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The Unification of the Globe by Disease (14th to 17th Centuries)¹ – I.



“The Black Death” – anon. – 15th century

The extraordinary upsurge of interest in the environment, and concern about pollution that characterizes contemporary civilization, has had the beneficial effect – as often happens – of obliging historians to rethink their ideas on certain important aspects of the past, in terms of present-day preoccupations. But when we look back from the twentieth century to the sixteenth, such “rethinking” requires a total change of perspective, indeed of direction. Despite its progress, for good or ill, towards an antiseptic and aseptic environment, our own civilization is confronted even now occasionally, sometimes more urgently than in the past, with dangerous outbreaks by virus or germ caused by increased facilities for contacts and transport. Various influenza viruses, for example, from Hong-Kong or elsewhere, have already circled the world more than once, thanks to jet airliners carrying infected passengers. Cholera, too, though not as terrifying a disease as it was in the 19th century, has made the leap from the poverty-stricken areas of Asia and Black Africa to the summer tourists in the Mediterranean. But the fact remains that the great environmental problems

¹ *Revue suisse d'histoire*, vol. 23, part 4, 1973.

of the day have more to do with chemicals than with microbes. Our major worries are carbon monoxide, lead in exhaust fumes, and pesticides. There is a universal agreement that poison-laden zones are affecting the atmosphere in our cities, the water in our rivers, and the biosphere of a whole.

Under the economic regimes of ancient or very ancient civilizations, the situation was of course quite different; the relatively simple technologies of those times generated few, if any, pollutant by-products. On the other hand, the earliest forms of growth in the medieval to “modern” era – from the 11th to the 16th century – put the accent very firmly on demography, ground clearance, urbanization, trade, colonization, “Crusades,” military campaigns, and conquests. The wealth of contacts thus established carried enormous risks of microbial pollution: to say so is, of course, to state the obvious. I should therefore like to step over the hallowed threshold of first truths and put forward the following concept, applied to a precise period of history, and borrowed, with some modification and extension, from [Woodrow Borah](#): the concept of *the unification of the globe by disease* between the 14th and the 17th century. This expression, as I shall attempt to show, is much more than a mere formula. It seeks to regroup and incorporate, within a complex but unique ensemble, phenomena apparently very diverse; on the one hand, the plague of 1348 in Western Europe with its lethal sequels of the 14th, 15th and 16th centuries; and on the other, the depopulation, amounting to genocide by disease, of the native peoples of the New World during the 16th century and afterwards. Such concept has the added interest, it seems to me, of focussing attention on the most severe and traumatic situations experienced to date by the human populations of America and Eurasia during the second millennium.

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When I refer to the unification of the globe by disease between the 14th and the 16th century (from now on for the sake of brevity I shall simply call it “the unification”), I do not of course mean that the process began at midnight on January 1, 1300. Large-scale epidemics were in fact afoot and on the move well before that date, though their radius of activity was less extensive than it later became: without going back all the way to the plague of Athens, there was, for example, the great epidemic of the 6th century.

Nor would I wish to suggest that the process of “unification” ended in the year 1600 – or even 1700; the spread of the cholera in the 19th century amply demonstrates the absurdity of such a claim. In the course of this essay my aim is simply to draw attention to the existence of a paroxysm: when what might be called global unification by disease or, to put it another way, the creation – first in Eurasia and then subsequently in the Atlantic area – of a “common market” of microbes, passed through a particularly intense, rapid, dramatic, one might even say apocalyptic phase, during the period roughly 1300-1600.

The sacrifice of human lives resulting from the global spread of pathogenic agents during these three centuries has had no parallel before or since.

“UNIFICATION” BY PLAGUE

I shall concentrate, to begin with at least, on certain specific categories of disease. As the reader will know, it is not at all easy to identify the illnesses of the past. The parish records which are by far the richest sources of information on *ancient regime* demography, can alas tell us nothing. Fortunately, the history of disease is open to investigation with the help of other, often very precise, sources (medical inquests, chronicles, military archives, etc.).² Such sources tell us a lot about deficiency diseases – goitre in mountainous areas, for instance – which of course fall outside the scope of this essay. But they are equally informative on run-of-the-mill infectious diseases as they tended to be grouped in former times: small-pox, typhoid, typhus, dysentery, malaria in marshy zones, etc. For the moment, I shall however leave the run-of-the-mill on one side and concentrate first on a bacterial disease: bubonic plague.

It has become commonplace to suggest that plague was one of the inevitable harmful by-products of the expansion of human numbers and activities in the ancient continent during the Middle Ages. But a number of different writers have gone beyond the original, rather too simple formulations and have vigorously explored, developed and refined this idea.³ With this in mind, I shall begin with the point of origin: the breeding-grounds from which the plague spread to produce one of the major episodes in the unification of the globe by disease. Of the three “natural” varieties of the plague bacillus,⁴ *Pasteurella pestis orientalis* took root in Manchuria and the eastern seaboard of China. “It was responsible for the most recent outbreak of plague, one which spread from China at the end of the 19th century.” It is not therefore of direct interest to this essay in which our concern is with an earlier period of history. The two other varieties of the “germ” are, however, central to our purpose: *Pasteurella pestis antiqua* which became endemic to various groups of rodents and fleas around the great lakes of Africa, and *Pasteurella pestis medievalis* (the name is a complete story in itself) which established itself in similar conditions in central Asia.

The world-wide ecology of plague ultimately concerns a complex relationship between man and bacillus, a relationship which relies upon the harmonious functioning of a *ménage à quatre* (rat, flea, bacillus, man), or as some writers suggest, of a *ménage à trois* (flea, bacillus, man). The very existence and geographical diffusion of “*ménages*” of this type inevitably leads in the long term to friction and incompatibility of temperament; the “ecological framework” of this cohabitation – which often ends in the death of the three or four partners – is very limited. The flea, for instance, needs certain strict conditions of temperature and humidity before it can breed. Such conditions are not always met by man’s changing habits, for instance in the matter of heating his houses in winter. For all these reasons, the plague complex with its multiple *dramatis personae* remained endemic in central Africa and central Asia; but in Europe, where it made only sporadic appearances, it proved relatively unstable: in its two visitations (6th/7th century and 14th/17th century) it never lasted more than two or three hundred years.

Central to these travelling complexes which, at the time of “unification,” made it possible for plague to become established, is of course the flea – and in the first place the rat-flea: bites of an infected flea introduce bacteria into the rat’s bloodstream and produce plague buboes in the groin. But the flea can also live on humans and with its bite transfer the plague bacillus to man. It is however repelled by the smell of olive-oil which is therefore an instant prophylactic. It is also driven away by the smell of horses and especially of male goats (the role of these animals as counter-agents to the plague was well known early on: the squire of Gouberville, in the middle of the 16th century,

² See articles by J. Goubert, J. Meyer and J.P. Peter in *Médecins, climat et épidémies à la fin du XVIIIe siècle* by J.P. Desai and others, Mouton, Paris-The Hague, 1972.

³ Elizabeth Carpentier, « *Autour de la Peste Noire,* » *Annales E.S.C.*, 1962.

⁴ R. Pollitzer, *Plague*, Geneva (World Health Organization), 1954.

thoughtfully presented his sister with a billy-goat when a plague epidemic broke out in her village⁵). The ordinary human flea, *Pulex irritans*, can also pass the bacillus directly from man to man without the intermediary of the rat. (There are, finally, other varieties of ectoparasites associated exclusively with a single species of mammal, dog-fleas for example; but precisely because they are found only on dogs these creatures have had nothing to do with the outbreaks of plague in Eurasia during the past two thousand years.

With this ecological basis established, the data on the pollution and contacts that account for the spreading of plagues have been researched by two schools of thought: the “rat school” led by the English historian, J.F.D. Shrewsbury, and the “flea school,” represented by the Frenchman J.N. Biraben.⁶

Shrewsbury important book, *A History of the Bubonic Plague in the British Isles*, offers the reader what amounts to a complete treatise on the rat, including – much to our purpose – the story of its role in spreading infection and disease all over the globe. Not that Shrewsbury imputes every kind of plague to the rat. He treats pulmonary, or pneumonic plague, accompanied by fits of coughing and spitting of blood, as quite a separate problem when it crops up. This lung disease, “the sickness that spreads terror,” is transmitted directly from man to man by the breath and infected spittle; rats play no part in the process. But setting aside this broncho-pulmonary form of plague (incidentally an extremely dangerous one), Shrewsbury is at pains to express most forcefully his belief in the crucial role played by the rat in the dissemination of plague. Indeed, if we are to believe him, rats can transfer contagion directly, from one to the other, by cannibalism. But, most importantly, the epidemic – or rather, the epizootic – disease induces in *rattus rattus* a lethal form of septicaemia: the rat-flea, gorging itself on this poisoned blood, clogs its stomach with a plug composed completely of the bacilli of *Pasteurella pestis*; the obstruction prevents it ingesting its food so the famished flea becomes enraged and bites the skin of any creature it lights upon, animal or human. Thus the epizootic disease of the rat becomes the epidemic of plague in man.

