

Epidemics in Colonial Punjab

Sasha Tandon

Panjab University, Chandigarh

The Punjab region was one of the worst affected from the epidemics of malaria, smallpox, cholera and the plague, which broke out recurrently from 1850 to 1947 and caused widespread mortality. The paper discusses the outbreak and pattern of epidemics as well as their handling by the colonial state which used unprecedented measures because of the military and economic importance of the region. However, its measures remained haphazard and tentative due to the lack of knowledge about the causes of the diseases till then. The outbreak of the plague during the closing years of the nineteenth century brought about an alarmist response from the British who tried to deal with it comprehensively, often using coercion. The effects of the epidemics and people's responses varied in rural and urban areas. While the urban middle classes generally collaborated with the government, people in villages and small towns resisted the government measures in different ways, thus shedding their generally docile attitude towards the administration.

Epidemics of malaria, cholera, smallpox and the plague broke out intermittently and recurrently, with varied intensity in different areas of colonial Punjab. Initially, the colonial medical opinion ascribed the epidemics to the habits and customs of the natives and geographical variations, overlooking, thus, the actual causal agents and environmental factors, particularly those created by the colonial policies and measures. Consequently, the measures adopted to combat the epidemics remained haphazard and tentative. The people looked at the government with suspicion and showed reluctance to adopt them. The mortality from epidemics remained rather high in the north-western region till the 1920s.

Outbreak and Pattern of Epidemics

From the 1850s to the 1920s, the Punjab (including North West Frontier Province) was one of the regions worst affected by epidemics. Its mortality rate was the highest for the plague, and the average annual deaths from malaria, smallpox, and cholera also remained comparatively high.

Fifteen major epidemics of malaria broke out in the region during 1850-1947, claiming 51,77,407 lives.¹ Both the official and non-official sources highlight the disastrous consequences of malaria. 'In 1891, several square miles of overripe rice fields could be seen as the villagers were too weak to reap them. In towns, no wages could be earned as the bread winners were prostrated'.² The *Khalsa Advocate* commented on the 1908 epidemic: 'Malaria is so depressing in its outset, so devitalising in its effect, so disorganising in its

result to the whole system, is (sic) better understood than it used to be, it is still unhappily exceedingly prevalent and is likely to continue until the conditions which produce it have been banished'.³ The malaria epidemic caused maximum havoc in nearly twenty five centrally located districts of the province where it is reported to have claimed 22,03,576 lives. A higher rainfall made the central Punjab districts of Jalandhar, Amritsar, Lahore, Gujranwala and Shahpur, and the sub-montane areas of Rawalpindi and Peshawar, a perennial breeding ground for mosquitoes, leading to recurrent outbreaks of malaria. In the north-west dry area of Montgomery, Shahpur, Lyallpur, Jhang, Multan and Dera Ghazi Khan, 8,78,763 people succumbed to the disease. There were relatively few casualties in the Himalayan region where only 1,55,493 deaths were reported.

Smallpox accounted for 8,50,591 deaths in the region from 1868 to 1947. Smallpox broke out with maximum intensity from 1875 to 1919 when nine major epidemics of smallpox affected in twenty-seven districts, claiming almost 2.5 lakh victims. One in every ten cases of smallpox turned out to be fatal, and of those who survived the attack, one-fourth were scarred.⁴ The average annual smallpox deaths were considerably higher than the rest of the provinces of British India.⁵ The worst affected districts were mainly in the north-west and south-east where vaccination was rather unpopular and people preferred recourse to variolation rather than vaccination. The close proximity of Karnal and Rohtak to the principal shrine of the goddess Sitala in Gurgaon resulted in the people preferring to visit the shrine to obtain relief rather than getting themselves vaccinated.⁶

Twelve major cholera epidemics broke out in the Punjab between 1866 and 1921, affecting all its areas and killing 2,49,050 people. On an average, 4,357 people died of cholera annually. The districts most affected by cholera were Gujranwala, Hazara, Rawalpindi, Ambala, Gurgaon, Lahore, Jalandhar, Peshawar, Amritsar and Shahpur. The recurrence of cholera in these areas was attributed to a large number of local and regional fairs which were marked by overcrowding, insanitary conditions, besides inadequate and contaminated water supply.⁷

From 1897 to 1918, the plague erupted with varied intensity in twenty-six districts, and had a mortality rate which was approximately four times the all India average. In mortality and dreadfulness, the plague surpassed all other epidemics in the Punjab. The first case of the plague occurred in Khatkar Kalan village in Banga circle on 17 October 1897. Until 1899, the plague remained confined to Jalandhar and Hoshiarpur districts. The ignorance regarding its cause and mode of spread did not help in arresting the disease which spread to Patiala state by 1900.⁸ In 1901, the epidemic moved to the other thickly cultivated, densely populated and humid areas in the upper *doabs* (interfluves) of central Punjab and affected seven districts, extending as far as Ferozepur, Gurdaspur and Sialkot.⁹ By 1901-2, it spread to the sparsely populated, arid areas in the south-west which were being canalised and colonised, and affected sixteen districts in all the five divisions of the province. The extensive irrigation from canals also resulted in increasing the humidity

level, which was conducive to the spread of the disease.¹⁰ By the end of 1902-3, twenty-one districts had been affected.¹¹ By 1904-5, the plague had spread to twenty-six districts, including Dera Ghazi Khan across the Indus.¹²

It should be possible by now to discern a pattern in the outbreak of epidemics and also understand the factors that probably contributed towards this situation. The outbreak of malaria coincided with the periods of heavy rainfall, which caused flooding of vast areas, water-logging of the sub-soil and providing a breeding place for mosquitoes.¹³ In 1878, Jalandhar and Hoshiarpur districts were affected by floods. These two districts recorded a high incidence of malaria; 254 villages were affected in Jalandhar district and an area spread over 5,512 acres was affected in Hoshiarpur district.¹⁴ In 1904, the sanitary commissioner noticed a greater prevalence of fevers in areas with heavy rainfall.¹⁵ In 1908, there was a high prevalence of malaria in Fazilka and Amritsar where the area was flooded with 'people homeless and buildings grounded'.¹⁶ The peak of mortality from epidemics occurred in particular months of the year. About forty per cent of the deaths from malaria occurred in the month of October. Of the total of fifteen major malaria epidemics, at least ten attained their height in October. After the monsoons, various low lying areas got flooded, the subsoil level was high and the conditions were conducive for the growth of mosquitoes. Sixteen epidemics of the plague reached their height in the months of March and April. About seventy-seven per cent of the total deaths from the plague were reported in these months when the humidity level and temperature were most conducive for the proliferation of rat fleas. The mean number of plague deaths per day in April was 1,648, followed by 1,218 in May and 923 in March.

