

# *News, Notes and Queries*

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## EDWARD JENNER: A MEDICAL MYTH

To the Editor:

I sympathize very much with your motives in publishing Mr. Razzell's paper, though I think it is rather rash of him to venture into territory which has been so exceptionally well explored for an iconoclastic essay. There must be very few incidents in the story of inoculation and vaccination which have not been fully and fairly discussed, and it only remains for the virological and immunological specialists to explain them all in the light of modern knowledge and further research.

You refer to the implications of the paper and as one reads through it one asks oneself what indeed they are. To begin with, certain of the writer's opinions are pretty positive:

1. That cowpox (or possibly vaccinia) virus is an attenuated form of smallpox (variola) virus, and is derived from it. Mr. Razzell's opening statement does not make it clear whether he distinguishes between the cowpox virus used by Jenner and the vaccinia virus in use today.

2. That contrary to the general verdict of historians, the inoculation of variola virus succeeded in eliminating smallpox in England in the eighteenth century; that it was reasonably safe for the individual, and was not contagious.

3. That the value of Jenner's method of immunization has been much exaggerated and his rewards undeserved.

4. That some form of variola inoculation could usefully replace vaccination in those parts of the world where vaccinia virus is difficult to obtain.

Can one accept Mr. Razzell's views and his appraisal of Jenner's work? Not on the evidence provided in his paper.

It has been in dispute for over two hundred years as to whether smallpox was checked by inoculation during the eighteenth century, and whether it led to contagion. Furthermore, inoculation, if not properly conducted, was an indubitable mortality risk, and if properly conducted, it might be very inconvenient, requiring anything up to five weeks.

These perpetual doubts of the efficiency and dangers of inoculation, from which vaccination was free, in themselves constitute an advantage of the latter. Vaccination has been well worth while and we have Jenner to thank for it. Its drawbacks, such as a shorter term of immunity and post vaccinal encephalitis must be recognized, but do not come within the scope of Mr. Razzell's paper. Looking at this in detail, one finds that the evidence for the effectiveness and non-contagiousness of variola inoculation is so condensed and selective that it is impossible to form a judgement on two of the questions vital to his thesis. Probably the matter does not lend itself to condensation. Inoculation admittedly gives immunity, the points at issue are: (i) whether it became universal enough to affect the incidence of smallpox; and (ii) whether the immunity was more than counterbalanced by the spread of the disease through its infectivity.

On these subjects Creighton, Dixon and many others have examined a wealth of contemporary literature and Dixon well describes the difficulty of sorting out the mass of material. Mr. Razzell does not appear to have any fresh information to offer and though new interpretations are of course always possible, they cannot be convincing

unless both sides of the case are presented. Much authentic evidence contrary to his views is missing. The truth is that the old reports and statistics can provide no more than an indication of the prevalence and results of inoculation. This is partly because, as Professor Downie points out, the circumstances are not fully set out and partly because the reports themselves so often conflict with one another. Mr. Razzell gives a few statistics in support of inoculation, but if the whole total of records is taken into account, the overall picture in England by no means shows a diminution of the disease during the eighteenth century. According to Dixon, the mortality in 1796 was the highest of the century. As to contagion, some inoculators did not meet with it but some did, even to the extent of minor epidemics. Similarly, some inoculators seemed to manage without causing any deaths among their patients, but others were less skilful or fortunate.

During the nineteenth century on the other hand, when vaccination was in operation, mortality and contagion were not found to be as complicating problems at all and by the end of the century the figures quoted by Creighton show smallpox to have declined remarkably. This may not have been exclusively due to vaccination but it is only natural to give it some of the credit. The disease still cropped up in epidemics but it could not be regarded as endemic any longer, in the sense that every one feared to catch it and very often did, much as we regard influenza in the present day.

It was only in Russia, where it could be forced on the whole population, prince and peasant alike, by a ruthless despot, that really universal immunization was possible and it is recorded by an English doctor resident there in 1825 that it was responsible for eradicating smallpox altogether.

Mr. Razzell blames historians for relying on London statistics to discredit inoculation, on the grounds that it was introduced there later than in other parts of the country. Even if it were true that they have done so, there does not seem to be good reason why the London figures should be 'faulty' on that account, so long as allowance has been made for immunity to become established.

