Medical History, 1999, **43**: 108–110

Texts and Documents

Edward Jenner's Unpublished Cowpox Inquiry and the Royal Society: Everard Home's Report to Sir Joseph Banks

DERRICK BAXBY*

Edward Jenner's *Inquiry into the causes and effects of the variolae vaccinae . . . known by the name of the cow pox*, published in 1798, contains the evidence on which he based his claim that inoculated cowpox (later called vaccination) induced lifelong immunity to smallpox. He did one vaccination in 1796, but more important was the small series of vaccinations done in 1798 which showed that vaccine maintained its effectiveness through at least four serial arm-to-arm transfers.[1]

Those interested in Jenner and vaccination will know that he originally intended to publish his evidence in the *Philosophical Transactions* of the Royal Society; also that two different manuscripts of the *Inquiry* survive. Both have been compared with the published version; the manuscripts were written during March and April 1797 and so describe only the first vaccination done in 1796.[2] That Jenner intended to submit his work to the Royal Society is evident from the phraseology used in the manuscripts, and is confirmed in a letter written by him probably in 1809.[3] However, other manuscript versions existed and there is no reason to assume that either of the surviving manuscripts was the one actually seen by the Society.[4] Further, there is no evidence in the Society's records or related correspondence that any paper was submitted formally.

*Derrick Baxby, PhD, FRCPath, FRSA, The University of Liverpool, Department of Medical Microbiology, Duncan Building, Daulby Street, Liverpool L69 3GA, UK.

The transcript of the Home letter is published with the permission of the Board of Trustees, Royal Botanic Gardens, Kew. I should like to thank Sir Christopher Booth for drawing my attention to its location, and Lesley Price of the Royal Botanic Garden for kindly providing a photocopy of the original.

[1] Edward Jenner, *An inquiry into the causes and effects of the variolae vaccinae . . .*, London, Sampson Low, 1798; information about the location of copies and availability of facsimiles is provided by William LeFanu, *A bibliography of Edward Jenner*, Winchester, St Paul's Bibliographies, 1985; the *Inquiry* and the immediate reaction to it is analysed in detail in Derrick Baxby, *Jenner's smallpox vaccine*, London, Heinemann Educational Books, 1981, pp. 52–88.

[2] Derrick Baxby, 'The genesis of Edward Jenner's Inquiry of 1798: a comparison of the two unpublished manuscripts and the published version', *Med. Hist.*, 1985, **29**: 193–9.

[3] Letter from Edward Jenner to James Moore, in John Baron, *Life of Edward Jenner*, London, Henry Colburn, 1838, vol. 2, pp. 363–4.

[4] Baxby, op. cit., note 2 above; Richard B Fisher, *Edward Jenner 1749–1823*, London, André Deutsch, 1991, p. 71. Jenner is known to have shown copies of his proposed publication to various colleagues. Baron, op. cit., note 3 above, vol. 1, p. 142.

The usual interpretation of events is that a paper was considered informally by the Royal Society through the agency of Everard Home FRS and Sir Joseph Banks, the President. Home, who was John Hunter's brother-in-law, and Banks were both known to Jenner through his period as Hunter's pupil in 1770–72. As a result, according to Baron, who knew Jenner well, he was advised that his reputation would suffer if he published conclusions based on so little evidence.[5] The important series of vaccinations was done in 1798, and the *Inquiry* published later that year.

Unfortunately Jenner's biographers have overlooked a letter from Everard Home to Sir Joseph Banks concerning Jenner's plans to publish in 1797. Although summarized elsewhere,[6] it is published here in full and commented upon for the first time. In effect it is a referee's report on Jenner's proposed publication of 1797.

Letter from Home to Banks

Dear Sir Joseph

I read over Dr Jenners [*sic*] paper, and think the account of the Cowpox curious, but dare not venture to be satisfied with the evidence there addressed that it is a prevention of Smallpox, for the following reasons. The same person can have the Smallpox only once, but the Cowpox Dr Jenner has met with twice in the same person, this is a strong characteristic difference. The persons who were not susceptible of the Smallpox after having had the Cowpox were grown persons and were probably not naturally susceptible of that disease, and the instances are much too few to admit of conclusions being drawn from them—if 20 or 30 children were innoculated [*sic*] for the Cow pox and afterwards for the Small pox without taking it, I might be led to change my opinion, at present however I want faith.

