

PUBLIC HEALTH AND MEDICINE IN BRITISH INDIA: AN ASSESSMENT OF THE BRITISH CONTRIBUTION*

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In the years between 1760 and 1860, India was the main focus of European colonial expansion. Under the auspices of the East India Company, the British annexed territory, first, in Bengal and southern India, and later in the north and west of the subcontinent. The north-eastern territories of Assam and Sikkim were also brought under British rule during the nineteenth century, together with what was to become British Burma. After 1860 British expansion in South Asia was limited, but the British became far more involved in the lives of their colonial subjects. Even before the transfer of rule from the Company to the Crown in 1858, the British had begun to develop the subcontinent and to improve communications by building railways and establishing telegraph lines. In the coming years, their involvement deepened, as colonial revenues, and monies raised by new municipal bodies established by the British, were allotted to the construction of a modern infrastructure on Western lines. This entailed irrigation, agricultural improvements, the cleansing of towns and cities, and the establishment of hospitals and dispensaries. By the end of the nineteenth century, the British boasted that they had brought civilisation to India and had implanted among Indians the desire for further reform. Many Britons had come to believe that this was their primary role in India. The medical scientist Sir Ronald Ross, who won a Nobel prize for his discovery of the mosquito vector of malaria, was convinced that British rule was essential to India's development. He believed that the British were¹

superior to subject peoples in natural ability, integrity and science ... They [had] introduced honesty, law, justice, order, roads, posts, railways, irrigation, hospitals ... and what was necessary for civilisation, a final superior authority.

In this article, I shall examine how and why such ideas took root in the European imagination and the extent to which they actually affected colonial policies. Were medical provisions for Britain's colonial subjects merely an expression of imperial altruism, or did they reflect less disinterested motives? How far did the colonial government push public health beyond the boundaries of colonial enclaves and into the towns and villages? Just how effective was colonial medical intervention and how did

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Quoted in M. Harrison, *Public Health in British India: Anglo-Indian Preventive Medicine, 1859-1914* (Cambridge: Cambridge University Press, 1994), p. 151.

indigenous peoples respond to the introduction of Western medicine and hygienic regulations?

**THE ORIGINS OF HEALTH CARE IN BRITISH INDIA:
THE COMPANY RAJ, C.1760-1858**

Military

It is often claimed that colonial medicine in India was 'enclavist' in character, in that its main function was to minister to the needs of Europeans and colonial troops.² This assertion is borne out, at least, by an examination of the origins of medical institutions in India, for the foundations of what were later to become the Indian Medical Service were laid in the mid-eighteenth century, when a series of wars against the French, and Indian polities such as Mysore and the Maratha Confederacy, led to the recruitment of more surgeons from Britain (particularly from Scotland and Ireland). A number of these doctors eventually entered civilian practice, and some made large amounts of money by treating Europeans and rich Indians, but their orientation remained chiefly military. Thus, the permanent Medical Board established in 1763 to coordinate the civil and military branches of the Bengal medical service, insisted that all would-be civil surgeons had to undergo at least two years military service, and remain subject to recall in time of war. Similar regulations were introduced in Madras and Bombay and remained in force for the remainder of British rule.

The conflicts of the eighteenth century also highlighted the need for more hospital assistants and orderlies — posts often filled by Indians trained in the rudiments of Western medicine, in addition to indigenous traditions. From the mid-eighteenth century, the Company increased its recruitment of such men and organised them into a separate Military Subordinate Medical Department. By comparison with the 'superior' medical service — staffed at this time entirely by Europeans — the subordinate service was poorly paid and its members often complained bitterly of their position. Nevertheless, the growing number of Indians trained in aspects of Western medicine, provided a conduit for foreign medical ideas to enter Indian culture.

Military considerations were also dominant in the growth of medical institutions such as hospitals. War against France provided the stimulus for the construction of the Royal Naval Hospital at Madras, and the British conquest of Bengal resulted in a hospital in Calcutta. In Bombay, by 1784, there were three large hospitals — two for British and one for Indian troops. The need for such hospitals was acute, since sickness amongst European troops in India remained extremely high until the end of the nineteenth century, at least by comparison with regiments stationed in Britain. Dragoon guards stationed in

² R. Ramasubban, *Public Health and Medical Research in India: their Origins and Development under the Impact of British Colonial Policy* (Stockholm: Sarec, 1982); idem, 'Imperial Health in British India. 1857-1900', in *Disease, Medicine and Empire*, ed. by R.Macleod and M.Lewis (London: Routledge, 1988); D.Arnold, 'Smallpox and Colonial Medicine in nineteenth-century India', in *Imperial Medicine and Indigenous Societies*, ed. by D.Arnold (Manchester: Manchester University Press, 1988); idem. *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India* (Berkeley: University of California Press, 1993).

