maintained indefinitely. Based on this, the availability from WHO of plasmids contained cloned fragments of the variola genome, and their own analysis, the Committee concluded that there was now no need to retain stocks of variola virus. A new discovery from the monkeypox surveillance project in Zaire was that squirrels were an important animal reservoir of monkeypox virus (WHO, 1986).

Surveying the situation in 1986, the Committee considered that there was no further need for its existence, but suggested that WHO might need to set up *ad hoc* committees at various times to consider specific problems that might arise. Such occasions arose in 1990 and 1994.

## Ad Hoc Committee on Orthopoxvirus Infections

### First Meeting, 11–13 December 1990

A somewhat enlarged group, of which I was elected Chairman, met in December 1990 for the express purpose of deciding whether all existing stocks of variola virus (thought to be those in the WHO Collaborating Centres in Moscow and Atlanta) should be destroyed. The *ad hoc* committee recommended that all stocks of variola virus and materials containing variola virus should be destroyed by 31 December, 1993. It endorsed proposals from the two collaborating centres that they should determine the nucleotide sequences of two strains of both variola major and variola minor before that was done. It also suggested that an expert technical committee should be established to oversee these sequencing efforts.

### Second Meeting, 9 September 1994

The same group that had met in December 1990 met again in 1994. The publication of the previous meeting, which had recommended that all stocks of variola virus should be destroyed by December 1993, had engendered a debate between those supporting and those opposing this proposal, and an open international scientific forum was organized by the Ninth International Congress of Virology in Glasgow in August 1993. The unanimous recommendation of the Committee was that the last remaining stocks of variola virus should be destroyed by 30 June, 1995, i.e., just after the meeting of the World Health Assembly in May 1995. A press release outlining the reasons for this recommendation was

given wide publicity and there were articles about it in many newspapers, all around the world.

## **Destruction of Variola Virus, the Final Outcome**

The WHO Executive Board, meeting in January 1995 in preparation for the World Health Assembly meeting in May, withdrew the item about variola virus stocks from the agenda. After consulting all members of the *ad hoc* committee that made the recommendation in 1994, I sent a letter to the Director-General of WHO and members of the Executive Board in March 1996 that was signed by seven of the 10 members of that Committee, suggesting that 'since 1996 is "the Year of the Vaccine" and 14 May, 1996, the bicentenary of Jenner's first vaccination against smallpox, destruction of all virus stocks in June 1996 would send a message of reassurance to all nations that smallpox will never occur again and that possession of smallpox virus would be a crime against humankind.'

In the event, the item was placed on the agenda of the World Health Assembly, which agreed but deferred the date to 1999. In 1999, the Assembly again agreed with the proposal but deferred the date to June 2002. In addition, it established a WHO Advisory Committee on Variola Virus Research, with a large membership, most of whom were poxvirus experts, to oversee the proposed research.

## **First Meeting of the WHO Advisory Committee on Variola Virus Research, 6–9 December 1999**

This Committee consisted of 16 members, most of them virologists, 10 expert advisers, 5 observers and the secretariat. I was a member; Dr André Plantinga, from the Netherlands, took the chair. The discussion focussed on experimentation with variola virus, which was to be carried out in approved high security laboratories. It was decided that the main topics to be investigated were: more DNA sequences, monoclonal antibodies for variola virus diagnostic tests, antiviral drugs, novel smallpox vaccines, and the need for a non-human primate model to evaluate antiviral drugs and novel vaccines. Since I had suffered from pulmonary embolism on the previous trip back from Europe in October 1998, and I felt even worse for three weeks after this trip, in spite of taking all the recommended precautions, I decided that it would be the last long overseas trip that I take.

## **The Book: *Smallpox and its Eradication***

### **Archiving WHO Records**

The book on smallpox eradication could not be written unless there was an adequate archive of all records in WHO Headquarters in Geneva, so, in February 1980, Isao Arita initiated discussions to establish this. With advice from Miss Julia Sheppard, Archivist at the Wellcome Institute for the History of Medicine,

and discussions with WHO administrators, Henderson and myself, Mr R. E. Manning was appointed Archives Consultant, Smallpox Eradication Unit, in November 1980 to carry out this task. He began work in December 1980, and submitted progress reports to the Meeting on Implementation of the Post-Smallpox Eradication Policy Committee, in February 1981, and to the Committee on Orthopoxvirus Infections, in March 1982. At the latter meeting it was noted that the records of the smallpox eradication program had been established in an archival mode and that there was a comprehensive inventory and guide indicating what was in each of the files.

## Early Plans

As early as March 1978, I wrote to Arita, then Chief of the Smallpox Eradication Unit, explaining that in January 1980 I would have retired from my university job and would like to make the production of the smallpox book my principal post-retirement activity. At the time I thought that I could produce a book with 12 chapters in about three years, and at his suggestion I set out a budget covering the salary for a typist (this was before the days of personal computers) and funds for travelling to Geneva and to Baltimore (to see Henderson). By December 1978 this had evolved into a plan whereby I was the author and Henderson and Arita were designated 'general editors'.

Two years later this concept had developed into a book of 800 to 1000 pages, with 14 chapters and Fenner, Arita and Henderson as the authors. Dr I. D. Ladnyi, then Assistant Director-General of WHO and responsible for its work on communicable diseases, was then included in all further discussions. Subsequently Henderson, Arita and I agreed that Ladnyi should be asked to be an author, as the most appropriate person to symbolize the important contributions of the Soviet Union to the program. We did not expect him to be involved in the writing. By October 1980, after discussions with Henderson during a visit to Baltimore, the plan had expanded to a book of about 1,400 pages, in one volume, arranged in 16 chapters, for each of which a designated author (Fenner, Henderson or Arita) would take primary responsibility. While these discussions were going on I produced two draft chapters, on Virology, and Pathogenesis and Epidemiology.

## Final Approval

On 31 March, 1981, the Director-General officially approved the proposal that Arita, as Chief of the Smallpox Eradication Unit, should undertake the preparation of a comprehensive book on smallpox and its eradication under the authorship of Drs Arita, Fenner, Henderson and Ladnyi, with these four authors and a publications officer serving as the WHO Editorial Board. The Head of WHO Publications, Dominic Loveday, undertook to do this work. It was also agreed that Dr Zdeno Jezek, a medical officer with the Smallpox Eradication Unit, and

two secretaries in Geneva, would work full time on the project, and a comprehensive budget for three years was approved.

## Reports of the Editorial Board

Although the Director-General's approval was dated March 1983, an Editorial Board, comprising Arita, Fenner, Henderson, Ladnyi and Loveday, with Ladnyi as Chairman, had already held meetings in March and September 1982, and subsequently met on 14 March and 11 October, 1983, 30 March and 13 December, 1984, and 26 March and 7 November, 1986. At the early meetings discussion was focussed on the structure and length of the book and the authorship of the various chapters. Subsequently it reviewed progress and looked at such matters as consultation with WHO Regional offices, publishers, estimated cost, formal distribution and promotion of the publication.

There were a few additional matters that warrant mention here. At the fifth meeting, in October 1983, the Board recommended to the Director-General that Jezek should be designated as an additional author, in view of his great assistance in assembling the materials and preparing the first drafts of several chapters. At an early meeting I was able to inform the Board that I had arranged for an excellent draughtsman in the Geography Department of the ANU to prepare all of the maps and diagrams. After a good deal of informal discussion it was decided that WHO should be the publisher, and in March 1982 Keith Wynn, who was in charge of printing at WHO, produced three full-sized mock-up books, on different types of paper and containing part of the text of the clinical chapter, which I had prepared, in 15 different fonts, from which the Board selected one. Arrangements were also made for each of the authors, and selected specialists in the fields covered in various chapters, to read and comment on draft copies of each chapter. Loveday informed the meeting, in March 1984, that Mrs Sheila Deck had been appointed editor. When he retired in 1986, Loveday took over from her. In 1984, John Wickett, an administrative officer during the eradication program, was taken on to supervise the acquisition and preparation of illustrations (other than maps and drawings). Also, in March 1984, I took responsibility for preparing name and subject indexes.

## Personal Experiences in the Production

I had travelled a lot overseas during the eradication campaign, often combining smallpox work with other activities, but now I travelled even more frequently, especially to Geneva (13 trips) but also to Baltimore, to see Henderson (five trips) and elsewhere. I also corresponded very frequently with Henderson and Arita, and, as the book progressed, with Loveday (who was an excellent editor and became a very good friend), and I have in my archives copies of letters to 24 other scientists with whom I exchanged letters about the book.

As early as July 1978, Arita had agreed that WHO should make a grant to the John Curtin School of enough money to cover the salary and related expenses of a secretary/typist, an allowance for overseas travel and sundry expenses. The arrangements were finalized in 1980, with a grant of \$US22,500 (then worth \$A19,800) annually, for two years. Since typists in Australia were paid much less than they were in Geneva, I saved over \$A8,000 in 1980 and used this plus savings in 1981 to purchase a Wang Computer (as used in WHO Headquarters) for \$A13,219. WHO continued to send me enough money to pay the cartographer, maintenance on the Wang computer and my travel expenses to Geneva until 1986. From 1982 WHO unexpectedly granted me an honorarium of \$US15,000, rising to \$25,000 in 1983 and 1984 and \$US20,000 for 1985, and finally, in 1987 a payment of \$US6,000 for preparing the index.

