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The History of Smallpox Vaccination in Germany: A First Step in the Medicalization of the General Public

Although vaccination against smallpox was the first public health measure that affected nearly the whole population, its history has seldom been investigated as part of the process of medicalization which characterized the nineteenth century.[1] The vaccine's introduction, which was sanctioned by state authorities and executed by medical professionals, marked the first time that the German population became the object of a large-scale medical action which had its origin in recent scientific discoveries. Thus it appeared as 'the first step in the medicalization of the general public and in the medicalization of the life-cycle of contemporary man'.[2] Medicalization, a term first used by Michel Foucault, refers to the gradual disappearance of traditional, more or less fatalistic attitudes towards health and illness, and the extension of professional medical services to those social strata in which the professional medical practitioner had hitherto remained unknown. As the process of medicalization advanced, it became increasingly common to appeal to competent experts, to the medical professionals. This process was accompanied by a loss of independence on the part of the patient, and at the same time resulted in an increase in the power and status of the medical profession.

The following article will examine several aspects of the process of medicalization, as illustrated by the case of the smallpox vaccine: the common and different interests of the state and the medical profession; the public response to this new measure of public health care, ranging from scepticism to open opposition; and finally, the strategies employed by the state to overcome these manifold forms of resistance.

Although smallpox had been known in Europe since the Middle Ages, its character and consequences were long underestimated. For centuries

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smallpox was considered to be merely a more malignant form of the comparatively harmless measles, while plagues, like the pestilence, which were even more dangerous than smallpox, raged periodically through Europe, depopulating towns and rural regions.[3] The importance of smallpox and the danger it represented to human life was fully recognized only when Thomas Sydenham, a seventeenth-century English scholar and physician, discovered the clear distinction between smallpox and measles and, at around the same time, the pestilence began to appear less frequently.

The first statistical records of causes of death of the population were compiled during the seventeenth and eighteenth centuries. They show that, at that time, smallpox was high on the list of the great 'killers', with roughly six to ten per cent of all deaths resulting from it. Children under five years were the most frequent victims of smallpox. Between 1758 and 1774, 6,705 people died of smallpox in Berlin; of these, 5,876 (87.6 per cent) were under five years of age and 742 (11 per cent) were between the ages of five and ten. Contemporaries estimated that about 80–85 per cent of the population contracted smallpox at some point during their lifetime. Estimates of the mortality rate vary, but overall between one in six and one in ten smallpox victims died. Sometimes it was as many as one in three, depending on the severity of the epidemic.[4] In the bigger towns the disease was always present. In less densely populated areas, an epidemic would strike nearly all children who had not already become immune through having had smallpox before. This was usually followed by several 'smallpox-free' years, after which the disease would strike again, finding its victims mainly among the children who had been born after the last epidemic. Those who had had smallpox and survived were normally immune from the disease for the rest of their lives.

Faced with an outbreak of smallpox, the medical profession was helpless. Doctors could do nothing to prevent the spread of the disease or prevent its often fatal consequences. Opinions differed widely about the possible means of alleviating patients' suffering. In the late seventeenth century, Thomas Sydenham opposed the widespread practice of keeping patients very warm by covering them with heavy blankets and giving them sudorific drugs. Instead, he recommended that smallpox patients expose themselves to cold fresh air. But adherents of both the cold and warm therapies suffered heavy casualties. Nor could doctors agree regarding the desirability of blood-letting. In addition to blood-letting and the use of clysters and purgative drugs, doctors tried to ease their patients' pain by giving them cool drinks containing officinal herbs

or by applying warm compresses around the neck. Although none of these remedies offered much relief – even today no successful therapy against smallpox exists – they at least did the patient no harm.[5] Attempts to isolate the pox victims in order to prevent infection of healthy persons remained as fruitless as these therapeutic efforts.

Many people therefore did not even try to prevent their children becoming infected, but instead sought an opportune time, for example during a mild epidemic, for their children to catch the disease. This was how the practice of *Pockenkaufen* (buying smallpox) arose. Children who were intended to fall ill were sent into a smallpox infirmary where they paid for a smallpox scab to rub into their hands. There was only a short step between *Pockenkaufen* and inoculation. Inoculation, that is the transmission of genuine smallpox matter under the skin (generally the arm) of the inoculated person, had been known in India for a long time, and in both Greece and the Ottoman Empire since the seventeenth century. In 1718, Lady Mary Wortley Montague, the wife of a British ambassador who had heard of this method, had her five-year-old son inoculated in Constantinople, and from that time inoculation began to find its adherents, first in Britain and later on the Continent. But in England and France as well as in Austria and the German states, inoculation remained a procedure which only a few educated people of the upper classes accepted for their children. Indeed, only well-to-do people could afford the high fees demanded by the expert physicians who could perform an inoculation and supervise the course of the subsequent disease. In England, less than one thousand children were inoculated in the eight years between 1721 and 1729.[6] In Prussia and other German states, where inoculations were first performed in the second half of the eighteenth century, even fewer people could make up their minds to have their children inoculated.[7]

Several serious arguments against inoculation caused many physicians to oppose its introduction. The smallpox infection that was induced artificially was generally milder than one otherwise contracted, but it could also take a bad turn and the patient might even die from it. Furthermore, the immunity resulting from inoculation was not always permanent: in rare cases, someone who had been inoculated in childhood could contract smallpox as an adult. Finally – and this argument became very compelling – an acute smallpox epidemic could be produced by the process of inoculation itself, which involved the handling of genuine smallpox matter.[8]

