

CHAPTER 31

Epidemic Diseases in the Past: History, Philosophy, and Religious Thought

D. Buchillet

Conditions et Territoires d'émergence des maladies, UR IRD 178, Paris, France

Epidemic diseases exerted a wide influence on human history through the ages. Some of them changed the course of civilizations: They brought devastation in lands affected, halted or exacerbated wars, defeated armies, indisposed leaders of nations, disrupted cities, destroyed or transformed state structures, sharpened political and social class divisions, and/or aggravated social antagonisms. Devastating populations that had never been in contact with them, they also enabled or facilitated European conquest, expansion, and colonization. But they also had cultural and intellectual effects, participating notably in the renewing of the medical understanding of the diseases. This chapter reviews briefly three of the major pestilences that swept over the world in the past at different times in repeated epidemic or pandemic waves (plague, smallpox, and cholera), examining their impact on human societies and the sociocultural and medical responses they gave rise to. They were chosen for their universal character, great virulence and rapidity of evolution, the high mortality rates they promoted in the past, and also because of the variety of social, cultural, and/or political responses they aroused.

31.1 PLAGUE¹

Plague is an infectious disease caused by the gram-negative bacillus *Yersinia pestis* that ordinarily parasites some wild

¹The term "plague" was frequently used in the past as a synonym for pestilence, hence the difficulty to know when the disease plague first appeared in the world. In any case, historians now agree that the first detailed account of plague in its bubonic form is the description by the Byzantine historian Procopius of the Plague of Justinian, that swept over the world between the sixth and the eight centuries [5,6,10].

rodents (rabbits, marmots, ground squirrels, prairie dogs, etc.) without causing any effect and passes on from rodent to rodent through the bite of infected fleas. As a result of an ecological change or disturbance, some susceptible rodents such as the black or ship rat (*Rattus rattus*) or the brown or sewer rat (*Rattus norvegicus*) may enter in contact with the bacillus. Once infected, these develop an overwhelming infection and quickly die from it. Moreover, plague bacillus can accidentally be transmitted to humans through the bite of infected rat fleas (*Xenopsylla cheopis*) or of human fleas (*Pulex irritans*) that feed indifferently upon humans and rats. The bacillus is highly pathological for man and causes bubonic plague. In a few days, the majority of the infected present a kind of severe influenza and develop, on the flea bite site, a carbuncle or necrotic pustule. Within 6 days of the infection, the bacillus spreads to the regional lymph nodes that, because of inflammation, edema, and necrosis, transform themselves into big swollen and painful nodes (the buboes). About 60% of the untreated victims die within 10 days. Moreover, disease can be spread to other humans through the bite of infected human fleas [5,6,10,25]. In approximately 20% of cases, the bacillus reaches the lungs, causing the pneumonic plague that is spread directly from a person to another through the inhalation of infected droplets exhaled by victims while breathing, coughing, or spitting. Pneumonic plague is highly contagious and mortality rates are close to 100% [35]. In some cases, generally at the climax of the epidemic, the bacillus reaches the bloodstream causing a septicemia, which kills the victims in a few hours or days. It is the septicemic form [5,10,25].

Epidemics and/or pandemics of bubonic plague exploded in recurrent waves in the past, killing million people all over the

world. Some of them are famous for the ravages they have caused, as, for example, the plague of Justinian that swept over the world in recurrent waves during the sixth and the eight centuries. Originating in 541 in the Middle East or, possibly, Ethiopia [5,23], it reached in 542 Constantinople, governed by Emperor Justinian, hence the name “Justinian” attached to it. The plague also reached some parts of Western Europe (France, Italy, and Spain). The second pandemic plague known was called the “Black Death,” probably because the skin of patients was covered with black plaques. Other names include “the Great Pestilence,” “the Great Mortality,” or “the Universal Plague” [24,25] because of the ravages it caused in humankind and the fact that it swept over the entire world. Originating in some region around the Caspian Sea, the Black Death spread to Central Asia, Constantinople, and the Mediterranean ports from where it invaded Western Europe. Lasting 7 years (1347–1354), it is said to have killed about 25% of the European population, for example, approximately 25 million people [6]. In the Muslim Middle East, one-third of the population died from the disease [35]. Given the rapidity of its dissemination into Europe and its high mortality rates, it seems that the bubonic and pneumonic forms of the disease were involved during this second pandemic, although their relative importance varied according to local conditions [25,35]. Progressing along the major maritime and land trade and communication routes, the disease stayed only a few months in each region or country, generally appearing in spring, summer and early autumn, and receding in winter [25]. After 1351, the Black Death began to retreat in Europe but bubonic plague continued to cause periodic, localized outbreaks (e.g., in Milan in 1639, in Genoa and Naples in 1656, in London in 1665, or in Marseille in 1720–1722, etc.) until the beginning of the eighteenth century.

