Jenner and the Origins of Vaccination’s Empire

Hands tell a lot about people. The hand pictured here (Figure 1), an engraving published in Britain in 1798, seems especially telling. It appears today, just as it must have to viewers of that era, strangely embodied, as if one could tell from its graceful arch, its refined whiteness, and its seeming gesture, who it might belong to. In fact, to the British of the early nineteenth century, it would have been clear from the three marks, as round as little globes, that this was not the hand of a gentlewoman but that of a dairy maid who had been infected with the common disease called ‘cowpox’. This hand, in particular, belonged to Sarah Nelmes and, paradoxically, it carried both the blessing of world health and the curse of Western imperialism in its elegant grasp.

Figure 1 The hand of Sarah Nelmes, printed in Edward Jenner’s 1798 An Inquiry into the Causes and Effects of the Variolae Vaccinae. By permission of the Jenner Museum, Berkeley.
Nelmes’s hand appeared in Edward Jenner’s 1798 treatise *An Inquiry into The Causes and Effects of the Variolae Vaccinae, A Disease Discovered in Some of the Western Counties of England ... and known by the name of The Cow Pox*. Jenner’s *Inquiry* was beautiful in its simplicity. It came from the bodies of those who worked in the English countryside. Just over seventy pages in length, it presented a series of stories about dairy maids, farm hands, paupers, and manservants whose daily, pastoral activities brought them in touch with cows and cowpox, and thus made them immune to smallpox.

The most important case in the *Inquiry* was that of Nelmes. Jenner had noticed that dairy maids had something the general population lacked: beautiful skin. In this time, everyone knew that smallpox epidemics left their victims either dead with broken pustules oozing bodily fluids, or living for the rest of their lives blind with severely disfigured skin. People also knew that dairy maids caught cowpox. To Jenner (and others), the maids’ beautiful skin was evidence that cowpox gave them some protection against smallpox. Nelmes just happened to be around when Jenner conducted his most crucial experiment. Since she had, he reported, just been ‘infected with matter’ from one of ‘her master’s cows’, an otherwise harmless beast named Blossom, he inserted her cowpox into the arm of ‘a healthy boy, about eight years old’.

The boy barely took sick and was thereafter immune to smallpox, confirming Jenner’s hunch: cowpox prevented smallpox.

![Figure 2](image-url) 'Blossom', the cow from whom Sarah Nelmes contracted cowpox, which became the crux of Jenner’s vaccination breakthrough. By permission of the Jenner Museum, Berkeley.
As it turned out, this revolutionary work on smallpox by a provincial British doctor made a breakthrough in epidemiology that changed the course of medicine – and history. Jenner, however, did not adequately understand the process by which vaccination worked. It was Louis Pasteur, a century later, who theorised and extended Jenner’s discovery to make vaccination applicable to diseases other than smallpox, but Pasteur named the process after Jenner’s work: ‘vaccination’, meaning ‘from cows’. One of the quaint ironies of epidemiology, and this one seems almost poetic in view of present-day fears of B.S.E., is that we derive our technology for fighting terrifying pandemics and threats of biological warfare from the diseased udders of a humble beast (Figure 2). Vaccination, which spread from a Gloucestershire farm to cover the whole world, protected people by infecting them with animal disease, making the hope of world health dependent on the mark of the beast.

When Jenner realised the importance of his discovery, he wasted no time in transporting it to both the nation and the world. As early as 1803, he hoped ‘soon to see Societies form’d throughout the Empire for the Extermination of the Smallpox, cooperating with that which we hope soon to see in full & effective action’ in Britain itself. Naturally, he began his proselytising first at home. He submitted details of his discovery to the Royal Society, which refused to publish them in its Transactions. Unfazed – Jenner was a man of excessive self-confidence – he published the Inquiry himself. Jenner knew well that he somehow needed to have his idea accepted by royalty and aristocracy, Britain’s prime movers. The more solid the systems of hierarchy and power, the more likely he would be able to transmit his vaccination to mass populations.

After publication, Jenner demonstrated his discovery to the local aristocracy whom he knew had connections to power and patronage. In 1800, based on Jenner’s prompting, the Earl of Lonsdale, one of the most powerful landowners in the country, ordered the vaccination of all the tenants in his estate village. In a matter of months, Jenner was presented to the King and his two sons, the Prince of Wales and the Duke of York. He was also received by the Queen whose eighth son had died of smallpox, and he later vaccinated the adopted boy of Princess Caroline. Patronage by the powerful worked. By 1803 the Royal Jennerian Society was established. The King and Queen were patrons. The Prime Minister, the Archbishop of Canterbury and the President of the Royal Society were Vice-Presidents. To top it off, Britain’s two most powerful financial institutions, the Corporation of London and the East India Company, funded it.

Royalty and aristocracy headed fairly rigid systems of power, but an even better structure for Jenner’s vaccination purposes was the military. Even before he sought royal patronage, in fact, Jenner had imagined vaccination in military terms, fighting smallpox, ‘that formidable foe to health’. Jenner’s patrons responded to his vision, for it was in the military that they had the
most direct authority. The Duke of York and the Prince of Wales ordered the vaccination of the army and navy as part of reforms designed to impose mass hygiene on the ranks. The military, which played a fundamental role in Britain’s latest colonisation efforts, turned out to be Jenner’s most important vaccination vehicle. For Britain wasted no time in using the military to spread vaccination to the colonies, to Gibraltar and Malta in 1800, then to Ceylon, India, Canada, Africa and the West Indies. In 1803, to take just one example, vaccine was dispatched on the India-bound *H.M.S. Wyndham* and *Walpole* with a detachment of the Royal Artillery. Vaccine, soldiers, and guns: from the start Jenner’s remedy for the disease that plagued Britain’s colonies was carried along with Britain’s somewhat grimmer antidote to colonial rebellion. Jenner congratulated himself and ‘all lovers of the Vaccine, on the introduction of our little *Pearl* into India’. Ironically enough, a remedy that had begun at the bottom, in the bodies of beasts and peasants, was now spread from the top down, from royalty to aristocracy, from aristocracy to their tenants and from the military to colonial subjects.