New possibilities for the prevention of smallpox appeared only with Edward Jenner's famous discovery regarding cowpox, a disease common among cows. Jenner, an English country doctor, observed that milkers who contracted this rather harmless disease became immune to smallpox for the rest of their lives. In 1796, Jenner performed his first vaccination on an eight-year-old boy using cowpox vaccine which he had taken from the blisters of a milker's hand. In order to prove the boy's immunity against smallpox, Jenner later inoculated him with genuine smallpox matter, but the boy showed no reaction. After further experiments with the vaccination method, Jenner published his results, in 1798, under the title: 'An Inquiry into the Causes and Effects of Variolae Vaccinae, a Disease...known by the name of the Cow Pox'. Although Jenner's theory first met with serious opposition, mainly from other members of the medical profession, the new method of vaccination spread very quickly – indeed more rapidly than most scientific discoveries – throughout Britain and the Continent. Within the next three years, that is by 1801, at least 100,000 children in the United Kingdom were vaccinated with cowpox vaccine, many more than those who had received a smallpox inoculation in the previous eighty years. In the years following the turn of the century, medical practitioners began to administer the vaccine in nearly all European countries.

The immediate and surprising success of Jenner's cowpox vaccination can largely be explained by the response of the respective governments to his discovery. Vaccination offered an apparently harmless remedy for smallpox, which was easy to apply and avoided the dangers of inoculation. For the first time in history, it seemed possible to protect the entire population against smallpox, and perhaps to eradicate the dangerous disease altogether. The fact that most governments encouraged the vaccine should be seen in the light of their policies on population and the interests that lay behind them. By this time, in Germany as well as in other European countries, an absolutist regime existed which aimed to strengthen central authority at the expense of the old powers of the estates, and to maximize all available resources in order to increase its military and financial power. This strategy ascribed great importance to the mercantilistic principle 'que le nombre des peuples fait la richesse des Etats'. This was especially true in Prussia during Friedrich II's rule. By the early eighteenth century, Prussia had already recovered the population it had lost during the Thirty Years War and during the second half of the century its population nearly doubled. Yet the aim of increasing the population was continually jeopardized by crop failures, famines, and epidemics. The high infant mortality rate, in particular, worried

government officials. Roughly half of all children died before the age of six; many of them were victims of whooping-cough, measles, scarlet-fever, diphtheria, and above all, smallpox. In years of severe smallpox epidemics, like 1766, 1786 and 1801, more than 20 per cent of all deaths in Berlin were caused by smallpox.[9] According to contemporary estimates, toward the end of the eighteenth century in the German states, there were 70,000 deaths a year from smallpox[10] and in Prussia alone over 40,000 a year.[11] It is therefore not surprising that late eighteenth-century governments were interested in a measure like cowpox vaccine, which promised to save thousands of lives every year. Thus the boards of health in all the German states were urged to test Jenner's discovery and, once its value was proved, to encourage its widespread use.

A second group whose interests played an important role in the history of vaccination were the medical practitioners. They did not comprise a uniform profession at that time, but consisted of distinct groups, including the two main sections, of university-trained physicians on the one hand and barber-surgeons on the other.[12] The top group within the medical hierarchy, the physicians, were few in number, in relation to the population. In Prussia, for example, there were 1,986 practising physicians in 1828, that is, only one per 6,408 inhabitants. Physicians usually lived in towns and practised only among the upper classes of society upon whom they were highly dependent. Medical men were often in a rather weak position in relation to their patients. For the knowledge which scientific medicine offered concerning the treatment and cure of disease was very limited and not significantly superior to the knowledge that laymen could acquire. Indeed, medical practitioners often complained that their well-to-do patients viewed them as a kind of servant. The medical practitioners' subordinate role also had financial implications. Because the market for professional medical services was very limited, the individual physician usually had only a few patients on whose fees his income depended. Therefore, adaptation to the wishes and caprices of their upper-class patients was the first virtue required of medical men. It was still completely out of the question for them to be viewed as an authority legitimized by professional skill and competence.

The medical profession's claim to be recognized by the public authorities as experts in all medical matters was also far from being realized. Since the late eighteenth century, doctors had intensified their efforts to win government support for their plans to bring the whole population under medical control.[13] But the state authorities usually regarded these plans as utopian and only very reluctantly began to put into effect the medical profession's proposals. Thus Jenner's method of

cowpox vaccination presented medical practitioners with a new chance to increase their prestige and influence on public health affairs. Doctors also foresaw an increase in their income through vaccination fees and hoped to establish themselves, with the help of the vaccine, among those classes of the population who had not consulted doctors before.

