

Theories to explain the decline of plague. Alan Macfarlane

A number of hypotheses have been put forward. One is a set of arguments concerning the biological adaptations to the disease. For instance, it has been argued that there was some accidental mutation in the disease, **yersinia pestis**, or its human host, which caused it suddenly to disappear. Yet there has been no sign of such mutation. It seems unlikely that people acquired immunity to it. As Post writes, 'The suggestion that bubonic plague disappeared from western Europe as a consequence of acquired natural immunity seems untenable.'¹ Furthermore, as Slack points out, where it continued, as in Turkey, 'There is no sign of any decline in the disease's infectivity or virulence in the later seventeenth century. There are similar objections to the argument that a build-up of human or rodent resistance to the disease explains its withdrawal.'² Having shown no signs of acquiring such immunity for three hundred years, it seems unlikely that more or less over-night the whole population of Europe simultaneously and suddenly became immune to the disease.

A second hypothesis concerns the favourite vector, the **black rat**. If it is indeed the case that much disease was caused by **rattus rattus**, it has been suggested that the replacing of the black rat by the Asian or brown rat might explain the rapid disappearance of plague. There are two insurmountable problems here. The first is timing. Plague disappeared in western Europe in the 1660s. The brown rat reached England in about 1728 and most of Europe in the 1750s. This is clearly much too late. The second problem is that it appears that the brown rat was just as lethal as the black. As Zinsser put it, the brown rat 'carries diseases of man and animals - plague, typhus, trichinella spiralis, rat-bite fever, infectious jaundice, possibly Trench fever, probably foot-and-mouth disease and a form of equine 'influenza'. Its destructiveness is almost unlimited.'³

A third hypothesis concerns possible alterations in the material environment. It is suggested that various changes occurred in Europe from the middle of the seventeenth century which made the environment less propitious for rats and fleas. Lord Kames in the middle of the eighteenth century suggested that 'Before the great fire **anno** 1666, the plague was frequent in London; but by widening the streets and enlarging the houses, there has not since been known in that great city, any contagious distemper that deserves the name of a plague'.⁴ He also wrote that 'The plague, pestilential fevers and other putrid diseases, were more frequent in Europe formerly than at present, especially in great cities,

¹Post, Modernization, 34

²Slack, Plague, 322

³Zinsser, 202

⁴Kames, ii, 89.

where multitudes were crowded together in small houses, separated by narrow streets'.⁵ This was a widespread view among English doctors. For instance Black wrote of 'That fortunate disaster which consumed a magazine of putrefaction; together with widened streets, ventilation, cleanliness, a more plentiful supply of water and many other causes, have all contributed to the extinction of this exotic incendiary.'⁶ In the early nineteenth century, Malthus thought that the sudden ending of the mortality caused by plague after 1666 in London was due to 'the removal of nuisances, the construction of drains, the widening of the streets, and the giving more room and air to the houses', which 'had the effect of eradicating completely this dreadful disorder...'⁷ Unfortunately for this theory, as Creighton pointed out, the area burnt down in the Fire of London was not that in which plague deaths mainly occurred.⁸ Creighton did believe that a general rise in the standard of living was probably the main cause for the decline of plague, however.⁹

This argument does take us some way. It would appear that for a number of years after the Black Death, plague may have become endemic in western Europe, re-infecting the population. For this to happen, a very dense population of rats and fleas are required to carry on the plague from year to year. It could be argued that after western Europe was hit by plague in the middle of the fourteenth century, for the next three hundred years the living conditions in terms of housing, sanitation, diet, clothing and cultural patterns were such that plague remained endemic. For the only time in history, perhaps, western Europe became an epi-centre of plague. This form of re-infection from within may have become less possible with the kind of improvements in housing, drainage and other aspects of the material environment which Kames, Black and Malthus described. As Zinsser put it, 'Plague epidemics in man are usually preceded by wide-spread epizootics among rats; and under the conditions of housing, food storage, cellar construction, and such, that have gradually developed...rats do not migrate through cities and villages as they formerly did'.¹⁰ But this may have occurred in much of England well before the seventeenth century. Creighton, who provides a detailed account of the plague in England, noted that there seems to have been a shift in the location of plague. From about 1465, plague became basically a

⁵Sketches, i, 244

⁶Black, Arithmetical, 66

⁷Malthus, ii, 2153

⁸Creighton, Epidemics, ii, 43.

⁹Creighton, Epidemics, ii, 39.

¹⁰Zinsser, Rats, 93; cf also Nikiforuk, fourth, 60

disease of towns, being largely absent in the countryside. Later it was largely confined to London and one or two large cities.¹¹

Such changes in the material environment, however, cannot explain the sudden and virtual disappearance of plague all over western Europe from the later seventeenth century. There are, for instance, far fewer signs of the kind of improvement Malthus alluded to in most other European cities. Furthermore, many of the improvements seem to have come **after** the disappearance, rather than before. Thus while it is reasonable to suggest 'More frequent changes of linen as standards of living rose in the later seventeenth and early eighteenth centuries no doubt freed many early modern Englishmen from the host of fleas which were a necessary condition for major urban epidemics,'¹² Slack is well aware that this cannot explain the original disappearance. 'By the end of the eighteenth century environmental improvements had no doubt made serious epidemics of plague in the more prosperous parts of Europe unlikely; but they do not explain their complete disappearance as early as the 1660s.'¹³