**Romanticising Cow Medicine**

Just as Jenner was congratulating himself on vaccination’s introduction into the empire, he was supervising a publicity drive designed to give it universal popularity. He and his allies, in a departure from eighteenth-century scientific practice, used the newly popular journals and reviews to seek validation of his discovery from the reading public. And they used what was agreed to be the loftiest literary genre to give vaccination status. The ode gave Jenner’s medicine the heroic role of saviour of the world. There was Christopher Anstey’s ‘Ode to Jenner’ (1804: translated from the Latin by Jenner’s chief publicist, John Ring). There was John Williams’s ‘Ode to the Discoverer of Vaccination’ (1810: published with Jenner’s encouragement). As the era progressed, Jenner ensured that poetry gave the vaccination campaign the boost it needed to move in the public mind from cow medicine to romantic cure and thus from national bodies to international ones. In 1811, Coleridge wrote a letter to Jenner advising him that vaccination was just the stuff of powerful poetry. The topic, he said, was ‘capable in the highest degree of being poetically treated, according to our divine bard’s own definition of poetry as “simple, sensuous, and impassioned”’. By calling on Milton, Coleridge effectively drew an analogy between *Paradise Lost* and vaccination as paradise regained, not just for England, but for the world.

Jenner, alert to poetry’s publicity value, welcomed Coleridge’s offer. But the indolent Coleridge never did end up writing a cowpox poem. Two of his fellow Romantic poets did – Robert Bloomfield and Robert Southey (the Poet Laureate). Bloomfield, working with Jenner’s encouragement and supervision, wrote in ‘Good Tidings, or News from the Farm’ (1804) of the transcendent ‘fragrance of the heifer’s breath’. Granting transcendence to
the ‘heifer’s breath’ seems almost laughable, but Bloomfield was perfectly serious. This is the voice of a politically and socially conscious literate class who were well aware that Jenner had made a brilliant medical discovery in the body of the cow. ‘May that dear fragrance’, Bloomfield continued,

... as it floats along
O’er ev’ry flow’r that lives in rustic song;
May all the sweets of meadows and of kine
Embalm, O Health! This offering at thy shrine. (91–94)

Robert Southey, who like Coleridge was fascinated with the relationship between imperialism, disease, and imagination, told in his poem ‘A Tale of Paraguay’ (1825) how ‘this hideous malady ... lost its power / When Jenner’s art the dire contagion stayed.’ Southey called smallpox the ‘scourge’ of ‘the West’, locating the origin of the disease in Africa. Smallpox was Africa’s revenge. It had been sent forth to rebuke Britain for its brutish enslavement of native peoples, a sin that Jenner had atoned for. Southey wrote:

Jenner! Forever shall thy honored name
Among the children of mankind be blest,
Who by thy skill hast taught us how to tame
One dire disease, the lamentable pest
Which Africa sent forth to scourge the West
As if in vengeance for her sable brood
So many an age remorselessly repressed. (Canto 1, stanza 1)

Christopher Anstey, in his ‘Ode to Jenner’, extended the national link between smallpox and British identity. He equated epidemics with the ‘downfall of the [British] state’, which (as in Southey’s poem) put Jenner in the position of heroic restorer of the nation. But Anstey also viewed other kinds of military invasion – specifically Napoleonic imperialism – as epidemic. Jenner’s ‘protection’, he wrote:

... but retards our fate
If France pursues her infamous career,
To spread the pest of her dominion here;
And if the blood of innocence must flow;
To grace the triumphs of a Gallic foe?20

Jenner’s imperial victory over smallpox must, Anstey argued, be duplicated by a successful war against French expansionism – an argument vindicated when Nelson’s fleet, newly armed with vaccine to protect its sailors, destroyed Napoleon’s imperial navy at Trafalgar.

For his part, Bloomfield (who in the early years of the nineteenth century was far more popular among the reading classes than Wordsworth,
John Williams agreed; his ‘Ode to the Discoverer of Vaccination’, showed Jenner doing God’s work, creating an empire of health. Women of the world should, Williams concluded, unite in thanking Jenner for saving their beauty:

    now with philanthropic mind
    He promulgates to all mankind
    That Indian maid or female Us
    May share the same sweet joy with us.
    May the fair, then, give with me
    Thanks, O Jenner, thanks to thee.22

What poetry helped do is solidify the image of vaccination as saviour of public health and of Jenner as imperial hero – both against Napoleon and for ailing millions in the colonies. Poetry established a neat metamorphosis from heifer to hero. The lowly British beast, exalted by Jenner’s transforming science, would atone for the sins of the nation’s past and then bless that nation to go forward guilt-free into the imperial future.