The enforcement of the smallpox vaccination involved a third group, namely the population concerned, in particular the parents of young children who were to be vaccinated. Contemporary sources show that, among this group, there was much distrust and doubt regarding the value of the new method during the first decade following Jenner's discovery. According to medical practitioners of the time,[14] this attitude resulted from religious superstitions and aversion to the new and unknown. Furthermore, parents feared that their vaccinated children would contract another serious disease if the impurities which were normally extruded through the smallpox pustules were now confined within the body. The rare cases in which vaccinated children became victims of a smallpox epidemic also fuelled opposition to the vaccination. Medical practitioners identified such cases as 'only the chicken-pox', or claimed that only the so-called 'unächte Kuhpocken' had followed the vaccination, in other words that it had not taken effect.[15]

The history of the vaccination must be seen in the framework of this triangle of different interests and motives formed by state, medical profession and the public. Each group exercised an influence on the specific forms and conditions under which the enforcement of the vaccination in the German states took place. During the early nineteenth century, the attitudes of governments toward the vaccination were very much alike in all the German states. So-called *Impfanstalten* were established in towns all over Germany, and the vaccine was free for the children of the poorer members of society. There is no evidence as to whether these institutions were accepted by the public and were thus able to fulfil their purpose of removing at least one obstacle to the widespread vaccination of children: namely, the high fee doctors would have charged for its administration. Some states, like Prussia, provided free vaccination only to people who could prove their destitution by official certificate.[16] On the other hand, in parts of Bavaria, the vaccination was not only free for all parents, whether rich or poor, but they even received a small premium for every vaccinated child.[17] In most parts of Germany, however, the costs associated with the vaccination proved to be prohibitive for large segments of the population not registered as paupers

but living near the subsistence minimum. In fact, when the medical practitioners in Prussia were asked in 1809 to vaccinate free of charge on certain days of the week, the authorities found that the number of vaccinations given that year far exceeded those administered in each previous year.[18] Medical practitioners readily agreed with free vaccination because the authorities then assumed the costs and engaged special medical personnel to administer the vaccine. Although the fees paid by the state were rather low, they could add up to a sizeable sum and for many practitioners constituted a welcome source of extra income.

In addition, vaccination policies in all German states involved the local authorities, teachers, clergymen and doctors, who were urged to promote the dissemination of the vaccine and to fight the people's prejudices against it. Clergymen in particular were continually encouraged to preach the benefits of the vaccine from the pulpit and to tell parents that they had a 'moral duty' to have their children vaccinated.[19] Leaflets describing the advantages of the vaccination were printed and distributed among the people, especially in rural areas. A special medal was awarded to doctors who made exceptional contributions to the introduction of the smallpox vaccine.[20]

Only a few governments limited the administration of the vaccine to university-trained doctors. In some cases it is not clear whether the term *Ärzte* included or excluded the semi-professional group of barber-surgeons, and most governments explicitly authorized members of this group to vaccinate. Without them, vaccination in rural areas would have been impracticable, since academic doctors were concentrated in towns and hardly ever practised in the countryside. The Prussian government went even further. During the years 1801 and 1802, it had advocated a policy of 'wait and see' and limited administration of the vaccine to university-trained doctors. But once it was convinced of the value of vaccination, it declared that not only were all medical personnel authorized to vaccinate, but also, in rural areas, teachers, clergymen, and midwives.[21]

Prussia, however, did not go as far as other German states with respect to other aspects of the vaccine. No law was enacted making vaccination compulsory, as it was in Hessen and Bavaria (1807), Waldeck-Pyrmont (1811), Baden (1815), Wurtemberg and Nassau (1818) and Hannover (1821). Evidently, the Prussian authorities hesitated to intervene so directly in the familial sphere or in the parents' right to decide about their children's well-being. Instead, Prussia preferred a 'smooth' way of influencing the people, that is, through oral and written propaganda and information, rewards, and so on. This 'smooth' Prussian course was

eventually complemented by methods of compulsion, either direct or indirect. For instance, a decree issued on 15 August 1810 made vaccination compulsory, in the event of an outbreak of a smallpox epidemic, for those within the area of the epidemic who had not yet received the vaccine.[22] An example of indirect compulsion was a decree (*Regulativ*) of 1835 concerning the duties of sanitary police upon the outbreak of an infectious disease. First, it urged everybody 'not to deprive themselves, their children or charges and other relatives of the smallpox vaccine'.[23] Schoolmasters, master craftsmen and heads of households were requested to accept only vaccinated persons as pupils, apprentices or servants.[24] Moreover, anyone who wished to obtain any type of state grant or state benefit had to show a vaccination certificate. Parents who had not allowed their children to be vaccinated could be fined, or even arrested, if their children contracted smallpox and became a source of infection for the general public. At the same time, the decree revoked the authorization of clergymen, teachers, and midwives to administer the vaccine and made it once again the exclusive right of the medical profession. This new arrangement was favourable to the academic doctors, who eventually came to monopolize the entire administration of the vaccine, after the number of semi-professional barber-surgeons began to decline rapidly from the early 1830s.

Thus, one important goal of the medical profession was realized and its opportunities for contact with the majority of the population were greatly increased. The second goal, however, that of the enactment of a law making vaccination compulsory, was not achieved. Through this, medical practitioners had hoped to exert more authority over those sections of the population who resisted vaccination. Some of the local governments (*Bezirksregierungen*) in Prussia pursued a similar aim and made the vaccine practically compulsory in their districts. But central government invalidated these local decrees, adhering strictly to its decision against compulsory vaccination.[25] The same strategy was pursued by Saxony and other German states, although elements of compulsion were present there too.[26]

The results of Prussia's policy did not differ significantly, however, from those of states with compulsory vaccination. In Berlin, for example, between 1844 and 1863, an average of 66.34 vaccinations were performed for every 100 births.[27] The results in Wurtemberg and Bavaria, where vaccination was prescribed by law, were not significantly better (although it is, of course, difficult to compare the vaccination results in a capital city with those in a region as a whole). In Bavaria, in the ten years from 1862 to 1871, there were 70.25 vaccinations for every

100 births of the previous year. In Wurtemberg, the results were even less favourable: between 1854 and 1866, only 64.5 per cent of the children born in the previous year received vaccinations.[28] Imperfections in the registration of children eligible for vaccination, defects in administration and organization and anti-vaccine agitation, particularly in Wurtemberg, were responsible for this.

