



WAYNE STATE
UNIVERSITY

Pandemic Perspectives

Department of History, College of Liberal Arts and Sciences



Pandemic Perspectives

Historical accounts of
pandemics and epidemics

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Cohn-Haddow

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Bubonic Pandemics in Late Antiquity and the Middle Ages

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Overview

This presentation will cover the First and Second Pandemics of the Bubonic plague in Late Antiquity and the Middle Ages. It will introduce the pathogen and the disease, theories of transmission, theories of the causes of the pandemics, the patterns of spread, and the historical impact of the pandemics. It includes observations from contemporaries and offers suggestions for further reading.



The Plagues

There have been three certain pandemics of Bubonic plague in recorded history

- The First Pandemic: The Justinianic Plague of the sixth century (with outbreaks for the next 200 years)
- The Second Pandemic: The Black Death in the fourteenth century, the deadliest pandemic in recorded history (with recurring outbreaks up to the early nineteenth century, including the London plague of 1665)
- The Third Pandemic: The Modern Plague of the late 19th and early 20th centuries in south and east Asia, which killed millions
- Unproven, but suspected, are earlier outbreaks as far back as the Bronze Age



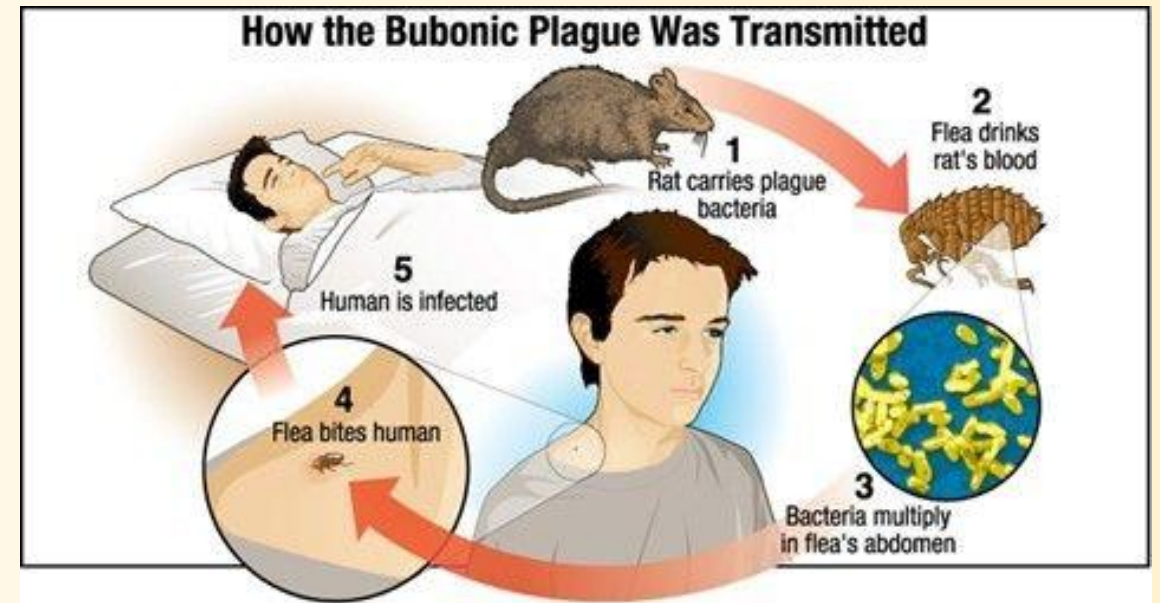
The Pathogen: Yersinia Pestis

- A bacterium, Yersinia Pestis was identified during the Third Pandemic in Hong Kong in 1894
- It is enzootic, meaning that it is endemic to wild rat/rodent populations, and has been for at least 3000 years
- Central Asia has historically been the most consequential reservoir of the plague
- DNA analysis of burials has confirmed that Yersinia Pestis was the pathogen of the First and Second Pandemics



Transmission of the Contagion: Fleas and Rats Model (based on observations of the Third Pandemic)