The language of Jenner’s poets was embraced by the rulers of Britain’s empire, for in the real world of trying to control native populations, vaccination romanticised gave the British the ability to portray their colonial rule as a blessing. In India, for instance, Governor General Richard Wellesley, who was responsible for vastly extending British territories through military conquest, said vaccination would ‘have a salutary effect on the native’ by showing that their government was ‘administered’ on ‘enlightened’ principles.23 Another British agent in India claimed it would bring ‘good will from the people’24 and the Governor of Madras predicted vaccination would ‘bring an increase to the population and to the prosperity of the [East India] Company’s territories in an incalculable ratio’.25 Jenner’s chief publicist at the time claimed that Jenner had turned imperialism from a threatening to a
benevolent force in world politics: ‘While our countrymen thus kindle the lamp of science in every clime, and shed the blessings of health and happiness around, they maintain the honour of Britain; who has rendered herself illustrious, by her achievements in the arts as well as arms’. Britain’s achievement in ‘arms’ – in both senses of that word – would, it appeared, create a stable and civilised empire in the colonies as it did in Britain itself.

Mad Cows

Appearances can be deceptive, and Jenner’s propaganda met resistance. Vaccination provoked anxiety because it differed in striking and disturbing ways from other medical advances: it made people sick to make them well. In doing so, it penetrated the human body with matter derived from the bodies of diseased beasts.

By the end of the eighteenth century, one of the agreed markers of gentlemanliness was one’s distance from beasts. Cowper, the most popular poet of the period, portrayed the civilised man as one who was sheltered in domestic comfort. Leisured and insulated from the outdoors, he was contrasted with the shepherd and the waggoner, peasants defined by their contact with

![Figure 3 James Gilray’s 1802 cartoon, ‘The wonderful effects of the New Inoculation’. By permission of the Jenner Museum, Berkeley.](image)
animals. Wordsworth, of course, focused on shepherds and waggoners in his poetry, but met hostility and incomprehension from reviewers and readers who failed to see how gentlemen and women could learn conduct from peasants who reeked of the stable and the cowshed. However, Jenner, however, practised a still more direct infusion of animal matter into the ‘civilised’ world and this violated the taboos of civility which gentlemen defined themselves against. He was rubbing gentlefolk’s noses in the ‘dirt’ that hygiene could not clean up – the ‘dirt’ of their bodily similarity not only to peasants but to beasts. At least it seemed so to Jenner’s critics, who made fears of the British turning wildly brutal central to their opposition to him. In 1802, James Gillray graphically illustrated fear of ‘the beast within’ in his cartoon ‘The wonderful effects of the New Inoculation’ (Figure 3). Here, one poor vaccination victim – possibly a horrified Nelmes – grows a giant cowpox pustule from the right side of her face. Vaccination turns from medical miracle to wild orgy of transformation, as a shifty-eyed Jenner administers the variolae vaccine to peasant patients who then sprout cows from their limbs, buttocks, mouths and ears. Satanic horns erupt through the skull of another. The cartoon finds a graphic language to voice the widely shared anxieties about the power of the new science in an increasingly assertive medical profession. Dr Jenner and his allies, like the later Dr Frankenstein and Dr Jekyll, metamorphosise men into hybrids – a sort of turning inside out of ‘normal’ Britons – into grotesque miscreations who wear their animal madness on the outside instead of hidden deep in their dark hearts.

Gillray was not the only one to reveal Britons’ fear that vaccination would bring their animality out of the closet. In fact, many doctors were alarmed by Jenner’s science in part because it reminded them of other scientific innovations that placed humans alongside beasts. William Rowley, for instance, attacked Jenner for infecting the medical profession with cow-pox madness. Vaccination was simply the latest in a series of corrupt medical practices. Already ‘electricity and galvanism mad’, Rowley said, doctors were betraying their profession by endorsing science that made people like cows. Jenner’s medicine was akin to the ‘fanciful and extravagant celestial visions’ of the ‘illuminati’ (the mystical secret society suspected of fomenting political revolution).

Like vaccination, galvanism was indeed the latest craze in medical advances. And like vaccination, it played with the medical power of the cow. One of the principal galvanism wizards of the time was Giovanni Aldini, who had come to London in 1803 to carry out public demonstrations of this strange science using the bodies of cows and criminals. ‘Galvanism’, Aldini claimed, ‘is not owing to the communication nor the transfusion of the general electricity, but to an electricity peculiar to animals, which acts a very distinguished part in animal economy’. Aldini believed that the bodies of animals were like gigantic electric batteries that could re-charge or reanimate dead things. In his first experiments he transferred this energy from animal
to animal. ‘Having provided the trunk of a calf’, he wrote, ‘I conveyed the arc from the muscles of the abdomen to the spinal marrow of a frog. The frog seemed much affected, and the contractions were exceedingly violent when the arc was composed of a chain of different persons, united together by the hands moistened with salt water’.34

This was eerie enough, but what worried Rowley and others like him was the way Aldini used animals to animate people. ‘I made the same observations on the body of a man as I had before made on the head and trunk of an ox’, Aldini reported. ‘Having obtained the body of an executed criminal, I formed an arc from the spinal marrow to the muscles, a prepared frog being placed between, and always obtained strong contractions’ (Figure 4).35 Mary Shelley, who had read Aldini, took these experiments to their fictional extreme in Frankenstein: cows and criminality in the hands of these promethean medical men had monstrous results. This is exactly how Rowley felt about Jenner’s experiments. But Rowley’s equivalent of Frankenstein’s monster was, he believed, a matter of fact. He claimed to have treated a boy who, after being vaccinated, ‘seemed to be in a state of transforming, and assuming the visage of a cow’.36 This ‘ox-faced boy’, pictured in close-up at the beginning of Rowley’s text, became a graphic warning of the dangers of the new science (Figure 5).

