

## 2 Fire with Fire

### Smallpox Inoculation in the Eighteenth Century

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In March 1756, when smallpox threatened Wotton-under-Edge in Gloucestershire, residents gave thought to inoculating their children and using parish funds to offer the procedure to the poor, including newcomers in the textile mill. At a vestry meeting, fifteen of seventeen vestrymen agreed to hire a local surgeon to inoculate the poor at 5s. per head. Over a couple of weeks, the surgeon prepared, inoculated and attended to 336 patients, two of whom died. The record of this 'general inoculation' only survives because one ratepayer took the overseers of the poor to court, unsuccessfully, for using parish funds for this purpose.<sup>1</sup> There is other evidence that the small town took smallpox prophylaxis seriously. In the following year, an eight-year-old orphan attending the town school was inoculated with his schoolmates. It was the full deal, with bloodletting, purgative medicine and a deep incision. 'After this barbarism of human-veterinary practice,' as the episode was recalled half a century later, 'he was removed to one of the then usual inoculation stables, and haltered up with others in a terrible state of the disease, although none died.'<sup>2</sup> It was just as well: the little boy was Edward Jenner.

The coming of spring in 1756 also raised concerns about smallpox in Paris. The Duke of Orleans resolved to have his son and daughter inoculated. When asked for permission, Louis XV would neither approve nor prohibit his cousin's plan of action. Dr Théodore Tronchin came from Geneva to perform the operation. More experienced than any Frenchman in the practice, he had developed a gentler procedure than was standard in England. His arrival in Paris caused a great stir. On 25 March, he inoculated the eight-year-old Philippe. The announcement of the happy outcome occasioned great rejoicing.<sup>3</sup> The audience at the Opera was entranced by the sight of the Duke and Duchess

<sup>1</sup> Q/SO/8, f. 145v, Quarter Sessions, Gloucestershire RO, Gloucester.

<sup>2</sup> Thomas Dudley Fosbroke, *Berkeley manuscripts . . . to which are annexed a copious history of the castle and parish of Berkeley . . . and biographical anecdotes of Dr Jenner* (London, 1821), p. 221.

<sup>3</sup> Miller, *Adoption*, pp. 212, 217.

taking their box with their children in their arms, and loudly cheered them.<sup>4</sup> For the young boy, later Duke of Orleans, it was a formative experience. Always hungry for public acclaim, he led the liberal nobles in support of the French Revolution, under the name Philippe Égalité. However, security from smallpox did not save him from the guillotine.

The inoculations in Gloucestershire and Paris in 1756–7 reflect significant developments in the history of the practice. The initiative at Wotton-under-Edge is testimony to increasing popular interest in inoculation in the English-speaking world. For its part, Tronchin's success in introducing inoculation in the house of Orleans made it fashionable in aristocratic and liberal circles in France, helping to establish its credibility and prompting emulation elsewhere in Europe. The two developments, at either end of the social spectrum, were mutually supportive. Prior to accepting the procedure, European princes and nobles often sponsored trials among children in charitable institutions under their patronage. Enlightened self-interest likewise led them to promote the practice among their servants and tenants. The widening demand for prophylaxis made it possible for more medical men to build expertise and introduce improvements, most notably a simplification of the procedure that made it more affordable and less traumatic for patients. The growing body of experience of inoculation challenged and transformed understandings of disease and inspired new thinking about public health. Furthermore, the expansion of smallpox inoculation in the late eighteenth century not only made possible Jenner's cowpox discovery but also created the conditions for its rapid appraisal and adoption in many parts of the world.

### **Inoculation in England: Survival and Revival**

By arranging the inoculation of her children and by publicising its benefits, Lady Mary Wortley Montagu brought smallpox inoculation into fashion in Britain. The Royal Society's experiments and Dr Jurin's collection of data showing its relative safety provided some basis for confidence in the procedure. Costly and time-consuming, however, the procedure initially had little social reach. The reports of some deaths and concern that inoculation spread the infection created anxieties and stoked outrage among the population at large. The chance of a severe or fatal outcome was a source of stress to the practitioners themselves. Physicians were disinclined to promote 'what so many are disposed to find fault with', and recommended it only when smallpox was an immediate threat.<sup>5</sup> Since the procedure was largely in the hands of surgeons, it

<sup>4</sup> *L'Année Littéraire*, 3 (1756), 232–4.

<sup>5</sup> James Kirkpatrick, *The analysis of inoculation: comprizing the history, theory, and practice . . .* (London, 1754), pp. 271–82; Miller, *Adoption*, p. 131; Lobb, *Treatise*, pp. 184–5.

is instructive that Samuel Sharp, a leading London surgeon, did not include inoculation in the first three editions of his bestselling surgical treatise (1739–40).<sup>6</sup> Lady Montagu herself came to regret ‘her patriotic undertaking’ and claimed she would never ‘have attempted it if she had foreseen the vexation, persecution, and even the obloquy it brought upon her’.<sup>7</sup>

In the early 1740s, however, smallpox inoculation staged a revival. The decade began with smallpox outbreaks across the British Isles, and in 1740–1 there was popular demand for inoculation in the southern counties of England.<sup>8</sup> The surgeon at Wotton-under-Edge in 1756 claimed that he ‘had practised the method for sixteen years’, that is, from around 1740.<sup>9</sup> John Ryder, Bishop of Down, reported in 1743 that in the last ‘two or three years’ 1,000 people had been inoculated in his diocese in northern Ireland.<sup>10</sup> In 1743, Sharp finally included a section on smallpox inoculation in the fourth edition of his textbook.<sup>11</sup> Although the revival in the practice was underway before Dr James Kirkpatrick’s return to Britain in 1742, Geneviève Miller was perhaps too hasty in discounting his role in re-establishing its fortunes.<sup>12</sup> After all, reports of inoculation in the American colonies in the late 1730s, including Kirkpatrick’s report of its success in Charleston in 1738, would have disposed British readers to reconsider its advantages.<sup>13</sup> In Britain, Kirkpatrick could claim an expertise in inoculation that was hard to match locally and his *Essay on Inoculation*, published in 1743, was unprecedented in ambition and scale.<sup>14</sup> His boast that ‘several’ people told him that his work ‘had been of some effectual tendency to revive the practice in England’ is entirely credible.<sup>15</sup> In dismissing the possibility of his influence on the decision of the Foundling Hospital to introduce inoculation, Miller mistakenly states that the decision was made in January 1743, before Kirkpatrick’s return, when it was actually made early in 1744.<sup>16</sup> Another signal event in the revival of inoculation, suggesting at least the timeliness of Kirkpatrick’s book, was its re-adoption

<sup>6</sup> Samuel Sharp, *A treatise on the operations of surgery* . . . 3rd ed. (London, 1740).

<sup>7</sup> Isobel Grundy, ‘Medical advance and female fame: inoculation and its after-effects’, *Lumen*, 13 (1994), 13–42, at 29.

<sup>8</sup> *London Evening Post*, 11–13 September 1740; 29–31 October 1741.

<sup>9</sup> R. Perry, *Wotton-under-Edge. Times past – times present* (Wotton-under-Edge, 1986), p. 68.

<sup>10</sup> *Eighteenth century Irish official papers in Great Britain: private collections*, vol. 2, ed. A. P. W. Malcolmsom (Belfast, 1990), pp. 14–15.

<sup>11</sup> Samuel Sharp, *A treatise on the operations of surgery* . . . 4th ed. (London, 1743), pp. 224–8.

<sup>12</sup> Miller, *Adoption*, pp. 134–46; Miller, ‘Reappraisal’, 487–92.

<sup>13</sup> *Weekly Miscellany*, 14 July 1738.

<sup>14</sup> James Kilpatrick [Kirkpatrick], *An essay on inoculation, occasioned by the small-pox being brought into South Carolina in the year 1738* (London, 1743), pp. 32–5; Smith, *Speckled monster*, pp. 37–9.

<sup>15</sup> Kirkpatrick, *Analysis* (1754), p. 111.

<sup>16</sup> Ruth K. McClure, *Coram’s children. The London Foundling Hospital in the eighteenth century* (New Haven, 1981), p. 206.

by the royal family. The five-year-old Prince George, the future George III, caught smallpox in November 1743, prompting the hurried inoculation of his older sister and younger brother.<sup>17</sup>

By the mid-1740s, there was a solid platform for the advance of inoculation. Established in 1746, the Smallpox Hospital in London included inoculation in its remit from the outset, and in 1752 began to offer the procedure at no charge. Thenceforward it provided an important focus for the practice, providing instruction and advice to practitioners, and generally building knowledge of the practice. Dr Richard Mead, who had been active in the early appraisal of inoculation, finally gave the procedure his endorsement in his long-awaited treatise on smallpox and measles in 1747.<sup>18</sup> A major smallpox epidemic in 1751–3 set the scene for further expansion in inoculation activity. In a sermon to the patrons of the Foundling Hospital in 1752, Bishop Maddox of Worcester presented a positive account of the practice and allayed religious concerns about it.<sup>19</sup> In 1755, the Smallpox Hospital reported that, while around one in seven who caught smallpox died, only one of its 593 inoculations had proved fatal.<sup>20</sup> There was growing demand for inoculation in the provinces as well. Expressing concern that the practice ‘as it is now managed, must necessarily exclude . . . the greatest part of mankind, from the benefit of it’, a letter to *The Gentleman’s Magazine* called on medical men to ‘perform it out of charity to the poor, on moderate terms to others, in proportion to their circumstances.’<sup>21</sup>

In his *Analysis of Inoculation* (1754), Dr Kirkpatrick offered a fuller account of the practice than had hitherto been available. Dedicating it to King George II, he praised his ‘sagacity and resolution’ in having his children inoculated and saving by his example many thousands of his subject’s children.<sup>22</sup> His ability to draw on the extensive notes of the practice by John Ranby, the king’s surgeon, was another indication of his standing.<sup>23</sup> Kirkpatrick presented an interesting analysis of inoculation as a business, contrasting the ‘economy of inoculation’ in London, where it was overseen by physicians and qualified

<sup>17</sup> *Daily Advertiser*, 15 November 1743; [Charles-Marie de] La Condamine, *A discourse on inoculation, read before the Royal Academy of Sciences at Paris*, transl. Matthieu Maty (London, 1755), p. 7n.

<sup>18</sup> He observed that, though established for some time in England, inoculation had ‘drawn our physicians into parties’: Richard Mead, *A discourse on the small pox and the measles*, transl. Thomas Stack (London, 1748), pp. 82–98, at p. 82.

<sup>19</sup> Isaac Maddox, Bishop of Worcester, *A sermon preached before [the] governors of the Hospital for the Small-pox, and for Inoculation . . . 1752* (London, 1752).

<sup>20</sup> The circular is tipped in at the end of the BL’s copy of James Killpatrick [Kirkpatrick], *A full and clear reply to Doctor Thomas Dale: wherein the real impropriety of blistering with cantharides in the first fever of the small-pox is plainly demonstrated* (Charleston, NC, 1739).

<sup>21</sup> *GM*, 22 (1752), 511–13. <sup>22</sup> Kirkpatrick, *Analysis* (1754), p. iv.

