Benjamin Jesty, the Grandfather of Vaccination

Benjamin Jesty, the Grandfather of Vaccination

By

Patrick John Pead

Cambridge
Scholars
Publishing

Benjamin Jesty, the Grandfather of Vaccination

By Patrick John Pead

This book first published 2020

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

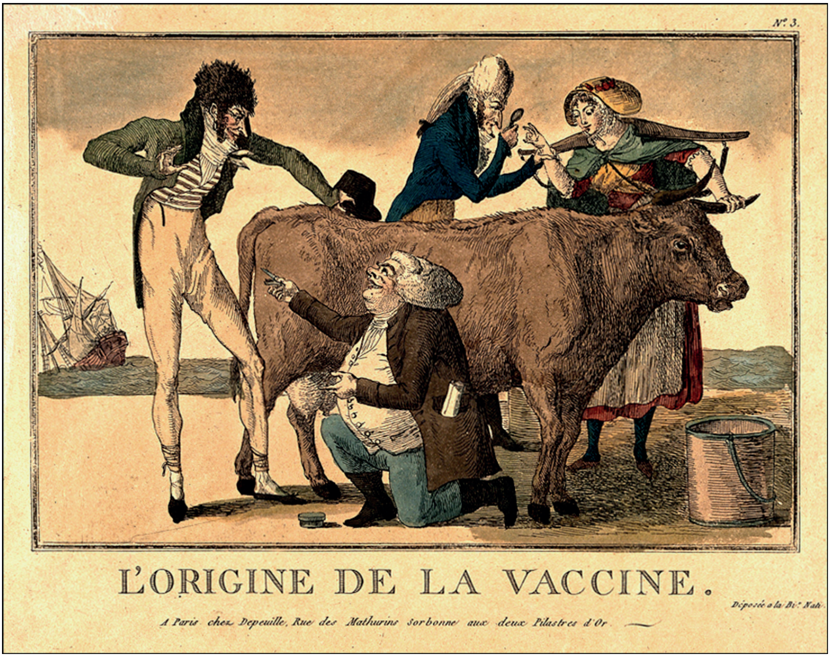
British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN (10): 1-5275-4382-X
ISBN (13): 978-1-5275-4382-9

Dedicated
To my Dearest Wife
Linda
for all her unwavering support
help and encouragement

And to the memory of the late
Marjorie Wallace
who set me on this journey

Mrs Wallace died aged 99 years
on the 26th October 2011,
32 years to the day on which smallpox
was first declared eradicated from the world
by Dr Halfdan Mahler of the World Health Organisation



'L'Origine de la Vaccine' an etching by Depeuille, Paris, c1800

A physician examines a cowpox lesion on a milkmaid's hand
whilst a farmer passes a lancet to another physician.

That the portly farmer appears to be a caricature of Jesty is coincidental.
One doctor appears reluctant to adopt the new procedure. Depeuille's inclusion of a shipwreck is assumed to be a satirical comment on the potential of vaccination

Contents

List of Illustrations

Permissions kindly granted as indicated

Front cover: Benjamin Jesty. Oil painting by M.W. Sharp, 1805. Credit: Wellcome Collection. CC BY and Medal commemorating smallpox vaccinations, France, 1830-1840. Credit: Science Museum, London. CC BY.

Frontispiece: 'L'Origine de la Vaccine' an etching by Depeuille, Paris, c1800.
A physician examines a cowpox lesion on a milkmaid's hand, while a farmer passes a lancet to another physician. *(Wellcome Library, London)*

Figure

* Out of copyright, or attribution not available

Acknowledgements

THE author would like to express his appreciation to all those who assisted in the production of this manuscript with information, advice, correspondence and much valued encouragement. Many people opened their doors, real or virtual, and told me their stories. Others provided professional opinions on specific questions, archival resources or generously gave their support in various ways, including:

