NATURE, NURTURE AND CHANCE

THE LIVES OF FRANK AND CHARLES FENNER
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FRANK FENNER

Visiting Fellow, John Curtin School of Medical Research
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Preface

Frank Fenner AC, CMG, MBE, FRS, FAA, MD, DTM, is undoubtedly the most highly decorated and awarded Australian scientist of the 20th and 21st century. Beginning with the David Syme Research Prize for his work on mousepox in 1949, through his diverse and pioneering work in virology and microbiology, he has picked up a glittering array of scientific honours which include the Mueller and Matthew Flinders Medals (1964 and 1967), the Britannica Australia Award for Medicine (1967), the Burnet Medal (1985), the Prime Minister’s Prize for Science (2002), and, internationally, the highly prestigious Japan Prize (1988), the Copley Medal of the Royal Society of London (1995), and the Albert Einstein World Award for Science (2000). Focusing his high place in university education, Fenner Hall, a college of The Australian National University (ANU), was named for him at its establishment in 1992.

For a researcher who never had time to gather a PhD, it is a formidable record. But at 91, Frank, with characteristic modesty, observes, ‘You just have to live a long time’ However, as the President of the Australian Academy of Science recently summed up, Professor Fenner is ‘the doyen of virology and one of the greatest scientists Australia has produced’.

Frank Fenner’s life, as it unfolds in these pages, marks a significant piece of the history of Australian science. His chapters are studded with the names of many of the major players in pathology, microbiology and the rising field of virology with whose lives he interconnected, and his mode of inserting boxed information on these participants throughout his text provides valuable biographical portraiture.

It was World War II that shaped Frank’s course. A graduate in Medicine of the University of Adelaide in 1938, he enlisted in the Army Medical Corps after his resident year, but, noting that unusual infectious diseases existed in the Middle East—a likely future theatre of war—he went first to Sydney University to do a three-month diploma course in tropical medicine. Thus, through chance and foresight—a combination that would mark his life—he seized on a path that would determine his future research career. Well prepared, he served as a malarialogist with the Australian forces in Palestine where he met the influential Hamilton Fairley. In 1942, he returned to Australia to serve as pathologist at the Australian General Hospital at Hughenden, Queensland, where he treated patients from the New Guinea campaign suffering from malaria and dysentery. Subsequently, he was transferred to New Guinea to become a key participant in the control of malaria and other insect-transmitted diseases in Papua and New Guinea, a crucial contribution in these theatres of war. His report on the ‘wastage’ through sickness and disease in the Australian capture of Lae and Finschhafen put him on the scientific map.
It was at Hughenden that Frank encountered that great ‘enabler’, Bill Keogh, and most importantly and for him most enduringly, met the charming, highly skilled nursing sister, ‘Bobbie’ Roberts, with whom he worked on malaria diagnosis and who later became his wife.

His research career, begun with his report and papers on disease among the Australian troops, took him in 1944 to an initial spell at the Walter and Eliza Hall Institute under Macfarlane Burnet, where he investigated North Queensland tick typhus, and, with his discharge from the Army early in 1946, he moved to a position there as Senior Haley Research Fellow. It was at the Hall Institute that he began his work on the experimental epidemiology of the ectromelia virus (mousepox). His baptism in virology, as he puts it, had begun, and it presaged his lifetime interest in the poxviruses and his ultimate involvement in the World Health Organization’s smallpox eradication campaign.

It was in 1949, during a postdoctoral period in America at the Rockefeller Institute for Medical Research (an opportunity set in train by Bill Keogh for former wartime workers in the Directorate of Hygiene and Pathology) working under the mentorship of René Dubos, that he received news of his appointment as first Professor of Microbiology in the new John Curtin School of Medical Research at the ANU. After travelling to London to make plans for the School with Howard Florey, he would hold this pioneering post until 1967, when he became Director of the School.