<sup>23</sup> Kirkpatrick, *Analysis* (1754), xxiii–xxiv and *passim*; Maddox, *Sermon*, p. 19.

surgeons, and in the country-towns and villages, where it was in more mercenary and careless hands. Acknowledging that the procedure's cost put it out of the reach of many people, he expressed the hope that his colleagues would make it available to the poor at reduced or no cost. He also acknowledged that, in seeking to protect themselves by inoculating smallpox, individuals could endanger their neighbours. It was widely recognised that in urban settings smallpox inoculation required careful control. In autumn 1752, medical men in Salisbury inoculated 133 residents and almost 300 people from the district but, as the epidemic began to subside, all but one practitioner agreed to cease the practice, as it threatened to reignite the infection.<sup>24</sup> For rural communities, Kirkpatrick recommended 'general inoculations' in which patients could go through the infective stage together, but accepted that they could be difficult to organise.<sup>25</sup>

### The Inoculation Controversy in Europe

Smallpox was as great a scourge and inoculation as interesting a topic in continental Europe as it was in Britain. The experiments by the Royal Society in London in the 1720s attracted significant attention and there were early trials in Germany and elsewhere. In 1722, the Dutch physician Hermann Boerhaave acknowledged inoculation's potential value in a new edition of his *Aphorisms*.<sup>26</sup> Francophone readers learned about inoculation from the *Journal des Savants* and in the *Mémoires de Trévoux*, a Jesuit journal with a broad circulation in Catholic Europe.<sup>27</sup> In Spain, the Benedictine monk Benito Feijóo was inspired by the Jesuit journal to include a cautiously positive report of the practice in the fifth volume of his popular compendium, *Teatro crítico universal*, in 1733.<sup>28</sup> In his *Philosophical Letters* (1734), Voltaire stoked interest among *salonistes* and *savants*. Presenting inoculation as a boon to mankind, he praised Lady Montagu for her boldness and good sense, and deprecated the French nation for not following the English example. In fashionable circles, approval of inoculation became emblematic of enlightened opinion. Prejudices and doubts about the practice, however, were nourished by stories of mishaps in England and reports that it had fallen into disrepute.<sup>29</sup> European visitors who had recourse to prophylaxis in London did not always have a positive experience: General Diemar, resident for the Principality of Hesse-Cassel, lost

<sup>24</sup> PTRS, 47 (1751–2), 570–1; *Salisbury Journal*, 4 December 1752, 2 July 1753.

<sup>25</sup> Kirkpatrick, *Analysis* (1754), p. 288. <sup>26</sup> Miller, *Adoption*, p. 174.

<sup>27</sup> Miller, *Adoption*, pp. 181–4, 189–91.

<sup>28</sup> Jacqueline Gratton, "'Un mal pequeño para un gran bien': Smallpox prevention and the dissemination of new ideas in Spain 1725–1775", MA thesis, University of Tasmania, 2012, pp. 88–9.

<sup>29</sup> La Mettrie, *Traité*, p. 9.

a daughter to inoculated smallpox in 1734.<sup>30</sup> As in Britain, the return of epidemic smallpox in the early 1740s revived interest in inoculation. Dr Tronchin, who lived in London in the mid-1720s, studied under Boerhaave at Leiden, and built his career in Holland, inoculated his son and other children in Amsterdam in 1748 and, in the following spring, supervised Daniel Guiot's trial of the practice in Geneva. After an enquiry into inoculation, the Republic of Geneva authorised its use on children of the state in 1751.<sup>31</sup> The Genevans wasted no time in publicising their success with prophylaxis.<sup>32</sup> In Lausanne, the humane physician Samuel Auguste Tissot followed their lead. Published in 1754, Tissot's *L'Inoculation justifiée* was hailed by Voltaire as 'a service rendered to humankind'.<sup>33</sup>

A smallpox epidemic in Paris in 1753 prompted Charles-Marie de La Condamine, mathematician and naturalist, to champion the cause. During his travels in 1731, he observed inoculation in Istanbul and, on his geodetic expedition to South America in 1743, learned of its successful use, fifteen or so years earlier, on a Carmelite mission at the mouth of the Amazon.<sup>34</sup> On 14 April 1754, he delivered a powerful oration on inoculation to the French Academy of Sciences, presenting its advantages and inviting the audience to consider them. In a rhetorical *tour de force*, he described smallpox as a monster who had fed upon human blood for twelve centuries. Of a thousand persons, who had survived infancy, he observed, it often took 200 victims. Likening the deaths to the tribute in young lives that the Athenians paid the Minotaur, he declared that the happy deliverance of Athens by Theseus 'seems to be realised in our own time in England' through inoculation. If the practice were adopted in France, he continued, the monster would only take those 'who imprudently expose themselves to its attack'.<sup>35</sup> The oration was a hot topic in Paris and the kingdom at large. Rapidly put into print, his *Mémoire sur l'histoire de l'inoculation* went through three editions in the first year. In the provinces, La Condamine met members of the medical school in Montpellier, made a presentation at the court of Stanisław Leszczyński, titular king of Poland and Duke of Lorraine, at Lunéville, and enjoyed the hospitality at Avignon of the Marquise of Bayreuth, Frederick the Great's sister, to whom he

<sup>30</sup> *Daily Journal*, 9 September 1734. <sup>31</sup> Gautier, *Médecine à Genève*, pp. 390–2.

<sup>32</sup> Jean Antoine Butini, *Traité de la vérole, communiqué par l'inoculation* (Paris, 1752); Gautier, *Médecine à Genève*, p. 393.

<sup>33</sup> Samuel Auguste Tissot, *L'inoculation justifiée, ou dissertation pratique et apologétique sur cette méthode* (Lausanne, 1754), esp. pp. 8–9; Henry Tronchin, *Un médecin du xviii<sup>e</sup> siècle. Théodore Tronchin (1709–1781)* (Paris, 1906), p. 105.

<sup>34</sup> [Charles Marie de] La Condamine, *Mémoire sur l'inoculation de la petite vérole* (Paris, 1754), pp. 18–19.

<sup>35</sup> La Condamine, *Mémoire*, pp. 64–5.

dedicated the third edition.<sup>36</sup> On a tour of Italy in 1755, he was pleased to hear that some ladies in the Romagna were inoculating their children without informing their husbands. He was informed, too, that ‘no theological scruples ... would be opposed at Rome’ to ‘a practice which tends to the good of mankind’, and that learned societies were planning to conduct trials with the Accademia dei Fisiocritici in Siena doing so in autumn 1755.<sup>37</sup>

La Condamine’s call to arms fanned sparks of interest across Europe. In Holland, the practice already had some credit in French Huguenot circles. Inspired by Bishop Maddox’s sermon of 1753, Charles Chais, pastor of the French Church in The Hague, published a defence of inoculation that was then made available in Dutch by the Haarlem Academy of Sciences.<sup>38</sup> Luisa von Wassenaar, Countess of Athlone, who had been inoculated as a child in London, led the way in 1754 by having her children inoculated in The Hague.<sup>39</sup> Dr Mathieu Maty, a Dutch physician, secretary of the Royal Society in London and editor of the *Journal Britannique*, translated La Condamine’s *Mémoire* into English and Dutch, and proved an influential lobbyist for smallpox prophylaxis. La Condamine’s *Mémoire* was translated into German, and his second *Mémoire* included a report on the revival of inoculation in Hanover.<sup>40</sup> In 1754 the Medical College in neighbouring Brunswick (Braunschweig) discussed introducing the practice.<sup>41</sup> In Denmark, Count Bernstorff, former ambassador in Paris and friend of La Condamine, was likely responsible for the publication of the *Mémoire* in the *Mercure Danois*.<sup>42</sup> His eighteen-year-old wife Charitas von Buchwald, the first noblewoman to be inoculated in Denmark, emerged from the operation in summer 1754 scarred but applauded for her pluck.<sup>43</sup> In Sweden, Carl Gustaf Tessin, the Chief Minister, wrote to the Crown Prince explaining its value and recommending

<sup>36</sup> [Charles Marie de] La Condamine, *Second mémoire sur l’Inoculation de la petite vérole* (Geneve, 1759), p. 12, and *Mémoire sur l’inoculation de la petite verole*, 3rd ed. (Avignon, 1755), pp. i–ii.

<sup>37</sup> [Charles Marie de] La Condamine, *Journal of a Tour to Italy* (Dublin, 1763), pp. 107–9; Francesco Vannozzi, ‘La “questione dell’innesto de vajuoli” ovvero la lotta contro il “veleno varioloso” in Francesco Vannozzi, *Siena. La città laboratorio* (Siena, 1999), pp. 15–16. Reports of early trials of inoculation make up the first volume of the Accademia’s published proceedings: *Gli atti dell’Accademia delle Scienze di Siena detta dei Fisiocritici dell’anno 1760*, 1 (1761).

<sup>38</sup> Charles Chais, *Essai apologetique sur la méthode de communiquer la petite vérole par inoculation* (The Hague, 1754); Uta Janssens, ‘Mathieu Maty and the adoption of inoculation for smallpox in Holland’, *BHM*, 55 (1981), 248–9.

<sup>39</sup> Janssens, ‘Maty and inoculation’, 248. <sup>40</sup> La Condamine, *Second mémoire*, pp. 32–3.

<sup>41</sup> Mary Lindemann, *Health and healing in eighteenth-century Germany* (Baltimore, MD, 1996), p. 331.

<sup>42</sup> The *Mercure Danois* was one medium through which the *Mémoire* was known in Spain: Gratton, ‘Smallpox prevention in Spain’, p. 168.

<sup>43</sup> Julius Petersen, *Kopper og koppeindpodning*, electronic version (1896), p. 63.

trials on condemned prisoners.<sup>44</sup> After sending Dr David Schultz to study the practice in London, the Swedish Medical Board resolved to authorise the practice early in 1756. Tessin commissioned a medal in honour of Katarina de Geer, who had set an example by having her four children inoculated.<sup>45</sup>

The princes of continental Europe were aware of the perils of smallpox, but their physicians hesitated to recommend inoculation. The Empress Maria Theresa spent her life in the shadow of the scourge. Her husband, Francis of Lorraine, had seen four older siblings fall to the disease, and her anxieties for her children increased over the years. Gerard van Swieten, her physician, was inclined to inoculation in 1755, but became more cautious in the 1760s.<sup>46</sup> The prince who came closest to championing inoculation in the early 1750s was Stanisław Leszczyński, titular king of Poland. Installed in Lorraine by his son-in-law Louis XV of France, he cultivated an image of himself as an enlightened ruler. After La Condamine's visit in 1754, he sought advice from the newly established royal medical college at Nancy.<sup>47</sup> In March 1755, Dr Bagard presented the case for inoculation on the college's behalf, arguing the desirability of princes introducing the practice into their states and offering the king an opportunity 'to give an example to the universe that could only be glorious to the realm'.<sup>48</sup> As opposition to inoculation hardened in France in the following years, Bagard's recommendations were shelved.<sup>49</sup> Early in 1755, the political economist Turgot organised the inoculation of several poor children in Paris and allies in government circles received a favourable report from Ambrose Hosty, an Irish-born doctor-regent in the Medical Faculty, who had been sent to London on a fact-finding mission.<sup>50</sup> On 14 May, the Chevalier de Chastellux became the first French nobleman to submit himself to the procedure.<sup>51</sup> Conservatives in the Faculty, however, were staging a counter-offensive. Their cat's-paw was another Irish doctor-regent, Andrew Cantwell, who prepared a thesis attacking inoculation. Claiming long familiarity with the practice in Ireland, England and France, he presented evidence of fatal and other adverse outcomes and reported that medical opinion in Britain had turned against it. In approving the publication of the thesis in July, the royal censor

<sup>44</sup> [Carl Gustaf Tessin], *Letters from an old man to a young prince; with the answers. Translated from Swedish*, vol. 3 (London, 1759), pp. 134–48, at p. 147.

<sup>45</sup> Sköld, *Two faces*, p. 260.

<sup>46</sup> Frank T. Brechka, *Gerard van Swieten and his world 1700–1772* (The Hague, 1970), p. 117.

<sup>47</sup> La Condamine, *Second mémoire*, p. 12.