A comparison between the figures for the rural and urban areas in the Punjab shows that the incidence of malaria, plague and cholera epidemics was greater in the countryside. For example, in 1882, the fever death rate in the rural areas was 18.50 per mille while in the urban areas it was 17.14 per mille.¹⁷ The rural population was more exposed to wet and marshy conditions, which were conducive for the breeding of mosquitoes.¹⁸ The lack of funds prevented drainage work and filling up of ponds and pools around the villages.¹⁹ In general, there was shortage of medical aid and personnel as well.²⁰ By and large, people lacked information about the cause of the disease and the preventive measures to be adopted.²¹

From 1868 to 1890, the average mortality rate of cholera in the rural areas was 4.87 per mille whereas in the urban areas it was 1.06 per mille. The marked difference in the death rate from cholera in the rural areas was primarily due to the impurities of drinking water which was obtained from *kacha* tanks or shallow wells, and got polluted by organic impurities.²² Also, the food sold in the villages was reported to be adulterated and unhygienic as the bylaws for the sale of milk, butter and other food articles, which were increasingly being adopted by the municipalities in the urban areas, were hardly operative in the rural areas.²³

The plague too was largely a rural phenomenon. The plague death rate in rural Punjab was 6.30 per mille in excess of the urban deaths caused by the

plague.²⁴ The poorly ventilated, ill-built and crowded houses facilitated a faster spread of the disease in the rural areas of the Punjab. In the towns, foodgrains were not stored in the houses in larger quantities as in villages, which probably contributed towards a lesser presence of rats and, consequently, a lower incidence of the plague.²⁵

The incidence of epidemics was generally greater among women as compared to men. The average mortality rate of the men per mille in the Punjab from 1901 to 1920 was 5.85 while that of the women was 7.55. Similarly, in case of fevers, the average annual death rate per mille for men was 21.75 while the corresponding figure for women was 23.95. There seems to have been a connection between the higher incidence of disease and mortality among women and the prevailing patriarchal structure. Compared to their male counterparts, women could benefit much less from the plague inoculation and smallpox vaccination. This was due to ignorance as well as the general disregard for women's health. The upper classes also brought in the question of 'honour' and 'custom'. A male physician's touch was considered 'polluting' due to which the women refused or were not permitted by the family members to get inoculated.²⁶ Also, the manner in which vaccination was carried out discouraged the women to get themselves vaccinated. Often, they were dragged out of their homes.²⁷ The vaccinators were not sensitive to the social susceptibilities of the women and were unmindful of their domestic privacy.²⁸ Family considerations, along with poverty, cost of medication, restrictions on the movement of women, and lack of time to travel long distances to reach medical institutions, were some inter-related factors which discouraged women from seeking medical aid. Consequently, there were lesser number of women, as compared to men, who received treatment in the government hospitals and dispensaries. From 1875 to 1885, of the total number of people going to dispensaries, the percentage of males varied between seventy and seventy-five, while the corresponding figures for women were twenty-five to thirty per cent.²⁹

The prevalence of epidemics was attributed to social customs as well as to poverty, insanitary conditions and unhealthy living. The colonial administrators considered India as the abode of diseases. The plague was understood as 'a disease of filth, a disease of dirt and a disease of poverty'.³⁰ The British attributed the prevalence of diseases to the 'peculiar sanitary habits of the Indians'. The houses of the natives were considered 'insanitary' and 'ideal homes' for rats, mosquitoes and diseases. 'The katcha floors absorbed filth of every kind and in rainy season became squalid and wretched'.³¹

The British attributed the spread of epidemics to certain medical and social practices. The 'obnoxious' practice of variolation was believed to be behind the spread of smallpox.³² Variolation was considered as infectious as the disease itself, because it induced the disease in its full intensity.³³ The epidemics at Kangra, Hoshiarpur, Jalandhar and Gujrat in 1873 were attributed in particular to the practice of variolation.³⁴ Elsewhere, variolation was said to be behind the outbreak of smallpox in 1886 at Peshawar, Dera Ismail Khan, Shahpur and Jhelum.³⁵ The social activities like condoling in groups, attending

religious gatherings and social customs like sitting next to a sick or a dying person were also considered responsible for the spread of the plague.³⁶

In the course of attributing the outbreak of epidemics to the prevalent 'insanitary conditions', certain racial stereotypes became evident in the general attitude of the administrators towards the poor. The cholera outbreak at Amritsar was traced to the 'Kashmiri Mohammedans' who were considered 'filthy beyond the ordinary filth of the inhabitants of the Punjab in their persons and clothing, their houses reeked with concentrated effluvia of long accumulated faecal dejecta on the tops, while their floors and courtyards were mere cess pools of urine and various sweepings of their household'.³⁷ The 1875 fever outbreak at Rawalpindi was explained in terms of the 'races' of urban population of Peshawar, Kohat and Rawalpindi who lived in 'closely packed and ill-ventilated townships', and who were 'notoriously filthy in their habits'.³⁸ The district administrators also assumed that the people belonging to certain social and occupational categories acted as the carriers of the plague. For example, the *Nais* (barbers) and the *Chamars* (leatherworkers) were believed to have spread the disease by taking the clothes of the dead as perquisites and by carrying these to other places.³⁹ The *Doms* were believed to carry the infection from one place to another as they also acted as porters.⁴⁰

The pilgrimages were considered as the chief mode of spreading cholera. As the pilgrim centres were crowded and had inadequate provisions for water and sanitation, often the pilgrims got infected from contaminated water and carried the infection with them on their way back. The water carried from the pilgrim centre as *prasada* (sanctified food) was also considered as a source of infection.⁴¹ Thus, for more than half a century, the specific outbreaks of cholera continued to be ascribed to the increasing number of people going to the fairs and places of pilgrimage; the chief sources of infection being the Kumbh fair at Hardwar, followed by the fairs at Nurpur, Katas, Jwalamukhi and Naina Devi.

However, the British overlooked the administrative and environmental factors that contributed to the recurrence and spread of epidemics. Due to the frontier location of the Punjab, there was a frequent movement of troops through the province. In 1872, the troops of the Peshawar Mountain Battery returning from the Looshaie expedition got infected and were reported to have introduced cholera in Jhelum, Rawalpindi, Lahore and Mian Mir.⁴² The movement of the troops specially in hot weather resulted in fatigue, lack of provisions, extreme sweating, consumption of water from contaminated sources, and insanitary conditions which led to the spread of the infection along the entire route.⁴³

The British were reluctant to admit any connection between the outbreak of epidemics and the environmental changes brought about by canalisation and colonisation and the development of railways. An enquiry instituted by the Government of India in 1875 noticed that the death rate in the districts irrigated by the Western Jumna Canal was higher than that in the province as a whole.⁴⁴ It was seen that the artificial flooding produced by irrigation resulted in water-logging and stagnation of water, which resulted in the breeding of the

mosquitoes.⁴⁵ The malaria outbreaks in the Karnal district were traced to the irrigation of the rice fields by the Western Jumna Canal.⁴⁶ The increased incidence of malaria and high mortality, in fact, coincided with the process of canalisation from the areas irrigated by the Western Jumna Canal, Bari Doab Canal and the Chenab Canal.⁴⁷ Furthermore, due to over irrigation and wrong alignment of canals, problem of water-logging was common, which increased the incidence of malaria.⁴⁸ The process of canalisation and colonisation also resulted in increasing the humidity levels which in turn caused conducive conditions for proliferation of rat fleas and the consequent increase in the incidence of the plague in these areas. As a result of canalization and colonization and the increased humidity levels this epidemic erupted in the districts of Gujranwala, Jhung and Lahore respectively during 1892-1905, 1902-6 and 1904-6.⁴⁹

The construction of railways too resulted in the ecological disturbance. Railways in the Punjab received the special attention of the British because of its frontier location and its potential for agricultural production and exports.⁵⁰ Its rivers necessitated the construction of several large bridges and piers which was accompanied by digging of the earth. This resulted in water-logging over large areas which helped in the breeding of mosquitoes. Moreover, the construction of embankments for laying the railway tracks resulted in creating burrow pits over large areas. These got filled with water and vegetation during monsoons and became 'mosquito hatcheries'. Also, the natural drainage lines would get blocked by the embankments and created ponds and raised sub-soil water levels.⁵¹ The Lieutenant Governor of the province admitted in 1878 that the water-logging resulting from the embankments on the Grand Trunk Road and the railway crossings was responsible for a higher incidence of malaria and mortality in the Jalandhar Doab.⁵²

Colonial Response to Epidemics

The British adopted rather comprehensive measures to deal with the epidemics. Their doing so enunciated the principle that providing relief measures during epidemics was the responsibility of the government. As may be expected, the resources were used selectively and according to the priorities of the colonial state. It appears that the British were concerned largely about preservation of their own political and material interests, including the safety of Europeans in the subcontinent. However, the measures became more focused and specific as the etiology of different epidemics became clear with the passage of time.