Thus, a considerable number of children failed to receive the vaccine, even taking into account the fact that approximately one-quarter to one-third of infants died within their first year. The actual percentage of children protected by vaccination can be better judged, therefore, by looking at the number of vaccinated school-age children. In Saxony, where vaccination remained voluntary until the National Vaccination Act of 1874, more than 90 per cent of children starting school, in three of four county districts, were vaccinated between 1859 and 1863. Only in the county district Zwickau did the percentage fail to exceed 80 per cent. Despite this high percentage, 4.6 per cent of those starting school had already had smallpox.[29] Sometimes, the percentage of those vaccinated in the same place but at different times varied as much as the percentage differences between states with and without compulsory vaccination. In Berlin, for instance, the relation between births and vaccinations was 83.49 per cent in 1840, rising to 89.46 in 1843. In the 1860s, however, the number of vaccinations dropped rapidly: there were only 37.0 to every 100 births in 1866, and 29.29 in 1870, with an average of 45.67 for the six years between 1865 and 1870.[30]

The degree to which clergymen, teachers, civil servants, and medical practitioners actively propagated the vaccine appears to be one important factor in analysing these variations. Another factor was the extent to which people feared a new and severe outbreak of smallpox. As long as the smallpox epidemics, in all their horror, were still a recent memory, the combined efforts of the authorities, clergymen, and doctors overcame the public's traditional distrust and persuaded people to have their children vaccinated. When smallpox epidemics became less common, both the public's fear and the enthusiasm of middle-class promoters of the vaccine decreased. Moreover, it became apparent in the 1820s that the protection offered by the vaccine tended to weaken after several years. Increasing numbers of vaccinated people fell ill with smallpox, because the necessity of periodically renewing the vaccine had not yet been fully recognized. These factors taken as a whole explain why the use of the vaccine did not increase steadily, but was more frequent in the 1840s than in the 1860s.

Smallpox epidemics had actually abated substantially after the end of

the eighteenth century. Again, viewing the figures for Berlin, the deaths caused by smallpox in the second half of the eighteenth century amounted to approximately eight per cent of total deaths. This figure dropped to below one per cent in most years after 1810. The same is true of the Prussian state as a whole.[31] Adherents and adversaries of the vaccine quarrelled vehemently about whether this remarkable decrease was due to the influence of vaccination. The anti-vaccinationists maintained that a connection between vaccination and the declining number of smallpox deaths could not be proved because vaccination statistics were unreliable.[32] They rather ascribed the decrease in the number of smallpox deaths to improved hygienic conditions and better nutrition. Yet, the visible shift in the ages of those who contracted smallpox provides evidence that the vaccine offered some degree of protection. While smallpox had been almost exclusively a children's disease in the eighteenth century, if afflicted increasing numbers of adolescents and adults during the nineteenth century. One explanation for this is that young children who had been vaccinated were still immune, while in the case of adults the vaccine's protection had already declined significantly.[33]

However one may answer the controversial question about the effects of vaccination the fact remains that a large portion of the German population was vaccinated against smallpox well before the Vaccination Act of 1874. The revaccination which was necessary for a lasting protection was not as widespread. Only in Nassau and some other small German states did the law make revaccination compulsory for the civilian population. In most other states, revaccination was required only for army personnel.[34]

The fact that revaccination was relatively rare, and that a considerable percentage of every age-group remained unvaccinated, meant that smallpox could not be completely eradicated, even if the number of cases was significantly less than in the eighteenth century. In Prussia, where exact figures are available covering the period from 1816 onwards, between 1,500 and 5,000 persons died of smallpox every year. These numbers increased dramatically in years when the disease assumed the proportions of an epidemic, such as 1833, when nearly 8,000 people died of smallpox, or in 1864 and 1866 when its victims numbered 8,900 and 12,000 respectively.[35]

A very serious smallpox epidemic developed throughout western Europe during the Franco-Prussian War of 1870–71. Prussia alone lost 59,839 inhabitants to smallpox in 1871, and another 65,109 in 1872.

The south German states, by contrast, were not as severely struck by the outbreak of the disease. In Bavaria, for example, 5,070 died of smallpox in 1871, and another 2,992 in 1872; in other words, there were 104.5 smallpox deaths per 100,000 inhabitants in 1871 and 61.1 in 1872. The respective figures for Prussia were 243.2 and 262.4.[36] These figures, and in particular the fact that a large percentage of German army personnel had been revaccinated and was less susceptible to smallpox than the largely unvaccinated French troops, appeared to point to the positive effects of the compulsory vaccination. In response to a petition circulated by medical practitioners in Königsberg, the German Reichstag decided on 23 April 1873 to pass legislation making vaccination and revaccination compulsory as soon as possible.[37]