Witnesses, chroniclers, and physicians noted certain peculiarities in the course of the Black Death. First, some regions (central Italy, southern France, East Anglia, and Scandinavia, etc.) suffered more than others whereas certain areas (as, e.g., Nuremberg) entirely escaped from it [6,25]. Second, although the disease spared no one, whatever its social origin, class or position, it seemed to affect with more severity the economically weaker population within a city or a region. Two reasons can be offered to this fact: People of privileged classes had the possibility to escape to more healthy regions when rumors of the epidemic began to circulate. Furthermore, when the causal agent of the disease as well as its mode of propagation were finally identified at the end of the nineteenth century,² this observation of a somewhat predilection for popular classes made sense considering their living conditions (crowded and unsanitary houses) that created a microenvironment favorable to the transmission of the disease from rats to humans and from person to person [6,25]. Third, persons whose occupations

brought them into contact with the sick (medical doctors, hospital nurses, priests, notaries as well as the “ravens,” as were called those who were in charge of the corpses removal and burials) and people who lived in communal institutions (members of religious orders, hospitalized persons, charity houses, for instance) also suffered greatly from the disease [5,6,24,25]. In numerous regions, famines probably worsened the ill effects of the disease, favoring its dissemination [6,23].

A third pandemic of plague, which spared most of Europe, being limited to some harbors, arose in central Asia around the mid-eighteenth century. From there, it spread to China (Canton in 1894, where it killed 100,000 persons) and India (Bombay in 1896, Calcutta in 1898, etc.). In Calcutta and in the province of Bengal, it is said to have killed 480,000 persons between 1898 and 1906 [24]. Australia, Eastern Africa, and North and South America were infected for the first time by the disease [10,24].

Between the end of the first pandemic (eight century) and the beginning of the second one (mid-fourteenth century), plague virtually disappeared from the Middle East and Europe. That is why, when the Black Death irrupted in Europe, it sounded as a new disease [6,24,25]. In front of its ravages, it rapidly caused panic and terror and generated diverse reactions, some of them extremely violent. Those who could afford it abandoned infected cities to more healthful regions, unwillingly acting as carriers of the bacillus and disseminating the disease. Others sought for spiritual remedies. Muslim and Christian religious authorities organized prayers, sessions of collective confession and penitence, processions, pilgrimages and special religious offices in order to supplicate God to put an end to the epidemic. Whereas for the most part of the Muslim world, the epidemic did not bear a moral connotation, for the Christians it was an unmistakable sign of the divine wrath because of human sins and, in some cases, as a sign of the approaching apocalypse [6,24,25]. Groups of flagellants were traveling across cities and public sessions of flagellations and of preaching repentance were organized in order to placate God’s wrath [6,24,25].

In the Christian world, the epidemic also gave rise to violent reactions, resulting in the stigmatization and, sometimes, in massacres of entire communities used as scapegoats. In some European regions or countries (e.g., Aquitaine, Languedoc, Savoy, Provence, Catalonia, Aragon, Switzerland, southern Germany), Jews offered the conspicuous targets for accusations of plague spreading through poisoning local fountains, springs, and wells.³ In some cases, these accusations were sustained by municipal or political authorities. Hundreds of Jewish communities were destroyed, their members exiled, imprisoned, tortured or burnt alive, and their property confiscated [6,24,25].

Whereas popular reactions sought for spiritual remedies and/or were involved in blaming and finding scapegoats,

²In 1894, A. Yersin identified in Hong Kong the bacillus in the tissues of plague-dead rats and of plague-dead humans. Two years later, P.S. Lewis demonstrated the link between the rat flea *Xenopsylla cheopis*, the rats and humans in the bubonic plague.

³It is interesting to note that during the plague epidemics in nineteenth century India, rumors of deliberate poisoning by doctors and hospital staff aroused among Indians [3].

medical authorities in Europe and the Middle East, basing themselves on Hippocrates and Galen's works who interpreted epidemics as a natural phenomenon resulting from the corruption of air and/or particular astrological events, recommended certain preventive (fortifying diet, rest, clean air, etc.) and curative (internal medication, salves, minor surgery, etc.) practices [25]. Moreover, certain governments and medical authorities of European countries, particularly in central and northern Italy, applied the existing sanitary legislation or instituted by law new large-scale public health and social measures in order to combat and prevent the plague: isolation of the sick, street cleaning, control of some odoriferous practices (as, e.g., butchery, tannery, dyeing), restrictions on travel to and from infected cities, control of the movement of infected goods, and so on. Public assemblies were prohibited by law, the burial of the dead regulated and medical doctors hired to treat the patients as many physicians had fled the cities like members of privileged classes. Boards of magistrates were in charge of the application of these measures [24,25]. Although largely ineffective given the complex ecology of the disease (it depends on the strict interaction of bacilli, rodents, fleas, and humans), these measures furnished, in some ways, the basis for widespread preventive practices such as quarantines, isolation of the sick and their household contacts, and sanitary cordons in succeeding epidemics in Europe [25]. Moreover, the decline of plague in Europe at the beginning of the eighteenth century is attributed by the historians to these public health measures and/or to a mutation of the bacillus in a less virulent strain [10]. In any case, these measures probably spared Europe from the third pandemic plague that aroused in Central Asia around the mid-eighteenth century.

