



## The Jenner Society and the Edward Jenner Museum: Tributes to a physician-scientist

A.J. Morgan<sup>a</sup>, Gregory A. Poland<sup>b,\*</sup>

<sup>a</sup> School of Cellular & Molecular Medicine, Medical Sciences Building, University Walk, Bristol BS8 1TD, UK

<sup>b</sup> 611C Guggenheim Building, Mayo Clinic and Foundation, 200 First Street, SW, Rochester, MN 55905, USA

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### ABSTRACT

Dr. Edward Jenner's discovery and application of vaccination against smallpox was one of the most important medical advances of all time. In the modern era many millions of lives are saved each year by vaccines that work essentially on the same scientific principles established by Jenner more than 200 years ago. Jenner's country home in Berkeley, Gloucestershire, UK, where he carried out his work and where he spent most of his life, is now a museum and something of a shrine for vaccinologists. Jenner's house is also now the focal point of a new international learned society dedicated to advancing modern vaccinology. The aims of the new Jenner Society are to engage, support, and sustain the professional goals of vaccinologists, and to perpetuate the memory of Dr. Edward Jenner. Ultimately it is hoped that the Jenner Society will be recognized as one of the leading academic societies representing and promoting vaccine science around the world. We invite readers to consider joining the society (<http://www.edwardjennersociety.org/>).

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In this the 30th anniversary of the eradication of smallpox, it is worth reflecting that it is more than 200 years since Dr. Edward Jenner (1749–1823) demonstrated that vaccination can prevent smallpox. His vaccination of James Phipps, age 8, on 14th May 1796 with cowpox taken from the hand of the milkmaid, Sarah Nelmes, and the boy's subsequent immunity to deliberate smallpox infection, was a landmark in the history of medicine. That cowpox infection of milkmaids provided them with resistance to smallpox infection was, apparently, common knowledge amongst medical practitioners in rural areas of south west England in the early 18th century. Although Jenner must be credited with the first proper scientific account of smallpox vaccination, he may not have been the first to vaccinate. Benjamin Jesty (1736–1816) vaccinated his family during a local smallpox epidemic in Yetminster, Dorset in 1774. Although Jesty did not publish his observations and they were not made in the context of formal scientific experimentation, some credit should be given to Jesty for having the foresight, intelligence, and courage to vaccinate his family with cowpox lymph, some 22 years before Jenner's vaccination of James Phipps [1,2]. He did eventually receive some acclaim from the medical establishment in 1805 in the form of a report from the Original Vaccine Pock Institute in the Edinburgh Medical and Surgical Journal [1]. Interest in the notion that Jesty was the first vaccinator has recently been

raised by the rediscovery and acquisition by the Wellcome Trust of a portrait of Jesty painted by Michael Sharp, also in 1805 [2].

Much has been written about smallpox and its eradication [3–6] and there have been many accounts of Edward Jenner's life and discoveries [7–9]. Edward Jenner is increasingly coming back into the public eye. A campaign was started some years ago to have the statue of Jenner, sculpted by Calder Marshall, returned to Trafalgar Square in London from where it was removed to Kensington Gardens in 1862 [10]. More recently the Jenner vaccination story has been aired on television on several occasions in the UK and a postage stamp has been issued by the Royal Mail. A modern sculpture depicting a smallpox vaccination scene was recently unveiled in the front of the WHO headquarters in Geneva to mark the 30th anniversary of the eradication of smallpox and to pay homage to the many unknown village-level workers who did most of the field work.

The scientific establishment in the form of the Royal Society had rejected Jenner's paper describing this work at the time, and he was forced to publish his findings at his own expense in a paper entitled "An inquiry into the causes and effects of the variolae vaccinae, a disease discovered in some of the western counties of England, particularly Gloucestershire, and known by the name of the cow pox." Recognition of Jenner by the Royal Society had come earlier from his work on the behaviour of the cuckoo carried out in 1787, when he was made a Fellow in 1789. With the benefit of hindsight, the failure of the Royal Society to recognize Jenner's vaccine work must have been somewhat embarrassing since in only a few years

\* Corresponding author. Tel.: +1 507 284 4968; fax: +1 507 266 4716.  
E-mail address: [poland.gregory@mayo.edu](mailto:poland.gregory@mayo.edu) (G.A. Poland).

