Credit control

Ronald Ross: Malariologist and Polymath – A Biography

by Edwin R. Nye and Mary E. Gibson
Macmillan/St Martin's: 1997. Pp. 316. £45, \$59.95

Mary J. Dobson

On 20 August 1897, Ronald Ross made the critical observations that were to prove that mosquitoes transmit malaria. On that day, in Secunderabad, India, Ross peered down his cracked microscope and saw pigmented swellings (oocysts) embedded in the stomach wall of an *Anopheles* mosquito that had been fed on a malarious patient. In the stifling atmosphere of a dingy little military hospital, and unable to use the *punka* (ceiling fan) for fear that his dissected mosquitoes might blow away, Ross recorded his first signs of success.

After several years of frustration, while working on the problem in the Indian Medical Service, he had at last established that malaria parasites, identified by Alphonse Laveran in 1880, spent part of their life cycle in 'dappled-winged' (*Anopheles*) mosquitoes. The mists of malaria were lifted and the following day Ross celebrated his discovery in verse that included the moving lines: "I find thy cunning seeds, O million-murdering Death".

Ross's breakthrough has often been cited as one of the most dramatic discoveries in medical science, and Ross himself was anxious to remind the world of its significance and to reap its rewards. It is a fitting tribute to Ross that Edwin R. Nye and Mary E. Gibson have produced this elegant and illuminating biography during his discovery's centenary year. Their book is more than an account of a great discovery. It reveals Ross (1857–1932) as a family man, malariologist and polymath who was caring, committed and, above all, determined to receive due recognition and financial reward for his discovery.

Ross emerges from this biography as one of the most active, ambitious and embittered pioneers in the history of tropical medicine. We read of his personal and scientific activities, extensive travels, interactions and quarrels with scientists, politicians and writers, his time at the Liverpool School of Hygiene, his literary and mathematical achievements, and the many accolades he received, including a fellowship of the Royal Society, the Nobel prize for medicine in 1902, a knighthood, and the legacy of the Ross Institute.

The authors have no shortage of material from which to construct their narrative. Much of Ross's story is already known from his *Memoirs*, which won him the James Tait Black Memorial Prize for biography in 1923 and were republished in part in 1988 as *The*

From life cycles to tricycles: Sir Ronald and Lady Ross, 1929.

Great Malaria Problem and its Solution. Ross's self-portrait is richly reinforced and supplemented by Nye and Gibson's selection of extracts from the unpublished Ross archives.

Ross was so obsessed with the need to keep a record of his personal achievements and to prove his priority in solving the great malaria problem that he requested and managed to obtain copies of letters he had sent to his numerous correspondents.

It is through his writings that the authors describe Ross's bitter disputes with colleagues and authorities, particularly his rift with Patrick Manson, the 'father of tropical medicine' who had first encouraged Ross to explore the link between malaria and mosquitoes, and his venom towards the Italian malariologist Giovanni Grassi. It would, however, have been interesting to have included more about the scientific activities and contributions of the Italian malariologists. For although Ross, while stationed in Calcutta in 1898, was able to follow up his initial discovery by showing the life cycle of bird malaria, it was the Italians who, later in the same year, worked out the complete life cycle of human malaria. We will, perhaps, have to await the Grassi centenary in 1998 to get the other side of the story.

The Ross archives played an important role in Ross's political manoeuvrings. In 1928, having unsuccessfully petitioned the British Parliament to reward his research, as it had Edward Jenner a century earlier when he discovered the smallpox vaccine, Ross made his grievance public by selling his personal papers for £2,000, a large sum at the time. He also fuelled a lively correspondence in the scientific literature, entitled "The Rewards of Research and How to Apply For

It". Undoubtedly, this dissatisfied scientist would have been well-satisfied that his biographers have given prominence to his strong personal feelings of pecuniary injustice—an issue as troublesome to scientists today as it was a century ago.

The rewards of Ross's research must, however, be seen in another light. Ross, Grassi and others not only transformed the understanding of malaria but they laid the foundations for the application of work on the practical control of the disease. For the first time in history, it was possible to show that, if the mosquito vector could be eliminated, malaria transmission could be prevented.

Shortly after his discovery, Ross turned his attention with passion and zeal to the prevention of malaria. Although the authors make an excellent job of portraying Ross as malariologist and polymath, they are much less effective in discussing the early schemes of malaria control that were opened up by Ross's pioneering work. They also miss an opportunity to examine Ross's ideas for the prevention of malaria, including the cost, value and feasibility of 'mosquito brigades', chemoprophylaxis and bed-nets, in the context of current policy.

The successes and failures of anti-larvae measures immediately following Ross's discovery, especially the contrasting outcomes in Panama and at Mian Mir in what is now Pakistan, not only demonstrated the possibilities and limits of eliminating the mosquito vector but also set in motion a series of dichotomies about how best to control malaria. The legacies of these early debates, which are not developed in this biography, have resurfaced throughout the twentieth century and are still with us. Indeed, it is a sad irony that, 100 years after Ross's brilliant dis-

covery, ways of tackling the great malaria problem remain unresolved.