<sup>48</sup> Pierre-Joseph Buc'hoz, *Manuel de médecine pratique, royale et bourgeoise; ou pharmacopée tirée des trois regnes, appliquée aux maladies des habitans des villes* (Paris, 1771), pp. 453 and 489.

<sup>49</sup> Nicolas Louis François, *Éloge historique de M. Gandoget* (Nancy, 1770), pp. 32–5.

<sup>50</sup> [Ambrose Hosty], *Extrait du rapport de M. Hosty* (no place, no date), p. 12.

<sup>51</sup> La Condamine, *Second mémoire*, pp. 15–16.



declared that, given the urgent need to combat favourable representations of inoculation, it could not be published soon enough.<sup>52</sup>

As the controversy broke, the Duke of Orleans was considering inoculating his children. If he hesitated in the face of the assault of the practice, he may have had his resolution strengthened by a clear statement of support from physicians in London. In the Harveian Oration to the College of Physicians in London in autumn 1755, Dr Robert Taylor praised the late Dr Jurin for demonstrating statistically the value of a procedure, 'by which so many thousands of mortals were freed from the fate hanging over them'. In the published text, Taylor reported that twenty of his colleagues, aware that the facts had 'lately been misrepresented among foreigners', had issued a statement that objections to inoculation had 'been refuted by experience', that it was currently 'more generally esteemed and practised in England than ever', and that it was, in their view, 'a practice of the utmost benefit to mankind'.<sup>53</sup> Early in 1756, Orleans made his decision to have his children inoculated, and Tronchin's success in April was a triumph for the practice, the practitioner and the patron. In his poem *L'inoculation*, Poinciset hailed Orleans as a prince *philosophe*.<sup>54</sup> Describing the change of attitude to inoculation as a 'revolution', one Parisian journal gave credit to La Condamine's *Mémoire*, which was widely read.<sup>55</sup> It was Dr Tronchin, however, who won most celebrity. He was soon called on to inoculate other members of high society, including the Duke of Villequier, the Marchioness of Villeroy and Turgot.<sup>56</sup> Inoculation became a fashion statement with ladies sporting '*bonnets à l'inoculation*', decorated with ribbons with red spots.<sup>57</sup> Dr Kirkpatrick crossed to France to seek a share of the action but, after the declaration of war between Britain and France in May, his time in the sun proved brief. His most illustrious patient, the Count of Gisors, only son of the Duke of Belle-Île, France's War Minister, was killed in action in 1758.<sup>58</sup>

The outbreak of war initially firmed up opposition to inoculation in France. The Diplomatic Revolution of 1756, in which the Catholic powers of France and Austria made common cause against Britain and Prussia, was mirrored by

<sup>52</sup> [Andrew Cantwell], *Dissertation sur l'inoculation, pour servir de réponse de M. de la Condamine* (Paris, 1755).

<sup>53</sup> Robert Taylor, *Oratio anniversaria in theatro Collegii regalis medicorum Londinensium ex Harveii instituto festo divi lucæ habita* (London, 1756), pp. 38–9, 50–3.

<sup>54</sup> [Antoine-Alexandre-Henri Poinciset], *L'inoculation. Poème à Monseigneur le Duc d'Orleans* (Paris, 1756), p. 10.

<sup>55</sup> Seth, *Les rois aussi en mouraient*, pp. 53, 239–40.

<sup>56</sup> La Condamine, *Second mémoire*, p. 25.

<sup>57</sup> A. H. Rowbotham, 'The "philosophes" and the propaganda for inoculation of smallpox in eighteenth-century France', *University of California Publications in Modern Philology*, 18 (1935), 268.

<sup>58</sup> James Kirkpatrick, *The analysis of inoculation: comprizing the history, theory and practice*, 2nd ed. (London, 1761), pp. 198–200, 405–9.

a conservative axis between medical men in Paris and Vienna. In a short tract against the practice in 1757, Anton de Haen, doyen of the Vienna Medical School, posed four questions – namely whether inoculation was permitted by God, whether it would save more lives than leaving matters to nature, whether everyone must have smallpox, and whether inoculation gave life-long immunity – that set the terms of debate for a decade.<sup>59</sup> De Haen's first question did not prove a sticking point. The theological consensus was that inoculation was not an offence if it could be shown to be a prudential measure that saved lives. The three other questions went to the heart of the matter. They were not easy to answer as a great deal depended on details of cases that were hard to verify and statistical evidence that could be variously interpreted. Given the complexity of the issues and uncertainties of the data, medical men with doubts about the procedure cannot be dismissed as blind reactionaries. Few physicians wished to limit the freedom of parents who had the means to have their children inoculated with minimal risk to their children, but they had good reason to fear the consequences of making inoculation available to the urban poor. Above all, they were reluctant to endorse formally and publicly the safety of a practice about which some had strong reservations.

The Seven Years War saw some marking of time in the controversy. Although it involved the movement of large armies across northern Europe, the conflict was not accompanied by major smallpox epidemics. British military surgeons were practising inoculation and it is likely, too, that many of the combatants – with the exception of the Cossacks, notable for their vulnerability to the disease – had immunity. The war, however, served to focus attention on preventive medicine as a means of saving lives for the state. In 1759, French supporters of inoculation enlisted Daniel Bernoulli, a pioneer of probability theory, to demonstrate the value of smallpox prophylaxis more precisely. He constructed a series of life tables, factored in the risks of natural and inoculated smallpox, and quantified the potential contribution of inoculation to increases in life expectancy and population. Even if one in nine inoculations proved fatal, he informed the Academy of Sciences in 1760, it remains 'geometrically true that the interest of princes is to favour and protect inoculation by all possible means; likewise, the father of a family with regard to his children'.<sup>60</sup> The rationalist approach, of course, left human nature and ethical

<sup>59</sup> Anton de Haen, *Quaestiones saepius motae super methodo inoculandi variolas, ad quas directa eruditorum responsa hucusque desiderantur; indirecta minus satisfacere videntur: orbi medico denuo propositae* (Vienna, 1757), pp. 10–11. For La Condamine's and Tissot's responses and De Haen's rejoinder: La Condamine, *Second mémoire*, pp. 42–7; [Samuel A. Tissot], *Lettre à Monsieur de Haen . . . en reponse à ses questions sur l'inoculation* (Lausanne, 1759); [Anton de Haen] *Refutation de l'inoculation, servant de reponse à deux pièces qui ont paru cette année 1759* (Vienna, 1759).

<sup>60</sup> Rusnock, *Vital accounts*, ch. 3, at p. 84.

considerations out of the equation. D'Alembert challenged not only Bernoulli's statistics but also his understanding of the psychology of risk. Since it cannot be assumed that children would catch smallpox, he argued, parents might be unwilling to take a present risk for an uncertain future advantage. He was unhappy, too, about Bernoulli's privileging the interests of the state. Observing the war in Europe, he noted that the state would happily sacrifice some lives to advance its larger ends. Intervening in the debate, Diderot professed to be more impressed by D'Alembert's mathematics than his ethics, declaring him 'a fine geometer but a very bad citizen'.<sup>61</sup>

Inoculation continued in aristocratic circles. The old Duke de La Rochefoucauld sponsored trials of inoculation in the French capital and, in March 1760, had his grandchildren immunised. In praising the La Rochefoucaulds as 'a model of paternal and maternal tenderness', Dr Onglée observed that all parents had as great a cause as grandees to wish to protect their children, and reported, approvingly, that the Duke of Villars had established an inoculation hospital in Aix-en-Provence and was offering a *louis* to each child inoculated.<sup>62</sup> In 1760, a new celebrity inoculator appeared in Paris. Dr Angelo Gatti, a professor at the University of Pisa, used a gentle mode of inoculation that involved raising a blister on the arm into which smallpox matter was injected. Sponsored by the Duke of Choiseul, whose grandchildren he had inoculated in Rome, Gatti was taken up by fashionable society. The *philosophe* Baron d'Holbach, who engaged him to inoculate his three children, became a great admirer. An outbreak of smallpox in Paris in 1762–3 increased the demand for his services, with the Princess of Chimay and the Duchesses of Pecquigny, Boufflers and Sully among his patients.<sup>63</sup> Sadly, Gatti was accident prone. His high-profile mishaps, the mistakes of colleagues and the carelessness of backstreet operators played into the hands of the opponents of the practice. In June 1763, the *Parlement* of Paris imposed a ban on inoculation until it had been explicitly approved by the Faculties of Medicine and Theology.

Voltaire and the *philosophes* lambasted the ban on inoculation. The theologians declined to pronounce on the procedure until their medical colleagues had given their advice. Divided on the issue, the Faculty of Medicine appointed a committee of twelve, six from each side of the debate, to solicit information about the safety and efficacy of the procedure and make recommendations. Questionnaires were sent to physicians across Europe. Many of

<sup>61</sup> Harry M. Marks, 'When the state counts lives: eighteenth-century quarrels over inoculation,' in Gérard Jorland, Annick Opinel and George Weisz (eds.), *Body counts: medical quantification in historical and sociological perspectives* (Montreal, 2005), pp. 51–64, at 57.

<sup>62</sup> *Journal de médecine, chirurgie et pharmacie*, 13 (July–December 1760), 79–85.

<sup>63</sup> [Angelo Gatti], *Lettre ... à M. Roux, Docteur Régent de la Faculté de Médecine de Paris* (1763), pp. 3–7.

the respondents had little direct experience of inoculation but took the trouble to collate the views of colleagues. Although most responses were cautiously favourable, the committee remained divided and issued two reports. In August 1764, Dr Guillaume-Joseph de L'Épine presented a detailed case for continuing the ban on inoculation. A week later, Dr Antoine Petit, physician to the Duke of Orleans, made a pithier case for lifting it. While the Faculty voted around two to one to permit inoculation, the conservative minority argued that a final decision should await further information arising from practice in England and elsewhere. The deadlock was never formally broken. By the late 1760s, the ban was relaxed in practice and then lifted, and attitudes to inoculation in France were becoming decidedly more positive.

### The New Inoculation

During the 1760s, the practice of inoculation in Britain was transformed. Two developments proved mutually reinforcing. One was a growing demand for prophylaxis from people who could not afford the money and time associated with the highly-medicalised procedure of the early decades. Some practitioners began to offer a stripped-down version of the procedure. There was naturally concern that country folk were seeking inoculation on market days from 'some operator, too often as crude and thoughtless as themselves'.<sup>64</sup> Still, some surgeons who were hired to inoculate groups of people – charity children, estate-workers, and entire villages – began to find that lighter incisions and simpler regimens delivered better outcomes than deeper cuts and purging. The complementary development, then, was an advance in technique that reduced the risk as well as the cost to the patient. Furthermore, the observation of groups of patients under inoculation showed the benefits of Dr Sydenham's cool regimen in which patients were encouraged to take the air. There were interesting similarities between the new modes of inoculation in Britain and America and the practices of the celebrity inoculators in continental Europe, with both Tronchin and Gatti puncturing the skin rather than making deep incisions and recommending convalescence in well ventilated rooms and strolls in the garden.

In Britain, the new inoculation was supported by an innovative business model. In the mid-1750s Robert Sutton, an apothecary of Kenton, Suffolk, was one among many inoculators offering a simplified procedure at a reduced rate.<sup>65</sup> He and his sons recognised the value of vertical integration and brand marketing. In 1757, he announced that he had set up 'a large commodious

<sup>64</sup> Kirkpatrick, *Analysis* (1754), p. 267.