It was while Professor of Microbiology that Frank carried out his monumental work on myxomatosis. Once more, ‘fortune favoured the prepared mind’. Myxomatosis, a virus disease long known to kill European rabbits, which had become a major pest in Australia; in the absence of country boys from the rural scene in the war years, the population of this imported species had multiplied spectacularly. From 1948, spurred by the strong advocacy of Jean Macnamara, the Commonwealth Scientific and Industrial Research Organization (CSIRO) was trialing the impact of the introduced virus in the field and during the Christmas—New Year period of 1950-51, the disease escaped from one of its trial sites and killed millions of rabbits. It was then that Frank decided to embark on the study of the virology of the disease. With Gwen Woodroofe and Ian Marshall as his assistants, he worked on the evolution of virulence of the virus, the genetic resistance of the rabbit, and conducted collaborative studies with entomologists and ecologists at the CSIRO on the ecology of the disease. He also began what became a lifetime of journeying when he travelled to conduct comparative studies of the disease in Britain, Europe and America. His definitive book, Myxomatosis, co-authored with Francis Ratcliffe, came out in 1965.

Under his leadership, the John Curtin School of Medical Research became a famous institution in virology and expanded through the appointment of diverse and illustrious talent into new disciplinary fields. In 1973, he moved to another
Directorship at the ANU’s new Centre for Resource and Environmental Studies (CRES) where he turned his ranging mind to environmental problems and international collaborative ventures. His travel mileages soared.

Yet Frank Fenner is undoubtedly best known to wide audiences in Australia and overseas for his part in the eradication of smallpox. ‘For almost the whole of my career at the laboratory bench’, he records mildly in an oral interview at the National Library of Australia, ‘I worked on pox viruses’. Through his expert research and his growing involvement in the burgeoning international committees and commissions of the Smallpox Eradication Program of the World Health Organization, initiated in 1967, he became a major figure in the development of strategies to eliminate the disease and offer a system of ‘certification’ of the eradication of the disease across the world. In May 1980, he addressed the World Health Assembly, which accepted the global eradication of smallpox. Never entirely complete, research continues on vaccination, vaccine stocks and monkeypox in which Frank emerges again as the authoritative public spokesman.

By any reckoning, Frank Fenner’s career evokes the loud exclamation ‘What a life!’ Yet, as the Chinese saying goes, ‘his nets never dried’. At his retirement from CRES 26 years ago, he moved across the ANU campus to a room in the John Curtin School of Medical Research as a perpetual Visiting Fellow. Large scientific volumes continued to flow from his desk, embracing every form of virology; microbiology; myxomatosis; smallpox eradication; an historical overview on the John Curtin School of Medical Research itself; and, most recently, a major historical compilation, The First Fifty Years of the Australian Academy of Science, a society in which Frank has, since its inception, been a notably active Fellow, ideas man, and benefactor. For the most part uncritical, and given to factual chronicle and reportage, Frank’s historical volumes draw on contributions from other players. But it is, undoubtedly, his missionary zeal and energy that bring them into print. There has, indeed, always been something about the quiet persistence of the man, a steady mode of dealing with ideas, organizations, and local and world scientific initiatives, that, coupled with a deep intention to record, has made him a unique phenomenon in Australia. Rich in information, his writings provide invaluable archival resources for historians of medicine, the biological sciences, and the steady rise of 20th-century science itself.

Appropriately, his book closes with his reflections on something at which he has always been singularly gifted—friendship and special friends. It leads him too to the raison d’être of the accompanying biography of his father, educationalist, scholar, and science communicator, Charles Fenner.

Frank once observed that he had always believed that his father was a greater intellectual than himself but did not have the same opportunities. Nature, nurture and chance all played their decisive part. Frank’s grandfather—Charles Fenner’s father—was born in the village of Niedergrenzebach, in the province of Hesse.
Emigrating to Victoria attracted by the prospect of gold, he brought to Australia a German lineage that dated back to the 15th century. (The family’s coat of arms is now the emblem at Fenner Hall).

Born at Dunach near Ballarat, where his father was the licensee of the Dunach Hotel, Charles left school early, in circumstances very different from those of his son, and was apprenticed at a printing office, becoming in turn pupil-teacher in local primary schools and then ‘principal’ simultaneously of two one-teacher bush schools. Ambitious, with a lucid mind, he took a two-year course at Melbourne Teacher’s College, taught briefly, but revealed his real ability when he gained a Kernot Research Scholarship at Melbourne University, where he majored in geology and biology under two great professors, E.W. Skeats and Baldwin Spencer, and graduated BSc with first class honours in 1912. He took a Diploma of Education the following year.