I wrote the first six chapters, which provided background information, as soon as I moved into the John Curtin School in January 1980, starting with the first chapter on the clinical features of smallpox. I had finished the first draft of this chapter in March 1981, sent it to Arita and Henderson for comment, and then to Jezek (who was not then a co-author), A. R. Rao and J. K. Sarkar (India), A. W. Downie and A. B. Christie (England) and G. Meiklelohn and C. H. Kempe (USA) for comment. In October-November 1981, I visited all these people. In my Basser Library Archives, their comments are filed or stapled into the bound draft chapter. The most detailed comments were from A. R. Rao, the author of an excellent book on smallpox in India (Rao, 1972), with whom I spent three days in Madras, going over the draft page by page.

I did not need so much assistance with other chapters, but with every draft I enlisted the help of colleagues and usually made a point of visiting them and discussing the work after they had sent me their comments.

Besides getting critical help from scientists on draft chapters, from mid-1983 I sought help from Loveday on a variety of topics, initially on some technicalities of indexing and from 1986 on matters like permission letters for illustrations, the preface and acknowledgements, reference lists and the like. Fortunately, with the advent of facsimile machines in the mid-1980s, international communication became much quicker and it was possible to exchange drafts with hand-written comments overnight.

## **The Problem of the 'Whitepox' Viruses**

The usual method of isolation of variola and other poxviruses throughout the campaign was inoculation on the chorioallantoic membrane of developing chick embryos. Variola virus produced small white pocks, standard strains of vaccinia virus produced large white pocks but some strains ('rabbitpox' and 'neurovaccinia' viruses) produced pocks with a haemorrhagic, ulcerated centre, and monkeypox virus produced small pocks with an ulcerated centre. In 1958, I had shown that

a large number of white pocks, each different in size, could be isolated from rabbitpox virus and that pairs of these would recombine to yield wild-type rabbitpox virus when inoculated into single HeLa cells (Fenner, 1959).

One problem that had worried us during the eradication program, but was not finally solved until after the declaration of eradication, was the isolation of what were called 'whitepox' or 'wild whitepox' viruses from several species of African wild animals, and later from stocks of monkeypox virus. Three sets of isolations of 'whitepox' viruses have been made. In 1964–65, four orthopoxvirus isolations were made from cynomolgus kidney cells, at the time being used for virus isolation in the National Institute of Public Health in Bilthoven (Gipsen and Kapsenburg, 1966); one was eventually recognized to be monkeypox virus, one was vaccinia, and two others were indistinguishable from variola virus (Gipsen and Brand-Saathof, 1972). On two occasions in 1964, material from smallpox patients from Vellore, in India, had been handled on the same bench in the same laboratory, and skilful detective work by Kapsenburg identified the passage transfer of cell cultures during which contamination could have occurred.

The second set comprised four strains of virus, isolated by workers at the Moscow Research Institute for Viral Preparations in Moscow, one of the two WHO Collaborating Centres for Viral Diagnosis, from the tissues of a chimpanzee, a monkey, a squirrel and a multimammate rat shot in Zaire between 1971 and 1975 (Marennikova et al., 1972). The third set were viruses that produced white pocks which had been recovered from stocks of monkeypox virus that had been maintained for several years in the Moscow laboratories (Marennikova et al., 1979); all these isolates were identical and indistinguishable from those of the second set.

Seeking an explanation, Marennikova postulated that the third set were white variants of monkeypox virus, a virus which had a wide host range and was known to occur in Zaire. However, investigations by Keith Dumbell in London showed that all the 'whitepox' viruses isolated in the Moscow laboratories resembled Indian and not African strains of variola virus, and studies by Jim Nakano at CDC, Atlanta, confirmed these results. In relation to the third set, other studies showed that monkeypox virus, like other orthopoxviruses that produced pocks with a haemorrhagic centre, did produce white pock mutants, but, as with rabbitpox, these differed from one another and resembled monkeypox and not variola virus in most biological tests.

Clearly, it was important to clarify the situation, so one of Marennikova's staff was despatched to the Atlanta laboratory to see if she could reproduce her results there. She was unable to do this using material supplied by the Atlanta laboratory, so she was given permission to use one of the 'monkeypox' strains that she had brought from Moscow, and with this she was able to reproduce her earlier results (Esposito et al., 1985). These investigations demonstrated that all

the 'whitepox' viruses, whether isolated from animals from Zaire or recovered from monkeypox virus strains from the Moscow laboratories, were laboratory contaminants, a conclusion with which Marennikova finally agreed.

## Book Launch

Eventually, on 18 January, 1988, came the launching ceremony, held as part of the 81st session of the Executive Board of WHO. There were four speakers: an introduction by Dr A. Grech, Chairman of the Executive Board; an introduction to the book by myself, as senior author; then a speech by Dr Mahler, Director-General of WHO; and closing remarks by Dr Grech. This ceremony was followed by a press conference, at which the speakers at the launch and the other authors were available to answer questions. Unfortunately, Dr Ladnyi, one of the authors, had died in 1987 as the result of a car accident.

The launch was followed that evening by a dinner arranged by the staff of the former Smallpox Eradication Unit, the demise of which, on 1 January, had been announced by the Director-General that afternoon. They had chosen one of the very pleasant restaurants that abound in the villages around Geneva. It was a Monday evening and there were few others than our group in the restaurant. I remember noticing a pile of cardboard boxes in one corner of the restaurant, near our table, but I thought nothing of it. Then, as the very pleasant and relaxed dinner drew to a close, Keith Wynn, who was in charge of production of WHO publications, started to open the boxes and pass around special leather-bound copies of the 'big red book'. Everyone at the dinner who had been involved with its production signed every copy and all received a copy. Years later, in 1997, I donated my copy to the Rare Books Collection in the ANU Library.

## Two Other Books Related to the Smallpox Program

There were always times in the 1980s when I could not work on *Smallpox and its Eradication*, and during these periods I produced two other books that expanded on various topics mentioned in that book. The chapter, entitled 'Variola virus and other orthopoxviruses', had been designed to provide background information for public health workers, and I thought that it was timely to expand that chapter into a book for virologists. The result was another book, *The Orthopoxviruses*, with Keith Dumbell and Riccardo Wittek as co-authors and published by Academic Press in 1989. Zdeno Jezek, one of the co-authors of *Smallpox and its Eradication*, had been involved in the survey of the human monkeypox set up in Zaire, with assistance from WHO, between 1980 and 1986. He and I collaborated in producing a short review of the results of this survey in another book, entitled *Human Monkeypox* and published in 1988. Wittek lived in Lausanne, so I was able to consult him and Jezek whenever I went to Geneva.

## The Orthopoxviruses

Since the chapter on virology was one of the first I wrote for *Smallpox and its Eradication*, by 1982 I had enlisted the help of two co-authors, Samuel Dales and Keith Dumbell, for this book, and, in 1981, I arranged for the book, with those authors, to be published by Academic Press, publishers of my virology textbooks. The proposed publication date was October 1983. We decided that we needed another poxvirus expert who was a molecular biologist and, in 1984, I persuaded Ricardo Wittek to be a co-author. Then, in 1986, Dales had to pull out, and the Memorandum of Agreement had to be altered accordingly. However, by late 1987 it went to press and was published in 1988 (Fenner et al., 1988). It received excellent reviews, including one from a poxvirus expert, who concludes with these remarks: 'This book is highly recommended...and is worth every cent of its price. The chapters are extremely well written, and the content is superb throughout. Collectively, this work presents the best up-to-date summary of the features of these viruses anyone, novice or specialist, is likely to need for a long time to come.'

## Human Monkeypox

Human monkeypox had been a problem in the smallpox eradication campaign ever since its discovery in 1970. From 1980 to 1986, WHO supervised institution-based surveillance of monkeypox in selected areas representing about 15 per cent of the land area of Zaire and containing about 5 million inhabitants. In 1984–86, WHO arranged for Dr Lev Khodakevich to supervise surveys in this area to determine the most important animal hosts, which turned out to be several species of squirrels.

Over a period from early 1985 to mid-1986 I corresponded with Zdeno Jezek, who had succeeded Arita as Chief of the Smallpox Eradication Unit, editing his articles on this program. In early 1987, we decided to publish a short book based on the work of the WHO program and I wrote to Joe Melnick, a friend of mine who was the editor of *Monographs in Virology*, published by S. Karger AG, suggesting that we should publish a monograph on human monkeypox in that series, with Jezek as senior author. He agreed, and Zdeno and I worked together from 30 July, 1987, until it was published in October 1988 (Jezek and Fenner, 1988). It is recognized as the definitive text on human monkeypox.

## Award of the Japan Prize to Henderson, Arita and Fenner

In 1985, Macfarlane Burnet nominated D. A. Henderson, I. Arita and me for the Nobel Prize in Physiology or Medicine; the nominations were repeated in 1986 and 1987, from both Australia and the United States. In 1988, the World Health Organization was nominated for the Nobel Peace Prize for the eradication of smallpox, which unlike the other Nobel Prizes had been awarded to organizations (UNICEF, UNHCR) as well as to individuals. This nomination was submitted

from Australia, the United States and Sweden, but like the earlier nominations, it was unsuccessful.

The Japan Prize, initiated in 1985 by the Science and Technology Foundation of Japan, with one award in the physical and one in the biological sciences each year, but each year in different designated topics, was regarded as the equivalent, for applied science, of the Nobel Prize for creative science. In 1988, the designated topic in the biological sciences was 'preventative medicine'. We were nominated, and for the first and only time so far, it was awarded for two subjects: to Henderson, Arita and me, for the eradication of smallpox; and to Drs L. Montagnier and R. C. Gallo, for the discovery of and diagnostic methods for the AIDS-causing virus. We and our wives all went to Japan for the presentation ceremony, which was held in Japan Prize week, 4–10 April, 1988. Details of this are set out later in this chapter.