- Wild rats are resistant to *Yersinia Pestis*, but some develop the disease
- The multiplying bacteria block the guts of fleas who feed on the rats
- Starving, the fleas aggressively bite other animals, including humans
- To clear their passages, the fleas regurgitate contaminated blood into the bite, thereby infecting other hosts



The Disease Takes Three Forms

1. Bubonic

- An infection of the lymphatic system
- Bubos, or pustules, appear in the groin or armpits
- Subcutaneous hemorrhaging and necrosis turns the skin black, hence 'Black Death'
- Neurological disorders
- Mortality: 70% death rate within a week

2. Pneumonic

- Infection of the lungs
- Highly contagious
- Mortality: over 90%

3. Septicemic

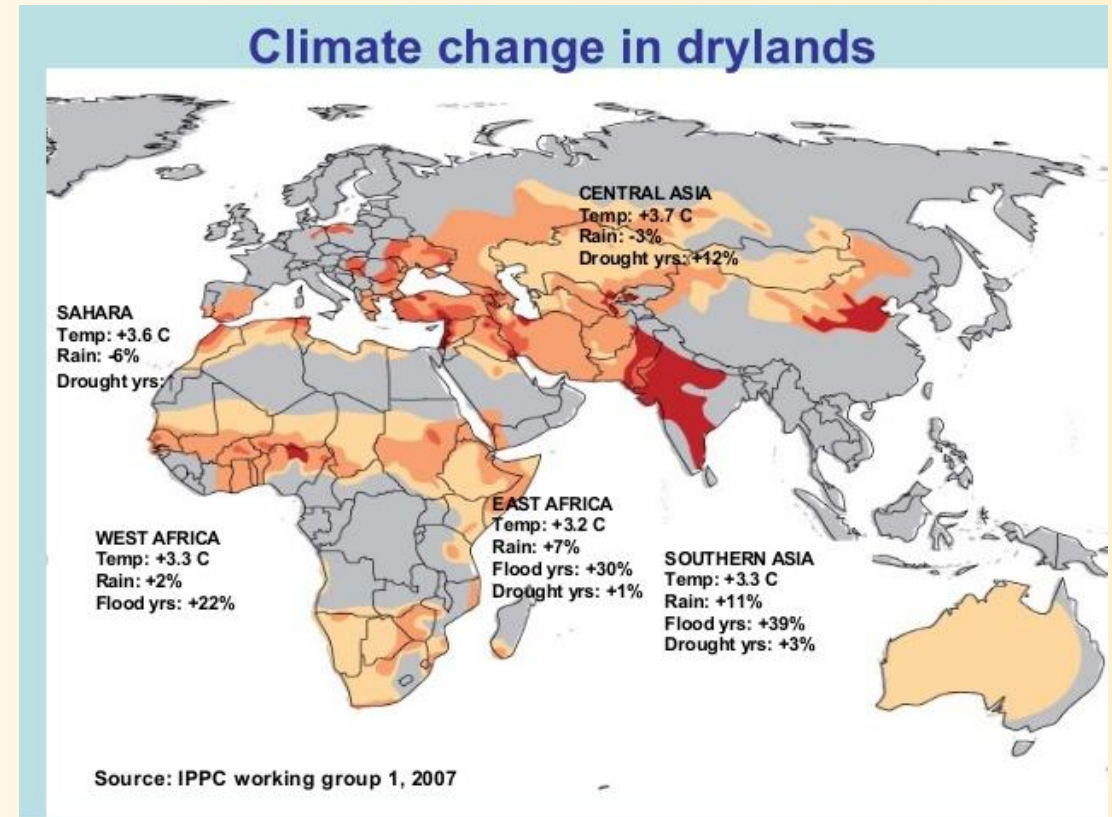
- Direct infection of bloodstream
- Death is swift, before even bubos can form
- Mortality: there are no survivors