Margaret Asquith, The Society of Apothecaries of London, St Bartholomew's Hospital Trust, Basingstoke and Deane Borough Council, Dr Derrick Baxby, Alfred and June Beers, Peter Birkett, Martin Body, The British Medical Association Library, Dr Simon Chaplin, Chawton House Library, Prof Ian Clarke, Michael Clarke, Prof Barry Coller, Mrs Dee Cook, Tina Craig, Annabel Crookshank, Prof Paul Davis, Dorchester Reference Library, Dorset History Centre, Dorset Life, the late Fred Dowse, Mike Dunn, Tony Dutton, Richard Emery, Pip Firth, John Foster, The Library and Museum of Freemasonry, Linda Garrat, Prof Frances Gotch, Dr Steve Green, Dr Gamal El Gurashi, Jacqui Halewood, Hampshire Records Office, David Harrison, Mr & Mrs Haysom, Nina Hayward, Prof John Heckels, Susan Henderson, Ian Hill, Ron Hill, Shelagh Hill, David Jesty, Prof Jolyon Jesty, Jonathan & Helen Jesty, Prof Sam Katz, Bryony Kelly, Shirley Laing, Cliff Lindsay, Judy Lindsay, Ordnance Survey, Oxford University Press, Brian & Carole Parsons, Ann Partridge, Amanda Paulley, the late Bernard Pead, John Pead, Prof Stanley Plotkin, Dr Susan Plotkin, Charles Pope, the late Christopher Pope, Sylvia Pope, Prof John Richardson, Charles and Mary Roe, Dr Awad Saeed, D A Shrapnell, Ann Smith, Denise and Brian Stickels, Dr and Mrs Sumner, The Lancet, The British Library, Michael Roe, Simon Tosswill, The Royal College of Physicians, The Royal College of Surgeons of England, Linda Thompson, The Wellcome Library for the History of Medicine, The Wellcome Trust, William Schupbach, Susan Snell, The Witt Library, the late Dave Turner, The University of Sussex Library, Milton Wainwright, Marjorie Wallace, the late Mary Spencer-Watson, West Sussex Record Office, Prof Gareth Williams, Michael Windridge, Yetminster Local History Society.

I am greatly indebted to Dr Rosalind Maskell for her initial proof-reading of the manuscript, and her considerable help with advice in its preparation. This project could not have been completed without her much valued assistance.

Thanks also to Margret Preece for translating the paper by Plett from the German.

Professor Jolyon Jesty kindly gave his permission for the reproduction of a page from the Jesty website in Appendix 2.

I would like to thank Professor Sam Katz for reading and advising on Appendix 1, which concerns Vaccinology.

I am particularly grateful to Bill and Vera Jesty for their considerable help over a number of years, which permitted some objectives within this project to be successfully achieved. I greatly value our strong and lasting friendship.

There are many who responded with their permissions for me to use illustrations in this manuscript as listed above. I feel this has enhanced the presentation of the book and wish to extend my thanks to all involved.

The creation of a book is a complex process. I must pay tribute to Geoff Fisher in this regard. His formatting and typesetting skills have refined my manuscript with professionalism.

My very special thanks goes to my dearest wife Linda, who has accompanied me on this adventure of discovery. She has supported me every step of the way. Linda has listened, proof-read and encouraged on so many occasions and her expertise with digital imaging has been invaluable. It has been a joint effort, and this book could not have been written without her patient forbearance over all the years that this endeavour has occupied our lives.

Introduction

THIS book was written to commemorate the bicentenary of the death of Benjamin Jesty, and to provide a source of reference for others pursuing similar studies in the future.

My enduring interest in Jesty began in 1985 after a chance encounter with the inscription on his gravestone in the churchyard of St Nicholas of Myra at Worth Matravers, a village in the Isle of Purbeck, Dorset, England.[1,2] The inscription stated that Jesty had used cowpox for vaccination against smallpox in 1774. This was 22 years before the commonly accepted originator, Dr Edward Jenner, undertook his first vaccination in 1796. The gravestone was pictured in a small booklet entitled 'Benjamin Jesty: the First Vaccinator and his Family' by Marjorie Wallace MA.[3] Intrigued by the title, the present author decided to investigate further.

Here was a man forgotten by history. A farmer whose contribution to medicine had been treated as an irrelevance amid the political manoeuvres surrounding the parliamentary debates for Dr Edward Jenner's rewards in the early 1800s. There is absolutely no doubt that Jenner brought the technique of vaccination to the world, but the full story of its origins spans a broader horizon. Delving into the history of vaccination more closely, it seemed that the reality had become distorted, like so many records of the milestones of mankind's achievements. Was the 'discovery' of vaccination really just the work of one man at a single time and place, as many textbooks would have us believe, or a *development* resulting from the culmination of a series of contributions over many years by a number of individuals - pioneers who based their ideas upon notions originating in folklore and traditional practices derived from antiquity?