⁵ Abbé A. Tollemer, *Un Sire de Gouberville, gentilhomme campagnard du Cotentin*, Mouton, Paris-The Hague, 1972.

⁶ J.F.D. Shrewsbury, *A History of the Bubonic Plague in the British Isles*, Cambridge University Press, 1970; and J. R. Biraben, *Les Hommes et la peste*, Paris, 1975.



“The council of rats,” illustration by Gustave Doré (19th cent.)

All these phenomena soon become associated with the urbanization and demographic expansion occurring in many places during the period immediately preceding or introducing the plague-ridden phase of the Middle-Ages. Fleas hidden away in old rags and blankets carted about by the small traders and pedlars of the time could become very hungry and aggressive from their failure to find adequate sustenance in the cloth-bundles that formed their temporary homes. And, in medieval times, the huts and hovels of the poor in both town and country, constituted an ideal habitat for rats and fleas: fleas lodged themselves in the daub and wattle walls, rats in the thatched roofs. The houses of the rich, on the other hand, offered a better defence against such infestations, for stone walls are no sanctuaries for ectoparasites, and an upper floor acts as a barrier between the rats in the roof and attic and the human family living on the ground floor.

From such observations, Shrewsbury moves on to a detailed history of rodents and parasites as a by-product, so to speak, of human activity which modified the animal environment. The chief culprit, according to *A History of the Bubonic Plague*, is the black rat, *Rattus rattus*. With its seventeen varieties of fleas, two of which (and in particular *Xenopsylla cheopsis*) “are capable of acting as vectors of plague,” *Rattus rattus* is apparently a comparatively timid creature and not much of a fighter: hence its inferiority, from the 18th century on, to the more aggressive brown or Norwegian rat, *Rattus norvegicus*. Furthermore, the black rat is a poor swimmer; in northern latitudes it lives in buildings, where it eats its way through stocks of grain. Despite its indifferent performance as a swimmer, it used to go aboard the wooden ships of the old days, putting its remarkable climbing skills to good use in their hulls and timbers (hence the ease and the great range of its travels, in the Mediterranean for example). *Rattus rattus*, it must be said, is not naturally indigenous to Europe: it was able to spread there only because of the high density of human settlement, with closely-grouped houses, silos, granaries and urban habitat in general. (This brings us back to the original question of environmental pollution by animal.) In his study of England, Shrewsbury has consulted a varied collection of documents and done his best to establish an accurate chronology of the spread of *rattus rattus*. It seems to have been comparatively rare in the British Isles before the arrival of William the Conqueror, or shall we say (since it is hardly likely that the rats waited until the very day

of the Norman Conquest to cross the Channel), before the year 1000. The manuscript of the [Book of Kells](#), however, which dates from an undetermined period between the 6th and the 9th century, shows us “two rats nibbling the Eucharistic bread under the eyes of a pair of cats.” In 1187, “large mice, popularly called rats” had been “expelled from the district of Ferns in Leinster by the curse of Bishop Yvor, whose books they had gnawed.”⁷ By the 13th century, still in Britain, *rattus rattus* had apparently gained the upper hand: its presence in London is vouched for in a local manuscript referring to “two black rats hanging a cat.” Mention of the purchase of rat-traps and rat-poisons is more frequent now, in both account-books and literary texts. It is of course possible to criticize Shrewsbury chronology and to point out that it uses material from illustrations which may themselves bear little relation to the actual history of the cohabitation of rat and man. Be that as it may, according to Shrewsbury, the introduction in medieval times of the rat into Great Britain amounted to the establishment of an epizootic infrastructure, providing a base from which the plague of 1348-9 and later, was to take off. It is possible to explain along similar lines certain aspects of the outbreak of plague in the 6th century.⁸ This affected southern Gaul, an area already urbanized to some extent and widely colonized by rats, but spared lands to the north of the Loire, which perhaps because of the scattered nature of human settlement in those parts, where not as yet densely inhabited by *rattus rattus*. England, being free of rats, was *a fortiori*, spared this early medieval plague. One might argue that this was one of the causes of the economic, demographic and indeed political and military advance of the north, from the 7th century on. Charlemagne owed his triumph, one might say, to an absence of rats!⁹

To return to 14th century Britain: Shrewsbury seeks to establish his entire theory of plague on the geography of rat infestation. In the 1340s, the densely populated and industrious England, which was also to become the England of plagues and epidemics, lay “south-east of a line between Exeter and York;” a privileged zone indeed, but one that was to pay dearly for its privilege!

In this England which, including Wales, had a population of approximately four million in 1300-30,¹⁰ it was indeed south and east of that line that the great majority of towns of more than 5,000 inhabitants were established. According to Shrewsbury’s theory, this figure of 5,000 constituted the lowest possible basis upon which rats could breed in sufficiently large numbers to maintain an epizootic murine plague, capable in turn of contaminating human populations in epidemic proportions; the spread of plague in humans, says Shrewsbury, calls for a constant traffic of infected fleas from man to rat and back again, if the pestilence is to maintain its fullest momentum. In the south, too, lay some of the most prosperous and most densely populated rural areas; here were the major networks of roads for the transport of grain, hay, straw, and above all, wool, providing opportunities for rats to ride the carts from town to town, while the traders in their flea-ridden furs also played their part in transporting the parasites who were the chief propagators of the bacillus. Here too were the fairs, and the great shrines such as Canterbury cathedral, visited by crowds of pious pilgrims in condition of dangerous and verminous promiscuity. Turning once more to the central fact of urbanization, though still somewhat undeveloped in 14th century England, it was yet again south of the York-Exeter line that town houses were to be found in sufficiently large numbers, stacked and huddled together, for the plague to be able to spread from one household to another. At the same time, these houses were still primitive enough in construction (wattle and daub, with

⁷ For these various references, Shrewsbury, op. cit. p. 12.

⁸ Biraben and Le Goff, *art. Cit.*

⁹ *Ibid.*

¹⁰ The pre-plague population of England is a matter of some dispute among the experts. I can express no opinion on this thorny problem: the figure quoted here is that advanced by one of the best demographic British historians, E.A. Wrigley, *Population and History*, 1969, p. 78.

thatched roofs) to support colonies of rats and fleas: rats in the thatch, fleas in the mud walls. The town houses of modern times, which replaced these old hovels, were built of brick, baked in either wood or coal furnaces; consequently they offered a better defence against vermin, their brick and stone presenting a daunting obstacle to feats of burrowing and climbing. And it was again south of the "York-Exeter line" that there lay, in the Middle Ages as in the 18th century, those areas of England with the best grain farmlands and the highest yields of corn,¹¹ the rat's favorite food. It was in the south-east of Great Britain, broadly speaking then, that human settlement of both urban and agricultural areas created a habitat for *rattus rattus*, man's fellow food-consumer and privileged form of vermin. So it was entirely logical that the great English plague that broke out in the 14th century should establish itself in this part of the country. The regions situated to the north and west of this famous line, on the other hand, where people were fewer, urbanization less highly developed and rural settlement more scattered, provided nothing like so good a breeding-ground for this devastating plague.

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Such then is Shrewsbury's theory, with the rat as chief culprit. The French expert on plague, J.N. Biraben does not challenge the Englishman's thesis as such, but his own research has led him to lay greater stress, as far as the West is concerned, on the independent role of the flea. The number of historic plagues in Europe in which the rat has played any significant part, have actually been very few.

