
Cases of Guinea Worm (*dracunculiasis*) in Nineteenth-Century Australia

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Reports of cases of Guinea worm (*dracunculiasis*) in Australia in the 1860s reflected the interest of local physicians in a disease originating far beyond the island continent. In 1860, Paul Howard MacGillivray (1834–99) wrote a report based on a case he had treated at Hobson's Bay, now known as Williamstown, in the colony of Victoria. His report demonstrated that he was well abreast of the current medical literature about this tropical disease.¹ In 1863, Alexander Stewart Paterson (1837–1902) reported a case in Sydney.²

Guinea worm (*dracunculiasis*) is a debilitating parasitic infection, which until recently was common in parts of the Indian subcontinent and tropical Africa. The number of people infected has fallen sharply since the global eradication program started in the mid-1980s. Guinea worm disease is contracted by swallowing water containing the embryo of an infective worm. The long duration of the transmission cycle of the disease agent (approximately twelve months) meant that travellers who contracted the disease in a part of the world where it was endemic might be thousands of kilometres

1. Paul Howard MacGillivray, 'On a case of Guinea worm', *Australian Medical Journal*, vol. 5, 1860, pp. 172–4.

2. Alexander Stewart Paterson, 'The dracunculus, or *filaria medinensis*', *Medical and Surgical Review: Australasia*, vol. 1, 1863–64, pp. 142–3.

away from that place when the female worm finally emerged through the skin. In an endemic area, the worm would expel thousands of eggs into a water source when the sufferer entered the water to bathe or to fetch water. The eggs would then enter the intermediate host, a species of *copepod*, a minute fresh water crustacean, and within about two weeks an individual would drink water containing the *copepods* and the infective embryo. Twelve months later, after a male and female worm mated in the human tissues, a worm would emerge. The transmission cycle could not continue unless the eggs were discharged into an unprotected semi-stagnant water source in which the appropriate host species were found; the optimum water temperature for the development of larvae was 25–30°C.³

Paul Howard MacGillivray (1834–95) made a name for himself as a surgeon and natural scientist in the colony of Victoria. After qualifying as a doctor at the University of Aberdeen, he immigrated to Australia in 1859 and established a practice in Hobson's Bay, an important entry point for people and goods bound for Melbourne.⁴ His first publication was a short letter to the editor of the *Australian Medical Journal* in February 1859, in which he reported a case of a ruptured bladder in a seaman on board a ship at Hobson's Bay. In passing, he commented that he had actually been called in to treat the patient for a Guinea worm in the foot. However, he did not comment on the infection.⁵

MacGillivray's brief encounter with Guinea worm was soon followed by another one. In April of the following year, he reported that he treated a ship's officer and rolled out the worm out round a strip of 'plaister', the usual treatment in endemic areas at that time. He reported that when the ship sailed a week later, the patient was almost better.⁶

In the interval between seeing the two Guinea worm cases, MacGillivray had been able to consult medical journals then available

3. Susan Watts, 'Perceptions and Priorities in Disease Eradication: Dracunculiasis Eradication in Africa', *Social Science and Medicine*, vol. 46, 1998, pp. 799; *Australian Medical Journal*, vol. 4, 1895, p. 151.

? *ibid.*; MacGillivray, 'On a case of Guinea worm'.

4. Anon., 'Obituary: Paul Howard MacGillivray', *Australian Medical Journal*, new series 17, 1895, pp. 325–6; Paul Howard MacGillivray, *Australian Dictionary of Biography*, vol. 5 (1851–1890, K–Q), MUP, Melbourne, pp. 155–6.

5. Paul Howard MacGillivray, 'Letter', *Australian Medical Journal*, vol. 4, 1895, p. 151.

6. *ibid.*; MacGillivray, 'On a case of Guinea worm'.

in Melbourne. Giving a full citation, he acknowledged that his comments on Guinea worm were taken from a paper by H. J. Carter in the *Annals and Magazine of Natural History* published in Calcutta the previous year.⁷ MacGillivray could have consulted this journal at the University of Melbourne or at the Public Library of Victoria. He would have read that Carter was puzzled by the origin of the worm. Carter examined worms found in soil and water in and around Bombay, and then suggested that one of a species of worm that he named *urolabes* entered the human body through the skin of people bathing in water tanks. He suggested that these eventually emerged from the skin as Guinea worms. In the apparent absence of any male worm, Carter thought that the young were produced by spontaneous generation, 'a process of internal gemmation'. He wrote that cases of Guinea worm were recorded in sailors ten months after they had returned to England from Bombay.

