

Plague in the Ancient World:

A Study from Thucydides to Justinian

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Throughout history, humans have been faced with disastrous catastrophes which must be endured in order to survive. One of the most incomprehensible disasters for humanity has been the plague. This term in Greek can refer to any kind of sickness; in Latin, the terms are *plaga* and *pestis*. In antiquity, two of the most devastating plagues were the Athenian plague of 430 B.C. and the Justinianic plague of 542 A.D. This paper will discuss these plagues, the manner in which they spread, and their consequences for the survivors. Also, the ways in which ancient writers wrote about these disasters will be discussed, with special reference to the role of the gods. Much of what is conventionally believed about these plagues comes from comparisons with the Black Death, a visitation of bubonic plague during the fourteenth century A.D. Although the sources for the Athenian and Justinianic plagues are insufficient, there is some question as to the validity of this analogy as an historical source.

The Athenian plague occurred in 430-26 B.C. during the Peloponnesian War, which was fought between Athens and Sparta from 431 to 404. Because of overcrowded wartime conditions in the city, the plague spread quickly, killing tens of thousands. <1> Included among its victims was Pericles, the former leader of Athens. <2> The only surviving source for the Athenian plague is the first-hand account of Thucydides in his *History of the Peloponnesian War*. Thucydides, who lived from c. 460 to c. 400, was an Athenian general and political critic.

In his *History of the Peloponnesian War*, Thucydides employed a carefully developed structure to investigate the meaning and causes of historical events. His writing, which evolved from Sophistic thought, reflected a constant conscious analysis of grammar and rhetoric. <3> History, according to Thucydides, was a process of human nature; and as such, it was highly influenced by mass movements. He, therefore, stressed physical reality, and did not allow for the active intervention by the gods. This is most evident in his account of the Athenian plague, since plagues were traditionally attributed to the wrath of the gods, as evidenced in Herodotus, as well as in the Book of Exodus and the *Iliad* of Homer. <4> Through this work, Thucydides began an historiographical tradition which would become the model for many future historians.

Having suffered from the plague himself, Thucydides presented a very systematic account of the symptoms. His aim was merely to "describe what it was like, and set down the symptoms, knowledge of which will enable it to be recognized, if it should ever break out again." <5> The Athenian plague originated in Ethiopia, and from there spread throughout Egypt and Greece. <6> Thucydides, however, remarked that the city of Athens suffered the greatest toll from the disease. <7> Initial symptoms of the plague included headaches, conjunctivitis, a rash which covered the body, and fever. The victims then coughed up blood, and suffered from extremely painful stomach cramping, followed by vomiting and attacks of "ineffectual retching." <8> Many people also experienced

insomnia and restlessness. Thucydides also related that victims had such an unquenchable thirst that it drove them to throw themselves into the wells. Infected individuals generally died by the seventh or eighth day. If anyone managed to survive this long however, s/he was then stricken by uncontrollable diarrhea, which frequently caused death. Those who survived this stage might suffer from partial paralysis, amnesia, or blindness for the rest of their lives. <9> Fortunately, infection of the plague provided immunity; that is, few caught the disease twice, and if this occurred, the second attack was never fatal. <10>

Thucydides' description also included the social consequences of the Athenian plague, which he conceived within the context of the war. <11> Doctors and other caregivers frequently caught the disease, and died with those whom they had been attempting to heal. <12> Spartans besieging the city, however, were not affected by the disease spreading through Athens. <13> The despair caused by the plague within the city led the people to be indifferent to the laws of men and gods, and many cast themselves into self-indulgence. <14> In particular, Thucydides mentioned that no one observed the customary funerary rites. <15> With the fall of civic duty and religion, superstition reigned, especially in the recollection of old oracles. <16> During the first century B.C., Lucretius would use this section of Thucydides' account of the Athenian plague to support the doctrines of Epicurus. <17> To him, the plague illustrated not only human vulnerability, but also the futility of religion and belief in the gods.

Although many disastrous epidemics probably occurred between the Athenian and Justinianic plagues, few sources detailing these plagues have survived. Unfortunately, the accounts which do exist, are meager; and because of this, the microbial origins of the described plagues cannot be diagnosed. These sources frequently copy the literary style of Thucydides; however, they do not generally adhere to his belief regarding the noninvolvement of the gods.