<sup>65</sup> David Van Zwanenberg, 'The Suttons and the business of inoculation', *MH*, 22 (1978), 71–82; Smith, *Speckled monster*, pp. 68–91.

house' for inoculation under the care of 'one of his constant nurses, the well-known Mrs Elizabeth Alexander, widow, of Framlingham'. He offered patients the choice of residential packages ranging between three and seven guineas a month, and a special deal at half a guinea for 'those that can board and nurse themselves'. Over time he leased other houses and inducted eight sons into the business. In 1761–2, he announced an 'improved method' that reduced the severity and expense of the operation.<sup>66</sup> In place of the costly preparation and after care, he offered colour-coded pills to be taken before and after the operation, and recommended a healthy diet and plenty of fresh air. The light incision, painlessly administered, left a minimal scar. The Suttons may have initially derived a good deal of their income from the accommodation they provided wealthier patients and the pills, made up from 'secret' ingredients, supplied to their out-patients. They trained other practitioners in the Suttonian system and sold them franchises in East Anglia and further afield.

The most enterprising of his sons, Daniel Sutton established himself at Ingatestone in Essex and made his mark in 1764 by suppressing smallpox in Maldon by inoculating 487 villagers in a single day.<sup>67</sup> In 1766, he successfully defended himself at the assizes against an indictment that his activities had caused an outbreak in Chelmsford. A clever move was to appoint Oxford graduate Robert Houlton as chaplain to his establishment. Houlton ministered to the patients and published a sermon that justified inoculation and celebrated his work. Sutton made house calls to inoculate the children of local notables like Bamber Gascoigne, who took surreptitious notes on his methods.<sup>68</sup> Around 1767, he set up 'Sutton House' in Kensington Gore, on the outskirts of London, aiming to go up-market. In spring 1769, children of the Duke of Bolton, the Earl of Coventry and Lord Pomfret passed through the house.<sup>69</sup> An empire-builder, Daniel Sutton extended his father's scheme of associates. In 1768, there were sixty-two accredited Suttonian 'artists' in Britain, Ireland, British America, France and the Netherlands. Acquiring a large fortune and the trappings of gentility, including a coat-of-arms, he lacked the breeding and education for social acceptance. Hester Thrale, Samuel Johnson's sharp-tongued patron, recalled him as 'a fellow of very quick parts [but] as ignorant as dirt both with regard to books and the world'.<sup>70</sup>

<sup>66</sup> Smith, *Speckled monster*, pp. 68–9.

<sup>67</sup> Robert Houlton, *Indisputable facts relative to the Suttonian art of inoculation with observations on its discovery, progress, encouragement, opposition* (Dublin, 1768), pp. 16–17.

<sup>68</sup> Smith, *Speckled monster*, pp. 73–82. Robert Houlton, *The practice of inoculation justified. A sermon preached at Ingatestone . . . 1766* (Chelmsford, 1767), pp. 56–60.

<sup>69</sup> *Public Advertiser*, 15 June 1767; *Lloyd's Evening Post*, 13–15 March 1769.

<sup>70</sup> Hester Lynch Piozzi, *Dr Johnson by Mrs Thrale. The anecdotes of Mrs Piozzi in their original form* (London, 1984), p. 17.

By the late 1760s, inoculation was a highly competitive business. A jocular piece appeared in newspapers about young boys charging half a penny for the procedure, a range of practitioners from men in greasy caps to men in pompous wigs, and Giles Wilcox the sow-gelder, 'by far the most in vogue', who 'takes pupils at 2s 6d a head, and teaches 'em the true orthodox method'.<sup>71</sup> The Suttons operated on an industrial scale. Between 1760 and 1767, they reportedly had registers documenting 55,000 inoculations, with only six fatalities.<sup>72</sup> Their prowess did not stop a canny estate manager like Thomas Davies, bailiff of the Glynde estate in Sussex, from shopping around. Observing the arrival of smallpox in the district in 1767, he hoped to 'persuade our little parish . . . to inoculate all, in order to be clear of it in about a fortnight or three weeks'. He found a local surgeon who had recently inoculated 2,000 people in eastern Sussex, 'with equal success but less physicking and more expedition than Sutton or his people', and agreed to inoculate forty or more villagers for twenty guineas. 'This will spoil Sutton's trade in Pleshut House', Davies observed, where the lowest price was four guineas for people sharing a bed, with eight beds in a room.<sup>73</sup> Some practitioners competed on grounds other than price. Thomas Dimsdale, a Quaker physician, was well educated and appeared less mercenary than the Suttons. He began inoculating in the late 1740s, and drew on his own experience as well as his understanding of the Suttonian method to achieve good results. His book on the 'present method' of inoculation, dedicated to the Royal College of Physicians, helped to give the 'new inoculation' professional respectability.<sup>74</sup>

From the late 1760s inoculation was a familiar practice in Britain and Ireland. Few letter collections in the following decades fail to include some reference to the inoculation of a child, usually presented as an event of shared concern, but not unusual. As the fussy bachelor Horace Walpole reassured his sister, the procedure 'now can scarce be called a hazard'.<sup>75</sup> Even among the elite, though, not all parents inoculated their children proactively in infancy and recourse to inoculation was frequently prompted by perceptions of a threat. In the countryside, there were opportunities to share the expense, inconvenience and anxiety associated with inoculation by hiring a practitioner to inoculate all the children. Young people who had not had smallpox often sought out inoculation. Groups of adolescents had themselves inoculated in

<sup>71</sup> *St James's Chronicle or the British Evening Post*, 1–3 March 1768; *Gazetteer and New Daily Advertiser*, 4 March 1768.

<sup>72</sup> Peter Razzell, *The conquest of smallpox. The impact of inoculation on smallpox mortality in eighteenth-century Britain*, 2nd ed. (Firle, 2003), p. 33.

<sup>73</sup> Razzell, *Conquest*, pp. 82–3.

<sup>74</sup> Thomas Dimsdale, *The present method of inoculating for the small-pox . . .* (London, 1767).

<sup>75</sup> *Horace Walpole's correspondence with the Countess of Upper Ossory. Vol. 2. 1778–1787*, ed. W. S. Lewis and S. Dayle Wallace (New Haven, 1965), p. 85.

town on market day, sometimes recklessly bringing the contagion back to their villages. Many others, seeking to make their way in the world, did so more purposefully. Arthur Young, whose mother arranged his inoculation behind his father's back, attributed London's rapid growth to smallpox prophylaxis. In 1768, he claimed that, in the past, smallpox 'frighted millions at the idea of London' but within a few years 'there will not be a lout in the country, that has not been inoculated; from which moment all bars are removed, and whip he flies to make his fortune at *London*'.<sup>76</sup> The value of inoculation was well recognised in Scotland and Ireland. After early mishaps, the practice resumed in Scotland in the late 1740s, becoming common from 1753. In his response to the Paris questionnaire in 1763, Alexander Monro, Professor of Anatomy at Glasgow University, reported over 5,500 inoculations across the country.<sup>77</sup> In Ireland, George Cleghorn lectured on 'inoculation, and its advantages' at Trinity College as early as 1756.<sup>78</sup> In his response to the questionnaire, he referred to Irish colleagues whose practice went back to the 1720s and reported that inoculation was offered by surgeons in many towns.<sup>79</sup> Itinerant inoculators may already have been active in the countryside. One of whom, a Gaelic-speaker, told an informant in 1796 that, lacking the means to train as a priest, he had taken lessons on inoculation and made a living from it in County Mayo for the thirty or forty years.<sup>80</sup>

The social range of inoculation in England was extended by paternalism and community-based initiatives. When arranging the inoculation of their own children, landed and professional gentlemen often offered prophylaxis to their servants and dependants. The leaders of village communities saw the advantages of 'general inoculations', in which all the population at risk could go through the procedure together. A collective approach brought down the unit costs to individual villagers and, most important, the co-ordination of activity reduced the dangers of cross-infection and the inconveniences of quarantine. The cost of inoculating the poor, it was often noted, would be less than the expense to the parish that might be necessary to treat smallpox victims and provide for orphans. From the late 1760s, general inoculations became quite common in the southern counties and the midlands. The system worked best in more nucleated settlements with a tradition of activism in poor relief. Even so,

<sup>76</sup> [Arthur Young], *The farmer's letters to the people of England* ... 2nd ed. (London, 1768), p. 341.

<sup>77</sup> Alexander Monro senior, *An account of the inoculation of the small pox in Scotland* (Edinburgh, 1765), pp. 4–5, 27–9.

<sup>78</sup> [George Cleghorn], *Index of an annual course of lectures* (Dublin, 1756), p. 3.

<sup>79</sup> *Medical and Philosophical Memoirs*, vol. 2., 1758–68, pp. 377–86, Medico-Philosophical Society, Dublin, ACC/1831/1, Royal College of Physicians of Ireland, Dublin.

<sup>80</sup> [Jacques Louis de Bougrenet, Chevalier de La Tocnaye], *A Frenchman's walk through Ireland 1796–7*, transl. John Stevenson (Belfast, 1917), pp. 175–7.

general inoculations were difficult to arrange. Aristocratic sponsorship could play a role. In 1788 David Stuart, vicar of Luton and grandson of Lady Montagu, funded a 'general inoculation' in Luton and declared his intent to repeat the exercise every few years.<sup>81</sup> Parishes did not always welcome aristocratic largesse and condescension. The parishioners of Shute in Devon pointedly declined to take up an offer by Sir John William de la Pole to sponsor a general inoculation and used their own funds to pay for the inoculation of ninety people.<sup>82</sup>

For the residents of small market towns, smallpox presented more complex challenges. An outbreak of the disease and even rumours of its presence had a deleterious impact on trade. For this reason, there was often opposition to inoculators setting up in town. The city of Oxford threatened anyone found harbouring a smallpox patient with legal action.<sup>83</sup> For the most part, inoculation houses were set up on the outskirts of the city, with two such establishments just outside Bristol.<sup>84</sup> Once smallpox took hold, there were calls for general inoculation, but after the outbreak began to subside the practice would again be disallowed. In many towns in the midlands and the north, however, the newly established infirmaries and dispensaries provided infrastructural support for prophylaxis. Dr John Haygarth, physician at Chester Infirmary, proved an energetic and visionary campaigner against smallpox. In 1778, he founded a Small-Pox Society to gather epidemiological data and to develop plans to eradicate the disease locally. His scheme involved incentives for poor parents to have their children inoculated within a framework of strict reportage and isolation of cases of smallpox.<sup>85</sup> Several other northern towns, notably Carlisle, Leeds, York and Newcastle, offered, usually through the dispensaries, free inoculation to the poor at specified times.<sup>86</sup>

London presented the greatest challenge. Many Londoners acquired immunity casually as children and many newcomers sought inoculation prior to moving to the metropolis. In inoculating several hundred people a year, the Smallpox Hospital (Figure 2.1) made a significant but minor contribution to protecting the population. The Suttons and their rivals set up inoculation

<sup>81</sup> *GM*, 58 (1788), 283–4.

<sup>82</sup> Pamela Sharpe, *Population and society in an east Devon Parish. Reproducing Colyton 1540–1840* (Exeter, 2002), p. 215.

<sup>83</sup> Jessie Parfit, *The health of a city: Oxford 1770–1974* (Oxford, 1987), pp. 3–5.

<sup>84</sup> Mary Elizabeth Fissell, *Patients, power, and the poor in eighteenth-century Bristol* (Cambridge, 1991), pp. 66–7.

<sup>85</sup> Haygarth, *Inquiry*.

<sup>86</sup> Henry Lonsdale, *The life of John Heysham, M.D. and his correspondence with Mr Joshua Milne relative to the Carlisle bills of mortality* (London, 1870), pp. 39–40, 45, 47, 51; *GM*, 60 (1790), 835–7; Katherine A. Webb, *One of the most useful charities in the city: York Dispensary, 1788–1988* (York, 1988), pp. 2, 13; Deborah C. Brunton, 'Pox Britannica: smallpox inoculation in Britain', unpublished PhD thesis, University of Philadelphia, 1990, p. 166.