During the middle of the nineteenth century, when the causal factors of the diseases were not clear, measures adopted to combat the epidemics were directed against the natives rather than the actual bacilli. The British administrators acted on the assumption that the Indians lived in unhygienic and insanitary conditions and required constant surveillance. Consequently, emphasis was laid on isolation through cordoning and quarantine, as well as the disinfection of the dwellings and personal belongings of the sick. Those

afflicted with the diseases were segregated in tents or huts while their attendants were isolated separately. Their dwellings and household articles were disinfected and fumigated to prevent the spread of the disease.

The medical efforts to combat malaria were marked by debates over the causes and curative factors, which often resulted in haphazard preventive measures. Until 1880, the British attributed malaria to 'miasma' arising from the decomposing vegetable matter. In 1880, Laveran discovered the malaria parasite but his findings were met with considerable hostility and scepticism. In 1897 Ronald Ross solved the problem of the causation of malaria, clearly establishing the role of mosquitoes in its transmission.⁵³ Due to differences of opinion regarding the cause and mode of controlling malaria, different sets of measures were adopted to combat it. Some administrators favoured Ross's view and advocated mosquito eradication measures while the majority favoured administering of quinine prophylaxis.⁵⁴

Thus, there was a general emphasis on the distribution of quinine to prevent and combat malaria. Initially, government officials and the government hospitals and dispensaries carried out the work of distribution of quinine.⁵⁵ From 1897 onwards, quinine was distributed all through the year to reduce the incidence of malaria.⁵⁶ The scheme of using postal agency to distribute quinine started in 1898 in Lahore division and was extended to all the divisions of the province in 1903.⁵⁷ At various places, local ventures supplemented the quinine distribution measures for a more effective coverage. The quinine distribution societies set up in Gurdaspur district in 1909, distributed the medicine free of cost to the poor.⁵⁸ In 1910, local bodies carried out the quinine distribution work. A scheme for the 'quinization' of school children was started in 1916.⁵⁹ A scheme for the spleen census of school children was prepared by the chief malaria medical officer in 1914 since malaria was most prevalent amongst the children. The scheme was to be applicable to all children studying in primary and secondary schools recognised by the education department of the government in towns and notified areas, and the villages where a government dispensary or a hospital existed.⁶⁰ However, due to the outbreak of the war, this scheme could not be carried out and it became operational only in 1918-19 when six medical inspectors were appointed in the province to carry out spleen census. In 1925, the scheme was extended to all schools and colleges but was confined only to boys studying in certain classes.⁶¹

Along with this, measures for the destruction of mosquitoes and mosquito-breeding places were undertaken. Investigations to control malaria were carried out in 1901 and 1908 which studied the relationship between the outbreak of malaria and the incidence of rainfall, canal irrigation and faulty drainage.⁶² The findings laid emphasis on the destruction of the mosquito-breeding places following which collections of water were either drained or filled up, irrigation channels were cut, swamps were oiled and grass and undergrowth were cleared.⁶³ The mosquito control measures received greater attention in 1940, as there was shortage of quinine supplies due to the loss of

Java Island in the war.⁶⁴ In 1944, spraying of pyrethrum and DDT was resorted to for destroying mosquitoes.⁶⁵

Several drainage schemes were introduced in the towns and cities which aimed to reduce the water-collections, thereby reducing the breeding of mosquitoes. However, such measures did not extend to the villages largely because it was believed that the measures like drainage of sub-soil were 'large scale, long term and expensive'. Consequently, from 1910 onwards, specific preventive measures which laid emphasis on mosquito extirpation and use of well-known contrivances for protection from mosquito bites were adopted.⁶⁶

As in the case of malaria, there was considerable difference of opinion among the British medical officers regarding the causal agent of cholera. These differences of opinion had a bearing on the preventive measures to be adopted which remained tentative. In fact, the British in India took more than a decade to assimilate the Robert Koch's discovery in 1883 of comma shaped bacilli in water as an essential cause of cholera. Some administrators agreeing to Koch's view advocated improvements in the water supply, while others were inclined more towards making sanitary improvements.⁶⁷

Until the last quarter of the nineteenth century, this scenario of ambivalence regarding the causal agent of cholera persisted and the British continued to lay emphasis on preventing the spread of cholera through cordons. A 'sufficient' number of men were deployed to set up a cordon around the infected area on the assumption that there was 'danger from the affected persons and their belongings'. The infected cases were segregated and restrictions were imposed on the movement of people. Disinfection followed cordons and segregation, though the disinfecting agent varied with place and time.

Nevertheless, some efforts were made in the rural areas towards improving the water supply. This was largely carried out by cleansing and disinfecting the wells but it is unlikely to have covered all the wells. The wells were disinfected with lime, alum or potassium permanganate from 1895.⁶⁸ Wells were also provided with platforms and parapets with finances drawn from the district funds.⁶⁹ In 1929, matters relating to water supply schemes in the rural areas were entrusted to the rural sanitary board, following which hand-pumps were installed in the villages.⁷⁰

However, cleaning of the wells in the towns preceded the cleanliness measures in the villages. Bathing on the platforms of the wells was prohibited in the towns in 1875.⁷¹ In 1879, the sanitary commissioner Punjab directed the municipalities to clean the wells and the tanks and to protect them from all polluting matter.⁷² In 1908, people were asked to consume boiled water.⁷³ In 1921, the district boards provided vessels to draw water from the wells.⁷⁴ Chlorination of water was started in 1937.⁷⁵

Water supply schemes which included construction of large reservoirs, laying of pipes and sinking of additional wells were undertaken initially in some urban centres, mainly the major cities and cantonments.⁷⁶ In the first decade of the twentieth century, such schemes were extended to other towns as well.⁷⁷ However, the 'financial stringency' due to the first world war resulted

in deferring the water supply projects for certain towns.⁷⁸ In view of the massive coverage area and finances involved for cleanliness and sanitation measures, the provincial government handed over sanitation matters ironically to the ill equipped and under resourced municipalities.

Vaccination against smallpox was one of the earliest forms of colonial medical intervention in India. However, vaccination was implemented selectively as this involved considerable infrastructure and heavy finances. An elaborate establishment, largely comprising of a superintendent-general, sanitary commissioner, deputy sanitary commissioner, district medical officers and Indian vaccinators was created for carrying out vaccinations. This establishment of vaccination scheme underwent modifications from time to time. During the 'vaccination season',⁷⁹ a few children were vaccinated and on the eighth day, from the children bearing the best lymph, the lymph was used for vaccination.⁸⁰ The people to be vaccinated were collected together at a central place and vaccinated from the lymph taken from children belonging to the same village.⁸¹ In 1884, arm-to-arm vaccination was replaced by calf lymph vaccination.⁸² The government sought to make vaccination compulsory for children in certain municipalities and cantonments. For this purpose, a bill was introduced in 1879, which also prohibited the practice of variolation.⁸³ In 1880, this bill was passed as the Vaccination Act. However, it was enforced mainly in the cities and in the summer capital Simla. Gradually, it was extended to some other urban areas of the province.⁸⁴ It was only in 1919 that all government servants were to be compulsorily vaccinated before entering service.⁸⁵ In 1929, compulsory vaccination was extended to rural areas, though it is not certain if it was ever intended to cover the entire population.⁸⁶

The practise of vaccination was seen mostly as interference in the customs and personal lives of the people, because of which there was a possibility of unrest. The British therefore, undertook different measures to popularise vaccination. The deputy sanitary commissioner went to a number of villages in 1874 to explain the benefits of vaccination to the people.⁸⁷ From 1877, the officials and the subordinate staff were directed to work towards removing the reluctance of the people for getting themselves vaccinated.⁸⁸ From 1886, the sanitary commissioner himself gave lectures about the benefits of vaccination in the villages.⁸⁹ The native elites were induced to set examples by getting the members of their families vaccinated. Members of municipal committees of Multan, Ferozepur and Ambala motivated the villagers to come forward for vaccination.⁹⁰ The native rulers, for instance of Bashahr and Faridkot, set examples for popularising vaccination by getting their own children vaccinated.⁹¹

The plague policy, however, involved an unprecedented degree of medical and sanitary intervention because its outbreak was perceived as an emergency situation by the Administration. 'To all intents and purposes', the plague was 'an exotic, generating fear and scientific interest on a scale unmatched by malaria and other diseases indigenous to India'.⁹² The British were initially reluctant to report the outbreak of the disease, for they feared the imposition of an international embargo on Indian shipping which would close an important

market and a source of raw material for Britain. Moreover, a period of heavy mortality also meant adverse effects on trade, reduced productivity and enhanced cost of administration.⁹³ Consequently, a comprehensive framework for the plague administration was created. It laid emphasis on early detection of the disease, evacuation of the infected dwellings, segregation of the sick and their relatives, and disinfection of the infected articles.