The bubonic form



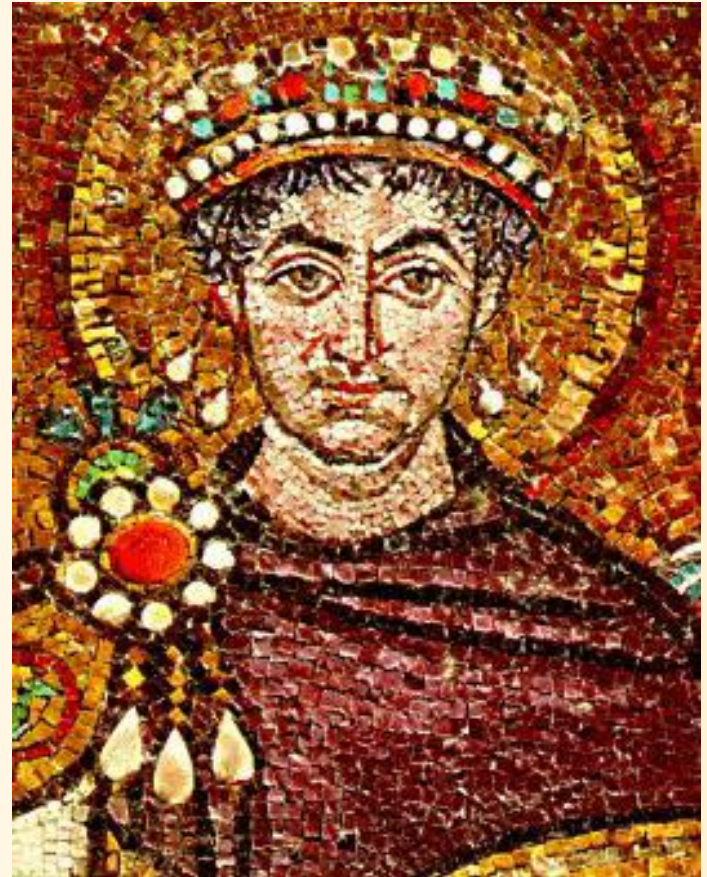
What Caused the Outbreaks?

- A pandemic requires more than a pathogen; it requires a confluence of conditions
- Conditions for the First and Second Pandemic are still debated
- Climate appears to have played a role when changes either forced wild rodent populations out of the grasslands; or caused their populations to collapse, provoking fleas to infest humans and domestic animals
- Spread was facilitated by trade routes and secondary human-human transmission
- Severity was compounded by premodern living conditions and a poor understanding of contagion
- Once a plague broke out, it persisted for centuries, flaring up again and again



The First Pandemic: The Justinianic Plague

- Named after the emperor of the Eastern Roman Empire, Justinian, during whose reign (527-565) the plague erupted in the capital city, Constantinople (today Istanbul, Turkey)
- When: 541-544, with outbreaks for the next two centuries

