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THE DECLINE OF PLAGUE IN EGYPT IN THE NINETEENTH CENTURY

Among the epidemic diseases which loom large in history, plague continues to hold particular interest for demographers, epidemiologists and social historians. New research periodically revives debate on the origins of the Black Death, or the reasons for the gradual retreat of plague from Europe ; was the disease contained and eventually eradicated primarily by economic and social improvements, or were biological factors — changes in the rat and flea vectors — the major causes for the decline ?

Another aspect of the debate involves the disputed role of quarantine establishments : were they effective in restricting the transmission of plague, as their supporters claimed ; or were they useless and vexatious bureaucratic encumbrances on the free passage of goods and persons, as their opponents insisted ? In his classic study on the conquest of plague, L. Fabian Hirst expressed doubt that sanitary cordons or quarantines could have stopped the progress of plague, since they did not take into account the rat-flea nexus, a concept which was unknown before the 20th century.

On the other hand, the great historian of plague, Jean-Noel Biraben, has proposed that, although quarantine measures multiplied in a random fashion following the 14th century Black Death, they gradually became more rational and eventually effective, as a result of empirical observation. Aided by a vague apprehension of the validity of the contagionist theory and a slow accumulation of experience and observation, quarantine officials increasingly emphasized the principle of isolation in modifying their procedures. In the seventeenth century they established an international intelligence network by requiring maritime bills of health denoting the presence or absence of plague in a vessel's port of origin. By the nineteenth century, according to Biraben, issuance of these certificates, combined with the two other major instruments of control — detention of vessels' cargoes and passengers (traditionally for 40 days), and isolation of suspected sources of infection in a lazaretto — could effectively contain and neutralize the dread disease. Thus, Biraben suggests that the Ottoman Empire's adoption of the European maritime quarantine system in 1841 brought immediate results in controlling the disease, and was in fact the single most important factor in the elimination of plague from the entire Mediterranean basin.

It is a historical fact that in Egypt, which was part of the Ottoman Empire at that time, the incidence of plague did indeed decline after 1841. It disappeared temporarily after 1844, and was not reported again until 1899, when it broke out in Alexandria during the third plague pandemic. But it is difficult to support a claim for the elimination of plague by quarantines alone, because they were never observed universally. In 1834 Egypt suffered a prolonged and devastating plague

epidemic which provoked a heated controversy over the etiology of the disease which was not settled until 60 years later, when Yersin discovered the specific causative pathogen in 1894. At the time of the epidemic public opinion divided into two antagonistic camps : ardent partisans of the principle of transmissibility of plague, and equally fervent opponents of the so-called « contagionist » hypothesis which underlay quarantine procedures. Opposition to quarantine measures among both Europeans and Egyptians was illustrated vividly during the epidemic beginning in 1834. We propose to examine that experience and to question whether the quarantine system could have been effective under the prevailing circumstances. A few general observations about the incidence of plague in Egypt may be appropriate first.

Epidemiologists today agree that only the Egyptian littoral, with its Mediterranean climate, is naturally vulnerable to plague. All of Egypt south of Cairo normally is too hot and dry to be susceptible to enzootic plague were it not for the Nile irrigation system which provides harborage for rats in the embankments along canals. Upper Egypt, however, was not extensively irrigated until the 1870's, therefore, a permanent rat-flea population of sufficient density to cause an epidemic was unlikely in the early 19th century, when a meager three to four million people inhabited the Nile Valley. However, river craft carried flea-bearing rats from the delta to ports on the Nile, and temporary concentrations of rats and fleas at optimum meterological conditions during a plague outbreak could and occasionally did trigger an epidemic in Upper Egypt. Historically, plague epidemics originating in Upper Egypt disseminated as pneumonic plague, causing extraordinarily high mortality. Normally, however, the Mediterranean port cities, Damietta, Rosetta and Alexandria, with their greater abundance of rats, suffered more frequent outbreaks.