During the outbreak of the plague, the primary concern of the district administrators was to prevent any communication between the infected and uninfected areas. They were acting on the assumption that human contact was the main agency for the spread of the epidemic. Therefore, they got the infected villages partially or wholly evacuated, village sites disinfected, and the plague infested areas cordoned off. The villagers were then asked to evacuate their homes and to move into the camps within forty-eight hours. They were required to take their moveable property and supplies for about two months. Once the evacuation had taken place, no one was allowed to go back.⁹⁴

Meanwhile, the evacuated houses in the villages were disinfected, ventilated and whitewashed.⁹⁵ The Chamars, coolies and water-carriers were ordered to thoroughly soak the walls, flooring and ceiling with the phenyl solution. A hole of about twenty-four square feet was made in the roofs to allow the sunlight. The next day, the house was white washed.

The plague measures extended even to the dead. The district administrators favoured corpse inspections.⁹⁶ The police disposed off the corpses of those who died in trains or in hospitals due to the plague or even of the suspected plague.⁹⁷ During the outbreak of 1911, at many places, including Jalandhar, corpse inspections were rigorously carried out much to the annoyance of the bereaved families.⁹⁸

The movement of people from one place to another in both urban and rural areas was restricted during the course of the epidemic. Orders were issued prohibiting the granting of leave to government servants, sepoy and students to visit any infected area.⁹⁹ People were not allowed to visit the neighbouring villages to fulfil social obligations.¹⁰⁰ The district magistrates were given powers to prohibit the holding of caste gatherings and other social assemblies.¹⁰¹ Special measures were taken to prevent the periodic and local fairs, which were a regular feature of people's life in both urban and rural areas. The assistant commissioner of Jalandhar district, Leslie Jones, prohibited the holding of fairs at villages Angle and Garcha.¹⁰²

The movement of rail passengers was likewise monitored and they were subjected to medical examination at various inspection posts.¹⁰³ Passengers of the first, second and intermediate classes were given precedence over the passengers travelling by the third class. The latter were 'inspected' on the railway platform itself while former were 'examined' in their carriages.¹⁰⁴ The clothes, bedding and other belongings of the passengers were also checked, and 'filthy' articles, belonging mostly to third class passengers, were burnt. Those third class passengers who seemed likely to be carrying the plague were detained. Here, the authorities went by their 'dirty' appearance and their social

background. It was believed that lower classes were more likely to spread the disease as they travelled in gangs whose whereabouts could not be traced on arrival at their destination; nor could they be depended upon to give correct information. The detained men and women passengers were taken to a separate disinfecting tank and quarters where they were disrobed, and their own clothes were disinfected with the steam apparatus after which the passengers were allowed to proceed with their journey.¹⁰⁵ By contrast, the Europeans and Eurasians, even if they were sick, were allowed to continue with their journey in the rail carriage in which they were travelling. Their relatives and friends could also accompany them.¹⁰⁶

Rather, special efforts were made to protect the European enclaves – cantonments, civil lines and the hill stations – from epidemics. Since they were meant for the British civil and military personnel, there already was physical distance from the areas inhabited by natives.¹⁰⁷ During the outbreak of epidemics the cantonments were cordoned off so as to prevent any communication with the infected areas.¹⁰⁸ The imposition of quarantine in the immediate vicinity of cantonments came to be generally regarded as ‘a means of protection’, which ‘certainly can do no harm’.¹⁰⁹ The Europeans acquired immunity from smallpox after getting themselves vaccinated and quinine gave them some protection against malaria. Due to concentration of the sanitary measures in and around the civil stations and cantonments, the European enclaves became relatively free of cholera as well. In the early years of the plague, however, the Europeans did not have any protection against this disease. The administration, therefore, sought to protect them by cordoning off their residential areas. Additional forces were deployed to ensure that the cordons were not broken and that the Europeans generally remained safe.

The hill station was another safe area for the Europeans. Its layout and administration ensured that epidemics were kept away. The preventive measures taken in Simla reveal the extent to which the colonial authorities worked to keep it safe from epidemics. Because Simla was the summer capital of the British Indian Empire from 1864 and the summer headquarters of the Punjab Administration, special measures were adopted there to keep it free from epidemics. ‘To improve the sanitary condition of Simla for establishing its agreeable character as the Summer Capital of the Government of India, and the resort of so many hundreds of Europeans’, seven lakh rupees were given as loan by the Punjab Government to the municipal committee to ‘improve water supply, conservancy and bazaar conditions’.¹¹⁰ The Lieutenant Governor sanctioned money for improving sanitary conditions and for re-roofing slaughterhouses.¹¹¹ Simultaneously, improvements were made in the water supply of Simla. As early as 1875, pipes were provided in the houses.¹¹² The water supply scheme of Simla was strengthened subsequently by some special grants.¹¹³ Furthermore, special efforts were made to protect Simla from infection. Medical examination of the travellers coming from plains was carried out at Kalka by the hospital assistants assisted by the police. This was done to ‘guard not only Simla from importation of the disease but also to guard

European soldiers' at the cantonments of Kasauli, Dagshai and Subathu and European children and staff at the Lawrence School at Sanawar.¹¹⁴

Response of the People to Government Measures

The diverse measures which were adopted by the British to handle epidemics affected different sections of the population in different ways. The epidemics not only entailed loss of life, but also affected the people materially and emotionally. Quite often their cultural and religious susceptibilities were hurt by forcible handling by the administrators. Physical dislocation and economic hardships, especially of the poorer sections, were integral to this situation.

Unsettling and hardship were built into the process of evacuation. During their evacuation to the camps, arrangements for accommodating the evacuees often caused discontent. People complained of inadequate number of huts in the camps; following which they were asked to live under the shades of trees, in the open, and in temples. During the cholera epidemic in 1872, the villagers were 'huddled in quarantine camps'; they were exposed to 'harsh conditions and inclement weather'.¹¹⁵ The assistant commissioner on plague duty at Zafarwal conceded that there was a shortage of huts in the villages of Gundial and Ali Mardan.¹¹⁶ Though the *zamindars* and the people with means could manage somehow, the rural poor, uprooted from their homes and hearths were left exposed to harsh conditions. They also complained of shortage of necessities of life in the camps as the authorities did not take up the responsibility of providing the necessary provisions.¹¹⁷

The villagers particularly complained of the coercive and callous attitude of the subordinate staff.¹¹⁸ The vaccinators of the provincial establishment used the authority and influence of the local officials – *lambardars* and *zaildars*, for vaccinating the children who were often gathered forcibly and vaccinated without the consent of their parents. Women were dragged out of their homes and children snatched from their arms. The beards of the men were also pulled for not bringing the children out of their homes.¹¹⁹

The epidemics, followed by measures like cordoning, resulted in suspension of the means of livelihood of different sections of population. The worst affected were those whose subsistence depended on their daily earnings.¹²⁰ Measures like evacuation and cordoning prevented the pedlars and traders from selling their goods.¹²¹ Trade declined in small places like Garhshankar.¹²² Even the larger centres were affected. During the plague epidemic, the wholesale market in Delhi was closed, resulting in paralysing local as well as external trade.¹²³ Agricultural production also declined in the process. During the cholera epidemic in 1872, quarantine prevented the farmers from cultivating their fields.¹²⁴ The owners of those crops which required selling or processing immediately on ripening were the worst affected as they were unable to get through the cordon at every attempt in order to sell their produce.¹²⁵

The responses of different sections of the people to the government measures varied, depending upon the extent to which they were involved and

affected, and the manner in which the representatives of the state dealt with them. Some sections of the society voluntarily carried out the requisite measures. In other cases, the reactions varied from sullen acceptance to active resistance.

