

Smallpox vaccination at the edges of the Empire

Around 1804-05, there occurred an international phenomenon that resonates today. This was the time when there began a global distribution of Edward Jenner's smallpox vaccine, derived from cowpox, and it saw the same issues of acceptance, and keeping the vaccine active over long voyages, that we've experienced in the last few years. The recent extraordinarily rapid development and distribution of covid vaccines, and their efficacy, has a lineage that is not often recognised.

This global effort pops up unexpectedly in rare, early books. One concerns the author of the first book written specifically on New Zealand in 1807 by Dr John Savage¹, a surgeon in Sydney, and the other an 1805 translation into Chinese in Canton by the British traveller, administrator and sinophile, George Thomas Staunton².

But some background first. Small pox was widespread globally for centuries, but its spread was hastened by the surge in trade, slavery, colonisation and global exploration in the 17th and 18th Centuries. A form of inoculation had also long been practised, known as variolation. It involved rubbing dried smallpox scab material or lymph fluid into scratches on the skin, or in some Asian countries such as China, snuffing it up the nose. There were risks of serious infection, but it was a fairly common method, with the Kangxi Emperor in the 17th C, and Catherine the Great and her family in the 18th leading the way. It was also used by slavers and in armies, usually after an outbreak.

By 1798, however, Edward Jenner had shown that inoculation with lymph fluid from cowpox pustules provided immunity, and from early in the next century, there was a global effort to use Jenner's vaccine, particularly by the French and Portuguese in the Indian Ocean, the British at their colonial and trading outposts, and in the Americas. Napoleon eventually used it for his army. The biggest problem was how to keep the vaccine active over long journeys, it being susceptible to heat and humidity. One way was to serially inoculate passengers on ships, particularly children, so keeping the vaccine alive by extracting lymph from the arms of those inoculated. One calculation suggested that 12 to 14 children would be enough, two inoculated each week, but this would scarcely be enough for a 10 weeks or more voyage.³ Eventually, ways of transporting dried vaccine were found.



John Savage and smallpox in Australia

In 1789, a smallpox outbreak occurred in the Sydney area, killing large numbers of Aborigines, and raising serious concerns with Governor Phillip (1788-1792), the medical officers, and particularly Phillip's successor but one, Governor King (1800-1806), as to its origin and potential spread.² King wrote to Lord Hobart, British Secretary of State for the Colonies, in 1803, requesting vaccine. And this is where our Dr John Savage comes in.

Savage was familiar with vaccination, and as a young, 33 year old doctor, departed from London in 1803 with a position of assistant surgeon for New South Wales. He carried with him a sample of cowpox lymph from John Ring, a colleague of Jenner. The plan was to inoculate passengers to keep the vaccine alive, but Savage met opposition from the ships' surgeon, with the captain reluctant to over-rule him. His dried sample was inactive when he arrived in Sydney in March 1803. It was this failure that prompted Governor King to write requesting vaccine, suggesting that the live arm-to-arm scheme, used successfully in India, might be used, and knowing Savage's lack of success on board his ship, also suggesting a reward for the surgeon as an incentive.²

Towards the end of 1803, samples sealed in glass, packaged by the Royal Jennerian Society and the London Cow-Pock Institution were sent with high hopes, but the vaccine also turned out to be ineffective. But here comes Dr Savage again. John Ring had sent out, alongside the official vaccine samples, a privately dispatched sample to John Savage, packaged differently, and Savage used this on a child in Paramatta with success. Savage, noting that he was the subject of some jealousy², subsequently worked with the Surgeon-General, Thomas Jamieson, to develop a successful vaccination campaign, targeted at children. This brought about the '*completion of cowpox's circumnavigation of the globe*'.