It is true that in his novel *La Peste*, (*The Plague*), set in Oran, Albert Camus mentions the corpse of a rat. But this was in the Mahgreb, and in any case, he may well have been influenced, if only indirectly, by the work of Yersin who, commenting on conditions in the Far East, refers to "the role of the murine epizootic preceding and accompanying the human epizootic."¹² Did some popular version of Yersin's research set Camus on the wrong track? It is quite possible. For as far as genuinely historical evidence is concerned, references to "murine" plague are very rare and we never glimpse so much as the tail of a rat in the corpse-countings of chroniclers. There is one text, however, which seems to point in that direction: in 1348-9, the Greek historian Nicephore Gregoras¹³ noted that "the plague invaded the islands of the Aegean; it attacked the inhabitants of Rhodes and Cyprus alike...; dogs, horses and *rats in the houses* died." One would give a great deal to lay hands on a few more texts of this kind in the West. The fact is there are scarcely any to be found. This gap in the archives (but is one justified in arguing *a silentio*?) led Biraben to draw attention to the special role of the human flea *Pulex irritans* as the direct carrier of plague from man to man without the intermediary of the rat.

With this in mind, Biraben suggests two possible theories in account for the ways in which the plague may (or may not) have spread:¹⁴

a) "In areas where human ectoparasitism is rare (this is the case in many tropical countries where the natives wear very little clothing), the incidence of plague is sporadic and infrequent." "Such cases as

¹¹ M. Morineau, *Les Faux-semblants d'un démarrage économique/ Agriculture et démographie en France au XVIIIe siècle*, A. Colin, Paris, 1971, p. 83 Cahiers des Annales, no. 30).

¹² J.N. Biraben, « Conceptions médico-épidémiologiques actuelles de la Peste, » in *Concours médical*, 26 janvier 1963.

¹³ Quoted by C. A. Bartsocas in *Journal of the history of medicine*, vol. 21 no 4, 1966, p. 395 according to Philip Ziegler, *The Black Death*, Penguin Books, 1969, p. 113 and 296.

¹⁴ Biraben, *art. cit.*, 1963, p. 622.

do occur [in X or Y village] are the result of accidental bites by rat-fleas (*Xenopsylla cheopsis*) which have abandoned dead rats.”

b) “If, on the contrary (as in the case of the clothed, indeed heavily clothed populations of the *anciens régimes* of the past) flea infestation of the human body is common, epidemics on a vast scale may be unleashed, their favored breeding-ground being every sort of place where people gather in crowds – town centers, fairs, armies, processions,” and also the main roads, thronged with traders and soldiers on the march; such were the factors, it would seem, that on a number of occasions during the 6th century and certainly during the 14th century and later, led to the pollution of Eurafica and subsequently of Eurasia.

It is no easy matter (for a historian who is not himself a specialist in medical history) to decide between Shrewsbury and Biraben. In the pages that follow, therefore, I shall take into consideration the various possibilities – often tending towards the same conclusion – that the two theories suggest.

A PRECEDENT: THE SIXTH CENTURY PLAGUE¹⁵

Shrewsbury or Biraben, flea-infested rats or fleas alone, Yersin’s bacillus was not an entirely new visitor to Europe. Eight hundred years before 1348, the “plague of the Early Middle-Ages” had reached Gaul in 543 A.D. ushering in a series of catastrophic epidemics which were to continue until at least 760 A.D. It then died out, thus proving, for the first time, what the later, comparatively short-lived epidemic cycle (14th-18th century) was to demonstrate quite emphatically: namely that plague is not spontaneously persistent in the countries of Western Europe.¹⁶ Is this incapacity to establish itself definitively in our part of the world attributable to the complex conditions¹⁷ of ecological equilibrium necessary for the maintenance of the *ménage à trois* (rat, flea, bacillus), on the cohesion of which the persistence of an epidemic in one locality depends? Whatever the explanation, it is a fact that in the course of the early Middle Ages, as in the later medieval and modern eras, plague tended, after a few centuries of repeated outbreaks, to die out in the West and withdraw to African and Asian bases: with the possibility of launching another lightning offensive some eight hundred years later.

It is also worth noting – and this relates to our ecological and environmental problem – that a map of the plague in the 6th to 8th century would correspond, broadly speaking, to the geography of the urbanization, demography and trade-networks of Gaul and the West in the early Middle Ages. Originating in [Pelusium](#) in Egypt, the plague made its way west through the Mediterranean to those classic reception centres for plague, the cities of Marseille and Narbonne. It then moved on into the northern part of Gaul, at the limits of its expansion reaching Trier in 542, the middle reaches of the Loire in 560, the middle reaches of the Rhône and the region of Albi in about 580. As Biraben and Le Goff put it: “the zones of activity of this early-medieval plague reveals some of the fundamental features of western Europe during the Dark Ages of the 6th and 7th centuries. The maintenance of an urban life-style favorable to the wider dissemination of epidemic disease; the continuance of trade-links between Alexandria, Byzantium, Africa and Genoa, Marseille, Narbonne – gateways to the plagues since they were gateways to the East (Venice and Marseille were to continue to pay the price into the 17th and 18th centuries); the importance of river communications, particularly the Rhône-Saône axis; all of these features show up in the geography of the epidemics. The northern

¹⁵ For, much of this section I am indebted to Biraben and Le Goff, *art. Cit.*

¹⁶ Biraben and Le Goff, .

¹⁷ In these complex ecological conditions, see Biraben, 1963, p. 620-1, in which he claims that plague is permanently endemic in Cnetral Asia but intermittent in the Far East.

limits of the plague – the Loire, the Marne, the Rhine, the Alps – correspond to the frontier enclosing the area of communication and urbanization, and to the terminal points of the oriental trade-routes.”

Now the plague of 1348, too, eventually encountered just such structural frontiers as its predecessor in the days of Justinian. The 6th century blazed the trail, so to speak, for the 14th. But as a result of developments that had taken place during the intervening centuries, the northern and eastern limits were much wider in 1348 than they had been in 542. The contagion, on this occasion, spread far beyond the Trier-Rheims-Tours-Agen line which had offered a solid barrier to any further advance in the age of Theodebert and Chilperic. In 1348-50 this *cordon sanitaire* of former days, which incidentally owed nothing to the conscious efforts of the authorities, broke down all along the line: from south to north, the whole of France and the area corresponding to all of ancient Gaul (with certain notable exceptions in both cases) crumbled before the onslaught of the bacilli. At this time too the vast human settlements of England, Germany and Scandinavia, which the 6th century plague had spared or barely touched,¹⁸ fell victim to the terrible onslaughts of the Black Death¹⁹ as the Middle Ages waned.

The differences in the radius of expansion of the two plagues demonstrate all the more forcefully the logical similarities between the two cases. On both occasions (6th century and 14th century), the outermost waves broke and died on those imaginary yet perfectly real shores, marking the extreme limits reached by demographic expansion, by a dense and much-used system of roads, and by the networks of towns.

The Merovingian plague, as we have seen, exhausted itself and expired when it met the great belts of forests barring its progress towards the plains and plateaux of the Paris Basin. The plague of 1348-9, however, surged on in full flood to the now hedgeless fields of Normandy and the open countryside around London; and on it went, further still, to Scotland in the north and the Elbe in the east without encountering an obstacle of any consequence. The great ground-clearances of the centuries after the year 1000 had in fact paved the way for it by improving communications, opening up isolated areas, felling the forest barriers, and by creating new centres of population. Both the open clearings and the new or expanding towns now became infested by various species of disease-bearing rats: all of them, whether they were country rats preying on harvests, or town rats living off refuse, were flea-ridden.²⁰ And when the time was ripe, they turned into sowers of pestilence of a kind the healthy, unpolluted Merovingian woodlands had never known.

Beyond the Oder and the mountains of Bohemia, (well outside the area discussed here) the picture is not so straightforward. Here, in 1349 and 1350, the dense forests and semi-deserts, comparatively empty of villages and cornfields, slowed down the onward march of the army of rats, fleas and men afflicted by the plague. As a result, the advance of the twin fronts of the plague, bubonic and pulmonary, was to some extent checked. The factors that in the 6th century had limited the spread of the catastrophe beyond the Loire were therefore found at work again in the 14th century: this time in areas further to the north and especially the north-east, well beyond the Germanic population centers which had greatly increased in size in the interval, and which because of their earlier scattered nature had been spared by the first, Merovingian outbreak of plague. It was only when it reached the Slav lands, as Frantisek Graus has shown, that the 1348-50 plague finally encountered

¹⁸ The 6th century plague only minimally affected the Rhineland.

¹⁹ For a good comparative assessment of the two plagues see the maps of Biraben and Le Goff in *Annales*, 1969, 1500-2 (the 6th century plague) and Carpentier in *Annales*, 1962, p. 1017 (for the plague of 1348).