the United Kingdom suffered an average annual mortality of 14 per 1000 in 1830-6, whereas British troops in the Bombay area suffered an annual mortality (almost entirely from disease) of over 47 per 1000 between 1830 and 1849.³

If the high incidence of diseases such as dysentery and malaria provided the main stimulus to the provision of hospitals for Europeans, other considerations were more evident in provisions made for Indian soldiers or 'sepoys', who constituted the majority of the Company's troops. At the end of the eighteenth century, the Company began to establish special communities (*tannah*) for sepoys invalided from its service. These provided land and other means of support for those who had been disabled by war-wounds, or who were honourably discharged for other reasons. As well as providing reassurance to soldiers in the Company's service, these *tannah* provided a core of 'reliable' men who could be used to police a district or train new recruits. But in some areas of India, particularly the poorer parts of Bihar, the settlements were established on marginal land, which often left sepoys impoverished and subject to disease. Even the more prosperous *tannah* experienced problems, being undermined by the fraudulent practices of some locals who sought a share of their riches. As a result, the *tannah* were abolished in 1831.⁴

The same year also saw the end of another short-lived experiment in care for Indian soldiers — the Monghyr Lunatic Asylum, founded in 1795. Although it was by no means the largest or longest-lived hospital for Indian troops, the Monghyr asylum is significant in that it was established at a time when there were no such institutions in Britain. Indeed, in Britain, care of the insane was still generally left to the family and the community, despite a trend towards the confinement of the mad, which had begun in Georgian England. According to Seema Alavi, the anomalous position of the Monghyr asylum suggests that its main function was to maintain discipline and to contain insubordination. She also argues that it may have been used for the segregation of sepoys infected with syphilis or gonorrhoea, which in severe forms can affect the nervous system.⁵ Her interpretation is borne out by the fact that the 1790s saw other measures to control sexually-transmitted diseases among Company soldiers, including the establishment of 'lock hospitals' to treat prostitutes frequented by Company troops.⁶ The disciplinary functions of insane asylums have also been emphasised by Waltraud Ernst, in her work on the European insane in India. The segregation of the European insane, she argues, was conducted in order to ensure that they did not bring British rule into

³ M. Harrison, *Climates and Constitutions: Health, Race, Environment and British Imperialism in India* (Oxford: Oxford University Press, forthcoming 1999), chapter 3.

⁴ S. Alavi. *The Sepoys and the Company: Tradition and Transition in Northern India 1770-1830* (Oxford: Oxford University Press, 1995).

⁵ *Ibid.*

⁶ *Ibid.*; D.Peers, 'Soldiers, Surgeons and the Campaigns to Combat Sexually Transmitted Diseases in Colonial India, 1805-1860', *Med.Hist.*, 42(1998), 137-60.

disrepute.⁷ The presence of European madmen, like that of European vagrants and criminals, jeopardised what had become known as the 'Empire of Opinion' — the belief that British power in India rested more on the impression than the reality of invincibility.

Municipal and Philanthropic

By comparison with the health care provided for soldiers, that for the Indian population as a whole remained meagre until the later nineteenth century. However, the first decades of the nineteenth century did see some initiatives in medical care. These were usually taken by Company servants and some Indians acting in a private capacity, with only occasional support from municipal bodies and the Company. For example, the Calcutta Fever Hospital, proposed in 1836, was to be funded largely by private subscriptions from among Europeans and a handful of wealthy Indians. Calcutta's municipal body, the Board of Commissioners, agreed to make a modest contribution to its running costs, but the Government of Bombay declined to co-operate. The scheme appears to have foundered as a result of this, and because of the reluctance of some residents to countenance the construction of what they regarded as a 'fever nest' close to their homes.⁸

The proposal for a Fever Hospital in Calcutta elicited an indignant exchange between advocates of sanitary reform and proponents of a *laissez faire* approach to matters of health, whom the reformers accused of having a narrow 'mercantile' mentality. The tension between these two groups was expressive of the wider debate taking place at this time in India over the remit of the Company and whether it should involve itself in the affairs of its subjects. The same was true of sanitary reform, which became an issue of some moment in Calcutta and other large Indian cities in the first decades of the nineteenth century, as urban growth led to deteriorating conditions. The cleansing of Calcutta was inaugurated in a modest way, in 1803, when the imperialistic Governor-General, the Marquis of Wellesley, began to clear away 'excessive' vegetation surrounding the European town. In the coming years there were more ambitious proposals for the drainage of parts of the city, including the large salt lake to the east, and for a sewerage system. Neither proposal, however, got very far, owing to the reluctance of the Company to fund such works. A small amount of revenue was raised by the city's municipal authorities, but this proved insufficient for anything more than basic conservancy, and that only in European parts of the town. While many Europeans (including the liberal, reformist Governor-General Lord William Bentinck) pressed for sanitary intervention, the reluctance of most Indian ratepayers to fund sanitary works meant that little was achieved before 1858. On a number of occasions they declared their opposition to any kind of property tax and objected vehemently when a house tax was introduced in

⁷ Waltraud Ernst, *Mad tales from the Raj: the European insane in British India, 1800-1858* (London: Routledge, 1991).