Figure 2.1 View of the Smallpox Hospital near St Pancras, 1771  
(Wellcome Collections)

houses in the suburbs and unlicensed practitioners may have been offering their services in the city. In January 1770, Daniel Sutton announced a charitable scheme to inoculate the London poor in their homes.<sup>87</sup> To be funded by subscription, patrons would be able to recommend, for each guinea subscribed, three people for treatment.<sup>88</sup> The plan was that patients would visit Sutton's house twice, first to collect preparatory medicine and then for inoculation, and would go through the infective stage in their homes, where they would be visited by one of Sutton's assistants.<sup>89</sup> The proposal caused some alarm in the city and threats of legal action.<sup>90</sup> The concept, however, gained some traction. The Quaker physician and philanthropist John Coakley Lettson formed a Society for the Inoculation of the Poor in their own Homes in 1775 and established a Dispensary for General Inoculation in 1777. This well-meaning initiative by no means allayed concerns. Drawing a distinction between 'general inoculations' and 'partial inoculations', Dr Dimsdale denounced the scheme, in which patients would bring the infection to their dwellings 'in close

<sup>87</sup> *Public Advertiser*, 9 February 1770; 21 October 1772; 30 December 1772. Cf. *Oxford Magazine*, 4 (1770), 43–6.

<sup>88</sup> *Public Advertiser*, 9 February 1770.

<sup>89</sup> *Lloyd's Evening Post*, 12–14 February 1770.

<sup>90</sup> *Oxford Magazine*, 4 (1770), 43–6.

alleys, courts, and lanes', as 'fraught with very dangerous consequences for the community'.<sup>91</sup> Reportedly flourishing in 1779, Lettsom's Dispensary disappeared soon afterwards.<sup>92</sup>

From the 1760s, the bills of mortality show that smallpox deaths in London were rising numerically and, most importantly, as a proportion of overall mortality.<sup>93</sup> It was argued in some quarters that the use of inoculation in the metropolis was serving to spread the infection.<sup>94</sup> Dr John Watkinson, physician at the London Dispensary, claimed that inoculated smallpox was less infectious than casual smallpox, but the hazard was real enough.<sup>95</sup> The out-sourcing of laundry and the comings and goings of servants meant that even inoculations conducted in the mansions of wealthy Londoners could be a source of contagion.<sup>96</sup> In any case, there was probably more casual inoculation among the lower orders than had been assumed. In seeking to explain the higher proportion of smallpox deaths in London, where inoculation was extensively practised, than in Paris, where it was restricted, Jonas Hanway pointed to 'indiscretion, with regard to the contagion, and the communication arising from inoculation.'<sup>97</sup> Though a decade later, in 1776, he called for measures to encourage inoculation 'among the labouring part of our fellow-subjects', he still acknowledged that the 'poor in the metropolis are very *thoughtless*' and that smallpox was spread by carelessness.<sup>98</sup> In continental Europe, London appeared less a showcase for the success of prophylaxis, and more the site of a failed experiment.

### Princes and Bodies Politic

La Condamine's advocacy in 1754 and Orleans's example in 1756 set the scene for the adoption of inoculation among the princely families of continental Europe. The first sovereign prince outside Britain to have a child inoculated was the Duke of Saxe-Gotha in 1759. His wife, Louise-Dorothea, wrote to Voltaire, after the operation, 'You see we are people who are up with the fashion and above prejudice'.<sup>99</sup> In 1760, Frederick V of Denmark arranged the

<sup>91</sup> Thomas Dimsdale, *Thoughts on general and partial inoculations* (London, 1776), pp. vi–vii, 36–7.

<sup>92</sup> Brunton, 'Pox Britannica', p. 162.

<sup>93</sup> Jonas Hanway, *Letters on the importance of the rising generation of the laboring part of our fellow-subjects*, vol. 1 (London, 1767), p. 42.

<sup>94</sup> Rusnock, *Vital accounts*, ch. 4.

<sup>95</sup> John Watkinson, *An examination of a charge brought against inoculation by De Haen, Rast, Dimsdale and other writers* (London, 1777), p. 46.

<sup>96</sup> Dimsdale, *Thoughts*, pp. 23–4. <sup>97</sup> Hanway, *Letters on rising generation*, 1, p. 42.

<sup>98</sup> Jonas Hanway, *Virtue in humble life: containing reflections on relative duties, particularly those of masters and servants*, 2nd ed., 2 vols. (London, 1777), 1, p. vii n.

<sup>99</sup> *Correspondance de Frédéric II avec Louise-Dorothee de Saxe-Gotha (1740–1767)*, ed. Marie-Hélène Cotoni (Oxford, 1999), p. 10.

inoculation of the Crown Prince, the future Christian VII. According to Dr C. F. Rottböll, who presided over and publicised the event, the king showed the Danish people his complete confidence in variolation by submitting to it his dear son, 'the hope of the twin Kingdoms'.<sup>100</sup> At the electoral court of Saxony, Princess Marie-Antonie, widely admired for her intellect and musical talents, was responsible for adopting inoculation in early summer 1763. In a letter to Frederick the Great, she acknowledged his assistance in helping to persuade her husband to accept the practice.<sup>101</sup> The adoption of inoculation at the Catholic court of Parma in 1764 was especially noteworthy. A cadet of the Spanish Bourbons, the Infante-Duke Philip of Parma, was a modernising ruler, who was left bereft by the death of his wife, a French princess, from smallpox. Their daughter, Isabella of Parma, who married the future Joseph II of Austria, believed that she too would fall victim to the scourge. News of her death from smallpox in Vienna in 1763 prompted her thirteen-year-old brother Ferdinand, pupil of the *philosophe* Condillac, to insist on his inoculation.<sup>102</sup> Dr Tronchin was invited to perform the operation and the Infante-Duke issued a letter to the magistrates and churchmen of Parma to explain the operation on his son. Prayers were arranged for the prince's safety and, after a period of some anxiety, his recovery was the occasion of popular rejoicing. A commemorative medal was struck depicting Condamine's image of inoculation as a boat carrying a person safely across a raging torrent and reports of the prince's inoculation were published in Italian and French.<sup>103</sup>

Smallpox made the case for inoculation irrefutable in Austria. Empress Maria Theresa's eldest son, Joseph II, survived smallpox in 1757, allowing him to attend his first wife, Isabella, in her final days. In selecting his second wife, he made the mistake of preferring Josepha of Bavaria, unblemished by smallpox, to a Polish princess who bore its marks.<sup>104</sup> Josepha's death from smallpox in 1767 wreaked havoc in the house of Austria. The Empress herself caught the disease and was left scarred. Maria Josepha, one of her daughters, due to set out for her marriage to the king of Naples, visited her father's resting place in the family vault and caught the disease from her sister-in-law's unsealed tomb. A fortnight later, it was grimly reported, 'the princess-bride became a bride of the Heavenly Bridegroom'. Maria Elisabeth, another daughter, was so badly scarred that she retired to cloistered life. Early in 1768, still raw from the tragic

<sup>100</sup> Anne Eriksen, 'A case of exemplarity: C. F. Rottböll's history of smallpox inoculation in Denmark-Norway, 1766', *Scandinavian Journal of History*, 35 (2010), 356.

<sup>101</sup> *Correspondance de Frédéric le Grand roi de Prusse*, vol. 9, ed. J.-D.-E. Preuss (Berlin, 1854), pp. 41–3.

<sup>102</sup> Henri Bédarida, *Parme et la France de 1748 à 1789* (Paris, 1928), pp. 350–3.

<sup>103</sup> *Relation de l'inoculation de Ferdinand, prince héréditaire de Parme* (Paris, 1764).

<sup>104</sup> Derek E. D. Beales, *Joseph II: In the shadow of Maria Theresa, 1741–1780* (Cambridge, 1987), pp. 33, 76–8, 84–5.

events, the Empress met the young Wolfgang Amadeus Mozart, who himself had just recovered from smallpox. In a rare display of emotion, she hugged Mozart's mother, and the pair wept on each other's shoulders.<sup>105</sup> By this stage, the matriarch was ready to set aside the doubts of her physicians and have her surviving family inoculated. Count Seilern, her ambassador in Britain, made enquiries about the 'new inoculation', secured a testimonial from leading British physicians attesting its standing, and recruited for the task Dr Jan Ingenhousz, a Dutch Catholic and pupil of Boerhaave, who gained experience of inoculation with Dr Dimsdale in England.<sup>106</sup> Passing through Brussels, where he demonstrated inoculation, Ingenhousz arrived in Vienna in May.<sup>107</sup> After being introduced to the imperial family, he set to work over summer inoculating groups of charity children in a house near the Schönbrunn Palace. Satisfied with their trials, the Empress and her son, now Emperor Joseph II, authorised the inoculation of two of the Empress's younger sons and the Emperor's eldest daughter in September. Appointed a royal physician with a retainer of 5,000 guilders a year, Ingenhousz inoculated other members of the imperial family, including the young Marie-Antoinette, future queen of France. Many nobles, too, availed themselves of the practice, and a clinic was established at the Archbishop of Vienna's summer palace at Ober-Sankt-Veit.<sup>108</sup>

1768 was an *annus mirabilis* for smallpox inoculation in Europe. Anticipating the inoculations in Vienna, the Anglophile Duke Leopold of Anhalt-Dessau and his wife were inoculated in June and the princes of Holstein-Gottorp, cousins of Catherine the Great, were inoculated in July.<sup>109</sup> Long anxious about smallpox and probably aware of Maria Theresa's resolve to introduce inoculation, Catherine, Empress of all the Russias, likewise instructed her ambassador in London to seek the services of a practitioner to inoculate her and the Tsarevich. Dr Dimsdale, Ingenhousz's mentor, took on the awesome responsibility reluctantly, but his success in St Petersburg in the last months of 1768 set him up for life with a fee of £10,000, a pension of £500 per annum, and a baronage.<sup>110</sup> The imperial inoculations were widely reported. The adoption of

<sup>105</sup> Robert W. Gutman, *Mozart: a cultural biography* (Orlando, FL, 2001), pp. 231–4.

<sup>106</sup> Jan Maarten Ingen Housz, Norman Beale, Elaine Beale, 'The life of Dr Jan Ingen Housz (1730–99), private counsellor and personal physician to Emperor Joseph II of Austria [by M. J. Godefroij]', *Journal of Medical Biography*, 13 (2005), 15–21. *Lettre de Monsieur Ingenhousz, Docteur en Médecine, à Monsieur Chais, Pasteur de l'Église Wallonne de la Haye* (Amsterdam, 1768).

<sup>107</sup> Geerd Magiels, *From sunlight to insight. Jan IngenHousz, the discovery of photosynthesis and science in the light of ecology* (Brussels, 2010), pp. 22–3.

<sup>108</sup> Magiels, *IngenHousz*, pp. 22–3.

<sup>109</sup> Jennifer Penschow, 'Wrestling *der Würangel*: smallpox and inoculation in German society and culture, 1754–1800', PhD thesis, University of Tasmania, 2016, pp. 67, 71.