One such disease, known as the Antonine plague, occurred during the reign of Marcus Aurelius (161-180 A.D.). It was brought back by soldiers returning from Seleucia, and before it abated, it had affected Asia Minor, Egypt, Greece, and Italy. <18> The plague destroyed as much as one-third of the population in some areas, and decimated the Roman army. <19> In 180, Marcus Aurelius caught some type of infection and died in his army camp. There has been some speculation that this infection was the plague. <20> Another plague occurred during the reigns of Decius (249-251 A.D.) and Gallus (251-253 A.D.). This pestilence broke out in Egypt in 251, and from there infected the entire empire. Its mortality rate severely depleted the ranks of the army, and caused massive labor shortages. The plague was still raging in 270, when it caused the death of the emperor Claudius Gothicus (268-270). <21>

After the third century, there is not another well-documented plague until the Justinianic plague in the mid-sixth century. This plague originated in 541-2 either in Ethiopia, moving through Egypt, or in the Central Asian steppes, where it then traveled along the caravan trading routes. From one of these two locations, the pestilence quickly spread throughout the Roman world and beyond. Like the Black Death which followed it in 1348, the Justinianic plague generally followed trading routes providing an "exchange of

infections as well as of goods," and therefore, was especially brutal to coastal cities. <22> The movement of troops during the campaigns of Justinian provided another source for the plague expansion. <23> These two factors, trade and military movement, spread the disease from Asia Minor to Africa and Italy, and also to Western Europe.

Although many writers documented this period, there are three main sources for the Justinianic plague: John of Ephesus, Evagrius Scholasticus, and especially Procopius. <24> John of Ephesus wrote his *Historia Ecclesiastica* during this period, while travelling around the empire. This work unfortunately survives only in fragments. Evagrius, a lawyer and honorary prefect living in the city of Antioch, wrote his *Historia Ecclesiastica* covering the years 431-594 at the end of the sixth century. His is the most personal of the accounts, having contracted the disease himself in 542 while still young. Although he eventually recovered, later recurrences of the plague would deprive him of his first wife, several children, a grandchild, and many servants of the family. <25> Another source for the Justinianic plague is the *Historia* of Agathias. A lawyer and poet, he continued the history of Procopius. His account of the Justinianic plague is of its second appearance in Constantinople in 558. A further account is the *Chronicle* of John Malalas; however, this work may have copied Procopius.

Although all of these sources give scholars important information about the plague, the *History of the Wars*, published in 550 by Procopius, gives the most systematic account of the symptoms and immediate consequences of the disease. Raised in Caesarea, Procopius became the legal secretary of the general Belisarius, and traveled with him throughout Justinian's reconquest campaigns in Italy, the Balkans, and in Africa. In 542, he witnessed the plague in Constantinople.

Procopius' primary literary model was Thucydides, a writer whom he, as well as every other writer in the classical world, consciously emulated. During the reign of Marcus Aurelius, Lucian of Samosata composed a work entitled *How to Write History*. <26> Here, Lucian stated that history was distinct from rhetoric, with the goal of writing the truth. He also included two criteria for an historian. First, the historian must have the natural gift of being able to understand public affairs. The second criteria was that the historian must be able to write. This, however, was not a natural gift. It was the result of practice and hard work, and a desire to imitate the ancient writers.

There are many reasons to state that Procopius consciously imitated the work of Thucydides. In the preface to his *History of the Wars*, Procopius claimed that he "considered cleverness suitable for rhetoric, the telling of myth for poetry, but for history, truth." <27> This introduction mirrors that of Thucydides, a fact that Procopius would have wanted his readers to recall to give his history credibility. Procopius also wrote his works in classical Attic Greek, which had long fallen out of use in the late Roman empire. Showing reluctance to use non-Attic words, Procopius was careful to avoid borrowing from Latin. For example, when he mentions a Latin term, such as *referendarii*, he always prefaces the word with a "as the Romans call it" phrase. <28> He also followed the example of Herodotus by referring, albeit inconsistently, to the Huns as the Massagetae, and the Persians as the Medes. <29> These are examples of how Procopius

emulated the classical historians, which his contemporaries would not only have admired, they also would have expected this sort of classical detachment from his work.