⁸ Harrison, 1999.

the 1850s. Such a tax had caused a massive strike in Benares in 1810 and many colonial administrators had warned against introducing it in other places, owing to the reliance of the British on indigenous elites.⁹

These tentative initiatives in both medical care and sanitary reform did not, then, amount to much in practical terms but they are nevertheless significant, in that they indicate a marked shift in British attitudes towards their role in India. They expressed the imperial ambitions of men such as Wellesley (Governor-General, 1798-1805) — who saw himself as a kind of Roman proconsul, and who was determined to leave an imprint on Indian soil — as well as the reformist impulses of men like Lord William Bentinck (Governor-General, 1828-35), a liberal in politics and an evangelical in religion. The Company, however, was reluctant to spend its money on public works that did not develop India economically; nor were municipal bodies able to raise the revenue required, on account of a general reluctance among Indian ratepayers to countenance taxation for sanitary and medical purposes. The situation changed only after the government of India came under the direct control of the British Crown, when municipalities were compelled — like their British counterparts — to provide certain services at the ratepayers' expense. But the scope of such services and the matter of who should pay for them remained contentious issues throughout British rule, as we shall see.

Vaccination against Smallpox

If the Company generally proved reluctant to intervene in the funding of municipal sanitation and hospitals, some governors of a philanthropic bent were prepared to make a modest contribution from provincial revenues towards vaccination against smallpox. Vaccination against smallpox, which had been developed in the 1790s by the English doctor Edward Jenner, commenced in India in 1802, initially among the European community in Calcutta. Unlike inoculation, which involved the implantation of a small amount of the smallpox virus, vaccination made use of the milder cowpox virus, which also provided immunity against smallpox. It was not long before a few Indians familiar with Western science were encouraged to try vaccination and some administrators came to believe that such a measure might prove popular among the Indian population as a whole. Vaccination, they believed, would demonstrate the benevolence of British rule and prove the superiority of Western civilisation. Among the most enthusiastic advocates of vaccination were administrators of recently annexed provinces in southern and western India. In 1805, William Bentinck, who was then Governor of Madras, urged the promotion of vaccination on economic grounds, claiming that 'every life saved is additional revenue and an increase to the population and the prosperity of the Company's territories in an incalculable ratio'.¹⁰ In 1827, the Governor of Bombay, Lord Elphinstone, also devised a scheme to vaccinate the rural population of

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Ibid

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Quoted in Arnold, 1988, on p. 53.

his Presidency. This went beyond the limited schemes in other areas, which provided vaccination only at hospitals and dispensaries; Elphinstone, by contrast, attempted to carry vaccination directly to the people. To this end, he established, under European supervision, teams of Indians trained in vaccination, who were to visit each district on an annual basis. Despite its limited success in the early years, the Bombay scheme provided the model for later and more ambitious attempts at vaccination in rural areas.¹¹

Elphinstone's pro-active approach to vaccination was conceived amidst general pessimism about its popularity among Indians, who seemed indifferent and in some cases even hostile to the practice. It was for this reason that Bentinck (now Governor-General of India), felt justified in cutting the Bengal vaccination establishment in 1829, as part of his more general programme of retrenchment. Vaccination was hampered by a number of difficulties: some were simply technical, in that the severe heat of the summer months reduced the effectiveness of vaccination lymph; others were cultural, in that many high-caste Hindus objected to arm-to-arm vaccination using low caste or untouchable vaccinifers (vaccination using buffalo lymph was not widely used until the 1870s). This opposition to vaccination came as a surprise to many Europeans who had initially believed that it would be acceptable to Indians, by virtue of the fact that the cowpox vaccine was derived from the sacred animal of the Hindus. They had also underestimated the popularity of the indigenous practice of inoculation against smallpox, which was usually performed in conjunction with some religious ritual, generally propitiation of the smallpox goddess Sitala ('the cool one'). In some hill tracts inoculation was, itself, a fairly recent import, but the fact that it was combined with religious ritual meant that it was more easily assimilated than the secular practice of vaccination.¹² Indeed, some Europeans were so disenchanted with the progress of vaccination that they contemplated abandoning it, and encouraging inoculation instead. But such men were very much in the minority and for many British doctors and administrators, the successful progress of vaccination remained the touchstone of Britain's sanitary mission in India.