Today it has become possible to examine historical records more critically than ever before. When Samuel Butler wrote;

'it is said that God cannot alter history, but historians can'

he demonstrated an understanding of how fragile our concept of the past can be, when its foundation is a biased interpretation of the written word.[4]

Sir Francis Darwin was well aware of such anomalies when he delivered his Galton Lecture in 1914, saying:

> 'In science the credit goes to the man who convinces the world, not the man to whom the idea first occurs. Not to the man who finds a grain of new and precious quality, but to him who sows it, reaps it, grinds it and feeds it to the world.' [5]

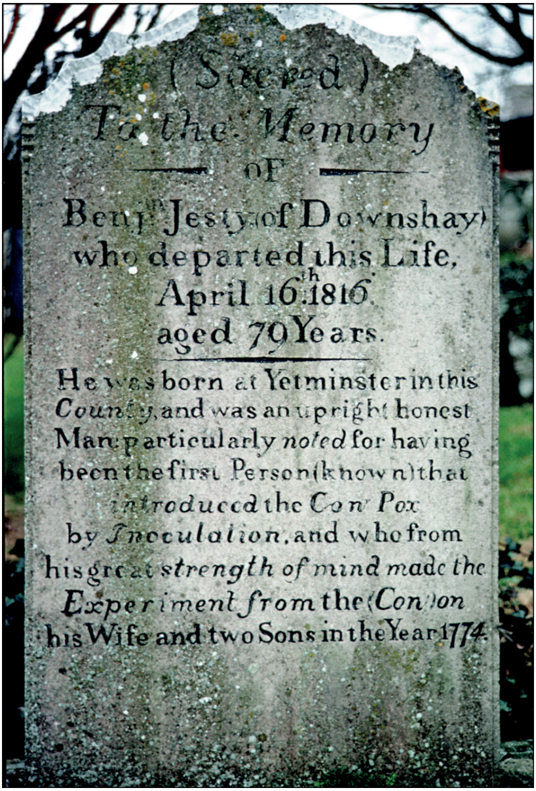


Figure 1. The gravestone of Benjamin Jesty as the author first saw it in 1985 at the churchyard of St Nicholas of Myra at Worth Matravers, Dorset

He was voicing an observation, neither expressing an opinion nor endorsing the situation as he saw it, but his words have often been quoted in support of the view that credit should lie with the developer of an idea rather than the originator. The first use of cowpox material as a vaccine is one such example.

Wainwright has compiled a review of the deficiencies in 'standard accounts' of discoveries in microbiology.[6] Most textbooks give credit to Louis Pasteur for linking moulds with the process of fermentation, but this work had already been explored in depth by Antoine Bechamp who published his findings many years before Pasteur began his experiments.[7] In 1849 the physicians Swayne, Britten and Budd described comma shaped 'fungoid bodies' in the faeces of cholera patients and also reported finding these organisms in water samples from cholera districts.[8]

This predated the father of epidemiology, John Snow, who is noted for identifying the role of water in spreading the infection. Ignatz Semmelweis is hailed as the first to show that hospital epidemics of puerperal fever could be prevented if medical staff washed their hands before attending women in childbirth. The American, Oliver Wendell Holmes, published a paper in 1843 mentioning a doctor washing his hands in chloride of lime during maternity visits.9 Semmelweis initiated the same practice three years later, but Holmes's earlier publication did nothing to establish his priority. Wainwright shows that in so many cases, the plenary records of our scientific heritage have become usurped by the 'standard accounts' and accepted as historical facts.