We then come to a further set of hypotheses. These are based on recent findings concerning the ways in which plague spread geographically. Appleby, Slack and others have argued that plague was 'continually re-imported as a result of overseas trade contacts'.¹⁴ Slack has come to the conclusion in studying English plague epidemics that 'Plague was always imported into Britain. We have seen the role of ports - Hull, Yarmouth and Plymouth as well as London - at the beginning of each epidemic wave. The disease might linger for several years afterwards, as it spread from one town to another; but in the end it disappeared and had to be reintroduced from outside.'¹⁵ This was not only true at the English, but also at the European level. 'So far as England is concerned, therefore, plague was an invader. It came in waves at irregular but frequent intervals, causing high mortality to begin with and only slowly dying away. The same might be said about Europe and the Mediterranean lands as a whole.'¹⁶ Thus 'studies of plague in Europe show that major epidemics in London and then in other English towns were the consequence of waves of infection sweeping across the whole Continent and coming into England from

¹¹Creighton, *Epidemics*, i,233; ii,42.

¹²Slack, *Plague*, 322

¹³Slack, *Plague*, 323

¹⁴Walter; Schofield, 62

¹⁵Slack, *Plague*, 313

¹⁶Slack, *Plague*, 14

outside.¹⁷ For instance, 'The last major plague epidemic in north-western Europe has been traced to Dutch ships returning to Amsterdam from Smyrna in 1663.'¹⁸

If it was the case that plague was constantly being brought in along trade routes, attention is focused on macro-changes in such routes. Such explanations are particularly attractive since it is clearly only some very large change, affecting all of western Europe, which can account for the practically simultaneous decline of plague throughout western Europe in the 1660s.

One theory is that there was a switch in the pattern of trade. This theory has several variants. One is the argument that '...the fact that northern Europeans turned to an Atlantic-based trade, shifting markets away from the Mediterranean to colonies in the Western Hemisphere and to the Far East, may be related to the decline of plague first in Great Britain, Scandinavia, and the Low Countries.'¹⁹ This may be a part of the reason, but if the change was spread over a number of decades, it is difficult to see why the 1660s were a turning point. Furthermore, plague vanished equally fast in Mediterranean western Europe. A supplementary theory was put forward by McKeown. He argued that 'Bubonic plague disappeared from London and from England because the maritime importations of *Pasteurella pestis* in plague-infected ship rats from European and Levantine ports ceased.' The reason for this is simple; 'the development of the all-sea trade between Europe and India, which abolished the caravan route for merchandise from the East across Asia Minor and with it the 'rodent pipe line' for the transit of *P. pestis* from its Indian home land to the ports of the Levant.'²⁰ Again this may be one factor, though the change was too spread out to account for the 1660s decline. What is true, as Slack points out, is that 'If ships from infected ports overseas or passengers and goods leaving infected English towns could be stopped, those epidemic waves which swept across Europe and then across England might be cut short.'²¹

This takes us to the last variant of the theories related to the cutting of the source of infection, namely that conscious national and international measures were taken to set up a **cordón sanitaire** to prevent plague from coming in from the East, and particularly through Turkey from India. The arguments are summarized by Flinn. 'It is likely that bubonic plague was extinguished in western Europe during the seventeenth century by vigorous local action that prevented the disease from spreading once it appeared

¹⁷ibid, 13

¹⁸Post, Modernization, 34

¹⁹Kiple (ed), Diseases, 282

²⁰Modern Rise, 88

²¹Slack, Plague, 315

and during the eighteenth century by national governmental migration of infection.²² This was indeed clearly important in the eighteenth century as contemporary observers noted. For example in the middle of the eighteenth century Black wrote of plague that 'It rarely now gains admittance, by stealth, into any of the European ports (Constantinople excepted) or even if imported to our shores, the wise precautions and regulation, enacted by quarantines, soon check its irruption and progress. This is a most interesting epoch and improvement in the police of modern states; for the original institution and rough draft of which, about 300 years ago, we are indebted to the Venetians.'²³ He wrote that 'At present, in all the Mediterranean ports they are, from fatal experience, scrupulously vigilant to guard, by a circumvallation of alarm posts, against the pestilential infection, and the clandestine entry of infected goods or merchandise.'²⁴

While this may help to explain how plague was kept at bay in the eighteenth century, it is difficult to see how it can explain the sudden disappearance in the 1660s. As Black(?) noted, attempts had earlier been made to provide a quarantine. We are reminded that 'From the very beginning of the epidemic, however, the populations of a number of European cities - above all, in central and northern Italy, which boasted a highly developed order or municipal and medical institutions - reacted aggressively in a largely futile attempt to protect themselves from the disease.'²⁵ Why was there suddenly universal success? 'There is no evidence...that noticeable improvements had occurred in this respect after 1660 until at least the end of the eighteenth century.'²⁶ We can only conclude with Slack that 'It would therefore be as simplistic to search for a single explanation for changes in the distribution of plague as for a single explanation for a political or an industrial revolution.'²⁷

²²Flinn, European (xerox), 61

²³Black, Arithmetical, 67

²⁴Black, Arithmetical, 66

²⁵Kiple (ed), Diseases, 615

²⁶Glass (ed), Population, 574

²⁷Slack, Plague, 312