31.2 SMALLPOX⁴

Differently to plague and, as we will see later, to cholera, and despite its horrible clinical manifestations and the high mortality rates it caused,⁵ smallpox did not give rise to violent reactions among people. Also known as “the Great Fire” or the “Spotted Death” [18], an allusion to two of its more characteristic symptoms (the high “burning” fever and the rash, respectively), this acute eruptive disease is caused by an orthopoxvirus transmitted through droplet infection or also *via* cotton articles (clothing, shrouds, or blankets) contaminated with pus or scabs.⁶ It is a strictly human virus with no

known animal reservoir of disease. After an asymptomatic incubation period (1–3 weeks) and a brief period of invasion (3–4 days) commonly with high fever with a burning sensation, splitting headache, chills and nausea, and other symptoms, a diffuse rash appears. First on the face, it spreads to the trunk and then to the arms and legs: Papules evolve into vesicles with a head (3rd–4th day) and into pustules (5th–6th day). On the 8th or 9th day of the rash, the pustules begin to dry and scab. In some patients, the virus causes corneal ulceration, resulting in permanent blindness of the infected eye(s). Fatal in 20–50% of all the cases,⁷ the survivors get a definitive immunity against the disease. In the past, smallpox often resulted in the permanent pockmarked and scarred face of those who recovered from it.

The geographic origin of the disease is unclear as are the dates when it first appeared into Europe and its routes of transmission. Nonetheless, certain archaeological evidences and ancient religious and medical writings seem to account for its antiquity in Asia and Egypt. For example, the *Susruta Samhita*, one of the oldest Sanskrit medical texts compiled before the fifth century, referred to a pustular disease named *masurika* which probably corresponds to smallpox. Moreover, as we will see later, the disease is associated to a goddess in India and is the object of an intense worship all over the country [2,3,18]. Scars resembling the typical pockmarks left by smallpox were found on the skin of three Egyptian mummies 3000 years old. In China, there is some evidence of the presence of smallpox in the fifth century. It seems that the disease was introduced in the north of the country during a war with the “barbarians” [18,20,21]. Under the Song dynasty (eleventh–thirteenth centuries), pediatricians published medical treatises on the disease, which seem to imply that smallpox was at that time a childhood disease among Chinese populations [20,21]. The *Xiao Er Yao Zheng Zhi Jue* [*Emergent Prescriptions for Pediatric Rash Diseases*] written in 1093 by the pediatrician Dong Ji is, for example, the first medical treatise on rash diseases in China. In this book, the author differentiated smallpox, measles, chickenpox, and scarlet fever [18,19,29,34]. Moreover, Chinese were the first in the world to use the variolation, a preventive method, which was intended to gain immunity in the individual through producing a controlled and mild form of the disease. The medical treatise *Yi Zong Jin Jian* [*Golden Mirror of Orthodox Medical Lineage*] written in 1742 by Wu Qian described four variolation techniques: water variolation (pulverized smallpox scabs were soaked into a moistened cotton swab which was inserted into the nostrils); dry variolation (powdered smallpox scabs were blown up into the nostrils *via* a long and

⁴The English term “small pox” is the translation of the French expression “la petite vérole” that was forged to distinguish its eruptive manifestations from those caused by syphilis known in France as “la grosse vérole” (the great pox) [18].

⁵It is considered by Hopkins [18], the author of a history of smallpox, as “The most terrible of all the ministers of death” in Europe. In the eighteenth century, it was twice more mortal than was plague in the seventeenth century, with case-fatality rates ranging from 8% to 10% against the 4% to 5% of the plague. At this period, it was considered a childhood disease [5,14].

⁶The smallpox virus can survive a few years outside human hosts in a dried state [31].

⁷Smallpox manifests itself in two forms: *Variola major*, the more virulent and lethal form, with a case-fatality rate ranging from 20% to 50% and *Variola minor* (*alastrim*), recognized in the late nineteenth century, with a mortality rate inferior to 1% and characterized by mild symptoms. Mortality rates of 100% were recorded during smallpox epidemic outbreaks among Native Americans [12,17,18].

fine silver tube); wet variolation (a cotton swab impregnated with pus from the smallpox vesicles was inserted into the nostrils); and variolation through clothing (a susceptible child was clothed for a few days with the undergarment of another one suffering from smallpox) [18,21,29,34]. It is worth noting that although water and dry variolation methods were devoid of danger for the variolated person because these methods used smallpox scabs of a child fully recovered from the disease, clothing and wet variolation methods could occasionally cause death because they were practiced with living matters [19,29,34]. Nevertheless, case–fatality rates were far lower in variolated peoples: About 1–2% died of smallpox against the 20 or 50% of those who contracted the disease naturally.

This preventive method was later introduced into the Americas and also into Europe after Lady Mary Wortley Montague (1689–1762), who learned about it when her husband was ambassador to Turkey, successfully used it on her own children. In Europe, variolation consisted in the cutaneous inoculation of pus or scab material from an infected patient into a susceptible person. The variolated would develop a mild form of the disease and be immune after recovery. Nevertheless, variolation was not easily or rapidly adopted by European and American populations. It was the matter of great debates between physicians because it was known to cause epidemics and/or fatal illness in some cases. By the end of the eighteenth century and in the beginning of the nineteenth century, it was progressively supplanted in Europe by Jennerian vaccination with cowpox virus [13,18,21,23].