Figure 4 The head and trunk of an ox, one of the crucial experiments of Giovanni Aldini, from his 1803 An Account of the Late Improvements in Galvanism. By permission of the British Library.
Rowley was part of a noisy campaign against Jenner led by Dr Benjamin Moseley, former surgeon to several powerful politicians of the time.37 Moseley argued that vaccination could cause ‘cow mania’, and in this sense he articulated an earlier version of the present day fear of B.S.E., or Mad Cow Disease. ‘Though I am ready to admit that the Cow-pox is not contagious’, he wrote, ‘yet I know the Cow Mania is; and that the malady, whether arising from empty ventricles of the brain, or from the excessive thickness of the os frontis, makes them distempered, to men not steeled against the infirmities of his fellow creatures, more objects of pity than of resentment’.38
Moseley adopted the position portrayed by Gillray’s cartoon, that vaccination would turn patients into beasts. ‘Owing to vaccination’, Moseley wrote, ‘the British ladies might wander in the fields to receive the embraces of the bull’.39 This was the comment of someone uneasy about a link between sexuality and beasts. Sexuality was an animal part of humanity that eighteenth and nineteenth century civilisation was deeply anxious about – particularly, at this time, women’s sexuality.40 For Moseley, being injected with matter from cows brought that sexuality into the open. As a result of vaccination, the bestial nature of women’s desire led them to acts of animal madness: they mated with bulls. ‘Can any person’, Moseley went on, ‘say what may be the consequences of introducing a bestial humour into the human frame, after a long lapse of years? Who knows, besides, what ideas may arise, in the course of time, from a brutal fever having excited its incongruous impression on the brain? Who knows, also, that the human character may undergo strange mutations from quadruped sympathy; and that some modern Pasiphae may rival the fables of old?’ Moseley’s readers would not have to be reminded that, in Greek legend, the gods caused Queen Pasiphae to make love to a bull and give birth to the minotaur, a monster with the body of a human and the head of a bull. Obviously, Moseley’s invocation of this myth was meant to suggest that sexuality, power, and beasts would have monstrous results.

Moseley’s account of ‘The Holles Street Case’ was perhaps an even more suggestive example of what vaccination could reveal about the bullish state of the British constitution because it implied that bestiality was indeed already part of being human. In this case, a nine month old boy who had been vaccinated began to grow ‘on his back and loins patches of hair, not resembling his own hair, for that was of a light colour, but brown, and of the same length and quality as that of a cow’.41 This hysterical account resembles Gillray’s cartoon, but the transformation here is more terrifying because less grotesque. It is more believable. It takes an outward feature that we humans have in common with cattle – hair – and uses this feature to turn us from human to beast.

Moseley’s language was excessive, but it had its origin in elements of Jenner’s own science. The *Inquiry into the Causes and Effects of the Variolae Vaccinae* began by assuming a necessary relationship between humans and animals. ‘The wolf, disarmed of ferocity’, Jenner observed, had degenerated into the domesticated dog, often ‘pillowed in the lady’s lap’.42 Such unnatural intimacy between the human and the animal made humans susceptible to a wide variety of animal diseases. This susceptibility had its benefits: it allowed cowpox to infect humans and so protect them against smallpox. Yet it also raised the spectre of humans losing their status as separate from and superior to animals. Sharing diseases and thus sharing constitutions might result in long-term degeneration. Animals, after all, mutated through cross-breeding to inferior versions of their former selves. Humans, likewise,
through a sort of unnatural crossbreeding with external influences, were in a constant state of ‘deviation’ from their original state. Among the causes of human degeneration, Jenner included the association with ‘a great number of animals’.43

Relations between species were crucial issues in the new scientific discipline in which Jenner had been trained. He had been the first pupil of Dr John Hunter, the surgeon and comparative anatomist. After moving back to the West Country, he continued to send specimens to Hunter for anatomical experimentation.44 Hunter wanted to establish an overall account of species based on the clinical demonstration of their organic and anatomical similarities and differences. The Hunterian museum, in which Hunter exhibited his collection, demonstrated his aims in its arrangement of specimens:

Mr. Hunter’s system begins with animals that have nothing analogous to a circulation; then follow others which have some approach towards one; and afterwards animals in which it is distinct; and so on through all the complicating which lead by almost imperceptible steps to man, in whom the heart is the most compounded.

All the organs of an animal body are arranged in distinct series, beginning with the most simple state in which each organ is met with in nature, and following it through all the variations in which it appear in more complex animals.45

Comparative anatomy became controversial because it demonstrated man’s kinship with animals – particularly apes. In the later nineteenth-century Hunter was suspected of embracing the idea of evolution.46 When his contemporary Erasmus Darwin expressed the idea explicitly in 1800, he found his morals and politics under vicious attack.47

Jenner did not embrace such radical views, but the language of the Inquiry brought them to mind anyway. ‘Degeneration’ and ‘deviation’ were charged terms; the German comparative anatomist J. F. Blumenbach argued that man had degenerated from the Adamic original.48 And some races had degenerated more than others: blacks more than whites. The Negro, it was agreed, was more animal-like than the Caucasian.49 Cross-breeding, as Jenner argued about animals, produced further degeneration. People of mixed race, it followed, were likely to be inferior to pure Caucasians. Cross-breeding threatened to lower Caucasians, by degrees, towards their ape-like black cousins.50

Natural historians used cross-breeding as a key test. After Buffon, it was regarded as a way of distinguishing species.51 If the offspring was always infertile, then it could be assumed that the parents were of different species. The mule showed the horse and donkey to be distinct. This theory got truly strange in the work of extreme racists. Unwilling to contemplate the mixing of whites and blacks, they applied the argument to people. Charles White and Edward Long, for instance, argued that black people were a different
specie from whites, and claimed as evidence the supposed ‘fact’ that mixed-race people were infertile.\textsuperscript{52} Benjamin Moseley, who was, like Long, an inhabitant of Jamaica and apologist for the plantation system, called Long ‘the father of correct English-West-Indian literature’.\textsuperscript{53}

For Moseley, Jenner’s \textit{Inquiry}, like comparative anatomy, threatened to undo the bodily distinctness upon which Long’s arguments were founded. If animals were similar enough for their diseases to breed and spread in humans, then different races of men could hardly be organically separate, whether or not they were of the same species. And so it was no coincidence that Moseley portrayed vaccination in the figure of Pasiphae mating with the bull. For him vaccination was an all-too successful form of cross-breeding. It was an intercourse issuing in an offspring that was monstrous because it was fertile evidence that whites were not constitutionally different from blacks and from the beasts whom blacks resembled.