### **The Threat of Smallpox Virus as a Bioterrorism Weapon**

In an earlier section of this chapter, I have referred to the prolonged discussions about the destruction of stocks of variola virus. With hindsight, these discussions were irrelevant, as became apparent when Ken Alibek (1999) announced to the world that, in spite of its signature of the Chemical and Biological Warfare Convention in 1975, the Soviet Union had taken that virus into its massive biowarfare program in 1980. When this program was dismantled by President Yeltsin in the early 1990s, it was realized that some of the unemployed scientists would be very likely to offer their services, and supplies of freeze-dried viruses and bacteria, to other countries or organizations.

By 1994, it became known outside the Soviet Union that the Russians had moved their variola virus samples from Moscow to Koltsevo, in Siberia, where one of their major biowarfare installations was located. After the events of 11 September, 2001, the industrialized nations became concerned with the risk of smallpox as a bioterrorism weapon. Especially in the United States, but also in the United Kingdom and Australia, access to vaccine stocks was arranged and plans for responding to various levels of risk developed, ranging from a single case of smallpox anywhere in the world to outbreaks in the country concerned. In Australia, the responsibility for making these plans lay with Professor Richard Smallwood, who was then Chief Medical Officer of the Commonwealth and a close personal friend of mine. I was a member of a team he assembled, with representatives of all the states and territories, to produce such a plan; this was published in January 2004 (Australian Government Department of Health and Ageing, 2004) and made widely available from Commonwealth, State and Territory health departments. Over the past few years, from 1999 onwards, I have given a number of lectures on this topic to a wide variety of audiences, and helped with several newspaper articles on smallpox as a bioterrorism threat.

## More Books

### Portraits of Viruses. A History of Virology

The journal *Intervirology* was established in 1973 as the official journal of the Virology Section of the International Association of Microbiological Societies, and continued in that role until 1990. The publisher was S. Karger, of Basel, the Editor-in-Chief was J. L. Melnick, and there were several Section Editors, among whom A. J. Gibbs was Section Editor for Plant Virology for many years, and I was Section Editor for Taxonomy from 1973 to 1977. Gibbs had joined the Department of Microbiology in JCSMR as a Research Fellow in 1966 and was promoted to Senior Research Fellow in 1967. He returned to England in 1969, but came out to Canberra again a few years later, to a senior post in the Research School of Biological Sciences in ANU. We were always good friends and in 1978 we suggested to Melnick that we would like to produce a book on the history of virology by asking selected experts to contribute articles to *Intervirology* on the history of viruses or virus groups in which they were recognized experts. We undertook to select and persuade the authors of these articles, and also to act as editors of the book in which these essays would be collated. Between 1979 and 1986, 15 such articles were published in *Intervirology*, and in 1988 assembled in Fenner and Gibbs (eds) *Portraits of Viruses: A History of Virology*. Nine of the chapters dealt with animal viruses, four with plant viruses and two with bacterial viruses. Each chapter also provided interesting portraits of the authors, each a leader in his field.

### White and Fenner, *Medical Virology*, Third Edition

The second edition of *Medical Virology* had been published in 1976 and was very popular as a university textbook. I started writing to Academic Press about a third edition in 1980, saying that David White and I thought that we might be able to get this to them by 1983. However, completing *Smallpox and its Eradication* was more demanding on my time than I had anticipated, and the third edition was not published until 1986. During that 10 years, virology had made great advances, and the book, in the same format as the second edition, was enlarged from 487 to 665 pages. Since I was much older than David, and at the age of 70 getting out of touch with molecular virology, I suggested that David should be first author, and he agreed. As with previous editions, the reviews were complimentary; different reviewers commented: 'Like its predecessor, this edition is beautifully illustrated...The single most appealing feature of this book is its extreme readability', and, 'The authors succeeded in presenting a fast growing branch of biology and medicine in a complete, condensed and at the same time comprehensive way.' Subsequently, Spanish, Japanese and Chinese editions were published and we received numerous requests for permission to use illustrations and/or tables in other books.

## White and Fenner, *Medical Virology*, Fourth Edition

We signed the Memorandum of Agreement for the fourth edition in November 1990, but this time it was David who was overcommitted and the manuscript was not completed until 1993. After discussion with Academic Press, we used a different format, with pages that included text within a rectangle measuring 20.5 x 12 cm, compared with the 17.5 x 12 cm used for earlier editions. As a result, the additional information we had to cover (including a much longer section on Retroviruses) was included within 601 pages. Once again, it received excellent reviews. David had to retire from his university post in 1994, for medical reasons, and I had my 80th birthday that year, so neither of us could help with a fifth edition. Academic Press is very anxious to publish one, but so far they haven't been able to find suitable authors. The need is clear, since 253 copies of the 10-year-old fourth edition were sold in 2004; total sales of this edition, from 1994, were 13,279.

## Fenner et al., *Veterinary Virology*

In January 1978, having found that several veterinary schools used *Medical Virology* as a textbook, I wrote to Dr J. Barsky, Vice-President of Academic Press, suggesting the possibility of producing a companion volume, *Veterinary Virology*. Academic Press made enquiries from veterinary schools in the United States, which convinced them that there was a market for such a book. Between 1979 and 1983 I wrote to a number of veterinary virologists and eventually asked Paul Gibbs, of the University of Florida at Gainesville, Fred Murphy at the Centers for Disease Control in Atlanta and Michael Studdert of the University of Melbourne, to join David White and me as co-authors. The plan we adopted was to use the scheme that had been so successful with *Medical Virology*, namely Part I, with 16 chapters on the Principles of Animal Virology, using examples from diseases of veterinary importance rather than human diseases, and Part II, with 19 chapters on viruses of domestic animals grouped taxonomically. An agreement with four of the authors was signed in June 1983, and with advice from Fred Murphy I persuaded Peter Bachman, of the Ludwig-Maximilians-Universität in Munich, to join us. Fortunately, I was able to visit Munich and see Peter in April 1984, during one of my many trips to Geneva. We allocated each chapter in Part II to one of these authors. When drafted, this was examined by all authors and, finally, it would go through my word processor, so that we maintained a unity of style. Royalties were shared equally between the six authors.

There was, of course, much more correspondence about this book than with *Medical Virology*, by letter and fax (email had not been invented). It was finally published in 1987, and was dedicated to Peter Bachman, who had died, unexpectedly, on 26 May, 1985. It received uniformly excellent reviews in veterinary journals, the only problem most of them mentioned was its high price.

In 1989, arrangements were made for it to be translated into Spanish; the Spanish translation was published in 1992.

### Fenner et al., *Veterinary Virology*, Second Edition

By 1989, Academic Press decided that a second edition of *Veterinary Virology* should be published and a Memorandum of Agreement was signed in October 1990. With the agreement of all authors, Bachman's place was taken by Rudolf Rott, of the Institute of Virology in Giessen, Germany. The second edition was published in 1993, and although it covered the many advances in molecular virology made since 1987, both books were almost the same length.

### Murphy et al., *Veterinary Virology*, Third Edition

David White and I ceased to be involved with the textbooks in 1994, but Fred Murphy, Paul Gibbs and Mike Studdert, authors of previous editions, and Marian Horzinek, of Utrecht University, produced a third edition in 1999, in the same improved format as that used for the fourth edition of *Medical Virology*. They dedicated it to David and me. The dedication, beneath portraits of each of us, reads:

This book is dedicated to our dear friends, Frank J. Fenner and David O. White, the founders of a series of books that now includes three editions of this book and four editions of *Medical Virology*. They set a standard of scholarship that is impossible to match and a *joie de vivre* that made the writing and editing almost fun. They taught us that the subject of virology must be seen within the context of society as a whole as well as within the context of science. They envisioned virology as being so broad as to extend from its roots as a microbiological science, a molecular and cell biological science, an infectious disease science, to become a major contributor to the overall advance of human and animal wellbeing. All this as a single seamless cloth. We hope our students will come to understand the 'big picture' of veterinary and medical virology as well as Frank and David have throughout their amazing careers.

### History of Microbiology in Australia

I had been a member of the Australian Society for Microbiology (ASM) since its foundation in 1960, President in 1964–65, and Honorary Life Member since 1975. In the November 1986 edition of its journal, *Australian Microbiologist*, Carolyn Beaton, the assistant editor, suggested that Australia's Bicentennial year, 1988, should be marked by a special issue chronicling 200 years of microbiology in Australia. Tragically, Carolyn died in April 1987. David White, then President of the Society, persuaded me to act as editor of a book on the topic and he acted as Chairman of an Editorial Advisory Panel to assist in the task. The result was a book of 610 pages, with 11 chapters:

1. The early days of microbiology in Australia
2. Teaching institutions
3. Research Institutes and CSIRO
4. Diagnostic laboratories and the Commonwealth Serum Laboratories
5. Australian contributions to bacteriology
6. Australian contributions to virology
7. Australian contributions to mycology
8. Australian contributions to protozoology
9. Industrial microbiology
10. National activities concerned with microbiology
11. International activities concerned with microbiology

To cover this broad field, I enlisted the help of 'Coordinators' for various sections of each chapter and, in addition, some 320 microbiologists selected by the appropriate coordinator supplied information which I organized and collated. Since some of them provided more material than could be accommodated within the book, I deposited any additional material in my file (MS 143) in the Basser Library Archives, along with glossy prints and if possible negatives of the 250 photographs of distinguished microbiologists. One device I had not used before but found useful here and in subsequent books on the history of science was to place a 'potted biography' beneath or alongside each portrait.