In the Middle East, there is some proof of the existence of smallpox before the sixth century when a smallpox epidemic struck Ethiopian invaders threatening Mecca. During the tenth century, the Moslem physician Rhazes (al-Razi, 850–925) published a *Treatise on the Smallpox and Measles*, differentiating, for the first time in the history of the Western world, its symptoms from those of the measles, and revealing smallpox to be a common childhood disease in Southwest Asia at his time [13,18].

In Europe, there is no evidence of smallpox epidemics before the fourth century. When the Huns invaded France in 541, they beheaded on the doorstep of the Cathedral of Rheims the bishop who was said to have recovered from smallpox the year before. Because of this, he became after his canonization the patron saint of smallpox victims in Europe under the name of Saint Nicaise (Nicasius) [18]. In any case, although widespread, smallpox does not seem to have been among humanity's chief curses in Europe until the eighteenth century when it maintained high mortality rates, accounting for 10–15% of all deaths in some European countries, the majority of the victims being under 10 years of age [13,18]. Edward Jenner, the discoverer of the vaccination that replaced the variolation (or inoculation) method, estimated to 45,000 the annual number of victims of the disease in England. In European colonies in Asia and Africa, smallpox continued to claim for great numbers of victims until the early nineteenth century when immunization procedures

were introduced [18]. The disease continued to rage in some countries of the Middle East until systematic vaccination campaigns, coordinated by World Health Organization (WHO), finally eradicated the disease. Between 1966 and 1977, national eradication campaigns (mass vaccinations, surveillance of smallpox outbreaks, etc.) were conducted by WHO in many countries and, in 1980, smallpox, one of the most dreadful and deadly diseases of humans, was officially declared as eradicated from the face of the world.

Unlike other epidemic diseases (e.g., cholera, as we will see later), smallpox attacked the rich and the poor alike. Contrarily to what happened with other pestilential diseases (e.g., plague and cholera) and despite its fearful and horrible clinical manifestations and the fact that it maintained high mortality rates in the seventeenth and eighteenth centuries, smallpox did not give rise to special popular reactions in Europe. It was considered a “familiar” or a childhood disease, being well integrated in the habits [14]. But in ancient Asia (especially in India, Bangladesh, China, and Japan) as well as in West Africa (Dahomey, in particular) and in Latin America (Brazil and Cuba) countries, the disease bore a strong religious signification. In India, where smallpox has long been endemic and was particularly raging under the British rule,⁸ it occupied an important place in Hindu beliefs and rituals, being considered as a manifestation of the goddess *Sitala* (or *Shitala Mata*, literally, the “cool one” or “the chilly one,” an allusion to the high fever and burning sensation she was supposed to relieve). Greatly feared, she was worshipped in virtually every part of the country, particularly by mothers on behalf of their children to protect them from smallpox, to ensure a mild attack or to secure the recovery of those ill with the disease. Shrines were built, temples erected, and people held propitiatory ceremonies to prevent the disease from circulating among the villages [2,3,18]. According to Hopkins [18], “Classically, and especially in Bengal, Shitala is represented by a woman riding an ass, with a broom in one hand (to sweep the disease along or to sweep away nonbelievers), a water-pot in her other arm (to hold the germs or to soothe feverish victims), a winnowing fan on her head (to sift the smallpox germs), and dressed in red clothes, sometimes with polka dots.”⁹ Cults to a goddess of smallpox were also reported in Bangladesh, China, and Japan.

For the Dahomeyan Yoruba (West Africa) as well as for the descendants of Yoruba who were brought to Brazil as slaves where they sought to maintain the cultural practices of their homeland, smallpox was attributed to an earth god named

⁸Accounting for several million deaths in the late nineteenth century alone, it was considered by British officials as “the scourge of India” [2,3].

⁹Interestingly, the variolation in India was considered as a religious ritual, involving a special dietary or ritual preparation, being performed by specific persons (the religious specialists *brahmins* in Bengal or the practitioners *tikadars* “mark-makers” in eastern India, for example) and accompanied by songs and prayers invoking the benevolence of the smallpox goddess. In contrast, vaccination, which was introduced by British medical officers in India at the beginning of the nineteenth century, did not bear a religious connotation [2,3].

Obaluaye (King of the Earth) in Yoruba land, *Omulu*, *Sapalá*, *Xapanã*, or *Obaluaê* in Afro-Brazilian religious cults (*candomblé* religion). Considered as the god of smallpox, he was known to punish people with the disease for wrong doing and also has the ability to cure it. Smallpox cults with offerings were organized to appease the smallpox deity in order to prevent the disease circulating among the communities [18,27]. In northeast Brazil, *Obaluaê* was identified with Christian saints as, for example, St. Roche, St. Sebastian, St. Lazarus, and St. Benoît [32, cited in 18] but, interestingly, not with St. Nicasius, the patron saint of smallpox in Europe [18].