Many popular history books lead readers to believe that Dr Edward Jenner was the first to discover, or invent, vaccination when he transferred cowpox material from the hand of Sarah Nelmes to the arm of James Phipps in 1796, but there is a growing acceptance amongst medical historians that Jenner's priority is a myth.[10,11,12] The standard account is now questioned.[13] Critical analysis of evidence described later in this manuscript establishes that it is now historically appropriate to recognise that Benjamin Jesty, the Dorset yeoman farmer, preceded Jenner by being the first to devise and perform vaccinations with cowpox to protect against smallpox. Chapter 13 contains accounts of others who used cowpox to protect against smallpox after Jesty and before Jenner. However, there is no doubt that the latter brought vaccination to the world through his persistent hard work and persuasion. We should celebrate Jenner's magnificent achievement in that respect, but equally, the contents of chapters 14 and 15 suggest that Dorset was the true birthplace of vaccination. The origins of induced immunity are so clouded by subjectivity in some previous volumes, that the archives of this branch of medical history are flawed.[14,15] The intention of this present study is to examine the factual evidence more closely and to explore the interactions of folklore, common experience and development of the scientific method - all of which played a part in the eventual eradication of smallpox.

Note referring to Appendix 1

This book is intended for anyone who has an interest in the 'discovery' of vaccination. The author considers it important that readers without a background in medicine or science should not think themselves excluded. Appendix 1 (Vaccinology) provides an overview of man's relationship with pathogenic microbes, and the role of vaccines in maintaining his wellbeing. Readers are invited to peruse this Appendix before embarking on Part 1 of the manuscript if they so wish.

PART ONE

CONTEXT

1

The 'Foul Disease'

THE origins of vaccination are associated with Man's attempts to protect himself against the global virus disease of smallpox. This perennial scourge of mankind is estimated to have killed at least one billion of the world's population in the one hundred years that preceded its elimination. The threat from naturally occurring infection no longer exists because the disease was formally ratified as eradicated by the World Health Assembly in 1980. At the time of writing the last known remaining stocks of the virus are held in maximum containment facilities at the Centers for Disease Control at Atlanta, Georgia, USA (461 isolates) and the VECTOR Institute in Novosibirsk, Siberia, Russia (161 isolates).[1] The possibility of secret stocks being held elsewhere remains a matter for concern.[2,3]

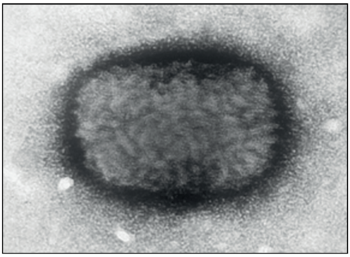
Smallpox is a member of the genus Orthopoxvirus, family *Poxviridae*, a group which also includes vaccinia together with several animal poxviruses such as cowpox, monkeypox, camelpox and ectromelia (mouse pox. Smallpox only affected humans and was a major problem in 31 countries as recently as 1970, with a total of 10 – 15 million new cases of infection each year.[4] The annual mortality from the disease was more than 2 million. There were two types of virus that gave rise to a number of clinical forms of the infection. The most virulent was *Variola major*, with case fatality rates ranging from 20% – 50% in unvaccinated people compared with 3% in those who had been vaccinated. The word *Variola* is derived from the Latin *varius* ('stained') or *varus* ('mark on the skin'). *Variola minor* was first reported in South Africa in 1904, and later in the United States in 1913. It became endemic in both countries. This mild version of the disease was also known as alastrim, kaffir or amass, and had a mortality rate of 1 – 2% in the unvaccinated.

Infection occurs by implantation of variola virus on the respiratory mucosa. After an incubation period of one to two weeks after contact, the patient experiences initial symptoms which usually include a high fever with rigors and prostration. A severe headache may be accompanied by nausea, vomiting and muscle problems predisposing to an excruciating backache. The rash appears after four days when the fever relents. Over a further period of three or four weeks, this rash which began as macules (flat thickened spots) progresses through a sequence of papules (raised spots), followed by vesicles containing clear fluid, then pustules where the fluid becomes pus. Finally the lesions dry to become scabs. In time the scabs fall from the skin to leave pitted scarring which is often permanent. The rash is most prolific on the bodily extremities and therefore the unclothed areas. This may help clinical differentiation from the lesions of chickenpox which are more confluent on the trunk and covered areas of the body. Another difference is that smallpox lesions are synchronous and always at the same stage of development, whereas those of chickenpox may be seen at different stages because eruptions are asynchronous as they appear on the skin.