The book was produced by a friend of mine, Robert Kirk, who had taken on desktop publishing when he retired as Head of the Department of Human Biology in the John Curtin School of Medical Research. Glaxo Australia shared the cost of production with the Society, with a grant of \$20,000. The ASM purchased 5,000 copies at a cost of \$58,160, i.e., about \$12 a copy, which has allowed it to provide every member with a copy; every new member receives one on election. To help pay for the printing, copies were sold for \$75 (prepublication \$50) to most of the institutions mentioned in the book.

## The Australian Academy of Science: the First Forty Years

In 1993, I suggested to Peter Vallee, the Executive Secretary of the Australian Academy of Science, that I should update the extensive Appendices of *The Australian Academy of Science: The First Twenty-Five Years*, in preparation of publication of a history celebrating the Academy's jubilee in 2004. However, noting that *The First Twenty-five Years* was then out of print, he suggested that I should update and revise the whole book. The co-editor of *The First Twenty-five Years*, Lloyd Rees, had died in August 1989, and I agreed to do this. With the guidance of a small Advisory Committee (Fellows R. W. Crompton, L. T. Evans, N. H. Fletcher and the Editor of *Historical Records of Australian Science*, R. W. Home), the book was published in 1995. In the same format as the previous book, it grew from 286 to 503 pages.

## The Australian Academy of Science: the First Fifty Years

Having finished the history of the first 50 years of the John Curtin School in November 2001 (see below), I started updating *The Australian Academy of Science: the First Forty Years* in 2002, with the intention in getting it published early in 2005. The task was quite different from the earlier versions, because all records were by then electronic. Once again, it was a matter of getting help from the secretariat and Fellows of the Academy. I decided to adopt a different format, using the fourth edition of *Medical Virology* as a model, both in relation to page size and details of page headings, etc. With special help from the Publications Manager, Maureen Swanage, and the Librarian, Rosanne Walker, the book was published in February 2005.

## Biological Control of Vertebrate Pests: the History of Myxomatosis—an Experiment in Evolution

Late in 1991, I was invited to give a paper on the history of smallpox at a conference, 'Emerging Infectious Diseases: Historical Perspectives', held at Merieux Conference Centre at Annecy, in France, in April 1992. At lunch one day, I sat next to the symposium organizer, Professor Bernardino Fantini, Director of the Louis Jeantet Institute for the History of Medicine at the University of Geneva. I accompanied him on the trip back to Geneva by taxi and he suggested that we should collaborate on a series of papers on the history of myxomatosis. During our correspondence between June 1992 and October 1993, the idea of a series of papers evolved into the concept of a book on the biological control of vertebrate pests (of which the only two successful agents were myxoma virus and rabbit haemorrhagic disease virus). By January 1994 we had developed a plan for the book and I promised to start writing as soon as I had finished work on the fourth edition of *Medical Virology*. My frequent trips to WHO in Geneva made it easy to discuss problems face to face, and we also corresponded a lot by email. By January 1996, *The History of Myxomatosis* had evolved into a more general book: *Biological Control of Vertebrate Pests: the History of Myxomatosis—an Experiment in Evolution*. I did most of the writing, but I wouldn't have started the book, nor worked out the best structure for it, without Fantini's help. We arranged for publication by CABI International, Wallingford, in February 1998 and the book appeared in July 1999. It is a book of 339 pages, arranged in 14 chapters, with numerous diagrams and many photographs, especially of persons involved in relevant research. I regard it as one of my best books.

## The John Curtin School of Medical Research: the First Fifty Years, 1948–98

In January 1997, I had a letter from the publishers, Allen and Unwin, who in 1996 had published *The Making of the Australian National University: 1946 to*

1996, saying that they would like me to consider writing a history of the JCSMR. At the time, I said that I was too busy with other books and the preparation of my archives for the Basser Library. However, by mid-1998 I had changed my mind and started to plan a book to be produced by me and David Curtis as co-authors. I chose to ask David because he had been Eccles' first PhD student, graduating in 1957, then rising through the academic ranks to be a Professor in 1966 and was Director of the School from 1989–92. However, I had been so impressed with the high quality and low price of *History of Microbiology in Australia*, which had been published in 1990 by Brolga Press, a desk-top publishing operation managed by Bob Kirk, that we decided to get him to publish this book. Late in December 1998, I wrote a letter to the Director of JCSMR for consideration by Faculty Board, canvassing this idea. Faculty Board approved and during 1999 David and I discussed its structure. We finally decided that it should consist of three parts: Part I, Development and Change, which was a chronological account of how the School developed and the gradual increase in coverage, by department and with later consolidation into Divisions; Part II, Highlights of Research, which consisted of 89 essays, arranged in 10 fields, according to discipline and Part III, Statistical Information, which included full details of all Academic Staff, Visiting Fellows, PhD students, Service by staff to organizations outside the School, and External Grants, in those days a minor source of funding.

We included many photographs, with long legends outlining the careers of all the major actors, and several illustrations of the development of the buildings. At this time Bob Kirk operated from Gunderoo, a village in New South Wales, some 35 km from Canberra. Publication was funded from a donation of \$40,000, which I made over a period of two financial years. The School ordered 5,000 copies, and is able to give them to all new staff and students and to visitors. The book was launched on 15 November, 2001, by Dr Barry Jones.

## **Overseas Trips Other than Those Concerned with Smallpox**

### **China, 1980, Australian Development Assistance Bureau**

This trip was my first and only experience of travel with members of the Diplomatic Corps. In October 1980, I was asked to be part of a mission to China by representatives of the Australian Development Assistance Bureau (ADAB), to investigate the potential for Australian aid to China. The members of the group were J. C. Ingram, Director of ADAB (leader), T. Terrell and W. Newton (both ADAB), R. Dun, NSW Department of Agriculture, D. Little, Director-General of Public Works, Victoria, and me. It was most interesting, although I felt that I could not contribute much to the discussion. What I remember most vividly is flying to Lan-Chou, capital of Gansu province, over miles of heavily eroded loess mountains. On the ground, there was always a heavy mist of dust; this was

the reason for the Huangho River being called 'the Yellow River'. We visited the Desert Research Institute, where they were trying to control the desert sandhills north of Lan-Chou by planting poplars on the ridges. We were given splendid meals and visited all the temples etc. around Beijing. I met up again with Dr Jiang Yu Tu, who had guided Joel Breman and me around on our visit to certify smallpox eradication in 1978.

## Washington, 1982 to 1983, Fogarty Scholar

I had spent three months as a Fogarty Scholar in the National Institutes of Health (NIH) in 1971–72, and Bobbie and I had spent three months there in 1973–74. In August 1979, anticipating my retirement at the end of the year, I wrote to NIH to follow up a suggestion from the official then in charge of the scheme, Dr Peter Condliffe, suggesting that since I expected to be deeply involved in writing books on virology, I would like to spend several months at NIH, preferably as a Fogarty Scholar, in 1982–83. Condliffe came out to Canberra in January 1980 and we arranged to take up the Scholarship again, with Bobbie, between September 1982 and February 1983. I copied all correspondence to my good friend Bob Chanock. Previously we had lived at Stone House; this arrangement was no longer possible, but I had an office there. We lived in a flat opposite the Clinical Center at NIH.

I came over from Geneva, where I had been working on the smallpox book. Bobbie flew directly from Canberra. I spent a lot of time in the National Library of Medicine, which was on the NIH campus and had long runs of most medical journals, which were very useful for historical material for the smallpox book. I also worked on a possible third edition of *The Biology of Animal Viruses* (unfortunately Joe Sambrook, who was a very able molecular virologist and had agreed to be a co-author, pulled out and this was never published).

My colleague, David White, was spending a few months on study leave at this time. He had hired a car and we visited a number of the interesting places near Washington, DC. We saw a great deal of Bob and Beth Chanock, who often took us to concerts at the Kennedy Center and introduced us to the wonderful galleries and museums in central Washington.

In December, we went up to the Rockefeller University in New York to attend a memorial service for René Dubos, who had died earlier that month, and met many old friends of the 1940s. Then I went to Atlanta, Georgia, to the CDC and talked with Jim Nakano, Joe Esposito and other poxvirologists. Later I went to Gainesville, Florida to discuss the projected *Veterinary Virology* with Paul Gibbs, and a couple of weeks later to Baltimore to see D. A. Henderson in his office at Green Mansions, a Hopkins University building where he worked on the operational chapters of the smallpox book each weekend. Finally we attended a ceremony at Stone House, where the Acting Director of the Fogarty

International Centre presented me with a Fogarty Medal and accompanying Certificate.

### Japan, 4–11 April 1988, Japan Prize Award Ceremony

Bobbie and I arrived in Tokyo on Monday 4 April, 1988, and were met at the airport, taken to the Akasaka Prince Hotel and given a press kit and a detailed program for the week. We met the Press on Tuesday, and the Governor of Tokyo and the Prime Minister on Wednesday morning, followed by a Japan Prize Lecture by each of us in a large hall, then an 'academic debate'. That evening, the Hendersons, the Aritas, Bobbie and I had dinner at the Australian Embassy, other guests included the Director-General of the Institutes of Health in Japan and his wife. The next morning, we met the Science Council of Japan and rehearsed the award ceremony in the National Theatre of Japan. The actual Award Ceremony occurred that afternoon, followed by a superb banquet in the Akasaka Prince Hotel, during which we met Crown Prince Akimoto and presented him with a copy of *Smallpox and its Eradication*. On Friday morning, we met Emperor Hirohito (who at that time was very frail and rarely met anyone) at the Imperial Palace. In the afternoon, we travelled by the bullet train to Osaka, where we gave the Japan Prize Lectures again. The next day, after meeting the Governor of Osaka in the morning, we spent the rest of the day sight-seeing in Osaka and Kyoto, followed by a splendid Japanese style dinner (including sitting at the table without chairs) at what we were told was the most exclusive restaurant in Japan. Our host was Mr Matsushita, 93 years old, who set up and largely endowed the Japan Foundation for Science and Technology, which operates the Japan Prizes.