PUBLIC HEALTH AND THE BRITISH DOMINIUM

The transfer of the government of India from the recently-abolished East India Company to the Crown, in 1858, heralded a new era in the provision of medical care and in sanitary reform. The main focus, as before, continued to be on the health of Europeans and those sections of the Indian population for whom the government had direct responsibility. Within a decade, however, government had extended its sanitary purview to include the whole of the Indian population. During these years, sanitary regulations and the machinery for the registration of births and deaths, which had been initially confined to military cantonments, was extended to neighbouring areas. In the late 1860s,

¹¹ Arnold, 1988 and 1993.

¹² *Ibid.*

at both central and provincial level. Sanitary Commissioners were also appointed to oversee the health of the 'general population', whose mortality from different diseases was now recorded in annual reports.¹³ These posts were chiefly advisory in nature, but they were indicative of the new principle that health was a responsibility of the colonial government. An increasing proportion of provincial revenues was also spent on vaccination against smallpox, which now came under the charge of the Sanitary Commissioners. Although vaccination still encountered considerable practical difficulties,¹⁴ the proportion of the population covered by vaccination increased steadily, as is demonstrated by the decline in mortality from smallpox which occurred after 1900 (see below). Indeed, the reduction of mortality from smallpox was arguably the only significant contribution to mortality decline in India that can be attributed to colonial medical intervention.

Vaccination was one of the few areas of public health for which provincial governments were directly responsible. As in Britain, the majority of sanitary work was conducted by local authorities, who were required and empowered by legislation in the 1870s and 80s to introduce sanitary regulations and to perform sanitary and hygienic services. Some basic provisions for the collection of refuse and the disposal of excreta were compulsory but the legislation was often of a permissive nature, and the extent of sanitary reform in any locality depended greatly on local circumstances, such as availability of funds and the enthusiasm of the municipal commission. This was especially true of large sanitary works in the form of drainage and sewerage schemes, for which local authorities were usually dependent on loans from government. Until the 1900s, there were very few direct government grants in aid of sanitation.¹⁵

But despite having created a sanitary infrastructure in India, the British government has been criticised for having 'lost the historic opportunity for initiating sanitary reform' and for scuttling initiatives by Indians themselves.¹⁶ Ramasubban argues, instead, that the British established a 'distinctly colonial mode of health care', characterised by residential segregation and neglect of the indigenous population.¹⁷ The tendency of Europeans to concentrate medical and sanitary expenditure on colonial enclaves has also been remarked upon by David Arnold¹⁸ who criticises the Government of India for devolving responsibility for health to poorly-funded and inexperienced local authorities. Yet Arnold also contends that medicine was a powerful 'colonizing force' and a vehicle for the transmission of Western ideas into India.¹⁹ These claims may be

¹³ Harrison, 1994.

¹⁴ *Ibid.*; Arnold. 1988 and 1993.

¹⁵ Ramasubban, 1988; M.Dossall, *Imperial Designs and Indian Realities: the Planning of Bombay City 1845-1875* (Oxford: Oxford University Press, 1995); Harrison, 1994, chapters 7-8.

¹⁶ Ramasubban, 1982, p. 41.

¹⁷ Ramasubban, 1982 and 1988.

¹⁸ Arnold. 1988 and 1993.

¹⁹ Arnold, 1993.

evaluated by examining a) epidemics and state medicine in British India; b) health, medicine and colonial hegemony; c) the impact of colonial rule on mortality decline in India.

a) Epidemics and State Medicine

The case of cholera

There are reports of a disease closely resembling cholera in European accounts of their travels in India during the seventeenth and eighteenth centuries. At that time, with the exception of sporadic outbreaks in some of India's coastal cities, the disease seems to have been confined to deltaic Bengal, where it was endemic. This situation changed dramatically in the monsoon season of 1817, amidst the upheaval created by the final war between the British and the Marathas. In that year, the disease spread beyond its 'home' in deltaic Bengal to cover much of the subcontinent, and from India to much of Asia and Europe in the course of the next 15 years.²⁰ In the coming years, cholera, or 'Asiatic cholera' as it was then commonly known, appeared regularly in epidemic form, claiming the lives of millions of Indians and thousands of Europeans, especially European troops. As well as the disruption caused by cholera to trade and military campaigns in India, these epidemics raised the question of intervention in such politically sensitive matters as religious pilgrimage, as a number epidemics appeared to originate amongst pilgrims congregated at sacred sites on the Ganges. Widely believed to be the home of cholera, India also attracted international attention, most of which was critical of the Government of India's failure to control the spread of the disease. In consequence, quarantines were established against Indian vessels in the Red Sea and in the Mediterranean, whenever an epidemic was reported. This proved irksome for the Indian authorities, for it hampered the free flow of trade and troops to and from India and Britain. Quarantines established in the Red Sea, and international demands for improvements in the sanitary condition of Indian ships, also impinged on the pilgrimage of Indian Muslims to Mecca and Medina. Pilgrims resented the increased fares and restrictions occasioned by these regulations, as well as their enforced stay in Ottoman quarantine stations in Arabia. As with pilgrimages within India, these regulations proved to be a sensitive political issue, especially in the light of British attempts to cultivate Muslim elites as a counter-weight to the Hindu-dominated Indian National Congress.²¹