Moseley and Long had reasons for their need to make blacks and beasts different from whites. In the West Indian plantations where they had developed their thought, slaveholders had a vested interest in arguing that ‘their’ blacks were not fully human. In most plantation account books that have come down to us today, slaves and cattle were listed as pieces of property, side by side. Moseley himself associated slaves with animals.\textsuperscript{54} Cow-like vaccination patients reminded him of the ‘distortions from that terrible distemper, the yaws, in the African race, where there has been the resemblance of various animals’.\textsuperscript{55} In parliament, William Wilberforce told the British that the Negro slaves were ‘driven at their work like brute animals. Lower than this it is scarcely possible for man to be depressed by man’.\textsuperscript{56} Thomas Clarkson also argued that West Indian planters thought of their slaves as the ‘offspring of cattle’.\textsuperscript{57} As Coleridge pointed out, thinking of blacks as beast-like made it easier to exploit and abuse them.\textsuperscript{58} So it was not simply fear of being infected with cattle that sent shivers up Moseley’s spine and obsessed his supporters, but the fear of discovering that they shared a common humanity with the slaves whom they wanted to believe to be bestial and inhuman.

\textbf{Colonial Resistance}

Benjamin Moseley had acquired his resistance to vaccination in the colonies and it was in the colonies that further resistance to it broke out. In India, high-caste Brahmins mirrored Moseley’s anxiety about unclean bodies. They too feared that vaccination would link their bodies to those at the bottom of the social hierarchy – not to black slaves but to low-caste children, from whose arms serum was often obtained.

While contact with ‘untouchables’ threatened caste, ingesting matter from cows raised the spectre of breaking Hindu and Buddhist prohibitions about killing and eating animals. Vaccination actually threatened to be a doubly-tabooed practice. The British were able to claim the vaccination did not
involve the death of holy cattle, but Indians still resisted contamination. Like Moseley and his followers, the Tamils of southern India linked vaccination to Mad Cow Disease. Mooperal Sreenivaschery, a Brahmin who supported vaccination, wrote to the East India Company’s doctor in the early 1800s. Sreenivaschery said that for the practice to succeed, ‘it might be useful to remove a prejudice in the minds of the people, arising from the term cowpox, being taken literally in our Tamul tongue; whereas there can be no doubt that it has been a drop of nectar from the exuberant udders of the cows in England, and no way similar to the humour discharged from the tongue and feet of diseased cattle in this country’.  

But changing the name was not quite enough. In the eyes of other Indians, the marks vaccinators left in patients’ arms were emblems of colonial rule. One Indian vaccinator reported being ‘impeded in his progress by an old woman, who attempted to persuade the people that this was to be the means of enslaving them, and that they would be known by the mark in the arm, which she termed “The Company’s chop”’  

Vaccination had become an enactment of British imperialism penetrating, contaminating and possessing the body of India. Indians did not view vaccination as a universal blessing the way poets like Robert Southey and colonial governors like Richard Wellesley had presumed. They resisted it because it violated their own religious taboos and because it marked them as property of a colonial government.

Besides, at this time Britain’s colonies already had their own indigenous methods for dealing with smallpox. One was the worship of smallpox goddesses. In India, for instance, the principal goddess, Sitala, was honored from Bengal to Gujurat, with village ceremonies and annual pilgrimages. Honouring her was designed to win her favour and gain protection from smallpox: angering her might lead to full infection and death. India’s native inoculators, the tikadors (‘mark-makers’), invoked Sitala. They had long been practising smallpox variolation in Bengal, Sind, Bihar, and much of the North West, working within the religious and cultural context of the people. Tikadors were ‘sought after and paid for by the people’ and had ‘long standing relations with client villages’. Theirs was the native and dominant tradition. As late as 1873, their practices still far exceeded vaccinations in Bengal.

To successive British administrators, Indians’ resistance was an indication of their cultural inferiority. The Superintendent-General of Vaccination for Bengal in the 1840s, for example, thought the Indians were in ‘the trammels of a degrading religion, by which their thoughts are chained, their reasoning faculties hoodwinked’. Thus vaccination became a means of justifying a stereotypical view of Indians as being rightly subject to British rule because they were, in the words of a Sanitary Commissioner responsible for vaccination, ‘unreasonable’ in their ‘religious beliefs’ and ‘caste prejudices’.
These views of Britain’s colonial officials gained currency with the aid of literature. Like vaccination poetry, prose used Jenner’s remedy to glorify British imperialism. The prose also hinted at an underlying anxiety about bestiality. In the work of James Morier, one of Britain’s first officials in Persia, vaccination was a figure revealing imperialist stereotypes, colonial resistance, and Britons’ fears about their own bestial nature. Morier’s popular novel The Adventures of Hajji Baba (1824) influenced British views of how Persia was. Sir Walter Scott wrote enthusiastically about its ‘fidelity’ to Persian life.