There are those scholars, however, who denigrate the work of Procopius as artificial because he imitated the style of the classical historians. One in particular claimed that "he [Procopius] could not even resist the opportunity which the plague...gave him to parallel his prototype's classic account of the great plague in Athens." <30> Statements such as these call the veracity of Procopius' account into question, suggesting that Procopius borrowed the plague description straight from the pages of the *History of the Peloponnesian War*. At the very least, they suggest that it is strange for Procopius to have recorded the event. After the Justinianic plague, there would not be another pandemic until the Black Death of 1348. According to Procopius in his *History of the Wars*, the death toll in Constantinople, when it struck in spring of 542 and raged for four months, reached 10,000 a day. <31> Although this figure is probably exaggerated, the plague did profoundly affect the population, both in terms of the victims and the survivors, and as such, was a worthy historical topic for Procopius. After devastating the capital, the plague continued to spread throughout the entire empire, remaining endemic after 542 until the middle of the eighth century. <32>

One reason to question those who feel that Procopius simply lifted Thucydides' account of the Athenian plague is that the two authors do not describe the same symptoms of plague. <33> Described in detail by Procopius, John of Ephesus, and Evagrius, the Justinianic epidemic is our earliest clearly documented case of the bubonic plague. <34> Each of these authors clearly makes reference to the formation of buboes, the tell-tale sign of bubonic plague, on the skin of victims. Thucydides, however, does not mention this symptom. The cause of the Athenian plague of 430 B.C. has not been diagnosed, but many diseases including bubonic plague have been ruled out as possibilities. <35> The most recent theory, postulated by Olson and a growing number of other epidemiologists and classicists, regarding the cause of the Athenian plague is Ebola virus hemorrhagic fever. <36>

The descriptions of the contagions also differed in another significant way. Thucydides noted that those who cared for the sick contracted the disease; in Constantinople, this did not regularly occur. <37> The Athenian plague was clearly a highly contagious infectious disease. Procopius, in contrast, was describing bubonic plague, which is not directly contagious unless the patient harbors fleas, or a pneumonic element of the disease is present. Although Procopius' account followed Thucydides as a literary model, Procopius did not lift the passage straight from *History of The Peloponnesian War*, since it is apparent that the two authors described different symptoms.

From the description provided by Procopius, it is known that in the spring of 542, the bubonic plague reached Constantinople. Modern scholars are uncertain as to its exact origins, which may have been the plague reservoir of the modern central African countries of Kenya, Uganda, and Zaire. <38> Still others believe the plague originated in the central Asian steppes and spread along the trade routes with the Far East, as did the Black Death of 1348. <39> The sources contemporary with the plague also disagree over

where the disease began. Procopius claimed the plague originated in Egypt near Pelusium; yet Evagrius stated that the plague began in Axum (modern day Ethiopia and eastern Sudan). <40> Evagrius' thesis may have stemmed from a traditional prejudice of the time that diseases came from warm areas. <41> At any rate, it certainly emerged in Egypt in 541; and following its sojourn in Constantinople, it spread throughout the empire along trade and military routes, always moving from the coastal cities to the interior provinces. <42> The plague then surfaced in Italy in 543, and reached Syria and Palestine in the same year. <43> From there, the contagion migrated to Persia, where it infected the Persian army and King Khusro himself, causing them to retreat east of the Tigris to the plague-free highlands of Luristan. <44> Gregory of Tours related how St. Gall saved the people of Clermont-Ferrand in Gaul from the disease in 543, and there is some speculation that the plague may have spread to Ireland by 544. <45> Moreover, like the Black Death, the Justinianic plague was recurrent, with the bacteria remaining endemic in the population for 250-300 years. <46> Agathias, writing of a second outbreak in the capital in 558, related that since the first epidemic, the plague had never completely abated, rather it simply moved from one place to another. <47>

This was the first known pandemic of bubonic plague to affect Europe. <48> While it is less famous than the Black Death of the fourteenth century, the Justinianic plague was certainly quite as deadly. Bubonic plague is spread by the bite of fleas which find their home on rodents. The black rat carried the Black Death, and there is no reason to believe that it was not an active carrier in the sixth century. It probably was not the only carrier; the dogs which are described as dying in Constantinople almost certainly carried fleas as well. Once trading brought the plague to a city, rats found urban areas, which were overcrowded with a stationary population, conducive to their lifestyle. This assessment agrees with the evidence in that although the disease overwhelmed the Roman and Persian Empires, the nomadic Berbers of Africa and the Arab peoples were not greatly affected by the plague. <49>