²⁰ At least if one accepts Shrewsbury's theory.

the conditions of sparse human settlement that were henceforth to check its progress, without however succeeding in halting it altogether.²¹

THE EURASIATIC “SHORT-CIRCUIT” OF THE FOURTEENTH CENTURY.

The comparative study of the medieval plague in France and the West thus tends in the first place to stress the importance of multiplicity of contacts as a condition for the occurrence of catastrophe. An analysis of this type, which helps us to understand the various ways in which the plagues spread, is even more useful when our aim is to solve the fundamentally important problem of origins with which we shall be concerned in the pages that follow. For, an explanation of the arrival of plague in Europe is to be sought in the establishment, long before the germ itself appeared in Italy or southern France, of a number of trade routes which became “short-circuits” and excellent conductors of disease between Eurasia and the Mediterranean.

At this point, if we are to understand the manner in which a process of crucial importance to mankind was triggered off, I must give a brief outline of the establishment of the conditions that set the scene for disaster. Without it, some of the significance of this essay on the pollution by microbe would be lost.

The 6th century plague - and also, so it is said, the plagues of antiquity – probably came originally from the great lakes of Africa.²² It was certainly around their shores that the natural variety of Yersin’s bacillus, *Pasteurella pestis antiqua*, was widespread, and this is the germ thought to have infected the Merovingian population. Having travelled from the great lakes and Ethiopia as far as Egypt and the delta port of Pelusium, via the Red Sea or possibly the Nile Valley, the Egyptian plague of 541-2 eventually made its way in the natural course of events to all the great Mediterranean cities, from Alexandria to Marseille. And then, in successive waves of persistent contamination, it gradually infected the whole of southern Gaul over a period of two centuries.

The nature of the 1348 pandemic suggests a break with this distant past and the establishment of very different bacillus-itineraries. For this plague came not from the Red Sea, but from the Black Sea, not from Pelusium in Egypt, but by way of [Caffa](#) in the Crimea, having originated far beyond this Genoese counting-house, in the depth of Tartary and the [Nestorian](#) communities of central Asia.

²¹ Poland was comparatively spared by the Black Death, Carpentier, *art. Cit.*, 1962. Bohemia likewise: Frantisek Graus, “Autour de la Peste Noire en Bohème au 14^{ème} siècle, » in *Annales*, 1963, p. 720-5.

²² Biraben and Le Goff, *art. cit.*, 1969.



The tarbagan marmot: sought after for its meat and fur... carrier of the flea hosting *Pasteurella pestis medievalis*...

In the heart of the Asiatic continent there lived then, and still lives now, widely disseminated, another natural strain of *Pasteurella pestis*, classified in commemoration of its most remarkable accomplishment, as *medievalis*.²³ Medical specialists have described²⁴ the various species of animals that ferry the carrier-fleas of *Pasteurella pestis medievalis* from both sides of the Urals across immense distances. They are: *tarbagans*, or giant marmots from Manchuria, Mongolia, Russian Turkestan and Transbaikalia (Siberia); little *spermophiles* (ground squirrels)²⁵ or *susliks*, a species resembling tiny marmots, whose habitat is southeast Russia and whose incredibly hardy fleas can survive temperatures of -25°C, and can fast for up to ten months on a meal or two of blood.²⁶ Other storehouses of the bacilli, through the intermediary of parasites, are colonies of *gerbils*, or desert rats from southeast Russia, Iranian Kurdistan and regions beyond the Caspian Sea. When they die in their underground burrows, their fleas and the bacilli survive on their dead bodies, waiting to pass on the disease, sooner or later, to human beings. Baltazard, and after him Biraben, both refer to those lethal chambers and their favorable micro-climates in which the germs hibernate. When summer returns, they infect other gerbils who, thinking they have struck it lucky, move in as squatters into the former homes of their deceased fellow-creatures; “meanwhile, other rodents may have moved into the burrow and serve as blood donors to fleas, thus ensuring the survival of these infected parasites.”²⁷

The distant equivalent of these species of Asiatic marmots and gerbils, according to Shrewsbury’s theory at any rate, were the great sedentary colonies of black rats that had established themselves

²³ Biraben and Le Goff, *ibid*.

²⁴ Pollitzer, *op. cit.*, p. 15 et 269; Biraben, *art. cit.*, 1963, p. 620.

²⁵ Pollitzer, *op. cit.*, p. 269-71.

²⁶ Pollitzer, *ibid.*, p. 335-6.

²⁷ Biraben, *art.cit.*; Baltazard, quoting G. Girard, “Peste tellurique et peste de foussement, » in *La Presse médicale*, May 30, 1964.

in Europe: these creatures, like that other rodent, the rabbit, had also multiplied prolifically since the 10th century so that their numbers had increased prodigiously in the open spaces created by the great ground-clearances. Urbanization and the demographic “take-off” had swollen their numbers immeasurably in the towns, villages and ports where they prospered uninhibitedly and without competition until their partial extermination by the brown rats in the 18th and 19th centuries. Between these two teeming populations of rodents, the Asiatic and the European, history from 1330-50 onward was to throw an unforeseen bridge of fraternal mortality. The staging-posts of this plague-bearing short-circuit, destined to unite the West and the East in the same fate, had gradually been placed in position beforehand by two groups of “sorcerer’s apprentices:” the builders of the Mongol empire and the bazaar merchants of the silk caravans. Both became the unwitting agents of a process of international pollution.

How did this happen? Between 1200 and 1260 the Mongols, under [Genghis Khan](#) and his successors,²⁸ achieved the unification of Asia and a part of Europe, from China to Russia; they were thus opening the way to the microbial integration of the ancient world on both sides of the Urals and the Caspian Sea, and setting up a common market of bacilli.

Very quickly, trade-routes were established across these wide open spaces where the frontiers had been removed. In about 1266, the Genoese founded the colony of Caffa on the southeast coast of the Crimea. The *pax mongolica*²⁹ enabled the pioneers of this new trading-post³⁰ to make safe and regular use of a route which “for the first time in history enjoyed absolute security”³¹ – an unthinkable situation before the unification and pacification of central Asia by the forces of Genghis Khan. This new safe route³² carried the Mediterranean and Black Sea trade of Genoese merchants all the way to the Far East. It crossed the Sea of Azov from Caffa to Tana at the mouth of the Don, after which it bore the Genoese traders on their seemingly interminable journey by ox-cart and then by camel, donkey and mule, and by boats when it came to the rivers and the Caspian Sea, into the heart of China,³³ the source of silk. This route was in constant use in those two fatal decades, the 1330s and 1340s, the very time it was described by [Francesco Pegolotti](#) in his book *Pratica della Mercatura*. It was a successful route, swarming with men and convoys ever moving to and fro, since Chinese silks brought this way to the bazaars of Constantinople cost much less than if they had come in the traditional manner along the ancient route travellers took before the establishment of this great Genoa-Mongolia road.³⁴ But this new trail, the creation of the 13th century spirit of invention, brought both good and ill in its wake. Indeed, the royal road of Chinese silks of the first half of the 14th century seems, from 1338 onward, to have become the plague-trail of contagion.

New light was thrown on this crucial itinerary by an archaeological dig towards the end of the 19th century. In 1885, the Russian archaeologist Chowlson³⁵ was engaged in excavating the remains of

²⁸ R. Grousset, *L’Empire des steppes*, Paris, 1939 ; for a fuller bibliography see Louis Hambis, *Genghis Khan*, Paris, 1973, and Chantal Lemerrier-Quellejey, *La Paix mongole*, Paris, 1970.

²⁹ Lemerrier-Quellejey, *op. cit.*

³⁰ G.I. Bratianu, *Recherches sur le commerce génois dans la Mer Noire au XIII^e siècle*, Paris, 1929, p. 219.

³¹ Lemerrier-Quellejey, *op. cit.*

³² For a fuller bibliography of the silk trade route see J. Heers, *Gênes au XV^e siècle* (full text), Paris, 1961, p. 366-7 (the map in particular); Robert Lopez, *Naissance de l’Europe*, A. Colin, Paris, 1962, p. 298-9; Francesco Pegolotti, *La Pratica della Mercatura*, ed. Allan Evans, Cambridge (Mass.) 12936, p. 21-2.

³³ Pegolotti, *op. cit.*, p. 21-2.

³⁴ Heers, *op. cit.*, p. 367.