This comment prompted MacGillivray to ask his patient about any recent travels. The officer replied that he had been in Bombay during March, April and May 1859, sailed to England and thence to Williamstown, arriving ten months after leaving Bombay. MacGillivray was not totally convinced of Carter's idea that the worm entered the human body through the skin; however, he thought it 'not very probable' that the source of the infection was the water used on the ship during the passage 'home'. It was not until 1869 that the young Russian natural scientist, Alexsej Fedchenko identified the intermediate host, which was swallowed when drinking water, and thus resolved much of the confusion about the life-cycle of the *dracunculus*.⁸

MacGillivray's 1860 paper on Guinea worm was his first substantive publication in the *Australian Medical Journal*, and the first of those that were later collected in book form.⁹ This paper can be said to mark the beginning of a distinguished career, first in Williamstown and after 1862 in Bendigo, where he was a surgeon

7. H. J. Carter, 'On *Dracunculus* and Microscopic *Filaridae* in the Island of Bombay. Part I', *The Annals and Magazine of Natural History*, 3rd Series, vol. 4, July–August 1859, pp. 28–44.

8. Watts, 'Perceptions and Priorities in Disease Eradication'.

9. P. H. MacGillivray, *Medical and Surgical Papers Reprinted from the Australian Medical Journal*, J. W. Pearson & Co, Trio Printing Office, High St, Sandhurst (Bendigo), 1872.

at the Bendigo Hospital and later ran a private practice in the town. MacGillivray's interest in parasitic diseases was later demonstrated in his thorough reports of hyatid cysts in Australia.¹⁰ His obituary in the *Australian Medical Journal* stated that he 'established for himself a reputation which made his name deservedly famous all through the colonies', and also noted that he regularly travelled to Melbourne for meetings of the Medical Society of Victoria, of which he was elected president in 1874.¹¹

A few years later, in 1863, a second and much less revealing report of Guinea worm in Australia was published by Alexander Stewart Paterson, then Resident Surgeon of the Yarra Bend Lunatic Asylum.¹² Later, as Resident Medical Officer of the Adelaide Lunatic Asylum for nearly thirty years, he acquired a reputation for being 'deeply versed in all matters relating to the treatment of mental diseases'.¹³ Paterson reported on a case of Guinea worm which 'occurred some time ago in Sydney' in a 'native' from India. The swelling was treated nightly with tincture of iodine and, as the swelling increased, an incision was made and the worm wound out around a piece of wood over a period of ten days. As this description was written in the passive voice, it is not clear if Paterson actually saw the case himself, or if he heard about it from a fellow physician. There was no information on the travel history of the patient, which might have shed some light on when and where the infection was contracted. Paterson was vague about the possible cause of the infection, noting that the patient 'had not bathed in India in fresh water for at least four months'. Paterson, like MacGillivray, referred to the work of Carter, mentioning the ova of animals contained in bathing water, which burrow into the subcutaneous tissue, but he cited no precise source for this statement.

These two accounts by MacGillivray and Paterson do suggest the likelihood that there were a number of unrecorded cases of Guinea worm in the ports of Victoria and New South Wales in the

10. P. H. MacGillivray, 'On a Case of Hyatids in the Orbit; with an Abstract of Cases of Hyatid Disease Treated in the Bendigo Hospital', *Australian Medical Journal*, vol. 11, 1865, pp. 243-53. See also an early case report by his partner in Williamstown: D. P. MacLean, 'Case of Rupture of the Liver, in Consequence of Hyatid Cyst with Fatal Haemorrhage', *Australian Medical Journal*, vol. 6, 1861, pp. 265-9.

11. Anon., 'Obituary: Paul Howard MacGillivray'.

12. Paterson, 'The dracunculus, or *filaria medinensis*'.

13. Anon., 'Obituary: Alexander Stewart Paterson', *Australasian Medical Gazette*, vol. 21, 1902, pp 97-8.

nineteenth century; transmission within Australia would have been improbable. During its early years, the young colony of New South Wales was often victualled from India. Along with foodstuffs and other necessary provisions, it is likely that Guinea worm was imported in the body of sailors. With the opening of the Suez Canal in 1869, ships more often sailed directly from England and there was less need for frequent communications between the ports of India and Australia.

These accounts, especially that of MacGillivray, also illustrate Melbourne's early start as a centre of medical excellence. The development by the 1860s of a lively medical community was supported by the University of Melbourne library and the Public Library of Victoria (both established in 1854), a medical association and a journal founded in 1855.

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