Some interesting features are revealed in Table 1 (from Boston, U.S.A.). A drop of 5,527 deaths from smallpox in 1792 which was seventy-one years after inoculation started, is certainly indicative of its good effect if one can be sure that no other factor is operating. Professor Downie has suggested a possible source of error in attributing it 'directly' to inoculation as Mr. Razzell does in his conclusion (3). It is curious that the inoculation deaths are added to the natural smallpox deaths in making up the grand total of mortality and it suggests that Boston had no doubts of the infectivity of inoculation. Dixon's idea of reduced contagion potential of the skin vesicle exudate had not been thought of, but even that postulates some contagiousness whereas vaccination leaves one free from anxiety on that score. Though the incidence of smallpox fell dramatically, the mortality for 1,000 cases was much higher. This is presumably what led Mr. Razzell to his conclusion (2) that there was an increase of virulence of the disease, though he does not expressly say so. Here again one does not know anything about the epidemic or endemic nature of smallpox in Boston. (Incidentally, is the figure 284 in the 1792 column a misprint for 248?).

Mr. Razzell contends in his opening declaration that 'vaccination is a more attenuated form of inoculation'. One does not know if he is referring to vaccinia virus as used for vaccination today, or to the cowpox virus which was the original source of the word vaccination. He also says that the early vaccines were directly derived from smallpox alone, but if by that he means the earliest vaccine of all, namely Jenner's, he must be mistaken as that came directly from a cowpox lesion and was therefore cowpox virus.

One would imagine that this part of Mr. Razzell's thesis was a matter for virologists, who, if they have not already settled it, will eventually do so by modern field work and research. It is not really a problem that can be solved by studying the ingenious but rough and ready experiments of a hundred and sixty years ago. Re-examination of these might throw some fresh light on the relationship between cowpox and smallpox but could not be decisive on the intrinsic nature of either of them. The trend at present is to regard cowpox virus as an irreversible mutant of variola virus and Professor Downie evidently thinks that the origin of the vaccinia virus in use today is obscure and may have been derived from variola virus.

Attenuation is of course a well known phenomenon and the story of Dr. Walker diluting variola virus with water and passing it off as vaccinia only confuses the issue. No wonder he was dismissed from the Jennerian Institute!

Among the implications of Mr. Razzell's thesis one would seem to be that our guardians of public health erred in discouraging inoculation, since he maintains that its infectiveness is a myth and that the elimination of smallpox at the time was a very real thing. One cannot feel that he proves these points beyond all reasonable doubt with his quotations from contemporary writings.

Another is that the historians have equally erred in adopting an attitude against inoculation without making sufficiently critical examination of the evidence. This imputation cannot possibly be allowed by anyone who has dipped into the literature.

On a theoretical level Mr. Razzell considers it a myth that cowpox virus is something different from smallpox virus. The implication of this is that our present-day virologists do not know their business, and that can hardly be judged in an historical journal.

On a practical level the implication is that vaccination was never necessary and so Jenner's services to mankind were mistakenly magnified to the proportions of a myth. This is a matter of opinion and probably always will be.

There may be something to be said for his final suggestion of going back to variola inoculation if the immunity period of vaccination proves to be as short as the U.S.A. immigration authorities would have us believe. At the same time it is doubtful if any safe variolous inoculation would give as much as a lifelong immunity.

When all is said and done, how does Jenner's reputation stand up to all this bombardment? It is always difficult to be fair in apportioning credit, but the plain fact is that after 1796, vaccination proved a successful and welcome alternative to the frightening ordeal of inoculation. It was originally linked up with cowpox and if Jenner was not the first person to think of it, or even the most successful practitioner of it, he was the first to make it work and to bring it before the public so that in effect it is through him that smallpox lost its terrors. Whatever modifications or theories may be developed in the future, it is certain that for most men and all women, Jenner's achievements in the past stand firm, and so one hopes will his statues.

NORAH SCHUSTER

## INOCULATION AND VACCINATION: SMALLPOX, COWPOX AND VACCINIA

The historical details of Mr. P. E. Razzell's paper (Edward Jenner, 'The History of a Medical Myth', *Med. Hist.* 9, 216) were dealt with by Professor A. W. Downie, and will probably be dealt with by others. However, there are some general viro-