On the Sunday, the smallpox group went to Kumamoto, Arita's home town. After dropping our baggage at the New Sky Hotel we visited several gardens, then D. A. and I went to the Kumamoto Hospital, where Arita had gathered an audience. D. A. spoke about international health perspectives and I about viral diseases in Australia. Next afternoon we visited Mt Aso, an impressive volcano in the middle of the island of Kyushu, then to the airport and back to Narita airport, before flying to Hong Kong next morning. After arranging for storage of most of our luggage, Bobbie and I flew to Guilin in China. We booked in at a hotel there and we went for a trip down the Liyuan River. Unfortunately it was very misty, and we could only catch glimpses of the famous mountains. Then back to Hong Kong and home, with a stop-off in Bangkok for Bobbie to buy some dresses.

### China, 18–25 September 1988, review of an ACIAR Project

The Australian Centre for International Agricultural Research (ACIAR) was established by Prime Minister Fraser in 1980, at the suggestion of Sir John Crawford, then Vice Chancellor of ANU. Among its projects was the utilization

of entomopathogenic nematodes to control insect pests in China, which had been initiated in October 1985, the principal investigator being Dr Robin Bedding, of the CSIRO Division of Entomology. In June 1988, I was invited to assist in reviewing the project, both in China and Hobart, Tasmania, where Bedding was producing nematodes on a large scale. I visited Hobart on 30–31 August, 1988, and China on 18–25 September, 1988. The other reviewer was Professor Qiu Shi-Bang, of the People's Republic of China. In China we visited the Guangdong Entomological Institute, where large scale production of nematodes was based, and the Biological Control Laboratory in Beijing, where it was intended that larger scale production could be carried out for use in the control of *Carposia* in apple orchards. We were very favorably impressed with the project and reported our opinions to Dr McWilliam, Director of ACIAR, in October 1988.

## Japan, 1991 to 1996, Agency for Cooperation in International Health

In 1991, just before he retired from his position as Director of the Kumamoto National Hospital, Isao Arita set up a new organization, the Agency for International Cooperation in Health (ACIH), which was based in his home town, Kumamoto, and planned to provide support for preventive medicine in developing countries. From 1993, he assumed chairmanship of ACIH. Among its varied activities were international conferences on such matters as vaccine supply to the poorest countries. At his invitation, I participated in several of these conferences, usually acting as rapporteur, and I edited the reports of the meetings, which were usually held in Kumamoto.

### Meeting on Global Vaccine Supply, 23–26 May 1991

11 international experts met in Kumamoto for two days to discuss such matters as vaccine supply for WHO's Expanded Program for Immunization, including both the production of new vaccines in developing countries and ways of assuring vaccine quality. On 26 May a symposium was held on 'Japan as seen by Foreigners'. After an introduction by Dr Arita, Dr Mark Radford, an Australian who had worked in Japan since 1985, and I discussed the topic from our different angles. After the speeches there was a vigorous discussion, and subsequently everything was published in both Japanese and English.

### Second Meeting on Global Vaccine Supply, 3–5 August 1992

This meeting included 10 overseas and 17 Japanese experts and met in Tokyo. The topic was the same as for the first meeting, but this time experts from Indonesia, Brazil and India spoke of the situation in their countries, and one from the United States Agency for International Development (USAID) described their long experience with these problems. A very useful graph was produced

in the report of the meeting which indicated, for all countries in the world, where they stood in relation to wealth, population and capacity to produce bacterial and viral vaccines. A series of recommendations was produced on global planning and coordination, achievement of vaccine self-sufficiency and assurance of vaccine quality, and, as before, I acted as rapporteur.

### **Third Meeting of the Consultative Group, Children's Vaccine Initiative, Kyoto, 7–9 November 1993**

The Children's Vaccine Initiative (CVI) was a global coalition of governments, UN organizations, non-governmental and private organizations, industry and research groups focused on the goal of bringing new and improved vaccine into national immunization programs. ACIH had played a major role in organizing this meeting in Japan and Arita was the keynote speaker. It was attended by 212 participants, representatives from the Rockefeller Foundation, UNICEF, UNDP and the World Bank, and 13 members of the WHO Secretariat. At the conclusion of the three-day meeting, it produced the Declaration of Kyoto, essentially a document emphasising the importance of promoting vaccination world wide and the need for the broadest possible support to be mobilized among developing and developed countries to catalyze the priority activities described in the CVI strategic plan. I helped produce an abridged report for the ACIH.

### **Children's Vaccine Initiative and Jenner Commemoration, Kumamoto, 25–26 November 1996**

There were 36 speakers at this meeting, which as well as celebrating the 200th anniversary of Edward Jenner's discovery, tried to work out ways of accelerating the process from laboratory research to the production of vaccines and their use in the field. For the first time, there was a detailed discussion of the problems in producing a vaccine against HIV, in which my colleague from the John Curtin School, Gordon Ada, participated. I prepared an abbreviated report for ACIH. This was the last meeting arranged by ACIH in which I was able to participate.

### **Bozeman and Yellowstone National Park, 11–25 July 1997**

I had been invited to give the Edwin H. Lennette Memorial Lecture at the annual meeting of the American Society for Virology in Bozeman, Montana, in July 1997. Fred Murphy got in touch with me well before the meeting and suggested that I accompany their family on a week's trip through the Yellowstone National Park. He had a new RV (recreational vehicle), which had beds for four, shower, toilet, stove and refrigerator. Fred, Irene and their son, Ric, his two young boys and I travelled in the RV; his other sons had brought their bicycles. We had a wonderful trip all around Yellowstone, not only the first national park in USA, but one of the most wonderful in the world, with entrancing hot springs, geysers and a great trip down the Snake River. Then we went to Bozeman, where the

meeting was very interesting. I gave my lecture and saw a lot of old friends, including Joe Esposito, Grant McFadden, Olin Kew, Dick Moyer and Mary Estes.

## Home Life and Bobbie's Death

There is brief mention of my marriage to Bobbie Roberts in Chapter 3 and of the children in Chapter 5, but she was such an important factor in my life and career that I must say a bit more about our life together, and her death. Throughout my career as a Professor of Microbiology, and even more when I was Director of the John Curtin School and of CRES, Bobbie was a tremendous support. With her help, we often entertained staff and visitors, with dinners at home and in summer, parties in our spacious garden. I travelled overseas a great deal. Most of these trips were short, and especially in Geneva I worked all the time. She did not come on these trips and did not want to. But, especially after my retirement, she often came as well, as outlined in the previous section.

Bobbie had always been a moderate cigarette smoker and when I was head of the Department of Microbiology I used always bring her back duty-free cigarettes when I had been overseas. But as soon as I became Director, she gave up smoking and told me to get rid of all the cigarettes in the house. Her initial distress, hunting everywhere for one more cigarette, brought home to me how addictive smoking is for some people (I had never smoked). Bobbie was very active in a range of community activities. Almost immediately after our arrival in Canberra, she was invited to become a Councillor of the Canberra Mothercraft Society. As a Triple Certificated Nursing Sister, she served with distinction, representing the Society as a delegate to the National Council of Women of the ACT and for many years was a member of the Executive. She supervised the monthly clothing sales for the National Council of Women and helped with the teas that were given every 'Pension Thursday' to the early pioneers of Canberra, before the advent of Senior Citizens Clubs. She was a member of the Pan-Pacific and South-East Asia Women's Association, helping many people from those areas settle into life here, and as one of the first members of the Ex-Servicewomen's Sub-Branch of the Returned Services League of the ACT, she represented the RSL on the Services Trust Welfare Fund, on which she served with distinction for many years. Among the many charities that Bobbie helped regularly were the Guide Dogs for the Blind, the Smith Family, the Knitting Guild, the Save the Children Fund and UNICEF, which in 1995 recognized her many years of service with an award.

As a close friend has said, 'It was Bobbie's way to "say it with flowers"' and the garden at 8 Monaro Crescent was the venue for many fetes and garden stalls, for many organizations, including the Canberra YWCA Annual Garden Sale, which raised thousands of dollars annually, and she gave help with flowers and plants to fetes held by Legacy and the Boys' and Girls' Grammar Schools.' Besides gardening, her hobbies included tennis, golf and bridge, and she was a member

of the University Ladies Drawing Room Committee, the Commonwealth Club and Friends of the National Gallery. In January 1980, she was decorated with a Medal of the Order of Australia (OAM) at a ceremony at Government house, for community service.

In 1989 she was found to have colon cancer, and had a colonectomy, with good results for several years. Then, in 1994 she was found to have extensive secondaries in the lungs, which progressed in spite of radium treatment and chemotherapy. For some months she was confined to bed, at home, but in October 1995 she was sent to the Respite Care Facility, on the shores of Lake Burley Griffin. She gradually got worse, but insisted that I should go to London in early December to receive the Copley Medal of The Royal Society, although at that stage she was at death's door. She died on 28 December, 1995.

To many, she will be long remembered as a loving friend. This is well encapsulated in a letter from Kunang Helmi, the eldest daughter of Indonesian Ambassador Helmi, who was a near neighbour in the late 1950s: 'In fact what I really want to say is how much I love you Aunt Bobbie, for what you are and what you did. You set me a shining example of what kindness and generosity are about—I often think of you in my prayers, as do Rana and Rio [Kunang's younger siblings].'