There is no mention made of extending the vaccine on to New Zealand, and given that there was no administration nor missionary activity at that time, it is not surprising. However there is a pamphlet in te reo Māori from 1849 warning against small pox⁴. The original appeared in the *Maori Messenger* along with the text in English⁵, describing the symptoms and its infectiveness. There is also a long description of its spread around the world, particularly to island nations such as Iceland and Australia. It suggests that the disease was not in New Zealand, describing how they had a narrow escape when smallpox was found on a ship bound for New Zealand 6 months previously, but had cleared by the time it reached New Zealand. The article then describes cowpox and how it is used for inoculation, and announces that the Governor (then Sir George Grey) is introducing vaccination, and '*wishes to teach some of yourselves to vaccinate; and after they have learned how to do it, he will send them to vaccinate all your men, women and children now living.....and in after years when you know more than you now know, I have no doubt that you will often say, that the Governor who introduced vaccination was a tried friend.*'

Back to John Savage. A year later we find him aboard the whaler the *Ferret*, stopping over in the Bay of Islands for a couple of months. Savage had been court martialled for malpractice in not attending a woman who died in childbirth. He had the backing of Governor King, and determined to clear his name, sailed to London to do so, successfully. There he wrote the first book on New Zealand. He says little about the health of Māori, but notes their strong build and healthy diet. But he does have one worry that links back to his profession and Sydney experiences. He is concerned about a '*most distressing malady*' and thinks that '*the captain of a ship might be required to ascertain that his sailors were incapable of communicating a disease which would entail misery upon the future population of a healthy and happy country.*' He never returned to Australia or New Zealand, but did turn up in Calcutta in 1826 as a surgeon with the East India Company.

George Staunton and smallpox in China

Smallpox was endemic in China, the first written account of the disease appearing in the 4th C CE. From around 1500, variolation with the dried scab blown up the nose with a bespoke pipe was widely practised. However, at about the same time as vaccine derived from cowpox arrived and was administered in Australia, Dr Alexander Pearson, senior surgeon with the East India Company in Canton and Macao, used vaccine recently arrived in Macao to successfully perform arm-to-arm vaccination in China. His description of this, with instructions on how to go about the vaccination, was printed in Canton in 1805, with a Chinese translation by George Thomas Staunton.

The young George Staunton first appears in late 1792 as a 12 year old member of the Macartney embassy to Peking, as a condition for his father, Sir George Leonard Staunton, an East India Company employee, accepting the role as secretary and thus second-in-charge to the embassy. A tutor for the young George, Johann Christian Hüttner, was also present, additionally acting as a translator (of Latin not Chinese). George learned some Chinese on the voyage from the couple of Chinese translators present, sourced from the Jesuit College in Naples. It transpired, that George was later able to make some conversation with the Qianlong Emperor, to the latter's bemusement. The elder Staunton wrote the official account of the Embassy⁶, and other members published their own accounts around the same time.⁷ Hüttner reluctantly published his in 1797, only recently translated into English.⁸

In 1798, George Thomas, still only 17 years old, was appointed a writer with the East India Company, stationed at Canton. His facility with the Chinese language reached a level where he was translating documents, and notably, in 1805, a translation of Alexander Pearson's text on smallpox. In 1816 he was taken aboard the Amherst Embassy to Peking as second commissioner, after Lord Amherst and Henry Ellis. The embassy was even more unsuccessful than Macartney's, with a failure to even have an audience with the emperor and being marched out of Peking with nothing achieved. On his return, Staunton left China for England and never returned, secure in his baronetcy and country house, and establishing himself as an MP and the resident expert on all things Chinese.