Yet, when Bismarck presented a vaccination bill to the Reichstag on 5 February 1874, it met with vocal opposition, especially from members of the Social Democratic and the Catholic Centre Parties. Opponents of compulsory vaccination challenged the government's right to force a father to consent against his will to the vaccination of his children as long as the benefits of the vaccine had not been definitively proved. Furthermore, they rejected compulsory vaccination because they feared that the vaccine itself could transmit other diseases to its recipients. The Social Democratic Reichstag representative, Reimer, argued that improvement in the living conditions of the working classes, that is better housing, nutrition, and clothing, were more crucial to the prevention of smallpox than the vaccine and would aid in the eradication of other infectious diseases as well.[38]

The supporters of compulsory vaccination, including the overwhelming majority of the medical profession, contested these arguments, which were repeated in a similar form in numerous petitions against the bill. The bill was eventually approved by 183 votes to 119 and became law on 8 April 1874. After that, every child in the German Empire had to be vaccinated 'before the end of the calendar year following the year of birth' and revaccinated at the age of twelve.[39] Exemptions from this law were allowed only if a medical certificate attested that the vaccine could endanger the child's life. A vaccination which had obviously failed to take effect had to be repeated within the following year at the latest. Those parents who, despite an official summons, failed to have their children vaccinated faced a fine of up to fifty Marks or three days detention.[40]

The vaccination question was, however, far from being settled even after the Vaccination Act had been passed. The national legal sanction

of compulsory vaccination produced a wave of protest and opposition among the public. This was, of course, nothing new: scepticism of and opposition to the vaccination had been widespread among the population, especially in the first decades of the nineteenth century, and many had refused to have their infants vaccinated. The anti-vaccination movement, which had developed in the 1850s in Wurtemberg, had its basis in these rather diffuse sentiments, though it was led by individual medical practitioners. The 1870s saw a new wave of broad-based organizations of vaccine opponents, who aimed to influence public opinion through meetings, lectures, leaflets, pamphlets, and numerous petitions to the Reichstag.

The opponents of compulsory vaccination based their arguments on the following points: first, reliable statistical investigations into the utility of the vaccine did not exist, a fact which neither the supporters of the Vaccination Act, nor the public officials could ignore. Thus, they argued, the government had no right to interfere in the private family sphere. Second, they claimed that unvaccinated persons could not present a danger to those who had received the vaccine if the vaccination actually provided protection against smallpox. It should, therefore, be possible to make vaccination voluntary and to abolish the compulsory practice. Finally, they argued that the vaccine itself endangered the lives of its potential recipients.[41] As this last point became one of their primary arguments, they sought to prove it by citing numerous individual cases. A petition to the Reichstag in January 1877[42] listed 251 individual cases of serious illness or death of a child who had received the vaccine. But these accounts could not substantiate the connection between vaccination and the subsequent illness or death, since infant mortality remained extremely high until the end of the century – roughly every fourth child did not live to see his first birthday.[43] Moreover, the cases listed in the petition had been collected by laymen, which, according to Dr Thilenius, physician and chairman of the petition commission, rendered them useless. In his report to the Reichstag in April 1877, therefore, he recommended that they pass over the petition and proceed to the next item on the agenda. During the next few years, the flood of petitions continued and the number of cases in which the vaccine's harmful side-effects (syphilis, for example) were officially confirmed increased to the extent that the commission could no longer afford to ignore such cases. In 1879, it recommended that the Reichstag inquire into a more efficient means of supervising the vaccinators.[44]

It should be said that the physicians who administered the vaccine received only a minimal amount of animal vaccine from state vaccination

institutes, which was only enough for first vaccinations. They themselves had to provide the vaccine for all subsequent vaccinations. This usually involved selecting a vaccinated child whose vaccination pustules were sufficiently well developed, and extracting fluid from them which could be used, in turn, for later vaccinations. The most common procedure was vaccination from arm to arm, that is the direct transference of vaccine from the pustule of a so-called *Stamm-Impfling* by lancet to other children, in whose arms small incisions had been made. In view of the often overcrowded vaccination rooms, full of crying infants, it is not surprising that most mothers were unwilling to allow their children to take part in the procedure of *Abimpfen* (removal of fluid from the child's pustules). Thus there was a shortage of *Stamm-Impflinge* and it is possible that the medical examination of those who were available was too perfunctory, often resulting in the acceptance of children whose condition of health was far from desirable. In this manner, infectious diseases could be transmitted by vaccination. One of the most spectacular of such cases was the so-called *Lebuser Fall*. In the village of *Lebus* in East Prussia, twelve schoolgirls who had been inoculated with the vaccine of a four-month-old syphilitic baby in the summer of 1876, also contracted syphilis.[45] In another case, of 81 one-year-old children who contracted syphilis from the vaccine in 1876, nine died.[46] Because of their different interests, the state and the medical profession judged these cases differently. The public authorities were much more inclined to ascribe the responsibility for any damage to health to the carelessness of the respective vaccinator, while the medical profession, especially those who administered the vaccine, claimed to have done their job carefully and scrupulously. But carelessness and lack of experience on the part of the vaccinator could have accounted for at least some cases of damage to health. The Prussian corollary to the Vaccination Act of 12 April 1875 entrusted the formation of vaccination districts and the hiring of vaccinators to the communities.[47] This often meant that the county councils (*Kreisausschüsse*) chose a medical practitioner who demanded the lowest fees, and who was usually a young, inexperienced, often unemployed, doctor who hoped thereby to establish a name for himself among the public and build up a practice.