It seems clear that Egypt was never free from plague for long intervals after the sixth century plague of Justinian. In Muslim chronicles, the mid-14th century pandemic known in the West as the Black Death, which had a catastrophic impact on Egypt's population, ranks chronologically as the sixth major epidemic. Severe epidemics, perhaps denoting pneumonic plague, recurred periodically during the century after the Black Death, followed by population recovery while plague outbreaks were relatively mild and infrequent during the 16th and 17th centuries. The number and intensity rose again, however, in the 18th and early 19th centuries.

During Napoleon's conflict with England, the French expeditionary force in Egypt struggled to prevent a major outbreak of plague, but witnessed one of the country's worst epidemics in 1801. The Arab historian, Abd al-Rahman al-Jabarti, does not mention plague after 1801 until 1812, but he then refers to actual, rumored or anticipated outbreaks annually or every year until 1824. From these accounts we learn that, as in Europe during the 16th and 17th centuries, a pattern of official activity evolved. In January, when plague usually broke out in one of the coastal cities, temporary quarantines were established at Alexandria and Damietta, the ruling family left the capital for Upper Egypt, while the Viceroy went into isolation across the river from Cairo. The government ordered all streets cleaned, and adopted rigorous fumigation procedures for official correspondence, but took no action to protect the inhabitants of the country.

During the interval between the last epidemic in 1824-1825 and the outbreak in 1834, however, many developments had changed the Egyptian government's attitude toward the threat of disease. The Viceroy, Muhammad Ali, had expanded the armed forces and had mobilized large numbers of people to work in dockyards and factories producing military equipment, or to train for government service in state schools. Safeguarding the health of this manpower had become one of his highest priorities. In response to a cholera epidemic, the Viceroy also had conferred unrestricted powers on a Quarantine Board composed of European consular representatives, which had organized a comprehensive and permanent

quarantine establishment in Alexandria. The Egyptian Government was prepared to enforce detention and isolation measures recommended by the European Quarantine Board with strict police action.

Those control measures, however, aroused fierce resistance among both Egyptians and Europeans in the country. For different reasons (which limited time and space do not permit detailling here), the majority of Egyptians and Europeans ignored, evaded, or opposed the emergency restrictions implacably. Among Egyptians there was widespread evasion of government rulings to separate the sick from the well. Fear of being transported to the lazaretto in Alexandria or the quarantine station outside Cairo caused people to hide the sick, and illness was rarely reported to the authorities until it had ended in death. Muslim women charged to verify the cause of death among members of their sex routinely falsified their declarations. To avoid discovery of plague, families would bury their dead in the courtyards of secretly deposit their corpses in the streets at night. As the epidemic grew more intense and the number of deaths rose from day to day, it proved impossible to enforce detention and isolation regulations. When the number of new plague cases in the capital approached a thousand a day, it had already far exceeded the authorities capacity to transport and accomodate them at the quarantine station.

Opposition to quarantine practices among Europeans had a wide range of motivations. Many reformers' reactions against the archaic, unexamined and sometimes illogical regulations were well-founded and sincere; as were those who saw a causal connection between the regularity of the NIle's seasonal inundations and the periodicity of plague outbreaks, and therefore considered Egypt « the cradle of the plague ». Many enlightened Physicians had rejected the so-called « contagionist » hypothesis on which quarantine practices were based. And many trade representatives resented the restrictions simply as interference with private enterprise. When the Egyptian government established a cordon sanitaire around Alexandria at the first signs of plague, the community of European merchants protested vigorously that the suspension of trade would cause them great suffering. We should remember as well that the liberal temper of the times was resistant to any authoritarian controls. Finally, many Europeans in Egypt simply resented any diminution of the immunity from domiciliary search which they enjoyed as citizens or subjects of the great powers of the 19th century.