'Leading men of influence' were required to assist the medical staff in the implementation of the plague eradication measures and convince the headmen and villagers of their area regarding the effectiveness of the measures. Several individuals co-operated with the authorities in their implementation.¹²⁶ Rai Bahadur Lala Kishen Das of Delhi placed four of his gardens at the disposal of the public for use during evacuation.¹²⁷ Some socio-religious associations too helped in the epidemic operations. The Arya Samaj in Jalandhar organized visits to the houses of the plague stricken and gave them financial help.¹²⁸ The relief committee of the Punjab Brahma Samaj supplied medicines and carried the work of disinfecting.¹²⁹ Public associations and committees were also formed to assist in the situation created by the plague. For instance, in Zafarwal, a public association comprising of both the Hindus and Muslims of the town was formed to allay the excitement of the people and to co-operate with the authorities to combat the plague.¹³⁰ In 1908, to assist in carrying out measures to prevent malaria, voluntary committees were formed in the towns and worked under a civil surgeon or a medical officer.¹³¹

The urban middle classes were generally restrained in expressing their resentment against the handling of epidemics. It was mostly voiced through the lodging of complaints with the authorities. For example, in Moga, a complaint was made against a native doctor in connection with the plague operations.¹³² In Jalandhar, higher authorities were approached against the 'arbitrary' orders of the cantonment magistrate to disinfect the houses by burning dry grass in them.¹³³ Sometimes, the educated sections made use of the press to express their anger against the insensitive handling and sadist attitude of the British administrators. In an article on 'The Plague Administration in the Punjab', *The Tribune* condemned the callous attitude exhibited by the officials in dealing with the plague afflicted people and highlighted the need for appointing men of special tact to take charge of the plague operations.¹³⁴ The *Khalsa Advocate* maintained that efforts to contain the plague had failed 'to secure the cooperation of the people or to exert much influence on the course of the epidemic'.¹³⁵

The circulation of rumours was a manifestation of people's disapproval of the preventive measures. Rumours chiefly revolved around the coercion associated with vaccinations and the plague. Regarding vaccination, it was said by some that the government was marking the children because it was looking for people fit enough to be slaves. Some believed that the British were taking out blood to prepare a blood mummy. It was also rumoured that the government was trying to find a child who had milk in his veins as such a child would be the expected Imam Mahdi whom the British were trying to kill.¹³⁶ Vaccinations were seen also as a means of spreading Christianity.¹³⁷ The set of rumours associated with plague measures was equally interesting. To arrest the plague, the government was believed to be resorting to poisoning the afflicted

persons.¹³⁸ The medical subordinates were administering pills of suspicious character and a certain hospital assistant was believed to have died after consuming his own pill.¹³⁹ The native officers like the assistant surgeons and *naib tahsildars* were suspected of spreading the disease by distributing poisoned sweets or by poisoning the village wells.¹⁴⁰ Credence was even given to the idea that the male members were being killed by the plague poison to secure their female relations for the enjoyment of the officials.¹⁴¹

The active resistance of the people was expressed in different ways. The general reaction to the government measures was to conceal the sick. The fear of separation from the family members added to the unpopularity of government measures. During the cholera epidemic in 1872, cholera cases were concealed because people were afraid of being quarantined.¹⁴² Children were concealed in their homes till the tour of the vaccinator was over to prevent them from getting vaccinated.¹⁴³ In Lahore city, children afflicted with smallpox were concealed at the time when the vesicles were ripe and they were required to be brought for inspection.¹⁴⁴ The fear of segregation was the main reason behind the concealment of plague cases. In Sadhowal village, a constable discovered graves of people who had been secretly buried after succumbing to the plague.¹⁴⁵ The villagers buried the corpses even in their houses; in Sheikhpura, the body of a person who had died of the plague was found hidden in a stack of fodder.¹⁴⁶ In Garhshankar, the *lambardars* probably accepted gratification to allow the plague victims to be buried secretly.¹⁴⁷

The rigour of the preventive measures resulted in giving of bribes to the lower government functionaries. In Palwal, members of the municipal committees bribed the vaccinators for not carrying out any vaccinations in their localities.¹⁴⁸ To avoid vaccinations of newborns in Ludhiana, the clerk registering births was bribed.¹⁴⁹

Role of some vested interests, religious susceptibilities, and unfounded fears accounted for the resistance to the eradication measures. During the cholera epidemic in Amritsar, in 1875, a native practitioner of traditional medicine incited the Kashmiris not to get them inspected because his private practice 'got affected by the medicines administered by the administration'.¹⁵⁰ Some sections of society like Brahman priests, keepers of Sitala temple, Mullas and variolators felt that vaccinators deprived them of their livelihood. Attempts were made to prevent them from doing their job.¹⁵¹ The villagers at Kathgarh refused to get themselves examined by the doctor till they were explained the importance of early detection of the infection. At Garhshankar, the *Sayyids* objected to the house-to-house inspection by the Muhammedan midwives (*dais*).¹⁵² The inhabitants of Kalka were so opposed to desiccation and disinfecting that they did not let even the affected houses to be desiccated or disinfected.¹⁵³ Hindus and Jains were opposed to rat destruction on religious grounds. They either buried the baits laid for rats by the district administrators or released the rats caught in the traps.¹⁵⁴ During the malaria epidemic in 1910 in Gurdaspur district, instead of taking the quinine given by the quinine distribution society, the villagers gave the medicine to their cattle or threw it into the ponds and dung heaps.¹⁵⁵ The orthodox Hindus opposed vaccination

on grounds of caste and religion. A strong reluctance was reported apparently from the Muslims of the districts of Gurgaon, Lahore, Gujrat, Muzaffargarh and Dera Ismail Khan on the plea that the serum contained animal matter forbidden by their religion.¹⁵⁶ The people in Sialkot district refused to evacuate their houses due to fear of theft.¹⁵⁷ The residents of Paragpur who had refused to evacuate their homes in the plague-affected area, moved into the camp only after the arrest of a couple of men.¹⁵⁸

The resistance of people in fact ranged from mild opposition and attacks on subordinate staff to more violent forms like riots. During the early period, their anger was directed against the vaccinators. In 1883, the vaccinators were actually assaulted four times and were prevented from carrying out their duty. In another incident, the head vaccinator of Delhi, Ghalib Ali, was attacked in the bazaar.¹⁵⁹ After outbreak of the plague, the anger of people was expressed through public demonstrations and threats to government functionaries and actual assaults on them. The residents of Garhshankar held a demonstration in the bazaar to protest against the house-to-house 'inspections' by the Muhammedan *dais* and the arrest of some men.¹⁶⁰ The residents of Sihawal and Darya Nangal violently threatened the naib tahsildar;¹⁶¹ at Kathgarh, a person actually attacked the naib tahsildar, while the watchman (*chowkidar*) who was ordered to arrest the culprit, refused to do so. In Banga circle, the hospital assistants and compounders were accused of bribery, extortion and ill treatment; abuses were hurled at them, and some of them were manhandled.¹⁶²

The growing discontent eventually resulted in clashes between people and the authorities. It was believed that highhandedness of the police and the tactlessness of the civil functionaries made the people defiant.¹⁶³ The functionaries at the lower rungs, who represented the state authority and came into contact with people, became the targets. They were beaten up, pelted with stones and sometimes killed. The people actually resorted to rioting at places like Bhangala in Nawanshahr *tahsil*, Shahzada in Sialkot district, Khanowal in Gurdaspur district, Garhshankar in Hoshiarpur district and in the town of Patiala where riots broke out, leading to attacks on officials, damage to government machinery, camps, hospitals and huts.