Only in the 1880s and 1890s were these grievances gradually remedied. Following a Reichstag decision, a commission of experts was formed which met from 30 October to 5 November 1884 under the supervision of the National Board of Health (*Reichsgesundheitsamt*). To guarantee meticulous administration of the vaccine in the future, the commission proposed drafting detailed codes of conduct for the doctors, for the

parents of vaccinated children, and for the local police authorities. The instructions for vaccinators referred to the selection of the *Stamm-Impflinge* and to the technique of vaccination, while the parents received instructions on how to take care of the child in the first few days after vaccination. Finally, the local police were to provide spacious, bright, and well-ventilated facilities for public vaccinations, as well as someone to do the necessary clerical work. The commission also recommended charging public health officers with the task of public vaccination.[48]

In 1887, the requirements for the final medical examinations were revised, and thereafter each candidate had to demonstrate his knowledge of the vaccination technique. Finally, another commission of experts met again at the National Board of Health in 1898 and decided that only animal vaccine should be used for public and private vaccinations in the future. The use of animal vaccine had already increased considerably since the early 1880s, when procedures for preserving the vaccine had been developed.[49] Now, at the end of the century, with sufficient amounts of animal vaccine available, the use of human vaccine was considered dangerous and prohibited. Thus, nearly a hundred years after its introduction and about a quarter of a century after the passage of the National Vaccination Act, the remaining dangers of vaccination were removed, allowing it to become what it had alleged to be for the previous hundred years: a harmless operation which offered protection against smallpox without any dangerous side-effects. Indeed, improvements in the administration of the vaccine would probably have taken even longer without the pressure of the anti-vaccinationist movement – a fact which is easily forgotten when surveying the overall successful struggle against smallpox. In 1979 the WHO announced the total eradication of smallpox in all countries.

To what extent can vaccination be viewed as a means of 'medicalizing the population', beyond its immediate purpose of fighting smallpox? It has been pointed out that the enforcement of vaccination meant more to the medical profession than merely increasing its income through vaccination fees. It provided a welcome opportunity for doctors to break out of the confines of exclusively treating the upper classes, to expand the market for professional medical services and, finally, to move towards a realization of their claim to be recognized by all sections of the population as singular experts in the questions of health and illness. In this respect, the interests of the state and the medical profession differed,

although they both shared a common interest in enforcing the vaccination. The medical profession, of course, wished to obtain a monopoly on public and private vaccination for its own members, while the state primarily aimed to facilitate administration of the vaccine in rural areas, where only a few doctors practised. In the long run, medical practitioners succeeded in gaining exclusive control over the vaccination process. On the other hand, they had to recognize that the introduction of vaccination by no means automatically resulted in greater credibility for medical men in the eyes of the population.[50] Instead, it often had the opposite effect and reinforced distrust and scepticism of professional medicine. The manifold forms of resistance provide ample evidence of this, especially where vaccination was enforced by law. In 1902, the Reichstag's petition commission had to point out that the vaccine was still unpopular and that the public endured this measure 'extremely unwillingly'.[51]

Overall, the vaccination's effect in medicalizing the people seems to have outweighed the resistance to it. Even if the signatures on the petitions to abolish compulsory vaccination amounted to tens of thousands,[52] millions of people allowed their children to be vaccinated each year, without any protest, even if 'extremely unwillingly'. Thus they placed the life and health of their children in the hands of medical science and its representatives, the academic doctors. No doubt, the medicalization effect here was not as direct or immediate as in the case of the sick funds, whose members were taught to react in a specific way to illness, namely, to consult only a qualified doctor. But the medical practitioner appeared as a responsible expert in the case of vaccination as well: he was to administer an example of public health welfare derived from the latest scientific findings. Furthermore, vaccinators, like *Kassenärzte* (panel doctors), could exert an influence on the 'hygienization' of everyday life which should not be underestimated. Doctors could encourage the adoption of certain standards of body-hygiene through the code of conduct which prescribed for parents the care of the recently vaccinated child. This code instructed them, for instance, to bring their children to their vaccination appointments washed and dressed in clean clothes. According to a proposal of public health officer Professor Dietrich, every doctor who administered the vaccine should use the vaccination appointment to emphasize the advantages of breast-feeding to the mothers who brought their infants to be vaccinated.[53]

The medicalizing effect of the vaccine was enhanced by the fact that by the first half of the nineteenth century, it encompassed the overwhelming majority of the people, and the entire population after the passage of the National Vaccination Act in 1874. In this respect, it was

more successful than health insurance organizations, which did not exist in the first half of the century and which, by the end of the century, still encompassed only relatively small segments of the population.[54]

Notes

My thanks to Kathleen Canning who corrected this paper and improved my rusty English and to Ute Frevert for the initial suggestion.

1. A first study covering the period of inoculation and the initial phase after the introduction of vaccination in Prussia can be found in U. Frevert, *Krankheit als politisches Problem 1770–1880. Soziale Unterschichten in Preussen zwischen medizinischer Polizei und staatlicher Sozialversicherung* (Göttingen 1984), 69–74.

2. G. D. Sussman, 'Enlightened Health Reform, Professional Medicine, and Traditional Society: The Cantonal Physicians of the Bas-Rhin', *Bulletin of the History of Medicine*, 51 (1977), 575.