Jenner's vaccine was being used across the world including the United States. Indeed Jenner received a much quoted letter in 1806 from the then U.S. president, Thomas Jefferson, and we make no apologies for quoting from it again here because of the beauty of the language and the profundity of the statement:

*"Medicine has never before produced any single improvement of such utility. . . You have erased from the calendar of human afflictions one of its greatest. Yours is the comfortable reflection that mankind can never forget that you have lived. Future nations will know by history only that the loathsome small-pox has existed and by you has been extirpated."*

During this time, England was at war with France between 1803 and 1815 but Jenner had, nevertheless, been awarded a Napoleonic medal for his work on vaccination. Jenner wrote to Napoleon during the period 1803–5 and secured the release of two English prisoners of war. Napoleon is reputed to have said: "Ah, Jenner, I can refuse him nothing." This event is reminiscent of later cooperation in the smallpox eradication campaign set against the background of the Cold War.

We should not forget that Jenner's vaccination experiment took place 63 years before the publication of Darwin's "Origin of Species" and 90 years before Louis Pasteur's "Traitements de la Rage" and almost a century before Ivanovsky's first report on viruses in 1892. Although the Age of Enlightenment was in full flood at this time, medicine and biology were still in the "dark ages," and Jenner conducted his experiment without any of the most basic scientific knowledge we now take for granted.

Thirty years is a long time in contemporary science and our knowledge of infectious disease, immunology, and molecular biology has increased almost beyond recognition since the eradication of smallpox in 1977, and its formal declaration in 1980. It has to be said that despite these advances, only two current vaccines are based on the "new" technologies, the hepatitis B and the human papilloma virus vaccines, in that they are the products of recombinant DNA technology.

The enormous success of vaccination in the 20th century was essentially based on live attenuated or killed whole virus vaccines where knowledge of the relevant immunology was almost completely absent. What is remarkable is that the technology used to produce the vaccine used in the eradication of smallpox was not much different from that used by Jenner in 1796 and in the years to follow in the 19th century. However, the technologies of transport and communication were dramatically more effective in the late 20th century and were obviously important in the smallpox eradication program.

### 1. The Edward Jenner Museum – <http://www.jennermuseum.com/>

Edward Jenner's house (Fig. 1), in which he lived between 1785 and his death in 1810, was purchased by the Edward Jenner Trust in 1785 with a grant from the Sasaskawa Foundation. The house was established as the Edward Jenner Museum and is run by a board of Trustees as a charitable foundation and an educational and public information resource. It is located in the small but historic Gloucestershire market town of Berkeley in the South West of the United Kingdom about 20 miles north of Bristol. The museum is nestled between Berkeley castle in which Edward II was murdered in 1327 and a 15th century church built by the 11th Lord Berkeley and in which Edward Jenner's grave can be found. Much historical interest also surrounds recent findings of evidence of Anglo-Saxon and Roman settlements at the site of Jenner's house.

The museum offers a window into the life and times of Edward Jenner in the late 18th century, his smallpox vaccination



Fig. 1. Edward Jenner's house – now the Edward Jenner Museum in Berkeley, Gloucestershire, UK.

experiments, smallpox itself and its ultimate eradication. Not only are there exhibits on modern vaccination and immunology, but also on the many other scientific activities Jenner was engaged in at one time or other such as the life and anatomy of the cuckoo, and hydrogen balloons. The grounds of the house also contain the Temple of Vaccinia where Jenner is reputed to have vaccinated the local poor for free, and which has recently been restored.

### 2. The Jenner Society – <http://www.edwardjennersociety.org/>

The authors desired to organize and initiate a learned society dedicated to vaccinology and to the memory of Dr. Edward Jenner with a vision that "The Jenner Society will be recognized as the leading academic learned society representing vaccinology around the world." The raison d'être for the society is to engage, support, and sustain the professional goals of vaccinologists everywhere, and perpetuate the memory of Dr. Edward Jenner. Currently, no single academic or learned society exists that is solely dedicated to the interests of academic vaccinology at the international level despite the tremendous positive impact on public health of vaccines and the appalling human suffering caused by transmissible infectious diseases. Three partners have come together to this end and include the Jenner Society itself, the Edward Jenner Museum and the academic journal Vaccine. The Edward Jenner Museum and the goals of the proposed Jenner Society are congruent and overlapping in intent and vision. Vaccine is now the official journal of the Jenner Society along with the International Society for Vaccines and the Japanese Society for Vaccinology. We see no conflict of interest between these three societies but more of a mutually beneficial relationship.