Although it was long expected, I was devastated by her death. Company at the John Curtin School each week day was a great help, and after there had been time to repaint the interiors of the main house and the extension that we had built in 1981–82, I moved into the extension and Marilyn and her family moved into the main house, which has proved an excellent arrangement for both of us. Even so, it took about three years before I could adjust to Bobbie's absence and, only then, I told myself: 'I see so many women who have lost their husbands and adjust to life as widows; I must adjust, as a widower.'

## Celebrations of the Lives of My Mentors

I was deeply involved in celebrating the centenaries of the births of two of the three scientists (other than my father) who had the greatest influence on my career, Lord Florey (1898–1968) and Sir Macfarlane Burnet (1899–1985). I had written biographical memoirs and obituary notices for both of them, I was involved in the unveiling of the Florey Stone in Westminster Abbey in 1982, and in the celebrations of the Florey Centenary in 1998 and the Burnet Centenary in 1999.

### Howard Florey

I wrote the obituary notice in the *Australian Journal of Science* (Fenner, 1968), and entries on Florey for *Scribner's Dictionary of Scientific Biography* (Fenner,

1972), the Roll of the Royal Australasian College of Physicians (Fenner, 1988) and the *Australian Dictionary of Biography* (Fenner, 1996).

I was also involved in the dedication of the Florey Stone in Westminster Abbey. The idea that there should be a record of Florey in one of Britain's great cathedrals was due to Dr Cecil Hackett. Lady Fairley, the widow of Sir Neil Hamilton Fairley and a close friend of the Hacketts, had noticed that there was a plaque commemorating Sir Alexander Fleming in St Paul's Cathedral, in London, but nothing commemorating Florey there, or in Westminster Abbey. Mrs Beattie Hackett was a voluntary helper in Westminster Abbey of many years standing. Cecil Hackett took it upon himself to get something done, and obtained support from The Royal Society and the South Australian government and agreement from the Dean of Westminster Abbey for the placement of a commemorative stone on the Abbey floor, adjacent to those of Herschel and Charles Darwin. Because I was an Australian, a Fellow of The Royal Society, had worked with Florey on the establishment of the John Curtin School, and was a close friend of the Hacketts, I was asked to give the address at the ceremony on All Souls Day, 1982, when the Florey Stone was unveiled by Lady Florey. Subsequently, I signed the register of those who had given 'sermons' at Westminster Abbey, something that I had never expected!

Florey was deeply involved in the establishment of the JCSMR and was Chancellor of the ANU at the time of his death. In 1969, The Royal Society and the ANU jointly sponsored an appeal to provide an endowment for Florey Memorial Fellowships, to be awarded to postdoctoral students for advanced work in Britain or Australia. I raised over \$6,000 from the staff of the JCSMR. In 1973, just before I resigned from the Directorship, I persuaded Council of the ANU to name the chair held by the Director 'The Howard Florey Professor'. My immediate successor, Colin Courtice, was the first to use this title. In 1981, The Royal Society established Howard Florey Lectures to allow eminent scientists to give lectures, in alternate years, in Australia and Britain. The first Lecturer was Sir Andrew Huxley, then President of The Royal Society, who visited Australia in 1982, and I was the second, visiting England in 1983.

## Florey Centenary Celebrations

Thirty years after his death, in 1998, the centenary of Florey's birth was celebrated in Australia and Britain. I was involved in the celebrations in both places.

### Celebrations in Australia

These were organized by Dr John Best, Chairman of the Australian Institute of Political Science and a close associate of Dr Michael Wooldridge, then Minister for Health and Family Services. In 1996, Best set up a national committee and state committees in Adelaide and Melbourne that organized a wide range of

activities: a two-day scientific meeting in Canberra, hosted by the JCSMR; a Florey Medal to be given to an outstanding Australian scientist, the initial presentation to be made at a Florey Day Dinner in Adelaide on 24 September, 1998; and a variety of arrangements with schools to celebrate Florey's achievements. I was a member of the National Committee and was the opening speaker at the Florey Centenary Symposium on *Helicobacter pylori*, held in Canberra, I launched the inaugural Medibank Private Teachers Awards at Florey Primary School in Canberra. I was a speaker at the Howard Florey Centenary Symposium 'Infectious Disease in Humans', organized by the Nature and Society Forum and held at the Academy of Science Dome in March 1998 and I helped organize the July 1998 issue of *Microbiology Australia*, the journal of the Australian Society for Microbiology, titled 'Howard Florey; a man of many parts' and wrote the article on Florey. I also wrote the biographical note on Florey for the 'Portrait of Howard Florey' exhibition held in the National Portrait Gallery, Canberra, 21 September to 15 November, 1998.

## Celebrations in England

John Best arranged for a small group of Australians, of whom I was one, to go to the England at the end of September for the British celebrations, which were held in Oxford at Queens College, where Florey was Provost at the time of his death and at the Science Park, where Bob May, then Chief Scientist, opened Florey Hall, and at The Royal Society in London. It was all very interesting and enjoyable. My only contribution was to give a short speech at The Royal Society reception to outline Florey's contributions to the establishment Memorial Fellows (see above) at The Royal Society reception.

## Frank Macfarlane Burnet

I wrote long and detailed Biographical Memoirs of Burnet for the Australian Academy of Science and The Royal Society, which differed in some details, and a short one for the American Philosophical Society (Fenner, 1987a, 1987b, 1987c).

## Burnet Centenary Celebrations

Pleased by the success of the Florey Centenary celebrations, Health Minister Michael Wooldridge and John Best took responsibility for organizing celebrations for the centenary of Burnet's birth. Understandably, because of his long association with the Walter and Eliza Hall Institute, these were held in Melbourne and both the Hall Institute and the Macfarlane Burnet Centre for Medical Research held their own functions. I was a member of John Best's committee, a speaker at the Macfarlane Burnet Centenary Symposium on Immunology and Virology, held at the Hall Institute on 4–5 August 1999, I helped organize the July 1999 number of *Microbiology Australia*, the journal of the Australian Society for Microbiology, and wrote the article 'Burnet, the virologist, 1925–40', and I wrote

the biographical note on Burnet for 'A Broader Vision; Celebrations of the Centenaries of the births of Macfarlane Burnet, Jean Macnamara and Ian Clunies Ross', held at the National Portrait Gallery between 2 September and 24 October, 1999. I also wrote a short article on 'The scientific achievements and legacy of Frank Macfarlane Burnet' for the 1989/1999 Annual Report of the Walter and Eliza Hall Institute, and I was on the Organizing Committee and gave a lecture at the Burnet Centenary Symposium: 'Q Fever', held at the Queensland Institute of Medical Research on 12–14 October, 1999.

## Prizes and Awards

Probably because I was still working, with advancing age I received a number of prestigious prizes and awards. I will list these chronologically, with a few remarks on some of them, most of them under four headings: national awards, fellowships and the like, named lectures, and prizes.

### National Awards

On Australia Day 1989, it was announced that I had been awarded the highest honour in Australia, Companion of the Order of Australia (AC), for service to medical science, to public health and to the environment.

In 2002, I was approached concerning nomination for the 2003 Australian of the Year Award. I said that I did not want to be nominated for that award because, if selected, it carried too many responsibilities for a person my age, but I would agree to nomination in the Senior Australian of the Year category. The nominator agreed, but the local Australia Day Committee ignored her proposal and selected me to be ACT Australian of the Year, 2003, and I am proud of that award; fortunately I was not chosen for the national award.

In November 2005, I received a letter stating that I was one of four finalists for the ACT Senior Australian of the Year, 2006, and later that month I was selected for that award. At a ceremony in Canberra on 25 January, 2006, the representative of Queensland, a nurse of Aboriginal descent, was chosen from the seven State and Territory nominees to be Senior Australian of the Year, 2006.

### Fellowships and the Like

<b>1980</b>	Honorary Life Member, Australasian Society for Infectious Diseases
<b>1991</b>	Emeritus Member, American Society for Virology
<b>1991</b>	Honorary Fellow, Indian Virological Society
<b>1993</b>	Honorary Member, Australian Veterinary Association
<b>1996</b>	Fellow, American Academy of Microbiology
<b>1998</b>	Patron, Nature and Society Forum
<b>1999</b>	Honorary Fellow, Australasian College of Tropical Medicine

- 2000 Patron, Australasian Society for Infectious Diseases
- 2001 Patron, Sustainable Population Australia
- 2002 Honorary Fellow, University House, ANU
- 2004 Honorary Life Member, Australian Conservation Foundation

## Named Lectures

- 1980 Sir Macfarlane Burnet Address, Australasian Society for Infectious Diseases
- 1983 Florey Lecture, The Royal Society of London
- 1985 Burnet Lecture, Australian Academy of Science
- 1987 John Murtagh Macrossan Lecture, University of Queensland
- 1987 A. W. T. Edwards Memorial Oration, The Australian Society for Medical Research
- 1989 Wallace Rowe Lecture
- 1990 Gordon Meiklejohn Lecture
- 1997 Edwin H. Lennette Lecture, American Society for Virology
- 1999 Derrick–Mackerras Lecture, Queensland Institute of Medical Research

## Prizes

- 1980 ANZAAS Medal, Australian and New Zealand Association for the Advancement of Science
- 1980 ANZAC Peace Prize
- 1982 Fogarty Medal, US National Institutes of Health
- 1986 Mudd Award, International Union of Microbiological Societies
- 1988 WHO Medal
- 1988 Japan Prize (Preventative Medicine)
- 1989 Advance Australia Award
- 1995 Copley Medal, The Royal Society of London
- 1999 Senior Australian Achiever of the Year Award
- 2000 Albert Einstein World Award of Science
- 2002 Clunies Ross Science and Technology Lifetime Award
- 2002 Prime Minister's Prize for Science
- 2003 Centenary Medal