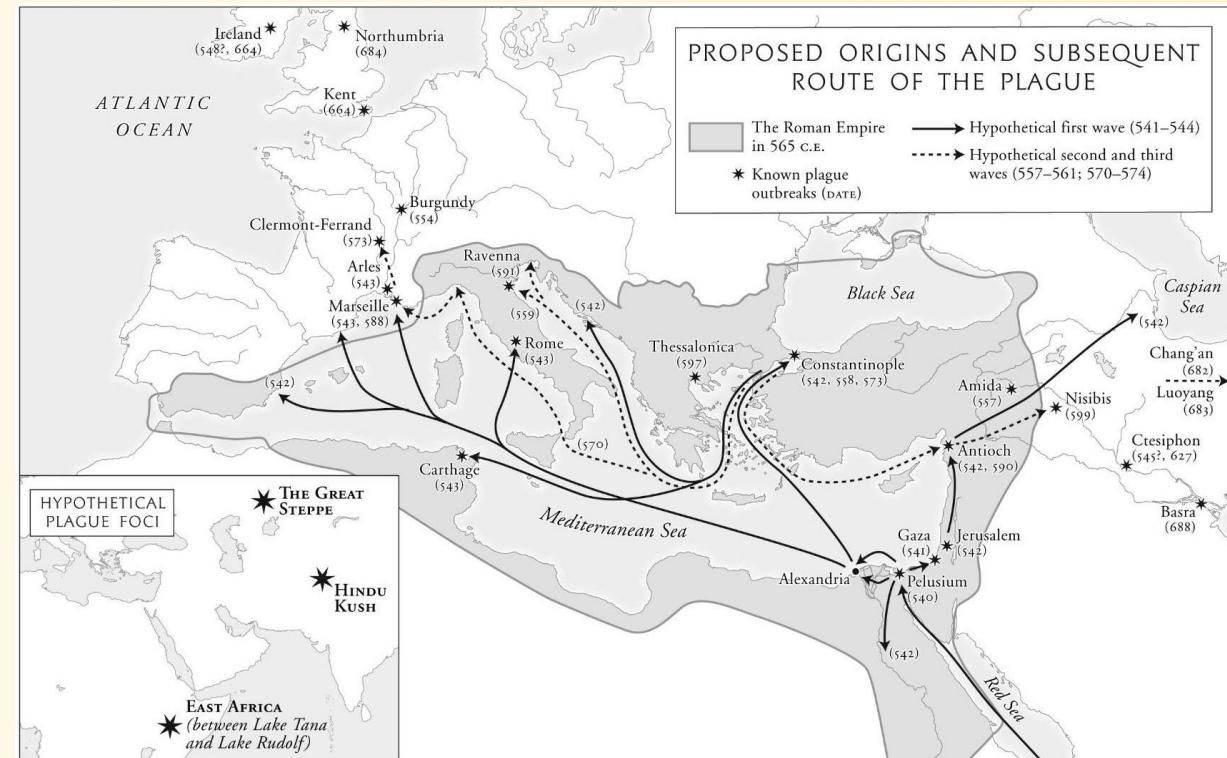


The Emperor Justinian



The Justinianic Plague

- Origin: according to Roman sources, it appeared first in Axum (today eastern Ethiopia), spread to Egypt, and from there throughout the Mediterranean and east to Persia (today Iran) via trade routes
- Pathogen: Strains of *Yersinia Pestis* unrelated to those responsible for the Second and Third Pandemics
- Scope: western Eurasia, as far north as England



The Justinianic Plague: Theory of Outbreak and Transmission

- A single source pandemic: it began with a unique strain of *Yersinia Pestis* in a specific location and spread from there. That is, the plague seems not to have been endemic to the afflicted area
- The drying of the grasslands in east Africa forced the plague out of the wild, whence it spread north along Red Sea trade routes
- The mode of transmission is unclear and currently under debate
 - The lack of evidence of rats in the archaeological record suggest the fleas-and-rats model might not apply beyond the ignition phase
 - Human to human transmission might have been mainly responsible for the subsequent spread



The Justinianic Plague: The Evidence

- Recent DNA evidence has confirmed what historians had long suspected from the Roman sources: the plague was bubonic
- Most prominent among the Roman accounts is that found in the *History of Justinian's wars* by Procopius, the emperor's court historian

Procopius on the disease

But with the majority it came about that they were seized by the disease without becoming aware of what was coming either through a waking vision or a dream. And they were taken in the following manner. They had a sudden fever, some when just roused from sleep, others while walking about, and others while otherwise engaged, without any regard to what they were doing. And the body showed no change from its previous color, nor was it hot as might be expected when attacked by a fever, nor indeed did any inflammation set in, but the fever was of such a languid sort from its commencement and up till evening that neither to the sick themselves nor to a physician who touched them would it afford any suspicion of danger. It was natural, therefore, that not one of those who had contracted the disease expected to die from it. But on the same day in some cases, in others on the following day, and in the rest not many days later, a bubonic swelling developed; and this took place not only in the particular part of the body which is called bubo, that is, "below the abdomen," but also inside the armpit, and in some cases also beside the ears, and at different points on the thighs. Death came in some cases immediately, in others after many days; and with some the body broke out with black pustules about as large as a lentil and these did not survive even one day, but all succumbed immediately. With many also a vomiting of blood ensued without visible cause and straightway brought death.