Morier made vaccination central to his story of Hajji Baba. Because the Persians resisted it, Morier treated them in his literary account as prejudiced, dishonest, and superstitious. Vaccination became a marker of Eastern inferiority. For example, this is what Morier has a Persian doctor say when a British physician arrives armed with vaccine:

He [the British doctor] pretends to do away with small-pox altogether, by infusing into our nature a certain extract of cow, a discovery which one of their philosophers has lately made. Now this will never do, Hajji. The small-pox has always been a comfortable source of revenue to me; I cannot afford to lose it, because an infidel chooses to come here and treat us like cattle. (78)

As it turns out, the Persian doctor in this novel embodies the traits Morier found characteristic of the whole nation: cunning, wiliness, self-interest, love of power and conquest. Morier asked readers to reject the Persian doctor’s fears of cultural contamination by Europe. After all, as all educated Britons knew, vaccination did not in fact contaminate people. It protected them from smallpox. Vaccination as a motif, in other words, confirmed British stereotypes about the people it tried to control.

But beneath Morier’s stereotyping ran a deeper fear, a fear that haunted the British imperialists as well as those they tried to control. It was the fear of the beast within themselves. In the voice of the Persian doctor, Morier wrote:

There must be a great affinity between beasts and Europeans, and which accounts for the inferiority of Europeans to Mussulmans. Male and female beasts herd promiscuously together; so do the Europeans. The female beasts do not hide their faces; neither do the Europeans. They wash not … They live in friendships with swine; so do the Europeans … As for their women, indeed! What dog, seeing its female in the streets, does not go and make himself agreeable? So doubtless does the European. Wife, in those unclean countries, must be a word without meaning since every man’s wife is every man’s property. (129)

This was not simply an Englishman’s idea of Muslim prejudice. Morier’s doctor ventriloquised the British fear of what they themselves might be made of – an animality which rendered them not superior but disturbingly like the
colonised people whom they themselves regarded as bestial and unclean. Thus vaccination marked not only Britons’ assumption of superiority, but, paradoxically, their fear of similarity to their colonial subjects. Vaccination (‘the blood of kine’, according to the poet Robert Bloomfield) revealed the beast-like nature of the British rulers because it imposed ‘civilisation’ through an injection of animality. Thus it made them insecure even as it seemed to confirm their superiority, and they were left trying to overcome that insecurity by forcing vaccination on their subjects and then reading resistance as evidence of native superstition. At home too, vaccination became a dirty marker of government imposition. British protesters declared they were fighting ‘the battle of pure blood against experimental butchery upon their defenceless little ones’. They preferred ‘salvation by sweetness’ to ‘salvation by filth’. Likewise, Indians who objected to British rule saw vaccination as a symbol of cultural imperialism that subjugated and contaminated others in the name of reason. Because it brought state control home to the body, vaccination made colonial resistance a matter of flesh and blood. Gandhi, for instance, declared it a ‘filthy process ... little short of taking beef’, and the Non-Co-operation movement of the 1920s made refusal of vaccination part of its political campaign. It was not until the British had left that India implemented vaccination on a wide enough scale to eradicate smallpox.

Vaccination has not altogether lost its status as a marker of Western imperialism. In a 1987 article in the Indian Express Newspaper called ‘Indo-US Vaccine Project Worries Scientists’, a reporter says, ‘the concern is about the enormous epidemiological data that will be collected as part of the vaccine trials. Samples of blood, sera, and cells tell a lot about the genetic make-up of a population, its immunity and antibody profile – collectively known as the “herd structure”’. . . Because of its potential uses to biological warfare specialists, no country gives its epidemiological data’. International science, Indians have learned from experience, is a mixed blessing. It may hurt as well as heal, infect as well as protect.

A Bestial Legacy

In 1977 the World Health Organisation snapped this photo of Ali Maow Maalin of Somalia, Africa (Figure 6). According the WHO, Maalin was the very last case of smallpox, and he certainly provides an eerie contrast to Nelmes’s diseased white hand. If Nelmes signalled the beginning of smallpox eradication, Maalin represents its end. In this sense, Maalin may be of some comfort. He is proof that we can prevail over the viral world. Yet, what we would like to suggest here, is that Maalin’s image may also be cause for alarm about the methods and motives of public health programs by world powers. It is, after all, no coincidence that between 1959 and 1963, at the height of the Cold War, the two countries most interested in worldwide smallpox...
Figure 6 Ali Maow Maalin, the last case of smallpox; taken by the WHO in 1977. From Smallpox and its Eradication. By permission of WHO.
eradication were the former USSR and the US, and one of the places they enacted both military and medical programs was Somalia.

As its history demonstrates so dramatically, vaccination has always been an international effort, and for those powers in control of public health, it means control of vast populations beyond the reach of anyone else. During the Cold War, eradication programs were set up by the USSR and the US in the very territories over which these two fought for influence or domination: Africa, Eastern Europe, South America, and Southeast Asia. These programs sought to win the hearts and minds of the indigenous peoples, whilst rendering them less infectious and so more easily governable. Yet they were just the heirs of campaigns carried out in the British Empire, when colonial governments spread British influence and power by vaccinating in Africa, India, the Caribbean, and South America.

We find ourselves, in a world that is post-British Empire and post-Cold War, left to ponder the imperial ironies of vaccination. To a world that grows increasingly terrified of outbreaks, plagues, and epidemics, vaccination certainly is a blessing. But it is also sinister, as one of the means by which governments seek to subjugate peoples through violence. They use vaccination not just to win hearts and minds, but to give their agents immunity to the biological weapons they produce to destroy their enemies – weapons that now include superviruses blended from plague and smallpox. In the hands of the germ warfare specialists of Iraq, the former USSR, the USA and the UK, Jenner’s blessing threatens to become a curse.