<sup>110</sup> Philip H. Clendenning, 'Dr. Thomas Dimsdale and smallpox inoculation in Russia', *JHM*, 28 (1973), 109–25, at 118–23; Simon Dixon, *Catherine the Great* (London, 2009), pp. 188–91.

the practice by the Empress Maria Theresa, a pious and motherly figure, sent a powerful message through Catholic Europe. She arranged for Ingenhousz to go to Florence to inoculate her fourth son, Archduke Leopold of Tuscany, in 1769 and then again to inoculate Leopold's children in 1772.<sup>111</sup> Catherine the Great's inoculation in 1768 achieved even greater celebrity. She was hailed by the *philosophes* across Europe. Voltaire applauded her bravery and German poets celebrated the event in song and verse.<sup>112</sup> Crown Prince Gustav of Sweden, who was inoculated with his wife and brothers in 1769, was probably inspired by her boldness. Travelling home from St Petersburg, Dr Dimsdale anticipated further commissions in northern Germany. In Berlin, however, he was given a brusque reception by Frederick the Great, seemingly peeved by the plaudits for the Russian empress. In 1781 Dimsdale returned to Russia to inoculate the empress's grandchildren.<sup>113</sup>

The French royal family remained unmoved. Although *Parlement* lifted its ban in 1768, smallpox inoculation remained under a cloud.<sup>114</sup> In congratulating Empress Catherine on accepting the procedure, Voltaire quipped: 'You have been inoculated with less fuss than a nun taking an enema . . . We French can hardly be inoculated at all, except by decree of the *Parlement*'.<sup>115</sup> Louis XV, who had reputedly had smallpox as a child and turned sixty in 1770, could not be expected to break with past prejudices. When he fell ill in 1773, it was some time before his illness was diagnosed as smallpox. The court physicians were so desperate that they called in Robert Sutton junior, Daniel Sutton's brother, who was running an inoculation house outside Paris. The French king's agonising and undignified death underlined the value of inoculation. His successor, Louis XVI, had himself inoculated shortly after his accession in 1774 and he and Marie Antoinette ensured that their children, born in the early 1780s, were inoculated.<sup>116</sup> After losing family members to smallpox, even the Spanish and Portuguese royal families became cautious converts to inoculation.<sup>117</sup>

The inoculation of princes had a public dimension. The stability of dynastic states depended on an orderly succession that was disrupted by smallpox on many occasions in the seventeenth and eighteenth centuries. Its ravages in the house of Habsburg-Lorraine and among the Romanovs certainly predisposed

<sup>111</sup> Magiels, *IngenHousz*, pp. 22–3.

<sup>112</sup> Penschow, 'Wrestling *der Würangel*', 71–3, 189–90.

<sup>113</sup> Clendenning, 'Dimsdale in Russia', 123–5.

<sup>114</sup> Rowbotham, "'philosophes" and inoculation', 271–3.

<sup>115</sup> *Voltaire and Catherine the Great. Selected correspondence*, ed. Anthony Lentin (Cambridge, 1974), p. 56.

<sup>116</sup> Pierre Darmon, *La variole, les nobles et les princes. La petite vérole mortelle de Louis XV* (Paris, 1989).

<sup>117</sup> Gratton, 'Smallpox prevention in Spain', p. 49, Jennifer Roberts, 'Portugal's mad queen', *History Today*, 57, no. 12 (2007), 32–8, at 33.

the two empresses to adopt the practice in 1768. Maximilian III Joseph, Elector of Bavaria, held the distemper in such dread that he could not bear the thought of being inoculated with it. His death from smallpox at the end of 1777 precipitated the War of the Bavarian Succession, the last of the wars of succession that embroiled Europe.<sup>118</sup> The princes born in the second half of the eighteenth century not only shed the robes of traditional rulership to don the uniforms of soldiers, they also rolled up their sleeves to receive inoculation. In 1780, an enthusiast for inoculation produced an impressive list of contemporary princes protected by the procedure.<sup>119</sup> Even if personal and dynastic concerns were paramount, some princes sought to set an example to their people. Disappointed by the neglect of inoculation, Frederick V of Denmark showed his support for the practice by publicising the Crown Prince's inoculation. Princess Marie-Antonie of Saxony claimed that her example had led to the inoculation of thousands in Saxony.<sup>120</sup> In 1761, Dr Kirkpatrick, who had earlier described George II as the 'political father' of all the British children inoculated after his adoption of the practice, congratulated George III for accepting the title of 'patron of inoculation'.<sup>121</sup> Although Catherine the Great was careful to keep her operation secret until its success was assured, she expected the court nobility to follow her lead and was happy to have her patronage of prophylaxis hailed across Europe.<sup>122</sup>

The rulers of Europe were conscious of the costs of smallpox to their states. It was axiomatic that a large and healthy population was a crucial determinant of power and prosperity and there was a growing interest in the collection and analysis of demographic data to inform policy. Statesmen and bureaucrats often led the way in assessing and acknowledging the advantages of prophylaxis. In the republic of Geneva, the magistrates took the initiative to make enquiries about the practice in 1754 and formally introduce it into state institutions. In the kingdom of Sweden, there was a nexus between close attention to demography – with a National Bureau of Statistics established in 1749 to receive annual reports on births, marriages and deaths from the parish clergy – and the early approval and promotion of the practice.<sup>123</sup> By the 1750s and 1760s, many European statesmen – like Bernstorff in Denmark, Tessin in Sweden, and Turgot in France – adopted inoculation for themselves and their families and explored the possibility of giving it the backing of the state. Most

<sup>118</sup> Nathaniel William Wraxall, *Memoirs of the courts of Berlin, Dresden, and Vienna in the years 1777, 1778, and 1779*, 2 vols. (London, 1800), 1, pp. 305–7; Marvin E. Thomas, *Karl Theodor and the Bavarian Succession, 1777–1778* (Lewiston, NY, 1989), p. 49.

<sup>119</sup> Hugues Maret, *Mémoire sur les moyens à employer pour s'opposer aux ravages de la variole* (Paris, 1780), pp. 150n–1n.

<sup>120</sup> Eriksen, 'Case of exemplarity'; *Correspondance de Frédéric le Grand*, 9, pp. 41–3.

<sup>121</sup> Kirkpatrick, *Analysis* (1754), p. iv; Kirkpatrick, *Analysis* (1761), p. iv. <sup>122</sup> See Chapter 9.

<sup>123</sup> Sköld, *Two faces*, pp. 257–8.

governments, though, regarded inoculation as a matter for parents. Even Frederick the Great, an early advocate of the practice, seems to have taken this view. In 1774–5, he brought an English physician, Dr William Baylies, to Berlin to demonstrate inoculation, ordering each province to send a medical man to receive training, but showed no interest in providing incentives or applying pressure to establish the practice.<sup>124</sup> Catherine the Great was the only ruler with the power and inclination to conscript large numbers of people for inoculation. Even she appears to have limited her role to setting an example at court, introducing the practice in charitable institutions under her patronage, and probably offering inoculation to her serfs. Although Sir Robert Walpole had his children inoculated and Lord Bute, Britain's Prime Minister in the 1760s, was the grandson of Lady Montagu, the British government seemingly showed no interest in Daniel Sutton's offer to divulge his trade secrets in return for a premium or in various proposals to make inoculation more generally available.<sup>125</sup> Despite his celebrity in Europe, Dr Dimsdale called in vain on the British Parliament in 1776 to support a modest scheme for the inoculation to the poor. Just as 'we are the first European nation who received and encouraged inoculation', he declared, 'we may also have the honour of being the first who have generously diffused the benefit of it to the community at large, and transmitted it to posterity'.<sup>126</sup>

### Smallpox Prophylaxis outside Europe

In relation to smallpox prophylaxis, Europe learned a good deal from the wider world. Medical men in western Europe adopted a prophylactic practice first observed among Greek women in Istanbul. Travellers like La Condamine and Gatti continued to be impressed by the relatively simple procedure in the Levant. Reference back to the authentic folk practice, even against the grain of learned medical opinion, served to inspire and vindicate the lighter procedures, like Gatti's use of a needle rather than a lancet, that increasingly gained ground in western Europe. There was interest, too, in Chinese prophylaxis. Drawing on reports to the Royal Society, Dr Mead made a trial of smallpox insufflation but found that it produced a severe response in the patient. In 1726, the French Jesuit D'Entrecolles produced a fuller account of the Chinese practice. During the inoculation controversy in the late 1760s, the French minister Turgot sought information and advice about the Chinese experience

<sup>124</sup> William Baylies, *Facts and observations relative to inoculation in Berlin, and to the possibility of having smallpox a second time* (Edinburgh, 1781).

<sup>125</sup> Jonas Hanway, *The defects of police: the cause of immorality . . . particularly in and about the metropolis* (London, 1775), pp. 89–90; Dimsdale, *Thoughts*, pp. 58–61; *GM*, 49 (1779), 192–3.

<sup>126</sup> Dimsdale, *Thoughts*, p. 68.

of prophylaxis from the Jesuit mission in Beijing. Father Martial Cibot provided a garbled summary of the information in the *Golden Mirror*, a medical treatise published under imperial auspices in 1749, and observed, a little unhelpfully, that the different modes of reasoning in Chinese and western medicine made it difficult to draw useful lessons.<sup>127</sup> A more promising focus of attention was the practice of inoculation in India. In setting pen to paper in 1767, John Z. Holwell, who had spent many years in Bengal, was keen to present his knowledge of the practice in India to inform discussion in Britain. He challenged the old canard that inoculation was a barbaric practice learned from ignorant women by presenting it as a venerable, precise and well proven procedure in India. He pointed, too, to the success in Bengal of the cooling regime that was still only beginning to gain acceptance in Britain.<sup>128</sup> The European style of inoculation was born and honed in a transnational setting.

The key driver in development, however, was the marketplace. Increasing demand for smallpox prophylaxis provided incentives and opportunities to inoculate more efficiently and improve outcomes for patients. The inoculation of people in groups, as when an outbreak of smallpox led to general inoculation or when inoculation was practised on children in institutions or on slaves, provided the clearest incentives for cost-cutting and the best chance of introducing and testing refinements to the procedure. The crucible of change was again by no means confined to Europe. The 'new inoculation' owed a great deal to experimentation in the colonial world. The early practice in Boston in 1721–2, involving a large socially and ethnically diverse population, proved far more instructive than the small-scale trials in London. In an epidemic in spring 1730, over 2,000 Bostonians defied a ban on the practice to have themselves inoculated.<sup>129</sup> In Philadelphia, inoculation was first used during an outbreak in 1730–1, when over 500 people followed the example of a prominent citizen in seeking inoculation. When smallpox returned in 1735–6, there were 129 inoculations, only one of which proved fatal.<sup>130</sup> During an epidemic in Charleston in 1738, medical men inoculated some 800 people, including many slaves. The thousands of people of all ages, backgrounds and states of health who were inoculated in Boston, Philadelphia and Charleston, many more than in Britain in the 1720s and 1730s, provided important datasets for British assessments of the procedure. Many British surgeons, too, gained experience of the practice through the inoculation of slaves in the Middle

<sup>127</sup> Larissa N. Heinrich, *The afterlife of images. Translating the pathological body between ancient China and the West* (Durham NC, 2008), pp. 20, 23–32.

<sup>128</sup> [John Zephania Holwell], *An account of the manner of inoculating the small pox in the East Indies* (1767).

<sup>129</sup> John B. Blake, 'Smallpox inoculation in colonial Boston', *JHM*, 8 (1953), 284–300, at 287–9.

<sup>130</sup> J. M. Toner, *Inoculation in Pennsylvania* (Philadelphia, 1865), pp. 7–8.