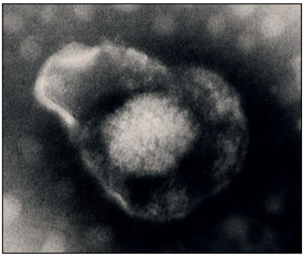
Figure 2. Benign smallpox in Halifax, England, in 1953 showing the clinical appearance of lesions on the 9th day of the rash with facial swelling. The patient survived.

The clinical presentation can take many forms. A comprehensive, illustrated review was compiled by Dixon.[5]

The smallpox virus is the largest and one of the most complex of the human viruses, but much smaller in size than a bacterium. Each virion (a single virus particle) contains a single linear double-stranded DNA molecule comprised of 186,102 base pairs. The genome was sequenced in 1994. Particles measure about 250 millionths of a millimeter in length and are commonly described as 'brick shaped', appearing as a rectangle with rounded corners. Although poxvirus virions were claimed to have been seen by experienced observers during light microscopy of stained preparations of vesicle smears, details of their structure are only seen when the virus is viewed by electron microscopy. This technique was used in tandem with laboratory gel diffusion tests to examine samples such as vesicle fluid, smears from lesions, or crust material from the late 1960s onwards. Electron microscopy enabled an accurate rapid differentiation between smallpox and chickenpox - very necessary to speed confirmation of a clinical diagnosis which might have considerable significance. The morphology of chickenpox, a member of the herpesvirus family, is that of an icosahedral proteinous core (the capsid) surrounded by a lipid envelope and may be likened to the shape of a fried egg. It is quite unlike the poxvirus particle as may be seen in the illustrations below.



Smallpox



Chickenpox

Figure 3. Virus particles found in vesicle fluids as described above when seen under an electron microscope.

Like all viruses, smallpox requires living cells in order to replicate. The virus was could be cultivated in conventional tissue culture, but confirmation of poxvirus type was only possible by the inoculation of the chorio-allantoic membrane of fertile hens eggs incubated at accurate ceiling temperatures. This required considerable expertise and control. The method was replaced by polymerase chain reaction (PCR) techniques for the differentiation of orthopoxviruses. The original diagnostic procedures were available at a number of hospital laboratories. A laboratory-acquired infection which occurred at the London School of Hygeine and Tropical Medicine in 1973 resulted in the deaths of two contacts of a hospitalised member of staff.[6,7] An enquiry into this incident led to the publication of the Howie Code of Practice (1978, a Consultative Document (1979), and the Categorisation of Dangerous Pathogens (1984).[8,9,10] After this, strict safety procedures for handling smallpox material were observed, and specialised identification methods were only retained at centres with appropriate containment facilities.

Smallpox disease is thought to have originated in North-East Africa c10,000 BC when hunter gatherers turned to agriculture and began to settle in communities. The earliest clinical evidence is the presence of typical skin lesions on the faces of Egyptian mummies of the 18th and 20th Dynasties. These include Pharaoh Rameses V who died in 1157 BC.[11] The first description of symptoms was written by the Persian physician Muhammad ibn Zakariya al-Razi (Rhazes) in 910 AD.[12]

Figure 4. Depiction of Rhazes attending a boy with smallpox.

It is thought that the disease may have been carried to the East by Egyptian merchants, then spread throughout North Africa and the Mediterranean during the 6th- 8th centuries by Arab invaders. Outbreaks began to appear in Europe when the crusaders returned from the wars in the Levant. Smallpox was introduced into the New World by the conquistadors.[13] They used it as a biological weapon. The population of Mexico numbered 25 million when the Spanish arrived in 1518 and was reduced to only 1.6 million within a hundred years. By the sixteenth century the disease had become established in Britain. Queen Elizabeth I survived an attack at the age of 29 in 1562 but she was only one of many monarchs to suffer. The virus was no respecter of rank or position. Smallpox proliferated among princes and peasants throughout the European countries in the following 200 years, killing about 400,000 people annually. John Dryden described the 'Foul Disease' of smallpox as 'The very Filth'ness of Pandora's Box'.[14] He described the appearance of typical skin lesions in a poem written in 1649 to commemorate the death of the son of the sixth Earl of Huntingdon, Lord Hastings:

> 'Blisters with pride swell'd; which th'row's flesh did sprout
> Like Rose-buds, stuck i' th' Lily-skin about.
> Each little Pimple had a Tear in it,
> To wail the fault its rising did commit'[15]