According to the WHO, there are only two vials of smallpox left in the world, one in Moscow, Russia and one in Atlanta, USA. Both were scheduled to be destroyed on June 30, 1999. This would have completely fulfilled Jenner’s prophecy of ‘extirpating from the earth’ one of the most ‘formidable foes of health’. But Russia is suspected of keeping a secret stash for further germ warfare research. If it is, we should not be surprised, for vaccination’s humble beginnings tell us what to expect from its future. The British learned to beat disease by invading healthy bodies with the matter of diseased beasts and forcing it on the populations they sought to control. They came to practise what one nineteenth-century opponent called ‘medical despotism’. Vaccination is strangely deceptive: though it wears a healthy face, it has from the beginning carried the bestial soul of imperialism.

Notes

The authors would like to thank the staff and trustees of the Jenner Museum, Berkeley, Gloucestershire, for their assistance and for permission to reproduce images in their possession (figures 1–3).

1 Edward Jenner, An Inquiry into The Causes and Effects of the Variolae Vaccinae, A Disease Discovered in Some of the Western Counties of England ... and known by the name of The Cow Pox (London, 1798), plate facing 32. All subsequent quota-

2 Such was smallpox’s prevalence that during the eighteenth century it killed six European monarchs and an annual average of 300 per 100,000 persons in Britain. See Donald R. Hopkins, *Princes and Peasants: Smallpox in History* (Chicago and London, 1983).

3 Jenner admitted taking his cue from the words of a local dairymaid. Others had preceded him in so doing. In 1774 Benjamin Jesty, a Dorset farmer, observing his dairymaid’s immunity to smallpox, scratched cowpox into the arms of his family. Lacking Jenner’s medical training and connections, Jesty could not develop his discovery on a national scale.


5 Vaccination should be distinguished from the existing eighteenth-century system, in which many doctors of Jenner’s day had a lucrative stake, of smallpox inoculation (variolation). Variolation (as we shall designate it to distinguish it from Jenner’s cowpox vaccination) was introduced to Europe in 1721 by Lady Mary Wortley Montagu. It involved protecting the patient by scraping a mild form of smallpox itself into the arm. It was risky, for it often communicated the virulent form of the disease, and it made the patient infectious.


7 The Society’s refusal ensured that Jenner’s arguments did not receive its full attention or impressur and remained, for the European scientific community, unvalidated. On the importance of receiving the Society’s validation, and the methods which the Society used to withhold that validation without causing disputes, see Steven Shapin, *The Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago and London, 1994).


9 Vaccination was introduced to the navy as part of reforms instituted by Admiral St Vincent designed to impose sanitation on the fleet. It was through these reforms that doctors and surgeons increased their status in the navy, as they became officially responsible for inspection and supervision of crews. This official responsibility for imposing health through discipline anticipated the development of a similar role by civilian doctors. On the institutionalisation of health discipline in the navy see Christopher Lloyd and Jack L. S. Coulter, *Medicine and the Navy 1200–1900, III 1714–1815* (Edinburgh and London, 1961), pp. 165, 349–52, and Christopher Lawrence, ‘Disciplining Disease: Scurvy, the Navy, and Imperial Expansion, 1750–1825’, in David Philip Miller and Peter Hans Reill (eds), *Visions of Empire: Voyages, Botany and Representations of Nature* (Cambridge, 1996), pp. 80–106. See also Sir Gilbert Blane, *Select Dissertations on Several Subjects of Medical Science* (London, 1822), pp. 354–55.


12 Shapin, in *The Social History of Truth*, shows that authority was at this time normally conferred upon scientific claims within the gentlemanly institution (clubs, societies). Jenner was one of the first scientists to take advantage of the burgeoning public sphere fed by the increasing circulation of journals.

14 Coleridge’s son Berkeley had died after being variolated with smallpox matter whilst his father was out of the country (i.e. he was not vaccinated but was treated on the old system introduced by Montagu: see note 5 above).


18 Southey’s friend and brother-in-law Coleridge argued that smallpox derived from Abyssinia whence it was carried by conquests, trade, and the Roman armies to Constantinople and to Italy and France. And he asked Southey to inform Jenner that the Danes’ successful control of an epidemic in cattle by inoculation of calves placed ‘the identity of the Small & cow pox out of doubt’: *Collected Letters*, vol. 2, p. 852.


21 Present-day Sri Lanka.

22 John Williams, *Sacred Allegories*.

23 Quoted in the *Asiatic Annual Register* (1807), 19.


25 Quoted in *ibid*.


28 The radical Whig leader, Charles James Fox, told Wordsworth he thought blank verse unfit for such simple subjects. Wordsworth was guilty of undermining the status of poetic language, as Francis Jeffrey agreed when he regretted Wordsworth’s derivation of ‘lofty’ conceptions from ‘low’ objects: ‘nor is there anything, – down to ... the evisceration of chickens, – which may not be introduced in poetry, if this is tolerated’. *Edinburgh Review*, in John O. Hayden (ed.), *Romantic Bards and British Reviewers* (London, 1971), pp. 15, 21.

29 On ‘dirt’ as what we perceive to be out of place, something transgressing a boundary, see Mary Douglas, *Purity and Danger* (New York, 1970).