The Justinianic Plague in Constantinople according to Procopius

- The scourge was 'sent from Heaven'
- People practiced social distancing, with residents 'remaining quietly at home'
- 'Work of every description ceased, and all the trades were abandoned by the artisans, and all other work as well'
- The funeral system was overwhelmed as 'burials were neglected'
- The disease was poorly understood: 'The physicians were at a loss because the symptoms were not understood'
- Social disruption and the plight of essential workers: 'For slaves remained destitute of masters, and men who in former times were very prosperous were deprived of the service of their domestics who were either sick or dead.'
- State action to meet the emergency (as one can see in the quote on the right)

'And it fell to the lot of the emperor, as was natural, to make provision for the trouble. He therefore detailed soldiers from the palace and distributed money'



Historical Impact of the Justinianic Plague

Maximalist View

- High mortality rate
- Plague killed over half the population of western Eurasia
- The devastation explains the collapse of the Roman Empire, the end of Antiquity, and the beginning of the Middle Ages

Problems with the Maximalist View

- Written evidence: while sources mention the plague, some don't, and others say little about it – hardly to be believed if the plague were as devastating as supposed
- Premodern sources are not reportage and cannot always be trusted. Procopius said that 'during these times there was a pestilence, by which the whole human race came near to being annihilated'; but he also claimed the Emperor Justinian, whom he despised, killed a 'trillion people'. More likely: the plague was severe in Constantinople where Procopius lived, so he assumed it was horrible everywhere (similar to how something that happens in New York, where national reporters tend to live, is assumed to be hugely significant everywhere).
- Archaeologic evidence: an absence of mass or hurried burials
- A catastrophist model that assumes any mention of an outbreak of disease during the two centuries of this plague era refers to a bubonic outbreak, even though other diseases are known to have been locally endemic, such as malaria near Rome
- The chronology doesn't work: the western half of the Roman Empire collapsed in the century before the plague, and the surviving portion of the Empire lost territory to Arab conquerors a century after the main outbreak



Historical Impact of the Justinianic Plague

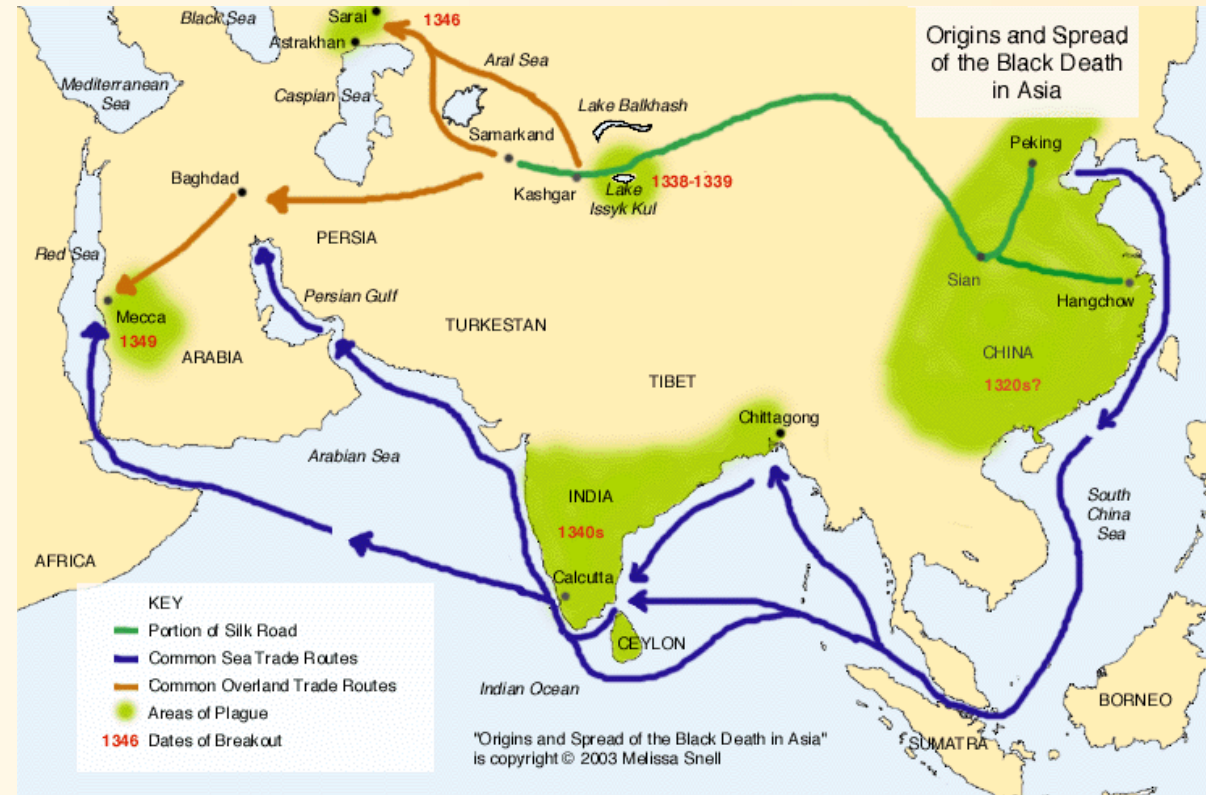
Minimalist view (more likely)