Geology and its fieldwork became his métier and, serving as Headmaster at Mansfield Agricultural High School, he published his first scientific paper. In 1914, he was appointed Principal of the Science Departments in the Ballarat School of Mines where he again concentrated on geology and conducted intensive field work in nearby Werribee Gorge, Bacchus Marsh and the Glenelg River. His substantial papers on these areas won him a DSc degree at Melbourne University. Two years later, he was appointed to the new post of Superintendent of Technical Education in the South Australian Department of Education, and moved his family to Adelaide. He was a highly cultured man who, during his 23 years in the post, worked against the odds to raise the profile of technical education as a necessary industrial underpinning in the State. He also emerged as a contributor and liaison officer of the ABC’s Educational Broadcasts in South Australia, a part-time lecturer in the Geography Department of the University of Adelaide (1927-39) and a highly productive and distinguished science communicator.

Frank shows an evident pride in his father’s accomplishments and his scholarship in science. But unfavourable chance (absent from his own experience) delayed Charles Fenner’s elevation to the Directorship of Education in South Australia, which came late in 1939, a decade later than he and his family had privately hoped. Yet his father’s interest in writing books—five came from his pen, along with chapter contributions and numerous articles— influenced Frank’s own addiction to producing works with a wider reach than the mainstream of his scientific papers. ‘Always generalize’, his communicator father advised him. It was a skill, he remembers, that shaped his writing of his most long-enduring paper, ‘The pathogenesis of the acute exanthems’, published in The Lancet in 1948 and reprinted as a classic paper in Reviews in Medical Virology in 1996.

Binding their lives in nature, nurture and chance, Frank Fenner has brought us into close acquaintance with two generations of men, bonded yet different, each
making a distinctive contribution—one widely international, the other, State-oriented—to the knowledge and education of this country.

Ann Moyal
Canberra, March 2006.
Acknowledgements

In Chapter 14, I have made extensive use of the article written by Bernard K. Hyams, published in *Biography, an interdisciplinary quarterly, 13,1, (Winter 1990) 57–75*. I am grateful to Dr Hyams and to Stanley Schab, managing editor of *Biography, Centre for Biographical Research, University of Hawai‘i*, for permission to reproduce this material. In the same chapter, I have also made use of the entry of his name in the *Australian Dictionary of Biography*, written by Lynne Trethewey; I thank both the publishers, ANU E Press and The Australian National University, and the author. I thank the World Health Organisation for permission to reproduce Figure 26.4 on page 1205 of *Smallpox and its Eradication* and the Smallpox Recognition Card.

Brian Swan helped with information on the Wongana Circle (Chapter 16), and my sister Winn, my brother Bill, and nephew Max Fenner have also kindly read over the drafts of sections relating to our family and producing the brief biographies in Chapter 1. Erica Jolly provided useful information about my father in *A Broader Vision*, her monumental book on vocational education in South Australia.

I owe special thanks to Dr Ann Moyal for writing the Preface to the book.