In the sixteenth century, smallpox was unwillingly transported by Europeans into the New World still free from the disease, causing million victims among the indigenous populations.¹⁰ In some cases, it was intentionally introduced through contaminated blankets among the Native Americans in order to resolve the “Indian problem” [11,30,33]. In many cases, as historical records showed, smallpox opened the way to European conquest and colonization of indigenous lands in the Americas, helping, for instance, Spanish colonists to knock down the pre-Colombian Aztec and Inca empires. European rapidly noticed an ethnic preference of the disease. A.F. Brandão, for instance, noted in his *Diálogos das Grandezas do Brasil* [*Dialogues on the Greatnesses of Brazil*] written in 1618 that “Fortunately, by the grace of God, smallpox affects only the natives, those who came from the African coast [African slaves] and the descendents of Whites and Indians that we name *mamelucos*. It was never transmitted to persons arriving from Portugal where they had been raised, be they of Portuguese or of any other European origin” [8].

The observation of a pathological selectivity of the disease (also made in other Latin American countries) was correct considering the fact that, at the time of the European conquest of the New World, smallpox was a childhood disease in Europe. Ignoring the causal agent of the disease, colonists and missionaries, who were assisting to the native demographic collapse, appealed to the only explanation they knew: that of the divine will. If epidemics were so catastrophic among the natives, it was, they thought, because of their moral and/or religious inferiority. The Christian God was pointing out the necessity of the spread of the Faith to all the natives and/or was punishing them for presumed crimes against nature (e.g., cannibalism) or for their simple reluctance to receive the Word [11,12]. Panic-stricken in front of this terrible and unknown scourge, Indians rapidly associated it with the arrival of the Whites and their goods into their territories. As some Jesuits noticed, they “die so easily that the bare look and

smell of a Spaniard causes them to give up the ghost” [30, cited in 11; see also 12]. In any case, Native Americans quickly too perceived the pathological selectivity of the disease. Europeans were minimally affected whereas they were dying by millions. When Europeans caught the disease, it always had a benign course. Some indigenous groups felt betrayed by their gods or concluded that the Christian God possessed much greater power than their own [12,16]. Others saw the devastating epidemics as an expression of a “supernatural” or “magical” power of the Whites [4,22,23]. Still other ones, like the Desana of the Upper Rio Negro Region in Brazil, assimilated the White’s apparent immunity to smallpox and other contagious diseases, along with their multiplicity, opulence and technical mastering to a special ontological characteristic: Their highly contagious nature which seemed to express itself only at the expense of the proper Indian existence and reality [9]. Whatever it may be, it seems evident that indigenous interpretations of contagious diseases cleared the way for European penetration and expansion and, in some cases, also precipitated Indian conversion to Christian faith.

31.3 CHOLERA

Cholera, also known as “epidemic cholera,” “cholera *morbus*,” “Asiatic cholera,” or the “disease of the blue fear” (an allusion to the blue-grey skin of the patient, see [7]) is an acute debilitating diarrheal disease characterized by massive and uncontrollable vomiting and diarrhea of “rice-water stools” [15] resulting in a severe dehydration and reducing the patient to an apathetic state with sunken eyes and a blue-grey skin. It is caused by the *Vibrio cholerae* bacterium, which is disseminated through the fecal-oral route as a consequence of sewage and fecal contamination of drinking water and food. It is now widely recognized that the disease was endemic in South Asia for at least 2000 years, especially in the delta lands of Ganges in West Bengal and Bangladesh, from where it has spread periodically in epidemic form to other parts of India and eventually of Asia [3,28]. In any case, there are some references on the disease in the *Susruta Samhita* medical treatise already mentioned. Hindu festivals and pilgrimages, which attract and concentrate pilgrims from endemic and nonendemic areas from all over India, have often been the scene of cholera epidemics in the past [3,28].

Although epidemic cholera appeared in Europe only at the beginning of the nineteenth century, Europeans knew of the disease through the descriptions of explorers, naturalists, and traders.¹¹ The Portuguese explorer Gaspar Correia, for

¹⁰Smallpox, measles, influenza, typhoid fever, bubonic plague, malaria, yellow fever are some of the diseases that were unleashed on New World indigenous societies without prior experience of them. Along with forced labor, wars of extermination, deportation, and so on, they were responsible for a demographic collapse among the Amerindians. This “pattern of bacteriological invasion” [1] was repeated in the eighteenth and nineteenth centuries among the Australian aborigines, the New Zealand Maori or the Pacific Islanders with the same lethal impact.

