

NATURE, NURTURE
AND CHANCE

THE LIVES OF FRANK AND
CHARLES FENNER

NATURE, NURTURE AND CHANCE

THE LIVES OF FRANK AND
CHARLES FENNER

FRANK FENNER

VISITING FELLOW, JOHN CURTIN SCHOOL
OF MEDICAL RESEARCH
THE AUSTRALIAN NATIONAL UNIVERSITY



E P R E S S



E P R E S S

Published by ANU E Press
The Australian National University
Canberra ACT 0200, Australia
Email: anuepress@anu.edu.au
Web: <http://epress.anu.edu.au>

National Library of Australia
Cataloguing-in-Publication entry

Fenner, Frank, 1914- .
Nature, nurture and chance : the lives of Frank and Charles
Fenner.

ISBN 1 920942 62 9
ISBN 1 920942 63 7 (online)

1. Fenner, Frank, 1914- . 2. Fenner, Charles, 1884-1955.
3. Microbiologists - Australia - Biography. 4. Virologists
- Australia - Biography. 5. Geographers - Australia -
Biography. 6. Educators - Australia - Biography. I. Title.

579.092

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior permission of the publisher.

Indexed by Frank Fenner.
Cover design by Teresa Prowse.
Frank Fenner, by Mathew Lynn, 1999, courtesy of the John Curtin School of Medical Research.
Charles Fenner, by Ivor Hele, 1935, courtesy of Education Centre, Adelaide.

This edition © 2006 ANU E Press

Table of Contents

List of Figures	v
Preface	vii
Acknowledgements	xiii
Acronyms	xv
Part I. The Life of Frank Fenner	
Introduction	3
Chapter 1. Childhood, 1914 to 1932	9
Chapter 2. The University Years, 1933 to 1940	21
Chapter 3. The War Years, May 1940 to February 1946	27
Chapter 4. Walter and Eliza Hall Institute, 1946 to 1948; Rockefeller Institute, 1948 to 1949	47
Chapter 5. Professor of Microbiology, John Curtin School of Medical Research, 1949 to 1967: Administrative and Domestic Arrangements	55
Chapter 6. Professor of Microbiology, John Curtin School of Medical Research, 1949 to 1967: Research	81
Chapter 7. Director of the John Curtin School of Medical Research, 1967 to 1973	97
Chapter 8. Activities Associated with the Australian Academy of Science	113
Chapter 9. Director of the Centre for Resource and Environmental Studies, 1973 to 1979	121
Chapter 10. Smallpox and its Eradication, 1969 to 1980	137
Chapter 11. Visiting Fellow, John Curtin School of Medical Research, From 1980	159
Part II. The Life of Charles Fenner	
Chapter 12. The Fenner Lineage	197
Chapter 13. Childhood, University, Marriage and Family	209
Chapter 14. Charles Fenner, the Educational Administrator	217
Chapter 15. Overseas Trips, Diary Extracts on Education	239
Chapter 16. The Scientist and Science Communicator	265
Chapter 17. Overseas Trips, Diary Extracts on Science	281
Chapter 18. Reflections, Frank Fenner	327
Index of Names	341
Subject Index, Part I, Frank Fenner, Chapters 1–11, 18	351
Subject Index, Part II, Charles Fenner, Chapters 12–17, 18	355

List of Figures

1.1. Iramoo, the house at 42 Alexander Avenue, Rose Park in 1931, after adding the second storey as the boys' shared bedroom	11
1.2. The family in 1937	12
2.1. Adelaide University Hockey Club, Inter-varsity team, Brisbane 1937	23
3.1. Officers' Mess, 2/6 Field Ambulance, Woodside, September 1940	28
3.2. Frank Fenner at the site of the 2/2 Australian General Hospital at Hughenden a day after the cyclone	35
3.3. Photograph of Bobbie Roberts in 1942, by Julian Smith	41
5.1. The temporary buildings of the John Curtin School of Medical Research	60
5.2. The Fenner house at 8 Monaro Crescent	61
5.3. Viewing the Canberra Meritorious Award for Architecture, 1956	62
5.4. Staff of Department of Microbiology in the temporary laboratories, June 1955	64
5.5. Team assembled in Indonesia at request of Ambassador Walter Crocker to investigate the establishment of a medical school in Sumatra, July–August 1956	67
5.6. Academic staff, visiting fellows and students of the Department of Microbiology in 1962, on the roof of Infected Animal House, with Black Mountain in the background	72
6.1. European and Brazilian Rabbit	84
6.2. Frank Fenner at the bench, inoculating chick-developing embryos with a virus suspension	91
10.1. The Smallpox Recognition Card, showing a child with smallpox at the pustular stage	138
10.2. Map showing my travel by air and road around South Africa and Namibia in 1978	150
10.3. Frank Fenner addressing the World Health Assembly on 8 May 1980	157
11.1. Frank Fenner receiving the Prime Minister's Prize for Science, from Prime Minister John Howard, August 2002	187
12.1. Map of Hesse and the Schwalm valley	198
12.2. Schwälmer men's and women's attire	199
12.3. The Fenner coat-of-arms	206
12.4. Fenner Hall, The Australian National University, Canberra	207

vi **Nature, Nurture and Chance**

13.1. Students and teachers at Dunach School in 1890	210
13.2. Charles Fenner with his father Johannes Fenner, in 1903, when Charles was 'principal' of two one-teacher schools	211
13.3. Photograph of Miss Emma L. Hirt	213
13.4. Photograph of the married couple	213
14.1. Cartoons of Charles Fenner published in <i>The Bulletin</i> , 1929, 1930 and 1935	225
14.2. Charles Fenner, Director of Education, at his desk	226
16.1. Charles Fenner with Sir Edgeworth David, examining a piece of fossil wood	271
16.2. Map of Australia showing the 'strewnfield' of australites	273
16.3. Australites	274
16.4. Medals	275

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 malariologist 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 Woodroffe 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

AAAS	Australasian Association for the Advancement of Science
ABC	Australian Broadcasting Commission (until 1983), Australian Broadcasting Corporation (thereafter)
AC	Companion of the Order of Australia
ACIAR	Australian Centre for International Agricultural Research
ACIH	Agency for Cooperation in International Health
ACT	Australian Capital Territory
ADAB	Australian Development Assistance Bureau
AIF	Australian Imperial Force
AGH	Australian General Hospital
ANU	The Australian National University
ANZAAS	Australia and New Zealand Association for the Advancement of Science
ANZAC	Australia and New Zealand Army Corps
ASID	Australasian Society for Infectious Diseases
ASM	Australian Society for Microbiology
AUC	Australian Universities Commission
BAAS	British Association for the Advancement of Science
BBC	British Broadcasting Corporation
BE	Bachelor of Engineering
BSc(Eng)	Bachelor of Science (Engineering)
CCC	Civilian Conservation Corps (USA = Youth Employment Scheme)
CCS	Casualty Clearing Station
CDC	Centers for Disease Control (USA)
CMG	Companion of the Order of St Michael and St George
CNR	Centre for Natural Resources
CRA	Conzinc Riotinto Australia
CRES	Centre for Resource and Environmental Studies
CSIR	Council for Scientific and Industrial Research
CSIRO	Commonwealth Scientific and Industrial Research Organization
CUMC	Chinese Union Medical College
CUP	Cambridge University Press
CVI	Children's Vaccine Initiative
DCM	Distinguished Conduct Medal
DSc	Doctor of Science
DTM	Diploma of Tropical Medicine
ESCAP	Economic and Social Commission for Asia and the Pacific

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
LHQMRU	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

WHO	World Health Organization
WPA	Works Progress Administration (USA)