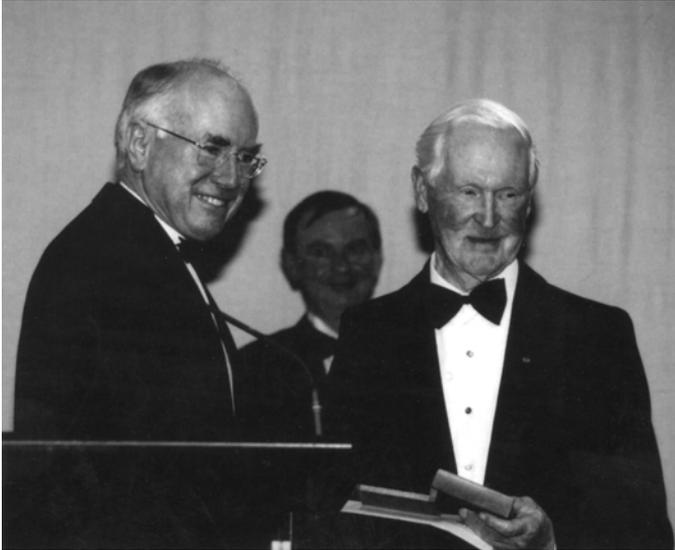


Figure 11.1. Frank Fenner receiving the Prime Minister's Prize for Science, from Prime Minister John Howard, August 2002

## Marks of Recognition other than Prizes and Awards

Since my retirement, I have received a number of marks of recognition other than the prizes and awards mentioned in the previous section. I will list them chronologically.

- 1982** On 8–12 February, 1982 a former PhD student, John Mackenzie, then Associate Professor of Microbiology in the University of Western Australia, organized an International Conference, ‘Viral Diseases in South-East Asia and the Western Pacific’, held in Canberra and dedicated to me. The proceedings were published as a book of the same title, by Academic Press, Sydney. I was presented with a leather-bound copy, signed by most of the contributors, which is now housed in the Basser Library.
- 1986** The Frank Fenner Visiting Fellowship at the Australian Animal Health Laboratory.
- 1990** The Frank Fenner Research Award of the Australian Society for Microbiology (ASM). This is presented at the Annual Meeting of the Society, at which the recipient delivers the Fenner Lecture. I attend most meetings of the ASM and usually present the Award.
- 1992** In 1991, the ANU purchased a multi-storey building on Commonwealth Avenue, formerly known as the Gowrie Hostel and used for the accommodation of public servants. It was refurbished and converted into a residential college, with rooms for about 500 students. The ANU Council, meeting in March 1992, renamed it Fenner Hall. Over the years since then it has developed into a vibrant

- student community, and I have enjoyed participating in their activities.
- 1992** Docteur *honoris causa*, Université de Liège. On the occasion of the 175th anniversary of the University of Liège in 1992, the Veterinary Faculty of the University arranged that I should receive an honorary doctorate. The celebrations were elaborate. There was also a symposium in the Veterinary School, in which I participated and gave a lecture.
- 1994** In April 1994 the ANU Council approved a prize—the Frank Fenner Medal, to be awarded for the outstanding PhD thesis in the JCSMR each year.
- 1994** In November 1994 the JCSMR opened a 'Fenner display' in the lower level foyer of its building.
- 1995** Honorary Doctor of Science, Oxford Brookes University.
- 1996** In 1996 the JCSMR set up Fenner Merit Scholarships, offering not less than \$5,000 to attract Australian students of high calibre to pursue postgraduate research at the School.
- 1996** Honorary Doctor of Science, The Australian National University.
- 1999** In 1999, Steve Redman, while Director pending the arrival of Judith Whitworth, commissioned artist Mathew Lynn to paint a portrait of me, which now hangs in the foyer of the building. It is a fine portrait, and I enjoyed sitting for it and observing the way in which Mathew talked to me as he painted, in order to draw out my personality.
- 2002** In 2002, I was made a Life Member of the ANU Endowment for Excellence and presented with a silver tray by the President of the Board, inscribed 'The Australian National University has pleasure in admitting Frank Fenner as a Life member of the ANU Endowment for Excellence in recognition and grateful appreciation of the generous support of the University and in particular for establishing The Frank and Bobbie Fenner Fund.'
- 2003** In May 2003, the ANU honoured me by naming the building which houses the administrations of both the Faculty of Science and the new ANU Medical School the Frank Fenner Building. It was opened by Science Minister, Mr Peter McGauran, on 21 May, 2003.
- 2003** In August 2003, the Australasian Society for Infectious Diseases, of which I had been Patron since 2000, named its most prestigious award the Frank Fenner Award for Advanced Research in Infectious Diseases. I have had the pleasure of presenting the award at the ASID Meetings in Alice Springs in 2004, Busselton in 2005 and Wellington in 2006.
- 2005** On 12 April, the Chief Minister of the ACT, Mr Jon Stanhope, unveiled the first 17 plaques installed in the ACT Honour Walk, on the Pedestrian Walk, Ainslie Avenue, Canberra. I was unable to attend because I was in Adelaide, but later I saw the plaque outlining

my contributions to science; it was the only plaque recognizing a scientist.

## **Lectures and Newspaper Interviews**

Omitting those listed under 'Prizes and Awards' and those given at meetings of the Frank and Bobbie Fenner Conferences on Medical Research and the Fenner Conferences on the Environment, between 1980 and 2006, I gave 107 lectures, 25 to overseas audiences and the rest within Australia. The majority of the lectures covered general topics, 14 were on smallpox, six on monkeypox, and four on mousepox. Over the same period I also gave 38 newspaper interviews, always in response to enquiries by journalists.

## **Donations**

In addition to minor donations to various charities and the like, and an early donation of \$1,000 to the National Gallery of Australia in 1983 (as a Founding Donor), I have made substantial donations to the Australian Academy of Science, The Australian National University and an NGO, the Nature and Society Forum.

## **Donations to the John Curtin School of Medical Research**

In 1984, five years after my retirement, Bobbie and I considered our financial situation and what we needed for our own and our daughter's and grandchildren's futures, and decided to make annual donations to support the two scientific interests that had been central to my life: medical research and concern for the environment. Stimulated by the example of Sir Frederick and Lady White, who had made substantial donations to the Australian Academy of Science to establish an endowment fund, the income from which could be used to sponsor Academy conferences, we agreed that such conferences were the most cost-effective way of using relatively small amounts of money. From 1984 onwards we therefore made annual donations to the Australian Academy of Science, to support conferences on current environmental and conservation problems in Australia (see below), and to The Australian National University, to build up an endowment fund the income from which could be used to support annual conferences on aspects of medical research of interest to the John Curtin School of Medical Research. Initially (1984), the annual donations to each institution were small (\$5,000), but in 1986 we increased them substantially (to between \$15,000 to \$30,000 a year). In 1997 these reached \$250,000. With income and additions from the University's Endowment for Excellence Fund this reached \$386,220 by the end of 2005; the University hopes to increase this to \$500,000, which will be adequate for the support of annual conferences in perpetuity. Between 1999 and 2006, I made other donations to the School, totalling \$87,000, for a variety of purposes.

This year, 2006, realising that I would soon really retire and cease coming to the School each day, I gave thought to disposal of my published books and my medals. The Basser Library already had all my books and bound reprints of my scientific papers. After consultation with my daughter and the Director of JCSMR, Judith Whitworth, I decided to give the medals and a set of my books to the JCSMR; the value of these, under the Australian Government's Cultural Gifts Program, was \$38,025.

## Donations to the Australian Academy of Science

Beginning in 1970 and continuing annually until 1983, I donated some of the royalties received from published books, particularly *Medical Virology*, to the Australian Academy of Science, to set up an Environment Fund, the proceeds of which were to be available for use of various Academy initiatives relating to the environment, often proposed by the Standing Committee (later National Committee) for the Environment. My donations to this fund totalled \$19,050.

As noted earlier, from 1984, Bobbie and I increased the size of our donations to the Academy of Science as well as the JCSMR. By 1988, the Academy decided that sufficient funds were available to start the conferences, and, with increasing donations, by 1997 the Environment Conference Fund reached \$230,000. This was judged by Council to be enough, given the success of the Conferences in attracting sponsorship, to maintain them indefinitely at a rate of one Conference annually.

Because the funding for conferences on medical research in the John Curtin School were initiated at the same time, there were discussions with Bob Porter, Director of JCSMR, and Ralph Slatyer, Chairman of the Environment Conference Committee, about the naming of the two conferences, resulting in the names used here: 'Fenner Conferences on the Environment' and 'Frank and Bobbie Fenner Conferences on Medical Research'. The first Fenner Conference on the Environment was in held 1988 and there have been meetings each year since then. The proceedings of most conferences have been published and copies are available in the Basser Library.

I was executor of the will of Alfred Gottschalk, a Fellow of the Australian Academy of Science and a close friend of mine, who died in 1973, and at his request I arranged for \$35,000 to be donated to the Australian Academy of Science as an endowment to support the annual award of a medal to a young scientist, who was not a Fellow, for distinguished research in medical or biological science. The first award was made in 1979; it and the majority of subsequent awards have gone to biomedical scientists. I saw the need for another similar award, in biology other than medical research. Given Gottschalk's background in biomedical research, and my broad interests in the conservation of biological diversity as well as preventive medicine, I decided, after consultation with the

Academy Council, to set up a fund for a medal for the work of a young scientist in biological science other than biomedical research. Having donated enough to support the Environment Conferences indefinitely, in 1997 I started to make donations for such a medal, which Council, following precedent, named the Fenner Medal. The first award was made in 2000, and the endowment reached the required total of \$100,000 in 2001.