One might have expected the disruptive effects of cholera upon trade, and the high mortality of British troops in India, to have brought a swift and decisive response from the authorities in India, but the cholera epidemics did not provide an ideal site for what David Arnold has termed the 'colonisation' of the Indian body. Although many

²⁰ D. Arnold, 'The Indian Ocean as a Disease Zone, 1500-1950', *South Asia*, 14(1991), 1-22; *idem*, 1993, chapter 4; Harrison, 1994, chapter 4; *idem*, 1999, chapter 4.

²¹ Harrison, 1994, chapter 5.

Europeans blamed the prevalence of cholera on the 'filthy' habits of the Indian people,²² the colonial government actually did very little to control the disease; much to the chagrin of sanitary reformers in Britain and India. General sanitary improvements were left to local authorities, while government intervened only reluctantly to prevent the spread of the disease at times of pilgrimage.²³ In the wake of the Mutiny and Rebellion of 1857-58, the colonial government was reluctant to intervene in the lives of its subjects. This can be seen in the government's response to outbreaks of cholera at pilgrim centres such as Haridwar in northern India. Although some doctors saw pilgrims as responsible for disseminating the disease throughout much of northern India, the Sanitary Commissioner with the Government of India, Dr J.M.Cunningham, played down the role of contagion in the epidemic, and stressed that outbreaks of the disease were caused by local sanitary and meteorological conditions. The official line was, accordingly, to concentrate on measures such as general sanitation.

It has been alleged by Ramasubban (1982) that the government was merely using Indian cultural prejudices as an excuse not to spend money on sanitary measures, yet other evidence indicates that pilgrims at Haridwar resented sanitary regulations and blamed them for the cholera epidemic (seeing them as a slight to the goddess Kali, on whom they had hitherto entrusted their fate). Elite Hindu newspapers such as the *Hindu Patriot* also warned the government against interfering with pilgrimages, warning that any intervention would be regarded as a 'great hardship by the people'.²⁴

Plague

If the Government of India was content, for the most part, to leave the control of epidemic disease to municipalities, then the plague epidemics of 1896 onwards provide a clear exception. Within three decades of the first appearance of plague in Bombay in the summer of 1896, the disease had claimed the lives of no fewer than 9 million people in India. Although mortality from other diseases such as malaria was often higher, plague was widely regarded as a new disease and it therefore made a considerable impression upon both the government and its colonial subjects. While plague had appeared sporadically in the past, in parts of Gujarat and Rajasthan, having been imported from the Persian Gulf, there had been no large outbreak within living memory, the last large outbreak being the so-called 'Pali Plague' of 1836.

Although it was reluctant to recognise that the disease which appeared in Bombay in 1896 was true plague, the government, having made this admission, acted far more decisively than in the case of any cholera epidemic. In October, the Government of Bombay extended the powers of the Bombay Municipal Corporation to authorise the segregation and detention of plague victims and persons suspected of having contact with

²² Harrison, 1999, chapter 4.

²³ Arnold. 1993, chapter 4; Harrison, 1994, chapters 4-5.

²⁴ Quoted in Harrison, 1994, p. 107.

them. The municipality also embarked on an unprecedented programme of sanitation, pumping gallons of disinfectant into the city's sewers. Finding these measures insufficient to prevent the spread of the disease, the Government of India passed in 1897 the Epidemic Diseases Act, which applied to the whole of British India, and which gave provincial governments the power to inspect any ship, train or passenger; to detain and segregate plague suspects; to hospitalise those suffering from the disease; and to disinfect, evacuate and, if necessary, to destroy, any dwelling at which the disease had appeared. It even gave governments the power to suspend religious fairs and pilgrimages.