¹¹There is some confusion in historical sources about the use of the term “cholera”. In Western Europe and in the Americas, before the nineteenth century, the term cholera (or its synonyms “cholera *nostras*” or “sporadic cholera”) designated endemic or sporadic diarrhea and historians agree that it was not caused by the vibrio. Today, the term cholera (“Asiatic cholera,” “cholera *morbus*,” or “epidemic cholera”) refers exclusively to the disease caused by the *Vibrio cholerae* [7,28].

example, reported the existence of “a disease, sudden-like, which struck with pain in the belly, so that a man did not last out eight hours time” [cited in 28]. The epidemic, which exploded in the spring of 1503 in the army of the Sovereign of Calicut, killed about 20,000 soldiers [28]. Other European reports repeatedly cited cholera epidemics in Goa in the 1600s, noting that the disease was more severe in June and July and that some epidemics were so devastating that people had no time to bury all the dead [28]. Garcia da Orta in his *Colloques des simples, des drogues et des choses médicinales de l’Inde*, first published in French in 1563, mentioned the presence in Goa of the cholera, highlighting its extreme virulence, the profound state of exhaustion it caused and the rapidity with which it killed an infected person. A “pestilential disorder” (probably a cholera-like disease) ravaged British troops in the Ganjam district of India in 1781 with 500 on a division of 5000 soldiers hospitalized. It reached Calcutta and other cities a few years later where it is said to have killed many persons and it continued to be reported in India during the rest of the eighteenth century and into the nineteenth century [3,28]. The virulence of the disease, which killed rapidly so many people, was frequently reported by European observers during the seventeenth and eighteenth centuries.

Although there are some discrepancies over the dates of the cholera pandemics (when they exactly began and ended), historians generally agree that, between the beginning of the nineteenth century and the second half of the twentieth century, cholera spread out of India, initiating a series of seven pandemic waves,¹² each one lasting a few years, that caused terror and panic and killed million persons all over the world [7,28]. The presence of English military troops and the augmentation of English commercial penetration in India and more largely in Asia are seen as the main factors that favored the dissemination of the disease out of the frontiers of the country [3,7,28]. Moreover, the intensification of commercial relations by navigation contributed to the multiplication of cholera epidemics during the nineteenth century.

The first of the pandemic waves, which initiated in the province of Bengal in 1817, had spread to other parts of India before reaching a few years later Ceylon, Burma, Siam (Bangkok), Malacca, Singapore, the Philippines, China, Java, Borneo, Persia, Egypt, the Caspian Sea shores, and Syria. It was during the second pandemic (about 1826–1837) that cholera reached for the first time Prussia, Poland, Hungary, Bulgaria, and Western Europe (England in October 1831, France in March 1832 where it killed about 100,000 persons). From Dublin, it crossed the Atlantic Ocean through an infected brig of emigrants and appeared in Quebec in June 1832. From there, it entered the United States. In 1833, it

reached Spain, Portugal, the Caribbean and Latin America and in 1835, Italy. In Mexico, it is said to have killed approximately 15,000 persons in a few time [28]. During the third pandemic (about 1841–1859), the disease entered Afghanistan with the British troops, and then China, Persia, Central Asia, Europe, the Near East, North and South America, North Africa, producing the worst cholera years ever reported. It was during this pandemic that John Snow, in his study of the Broad Street water pump in London, demonstrated the transmission of the disease by contaminated water.

During the fourth pandemic (about 1863–1875) which reached, in 1865, the Middle and the Near East, about one-third of 90,000 pilgrims succumbed at Mecca. Those who survived brought the infection to Suez and to the Mediterranean ports from where it reached Western Europe and Russia where it killed many persons [7]. It was during the fifth pandemic (about 1881–1896) which reached the Mediterranean shores of Africa and Europe, Russia, Germany, North and Latin America, China, and Japan, that the German bacteriologist Robert Koch identified (1883–1884) in Calcutta and Alexandria the causative agent of the disease, thus initiating the modern understanding phase of the disease. During this pandemic, cholera installed itself in an endemic form in the countries localized in east and south-east of India (Ceylon, Indonesia, Java, Thailand, China, Japan, and Philippines). The sixth pandemic (about 1899–1923) followed much of the same routes than the preceding ones but did not reach Western Europe. Finally, the seventh pandemic, contrarily to the precedent ones, arose in Indonesia (in 1961) before reaching Bangladesh, India, Russia, and Africa a few years later. In 1991, it touched the port of Chancay in Peru. From there, it diffused rapidly along the 2000 km of the Peruvian coast and reached in 1992 the majority of the South (Bolivia, Ecuador, Colombia, Chile, Venezuela, Brazil) and Central (Mexico, Guatemala, Salvador, Honduras, Nicaragua) American countries. About 300,000 persons were infected in Peru, with a mortality of 1% [26]. At the same period, an epidemic outbreak killed more than 10,000 persons in Africa. This seven pandemic is always of actuality in some parts of the world [28].

It was reported that cholera did not affect evenly communities and populations, attacking with more severity persons of low conditions [7,15]. Human concentrations deriving from pilgrimages, markets, feasts, and so on, also appeared to furnish the ideal conditions for the explosion of an epidemic outburst, as it was frequently reported in the past in India [3,28]. Although the disease was essentially imputed by medical authorities to some environmental conditions (weather, seasons, bad air and miasmas, dietary transgressions), the question of its contagiousness was a matter of debate between contagionists and infectionists. The identification by Koch of the causative agent of epidemic cholera (the vibrio) and the demonstration by Snow of the water-borne nature of the disease furnished the base for the recognition of the impact of socioeconomic and sanitary conditions on health. These two discoveries also proved the contagious character of the disease [15,28].