Macaulay described smallpox as 'the most terrible of all the ministers of death', and when writing about the death of Queen Mary II in 1694 he noted that it had become more prevalent than the plague:

> 'The havoc of the plague had been far more rapid: but the plague had visited our shores only once or twice within living memory; and the smallpox was always present, filling the churchyards with corpses, tormenting with constant fears all whom it had not yet stricken, leaving on those whose lives it spared the hideous

traces of its power, turning the babe into a chengeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to the lover'.[16]

Fatal victims included six members of the Stuart dynasty, among them William the 11-year-old son of Queen Anne. The resulting constitutional crisis led to the Act of Settlement of 1701 which prevented any claim to the throne from the Catholic descendants of James II. Thus, a pathogenic micro-organism was a factor in bringing the House of Hanover to rule over a Protestant England. Smallpox was responsible for more than one third of all blindness or impaired sight. Other possible sequelae included encephalitis, infertility, limb deformities, fatal pneumonia and secondary bacterial infections. In urban conurbations like London it was assumed that nearly everyone would contract the disease during their lives, but this usually happened when they were young. Those who lived bore ugly scars of the pocks thereafter. Dick Turpin survived, as did Voltaire, Mozart, George Washington, and Abraham Lincoln who delivered his Gettysburg Address when he was in the incubation stage of the disease. Josiah Wedgewood was pockmarked and suffered an abscess in his right knee which required a leg amputation when he was aged 38. Joseph Stalin would not permit un-retouched photographs of his smallpox-scarred face to be published during his early years of power.

Figure 5. The Smallpox Hospital at St Pancras, London, 1807. This building, now demolished, was situated at the end of Euston Road. The present Kings Cross Railway Station was built on the site in 1851 - 52.

Medical care at the dawn of the eighteenth century was still very much in its scientific beginnings. Advances had been made - Harvey described the circulation of the blood as early as 1628, but treatments in the early 1700s were limited to patent medicines of questionable safety. They were administered, and their efficacy monitored, by a few university schooled physicians within numerous apprentice trained healers, apothecaries and quacks. At that time there was no unifying standard for qualified physicians, and those who had attended medical school sought to maintain an aura of mystique, being unwilling to give any credence to discoveries made by those who were not 'learned'. However, the services provided by apprentice trained practitioners and apothecaries necessarily overlapped with physicians, particularly in rural areas, sometimes making it difficult to separate the quacks from legitimate healers. Treatment commonly involved a process of trial and error, often including application of a number of herbal curatives, and observation of those which seemed effective! Healers still adhered to the classical belief that the body was composed of four 'humours' and so were unable to determine why their prescriptions worked in some cases or not in others. One example was that of the popular use of Jesuit's Bark (cinchona, the source of quinine) for fevers.[17] Doctors could not make a differential diagnosis between the causes of fevers and would often use this remedy, though its only real effectiveness was in cases of malaria. Despite these shortcomings, published herbals such as Nicholas Culpeper's contained recommendations born of a wealth of experience, and some medicines would often bring relief to sufferers.[18] Opium dulled pain; black willow bark provided salicylic acid (aspirin); calamine eased itching; and chalk absorbed excess stomach acid. Bleeding was commonly used to 'restore balance to the humours'.

As the eighteenth century wore on, the spirit of the Enlightenment played its part in medical progress. The number of hospitals increased, staffed by combinations of physicians, surgeons, apothecaries and women with minimal training acting as nurses. Medical staff became more involved in hospital administration but had control over who was to be admitted. Priority was given to patients requiring surgery, or those with non-contagious conditions and those believed to be treatable. Purpose built hospitals cared for patients with diseases known to be infectious such as smallpox. Hospices provided succour for untreatable conditions. There were great advances in surgery (John Hunter), and in dentistry (Pierre Fouchard).[19,20] Giovanni Battista disproved the ancient theory of humours.[21] Formal training of physicians increased, and by the 19th century many cities had large hospitals which provided training for students. In 1750 the population of Europe was 120 million and this more than doubled over the next 100 years. However, this demographic change is now thought to have been associated more with better diet and an increase in fertility rather than medical advances alone. Some advances were demand led by market forces – all medicine care at this time had to be paid for. A growing population meant that public authorities paid