3. Even today, the best and most detailed study of smallpox and smallpox vaccination, written by a medical officer of health in the Prussian ministry, is P. Kübler, *Geschichte der Pocken und der Impfung* (Berlin 1901). Concerning the pestilence, see E. H. Ackerknecht, *Geschichte und Geographie der wichtigsten Krankheiten* (Stuttgart 1963), 6–19.

4. *Blattern und Schutzpockenimpfung. Denkschrift zur Beurteilung des Nutzens des Impfgesetzes und zur Würdigung der dagegen gerichteten Angriffe*, ed. Kaiserliches Gesundheitsamt (Berlin 1896), 8–11; Kübler, 99, 101; J. E. Wetzler, *Aktenstücke über die Schutzpockenimpfung in der königlich-baierschen Provinz in Schwaben. Nebst einer Abhandlung über die Massregeln und Anstalten, welche die Regierungen in Hinsicht der Schutzpocken-Impfung treffen sollen* (Ulm 1807), 8.

5. Kübler, 106–10.

6. Ibid., 122.

7. W. Kaiser, 'Impfärzte des 18. Jahrhunderts', *Zahn-, Mund- und Kieferheilkunde*, 64 (1976), 385–96; W. Kaiser and K. Werner, 'Die Anfänge der Pockenschutzimpfung (Variolation) in Halle und Umgebung', *Zeitschrift für die gesamte Hygiene*, 19 (1973), 806–12.

8. The fact that in Geneva smallpox took on a more epidemic character in the second half of the eighteenth century – there were only two years when there were no smallpox deaths, while there had been nineteen in the first half of the century – seems to bolster this argument. See A. Perrenoud, 'Contribution à l'histoire cyclique des maladies. Deux siècles de variole à Genève (1580–1810)', in *Mensch und Gesundheit in der Geschichte*, ed. A. E. Imhof (Husum 1980), 175–98, here 177f.; for the risk of infection see J. C. W. Juncker, *Gemeinnützige Vorschläge und Nachrichten über das beste Verhalten der Menschen in Rücksicht auf die Pockenkrankheit* (Halle 1792), 81–85 who recommended inoculation only to the upper classes of society, which were more likely and able to isolate the inoculated persons (89f.).

9. A. Guttstadt, 'Die Pocken-Epidemie in Preussen, insbesondere in Berlin 1870/72', *Zeitschrift des königlich-preussischen statistischen Bureaus* (1873), 116.

10. J. C. W. Juncker had received records for the year 1796, proving the deaths of 65,200 persons.

11. This number is mentioned in a Prussian government decree of 31 October 1803; F. L. Augustin, *Die Königlich-Preussische Medicinal-Verfassung*, vol. 2 (Potsdam 1818), 614.

12. For the situation of the medical profession in the early nineteenth century see C. Huerkamp, *Der Aufstieg der Ärzte im 19. Jahrhundert. Vom gelehrten Stand zum professionellen Experten: das Beispiel Preussens* (Göttingen 1985; forthcoming) ch. II.

13. See J. P. Frank, *System einer vollständigen medicinischen Polizey*, 4 vols. (Mannheim 1779–88); recently: Frevert, *Krankheit* 60–69.

14. M. Schmid, *Bericht über die Schutzpocken-Impfung im Physikatsdistrikte Rosenheim* (Rosenheim 1816), 15f.; Wetzler, 11, 14.

15. Wetzler, 64, 40, 123.

16. Decree of 31 October 1803, Augustin, vol. 2, 617.

17. Wetzler, 55, 69f.; Announcements of 25 February 1805 and 17 May 1805.

18. Augustin, vol. 2, 621f.

19. See the numerous appeals to clergymen in the decrees of the Prussian government: Augustin, vol. 2, 613ff.; see also Wetzler, 74, 95, who traced favourable results of vaccination back to the 'beharrliche Thätigkeit...der Pfarrer und Kaplane'.

20. Augustin, vol. 2, 655–57; for an illustration of such a medal see Kübler, 180.

21. See several relevant decrees in Augustin, vol. 2, 607–13, 616.

22. J. P. Rupp. 'Die Entwicklung der Impfgesetzgebung in Hessen', *Medizinhistorisches Journal*, 10 (1975), 115.

23. Section 50 of the 'Regulativ', printed in W. v. Horn, *Das Preussische Medizinalwesen*, 2nd edition (Berlin 1863), part I, 231.

24. Ibid., section 54, 231f. This did not apply to school-age children who visited the compulsory *Volksschule*: see *Ministerialverfügung* of 14 August 1856, ibid., 308.

25. *Beiträge zur Beurteilung des Nutzens der Schutzpockenimpfung*, ed. Kaiserliches Gesundheitsamt (Berlin 1888), ch. 5: Die Regelung des Impfwesens in den neun älteren Provinzen Preussens bis zum Jahre 1874, 100–20. esp. 106f.

26. In 1883 in the Saxon town of Bautzen, all parents who had not yet allowed their children to be vaccinated were summoned to the police station and had to explain why they had not made use of the vaccination (D. Tutzke, 'Blatternsterblichkeit und Schutzpockenimpfung in der Sächsischen Oberlausitz 1800–1875', *Wissenschaftliche Zeitschrift der Universität Halle*, Math.-Nat. Reihe, 4 (1955), 1104).

27. *Blattern und Schutzpockenimpfung*, 56f.