It is unlikely that such draconian measures can be explained simply by the unprecedented nature of the epidemic and the fear which plague aroused in the European psyche. To some extent, they can be attributed to the government's fear of social disorder, and also to a more interventionist mood amongst colonial administrators in the last decade of the nineteenth century.²⁵ Intervention also owed something to the ambitions of the medical profession, which saw the plague crisis as an opportunity to press for more sanitary legislation and to test the newly-developed inoculation against plague. But the main reason why the government chose to intervene more drastically than in previous epidemics was that it had been forced to do so by international opinion, which demanded more vigorous sanitary measures to prevent the spread of plague from India. Until it was seen to act, the government had no chance of lifting the embargo on Indian exports imposed by countries such as France, who feared that materials like hides and skins (one of the principal exports of eastern India) or cotton (one of the main exports of western India) would harbour the disease. This embargo had consequences far more serious than the quarantines routinely imposed against plague, which merely added to the length and cost of commercial voyages. The anti-plague measures imposed in 1896-7 amounted to an out-right ban on the importation of Indian goods.

Indeed, once these restrictions were relaxed, following the passage of the Epidemic Diseases Act of 1897, the government gradually eased its restrictions upon population movement, and began to make special provisions for internment and hospitalisation that were sensitive to the requirements of religion and caste. That it did so was also a consequence of the violent protests and strikes which occurred in parts of western India against the plague measures, and which led, in the case of Pune's Plague Commissioner, W.C. Rand, to the murder of European personnel. Such events immediately recalled those of 1857, and fear of a 'second Mutiny' was widespread. Such fears were well grounded in view of the fact that the plague disturbances of 1896-7 were the most serious outbreaks of popular disaffection in India since Mutiny and Rebellion. A more mundane reason was the cost of maintaining anti-plague measures, which many officials claimed were unsustainable.²⁶

²⁵ I.J. Catanach. 'Plague and the Tensions of Empire: India, 1896-1918', in *Imperial Medicine and Indigenous Societies* (1988).

²⁶ *Ibid.*; Arnold, 1993, chapter 5; R.Chandavarkar, 'Plague panic and epidemic politics in India,

But the plague epidemic was, as Arnold has noted, 'perhaps a necessary rite of passage for Western medicine in India',²⁷ after which it became less 'enclavist' in nature and more concerned with reaching the population as a whole. This claim can be evaluated in two ways. First, whether plague measures brought indigenous peoples into contact with Western medicine for the first time. And, secondly, by looking at the extent to which plague created a crisis of confidence within Western medicine, and, more particularly, in the scope and effectiveness of public health measures established by the colonial government. Whether or not plague measures constituted the first contact which many Indians had with Western medicine is difficult to quantify, as we have no way of knowing whether those touched in some way by special plague measures had had any prior contact with Western medicine. However, given the gradual spread of smallpox vaccination, even into many rural areas by this time, and the fact that it was compulsory in many cities, the likelihood is that most had. However, it is true that plague did create a crisis of confidence in Western medicine and to attempts to improve its scope and effectiveness. The government responded to the adverse criticism it received in India and overseas by allocating more money for sanitation to provincial governments and, ultimately, to municipal and district boards. However, government grants did not increase markedly until after 1908, when revenue surpluses permitted higher expenditure than hitherto.

The plague epidemic also had other important consequences for the development of public health. It led, for example, to the wholesale clearance of insanitary dwellings — mostly slum rental accommodation, the improvement of which had previously been blocked by landed interests in Indian-dominated municipal commissions. It also led to far more discussion of town planning, to prevent insanitary buildings being erected in future. The restructuring of towns on such a scale was possible only because the plague emergency had led to the suspension of the elected element within many large municipalities. In Calcutta, for example, the elected element was reduced to a minority in 1899, and the Corporation remained under the direction of Europeans and an elite, nominated Indian element until 1923. This meant that opposition to sanitary improvements from rate-payers and petty landlords could effectively be ignored. Indeed, most of the clearances and rebuilding work undertaken in the wake of the plague were carried out, not by the municipality itself, but by a 'quango' of nominated officials and businessmen.

b) Health and Hegemony

1896-1914', in *Epidemics and Ideas. Essays on the Historical Perception of Pestilence*, ed. by T.Ranger and P.Slack (Cambridge: Cambridge University Press, 1992), pp. 203-40; Harrison, 1994, chapters 5-6.

²⁷ Arnold, 1993, p. 238.