April 22 1797 Yrs much obliged
and most truly
Everard Home

Discussion

The letter is of interest because it provides the only known contemporary documentary evidence of what an independent critic thought of Jenner's earliest paper.[7] It is of interest to note Home's comments on Jenner's observation that second attacks of cowpox, but not smallpox, could occur; "a strong characteristic difference" which biased Home against Jenner's views. In fact Jenner's observations were sound. Human cowpox is now so rare that second attacks are most unlikely; however, they are theoretically possible. Revaccination against smallpox showed that individuals are commonly susceptible to repeated dermal infection with smallpox vaccine,[8] and the author has seen quite severe cowpox in someone who was successfully vaccinated thirteen months earlier.[9]

[5] Baron, op. cit., note 3 above, vol. 2, p. 168.

[6] The letter is in the Banks collection, Royal Botanic Gardens, Kew, Banks letters, vol. 2, Doc.159; Warren A Dawson (ed.), *The Banks letters*, London, British Museum, 1958, p. 419; Christopher C Booth, 'The development of medical journals in Britain', *Br. med. J.*, 1982, **ii**: 105–8.

[7] Friendly "critics" such as Worthington, Paytherus and Hicks who saw drafts of the *Inquiry*, including the one published, obviously agreed with Jenner and failed to appreciate the faults that soon attracted attention, Baxby, op. cit., note 1 above.

[8] Frank Fenner, D A Henderson, I Arita, Z Jezek, I D Ladnyi, *Smallpox and its eradication*, Geneva, WHO, 1988, pp. 294–9.

[9] Baxby, op. cit., note 1 above, pp. 76–7.

Home's conclusion that adults not susceptible to smallpox after having cowpox were naturally immune to the former is perhaps unfair. This might have been so in a very rare case. In any event, Jenner's evidence on this was circumstantial only and it is possible that some, as children, may have had mild smallpox mis-diagnosed as chickenpox.[10] Home properly picked up the need for more vaccinations to support Jenner's principal claim that inoculated cowpox protected against smallpox.

We have no information about the precise contents of the paper seen by Home. His report was written at the end of April 1797 shortly after the two surviving manuscripts were finished.[11] Consequently it is probable that the missing paper contained the same information. If so, then Home's report is perhaps somewhat superficial and there were other important points on which he did not comment. As discussed briefly below, these deficiencies were not rectified and attracted criticisms when the *Inquiry* was published.

Despite the reservations of Home and Banks, Jenner evidently still thought he had enough evidence to support his claims and apparently planned to publish privately in 1797.[12] However, he saw, or was shown, the need for more vaccinations and these were done in 1798. Perhaps fearing rejection again, he published the *Inquiry* privately. Although quite a common practice, this was unfortunate because the published version still had defects to which attention was soon drawn.[13] The total number vaccinated, still small, was not stated; not all were challenged with smallpox; the theory that cowpox originated as "grease", an equine disease, was untenable on the evidence presented; there was ambiguity over the appearance of the lesions of inoculated smallpox and cowpox; attempts to differentiate between effective ("true" cowpox) and ineffective material ("spurious" cowpox) were poorly explained. Finally the idea that inoculated cowpox offered lifelong protection against smallpox was over-optimistic, and in any case could be assessed only by long-term studies. These deficiencies were soon to be addressed by Jenner, his supporters and opponents, but firm initial advice from independent critics, acted upon by Jenner, would have prevented some of his future problems.

[10] Although the clinical distinction between smallpox and chickenpox was drawn by Heberden in 1768, confusion between the two continued to be a major problem until the final eradication of smallpox was announced, Fenner, *et al.*, op. cit., note 8 above, pp. 55–63.

[11] Baxby, op. cit., note 2 above.

[12] Fisher, op. cit., note 4 above, p. 71, records a newspaper announcement of intended publication in August 1797.

[13] Baxby, op. cit., note 1 above. Derrick Baxby, 'Edward Jenner's *Inquiry*: a bicentenary analysis', *Vaccine*, 1998, **17**: 301–7.