Thus, in the course of the epidemics, varying attitudes and responses, both from the government and the people, came to the forefront. In the initial years, the British laid emphasis on measures emphasising physical distance from the natives who responded with some restraint and a few incidents of resistance. However, outbreak of the plague brought about considerable change in the manner of handling the epidemics. Since the plague threatened the economic base of the British, it evoked an alarmist response from them. They handled the situation with determination, using coercion under-towed with apathy. People reacted sharply, and in voicing their discontent, at least for some time, Punjabis from different backgrounds came together, cutting across communal and caste barriers. To control the situation and reduce the escalating tension, the administration felt obliged to become more accommodating towards the natives. At the same time, responsibility for sanitation was passed on to the municipalities which were altogether unequipped to handle the epidemics.

Notes

1. Major F. Norman White, *Twenty Years of Plague in India with Special Reference to the Outbreak of 1917-18*, Punjab Government Civil Secretariat Proceedings, Home: Medical and Sanitary, April 1919, Numbers 190-94 (cited hereafter as *Twenty Years of the Plague in India*), p. 2. Also, *Census of India, 1951*, Volume I, India, Part I-B (New Delhi: Government of India Press, 1953), pp. 265-68.
2. Punjab Government Civil Secretariat Proceedings, Home: Medical and Sanitary (cited hereafter as *Proceedings, Home: Medical and Sanitary*), June 1891, Serial Numbers 30, 34.
3. *Khalsa Advocate*, 13 March 1909.
4. *Gazetteer of Bannu District, 1883-84*, p. 14.
5. David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in the Nineteenth Century India* (New Delhi: Oxford University Press, 1993), pp. 118-19.
6. *Proceedings, Home: Medical and Sanitary*, December 1887, Serial Number 24, pp. 131-36.
7. *Proceedings, Home*, October 1876, Serial Number 8, pp. 660-61. Also, *Proceedings, Home: Medical and Sanitary*, June 1877, Serial Number 9, p. 440; Punjab Government Civil Secretariat Proceedings, Home: Jails (cited hereafter as *Proceedings, Home: Jails*), May 1889, Serial Number 26, pp. 45-47; *Gazetteer of Shahpur District, 1897*, p. 14.
8. *Proceedings, Home: Medical and Sanitary*, July 1908, Numbers 10-11, pp. 5-8.
9. *The Tribune*, 24 March 1904, pp. 2-3. Also *Proceedings, Home: Medical and Sanitary*, October 1905, Number 13-21, pp. 5-8.
10. *Census of India, 1921, Volume XV for Punjab and Delhi*, (Lahore: Civil and Military Gazette Press), 1923, pp. 46-47.
11. *The Tribune*, 24 March 1904, pp. 2-3.
12. *Proceedings, Home: Medical and Sanitary*, October 1905, Number 13-21, pp. 5-8.
13. *Proceedings, Home: Medical and Sanitary*, May 1884, Serial Number 17, pp. 61-62. Also, Chas A. Bentley, *Malaria and Agriculture in Bengal, How to*

Reduce Malaria in Bengal by Irrigation (Calcutta: Bengal Secretariat Book Depot), 1925, p. 1.

14. *Proceedings, Home: Medical and Sanitary*, March 1879, Serial Number 11, pp. 123-26.

15. *Proceedings, Home: Medical and Sanitary*, July 1904, Serial Number 62, p. 55.

16. *Khalsa Advocate*, 2 September 1908.

17. *Proceedings, Home: Medical and Sanitary*, May 1884, Serial Number 17, p. 61.

18. *Proceedings, Home: Medical and Sanitary*, July 1894, Serial Number 37, p. 132.

19. *Administration Report, 1903-04*, p. 44.

20. *Census of India, 1921*, p. 13.

21. *Khalsa Advocate*, 29 October 1918.

22. *Proceedings, Home: Medical and Sanitary*, July 1890, Serial Number 29, p. 48.

23. *Proceedings, Boards and Committees Department*, 1916, Serial Number 37, pp. 1-2.

24. *Proceedings, Home: Medical and Sanitary*, July 1916, Number 15-17, p. 1. Also, *Proceedings, Home: Medical and Sanitary*, July 1903, Number 1-2, pp. 2-3; *Proceedings, Home: Medical and Sanitary*, July 1908, Numbers 10-11, p. 2; White, *Twenty Years of the Plague in India*, p. 5.

25. *Proceedings, Home: Medical and Sanitary*, April 1906, Number 20-26, p. 1.

26. Captain E. Wilkinson, *Report on Inoculation in Jullundur and Hoshiarpur districts of the Punjab October 1899- September 1900* (cited hereafter as *Inoculation in Jullundur and Hoshiarpur*), (Lahore: Punjab Government Press, 1901), pp. vi-vii, 50-51.

27. *Proceedings, Home: Medical and Sanitary*, February 1881, Serial Number 13, p. 83.

28. *Proceedings, Home: Medical and Sanitary*, December 1884, Serial Number 18, pp. 140-41.
29. *Proceedings, Home: Medical and Sanitary*, July 1903, Numbers 46-47, p. 1.
30. Rajnarayan Chandavarkar, 'Plague Panic and Epidemic Politics in India, 1896-1914, in Terence Ranger and Paul Slack, eds., *Epidemics and Ideas: Essays on the Historical Perception of Pestilence* (Cambridge: Cambridge University Press, 1995), p. 209.
31. *Proceedings, Medical and Sanitary*, October 1908, Numbers 21-26, pp. 2-4.
32. *Proceedings, Home: Medical and Sanitary*, October 1880, Serial Number 12, p. 541.
33. *Proceedings, Home: Medical and Sanitary*, December 1879, Serial Number 11, pp. 6-7.
34. *Proceedings, Home*, October 1873, Serial Number 5, pp. 814-15.
35. *Proceedings, Home: Medical and Sanitary*, June 1887, Serial Number 23, p. 56.
36. Major E. Inglis, *Report on the Outbreak of the Plague in Jullundur and Hoshiarpur Districts of the Punjab in 1897-98* (cited hereafter as *Plague in Jullundur and Hoshiarpur 1897-98*), (Lahore: Punjab Government Press, 1898), p. 15.
37. *Proceedings, Home: Medical and Sanitary*, June 1876, Serial Number 8, p. 336.
38. *Proceedings, Home: Medical and Sanitary*, January 1875, Serial Number 7, p. 3.
39. Major E. Inglis, *Plague in Jullundur and Hoshiarpur 1897-98*, p. 6.
40. *Proceedings, Home: Medical and Sanitary*, January 1901, Number 69-70, p. 2.
41. *Proceedings, Home: Medical and Sanitary*, May 1873, Serial Number 5, p. 286.