At the Second Global Meeting of Parasitology held in Hyderabad, India, in August to commemorate the centenary of Ross's discovery, the hope, the frustration and the determination to control malaria were as much in evidence as they had been in the early twentieth century. If one lesson has to be learnt from this history, it is the difficulties of moving forward from the results of scientific discovery.

Ross would have been delighted by the attention he has received in this centenary year. Not only have we welcomed this biography, we have also witnessed the renaming of a road and a hospital in his honour, the renovation of his laboratory in Secunderabad, the unveiling of Ross busts, and his picture projected on postage stamps and T-shirts. But Ross would not have been happy to learn that 300–500 million people are still suffering from malaria 100 years after 'Mosquito Day' 1897.

I hope that this biography will be read both for its own merits and as a way of stimulating further interest in Ross's views and vision for the prevention of malaria. □

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Heavyweight history

Science in the Twentieth Century

edited by John Krige and Dominique Pestre
Harwood Academic: 1997. Pp. 941. £80, \$120

Graham Farmelo

One of the saddest sights in science is the chasm between its practitioners and its historians. Although scientists are curious about the history of their subject and most historians of science have an interest in contemporary science, the professions have yet to establish an effective dialogue.

This cultural division was exemplified two years ago when the British and American Institutes of Physics published a three-volume history of twentieth-century physics that featured contributions from 31 distinguished scientists, not one of them a trained historian. The result was an impressive but introspective account that would have been a good deal richer if the contributors had brought to their essays a wider historical awareness.

Science in the Twentieth Century goes to the other extreme: its contributors are 50 leading historians, none of whom is a practising scientist. At first sight, its 941-page bulk and the austerity of its design make it one of those books that cry out to be weighed rather than read.

But a cursory look through its pages reveals it to be something rather special. For these are authoritative essays intended for scientists and lay people with an informed interest in modern science. Almost all the contributions are devoid of historiographical jargon and have relatively few references, so the authors are not writing solely for their peers. The book, or "project" as its editors tellingly describe it, is an ambitious and laudable attempt to make the best thinking about the history of modern science accessible to scientists.

There is no denying the sheer range of the material covered. Between them, the authors review the nature of science, its place in the social fabric, how the most productive research has been carried out and what has been achieved. Although the content of the essays reflects the pre-eminence of the scientific contributions from the United States and Europe, it is good to see thorough reviews of the work done in other parts of the world, notably Russia, India, Latin America and Japan.

Similarly, the branches of science considered go way beyond the historians' favourite areas of medicine, astronomy and fundamental physics; between these covers are first-rate histories of disciplines as diverse as geology, mathematics and polymer chemistry. To read this book is to begin to appreciate how much our understanding of science (not to mention technology and industry) has been enriched by the comparatively small community of historians of science since their subject became

established as an academic field, only about 50 years ago.

Invidious though it is to focus on a few of the 46 essays in this tome, three will serve to give an idea of the breadth of coverage. In one of the three introductory pieces, Simon Schaffer of the University of Cambridge considers how science has been perceived by the public in different countries during the past century. In a characteristically lucid piece, he examines a wide variety of media and comes to the surprising conclusion that the most important way in which the public has derived its image of science is through exhibitions. (It would be fascinating to use survey data to check whether this hypothesis holds in the future.)

In this most violent of times in human history, every branch of culture has been influenced by the military, and science is no exception. In a masterly review, Everett Mendelsohn of Harvard University looks at the impact on Western science of the armed forces, notably in the world wars. He points out that after the First World War none of the major powers developed a clear policy for science in the military, with the result that on the eve of the Second World War most of the agencies linking science and industry had to be reinvented. Now, in the aftermath of the Cold War, Mendelsohn suggests that scientists have the "illusion of autonomy", a notion with which he abruptly and tantalizingly ends his piece.

One branch of science served particularly well in the book is immunology. Anne Marie Moulin, of L'Hôpital des Enfants Malades in Paris, reminds us that this subject is not much older than the century itself. She gives a fascinating account of its history, which she believes is best characterized as a series of controversies rather than of Kuhnian revolutions. How much has been achieved in these disputes will be tested, Moulin asserts, in the "clear-cut assignment" of tackling the AIDS epidemic.

This book would be an asset to any science library. For scientists who have the time to read it and the stamina to carry it back to their offices, there is much to be learned and enjoyed. They may be disappointed that the index does not do justice to the richness of the text and that the editors do not provide a coherent summary in their otherwise admirable introduction. Also, many will regret that there are no contributions from historically aware scientists, who could have given a more vivid sense of what actually happens at the coal-face of research.

There is, however, no doubt that the editors deserve our gratitude for all they have done, as we approach the end of science's most productive century, to bring us this monumental collection. It is of much more than historical interest. □

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