It appears that Europeans resident in Egypt later followed Egyptians' example of hiding the sick or the dead during an outbreak of plague, but at this time is was common for them to resist quarantine by force. Such incidents often became armed confrontations between Quarantine Board officials and the police on one side, and a crowd of supporters for the family threatened with detention on the other side. The Viceroy became « tired of these scenes », we are told, and instructed the police to call three times for Europeans' compliance with regulations, and if they continued to resist after the third summons, to fire.

The plague epidemic which broke out in July, 1834 and did not end, technically and officially, until the end of October, 1837, was one of the worst in Egypt's modern history. According to European consuls' reports, at its peak, during the eight months between November 1834 and July, 1835, at least 75,000 people died in Cairo alone, and perhaps 200,000 in all Egypt.

In view of this staggering mortality, the widespread evasion of domestic quarantines in Egypt, and considerable later evidence that maritime regulations, especially bills of health, were circumvented with even greater determination

and deception, is there any justification for claiming that the quarantine system did indeed play a role in the decline of plague in Egypt ?

To phrase the issue differently : were the quarantine procedures enforced by the government effective at all, or were they, as their opponents saw them, simply additional hardships inflicted on an already suffering populace ? On this point the opponents of quarantines were weak, for positive evidence outweighed the negative, and the establishments which escaped during the plague epidemic generally were those isolated from the community. Although restrictive measures on the entire urban population of Alexandria or Cairo had proved unenforceable, the Egyptian government nevertheless did not relax quarantine regulations for hospitals, schools, military units, the fleet, all government installations, and the ruling family's palaces. Cordons were ordered around all hospitals, military units, government installations and schools, and supervisors were enjoined to observe the traditional Frank precautions against admitting any objects « susceptible » to disease transmission. These hit-or-miss measures traditionally included the destruction of any stray animals, which must have, at least in some cases, prevented the intrusion of infected rats and fleas into segregated premises. Public baths were closed and regiments garrisoned in towns and villages were evacuated to the desert until the plague had passed.

In the final summing-up, schools where students were confined in buildings ringed by a military cordon and the supervisor stood guard with a loaded rifle, were spared throughout the epidemic ; the dockyards, where 6,000 workers were effectively detained by a military cordon, and the Viceroy's palace, where elaborate precautions were enforced strictly, were struck only after quarantine restrictions were lifted. Critics of the quarantine system, who had a wide following at this time and used the Egyptian experience to support their views, neglected to mention in their writings what the European consuls reported : that plague did indeed break out among those who had been quarantined in 1835, but not until 1836, when restrictions had been lifted.

To clarify the disappearance of plague from Egypt between 1844 and 1899, we can draw on the literature on plague in Europe. In addition to quarantine procedures, epidemiologists and historians have suggested four possible explanations for plague's withdrawal from western Europe after the 17th century : a gradual development of immunity to the bacillus among people subject to contact with plague-bearing rats and fleas ; a gradual development of general resistance to disease gained from improved nutrition ; improvements in housing which separated flea-bearing animals from human habitation ; and changes in the dominant rat and flea species. The fourth factor may explain the establishment of a locus for plague in Upper Egypt in the 20th century. According to Wakil's study of the third pandemic, the brown rat and the flea *xenopsylla cheopis* settled permanently in the area, probably after perennial irrigation was introduced in 1903. However, none of the other factors satisfactorily explains the decline of plague in Egypt. A gradual development or decline of immunity has been only relative and temporary. As for improved nutrition, housing and general living standards, it is not clear that the masses of poor Egyptians enjoyed a higher level of living at mid-century than they had at the outset of the nineteenth century. Egypt's increase in population has been attributed primarily to the elimination of epidemic disease and of compulsory military service. Contemporary accounts indicate that, because of growing population pressure in urban and seaboard communities, poorer Egyptians' living conditions probably deteriorated during the 19th century.

Thus, cumbersome, hit-or-miss and frequently irrational as they were, the traditional quarantine procedures must have, at least occasionally and fortuitously, excluded plague-bearing rats and fleas, and they remain the most likely explanation for the decline of plague in Egypt.

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