¹²The first six pandemics are attributed to the *V.cholerae* biotype 01. The seventh pandemic which, contrarily to the precedent ones, arose in Indonesia, was attributed to the *V.cholerae* 01 biotype El Tor serotype Inaba. Recent epidemiological works seem to account for an influence of the *El Niño* climatic phenomenon on the multiplication of the vibrio [26].

The 1832 cholera epidemic in Paris is particularly illustrative of the different social and political meanings that can be attached to a same epidemic event by different groups in a society. First, in France as well as in other European countries, cholera mortality was higher among popular classes than it was among upper classes that always had the possibility to flee to cholera-free regions, as we have seen in the case of the Black Death pandemic. Second, the rapidity of the evolution of the disease (it was said to kill a healthy person in a few hours) as well as the fact that it struck suddenly its victims in the more diverse settings (at home, in hospitals, in streets, in public places, in taverns after eating or drinking or in places frequented by beggars and unemployed, etc.) exalted popular imagination. To ordinary persons, some of its symptoms (massive and violent diarrhea, vomiting, spasms, and convulsions) look like the symptoms of poisoning. The fact that it can strike its victims after eating or drinking and the rapidity with which it killed also lent credence to the rumor of poisoning [15].

All over Europe, popular reactions were dominated by panic, fear of poisoning, and anger. Because the disease was first flourishing among the poor, these pointed out the same enemies. The cholera epidemic was a consequence of a plot hatched by external enemies (privileged classes, members of government and also medical doctors who were seen as their allies) to poison the poor by throwing poisons in local springs, wells, food, and drinks. Some imagined that it was in order to release their body for anatomical experiences on behalf of the rich, others that government agents tried to avert an imminent famine, reduce the burden of poverty by ruling out its main victims, resolve the problem of unemployment by eliminating unproductive elements of the society, or also to get rid of dissidents [7, 15]. Popular classes reacted violently. Rebellions and destruction of property took place. Suspects of poisoning were arrested, beaten, or massacred by the furious populace.

For their part, when rumors of cholera began to circulate, many members of the privileged classes tried to escape from the disease by fleeing to more healthy regions. When the disease invaded the rich districts of the city and they also began to fall ill and die from it, albeit in smaller numbers than members of the working classes, they attributed the contagion to a corrupted air arriving from the popular and impoverished districts of the city [15]. The rapid progression of the disease in the entire society and the high mortality rates registered in popular classes, they thought, was a consequence of the “barbarousness” and “moral inferiority” of the poor. These were blamed as being incubators and disseminators of the disease, a threat to public welfare and fomenters of riots [15]. The 1832 cholera epidemic, which killed 20,000 persons only in Paris, acted in this way as a revealer of social and political hate and class antagonisms.¹³

¹³See [3] for another example of the diversity of meanings that were attached to cholera epidemics in India under the British rule.

31.4 CONCLUSION

In the past and more recently, as the advent of AIDS in the 1980s reminds us, epidemic diseases take on a wider significance, serving to prove, undermine and/or reshape religious, social and political ideas and attitudes. Their dissemination and impact on human populations were often influenced by social and political factors. Moreover, they can affect different groups in a society in varying ways and degrees. Different and sometimes divergent meanings can also be attached to a same epidemic event, as we saw for the 1832 cholera epidemic in Paris. In some cases, epidemic diseases contributed to the renewing of official medical thought and practice. Social and public-health measures applied in some European countries during the Black Death years, although largely ineffective given the natural history of the disease, nonetheless furnished the basis for public-health policies for subsequent epidemics. The 1832 cholera epidemic in Paris, and more generally in France, revealed the impact of living conditions and sanitation on health, contributing to the development of private hygiene and public sanitation and to the reinforcing of the medical power. These founding events like many others, as for example, the discovery of the causative agents of the diseases, caused a revolution in public health and medicine that led to the dream of the eradication of the infectious diseases all over the world. The advent of AIDS as well as the recent emergence of new or previously unrecognized virus and/or the resurgence of infectious diseases once thought to be controlled, put unfortunately an end to this optimism in countries complacent with their success in banishing infectious diseases worldwide.

REFERENCES

1. Arnold D. Introduction: disease, medicine and empire. In: *Imperial Medicine and Indigenous Societies* (ed. D. Arnold), Chapter 1, Manchester University Press, Manchester, UK and New York, USA, 1988, pp. 1–26.
2. Arnold D. Smallpox and colonial medicine in nineteenth-century India. In: *Imperial Medicine and Indigenous Societies* (ed. D. Arnold), Chapter 3, Manchester University Press, Manchester, UK and New York, USA, 1988, pp. 45–65.
3. Arnold D. *Colonizing the Body. State Medicine and Epidemic Disease in Nineteenth-Century India*, University of California Press, Berkeley, Los Angeles, USA, 1993.
4. Axtell J. *The Invasion Within: The Contest of Cultures in Colonial North America*, Oxford University Press, New York, USA, 1985.
5. Biraben J-N, Le Goff J. La peste dans le Haut Moyen-Âge. *Ann: Econ Soc Civilisations* 1969;24(6):1484–1510.
6. Biraben J-N. *Les hommes et la peste en France et dans les pays européens et méditerranéens: Tome I. La Peste dans l'histoire* (1975); Tome II. *Les hommes face à la peste* (1976), Mouton & Co. and Ecole des Hautes Etudes en Sciences Sociales, Paris, France, 1975–1976.
7. Bourdelais P, Raulot J-Y. *Une peur bleue: histoire du choléra en France*, Payot, Paris, France, 1987.