28. Ibid., 57.

29. Tutzke, 1108; A. Geissler, 'Die Entwicklung des sächsischen Impfwesens mit besonderer Rücksicht auf die Jahre 1880–1883', *Zeitschrift des königlich-sächsischen statistischen Bureaus*, 30 (1884), 1.

30. Guttstadt, 119; *Blattern und Schutzpockenimpfung*, 57.

31. Guttstadt, table 1, 116; 128f.

32. See, for instance, the statements of the learned statistician and anti-vaccinationist G. Fr. Kolb, *Zur Impffrage. Unzulänglichkeit der bisherigen Ermittlungen und Verlangen nach Aufhebung des Impfzwanges* (Leipzig 1877), 22–55. Even the authorities and other supporters of vaccination had to admit the inadequacy of statistical data, which in cases of smallpox epidemics, for instance, did not always specify the vaccinated and unvaccinated persons who had fallen ill. (Letter from the Prussian ministry of health, to the *Reichskanzleramt*, 20 November 1873, *Bundesarchiv Koblenz*, R 86 Reichsgesundheitsamt, no. 1208.

33. Tutzke, 1101.

34. F. Ring, *Zur Geschichte der Militärmedizin in Deutschland* (Berlin 1962), 124; Kübler, 28–32.

35. Guttstadt, 129, table 8.

36. *Blattern und Schutzpockenimpfung*, 65.

37. *Stenographische Berichte über die Verhandlungen des Deutschen Reichstags* (in the following notes: *Sten. Berichte*), vol. 27 (1873), 286.

38. *Sten. Berichte*, vol. 31 (1874), 106–08; cf. ibid., 228–34.

39. Section 1 of Vaccination Act, printed in E. Bach, *Das Reichsimpfgesetz vom 8 April 1874, durch Motive und Ministerialreskripte etc. etc. erläutert...* (Düsseldorf 1888), 5.

40. Sections 2, 3, 4, 6 ibid., 7f.

41. Kolb; R. Gerling, *Blattern und Schutzpockenimpfung. Öffentliche Anklage: Impfgegner c./a. Reichsgesundheitsamt*, ed. Berliner Impfgegner-Verein (Berlin 1896). A further choice of anti-vaccinationist pamphlets can be found in the *Bundesarchiv Koblenz* (R 86 Reichsgesundheitsamt, no. 1205[a]). Cf. the report by Dr Brauser, 'Agitation gegen das Reichsimpfgesetz' in *Ärztliches Vereinsblatt für Deutschland* (1876), no. 51, 87–93.

42. 'II. Hilferuf an den Hohen Deutschen Reichstag um Aufhebung des Impfzwangs, Januar 1877', *Bundesarchiv Koblenz*, R 86 Reichsgesundheitsamt, no. 1204, vol. 1.

43. R. Spree, 'Strukturierte soziale Ungleichheit im Reproduktionsbereich. Zur historischen Analyse ihrer Erscheinungsformen in Deutschland 1870–1913', in *Geschichte als politische Wissenschaft*, eds. J. Bergmann et al. (Stuttgart 1979), esp. 69ff.

44. Report of 8 May 1879, *Sten. Berichte*, vol. 58 (Anlagen), Aktenstück no. 304, 1746.

45. Bericht der Petitionskommission des Reichstages, *Sten. Berichte*, vol. 50 (1878) (Anlagen), Aktenstück no. 224, 1143f. This case was discussed at the annual conference of German doctors as well (Sten. Protokoll des Ärztetages 1878, *Ärztliches Vereinsblatt für Deutschland* (1878)), no. 77, 155–60.

46. Bericht der Petitionskommission, *Sten. Berichte*, vol. 50 (1878) (Anlagen), Aktenstück no. 224, 1145. For further cases of damage to health which were officially confirmed, cf. the voluminous records comprising 14 volumes for the years 1878–1913, in the *Bundesarchiv Koblenz*: R 86 Reichsgesundheitsamt, no. 1,203 (Impfschädigungen).

47. Bach, 17.

48. Beschlüsse der Kommission, *Verhandlungen des Bundesrats. Drucksachen 1885*, Drucksache no. 3, 3–12.

49. In Saxony, only 5.5 per cent of children were vaccinated with animal vaccine in 1880, but by 1883 this number had increased to 32.8 per cent (Geissler, 3). Cf. article in *Beiträge zur Beurteilung*, 180–92.

50. Cf. the statement of a country doctor in southern Germany: 'Über das Leben und Wirken eines Arztes auf dem Lande', *Medicinischer Almanach für das Jahr 1843* (Berlin 1843), 65.

51. *Sten. Berichte*, vol. 191 (1900/1902) (Anlagen), Aktenstück no. 573, 2802.

52. In 1877, the petitions were signed by less than 30,000 persons, in 1891 by about 90,000 (*Blattern und Schutzpockenimpfung*, 93).

53. Dietrich, 'Hygiene des frühen Kindesalters; Säuglingspflege und Haltekinderwesen', in *Das Preussische Medizinal- und Gesundheitswesen in den Jahren 1883–1908*, ed. O. Rapmund (Berlin 1908), 224.

54. Before 1883, about five per cent of the German population was insured against illness. After the passage of the National Health Insurance Act of 1883 this percentage doubled, and by the turn of the century had increased to approximately 17 per cent, not including family members. See Huerkamp, forthcoming, VII, 1.

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