- The pandemic could be severe where it occurred, but its spread and effects were uneven
- It was disruptive in the short term, but Roman records of administration show no breakdown of institutions, and the patterns of spread actually attest to the persistence and strength of trade routes throughout the plague period
- The strain of *Yersinia Pestis* might have been less deadly than the one responsible for the Black Death



The Black Death

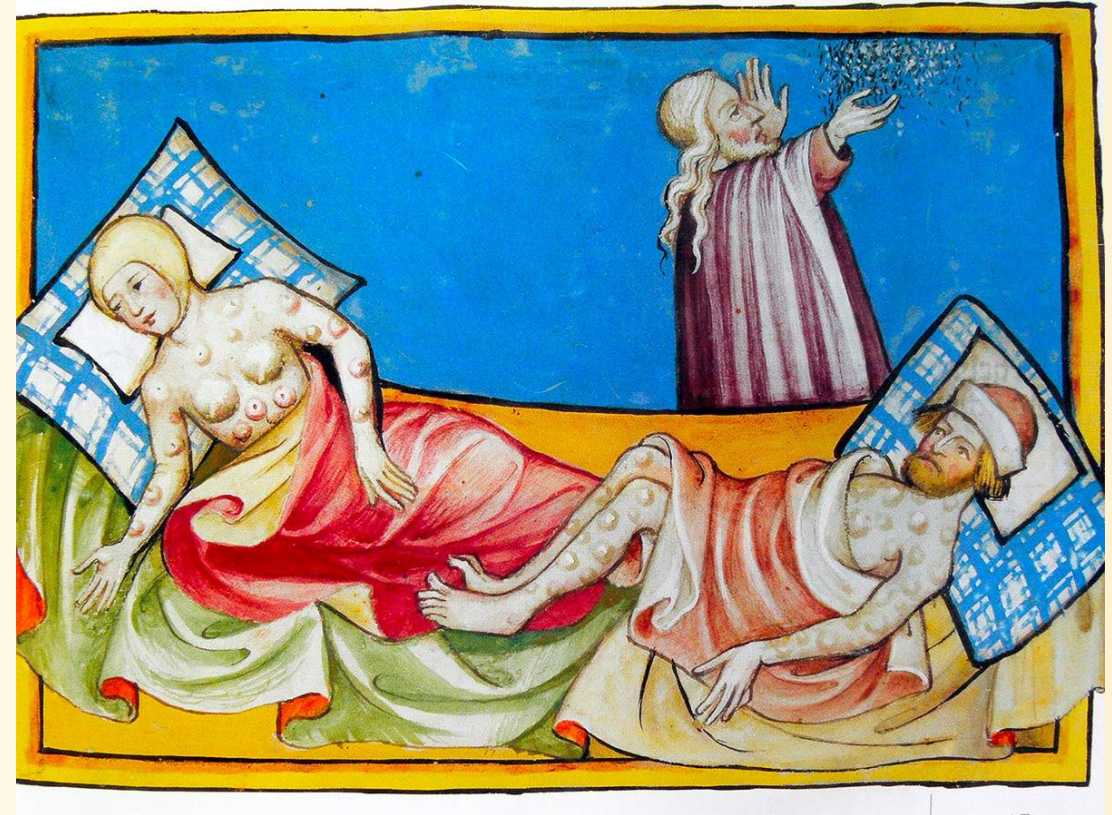
- When and where: China, 1330s; western Eurasia 1346-53
- Origin: Central Asia was probably the source of simultaneous outbreaks in China and in the West; that is, the disease seems not to have originated in China and then moved west
- Cause of outbreak: drying of the grasslands in the 'great lakes' region of Central Asia. Climate cooling in Europe after 1300 triggered famines that weakened the population ahead of the plague
- Pathogen: a strain of *Yersinia Pestis* related to that of the deadly Third Pandemic
- Mortality: 50%-60% of the population of Europe (the best studied area), making it the deadliest pandemic in history (although it might have been surpassed by smallpox in the New World in the sixteenth century)