The plague itself actually occurs in three forms: bubonic, pneumonic (also called pulmonary), and septicaemic. The bubonic variety, which must exist before the other two strains can become active, will be described in detail; this form is not directly contagious unless the patient harbors fleas. Since Procopius did not state that those who cared for the sick necessarily contracted the disease, it is inferred that the bubonic form was most active in the Justinianic plague. <50> Pneumonic plague occurs when the disease bacilli, called *Yersinia pestis*, invade the lungs. This variety is highly contagious from one person to another, and is spread by airborne droplets. Due to Procopius' observation that the plague was not directly contagious, and the absence of the major symptoms of pneumonic plague in the accounts, namely shallow breathing and tightness in the chest, this form was probably not very active. Septicaemia occurs when the infection enters the bloodstream, and death is swift, usually before buboes are able to form. In his account, Agathias reported some victims dying as if by an attack of apoplexy. <51> This seems to indicate that the septicaemic form did exist during the sixth century outbreak. Bubonic plague results in death in roughly 70 percent of cases; pneumonic plague has over a 90 percent mortality rate. Septicaemic plague leaves no survivors. <52> Although all three

forms probably existed during the Justinianic plague, clearly the bubonic form predominated.

During the Justinianic plague, many victims experienced hallucinations previous to the outbreak of illness. <53> The first symptoms of the plague followed closely behind these hallucinations though; they included fever and fatigue, neither of which seemed life-threatening. Evagrius described facial inflammation, followed by a sore throat, as an introductory symptom. <54> Some victims also initially suffered from diarrhea. <55> Soon however, buboes appeared in the groin area or armpits, or occasionally beside the ears. <56> Following this symptom, the disease progressed rapidly; infected individuals usually died within two to three days. <57> The victim generally entered a semi-conscious, lethargic state, and would not wish to eat or drink. Following this stage, the victims would be seized by madness, causing great difficulties to those who attempted to care for them. <58> Many people died painfully when their buboes gangrened. A number of victims broke out with black blisters covering their bodies, and these individuals died swiftly. <59> Still others died vomiting blood. Pregnant women who contracted the disease generally died through miscarriage or in childbirth, but curiously, Agathias reports that young males suffered the heaviest toll overall. <60> There were also cases, however, in which the buboes grew to great size, and then ruptured and suppurated. <61> If this occurred, the patient usually recovered, although s/he would often suffer afterwards from muscular tremors. Doctors, noticing this trend and not knowing how else to fight the disease, sometimes lanced the buboes of those infected to discover that carbuncles had formed. <62> Those individuals who did survive infection usually had to live with withered thighs and tongues, classic aftereffects of the plague. <63> One interesting fact to note here is that humans were not the only victims of this contagion. Animals, including dogs, mice, and even snakes, contracted the disease. <64>

John of Ephesus recounted a long, somewhat rhetorical description of the plague and its effects in Palestine and within the city of Constantinople. As a Christian writer who clearly stated that the end of the world was at hand, he related many of the more grotesque elements of the epidemic. <65> To him, the plague was a manifestation of divine wrath, and a call for repentance. <66> His account vividly detailed scenes of havoc in which men collapsed in agony within the public quarters. The fear of being left unburied, or of falling prey to scavengers, led many individuals to wear identification tags, and when possible, to avoid leaving their homes at all. <67> In a related description, John of Ephesus described a house which men avoided because of its foul odor. When it was finally entered, they found over twenty corpses decaying. Many men also saw apparitions and terrible visions both before and after the disease produced symptoms in them. <68> In typical apocalyptic literature style, John of Ephesus did not see these "apparitions" and "visions" as hallucinations; to him, they offered a glimpse of the otherworldly realm. As previously mentioned, the plague spread along trade routes infecting port cities. John of Ephesus reported in his account that many ships would float aimlessly at sea, later washing up to shore with all of their crew dead from plague. He also described sailors reporting sightings of a spectral bronze ship with headless oarsmen, and monsters which appeared in the sea off the Palestine coast. <69>