42. J.M. Cunningham, *Report on the Cholera Epidemic of 1872 in Northern India* (cited hereafter as *Cholera Epidemic of 1872*), (Calcutta: Government Printing, 1873), pp. 9-11.
43. *Proceedings, Home: Medical and Sanitary*, October 1892, Serial Number 33, p. 76.
44. *Gazetteer of Delhi District, 1883-84*, p. 15.
45. *Proceedings, Home: Medical and Sanitary*, May 1884, Serial Number 17, p. 63.
46. *Gazetteer of the Karnal District, 1883-84*, p. 10.
47. *Proceedings, Home: Medical and Sanitary*, July 1892, Serial Number 33, pp. iv, v.
48. *Proceedings, Home: Medical and Sanitary*, August 1882, Serial Number 14, p. 59.
49. Imran Ali, *Punjab Under Imperialism 1840-1947* (Delhi: Oxford University Press, 1981), pp. 9-23.
50. B. S. Saini, *The Social and Economic History of the Punjab including Haryana and Himachal Pradesh (1901-1939)*, (Delhi: Ess Ess Publications, 1975), p. 312.
51. Ian J. Kerr, *Building the Railways of the Raj 1850-1900* (Delhi: Oxford University Press, 1997), pp. 130-60.
52. *Proceedings, Home: Medical and Sanitary*, January 1878, Serial Number 10, p. 2.
53. Simkie Sarkar, 'Malaria in Nineteenth Century Bombay', in Deepak Kumar ed. *Disease and Medicine in India: A Historical Overview*, ed. Deepak Kumar (New Delhi: Tulika Books, 2001), pp. 134-39.
54. Mark Harrison, *Public Health in British India: Anglo Indian Preventive Medicine 1859-1914* (New Delhi: Foundation Books, 1994), pp. 158-65.
55. *Proceedings, Home: Medical and Sanitary*, April 1891, Serial Number 30, pp. 15-17.
56. *Proceedings, Home: Medical and Sanitary*, July 1898, Serial Number 46, p. 177.

57. *Proceedings, Home: Medical and Sanitary*, July 1903, Serial Number 60, p. 53. Also, *Proceedings, Home: Medical and Sanitary*, July 1908, Serial Number 72, p. 55. The distribution agencies were attached to the office of the inspector general of hospitals.

58. *Gazetteer of Gurdaspur District, 1914*, p. 197. Also, *Proceedings, Home: Medical and Sanitary*, September 1910, p. 87. In 1910-11, the societies ceased to exist and the work of distribution was taken over by the vaccinators and dispensaries.

59. *Proceedings, Home: Medical and Sanitary*, September 1915, Serial Number 86, p. 46. Local bodies were asked to bear the cost of 'quinization' of the children.

60. *Proceedings, Home: Medical and Sanitary*, August 1914, Serial Number 84, pp. 70-72.

61. *Proceedings, Home: Medical and Sanitary*, March 1926, Serial Number 106, pp. 1-3. The boys studying in classes I, V, VII, IX and XI were examined.

62. Major S. R. Christophers, *Malaria in the Punjab* (Calcutta: Superintendent Government Printing, 1911), pp. 5, 84.

63. *Proceedings, Home: Medical and Sanitary*, October 1908, Serial Number 72, p. 80. Also, *Gazetteer of Gujranwala District, 1935*, p. 54. In the towns, voluntary committees were set up which carried out the work of the destruction of mosquitoes under a civil surgeon or a medical officer.

64. *Punjab Government Civil Secretariat Proceedings, B, Home: Public Health*, (cited hereafter as *Proceedings, Home: Public Health*), 1943, Number 140, pp. 3-4.

65. *Proceedings, B, Home: Public Health*, 1944, Number 102, pp. 2-3. Local bodies or municipal committees carried out the work of spraying in the towns. In the villages spraying was done twice a week.

66. *Proceedings, Home: Medical and Sanitary*, January 1911, Serial Number 77, p. 88. Training was imparted to medical officers and subordinates on malaria prevention.

67. *Proceedings, Home: Medical and Sanitary*, July 1897, Serial Number 44, p. 609.

68. *Proceedings, Home: Medical and Sanitary*, July 1896, Serial Number 41, p. 120.

69. *Proceedings, Home: Medical and Sanitary*, July 1897, Serial Number 44, p. 609. Also, *Proceedings, Home: Medical and Sanitary*, September 1905, Serial Number 65, p. 59.
70. *Proceedings, B, Home: Public Health*, 1929, Number 6, pp. 1-2. Also, *Proceedings, B, Home: Public Health*, 1944, Number 66, p. 3.
71. *Proceedings, Home*, June 1876, Serial Number 8, p. 335.
72. *Proceedings, Home: Medical and Sanitary*, January 1879, Serial Number 11, p. 13. The wells were cleaned with Potassium Permanganate.
73. *Khalsa Advocate*, 13 March 1909.
74. *Proceedings, Boards and Committees Department*, January 1921, Serial Number 42, p. 6.
75. *Proceedings, B, Home: Public Health*, 1938, Number 195, pp. 8-10.
76. *Proceedings, Municipal*, May 1878, p. 17. Also, *Proceedings, Boards and Committees Department*, 1887, Serial Number 10, p. 32; *Proceedings, Boards and Committees Department*, 1892, Serial Number 15, p. 258; *Proceedings, Boards and Committees Department*, 1893, Serial Number 16, pp. 5-7.
77. *Proceedings, Boards and Committees Department*, 1901, Serial Number 23, p. 262. Also, *Proceedings, Boards and Committees Department*, 1907, Serial Number 28, p. 3; *Proceedings, Boards and Committees Department*, 1912, Serial Number 33, p. 31.
78. *Proceedings, Home: Medical and Sanitary*, July 1917, Serial Number 90, pp. 77-79.
79. *Proceedings, Home: Medical and Sanitary*, September 1882, Serial Number 14, 95. The vaccination season extended from November 1 to March 31 in the plains and from April 1 to October 31 in the hills.
80. *Proceedings, Home: Medical and Sanitary*, June 1880, Serial Number 12, pp. 342-43.
81. *Proceedings, Home: Medical and Sanitary*, September 1882, Serial Number 14, p. 95.
82. *Proceedings, Home: Medical and Sanitary*, September 1903, Serial Number 60, p. 127. Initially, calf lymph was used, which was taken on the fifth day from the udder of the animal under one year who was free from any contagious disease.

83. Variolation was a practice in which the inoculators kept dry crusts from pustules mixed with a few grains of rice in a box. Smallpox was induced by inserting the mixture into a wound made near the base of the thumb. This was kept for six hours. Dietary restrictions were imposed. For six days cold water was poured over the patients' head. This was discontinued for three days when the eruptions began. Pustules were opened and pus drained off. *Imperial Gazetteer of India, Provincial Series, Punjab, Volume I*, (Calcutta: Superintendent of Government Printing, 1908), p. 146.

84. *Proceedings, Home: Medical and Sanitary*, December 1879, Serial Number 11, p. 1; *Proceedings, Home: Medical and Sanitary*, July 1884, Serial Number 18, p. 93. Also, *Proceedings, Home: Medical and Sanitary*, August 1887, Serial Number 24, p. 89; *Proceedings, Home: Medical and Sanitary*, August 1888, Serial Number 25, p. 89. In 1884, the Act was enforced in Lahore Municipality, and in 1887 at Simla and Amritsar.

85. *Proceedings, Home: Medical and Sanitary*, February 1886, Serial Number 21, pp. 19-20. Also, *Proceedings, Home: Medical and Sanitary*, August 1919, Serial Number 94, p. 70.

86. *Proceedings, A, Home: Public Health*, 1929, Number 4, p. 3.

87. *Proceedings, Home*, February 1874, Serial Number 6, pp. 88-89.

88. *Proceedings, Home: Medical and Sanitary*, July 1877, Serial Number 9, p. 681.

89. *Proceedings, Home: Medical and Sanitary*, May 1886, Serial Number 21, p. 75.

90. *Proceedings, Home: Medical and Sanitary*, October 1880, Serial Number 12, pp. 540-41.

91. *Proceedings, Home*, August 1876, Serial Number 8, pp. 552-53. Also, *Proceedings, Home: Medical and Sanitary*, October 1880, Serial Number 12, p. 541.