³⁵ Encyclopedia Britannica, 1960 edition, article “Plague”; John Stewart, *Nestorian Missionary Enterprise*, Edinburgh, 1928; Stewart made use of a series of articles that appeared in three volumes of *Mémoires de l’Académie de Saint-Petersbourg* (VIIth series), from 1886 to 1896, especially vols. 34-5 and 37-8.

some ancient Nestorian cemeteries near Lake Issuk-Kul in the district of Semiryechensk at the extreme eastern corner of Kirghizistan. This region which, as we now know, was situated at the epicentre of one of the original sources of the plague, was also, in an entirely different context, towards the end of the Middle Ages, an important focus of Nestorian propaganda. In the course of his excavations, Chowlson uncovered three tombstones on which contemporary epitaphs bore witness to the fact that the persons buried beneath them had died of the plague in 1338-9. Furthermore, the discovery of a whole row of graves of similar date was proof that the death-rate for the two years (1338-9) had been extremely high. "It is certain therefore," writes Pollitzer³⁶, "that plague was conspicuous in Central Asia a few years before the Crimean ports became infected (Caffa, 1346), and the disease was carried from there by ship to Europe."

So, if Pollitzer is right, the Mongolian road played a prominent part in the story. [Semiryechensk](#), Przelvalsky and Lake [Issuk-Kul](#), the first *known* cradles of the plague, are situated near the approaches of the Tian-Chan mountains, not far from the little towns of Almaligh and Kachgar, each of which was an important staging-post on the two alternative branches of the Genoese route from Caffa to the hinterland of Asia and from there into China.³⁷ That the plague germs should have swept through this region in 1338, the first known zone of infection, and then spread westward by flea-hops from victim to victim along the great axis of the Turcoman caravans, the Mongol armies and the Italian merchants, is surely a plausible hypothesis, consistent with all that we have learnt, with the passage of time, of the regular trajectories of the plagues as they spread on their lethal way.³⁸

We know what followed: how the contagion was conveyed in 1346 by plague-stricken soldiers of a Tartar army to the gates of Tana and Caffa, which lay at the Crimean terminus of the China-Genoa road. The Tartars laid siege to Caffa and used catapults to hurl a number of diseased corpses over the city walls, with the result that the fatal infection spread to the Italian defenders of this Black Sea port; alternatively, a number of infected rats may have made their way into the town by burrowing under the gates. At all events, healthy or sick, those who survived the siege embarked on the last remaining ships and made their escape to Byzantium, Genoa, Venice and Marseille, contaminating in turn those great cities and, through them, the whole of the West.³⁹

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By November 1347, then, or at the latest by January 1348, the plague had reached Marseille (by way of a Genoese cargo boat from the Crimea?) The Bishop of Marseille died of it, as did all his canons, so it is said, together with countless numbers of mendicant friars. Off the Canebière, phantom ships,

³⁶ Pollitzer, *op. cit.*, p. 14.

³⁷ Heers, *op. cit.*

³⁸ For a chronology of the spread of the plague, see J. Glénisson, *Le Temps des Périls, 1300-1500*, p. 67ff. in the collection *Les métamorphoses de l'humanité*. Glénisson believes that even if the plague had not come to Europe from Caffa, it would have reached us anyway in the end from central Asia by way of Antioch and Asia Minor.

³⁹ I make no claim to have shed new light in this essay on the *événementiel* aspect of the spread of the Black Death (the conventional name for the plague of 1348). In this connection see F.A. Gasquet, *The Great Pestilence*, London, 1893, republished in 1908 under the title *The Black Death*, London, together with a number of other accounts up to the previously mentioned study by P. Ziegler. For a critical appreciation of these studies see W.M. Bowsky, *The Black Death*, Holt, Rinehart and Wilson, New York, 1971, p. 126-8.

their crews all dead, drifted on the tide, tossed by the waves; no one was interested in the precious merchandise still in their holds.⁴⁰

The Provençal plague hit not only sea-ports and towns but the surrounding countryside as well. And it also rapidly gained ground, spreading within months to towns and rural communities in Languedoc, in the crowded mountain settlements of Dauphiné and into the villages and townships of Forez and Burgundy. It also rediscovered the route along the Rhône-Saône axis it had already followed once before, in the 6th century pandemic. In Provence, in town and village alike, the plague assumed apocalyptic dimensions. The statistics on households all tell the same story:⁴¹ in the district of Moutiers, where we have the population figures for five localities, the number of households fell by 75.4 per cent between 1345 and 1354; the town of Grasse lost 45.7 per cent of its households between 1341 and 1351; three village communities coming under the jurisdiction of Grasse experienced similar losses – a decline of 46.5 per cent between 1345 and 1352. In all, ten localities, villages and townships whose fate between 1345 and 1355 – roughly the period of the Black Death – we are able to piece together, the number of household fell from 8,511 to 3,839, i.e., a drop of more than a half (54.9 per cent).

The thirty or so other villages and country towns for which we have the necessary documentary evidence, the starting date is a little earlier – about 1340 – and the finishing date somewhat later – about 1365. In these cases, the demographic statistics cover at least two separate outbreaks of the plague, those of 1348 and of 1361, but without distinguishing between them. The total number of households in this sample fell from 7,860 (in about 1340) to 4,069 (in about 1365) – a drop of 48.2 per cent.⁴²

In short, it seems reasonable (if reasonable is the right word to apply to so cruel an episode) to estimate that by the end of the two first epidemics, those of 1348 and 1361, Provence had lost, at a low estimate, 40% of its pre-plague population, the majority of deaths resulting from the first outbreak in 1348. How can we possibly account for this appalling catastrophe, the equivalent – *mutatis mutandis* - of a present-day medium sized nuclear holocaust?

We find the answer to this question in the words of Guy de Chauliac, a brave eye-witness of the Provençal plague in Comtat:

“The great death toll began in our case in the month of January [1348], and lasted for the space of seven months. It was of two kinds: the first lasted two months; with continuous fever and spitting of blood; and death occurred within three days. The second lasted for the whole of the remainder of the time, also with continuous fever, and with ulcers and boils in the extremities, principally under the arm-pits and in the groin; and death took place within five days. And [it] was of so great a contagion (especially when there was spitting of blood) that not only through living in the same house but merely through looking, one person caught it from the other.”⁴³

⁴⁰ F.A. Gasquet, *op. cit.*, 1908, p. 39.

⁴¹ Edouard Bartier, *La démographie provençale du XIIIe au XIVe siècle, avec chiffres de comparaison pour le XVIIIe siècle*, Paris, SEVPEN, 1961.

⁴² Readers will not with some surprise that the places which were affected by *one* plague only, that of 1348, suffered more heavily, losing 54.9 per cent of their population, than those of the second group which underwent *two* outbreaks (1348 and 1361) but nevertheless lost only 48.2 per cent. The reason is that the places for which it was felt necessary to make a recount of households in the years immediately after the 1348 plague were probably among those most seriously affected. Hence, possibly a false “weighting” in our first group. But in any case, from all the existing data, it seems clear that when both plagues, 1348 and 1361, had run their course, the population of Provence had fallen by at least 40%.

⁴³ Guy de Chauliac, *La Grande Chirurgie*, ed. E. Nicaise, Paris, 1890, p. 167-70.

So there can be no question about it: the Comtat epidemic occurred in two distinct stages. During the first, winter stage (January-March 1348), pulmonary (or pneumonic) plague launched a devastating attack: it was characterized by fever, spitting of blood, ultra-rapid death, causing wholesale slaughter; the infection was transmitted directly, person to person, by the breath (not simply by looking, as Chauliac – who was mistaken on this point – seemed to think). This pneumonic phase, it goes without saying, invests the events of 1348 in Provence with their own particular dimension of horror, never to be equalled in any subsequent period of time. On the other hand, the following five months of the spring and summer of 1348 were marked by outbreaks of bubonic plague only – and bubonic plague, highly dangerous though it may be, is less of a killer disease than its pulmonary counterpart. And looking to the future, it offered a warning of things to come, heralding as it did a type of epidemic that was to become common, for from the 14th century onwards, hundreds of outbreaks, for the most part bubonic only, with a small percentage of pulmonary complications, were to recur in Provence and elsewhere in the West in the course of the plague-ridden era between 1348 and 1720.

The question left unanswered by the events and documents of Provence in 1348 is easily defined, not so easily resolved. Why, in a word, did it ever happen? What caused this massive and complex wave of plague, first pneumonic, then bubonic? What was it that set in motion this uncontrolled bacteriological disaster producing a demographical impact in the West which has so far had no equivalent in the last thousand years (and never will have, let us hope, in the future)?