8. Brandão AF. *Diálogos das Grandezas do Brasil*, Fundação Joaquim Nabuco, Editora Massangana, Recife, Brazil [text dating from 1618 and first published in 1883–1887], 1997.
9. Buchillet D. Perles de verre, Parures de blancs et “Pots de paludisme”. *Epidémiologie et représentations Desana des maladies infectieuses (Haut Rio Negro, Brésil)*. *Journal de la Société des Américanistes* 1995;**81**:181–206.
10. Carmichael AG. Bubonic plague. In: *The Cambridge World History of Human Disease* (ed. K.F. Kiple), Chapter VIII-21, Cambridge University Press, Cambridge, USA, 1993, pp. 628–31.
11. Cook ND. *Born to Die. Disease and New World Conquest, 1492–1650*, Cambridge University Press, Cambridge, USA, 1998.
12. Crosby AW, Jr. *The Columbian Exchange. Biological and Cultural Consequences of 1492*, Greenwood Press (Contributions in American Studies No 2), Westport, Connecticut, USA, 1972.
13. Crosby AW, Jr. Smallpox. In: *The Cambridge World History of Human Disease* (ed. K.F. Kiple), Chapter VIII-128, Cambridge University Press, Cambridge, USA, 1993, pp. 1008–13.
14. Darmon P. *La longue traque de la variole. Les pionniers de la médecine préventive*, Librairie Académique Perrin, Paris, France, 1986.
15. Delaporte F. *Disease and Civilization. The Cholera in Paris, 1832*, The MIT Press, Cambridge, MA, USA, 1987.
16. Dobyns HF. *Their Number Become Thinned. Native American Population Dynamics in Eastern North America*, The University of Tennessee Press, Knoxville, USA, 1983.
17. Duffy J. Smallpox and the Indians of the American Colonies. *Bull History Med* 1951;**25**:324–41.
18. Hopkins DR. *Princes and Peasants. Smallpox in History*, With a foreword by G.I. Lythcott, The University of Chicago Press, Chicago, USA, 1983.
19. Huard P, Wong M. *Chinese Medicine*, McGraw-Hill, New York, USA, 1968.
20. Leung AKC. Diseases of the premodern period in China. In: *The Cambridge World History of Human Disease* (ed. K.F. Kiple), Chapter VI-2, Cambridge University Press, Cambridge, USA, 1993, pp. 354–61.
21. Leung AKC. Variolisation et vaccination dans la Chine prémoderne (1570–1911). In: *L'aventure de la vaccination* (ed. A.-M. Moulin), Fayard (Penser la Médecine), Paris, France, 1996, pp. 57–70.
22. Martin C. *Keepers of the Game: Indian-Animal Relationships and the Fur Trade*, University of California Press, Berkeley, Los Angeles, USA, 1978.
23. McNeill W.H. *Plagues and Peoples*, Anchor Doubleday, Garden City, New York, USA, 1976.
24. Naphy W, Spicer A. *The Black Death*, Tempus Publ, Gloucestershire, UK, 2000.
25. Park K. Black Death. In: *The Cambridge World History of Human Disease* (ed. K.F. Kiple), Chapter VIII-16, Cambridge University Press, Cambridge, USA, 1993, pp. 612–6.
26. Parola P, Raoult D. Changements climatiques et maladies bactériennes. *Arch Pédiatr* 2004;**11**:1018–25.
27. Prandi R. *Mitologia dos Orixás*, Companhia das Letras, São Paulo, Brazil, 2001.
28. Speck RS. Cholera. In: *The Cambridge World History of Human Disease* (ed. K.F. Kiple), Chapter VIII-27, Cambridge University Press, Cambridge, USA, 1993, pp. 642–9.
29. State Administration for Traditional Chinese Medicine, *Advanced Textbook on Traditional Chinese Medicine and Pharmacology*, Vol. I. *History – Basic Theory – Diagnostic*, New World Press, Beijing, China, 1995.
30. Stearn EW, Stearn AE. *The Effect of Smallpox on the Destiny of the Amerindian*, Bruce Humphries, Boston, USA, 1945.
31. Upham S. Smallpox and climate in the American Southwest. *Am Anthropol* 1986;**88**:115–28.
32. Verger P. Notes sur le culte des orisa et vodun. *Mémoires de l'Institut Français d'Afrique Noire* 1957;**51**:236–69.
33. Wallace A.R. *A Narrative of Travels on the Amazon and Rio Negro*, Dover Publ, London, UK, 1853.
34. Wang Z, Chen P, Xie P. *History and Development of Traditional Chinese Medicine*, Science Press (Advanced TCM Series, Vol. 1), Beijing, China, 1999.
35. Watts S. *Epidemics and History: Disease, Power, and Imperialism*, Yale University Press, New Haven, USA, 1997.

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