The plague epidemics and their aftermath are, thus, central to Arnold's claim that medicine was a powerful colonising force. Medicine, he argues, was not simply a 'tool of empire' in the sense that it had economic or military utility, but it performed an important function in legitimating British rule. Medicine was valuable in imperial propaganda, for it manifested the benevolent intentions of India's rulers and stemmed increasing criticism of colonial rule in Britain itself. But in addition to these overtly propagandist functions, medicine also played a more subtle role in the subordination of Indian culture. In the spirit of Antonio Gramsci and Edward Said, Arnold argues that medicine reflected and produced structures of European dominance. It was important in securing the consent of the governed to imperial rule — consent being the essence of Gramsci's notion of hegemony. Arnold argues that many Indians who had been exposed to Western medicine — through education, hospitals, dispensaries, and the sanitary work of local authorities — came to believe its assertions of superiority over indigenous systems of medicine, which were portrayed as backward and unscientific. Indians also began to criticise their own people for their neglect of public health, and to spread the Western gospel of hygiene. The implication is that those Indians who accepted the dominance of Western medicine might be more easily persuaded of the necessity of colonial government, but Arnold also acknowledges that a desire for sanitary reform often led to frustration with the lack of progress achieved by the colonial government.²⁸ It must also be stressed that the imperialistic ambitions of the medical profession and those of the Government of India did not always coincide. Indeed, the government showed itself reluctant to back professional demands for the restriction of unlicensed medical practice, believing that these would be seen as a threat to practitioners of indigenous medicine.²⁹

How, otherwise, does Arnold's case for the hegemonic role of Western medicine stand up to scrutiny? The growing number of Indians educated in Western medicine (around 2,000 per annum by 1930) and the steady increase in the numbers attending hospitals and dispensaries,³⁰ indicate that a substantial number of Indians did value Western medicine. A similar increase in the numbers of those submitting to vaccination against smallpox provides further evidence that cultural barriers to vaccination were gradually being overcome.³¹ From the late nineteenth century, Indians also began to find employment as municipal health officers and a number were actively involved in campaigns for sanitary reform.³²

²⁸ Arnold, 1993, chapter 6.

²⁹ Harrison. 1994. chapter 1.

³⁰ R. Jeffrey, *The Politics of Health in India* (Berkeley: University of California Press, 1988); Harrison, 1994, pp. 88-90.

³¹ Arnold, 1988, chapter 3; Harrison, 1994, chapter 3.

³² Harrison, 1994, chapter 7; M. Harrison and M. Worboys, 'A Disease of Civilization: Tuberculosis in Britain, Africa and India, 1900-39', in *Migrants, Minorities and Health*, ed. by M. Worboys & L. Marks (London: Routledge, 1997); M. Ramanna, 'Randchodlal Chotalal: Pioneer of Public Health in Ahmedabad'. *Radical Journal of Health*, 2(1996), 99-111.

However, to set against the claims made by Arnold, we have those of nationalist and leftist writers who argue that colonial medicine remained enclavist in nature throughout British rule.³³ In 1940, for example, the Indian Marxist R. Palme Dutt claimed that 'provision for the most elementary needs of public hygiene, sanitation or health is so low, in respect of the working masses in the towns or in the villages, as to be practically non-existent'. Nor does attendance at hospitals and dispensaries, or, indeed, submission to vaccination, necessarily imply cultural subordination. In many cases, Western medicine simply provided additional options within an already pluralistic medical system, some indigenous elements of which had begun to revive in the twentieth century after initially suffering from the impact of colonial rule.³⁴ In the case of vaccination or operations for the removal of cataracts. Western medicine was often the preferred option, but in other cases, especially medication for common diseases, it generally was not. Nor did all Indians have easy access to Western medicine. Rural areas continued to be poorly served by dispensaries and Western-trained practitioners right through to Independence in 1947.³⁵ Women were also much less exposed to Western medicine than men, because the latter often forbade them from attending dispensaries and hospitals. Consequently, while the numbers attending such institutions increased under colonial rule, the proportion of women remained consistently low for most of the colonial period. Efforts designed to penetrate the veil of the zenana, such as the Countess of Dufferin's Fund to supply medical women for India, were generally limited in scope and tended to concentrate on women of high caste.³⁶

In the arena of municipal health, too, there is ample evidence of resistance to many Western forms of medical intervention, although the extent of opposition to sanitary and other reforms is contested. Ramasubban, for example, suggests that British parsimony thwarted Indian initiatives for reform at a local level,³⁷ a claim which contrasts sharply with that of earlier historians such as Hugh Tinker (1954), who argues that sanitary initiatives flourished only where Europeans took an active part.³⁸ Tinker, then, sees the local government reforms of the 1870s and 80s — which gave a controlling interest to an elected (Indian) element — as having an adverse effect upon public health, although not simply because of colonial reluctance to make available adequate funds. Tinker's claim has been endorsed to some extent by Harrison who, while acknowledging the limitations of government funding, points to the resistance of many Indian municipal

³³ Ramasubban, 1982 and 1988.

³⁴ Jeffrey, 1988; P. Bala, *Imperialism and Medicine in Bengal* (New Delhi; Newbury Park, CA: Sage, 1991).

³⁵ V.R. Muraleedharan, 'Rural health care in Madras Presidency: 1919-39', *Indian Economic and Social History Review*. 24(1987). 324-34.