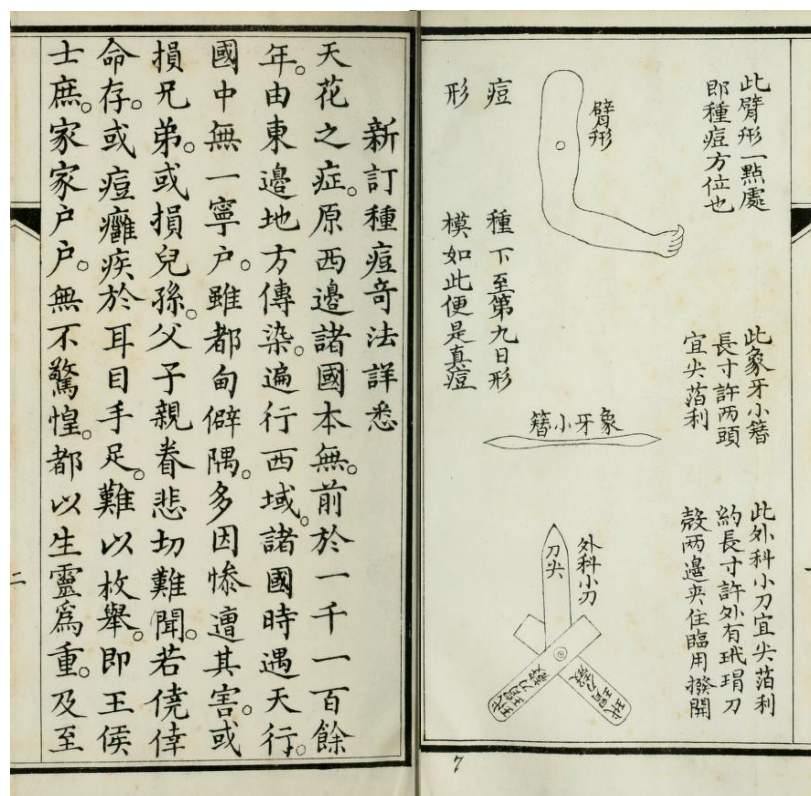
Among the works that Staunton wrote over this time was a book of Miscellaneous Notes on China, published in 1822, comprising a series of notes on the language, trade, history, and including some translations.⁹ In 1828, he published a second set, and there at the end is a copy of the translation of Pearson's document on smallpox.² Staunton provides an English summary of Pearson's text before printing his translation.

Vaccine Inoculation

Originally written in English, by Alexander Pearson, Esq. translated into Chinese by Sir George Thomas Staunton, Bart, and printed at Canton in 1805, at the expence of the East India Company, under the direction of James Drummond, Esq. (now Viscount Strathallan) then President of the Select Committee, and with the sanction of Gnewqua, a Chinese merchant of the privileged class.

Origin of the small pox — when and where first known — its dreadful ravages on the human frame and race. — First introduction of common inoculation, a remedy, but an imperfect one — description of it. — At length the vaccine disease is discovered in England — certain persons employed in milking cows are found not to contract the disease of the small pox. — This fact comes to the knowledge of Dr. Jenner — he investigates the cause — discovers blue pustules on the udder of the cow, and conceives the idea of applying the matter arising therefrom, to the human body, as a preventive to the contagion of the small pox. — On experience it is found that on the fourth day, a pustule appears — on the eighth or ninth it fills with matter, and on the fourteenth disappears. — The practice is approved, and extends all over Europe, Asia, and America — millions are thus inoculated and protected against the ravages of the natural small pox. The king of Spain, highly approving of it, sends children who had been inoculated with this vaccine virus in his ships to various parts of his dominions, especially the Philippine Islands ; from whence this vaccine matter has now, in the 4th moon of the 10th year of the reigning emperor Kia-king, been at length obtained in China. The English and Portuguese physicians residing on the spot have introduced the practice — some hundreds have already been inoculated, without one instance of failure. — Recapitulation — Essential difference between the vaccine and the small pox — mode of inoculation minutely described — progressive symptoms — genuine pustule how distinguishable — mode of conveying the virus upon needles to a distance — false or spurious appearances described — regimen proper to be observed by the patient.

Near the end of the Chinese text, Staunton provides an illustration of an arm with the site of inoculation marked.



The text is at pains to show how safe the vaccine is and that notables, such as the King of Spain and his family, have been vaccinated. It spells out the difference between smallpox and cowpox, one providing resistance to the other, and notes that the vaccine supply in Macao came from the Philippines (hence the interest in the King of Spain). Modern takes on the Pearson/Staunton text suggest that it was instrumental in bringing and applying the vaccine to China.¹⁰ Within the next few years the London Missionary Society

missionary Robert Morrison and the East India Company doctor John Livingston were recorded vaccinating the poor in Macao¹¹.

