Frank Fenner

(1914–2010)

A guiding light of the campaign to eradicate smallpox.

On 8 May 1980, the Australian virologist Frank Fenner stood before the World Health Assembly in Geneva, Switzerland — the governing body of the World Health Organization (WHO) — and reported that smallpox, which had plagued mankind for more than 3,500 years, had been eradicated. That moment marked the first time in human history that a disease had been wiped out.

For Fenner, who died on 21 November at his home in Canberra, the announcement also represented the culmination of 35 years of research on poxviruses. This included more than a decade's work on the eradication campaign, first as principal adviser, and latterly as chair of the WHO commission that decided when the virus had been conquered.

Fenner's father was a writer and teacher in the small town of Ballarat, near Melbourne. He passed on his enthusiasm for geography, geology and social history to his family. At his father's urging, Frank studied medicine, graduating from the University of Adelaide in 1939; but he retained wide interests and was working on manuscripts pertaining to ecological and environmental questions up to his death.

With war imminent, Fenner took a diploma in tropical medicine before enlisting. This, he believed, would give him a better chance of receiving the more challenging assignments in disease research and prevention. And so it turned out. During five years of service, primarily in New Guinea, he dealt with all manner of tropical diseases, reducing malaria — then a major drain on Australia's fighting forces — to a trivial problem. He also met his wife, ebullient army nurse Ellen (Bobbie) Roberts, who served as a part-time assistant in his laboratory. She died in 1995.

At 31, Fenner began his research career late. He soon made his presence felt. His first appointment, in 1946, to a fellowship at the Walter and Eliza Hall Institute of Medical Research in Melbourne, proved pivotal. The institute's director was Macfarlane Burnet (few used his first name, 'Frank'), who in 1980 won the Nobel prize for his work on immunology. Burnet tasked Fenner to work on the pathogenesis and epidemiology of ectromelia, the mouse pox virus. Only months before, Burnet's group had discovered that this virus was in the same family as smallpox, making it a model for studying the human disease.

Fenner's next challenge was myxomatosis or rabbit pox, caused by the myxoma virus. In 1948, massive epidemics of the disease exploded across Australia, killing almost all infected animals. The virus had been introduced into trial sites to evaluate its use in controlling rabbits, but it escaped and millions of rabbits began dying.

In the early 1950s, Fenner, now chair of microbiology at the medical school of the newly founded Australian National University in Canberra, began comprehensive studies of myxomatosis in the laboratory and the field. As the epidemic peaked, there was an outbreak of human encephalitis, an inflammation of the brain. Media reports blamed the outbreak on the myxoma virus, and vilified the authorities. To allay the panic, Fenner and two colleagues rolled up their sleeves and injected themselves with the virus, to no ill effect. It was a typical, if dramatic, example of his scientific confidence.

SYDNEY MORNING HERALD

In 1967, the WHO began a global programme to eradicate smallpox and I was asked to be its director. That year, more than 10 million cases of the disease and 2 million deaths had occurred in 42 countries. Each year we vaccinated, on average, 300 million people under the programme and contained hundreds to tens of thousands of individual outbreaks.

It was thought that the smallpox virus infected only humans. But greater certainty was needed. If the disease could persist in an animal reservoir — as, say, plague does in wild rodents — then eradication would be impossible. Primates were the prime suspects for such a reservoir. In 1958, a new virus had been discovered that caused a smallpox-like disease in monkeys. In 1969, the WHO convened a group to design field and laboratory studies to investigate the virus's natural behaviour. Fenner, author of one of the principal virology textbooks, was a member. In 1970, human cases of monkey pox appeared in smallpox-free areas. They looked like typical smallpox. The consultant group reconvened regularly, with Fenner providing the voice of calm and reason. Not until 1979 was it proven that humans infected with monkey pox did not spread the virus easily or quickly, and that cases probably resulted from villagers eating infected rodents. Eradication of smallpox was possible.

As the programme progressed, governments needed convincing that no smallpox remained, and that vaccination and border checks could end. Fenner took the chair of the international commission for certification of eradication, which had the last word on whether the world was free of the virus. They examined the quality of national reports prepared two or more years after the occurrence of a country's last known case and recommended some additional studies.

In December 1979, the committee was satisfied that the disease had been eradicated, and submitted its report to the WHO's director-general. The ready acceptance of the report by the World Health Assembly on that May day in 1980 was a tribute to the wisdom and integrity of Frank Fenner, the programme's distinguished senior mentor and ever-willing consultant throughout the campaign's many difficult years. ■

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