The Disease according to an Eyewitness

Boccaccio on the Black Death in Florence

In men and women alike it first betrayed itself by the emergence of certain tumors in the groin or the armpits, some of which grew as large as a common apple, others as an egg, some more, some less, which the common folk called *gaboccioli*. From the two said parts of the body this deadly *gabocciolo* soon began to propagate and spread itself in all directions indifferently; after which the form of the malady began to change, black spots making their appearance in many cases on the arm or the thigh or elsewhere, now few and large, then minute and numerous. And as the *gabocciolo* had been and still were an infallible token of approaching death, such also were these spots on whomsoever they showed themselves.... Almost all within three days from the appearance of the said symptoms, sooner or later, died, and in most cases without any fever or other attendant malady.



Evidence for the Severity of the **Black Death**

- Abundant written sources attest to the brutality and trauma of the plague
- Swift population decline can be measured in manorial records
- Archaeological evidence reveals the shrinking of cities. (The population of Europe did not recover until the 18th century)
- Death is ubiquitous in art after 1347, as one can see in a genre known as the 'dance of death'

The Dance of Death



Contemporary Responses to the Black Death according to Boccaccio of Florence

- Divine punishment was a suspected cause: some believed the pestilence was **'sent upon us mortals by God in His just wrath by way of retribution for our iniquities'**. Some prayed and reformed themselves, others did nothing, others decided nothing mattered so they ate, drank, and made merry.
- Sanitation and distancing: **'the cleansing of the city from many impurities by officials appointed for the purpose, the refusal of entrance to all sick folk, and the adoption of many precautions for the preservation of health'**
- Social dislocation: **'citizen avoided citizen, how among neighbors was scarce found any that showed fellow-feeling for another, how kinsfolk held aloof, and never met, or but rarely; enough that this sore affliction entered so deep into the minds of men a women, that in the horror thereof brother was forsaken by brother nephew by uncle, brother by sister, and oftentimes husband by wife'**
- Psychological trauma of the survivors, unable to honor the dead **'who passed from this life unregarded'**
- Medical knowledge could not cope with the pestilence: **'maladies seemed to disregard the art of the physician.'** As one can see in the next slide, the experts – unaware of microscopic contagions which had yet to be discovered – settled on an astrological explanation

Burying Plague Victims



A Contemporary Explanation of the Black Death

Report of the University of Paris Medical Faculty, prepared for King Philip VI of France in 1348