92. Harrison, *Public Health in British India*, p. 150.

93. Anil Kumar, *Medicine and the Raj: British Medical Policy in India, 1835-1911*, (New Delhi: Sage Publications, 1998), p. 194.

94. Inglis, *Plague in Jullundur and Hoshiarpur 1897-98*, pp. 2, 10, 24.

95. *Proceedings, Home: Medical and Sanitary*, June 1898, Number 119-121, pp. 1-2.

96. Inglis, *Plague in Jullundur and Hoshiarpur 1897-98*, 21, pp. 31-33.
97. *Proceedings, Medical and Sanitary*, August 1898, Number 172-B, p. 3.
98. *The Tribune*, 18 May 1911, p. 3.
99. *Proceedings, Home: Medical and Sanitary*, March 1901, Number 58, p. 1.
100. *Proceedings, Home: Medical and Sanitary*, August 1898, Number 208.
101. *Proceedings, Home: Medical and Sanitary*, May 1901, Number 134-35, p. 1.
102. *Proceedings, Home: Medical and Sanitary*, April 1898, Number 276-B, p. 23.
103. *Proceedings, Home: Medical and Sanitary*, May 1898, Number 69-71, p. 3. Also, *Proceedings, Home: Medical and Sanitary*, July 1898, Number 91-104, pp. 3-5; *Proceedings, Home: Medical and Sanitary*, July 1898, Number 282-85, p. 3.
104. *Proceedings, Home: Medical and Sanitary*, August 1898, Number 172-B, p. 1.
105. Inglis, *Plague in Jullundur and Hoshiarpur 1897-98*, pp. 46-47. The detained men and women passengers were escorted by the policemen and the *dais* respectively.
106. *Proceedings, Home: Medical and Sanitary*, August 1898, Number 172-B, p. 1.
107. Anthony D. King, *Colonial Urban Development: Culture, Social Power and Environment*, (London: Routledge and Kegan Paul, 1976), p. 37.
108. *Proceedings, Home*, May 1875, Serial Number 7, p. 381.
109. *Proceedings, Home*, March 1874, Serial Number 6, p. 132.
110. *Proceedings, Home: Medical and Sanitary*, March 1878, Serial Number 10, p. 349. Also, *Proceedings, Home: Medical and Sanitary*, August 1877, Serial Number 9, pp. 704-5.
111. *Proceedings, Home: Medical and Sanitary*, August 1877, Serial Number 8, pp. 705-11.
112. *Proceedings, Home*, October 1875, Serial Number 7, pp. 778-79.

113. *Proceedings, Home: Medical and Sanitary*, March 1878, Serial Number 10, pp. 349-50. Also, *Proceedings, Boards and Committees Department, 1893*, Serial Number 16, p. 9; *Proceedings, Boards and Committees Department, 1920*, Serial Number 41, p. 15; *Proceedings, B, Home: Public Health, 1936*, Number 129, pp. 4-5.

114. *Proceedings, Home: Medical and Sanitary*, October 1875, Serial Number 7, p. 774.

115. Cunningham, *Cholera Epidemic of 1872*, p. 28.

116. *The Tribune*, 4 May 1901, p. 5. Also, *The Tribune*, 27 April 1901, p. 2; *The Tribune*, 4 May 1901, p. 3.

117. *The Tribune*, 27 April 1901, p. 2.

118. *Proceedings, Home: Medical and Sanitary*, November 1878, Serial Number 10, p. 941; Also, *Proceedings, Home: Medical and Sanitary*, December 1879, Serial Number 11, p. 7.

119. *Proceedings, Home: Medical and Sanitary*, February 1881, Serial Number 13, pp. 82-83.

120. *The Tribune*, 27 April 1901, p. 2.

121. *Proceedings, Home: Medical and Sanitary*, April 1898, Number 279 B, pp. 1-2.

122. *Proceedings, Home: Medical and Sanitary*, June 1898, Number 149, p. 15.

123. Narayani Gupta, *Delhi: Between Two Empires 1803-1931, Society, Government and Urban Growth*, (New Delhi: Oxford University Press, 1981), p. 137.

124. Cunningham, *Cholera Epidemic of 1872*, p. 28.

125. *Proceedings, Home: Medical and Sanitary*, August 1898, Number 206, pp. 3-4.

126. *Proceedings, Home: Medical and Sanitary*, December 1907, Number 6-9, pp. 1-2.

127. *The Tribune*, 17 April 1907, p. 3.

128. *The Tribune*, 20 February 1902, p. 5.

129. *The Tribune*, 19 April 1907, p. 5.
130. *The Tribune*, 27 April 1901, p. 2.
131. *Proceedings, Home: Medical and Sanitary*, September 1915, Serial Number 86, p. 40.
132. *The Tribune*, 30 April 1901, pp. 3-4.
133. *Proceedings, Home: Medical and Sanitary*, July 1911, Number 16-18, pp. 1-3. Also, *The Tribune*, 19 May 1911.
134. *The Tribune*, 30 April 1901, pp. 3-4.
135. *Khalsa Advocate*, 8 December 1903.
136. *Proceedings, Home: Medical and Sanitary*, February 1881, Serial Number 13, p. 84.
137. Loc.cit.
138. *Proceedings, Medical and Sanitary*, June 1898, Number 122-26B, p. 1.
139. *The Tribune*, 14 May 1901, p. 3.
140. *Proceedings, Home: Medical and Sanitary*, June 1901, Number 99-100, pp. 2-3.
141. *The Tribune*, 14 May 1901, p. 3.
142. Cunningham, *Cholera Epidemic of 1872*, pp. 4-5.
143. *Proceedings, Home: Medical and Sanitary*, June 1880, Serial Number 12, pp. 342-43.
144. *Proceedings, Home: Medical and Sanitary*, July 1884, Serial Number 18, p. 92.
145. *Proceedings, Home: Medical and Sanitary*, June 1898, Number 149, p. 3.
146. *Proceedings, Home: Medical and Sanitary*, April 1898, Number 276 B, p. 20. Also, Inglis, *Plague in Jullundur and Hoshiarpur 1897-98*, p. 81. In Dhahan village, in Banga circle, an infected corpse was found locked up in a room.

147. *Proceedings, Home: Medical and Sanitary*, April 1898, Number 280B, p. 5.
148. *Proceedings, Home: Medical and Sanitary*, October 1880, Serial Number 12, p. 540.
149. *Proceedings, Home: Medical and Sanitary*, June 1880, Serial Number 12, pp. 342-43.
150. *Proceedings, Home*, June 1876, Serial Number 8, p. 337.
151. *Proceedings, Home: Medical and Sanitary*, February 1881, Serial Number 13, pp. 81-82.
152. *Proceedings, Home: Medical and Sanitary*, June 1898, Number 149, pp. 2-5.
153. *Proceedings, Home: Medical and Sanitary*, May 1904, Number 42--43, p. 2.
154. *Proceedings, Home: Medical and Sanitary*, October 1907, Serial Number 70, p. 75.
155. *Gazetteer of Gurdaspur District*, 1914, p. 197.
156. *Proceedings, Home: Medical and Sanitary*, July 1890, Serial Number 29, pp. 40-41.
157. *Gazetteer of Sialkot District*, 1920, p. 31.
158. *Proceedings, Home: Medical and Sanitary*, June 1898, Number 148, p. 3.
159. *Proceedings, Home: Medical and Sanitary*, July 1884, Serial Number 18, p. 87.
160. *Proceedings, Home: Medical and Sanitary*, June 1898, Number 149, p. 5.
161. *Proceedings, Home: Medical and Sanitary*, May 1901, Number 111-23, pp. 3-4.
162. Inglis, *Plague in Jullundur and Hoshiarpur 1897-98*, pp. 53,146.
163. *The Tribune*, 9 May 1901, p. 3; 11 May 1901, p. 1.