I had always been interested in the history of science, and hence in the Basser Library, and in 1996 and 1997, I donated \$10,000 to the Academy for use by the Basser Library, initially for cataloging and to support the Video History Project. In 2000, I made a donation of \$20,000 to the Library Fund, the bulk of which was used to put in place a series of cupboards for housing archive boxes, at the rear of the top floor of the Shine Dome. In 2003–04 I donated \$25,000 to the Academy to help with the production of video histories of Fellows and in 2004–06, another \$25,000 for the Basser Library, a total of \$80,000 between 1996 and July 2006.

### Other Donations to The Australian National University

From 1996, I began making donations to the ANU to be used by Fenner Hall. These amounted to \$118,000 by the end of 2002, but after I was awarded the Prime Minister's Prize for Science in 2002, I decided to use the tax-free \$300,000 that accompanied that Prize for donations. In 2003, I donated \$100,000 from that source to establish Bobbie Fenner Scholarships at Fenner Hall, which was augmented in 2004 and again in 2005 by donations of \$23,000, plus \$38,000 for improving facilities in the Hall, reaching a total for Fenner Hall, by July 2006, of \$293,000.

In March 2005, I donated \$5,000 to the Judith Wright Award Fund, and in 2005–06 I initiated donations of \$30,000 for scholarships for students in the Centre for Resource and Environmental Studies (CRES). I intend to maintain the latter donations as long as I am alive.

### Donations to an NGO, the Nature and Society Forum

I have always felt guilty about my inability to become involved in community activities (my wife Bobbie more than made up for my deficiencies here), but in 1992 I had joined the Nature and Society Forum (NSF), a brainchild of my friend Stephen Boyden. In the 1990s, I took an active part in its activities, and in 1997 I was invited to become its Patron. In 1998, I decided to make annual donations to NSF to assist their work, usually of \$20,000 annually. After receiving the Prime Minister's Science Prize, I donated \$50,000 to NSF, and by June 2006 the donations totalled \$214,045.

## Two Personal Celebrations

During the 25 years covered in this chapter, two events were staged marking milestones in my career at the ANU: my 80th birthday in 1994 and the 50th anniversary of my appointment to the ANU in 1999.

### 1994, The Sixth Frank and Bobbie Fenner Conference

Celebrating my 80th birthday, this conference, organized by Gordon Ada and entitled 'Viruses, Vaccines and Vectors', was attended by a number of distinguished overseas colleagues and long-time friends of mine: Isao Arita, Bob Chanock, Ciro de Quadros, Paul Gibbs, D. A. Henderson, Dick Johnson, Fred Murphy, Bernie Moss, Parker Small and Rob Webster, as well as leading Australian scientists. On the first day, the Chief Minister of the ACT, Rosemary Follett, opened a Frank Fenner exhibit in the lower level foyer of the JCSMR, and on the evening of the second day, a birthday banquet was held in the Dining Room of Old Parliament House, at which the audience included, as well as the speakers, many old students and research staff and their wives. D. A. Henderson, Bob Chanock and David White spoke, and D. A. presented me with a unique award, a sculpture in brass symbolizing my election as Grand Master of the Order of the Bifurcated Needle. The occasion was all the more pleasant for me because my wife Bobbie, my daughter Marilyn and her husband and children were all there. Bobbie died just over a year later.

### 1999, Fifty Years in the ANU

On 29 July, 1999, was the 50th anniversary of my appointment as foundation Professor of Microbiology in the ANU. I celebrated it with a dinner in the Common Room at University House, which was attended by as many of my past students, research staff and general staff as could come. My daughter Marilyn acted as Master of Ceremonies, and the Vice-Chancellor, Deane Terrell, Ian Marshall, my first PhD student, Stephen Boyden and Gordon Ada spoke. Among other items on display was a book containing photographs of all academic staff and PhD students from the Department of Microbiology, 1952–67, at the time of their appointment.

## References

- Alibek, K. with Handelman, K. 1999, *Biohazard. The Chilling True Story of the Largest Covert Biological Weapons Program in the World*, Hutchinson, London.
- Arita, I. and Gromyko, A. 1982, Surveillance of orthopoxvirus infections, and associated research, in the period after smallpox eradication, *Bulletin of the World Health Organization*, vol. 60(3), pp. 367–75.

- Australian Government Department of Health and Ageing 2004, *Guidelines for Smallpox Outbreak, Preparedness, Response and Management*. Australian Department of Health and Ageing.
- Blanden, R. V. (ed) 1989, *Immunology of Virus Diseases*, produced by Brolga Press for the John Curtin School of Medical Research.
- Dumbell, K. R. and Huq, F. 1986, Epidemiological implications of the typing of variola isolates, *Transactions of the Royal Society of Tropical Medicine and Hygiene*, vol. 69, pp. 303–6.
- Esposito, J. J., Nakano, J. H. and Obejeski, J. F. 1985, Can variola-like viruses be derived from monkeypox virus? An investigation based on DNA mapping, *Bulletin of the World Health Organization*, vol. 63, pp. 695–703.
- Fenner, F. 1959, Genetic studies with mammalian poxviruses. II. Recombination between two strains of vaccinia virus in single Hela cells, *Virology*, vol. 8, pp. 499–507.
- Fenner, F. 1968, Howard Walter Florey: Baron of Adelaide and Marston, *Australian Journal of Science*, vol. 31(1), pp. 37–9.
- Fenner, F. 1972, Howard Walter Florey, *Dictionary of Scientific Biography*, vol. 5, pp. 41–4.
- Fenner, F. J. 1988, Florey, Lord Howard Walter, Baron Florey of Adelaide and Marston, in *Roll of the Royal Australasian College of Physicians*, G. L. McDonald, (ed), vol. I, pp. 95–7, The Royal Australasian College of Physicians, Sydney.
- Fenner, F. 1996, Howard Walter Florey, *Australian Dictionary of Biography*, vol. 14, pp. 188–90.
- Fenner, F. 1987a, Frank Macfarlane Burnet, 1899–1985, *Historical Records of Australian Science*, vol. 7(1), pp. 39–77.
- Fenner, F. 1987b, Frank Macfarlane Burnet, 1899–1985, *Biographical Memoirs of Fellows of The Royal Society*, vol. 33, pp. 101–62.
- Fenner, F. 1987c, Sir Frank Macfarlane Burnet, Biographical Memoir, *Year Book of the American Philosophical Society*, 1987, pp. 90–5.
- Fenner, F. (ed), 1990, *History of Microbiology in Australia*, Brolga Press, ACT, for the Australian Society for Microbiology.
- Fenner, F. and Fantini, B. 1999, *Biological Control of Vertebrate Pests. The History of Myxomatosis, an Experiment in Evolution*, CAB International, Wallingford.
- Fenner, F. and Gibbs, A. J. (eds) 1988, *Portraits of Viruses. A History of Virology*, S. Karger AG, Basel.

- Fenner, F., Wittek, R. and Dumbell, K. R. 1988, *The Orthopoxviruses*, Academic Press, San Diego.
- Fenner, F. J., Bachman, P. A., Gibbs, E. P. J., Murphy, F. A., Studdert, M. J. and White, D. O 1987, *Veterinary Virology*. Academic Press, Orlando, USA.
- Fenner, F.J., Gibbs, E. P .J., Murphy, F. A., Rott, R., Studdert, M .J., and White, D. O. 1993, *Veterinary Virology*, Second Edition, Academic Press, San Diego, USA.
- Gispen, R. and Brand-Saathof, B. 1972, 'White' poxvirus from monkeys, *Bulletin of the World Health Organization*, vol. 46, pp. 585–92.
- Gispen, R. and Kapsenberg, J. G. 1966, Monkeypox virus-infectie in cultures van apeniercellen zonder duidelijk epizootisch verband met pokken, en in een kolonie van apen lijdende aan pokken, *Verslagen en mededelingen betreffende de volksgezondheid*, vol. 12, pp. 140–4.
- Jezek, Z. and Fenner, F. 1988, *Human Monkeypox*, Monographs in Virology No. 17, S. Karger Publishers, Inc., New York.
- Marennikova, S. S., Selukhina, E. M., Mal'ceva, N. N. and Ladnyi, I. D. 1972, Poxviruses from clinically ill and asymptotically infected monkeys and a chimpanzee, *Bulletin of the World Health Organization*, vol. 46, pp. 613–20.
- Marennikova, S. S., Selukhina, E. M., Mal'ceva, N. N. and Matsevich, G. R. 1979, Monkeypox virus as a source of whitepox viruses, *Intervirology*, vol. 11, pp. 333–40.
- Murphy, F. A., Gibbs, E. P. J., Horzinek, M. C. and Studdert, M. J. 1999, *Veterinary Virology*, Third Edition, Academic Press, San Diego.
- Rao, A. R. 1972, *Smallpox*, Bombay, The Kothari Book Depot.
- White, D. O. and Fenner, F. J. 1986, *Medical Virology*, Third Edition, Academic Press, Orlando.
- White, D. O. and Fenner, F. J. 1986, *Medical Virology*, Fourth Edition, Academic Press, San Diego.
- WHO 1984, The current status of human monkeypox: Memorandum from a WHO Meeting, *Bulletin of the World Health Organization*, vol. 62(5), pp. 703–13.
- WHO 1986, Committee on Orthopoxvirus Infections, *Weekly Epidemiological Records*, vol. 38, pp. 289–93.