One side issue of interest with the books, is that Staunton's 1822 Miscellaneous Notes book has no Chinese characters, whereas 6 years later there are pages of them. In the early 1820s, British printers did not have blocks of characters available, but this seems to have changed quickly. That is partly why early books or documents were printed at the East India Company press established in Macao by Peter Perring Thoms in 1814, when he brought out to an English press, movable type and other necessities. It was originally applied to the printing of Robert Morrisons '*Dictionary of the Chinese Language*', published from 1815 to 1822. The first works of John Francis Davis, for instance, were sent back to Macao from London because of the absence of type. The 1805 printing of the Pearson/Staunton piece on smallpox was printed at Canton prior to Thoms setting up his press. The pages of Chinese text here in the 1828 book, however, are plates. Staunton's book was printed by I Skelton, Havant, from a prominent printing and booksellers family in and near Southampton and Portsmouth. It is interesting that while the first volume of 1822 was published by John Murray, this second one was privately printed, for 'Private Circulation'. Perhaps Murray saw no business in yet more bits and pieces on China.

The analogies with our recent Covid pandemic are easily seen. Just as the distribution of smallpox vaccine needed international cooperation, made much easier by the power of the British, Spanish and French empires, so we had extensive cooperation, mostly, across international borders with Covid. Again, the major 19th C issue of getting active vaccine to far away places, with Jenner's vaccine susceptible to heat and high humidity, has an analogy in the need for extra low temperature storage for some of the early Covid vaccines. And there was opposition, both from some in the medical fraternity, and from the public, with the fears of the disease, dislike of injecting material from animals (lovable calves in the smallpox instance) into the body, and conspiracies. The other commonality is that the vaccine worked – eradication of smallpox being one of the triumphs of medicine and modern health systems. There's not much new.

¹ **Savage, J.**, Some account of New Zealand; particularly the Bay of Islands, and surrounding country; with a description of the religion and government, language, arts, manufactures, manners and customs of the natives, &c. &c. London, J. Murray, 1807.

² **Staunton, Sir George Thomas**, Miscellaneous Notices relating to China and our commercial intercourse with that country. Part the second. By Sir George Thomas Staunton Bart. L.L.D. & F.R.S. For private circulation only. MDCCCXXVIII [1828]. pp 311-312, + 14 pp Chinese text and diagram.

³ **Bennett, M. J.**, Smallpox and cowpox under the Southern Cross: The smallpox epidemic of 1789 and the advent of vaccination in colonial Australia. Bull. Hist. Med. 83, 37-62, 2009.

⁴ Pukapuka ki nga tangata Maori, hei tohu i a ratou i te mate Koroputauta. Akarana: hei mea ta i te Perehi o Williamson & Wilson. 1849. Bagnall 4716.

⁵ The Maori Messenger, Volume 1, Issue 2, January 19, 1849. pp 2-4.

⁶ **Staunton, J. L.** An authentic account of an embassy from the King of Great Britain to the Emperor of China; London: W Bulmer and Co. MDCCXCVII [1797].

⁷ See a full account of the various publications from the Embassy at <https://ianferg.nz/early-books-on-china/>

⁸ https://www.hakluyt.com/downloadable_files/Journal/Huttner.pdf

⁹ **Staunton, George Thomas** Miscellaneous Notices relating to China, and our Commercial Intercourse with that Country, including a few translations from the Chinese Language. London, John Murray, 1822

¹⁰ There is also a copy of Pearson's 1805 article in Vol. 2 of *The Chinese Repository* ed. Elijah Bridgman, Canton, 1833-34. The Repository was the leading protestant monthly magazine in China over this period. See Lowendahl 893.

¹¹ **Fu, Louis**, The Protestant medical missions to China: the introduction of Western medicine with vaccination. *J. Med. Biography*, Vol. 21, 2013. pp 112-117.