Although the emperor Justinian contracted the disease himself, he nevertheless attempted to minimize the disaster. <70> Following the outbreak within Constantinople, Justinian commanded Theodore and the palace guard to dispose of the corpses. <71> By this time all gravesites were beyond capacity, and the living resorted to throwing the bodies of victims out into the streets or piling them along the seashore to rot. <72> Theodore responded to this problem by having huge pits dug across the Golden Horn in Sycae (Galata) and then hiring men to collect the dead. Although these pits reportedly held 70,000 corpses each, they soon overflowed. <73> Bodies were then placed inside the towers in the walls, causing a stench which pervaded the entire city. <74>

The plague left a severe impact on urban life. Although the urban poor were the first to suffer from the devastating effects, the pestilence soon spread to the wealthier districts. As if the threat of disease was not problem enough, bread became scarce, and some of the sick may actually have died of starvation, rather than disease. <75> Many houses became tombs, as whole families died from the plague without anyone from the outside world even knowing. Streets were deserted, and all trades were abandoned. <76> Inflation soared. In 544, Justinian's legislation of price controls was partly successful, but the scarcity of food persisted, especially in the capital. <77> As the taxation base shrank dramatically, financial pressure on the cities also increased. In an effort to economize, civic governments curtailed salaries for teachers and physicians and slashed the budgets for public entertainment. <78>

Although many rural areas were spared from the plague, those areas infected were crippled. This, in turn, affected the urban areas, since a reasonable harvest was essential to ensure that the cities would not experience food shortages. In Syria and Palestine, the plague reached the interior farmlands after the planting, and the crops ripened with no one to harvest them. <79> Heightening this existing problem in Syria, some sort of disease, possibly anthrax, attacked cattle in 551, causing fields to be left unplowed due to lack of oxen. <80>

Taxes on farmland whose owners died of plague became the responsibility of the neighboring landholders. In actuality, this regulation, had existed as a standard practice in the empire long before the plague years. <81> Procopius, however, always a champion of the landowning class, bitterly complained about this law. <82> It is likely that with the high mortality rate of the plague, this practice had become extremely burdensome. In 545, Justinian attempted to ease the financial distress of these landowning subjects by ruling that unpaid taxes on these deserted properties should not be charged to the neighboring landowners. <83> Apparently, the owners of neighboring properties had been forced to pay debts on the abandoned lands. This may have been the specific source of Procopius' complaint, rather than the former practice.

The plague also attributed to the shrinkage of two particular groups in the empire, namely the army and the monastic houses. Even without the shortage of manpower caused by the plague, recruits for the army had become increasingly more difficult to find, with the result that the empire was mostly served by barbarian mercenaries. <84> The campaigns for expansion and reunification of the west with the eastern Roman empire served as a

conduit for sacrificing immense numbers of soldiers. <85> In Justinian's final years, there were virtually no men either to volunteer or to be impressed into the service. Fortunately for the Romans, the plague had also attacked and weakened the Persian empire. In most other areas of the empire however, they were not so fortunate. In Italy, the Ostrogoths resumed the war, and new revolts broke out in the previously subdued African provinces. There were also renewed threats from the eastern barbarian tribes. Remnants of the Asiatic Avars, whom Chagan Baian had reunited, approached the imperial frontiers for recognition, and the Kotrigur Khan attacked the Balkan territories. <86>

Another group greatly affected by the plague included the monasteries. In the area of Constantinople, records list over eighty monasteries before 542; however, after the plague, most of these seem to disappear. <87> There is no doubt that the plague contributed to this decline. Highly infectious contagious diseases like the bubonic plague thrive in close-knit populations. Much like John of Ephesus' description of unmanned ships washing ashore, it was not uncommon for an entire monastery to be wiped out by the plague during the Black Death.

Although there were these setbacks in the growth of the clergy, the Byzantine empire moved into closer alliance with the church in the crises of the sixth century. Surrounded by disasters, the religiosity of the people increased, and the church financially benefited from private resources which would have previously supported civic projects. Although building activity continued in the empire, indicating that some level of prosperity persisted, the types of construction changed. In Syria for example, there was a marked shift from civic construction to the building of churches and monasteries by the middle of the century. <88> The public sector wealth which paid for civic construction relied upon tax revenues, which had been greatly depleted by the plague. In comparison, the church could receive funding from private donors, individuals whose purse strings were loosened by their brush with death.