³⁶ Arnold, 1993; Harrison, 1994; M. Lal, 'The Politics of Gender and Medicine in Colonial India: The Countess of Dufferin's Fund, 1885-1888', *Bull. Hist. Med.*. 68(1994), 29-66.

³⁷ Ramasubban, 1982 and 1988.

³⁸ H. Tinker, *The foundation of local self-government in India. Pakistan and Burma, etc.* (London: Athlone Press, 1954).

commissioners and ratepayers to the raising of revenue for the purposes of sanitary reform.³⁹ Harrison demonstrates that matters of public health proved to be one of the most contentious issues in Indian local politics and that vested economic interests, rather than simply cultural barriers, stood in the way of sanitary reform.

c) Colonial Medicine and Mortality Decline

Perhaps the ultimate test of colonial medicine in India was the extent to which it contributed to the general decline in mortality which occurred from around 1910. Crude death rates in India began to decline erratically from this time when deaths from plague began to level off, the downward trend being punctuated only by the huge increase in mortality which occurred as a result of the influenza pandemic of 1918-19. During that year, influenza claimed no fewer than 17 million victims, approximately half of the global total of deaths from influenza. Notwithstanding the imperfection of death registration in British India, this decline in mortality is undeniable; more controversial, however, are the reasons why this decline occurred. Roger Jeffery, for instance, attributes the decline chiefly to general improvements in the standard of living in India, caused by rising real wages from the middle of the nineteenth century.⁴⁰ We must also consider the famine relief measures established by the British towards the end of the nineteenth century and the central role of the new railway network in transporting supplies of grain. Famine rarely killed in its own right but the drought conditions which precipitated it may have led to concentration around just a few water supplies, which were often infected with lethal pathogens. Malnutrition probably contributed, too, to mortality from diseases such as malaria, by affecting the immune system adversely. While a causal link has still to be proven, there is a significant correlation between rising agricultural prices (reflecting drought and scarcity) and mortality from malaria and some other diseases.⁴¹ It is unlikely, however, that specific measures contributed to any decline in malaria that may have occurred in any region of British India, for there was no quick technical fix to the problem of how to control this disease.⁴² Attempts to eradicate the insect vector of malaria were unsuccessful, even within confined spaces,⁴³ while quinine prophylaxis was expensive and impracticable.⁴⁴ The question of whether more could have been done by the British authorities to prevent malaria remains a matter for debate.⁴⁵

³⁹ Harrison, 1994, chapters 7-8.

⁴⁰ Jeffery, 1988.

⁴¹ K. Wakimura, 'Famines, Epidemics and Mortality in Northern India, 1870-1921', in *Local Agrarian Societies in Colonial India*, ed. by P.Robb, K.Sugihara and H.Yanagisawa (Richmond: Curzon Press, 1996).

⁴² M. Harrison, "'Hot Beds of Disease': Malaria and Civilization in Nineteenth-Century British India", *Parassitologia*, 40(1998), 11-18.

⁴³ W.F. Bynum, "An Experiment that Failed: Malaria Control at Mian Mir", *Parassitologia*, 36(1994), 107-20.

⁴⁴ Harrison, 1994, chapter 6.

⁴⁵ V.R. Muraleedharan, 'Malady in Madras: The Colonial Government's Response to Malaria in the

Much the same can be said of cholera, although mortality from this disease did decrease somewhat in the early twentieth century by contrast to malaria.⁴⁶ Again, it is unclear whether this modest decline can be attributed to medical intervention in the form of sanitary reforms at municipal and district level, or to general improvements in the standard of living. In the case of cholera, it is also important to bear in mind the claim that colonial rule massively increased the number of deaths from disease, as it assumed epidemic proportions only after the Anglo-Maratha war of 1817, when the disease followed the Company's armies.⁴⁷ Whether the spread of cholera from its endemic region would have occurred anyway, given the loosening of central authority in the wake of Mughal decline, and the growth of indigenous commerce, must remain a matter for speculation.

This leaves us with only one clear case of mortality decline having occurred as a direct result of colonial medical intervention. This is the case of smallpox, which declined from a high of 200,000 deaths per annum in 1894 to less than 10,000 in 1920.⁴⁸ While it remained for a WHO-sponsored eradication programme to eliminate the disease from India in 1977, the contribution made by the British is nevertheless highly significant, in both demographic and institutional senses.

Early Twentieth Century', in *Science and Empire*, ed. by D.Kumar (Oxford: Oxford University Press, 1991).

⁴⁶ Wakimura, 1996.

⁴⁷ S. Watts, *Epidemics and History: Disease, Power and Imperialism* (New Haven and London: Yale University Press, 1997).

⁴⁸ Wakimura, 1996.