The primary aims of the Jenner Society can be summarised as follows: (1) to promote biomedical research and collaboration in vaccines ("to advance the science"), (2) to promote growth in the field of vaccinology ("to develop interest in the field of vaccinology and to mentor the next generation"), (3) to provide education and ongoing opportunities for professional interaction amongst members ("to promote collaboration"), and (4) to honour and promote the memory of Dr. Edward Jenner and the Jenner Museum. We will also encourage activity in the history of vaccination from ancient times, through Jenner, Pasteur, Salk and the eradication of smallpox in the late 1970s. We have already realized a strong interest amongst potential members in historical aspects of vaccination including specialists in the history of medicine, and the society was officially launched at this 30th International Smallpox Eradication Commemorative meeting in Rio de Janeiro, Brazil.

There is clearly another role for the new Jenner Society and that is seeking clarity in the medical ethics associated with vaccination in the modern world. The study of ethics is the science of morals and can provide few absolute benchmarks (i.e., ethical values are always a reflection of the times). Medical ethical values in Jenner's day were not the same as contemporary ones and his vaccination and challenge of James Phipps with smallpox has often been criticised as having been distinctly unethical. The fact is that variolation was common practice in 18th century England and had originated in China a millennium earlier. Presumably people were able to make their own minds up about the relative risks of variolation versus actually catching smallpox. The fact that many followed the example of the English aristocrat Lady Mary Montague who had her own children variolated underlines the relationship between fashion, contemporary culture, and ethics in this respect. Many aspects of this topic are contentious and sometime serve to reduce the numbers of persons who could and should be vaccinated. There have always been vehement opponents of vaccination, in Jenner's day and now [11]. Some of the key ethical and constitutional questions associated with compulsory smallpox vaccination in particular, and vaccination in general, were publicly debated in Boston during the smallpox epidemic of 1901. The Boston Board of Health introduced compulsory smallpox vaccination and persons refusing vaccination were subject to a \$5 fine or 15 days in jail. Despite legal challenges and constitutional objections, compulsory smallpox vaccination was maintained. Smallpox vaccination had been compulsory in England and Wales since 1853 in the face of vociferous opposition based on religious, ethical, safety, and even scientific grounds.

In the early 1900s Sir William Osler, frustrated at smallpox vaccine opponents wrote:

*"A great deal of literature has been distributed casting discredit upon the value of vaccination in the prevention of smallpox. I do not see how anyone who has gone through epidemics as I have, or who is familiar with the history of the subject, and who has any capacity left for clear judgment, can doubt its value. Some months ago I was twitted by the editor of the Journal of the Anti-vaccination League for "a curious silence" on this subject. I would like to issue a Mount Carmel-like challenge to any ten unvaccinated priests of Baal. I will go into the next severe epidemic with ten selected vaccinated persons and ten selected unvaccinated persons. I should prefer to choose the latter—three members of parliament, three anti-vaccination doctors, if they could be found, and four anti-vaccination propagandists. And I will make this promise—neither to jeer nor to jibe when they catch the disease, but to look after them as brothers, and for the four or five who are certain to die I will try to arrange the funerals with all the pomp and ceremony of an anti-vaccination demonstration."—Sir William Osler, Man's Redemption of Man, London: Constable & Co., 1910*

More often than not, the views of the anti-vaccinationists do not have any scientific credibility but nevertheless can damage

important public health programs, for example, in the case of measles, mumps, rubella (MMR) vaccination following the publication of the notorious paper in The Lancet in 1998 allegedly linking autism with MMR vaccination [12]. Regrettably, this paper was not retracted for another 12 years [13]. Opinions on vaccinations offered by the Jenner Society will only ever be based on the scientific evidence available and will not be influenced by political, commercial, or religious considerations.

We also hope to provide increased visibility and credibility for the Edward Jenner Museum and Dr. Jenner, identify philanthropic interests, and honour, in a lasting way, Dr. Edward Jenner and his immense contributions to health and vaccinology. A number of other things will come from the new society including perhaps certification in vaccinology as a mark of professional collaboration and credibility for its members, conferences, communications, information exchange, travel grants, and research fellowships. Finally, we believe that the new society will fill an important scientific and educational niche.

Thus far the society has passed the exploratory phase and established amongst vaccinologists that there is a need for the society. A website has been created and applications for membership can now be made online ([www.edwardjennersociety.org](http://www.edwardjennersociety.org)). We are now in the early membership phase and are in the process of appointing a representative executive team to give leadership in the establishment of the society and its constitution. We will embark on membership, public awareness, and fundraising campaigns and encourage interested readers to join the new society and to contact us to let us know of their interest.

*Conflict of interest statement:* None declared.

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