Passage and in the plantations of the Caribbean.<sup>131</sup> Since some African slaves would have been familiar with forms of smallpox prophylaxis, they themselves may have helped to shape the practice in the Caribbean. The inoculation of cohorts of slaves provided surgeons with opportunities to assess the value of prophylaxis and to put possible improvements to the test.<sup>132</sup>

Inoculation in the English-speaking world developed as a transatlantic enterprise. Although it was alert to developments in Britain, the medical fraternity in North America needed to be resourceful. Born and educated in Massachusetts, Zabdiel Boylston showed some boldness in inoculating in Boston, was acknowledged as an expert in the practice in London, and was elected to the Royal Society in 1726.<sup>133</sup> The Irish-born James Kirkpatrick, who was living in Charleston when smallpox struck in 1738, could present himself in London in 1743 as the leading expositor of inoculation. In Maryland, Dr Adam Thomson, an Edinburgh graduate, achieved success in treating smallpox with small doses of mercury and antimony. Using this prescription to prepare patients, and prescribing a cool regimen after the procedure, he experienced good results as an inoculator in Scotland in the late 1730s. He helped to establish inoculation as a routine practice in Philadelphia in the 1740s.<sup>134</sup> Benjamin Franklin, who had lost a son to smallpox, published Thomson's lecture on inoculation to the Academy of Philadelphia, and, on a visit to London in 1758–9, reported on the American experience to Dr William Heberden, who prepared a short tract on inoculation for Franklin to publish in America.<sup>135</sup> A new generation of practitioners in British America embraced the 'American method', somewhat anticipating the 'new inoculation' in Britain. According to Benjamin Gale, the method reduced the case fatality rate of inoculated smallpox from one in 100 to around one in 800.<sup>136</sup>

Medical practice in the colonies encouraged a simplification of inoculation and provided scope for adaptation. On Antigua in 1758, Dr Thomas Fraser inoculated forty white people, including twenty-one soldiers, and oversaw the treatment of 270–300 slaves, only two of whom died, almost certainly from prior infection. He felt some unease with the hurried inoculation of the slaves and regretted that the 'scanty allowance' he received did not allow for preparatory medicine. 'Reputation, however, as well as conscience', he declared, 'was always with me a motive to avail myself of every artifice that might secure a happy event.' In any event, his experience soon led him to doubt the value of

<sup>131</sup> *London Evening Post*, 15 July 1738. <sup>132</sup> Stewart, 'Edge of utility', 54–70.

<sup>133</sup> Boylston, *Defying providence*, pp. 116–23.

<sup>134</sup> Henry Lee Smith, 'Dr Adam Thomson, originator of the American method of inoculation for small-pox: an historical sketch', *The Aesculapian* 1 (3–4) (1909), 151–5.

<sup>135</sup> John Farmer, 'Letter from Dr Franklin to Dr Heberden, 1759, on inoculation for small pox', in *Collections of the Massachusetts Historical Society*, 2nd series, VII (1826), pp. 71–4.

<sup>136</sup> Smith, 'Adam Thomson', 154.

elaborate preparation.<sup>137</sup> Dr Quier, who arrived in Jamaica in 1767, found that the inoculation was well accepted. He heard details of the 'new inoculation' from an acquaintance, recently returned from England, and he soon had to hand a copy of Dr Dimsdale's book.<sup>138</sup> He reported his own findings to his mentor in London. One task was to inoculate a group of slaves, including pregnant women. Since medical men in Britain thought it dangerous to inoculate women during pregnancy, he reported that he had been able to do so without any mishaps. When he later conceded that inoculation may have occasioned two miscarriages, he stressed that there was greater danger in leaving them exposed to casual smallpox. In a letter in 1775 he reported observations of immune responses and the use of inoculation to test previous exposure to smallpox.<sup>139</sup>

Inoculation was taken up in French and Spanish colonies in the Americas. Saint-Domingue, with its huge slave population and prosperous colonial elite, led the way in inoculation in the French-speaking world. After early trials in 1745, inoculation on a large-scale became common in the late 1760s. Dr Joubert de la Motte, director of royal botanical gardens at Port-au-Prince, was a great champion of the practice. In 1774 Simeon Worlock, Daniel Sutton's father-in-law, relocated from France to Saint-Domingue to exploit the burgeoning market.<sup>140</sup> From the 1760s onwards there was more interest in inoculation in Spanish America than in metropolitan Spain. During a lethal epidemic in Santiago de Chile in 1765, Pedro Manuel Chaparro inoculated some 5,000 people.<sup>141</sup> His success inspired the use of prophylaxis in Lima the following year and Cosme Bueno published a treatise in 1774 calling for its general adoption in Peru.<sup>142</sup> When major epidemics spread through Spanish America in the late 1770s, the authorities, political and medical, were sufficiently familiar with the value of inoculation to make some effort to promote it. The arrival of smallpox in Mexico City in summer 1779 presented a formidable challenge. An epidemic in the most populous city in the New World generated a 'centrifugal force' that spread the disease far and wide, as is evident from spikes in monthly burial records of parishes and mission stations as far as New Mexico and California.<sup>143</sup> The Viceroy of New Spain wasted little time in authorising inoculation. Despite the increasing death-toll,

<sup>137</sup> *Letters and essays on the small-pox and inoculation ... of the West Indies* (London, 1778), pp. 105–12.

<sup>138</sup> *Letters of West Indies*, pp. 6–7.

<sup>139</sup> *Letters of West Indies*, pp. 11–12, 54–6, 67–70 and 89–99.

<sup>140</sup> James E. McClellan III, *Colonialism and science. Saint Domingue in the old regime* (Baltimore, MD, 1992), pp. 144–5; Bennett, 'Curing and inoculating smallpox', 35–6.

<sup>141</sup> Diego Barros Arana, *Historia jeneral de Chile*, vol. 6 (Santiago, 1886), pp. 227–30.

<sup>142</sup> Adam Warren, *Medicine and politics in colonial Peru. Population growth and the Bourbon reforms* (Pittsburgh, 2010), pp. 81–4.

<sup>143</sup> Fenn, *Pox Americana*, p. 142 and ch. 5 passim.

Dr Esteban Morel, who headed the government facility, was disappointed by the lack of response, attributing it to ‘the innate repugnance of those who were naturally healthy to voluntarily contract a sickness by artificial means’ and who remained hopeful that they would escape the disease.<sup>144</sup> In giving the practice official countenance, however, the authorities proved themselves more pragmatic than their counterparts in Old Spain and laid the foundations for larger and more successful programmes in the 1780s and 1790s.

In British North America, inoculation was widely known, though not generally used except when smallpox threatened. Familiarity with inoculation even led, on at least one notorious occasion, to the attempted use of smallpox as a weapon of war against the Native Americans. During Pontiac’s War in 1763, the British commander at Fort Pitt – crowded with civilians and with smallpox breaking out – sent out blankets from the smallpox ward to disperse the warriors conducting a siege.<sup>145</sup> Smallpox and inoculation played a major role in the War of American Independence. Drawing impetus from the movement of armies and refugees, a major epidemic ravaged North America from the mid-1770s to the early 1780s, adding to the distress and death-toll, and ultimately spreading the contagion across the continent. Most of the recruits to the Continental Army had not previously been exposed to smallpox, putting them at a disadvantage to the British soldiers, most of whom had had smallpox casually or by inoculation.<sup>146</sup> The American commanders faced a real dilemma. During the assault on Quebec, where smallpox raged, they prohibited inoculation, although some soldiers risked court martial by inoculating themselves.<sup>147</sup> Although he was desperately short of combat-ready men, and recognised that inoculation would put many of them out of action for two weeks, Washington took the bold decision early in 1777 to make the procedure mandatory for all recruits who had not had smallpox and to conduct a general inoculation in winter quarters at Valley Forge.<sup>148</sup> Efficiently conducted, and involving tens of thousands of men, the inoculation of the Continental Army was the largest and most successful immunisation campaign to date. During this time, too, large numbers of civilians had themselves inoculated.

In the late eighteenth century, the western style of inoculation spread in all directions in the wake of trade and empire. After a terrible epidemic in 1713, the Dutch colony at the Cape of Good Hope sought to keep smallpox at bay through strict quarantine. In Ceylon in 1754–5, however, the Dutch authorities turned to inoculation, with Governor Loten expressing his disappointment that

<sup>144</sup> Donald B. Cooper, *Epidemic disease in Mexico City 1761–1831* (Austin, TX, 1965), pp. 64–7.

<sup>145</sup> Elizabeth A. Fenn, ‘Biological warfare in eighteenth-century North America: Beyond Jeffery Amhurst’, *Journal of American History*, 86 (4) (1999–2000), 1552–80, esp. 1553–7.

<sup>146</sup> Fenn, *Pox Americana*, pp. 49–50. <sup>147</sup> Fenn, *Pox Americana*, p. 71.

<sup>148</sup> Fenn, *Pox Americana*, pp. 93–102.

the local people were unwilling to accept the 'salutary and universal remedy, which . . . has had such happy and certain results in various climates temperate as well as tropical'.<sup>149</sup> In 1756 Governor Magon authorised the inoculation of 400 slaves on the French island colonies of Mauritius and Réunion.<sup>150</sup> Around this time, too, Cape Colony authorised inoculation during a smallpox outbreak, withdrawing permission once it had been staunched. In Bengal and Java, where smallpox was virtually endemic, western style inoculation was practised, largely in the European enclaves and, in Bengal, in competition with the Indian form of inoculation. In Madras and in Ceylon, the governments made inoculation available to the indigenous population in the late 1790s and large numbers were seemingly inoculated. In Mauritius, again, the authorities introduced the practice to staunch an epidemic and then banned it again for fear that it would serve to maintain the infection. The British medical men on the First Fleet to Australia who brought variolous matter for use in inoculation may have been indirectly responsible for a major epidemic among the Aboriginal peoples living near the British settlement early in 1789.<sup>151</sup>

In the last decades of the eighteenth century, the western style of inoculation became familiar in many parts of the world. Prior to 1740, the number of people inoculated in the western world may have been no more than a few thousand, with half that number being in British America. By the 1790s, the total number of people inoculated with smallpox would have been many hundreds of thousands, including large numbers of people of non-European descent. Its success in the wider world helped to establish its reputation in Europe and built up pockets of experience and expertise among colonial officials, soldiers and medical men. Governor Magon's experience of inoculation in Mauritius inspired him, a decade later, to take the lead in having his child inoculated in his home-town of St Malo.<sup>152</sup> French champions of prophylaxis like Dr Louis Valentin gained important experience of inoculation in Saint-Domingue and the United States.<sup>153</sup> British America and the United States offered lessons on the controlled use of inoculation. Philadelphia was unusual in its liberalism with respect to inoculation. In Massachusetts, where inoculation was first introduced, the practice was ironically most closely regulated. Aware of the risks, the robustly independent townships of New England put proposals to inoculate to the vote and mandated quarantine, with red flags, in smallpox cases. Inoculation centres on islands off the Atlantic

<sup>149</sup> Alexander J. P. Raat, *The life of Governor Joan Gideon Loten (1710–1789): a personal history of a Dutch virtuoso* (Hilversum, 2010), p. 101.

<sup>150</sup> *Journal de médecine, chirurgie et pharmacie*, 34 (January–June 1770), 135n.

<sup>151</sup> Bennett, 'Smallpox and cowpox', 43, 46–9.

<sup>152</sup> *Journal de médecine, chirurgie et pharmacie*, 34 (January–June 1770), 135n.