Unfortunately, the bubonic plague was not the only disaster of the time. In the *Secret History*, Procopius catalogued the natural catastrophes, including floods and earthquakes, as well as barbarian invasions, that had afflicted the empire since Justinian began his reign in 518. He claimed that at least half of the survivors of these previous calamities then died of the plague. <89> Also, after the initial outbreak in 541, repetitions of the plague established permanent cycles of infection. To explain these events, Procopius in his *Secret History* stated that God had turned away from the empire because it was ruled by a demon emperor. <90> Excellent religious symbolism of this theory was provided with the collapse of the original dome of Hagia Sophia, following an earthquake which had beset the capital. <91> Of course in his official *History of the Wars*, Procopius had claimed that human beings were not capable of understanding why such disasters occur. <92>

During the reign of Justinian, the classical literary tradition was in the process of being adapted to Christian culture and history. A Christian writer could not employ the classical notion of *moira* as a causal factor in history. <93> These factors had to be replaced with

a Christian explanation of sin leading to punishment. Although Procopius regarded religious events as inappropriate for his histories, he is clearly the last of the classical historians in this respect. <94> After Procopius, most Roman historians use sin as a historical causal factor. This is especially apparent in the Christian plague accounts.

The Christian writers, whose literary plague model was the Book of Revelation, clearly felt that the plague was a punishment sent by God in response to human sinfulness. "It was known," wrote Zachariah of Mytilene, "that it was a scourge from Satan, who was ordered by God to destroy men." <95> Near Antioch, St. Symeon the Younger tearfully prayed to Christ, and received the reply, "The sins of this people are manifold, and why do you bother yourself about their diseases? For you love them no more than I." To save the saint grief, however, God granted Symeon the power to heal the believers. In this way, many who were infected with the disease called on St. Symeon, and were cured. <96> Gregory of Tours in Gaul also wrote about St. Gall, who saved his flock from the plague. <97> Through these accounts, it is clear that the Christian writers felt the sufferings caused by the plague were the justifiable punishments of God, but also that the faithful should be saved by their belief in Christ.

To modern readers, the accounts of the plague, even those of the Christian writers, seem strikingly sober, given the magnitude of the disaster. Procopius and Agathias, like Thucydides before them, employed a detached, almost agnostic, stance, while the Christian writers accepted the plague as a just punishment from God. <98> Unlike the Black Death, the Justinianic plague appears not to have been accompanied by mass hysteria, flagellant processions, or persecutions of the Jews. The general populace seems almost accepting of the calamity. John of Ephesus reported visions, but even these are nothing compared with the wild descriptions which accompanied the Black Death of the fourteenth century. Henry Knighton, who wrote a chronicle in England during the Black Death, claimed that the earth had swallowed many cities in Corinth and Achaia, and in Cyprus, the mountains were leveled causing the rivers to submerge the nearby cities. The hallucinations described by John of Ephesus could be a symptom of the plague, but the description indicated by the medieval chronicle illuminates a greater hysteria. <99> The attitude indicated by the Christian writers during the Justinianic plague, however, paralleled a common fourteenth-century interpretation of the Black Death; that is, it was caused by the wrath of God. <100>

The Justinianic plague, apart from its devastating immediate impact, is generally viewed as undermining the late Roman empire, politically and economically, creating conditions ripe for disaster. <101> Coupled with the other disasters of the reign of Justinian, the plague may have reduced the population of the Mediterranean world by the year 600 to no more than 60 percent of its count a century earlier. <102> Such a massive mortality rate would naturally lead to social and economic ruin. Also, the depopulation of the urban centers might have created a structural imbalance in favor of the desert Arabs.

The main problem with this thesis is the lack of firm demographic evidence for the late Roman empire. Before plague mortality can be determined, modern scholars need an estimate of the overall population of the empire for this period. Unfortunately, this

information has not been effectively determined. There are also other problems in calculating definitive population data. Although any kind of epidemic disease has severe effects on a previously unexposed population, the recurrences of that disease would not be as devastating. <103> Also, the "dark age" of Byzantine literature which follows the reign of Justinian fails to firmly document these recurrences of the plague. The many other natural catastrophes during this period constitute another problem when trying to determine plague mortality. Even if it could be determined that 300,000 people perished in Constantinople during the spring of 542, there would still be a question whether these individuals died from the plague or in the massive earthquake which also occurred at this time. The sources to discover this type of information unfortunately do not exist.