A question of this type⁴⁴ probably calls, first of all, for purely epidemiological answers. Always supposing that historical and medical science could provide them, which at present they cannot, such answers would concern the changing patterns of behavior of the plague bacillus down the ages, the mutations it may have undergone and the competition it has encountered from other types of bacteria: in a word, the changing pattern of infectious diseases about which we know so little, save that it does indeed exist, and that it has, to some extent, determined the key-dates in the demographical fluctuations of mankind. Since present-day research is as yet incomplete, these purely biological factors still constitute the concealed but crucial face of the Black Death. Other, more superficial, aspects are comparatively better understood. As such, they offer a useful approach, helping us to at least a partial understanding of the different factors that led to the ultimate catastrophe.

Firstly, climate. In the Comtat in 1348, as in [Manchuria in 1911](#), the pulmonary or pneumonic form of plague was a winter phenomenon which disappeared at first signs of spring. Diseases that attack the lungs are greatly affected by a rise in temperature, be it seasonal as in these two cases, or geographical (as in the instance of Madagascar: the epidemics of plague on this large island were bubonic on the coast, pulmonary in the cooler regions of the high inland plateaux). The introduction of pulmonary plague to the south of France during the disastrous winter of 1348 followed a time-honored pattern. Firstly, it must be emphasized that pneumonic plague – *and not only the bubonic!* – may well have sprung fully armed from the Genoese vessels responsible for the introduction of the germs.⁴⁵ Secondly, the probability of the disease spreading to the lungs in an area recently infected with bubonic plague, as was the case in Provence in 1348, is always likely in the winter season. Since respiratory complications and secondary infections are more frequent and more serious between

⁴⁴ My thanks are due to Professor Mollaret of the Pasteur Institute in Paris, an expert on bubonic plague, for the suggestions he kindly offered in the course of several conversations I had with him.

⁴⁵ It is not impossible (nor, on the other hand, is it certain) that the plague was pneumonic when it reached Constantinople on its way from the Crimea. In this connection, cf. Jean Cantacène's text quoted by Gasquet, *op. cit.*, ed. 1908.

December and March, as is only to be expected, it was sufficient in January 1348 for an inhabitant of Provence to contract a straightforward attack of bubonic plague, followed by septicaemia, for the germ to settle upon the lungs, which are particularly vulnerable in the winter season. A single victim, or perhaps a few individuals, scattered here and there in different places in Provence, would be enough to set up a chain reaction, and this, indeed, is what occurred. The first person to fall victim to this pulmonary form of plague was no doubt someone who had plenty of contacts (this was gregarious Provence). And he no doubt had a cough (because it was winter). With his breath and saliva droplets freely laced with germs, he must have bombarded his family, his friends, passers-by, his confessor and his notary, and they in their turn passed on the infection to their nearest and dearest. From that moment on, a chain reaction set in, from which the only escape was isolation. But in these southern villages, whose poverty-stricken inhabitants crowded together for comfort, solitude was the last thing their house-builders had thought about.

For such a sequence of events to have been set in motion there is no need to suppose that the winter of 1348/9 was particularly severe.⁴⁶ A normally keen winter, such as Languedoc and Provence still experience about every third year, would have been sufficient to launch the deadly cycle of pulmonary plague. Once on its way, it developed spontaneously through countless agents of contagion. Proof *a contrario* is that with the arrival of the milder temperatures of spring and the consequent decrease in coughs and colds, the respiratory organs became less vulnerable to attack: the plague in Provence, Chauliac records, at once ceased to be pulmonary and reverted to the simply bubonic.

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Unpredictably, perhaps, social history has something to say on the question of assessing the effect of wintry conditions accompanied by a pneumonic epidemic. The coldness a person senses is not necessarily the same thing as the temperature shown on a thermometer; it also varies in inverse ratio to the effectiveness of heating and clothing. In this respect the inhabitants of Provence and the south of France generally in the 14th century were rather badly off. Without question, heating was pitifully inadequate in Provence in the first part of the 14th century, when the forests had been ravaged⁴⁷ by the high concentrations of people, goats and sheep. In the trade records of the region, we find more references to staves needed for barrels, planks and beams for the building-sites and charcoal for the kitchen-stove⁴⁸ as we do to logs for fireplaces, which as yet scarcely existed, or if they did took the form of simple open hearths.⁴⁹ During the preceding decade, Marseille (from where the plague was to spread in the January and February of 1348), was by no stretch of the imagination a sparsely populated city, but it was deprived and chilly in winter judging by the scanty deliveries of fire-logs. As for the average Provençal home, this too was quite inadequate (even

⁴⁶ The winter lasting from December 1347 to March 1348 is not mentioned as being either mild or severe in C. Easton's *Les hivers dans l'Europe occidentale*, Leyden, 1928. The few years *preceding* the plague in Montpellier were wet (for three years, according to the possibly simplified account by an anonymous doctor: *Tractatus de epidemia*, 1349, Bibliothèque National ems. Latin, 7026, f. 86; and 227, F. 209, verso). It would be interesting to know what the weather was like in the months of January and February 1348, around the shores of the Gulf of Lion.

⁴⁷ Thérèse Sclafert, *Cultures en Haute-Provence, déboisement et pâturages au Moyen Âge*, Paris, 1959.

⁴⁸ *Histoire du commerce de Marseille*, *op. cit.*, vol. II, p. 304-16, text and tables.

⁴⁹ On this question of chimneys and fireplaces in medieval times, see F. Braudel, *Civilisation matérielle et capitalisme*, A. Colin, Paris, 1967, p. 223ff.

measured by the undemanding norms of the 14th century) to protect its occupants from the cold. A few years ago, excavations were carried out in the now abandoned village of Rougiers which dates back to somewhere between 1200 and 1400.⁵⁰ The houses discovered by the archaeologist were no more than shacks with neither stairs nor chimneys, with uneven earth floors and smoky fireplaces hollowed out of the living rock, all set in a maze of narrow alley-ways where much of the social life of the village took place, so that the close crowding of the settlement was complemented by promiscuity. The 1348 epidemic was to deal harshly with the poor folk on this site – as in other parts of Provence, more than half the villagers were wiped out. Their fate is comparable, in fact, with that of the agricultural workers of Manchuria who fell victim in their thousands, in their chilly huts, to the pulmonary plague of the winter 1910-1.⁵¹

The people of Provence, then, were poorly housed and poorly heated. Were they poorly clad as well? It seems quite likely. In Marseille, the trade in leather and textiles of all kinds (from Languedoc, northern France and Flanders) had been in decline throughout the period from the 1260s to the 1340s.⁵² True, the textile trade was more closely linked to the sea-borne commerce of the Mediterranean; the leather trade was rather more regional. Nevertheless, taken as a whole, the statistics we have for leather and textiles all tell the same story; they suggest that many of the natives of Provence in the 14th century were not only without adequate heating or comfort in their houses; they also lacked warm woollen clothing and stout boots for their feet. In 1348, a winter plague, *ipso facto* pneumonic, would have caught these unfortunate people unawares. They would provide ideal breeding-ground for the bacteria and the chain reaction of pulmonary complications that followed; and they would be unlikely to survive the winter.

The broncho-pulmonary slaughter of that winter is not our only concern. We have also to account for the virulence of the bubonic outbreak that flared up in Provence and Languedoc in early spring 1348 just as the last flickers of the lung disease were dying out.

In this second stage, we must look to vermin, and to the promiscuity that favours the breeding of vermin, for one of its fundamental causes. Bubonic, septicaemic plague is transmitted to man not only by parasites of the rat but also by the species of fleas that prey on man (see above). Thus it is not the relatively slow cycle – *rat-flea-man-flea-rat-man*, etc. – that we find, but a much speedier rotation of the bacteria – *man-flea-man*, etc.

What conditions did it take, in the spring and summer of 1348, to produce bubonic catastrophe on so vast a scale? In the first place, a certain degree of crowding, easy enough to find in Provence in 1348 as a result of population growth, the development of towns, especially the little country towns, and the proliferation of roads and trade-routes. In the second place, much depended on the degree of hygiene, or rather non-hygiene practised at the time. In the detailed account of the daily life of the people of southern France, to be found in the Inquisition registers compiled by Jacques Fournier in about 1320,⁵³ the only reference to bathing in the life of the ordinary village folk is to the hot mineral baths taken both by the lepers in Ax-les-Thermes, and by the parish priest of Montailou⁵⁴ on occasions when he turned up there hoping for good fortune... Not very much. To which we might add that the spread of bubonic septicaemia, helped considerably by such inadequate attention to

⁵⁰ My thanks to Gabrielle d'Archambault who pointed out to me, *in situ*, archaeological work carried out at Rougiers.