<sup>153</sup> François Dezoteux and Louis Valentin, *Traité historique and pratique de l'inoculation* (Paris, An. VIII), pp. 14–15.

coast and in rural New York attracted clients from places where the practice was outlawed. In Virginia, too, a private initiative to inoculate in a country house in 1768–9 provoked riots, a notable court case, and highly restrictive legislation.<sup>154</sup> In letters to Dr Haygarth in England, Dr Benjamin Waterhouse, a Rhode Islander and professor at Harvard, pointed out that, despite the regulation of the practice, a high proportion of Bostonians were inoculated when necessary and that, notwithstanding the prohibition of inoculation, strict quarantine measures proved very effective in controlling smallpox in New England, not least in Rhode Island, where smallpox had been largely eliminated.<sup>155</sup> In response to Haygarth's claim that some of the American measures were unnecessary, he playfully observed that 'we have some pretence of knowing more of the disease than you in Europe'.<sup>156</sup>

### The Mirage of Eradication

In the late eighteenth century, the western style of inoculation, stripped down by experiment and experience, was accepted as a prophylactic tool in Britain and elsewhere, and was proving a catalyst for wider changes. In England, the tally of inoculations rose from a few thousand in the 1740s to hundreds of thousands in the 1760s. In 1771, George Baker, doyen of the Royal College of Physicians, observed that among the benefits of the 'modern method of inoculating' was that the practice, 'which was heretofore in a manner confined to people of superior ranks, is now practised even in the meanest cottages, and is almost universally received in every corner of this kingdom' and did not doubt that 'many valuable lives have hence been saved to the community'.<sup>157</sup> The role of inoculation in Britain's rapid population growth in the late eighteenth century has been hard to establish. The decline in infant mortality-rates began before inoculation became widespread in the 1750s, and the London bills of mortality reveal increases in the proportion of smallpox deaths in the capital in subsequent decades. Still, inoculation was evidently important in reducing mortality-rates in many towns and villages.<sup>158</sup> As Baker and other

<sup>154</sup> Patrick Henderson, 'Smallpox and patriotism: the Norfolk riots 1768–9', *Virginia Magazine of History and Biography*, 73 (1965), 413–24; Frank L. Dewey, 'Thomas Jefferson's law practice: the Norfolk anti-inoculation riots', *Virginia Magazine of History and Biography*, 91 (1983), 39–53.

<sup>155</sup> Haygarth, *Inquiry*, pp. 138–46.

<sup>156</sup> Philip Cash, *Dr Benjamin Waterhouse. A life in medicine and public service (1754–1846)* (Sagamore Beach, MA, 2006), p. 118.

<sup>157</sup> George Baker, 'Observations on the modern method of inoculating the small-pox', *Medical Transactions*, 2 (1772), 275–324, at 279.

<sup>158</sup> Alex J. Mercer, 'Smallpox and epidemiological-demographic change in Europe: the role of vaccination', *Population Studies*, 39 (1985), 287–307; Razzell, *Conquest*, pp. 187–210; Mary J. Dobson, *Contours of disease in early modern England* (Cambridge, 1997), pp. 481–3.

contemporaries observed, there can be no doubt that it saved 'many valuable lives'. Outside of Britain, the scale of inoculation activity in the late eighteenth century was too small to have a significant demographic impact. Even in Sweden, where there was official commitment to inoculation, the number of people inoculated may have been no more than 35,000.<sup>159</sup>

The impact of the new inoculation needs to be seen in broader terms. The idea of smallpox prophylaxis as the means of protection against an ineluctable scourge, a force of nature and indeed part of a divine plan, was revolutionary in its implications. Initially, it appeared almost blasphemous. As late as 1766, a dissenting minister in Newcastle publicly declined to pray for the recovery from inoculation of George III's eldest son, declaring that 'he was in the hands of Man, not of God since his inoculation'.<sup>160</sup> By this stage, clerical opposition of this sort was not at all common. Across Europe, the major Catholic and Protestant churches generally took the position that, if the practice could be recommended as beneficial by medical men, it raised no ethical concerns and could even be regarded as a blessing. Superstitious unease about tempting fate continued to weigh with some parents but, as many thousands of children went through the procedure with little danger, there was increasing optimism that smallpox could be prevented and controlled. Broad acceptance of the legitimacy and benefits of smallpox inoculation, along with recognition of the hazards of fighting fire with fire, would provide a receptive milieu for the promotion of a novel form of inoculation, cowpox inoculation, that promised to provide the same level of protection without risk either to the individual or the community.

The scale of inoculation activity likewise meant that large numbers of medical practitioners, including university-educated physicians and empirically observant surgeons, made it their business to concern themselves with smallpox prevention. The practice established beyond doubt that smallpox spread by contagion and the insights derived from observing the progress of the disease from the moment of infection made it increasingly possible to isolate cases and make therapeutic interventions in a timely fashion. It was found that improvements associated with the 'new inoculation', especially the use of mild purgatives and a cool regimen for recuperation, were as relevant to cases of casual smallpox as inoculated smallpox.<sup>161</sup> The discovery that the inoculated disease 'outruns and anticipates accidental infection', made it possible to use inoculation to good effect on patients already exposed to the disease, including babies nursed by mothers with smallpox.<sup>162</sup> Among

<sup>159</sup> Sköld, *Two faces*, p. 288.      <sup>160</sup> *Newcastle Courant*, 15 March 1766.

<sup>161</sup> Sarah Stidstone Gronim, 'Imagining inoculation: smallpox, the body, and social relations of healing in the eighteenth century', *BHM*, 80 (2006), 247–68, esp. 254–8.

<sup>162</sup> Baker, 'Observations', 310–11.

specialists in inoculation, a major focus of interest was the possibility of attenuating the smallpox by diluting variolous matter, or by using fresh 'humanised' lymph from mild cases. In the late 1780s, Jenner and his friends were intrigued by an outbreak of an unknown disease that was popularly dubbed swinepox, and decided to inoculate with it experimentally. After observing their patients' responses to swinepox and subsequently confirming that they were no longer susceptible to smallpox, they felt it reasonable to assume that swinepox was a mild strain of smallpox.<sup>163</sup> The focus on smallpox was leading to other advances in comparative pathology. The ability to distinguish more clearly between smallpox and chickenpox was a great boon. The interest in pustular diseases, their specificity and cognateness and the use of inoculation as an investigative tool, would make possible the discovery and demonstration of the prophylactic value of cowpox.

Observation of the process of infection and recognition of the role of contagion encouraged new studies of the epidemiology of smallpox that could assist in managing cases and preventing its spread. In his report on an epidemic in Chester that took 202 lives in 1774, Dr Haygarth found a case fatality rate of almost one in six, with a quarter of deaths being infants less than one year old and a concentration in the poorer parishes.<sup>164</sup> He found that smallpox spread almost entirely between people in close proximity and, while he recognised the utility of inoculation, he highlighted the importance of isolating smallpox cases and other sanitary measures. When smallpox struck again in 1777, he organised a Society for the Prevention of Smallpox to promote inoculation but, critically too, 'rules of prevention'. The Society gave sums of money to poor parents who were willing to have their children inoculated and commit to keeping them off the streets during the infective stage.<sup>165</sup> Although he thought that it was less contagious than casual smallpox, he nonetheless recognised that inoculated smallpox could still spread the disease. He solicited information about smallpox cases that could be attributed to particles of variolous matter surviving in clothes and other fomites. Although he found that such cases were very rare, he recognised that smallpox in this form had the capacity to spark a severe outbreak. In the late 1780s, he put forward a scheme for the eradication of smallpox in Britain, district by district, through a combination of strict reportage, isolation of cases, and inoculation of people in contact with them.<sup>166</sup> Although costly and hard to enforce, it seemed feasible in theory. A concern to eliminate future sources of infection gave an added reason to be

<sup>163</sup> Baxby, *Jenner's vaccine*, pp. 53, 151.

<sup>164</sup> John Haygarth, 'Observations on the population and diseases of Chester, in the year 1774', *PTRS*, 68 (1778), 131–54.

<sup>165</sup> Haygarth, *Inquiry*; Christopher C. Booth, *John Haygarth, FRS (1740–1827): a physician of the enlightenment* (Philadelphia, 2005), pp. 54–9.

<sup>166</sup> Haygarth, *Sketch of plan*, 1, pp. 113–89.

interested in the length of time that smallpox matter remained infective. His colleague James Currie of Liverpool conducted an experiment in 1792–3 that showed that variolous matter, dried on glass and left at room temperature, remained viable for inoculation purposes for some seventeen months.<sup>167</sup>

The recognition that smallpox was not innate and the use of inoculation and other prophylactic measures made it possible to imagine the eradication of smallpox. In the British colonies of North America, for example, it proved feasible to keep smallpox at bay for periods of time by quarantine measures and then to deploy inoculation whenever it made landfall. It was probably his experience of the use of inoculation to suppress a smallpox epidemic in Charleston, South Carolina, in 1738, that prompted Dr Kirkpatrick to claim in the wake of the epidemic in Britain in 1751–3, when inoculation was used extensively, that the practice has ‘very nearly expunged the small pox from the catalogue of mortal diseases’.<sup>168</sup> The stubborn persistence of smallpox in London and the suspicion that inoculation added fuel to the contagion, made this sort of optimism hard to sustain. In Germany, on the other hand, the recognition that smallpox was avoidable appeared to some physicians to offer the promise of expelling smallpox through the sorts of containment and sanitary measures that had assisted in banishing bubonic plague. In a much-discussed work in 1763, Dr F.-C. Medicus of Mannheim included inoculation as another tool to suppress and eradicate smallpox.<sup>169</sup> Medical men in Germany began to collect data on smallpox outbreaks, the advantages of inoculation for individuals and the risks of inoculation for the broader community. In 1797, Dr Juncker launched a bi-annual journal that served as a clearing house for this material. Inspired by Dr Haygarth’s plan for smallpox eradication in Britain, he and Dr Faust set forward a scheme in 1798 for the eradication of smallpox in continental Europe, using quarantine measures and inoculation in a network of inoculation houses.<sup>170</sup>

At the close of the eighteenth century, inoculation was more than holding its own in Britain and elsewhere in the European world. Medical men expressed surprise that the practice, well accepted in the upper strata of society, was neglected by most people. There were signs of interest, not least in France before and after the Revolution, in making the practice more available to the population at large. In the 1790s, too, inoculation was put into service on a significant scale in Europe’s colonies and on the colonial frontier. In the interstices of the wars that followed the French Revolution, there was some readiness to acknowledge inoculation as one of the beneficial innovations of

<sup>167</sup> James Currie, *Medical reports on the effects of water, cold and warm, as a remedy in fever and other diseases* . . . 4th ed., 2 vols. (London, 1805), I, pp. 61–2n.

<sup>168</sup> Kirkpatrick, *Analysis* (1754), p. iv. <sup>169</sup> Penschow, ‘Wrestling der Würgengel’, 255–7.

<sup>170</sup> Penschow, ‘Wrestling der Würgengel’, 274–91.



the age. In a relatively short time, it was showing some capacity to transform lives for the better. Even in Britain, the transformation had taken place in a single lifetime. Lady Mary Wortley Montagu, who died in 1762, did not live to see the large-scale adoption of the practice and the posthumous celebration of her achievement. The Countess of Bute, her daughter, the first person to be inoculated in Britain, survived until 1794. In 1796, William Woodville, director of the Smallpox and Inoculation Hospital, published the first volume of what might have been the decline and fall of the smallpox empire.<sup>171</sup> In the following year, Drs Faust and Juncker seized the opportunity of a lull in the European war to present to the Congress of Rastatt a plan for the eradication of smallpox on the continent. Practitioners across the world were continuing to seek improvements, technical and organisational, in smallpox inoculation. Very few people had heard about cowpox and still less paid it any heed. Still, it was the remarkable expansion of smallpox inoculation (variolation) that revealed its prophylactic value of cowpox, built the technology, expertise and interest that made inoculating cowpox (vaccination) a viable practice, and provided the impetus for its rapid spread around the world.

<sup>171</sup> William Woodville, *The history of the inoculation of the small-pox in Great Britain*, vol. 1 (London, 1796), p. v.