Because scholars have been unable to determine the overall population, they have attempted to conclude the mortality rates in well-documented cities, such as Constantinople. The population of Constantinople, however, has also not been determined conclusively. <104> Data used by modern scholars is generally based on the literary descriptions of the plague, which are very likely colored by exaggeration. John of Ephesus stated that people died at a rate of 5,000 to 16,000 a day, and that men at the city gates stopped counting the exiting corpses at 230,000 when they realized the bodies were innumerable. <105> Procopius claimed that 10,000 people died a day, and that the plague lasted for four months in Constantinople. <106> Based on these figures, it is possible that one-third to one-half of Constantinople perished. Although this conclusion seems high, John of Ephesus, who was travelling during the first outbreak of the plague, noted that the deaths in Constantinople exceeded those in other cities. <107> Urban mortality rates are inconclusive in most of the other large cities of the empire. Some cities became practically deserted from the plague, while others, especially those which were not trade centers, were less affected.

Faced with these difficulties, and in light of the need for additional demographic data, scholars have postulated an overall mortality rate for the empire of about one-third of the population, which, not surprisingly, happens to be a figure comparable to the toll probably taken by the Black Death. <108> Comparisons with the demographic patterns following the Black Death have also led some modern scholars to postulate that the plague might not have caused permanent damage to the Roman Empire. <109> This theory, however, is based off of invalid comparisons, which assume similarities based on the fact that both plagues were bubonic in nature. Although the evidence for the plague being devastating to the empire stems from vague and unquantifiable literary accounts, the evidence to the contrary is not conclusive.

For example, after the Black Death, the marriage rate increased sharply, and resulted in prolific unions. Agathias observed, however, that young men suffered the most from the plague. If this observation was true, combined his statement that the plague recurred at fifteen year intervals, this clearly would have caused disastrous demographic consequences. <110> One scholar has pointed out that the Egyptian papyri give no indication of either economic crisis or even a population decline during the plague. Although this is troubling, John of Ephesus did state that Alexandria was not affected like the city of Constantinople. <111> Also, the sources do not indicate that the plague

struck Egypt again after 541. Another objection is that despite literary sources recounting tales of bodies overflowing graveyards, nowhere has any archaeologist working in the Near East discovered a plague pit. <112> It seems probable, however, that further archaeological investigations will counter this objection.

These questions do not deny the existence of the plague, but simply challenge whether it had enduring catastrophic effects on the empire. The Black Death in medieval Europe has been described as having a "purgative rather than toxic" effect on what had previously been an over-populated society facing Malthusian checks. <113> Following the Black Death, a lower people-to-land ratio was produced, causing wage inflation. In 544, Justinian issued a law which vetoed pay increases for artisans, laborers, and sailors, in an effort to control wage inflation. <114> Although higher grain prices dampened real wages immediately after the plague, the population decrease clearly benefited the lower economic classes. <115> It is important to remember, however, that this comparison can only stretch to an extent; in contrast with fourteenth-century Europe, there is no hard evidence that the late Roman empire was overpopulated. Although it is clear that the plague did devastate the empire, at least temporarily, it is necessary to remember that the Roman Empire in 600 was still a powerful state, facing favorable political conditions, and supported by a prosperous economy.

Throughout history, plagues have severely affected human societies. To understand their effects, however, there is a need for much demographic and archaeological research. Many of the archaeological investigations conducted in the Near East have not been carried out in a sufficiently methodical manner; they have been in effect, exercises in treasure hunting. In Athens, few digs have concentrated on the problems presented by the plague. The superimposition of modern cities on these ancient sites has also hampered archaeological investigations in some areas of the greatest importance, notably Constantinople. Politics have, unfortunately, also played a part in these difficulties. In the future, perhaps new investigations into the mediums of archaeology and demographics will offer more insights into the effects and consequences of the Athenian and Justinianic plagues.

Notes

1 Thucydides, *History of the Peloponnesian War*, II, 52. The city of Athens was overcrowded because Pericles had arranged for the rural population to enter the city before the Spartan siege. There is unfortunately no demographic evidence to determine the mortality rate of the Athenian plague.

2 Thucydides, II, 65.

3 Chester G. Starr, *A History of the Ancient World* (Oxford, 1991) 328.

4 Homer, *Iliad*, I, 9-11; "Zeus' son and Leto's, Apollo, who in anger at the king drove the foul pestilence along the host, and the people persihed, since Atreus' son had dishonored Chryses, priest of Apollo...."