⁵¹ Pollitzer, *op. cit.*

⁵² *Histoire du commerce de Marseille, op. cit.*, vol. II, p. 304-16, text and tables.

⁵³ J. Duvernoy, *Inquisition de Pamiers*, Privat, Toulouse, 1966, chs. iv and ix. The original texts were published by J. Duvernoy, *Le Registre d'Inquisition de Jacques Fournier*, Privat, Toulouse, 1965 (3 vols).

⁵⁴ See [Montailou, Promised land of error](#), E. Le Roy Ladurie's best-seller, Vintage Books (1978)

hygiene, may also, on occasion, have resulted from the locally prevalent practice of nit-picking! The southern French of the 14th century were much addicted to this form of warfare upon their parasites: one of the greatest proofs of affection that his mistresses – he had more than one – could show the priest of Montailou, was to pick at his fleas as he lay upon a table or at a window-ledge, expounding some Cathar mystery or listing the charms of young girls as they went down the village street. This practice was so prevalent in Languedoc that one finger was especially assigned to it and given the name of “louser” (*tuepoux*).⁵⁵ Now of course, squashing parasites – bugs and fleas – in this way could be dangerous, for if the “squasher,” male or female, happened to have a scratch on his or her “louser,” the bacilli of bubonic plague (or typhus) of which the tiny creatures are carriers, could easily enter the bloodstream.

To conclude this review of the possible or actual causes of the epidemics of the plague, perhaps we should also ask ourselves whether, throughout the vast region known as the Midi, extending from Toulon to Port-Vendres, or more broadly from Genoa to Barcelona, deficiencies in the diet of the common people on the eve of the Black Death weakened them, ruined their constitutions, and so prepared the ground for the pulmonary epidemics? This apparently plausible point of view is put forward by Pollitzer *à propos* of the plague in Manchuria.⁵⁶ He suggests that diet deficiencies in both calories and vitamins may have cleared the way for the lung infections that afflicted the poorer, agricultural laboring population in and around Harbin in 1911. These diseases in their turn prepared the ground for the pulmonary plague that carried off these unfortunate people, month by month, throughout the winter. *Mutatis mutandis*, one is tempted to apply this Manchurian model retroactively to the Midi of Languedoc and Provence, which also, between 1300 and 1348, suffered from repeated shortages of food and from chronic poverty,⁵⁷ affecting not only the housing and clothing of the poorer classes but also their diet. Honesty however compels us to say that present-day specialists in the history and epidemiology of the plague, Biraben and others, for example, are reluctant to accept the notion of malnutrition as a determining factor in pulmonary outbreaks.(...)

⁵⁵ A. Montel and P. Lambert, *Chants populaires du Languedoc*, Paris, 1880.

⁵⁶ *Op. cit.*

⁵⁷ E. Le Roy Ladurie, *Les Paysans du Languedoc*, Paris, SEVPEN, 1966, vol. I, p. 141. See also W. Abel, *Crises agraires en Europe*, Flammarion, Paris, 1973, p. 61 and note 1.



Manchurian plague of 1911 – the first apparition of face-masks and hazmat suits.

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Despite these uncertainties, it seems clear that in Provence, as elsewhere, in town or country, the Black Death was the outcome of a culture of poverty, dirt and promiscuity. Poverty was reflected both in housing and clothing (if not in diet) making all the more cruel the bite of winter's cold; there was dirt from the filthy living conditions and the fleas they harbored; and there was promiscuity both on the international scale (via the great trade-routes between Eurasia and the Mediterranean), and at the local level (rising population, expansion of the towns and the larger villages, trade and migrations of every kind). This triple "culture", the potential dangers of which were exposed by the hazards of a harsh winter, had been slowly maturing over the centuries in the bright sunshine of Provençal expansion. The problems of the early decades of the 14th century, which were severely felt all around the [Gulf of Lion](#)⁵⁸ had served to mitigate some of these features (e.g. the decline of large-scale trade); but other characteristics of the "plague culture" had emerged, stronger than ever, thanks to the hardships of 1310-40. Foremost among these was poverty, as can be ascertained from the repeated food shortages, the incessant protests of villagers (against usury and deflation),⁵⁹ and

⁵⁸ *Histoire du commerce de Marseille*, *op. cit.*, vil. II, p. 39; Baratier, *op. cit.*, p. 81; G. Lesage, *Marseille angevine*, E. de Boccard, Paris, 1950, p. 165.

⁵⁹ See anti-usury texts quoted in Sclafert, *op. cit.*, and Baratier, *op. cit.* These texts show the anti-semitism of the times.

the low wages of the farm-workers, gardeners and vine-dressers.⁶⁰ Everything in 1348 was ripe for the unleashing of a catastrophe: it might never have happened, at least not on so cataclysmic a scale, if the accident of severe winter had not lent maximum strength to the onslaught of the plague bacilli. Is it possible that the winter of 1347-8 was wet as well as cold – a paradoxical combination of weather conditions, rarely experienced in the south of France? Such a hypothesis would no doubt help to explain the rapid spread of the broncho-pulmonary diseases which furnished the appropriate breeding-ground for the most virulent forms of the plague.

In the period before the Black Death, in about 1330 or 1340, France was swarming with people. The Paris basin, upper and central Normandy, Picardy, Dauphiné, Central Languedoc, were all registering rural population densities already the equivalents of census returns in the same region four and five centuries later, the age of Louis XIV, or even Napoleon. In the kingdom as a whole, the 1328 register of households confirms the local figures. First of all, in terms of the number of communities: in 1328, in the areas directly controlled by agents of the King, the number of parishes was approximately 24,000. This enormous figure indicates a very high density of population, and in itself represents a peak that was never subsequently exceeded. As for the number of households, in 1328 in the areas controlled by agents of the King, it was 2,470,000, equivalent to 84.6 per cent of the total figure for the same area towards the end of the 17th century (2,919,316 households).⁶¹

With such statistical parameters in mind, it seems not at all absurd to suggest that in 1328, a time of high population, “France,” within boundaries approximately those of today, had a population of some 16 or 17 million. The mass of human beings alive in 1328 was enormous, when one considers how inadequate were the means available to sustain all these people: not only did they lack the resources of the highly productive agriculture we have today, but they were also partly or entirely deprived of those simple additional elements which in the 18th century enabled French populations of 20 and later 25 million to maintain an adequate standard of living. Among these additional elements, some were vital, others secondary: foreign and colonial trade, monetary supply, urban and rural industries, the network of cities, administrative offices and capitalist enterprises; and also, impossible to evaluate statistically, but certainly stimulating, the *savoir-faire* and competence of economic experts. All these factors, which were either absent altogether or only present in moderate form in the first half of the 14th century, were to count so much in the 18th century that even without any technological revolution the national economy prospered.

These over-populated communities of the first forty years of the 14th century, despite the heavy tolls exacted from time to time by famine, logically invited calamity. Admirable regional accomplishments such as wine production in Bordeaux and cereal-growing in the great landed estates in the Paris basin did not prevent the picture from looking on the whole rather gloomy. The great ground-clearance operations, long since completed, had stopped short at the marginal lands and forests which it was considered vital to preserve for timber and fuel requirements. The medieval “frontier” which for so long had moved forward, opening up new territories for farms and market-gardens, advanced no further. Grain yields reached a ceiling and levelled off: the resulting unfortunate stability – or rather stagnation – in the economy is not difficult to explain: the agricultural revolution of the late Middle Ages, bringing such innovations as the mill, the wheeled plough and the horse

⁶⁰ Lesage, *op. cit.*, p. 164 (low pre-plague wages).

⁶¹ G. Prat, “Albi et la peste noire,” in *Annales du Midi*, 1952; Philippe Wolff, « Trois études de démographie dans la France méridionale, » in *Studi in onore di Armando Saporì*, Milan, 1957; and by the same author, *Les « estimes » toulousaines des XVI^e et XV^e siècles*, Toulouse, 1956; E. Le Roy Ladurie, *op. cit.*, p. 142; *Documents de l’histoire du Languedoc*, published under the direction of Philippe Wolff, Privat, Toulouse, 1969 (Collection Univers de la France), p. 159-61.

collar, had had beneficial repercussion over a long period on the economy of the Roman and Gothic eras; but subsequently, and for some time to come, agricultural technology seems to have run out of inspiration.