30 Anxieties manifested also in opposition to new treatments with gases and electricity. On these see Roy Porter, *Doctor of Society: Thomas Beddoes and the Sick Trade in Late-Enlightenment England* (London and New York, 1992). Also relevant is the panic over bodysnatching to supply surgeons with corpses for dissection. See Hugh Douglas, *Burke and Hare* (London, 1974).


33 Giovanni Aldini, *An Account of the Late Improvements in Galvanism, with a series of curious and interesting experiments ... containing the Author’s experiments on the body of a malefactor executed at Newgate* (London, 1803), p. 6.

Moseley, like many of Jenner’s medical opponents, had a lucrative practice in administering variolation. Details of the campaign, in which fifteen doctors joined Moseley in anti-Jenner pamphleteering, can be found in Saunders, \textit{Edward Jenner The Cheltenham Years}. By 1810, however, Moseley had lost, partly because the extreme rhetoric of his attacks on vaccination offended the proprieties of current scientific discourse. \textit{The Edinburgh Review} complained of Moseley’s language and summed up the debate conclusively in Jenner’s favour: ‘Review of Pamphlets on Vaccination’, 15 (January, 1810), 322–51.


The new botany was also depicted by conservatives as an unleashing of female sexuality which undermined the social order. See Richard Polwhele, \textit{The Unsex’d Females: A Poem} (London, 1798). Similarly, in Coleridge’s sarcastic view of politics in 1820, the governing aristocracy, recognising itself as bestial in its promiscuous sexuality, treated those it ruled as beasts too. In the process civilisation was undermined: ‘Fodder the man, beasts well – be a knowing Grazer &c! it is a paternal Government’. See Kathleen Coburn (ed.), \textit{The Notebooks of Samuel Taylor Coleridge}, 5 vols. (London and Princeton, 1957–), vol. 4, note 4720.


\textit{An Inquiry}, p. 153.

Including hedgehogs, a dolphin and parts of a whale. With Hunter’s encouragement, he also carried out observations of cross-breeding in dogs and foxes.


Hunter’s proto-evolutionary ideas were expressed more clearly in the work of his follower, William Lawrence. See William Lawrence, \textit{Lectures on Physiology, Zoology and the Natural History of Man} (London, 1819).


Camper and Blumenbach argued that blacks’ skulls were measurably more like those of apes than were whites’. See J. F. Blumenbach, \textit{Decas Tertiae Collectionis Suae Craniorum Diversarum Gentium Illustrata} (Göttingen, 1795).


60 Quoted in Thornton, *Vaccinae Vindicia*, p. 423.


63 Quoted in Arnold, ‘Smallpox and Colonial Medicine’, p. 53.


65 Morier served as secretary to the British embassies to Persia from 1809 to 1812, and as minister plenipotentiary in Tehran from 1812 to 1815. The narrative of his visit, published in 1810, became an authoritative work on Persia: it was translated into French and German.

66 All citations from *The Adventures of Hajji Baba of Ispahan* (London, n.d.).


68 ‘Good Tidings’, line 85.

69 In Britain the Vaccination Act of 1841 made variolation illegal. A further act of 1853 made vaccination compulsory for all children within three months of birth. In 1861 Poor Law Guardians in each district of the land were permitted to appoint officers to enforce the law. And in 1867 Parliament made those who refused vaccination punishable by repeated fines. In India, meanwhile, the native practice of tikadar inoculation was banned in Calcutta from 1804. Although this ban was ineffective, it was succeeded by further bans until in 1880 the Vaccination Act made Jenner’s system compulsory wherever the government of India chose to enforce it. Vaccination had become one of the chief means by which a fully centralised government sought to supervise the people. Medicine had become a bureaucratised discourse of state control, a means of imposing on the public the kind of order that their legislators thought was good for them. On hygiene and order see Michel Foucault, *The Birth of the Clinic: an Archaeology of Medical Perception* (London, 1989).

70 On 23 March 1885 over 20,000 Britons demonstrated against vaccination in Leicester. Their slogans are quoted in MacLeod, ‘Law, Medicine and Public Opinion:


72 Lack of vaccination is also political. Whether immunising technology has been distributed across needy countries has in practice depended on their perceived attitudes and usefulness to the West. On the geopolitics of funding immunology see Anthony Robbins and Phyllis Freeman, ‘Obstacles to Developing Vaccines for the Third World’, in Thomas D. Brock (ed.), Microorganisms From Smallpox to Lyme Disease: Readings from Scientific American Magazine (New York, 1990), pp. 66–75.

73 As Barton J. Bernstein points out, the development of vaccines in the Cold War period proceeded in conjunction with the development of biological warfare. See ‘The Birth of the U.S. Biological Warfare Program’, in Brock (ed.), Microorganisms, pp. 150–60.

74 Recent intelligence reports suggest, however, that the Moscow vial has been removed to closed research establishments elsewhere in Russia, where research on breeding a supervirus continues.

75 Jenner, A Continuation of Facts, p. 231.

76 British authorities made vaccination compulsory at home and established a series of laws to punish those who refused, from the 1840s on. For details of this and of the, mostly working-class, resistance to it see R. M. MacLeod, ‘Law, Medicine and Public Opinion’. On resistance in the colonies to forced vaccination see Arnold, ‘Smallpox and Colonial Medicine in Nineteenth-Century India’, pp. 45–63 and Radhika Ramasubban, ‘Imperial Health in British India, 1857–1900’, in Roy MacLeod and Milton Lewis (eds), Disease, Medicine And Empire: Perspectives On Western Medicine And The Experience Of European Expansion (London and New York, 1988), pp. 38–60.

77 Quoted in MacLeod, ‘Law, Medicine and Public Opinion’, 120.