A number of institutions in South Australia provided useful information and/or photos relating to my father's career: the State Library of South Australia, the University of Adelaide, and the Royal Society of South Australia, the Royal Geographical Society of South Australia and the Field Naturalists’ Society of South Australia. The source of most data in Part I was in MS143 of the Basser Library Archives of the Australian Academy of Science, located in Canberra. Much of the material used in Part II was in MS178, in the Basser Library Archives. Barbara Holloway provided invaluable help as editor and in final organising of the chapters on the ANU E Press template. Compilation of all this data and, indeed, my long post-retirement career would have been impossible were it not for the generosity of the John Curtin School of Medical Research for providing me with a large study, a succession of computers, and access to such facilities as the Eccles Library, the School Photography Service and the IT Help Desk.
### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AAAS</td>
<td>Australasian Association for the Advancement of Science</td>
</tr>
<tr>
<td>ABC</td>
<td>Australian Broadcasting Commission (until 1983), Australian Broadcasting Corporation (thereafter)</td>
</tr>
<tr>
<td>AC</td>
<td>Companion of the Order of Australia</td>
</tr>
<tr>
<td>ACIAR</td>
<td>Australian Centre for International Agricultural Research</td>
</tr>
<tr>
<td>ACIH</td>
<td>Agency for Cooperation in International Health</td>
</tr>
<tr>
<td>ACT</td>
<td>Australian Capital Territory</td>
</tr>
<tr>
<td>ADAB</td>
<td>Australian Development Assistance Bureau</td>
</tr>
<tr>
<td>AIF</td>
<td>Australian Imperial Force</td>
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<tr>
<td>AGH</td>
<td>Australian General Hospital</td>
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<tr>
<td>ANU</td>
<td>The Australian National University</td>
</tr>
<tr>
<td>ANZAAS</td>
<td>Australia and New Zealand Association for the Advancement of Science</td>
</tr>
<tr>
<td>ANZAC</td>
<td>Australia and New Zealand Army Corps</td>
</tr>
<tr>
<td>ASID</td>
<td>Australasian Society for Infectious Diseases</td>
</tr>
<tr>
<td>ASM</td>
<td>Australian Society for Microbiology</td>
</tr>
<tr>
<td>AUC</td>
<td>Australian Universities Commission</td>
</tr>
<tr>
<td>BAAS</td>
<td>British Association for the Advancement of Science</td>
</tr>
<tr>
<td>BBC</td>
<td>British Broadcasting Corporation</td>
</tr>
<tr>
<td>BE</td>
<td>Bachelor of Engineering</td>
</tr>
<tr>
<td>BSc(Eng)</td>
<td>Bachelor of Science (Engineering)</td>
</tr>
<tr>
<td>CCC</td>
<td>Civilian Conservation Corps (USA = Youth Employment Scheme)</td>
</tr>
<tr>
<td>CCS</td>
<td>Casualty Clearing Station</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control (USA)</td>
</tr>
<tr>
<td>CMG</td>
<td>Companion of the Order of St Michael and St George</td>
</tr>
<tr>
<td>CNR</td>
<td>Centre for Natural Resources</td>
</tr>
<tr>
<td>CRA</td>
<td>Conzinc Riotinto Australia</td>
</tr>
<tr>
<td>CRES</td>
<td>Centre for Resource and Environmental Studies</td>
</tr>
<tr>
<td>CSIR</td>
<td>Council for Scientific and Industrial Research</td>
</tr>
<tr>
<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organization</td>
</tr>
<tr>
<td>CUMC</td>
<td>Chinese Union Medical College</td>
</tr>
<tr>
<td>CUP</td>
<td>Cambridge University Press</td>
</tr>
<tr>
<td>CVI</td>
<td>Children’s Vaccine Initiative</td>
</tr>
<tr>
<td>DCM</td>
<td>Distinguished Conductor Medal</td>
</tr>
<tr>
<td>DSc</td>
<td>Doctor of Science</td>
</tr>
<tr>
<td>DTM</td>
<td>Diploma of Tropical Medicine</td>
</tr>
<tr>
<td>ESCAP</td>
<td>Economic and Social Commission for Asia and the Pacific</td>
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</table>
FNS  Field Naturalists Society
FRS  Fellow of the Royal Society
GP   general practitioner
GTC  Government Training Centre (UK)
IC   Instructional Centre (UK)
ICI  Imperial Chemical Industries
ICMR Indian Council for Medical Research
ICSU International Council of Scientific Unions
ICTV International Committee on Taxonomy of Viruses
IIASA International Institute of Applied Systems Analysis
JCSMR John Curtin School of Medical Research
LHQMRI Land Headquarters Medical Research Unit
MB BS Bachelor of Medicine, Bachelor of Surgery
MD   Doctor of Medicine
MM   Military Medal
MSU  Moscow State University
NGO  Non-Governmental Organization
NHMRC National Health and Medical Research Council
NIH  National Institutes of Health (USA)
NOC  National Occupational Conference
NSF  Nature and Society Forum
NZ   New Zealand
OAM  Order of Australia Medal
OBE  Officer of the Order of the British Empire
RAAF Royal Australian Air Force
RV   Recreational Vehicle
SBS  Special Broadcasting Service (Australia)
SCOPE Scientific Committee on Problems of the Environment
SPF  Schools Patriotic Fund
TFM  Training of Fit Men (UK)
TQM  Total Quality Management
UCLA University of California Los Angeles
UNDP United Nations Development Programme
UNEP United Nations Environment Programme
UNESCO United Nations Educational, Science and Cultural Organization
UNHCR United Nations High Commission for Refugees
UNICEF United Nations Emergency Fund
USAID United States Agency for International Development
WAAF Women’s Australian Air Force
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WPA</td>
<td>Works Progress Administration (USA)</td>
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