The early decades of the 14th century, when a large population was faced with this lack of growth in the economy, were times not so much of crisis – in the somewhat vague sense of that over-used word – but rather of a predominantly agricultural society whose expansion was blocked, or nearly so. It was all the more vulnerable to short-term hazards such as the [famine of 1315](#), which brought unprecedented hardship. In such hostile environment the peasants bowed before the storm and at times, in true Ricardian and Malthusian fashion, laid down and died under the triple burden of high rents, wretchedly low pay, and inadequately tiny plots for cultivation. Landowners took advantage of the high demand for land, resulting from the increase of the peasant population, to put up dues of every kind: land rents, seigneurial dues, tithes and taxes. The surplus labor supply contributed to a drastic lowering of wages, whether in cash, goods, or a mixture of both. And lastly, the demographic boom of the preceding centuries was the cause of an excessive subdivision of the land into individual plots, creating a permanent checker-board pattern across the country; these individual plots had to coexist alongside the huge *reserve* of land farmed directly by the *seigneur* or his tenant – a source of friction, as may be imagined. Such private estates were not perhaps as extensive as was once thought,⁶² but they were certainly not negligible.

This accumulation of hardships was not necessarily intolerable. The peasants of France were to experience many more, for example during the worst moments of the tragic 17th century; and their society did not collapse under the strain. But in 1340, the gods were against them. After a number of military encounters, familiar to us from history books, that ushered in the Hundred Years War, the plague of 1348 set in motion a whole series of catastrophes, wholly or partly attributable to the bacillus, which spelled disaster for the population figures. A hundred years passed by, bringing wave after wave of trials and tribulations; finally, in about 1445, the demographic decline reached its nadir, setting a “bench-mark” for future time against which to measure the new “lows” in post-Plague population counts, whether long past or more recent.

During its peak period, the population of France is known to have reached something like 17 million in about 1330, 19 million in about 1700. At its lowest, in about 1440-70, it was probably no more than 10 million, if indeed it reached that figure at all. At a modest calculation, too modest no doubt, set against the probable peak of 1328, 10 million represents a fall of 42 per cent.

Ten million – of whom 8 to 9 million would have lived in the rural areas – is the reasonable estimate. And, in any case, it is the absolute *maximum* that could have been possible at this time of depressed population figures at the very end of the Middle Ages.

In any given area in the 15th century, the plague might be expected to strike every ten years, on average, as for example in the Châlon-sur-Saône region.⁶³ but in some regions it was every two, three or four years, or even as often as annually (as in the Toulouse area, for instance,⁶⁴ which like the whole of the South was much more plague-ridden than the North of France). On the whole, the towns suffered more seriously, but the country was by no means spared – throughout the 15th century, plague was an ever-present fact of life. Every year, without exception, it was active somewhere or other in the kingdom. Viewed nationally, the cycle of disease enjoyed only brief

⁶² Guy du Bois is emphatic on this point in his *Crise du féodalisme*, Paris, 1976.

⁶³ S. Guilbert, in *Annales*, 1968, p. 1283-1300.

⁶⁴ Le Roy Ladurie, *Paysans de Languedoc*, *op. cit.*, vol. III, p. 942.

intervals of remission (never of more than two or three years at a time throughout the period 1350-1450). There was always a trouble-spot somewhere, near Caen, or Béziers, or Beauvais, depending on the year. It was this same demonic rhythm, maintaining plague as an ever-present uninvited guest, that certain Islamic countries were to experience until as late as 1840, long after its disappearance in the West. Somewhere about that date, a few simple prophylactic measures (quarantine, etc.) similar to those that had been adopted in Europe in the middle of the 16th century, reduced the numbers of the plague epidemics in the Muslim world.⁶⁵ Judging from this comparison, it seems that the 15th century, European and in particular French populations were still almost defenceless against the scourge; but later, they were to combat it rationally and, eventually, in the 17th century, successfully. At the latter end of the Middle Ages, people were still far too inclined to rest their hopes of salvation in processions to Saint Roch, or else to confine their activities to acts of senseless bravado. At times, they behaved as if there were nothing to worry about, often failing to put into practice the energetic measures of disinfection, evacuation and isolation that health officers, public administrators and eventually military authorities increasingly adopted in the 16th and above all in the 17th and 18th centuries. The result was that each succeeding decade of the late Middle Ages witnessed a series of hecatombs that vastly depleted the stock of humankind and prolonged demographic stagnation by a kind of slow torture – without however succeeding in preventing the eventual recovery which took place, at different times and in different parts of the country, during the second half of the 15th century.



The reader may object that in France, both wars and famines, as well as plague, played an important part in accelerating depopulation. But comparative history must be our guide: and in the other countries of Europe, this combination of factors was not present. It is true that between 1340 and 1450, Germany, Italy, England, the Scandinavian countries, Catalonia and Portugal all experienced war in one form or another; but their peoples escaped the worst of the devastation during the Hundred Years' War, which was fought on French soil. (Indeed, the very term *Hundred Years' War* has no real meaning for the majority of continental countries other than France). And yet, towards the end of the Middle Ages, every one of these countries experienced a century-long period of depopulation, by a third or a half, very similar to that of France. In Germany, pollen-graphs from the peat-bogs of the Rhön valley show that the *Wüstungen* or bad times of the second half of the 14th century were the worst and most prolonged on record between the year 1000 and the 18th century.⁶⁶ Since war as an overall factor on the European scale is ruled out, we must look for some other explanation. Famine, perhaps – or, more generally, the secular series of subsistence crises? Surely not: famine on its own could never explain the disastrous decline, in a single century, of the populations of the West. For successive famines, in the medium or long run inevitably create the conditions of their own alleviation: the fewer mouths there are to feed, the more food there is to go around. So when we talk of a massive, century long crisis of depopulation, famine is highly unlikely to have caused it. More generally, the over-population of 1280-1310, the “peaking” that produced a surplus of people at the beginning of the 14th century, not only could, but did, culminate (as Postan, in the Malthusian tradition, has demonstrated) in demographic stabilization, and indeed in a modest decline in the late Medieval population figures. We find a similar stabilization later, under somewhat

⁶⁵ Biraben, *op. cit.*

⁶⁶ See Overbeck's pollen graphs, 1557, reproduced in *Annales*, 1962, p. 445.

similar circumstances, in the 17th century, after the population explosion of the 16th. But there is no intrinsic reason why the overpopulation of the early years of the 14th century should, simply because it preceded them, have engendered the calamitous sequence of events recorded from 1348 on. For this to have occurred, some additional factor must have been present: one which in all the countries of the West *made all the difference*. This factor, external in origin to Europe, internal to Eurasia, was Yersin's bacillus. Without the intervention, as an additional factor of this deadly scourge from outside Europe, it is difficult to see how the surplus populations of the early 14th century could have found *within themselves* the dialectical impulse to transform themselves – by some sort of Hegelian pirouette – into their opposites: producing the strikingly low levels one finds almost everywhere by 1450, and which differ so radically from those of the pre-Plague era.

So we are left with one antecedent, for which no substitute seems at all possible, one common factor in a general and drastic demographic collapse: death from epidemic disease, and more particularly from repeated outbreaks of plague, as a result of the “short-circuit” of plague-germs in circumstances I have tried to outline above. Every outbreak of plague, as it occurred regionally, would of course take its place within an overall and much more complex process. Depopulation, brought about in the first place by outbreaks of plague, could lead to a series of economic crises of slump and stagnation, which might in turn lead to a kind of “gang warfare” (Postan's expression), thus contributing further to the population collapse. But secondary factors could not have accounted on their own for the extraordinary and indeed absolutely unprecedented character of demographic developments in western Europe between 1348 and 1450. So unprecedented were they that the only possible comparison would be with the hypothetical results of a modern nuclear or bacteriological war. The nature, at once universal and horrendous, of the biological catastrophe that occurred towards the end of the Middle Ages cannot be understood unless proper recognition of its primary importance in the causal chain is accorded to the plague bacillus.⁶⁷

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The full paper (much recommended) is to be found in Emmanuel Le Roy Ladurie, *The Mind and Method of the Historian*, The University of Chicago Press, 1981.

⁶⁷ See W. Abel, *Crises agraires en Europe (IXe-XIXe siècles)*, Flammarion, Paris, 1973, p. 61-70.