- We say that the distant and first cause of this pestilence was and is the configuration of the heavens. In 1345, at one hour after noon on 20 March, there was a major conjunction of three planets in Aquarius. This conjunction, along with other earlier conjunctions and eclipses, by causing a deadly corruption of the air around us, signifies mortality and famine, and also other things about which we will not speak here because they are not relevant. Aristotle testifies that this is the case in his book Concerning the causes of the properties of the elements, in which he says that mortality of races and the depopulation of kingdoms occur at the conjunction of Saturn and Jupiter, for great events then arise, their nature depending on the trigon in which the conjunction occurs. And this is found in ancient philosophers, and Albertus Magnus in his book, Concerning the causes of the properties of the elements (treatise 2, chapter 1) says that the conjunction of Mars and Jupiter causes a great pestilence in the air, especially when they come together in a hot, wet sign, as was the case in 1345. For Jupiter, being wet and hot, draws up evil vapours from the earth and Mars, because it is immoderately hot and dry, then ignites the vapours, and as a result there were lightning, sparks, noxious vapours and fires throughout the air.
- These effects were intensified because Mars -- a malevolent planet, breeding anger and wars -- was in the sign of Leo from 6 October 1347 until the end of May this year, along with the head of the dragon, and because all these things are hot they attracted many vapours, which is why the winter was not as cold as it should have been. And Mars was also retrograde and therefore attracted many vapours from the earth and the sea which, when mixed with the air, corrupted its substances. Mars was also looking upon Jupiter with a hostile aspect, that is to say quartile, and that caused an evil disposition or quality in the air, harmful and hateful to our nature. This state of affairs generated strong winds (for according to Albertus in the first book of his Meteora, Jupiter has the property of raising powerful winds, particularly from the south) which gave rise to excess heat and moisture on the earth; although in fact it was the dampness which was most marked in our part of the world. And this is enough about the distant or universal cause for the moment.
- Although major pestilential illnesses can be caused by the corruption of water or food, as happens at times of famine and infertility, yet we still regard illnesses proceeding from the corruption of the air as much more dangerous. This is because bad air is more noxious than food or drink in that it can penetrate quickly to the heart and lungs to do its damage. We believe that the present epidemic or plague has arisen from air corrupt in its substance, and not changed in its attributes.



Historical Impact of the **Black Death**

- Widespread death, depopulation, and psychological and cultural trauma
- However, no civilizational collapse
 - States did not collapse, but became more potent as they met the emergencies
 - Scrutiny and skepticism of received wisdom led to cultural renewal and innovation
 - Rise in wages due to depopulation
 - The Black Death contributed to the development of modern diagnostic medicine
- Religious skepticism: What kind of God would send such a punishment?

The peasants in England revolted in 1381 when the lords tried to enforce pre-Black Death wages



Lessons for Us

- Epidemic diseases often begin with animals and move to humans
- A cluster of factors create the conditions for a pandemic, among them climate change
- Pandemic diseases spread along routes of trade and communication
- Pandemics are traumatic and disruptive, but short-lived, so they do not lead to societal collapse
- The onset causes confusion among medical authorities confronted with something novel
- People and authorities cope with pandemics by social distancing, improvements in sanitation, and – after the pandemic has passed – the renovation of thinking and institutions



Further Enrichment

- The standard account of the Black Death is Ole Benedictow, *The Black Death 1346-1353: The Complete History* (Rochester NY: Boydell Press, 2004)
- For primary sources of the Black Death see *The Black Death*, translated and edited by Rosemary Horrox, Manchester Medieval Sources (Manchester: Manchester University Press, 1994)
- On the Justinianic plague see
 - Lee Mordecai et al, The Justinianic Plague: An inconsequential pandemic?, *Proceedings of the National Academy of Sciences* v. 116, no. 51 (2019), 25546-25554 (<https://www.pnas.org/content/116/51/25546>)
 - Lee Mordecai and Merle Eisenberg, 'Rejecting Catastrophe: The Case of the Justinianic Plague,' *Past and Present* 244, 1 (2019), 3-50
- Primary sources on the Justinianic plague are scarce, but Procopius's account can be seen here: <https://sourcebooks.fordham.edu/source/542procopius-plague.asp>
- Additional readings on the Bubonic plagues can be found at the blog site 'Infectious Historians' (<https://infectioushistorians.com/further-reading/>)
- Lastly, this entertaining music video – based on "Hollaback Girl" by Gwen Stefani – offers an excellent sketch of the bubonic disease and the Black Death: <https://www.youtube.com/watch?v=rZy6XilXDZQ>

