

## Case histories

### Malaria

In 1866 a newly qualified Aberdonian doctor, Patrick Manson, followed his older brother into the Chinese Imperial Maritime Customs Service. After a decade in the service Manson retired to Scotland, but in the early 1890s he was forced back into practice by a currency crash that wiped out his Chinese pension. Drawing on his experiences in east Asia, he began to concentrate on the study of tropical diseases, developing an ecological approach in which bacteriology and pathology were combined with entomology and geography. Early tropical medicine was truly “Mansonian medicine”, and its greatest vindication came with the decipherment of the emblematic tropical disease—malaria.

Malaria had not always been associated with the tropics. For centuries it was an occupational hazard for the inhabitants of European estuaries, fens, and marshes, a disease associated with rural poverty and ameliorated with opium. 18th-century physicians understood it as one of a class of relapsing fevers, brought on by exposure to putrid miasmas—an idea reflected in its Italian name, *mala aria*, “bad air”—and controlled it with infusions of bark from the Peruvian cinchona tree. In 1820, two French chemists extracted the active constituent, quinine, from cinchona bark.

During a stint in Algeria, in 1880, the French army surgeon Alphonse Laveran had identified parasites in the blood of patients with malaria, but the lifecycle and transmission of this suspect organism remained obscure. This began to change when Manson met Ronald Ross, a young doctor working in the Indian Medical Service, in 1894. Ross’s work on elephantiasis had led Manson to make what he called his “Grand Induction”, that malaria was spread by the bites of mosquitoes. Manson taught Ross his own techniques for observing microscopic parasites and for studying vector insects in their own habitats, and when Ross returned to India he served as an agent, obtaining research funding and working to get his papers published.

On Aug 20, 1897—“Mosquito Day”, he noted in his diary—Ross worked out the last details of the transmission of malaria by *Anopheles* mosquitoes. Early the next year his work was published in several London journals, to widespread acclaim. An Italian team, working in the Pontine Marshes to the south of Rome, published almost identical work in the same year. Ross, however, had Manson and the might of the British Empire behind his work. He was given sole credit, and in 1902 received the second Nobel Prize in Physiology or Medicine.

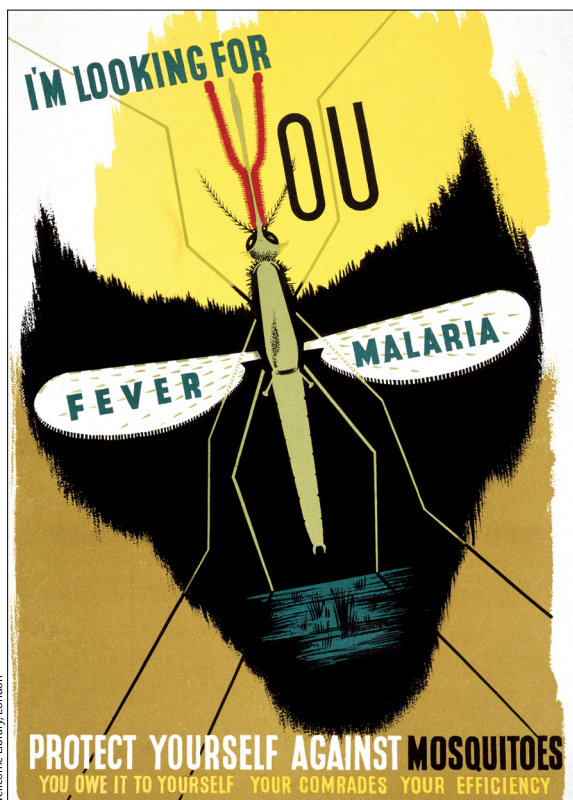
In the early 20th century tropical medicine emerged as a distinct clinical specialty, combining the apparatus of imperial government with the techniques of laboratory science. This discipline was not merely a new avenue for clinical curiosity and global humanitarianism, but also a response to the military, economic, and political problems associated with a European presence in tropical colonies. In early public health campaigns the mosquito served as a vivid symbol of malaria, but initiatives intended to eliminate mosquitoes proved controversial, particularly with the decline of western imperial power and the indiscriminate use of insecticides in the 1950s and 1960s.

Mepacrine, the first synthetic antimalarial, had appeared in the 1930s, but during World War 2 many troops preferred the risk of infection to severe side-effects such as psychosis. In 1972 Tu Youyou, a researcher in a secret Chinese military project, found that artemisinin, a plant extract, provided effective treatment for severe malaria, and over the past 20 years other researchers, such as Nick White, have developed artemisinin-based combination therapies. In the past 20 years, a series of high-profile initiatives—notably with the Bill & Melinda Gates Foundation and WHO’s Roll Back Malaria Partnership—have brought malaria back on to the global agenda as an example of integrated global health care, with treatment, prevention, and health education running alongside programmes tackling poverty and economic inequality.

Richard Barnett  
richard@richardbarnettwriter.com



For more on **Case histories** see **Comment** *Lancet* 2016; **387**: 211 and **Perspectives** *Lancet* 2016; **387**: 217, 737, 1265, 1711, and 2082



#### Further reading

- Dobson MJ. Contours of death and disease in early modern England. Cambridge: Cambridge University Press, 1997
- Packard RM. Malaria dreams: postwar visions of health and development in the third world. *Med Anthropol* 1997; **17**: 279–96
- Worboys M. Germs, malaria and the invention of Mansonian medicine: from “Diseases in the Tropics” to “Tropical Diseases”. In: Arnold D, ed. Warm climates and western medicine: the emergence of tropical medicine, 1500–1900. Amsterdam: Rodopi, 1996: 181–207