5 Thucydides, II, 48.

6 Thucydides, II, 48. Thucydides does not indicate any of his sources.

7 Thucydides, II, 54 and 47.

8 Thucydides, II, 49. The "ineffectual retching" has recently been retranslated as "hiccuping" by Olson, who attempts to connect the Athenian plague with the disease Ebola. Ebola is the only epidemic disease which has hiccuping as a symptom, and the word means hiccuping elsewhere in Greek literature, for instance, in Plato's *Symposium*. The search to identify the Athenian plague is discussed in greater detail later in this paper.

9 Thucydides, II, 49.

10 Thucydides, II, 51.

11 Thucydides believed the plague contributed to the defeat of Athens, because the willingness of the people to endure suffering for the public good was destroyed by the disease; II, 53.

12 Thucydides, II, 47 and 51.

13 Thucydides, II, 54. The Athenian plague was directly contagious, probably by means of airborne droplet infection. It spread to other cities when infected individuals either traveled or fled to the new areas.

14 Thucydides, II, 52 and 53.

15 Thucydides, II, 52.

16 Thucydides, II, 54.

17 Lucretius, *On the Nature of Things*, XI.

18 There are two major sources for information about the Antonine plague. Galen listed some of the symptoms of the pestilence in *On the Natural Faculties*; however, since he did not go with Marcus Aurelius on campaign, he possibly did not see the disease first hand. Other plague information is included in the *Letters* of Marcus Cornelius Fronto, who was a tutor of Marcus Aurelius.

19 Based on demographic studies, the average mortality rate during the Antonine plague was probably only 7-10% and possibly 13-15% in cities and armies; R.J. and M.L. Littman, "Galen and the Antonine Plague," *American Journal of Philology* 94 (1973) 254-55.

- 20 J. F. Gilliam mentions this thesis, but does not offer any evidence; see "The Plague under Marcus Aurelius," *American Journal of Philology* 82 (1961) 249.
- 21 Zosimus, *New History* I, 26, 37 and 46.
- 22 W. H. McNeill, *Plagues and Peoples* (Oxford, 1977) 125.
- 23 Donald M. Nicol, "Justinian I and his successors, A.D. 527-610" in Philip Whitting, ed., *Byzantium: An Introduction* (New York, 1971) 28.
- 24 Other sources include the writings of Gregory of Tours, Marcellinus Comes, Michael the Syrian, Zachariah of Mytilene, Philostorgius and the *Vie de S. Symeon*.
- 25 Evagrius, *Historia Ecclesiastica* IV, 29.
- 26 Cited from J. A. S. Evans, "The Attitude of the Secular Historians of the Age of Justinian towards the Classical Past," *Traditio* 32 (1976) 354.
- 27 Procopius, *Wars* I, 1.
- 28 Procopius, *Secret History* XIV, 11.
- 29 Procopius, *Wars* XIII and *Secret History* III, 2.
- 30 John W. Barker, *Justinian and the Later Roman Empire* (Madison, 1966) 76. Cf. J. A. S. Evans, *The Age of Justinian* (New York, 1996) 160-1.
- 31 Procopius, *History of the Wars* (The Persian War) II, 23, 1; see also the *Chronicle* of John Malalas, XVIII, 92. All following Procopius citations will be from "The Persian War," unless otherwise stated.
- 32 The eighth-century date is contested because Byzantine writing experienced a 'dark age' following the reign of Justinian. Despite this, the plague remained endemic at least until the end of the seventh century, and took roughly two-and-a-half centuries to burn itself out; the Black Death in Europe remained endemic for roughly the same amount of time; P. Allen, "The 'Justinianic' Plague," *Byzantion* 49 (1979) 14, citing among others the works of Agapius, Bede, Theophanes, Theophylact, and the *Vita* of John the Almsgiver by Leontius of Neapolis, which record the various outbreaks of the plagues.
- 33 Cf. Thucydides, 11, 51 and Procopius, *Wars*, 11, 22.
- 34 Plague symptoms are described in Procopius, *Wars* 11, 22-23; Evagrius, IV, 29; John of Ephesus, *Historia Ecclesiastica* frgs. 11, E-H.

35 See J. C. F. Poole and J. Holladay, "Thucydides and the Plague of Athens" *Classical Quarterly* 29 (1979) 282-300; also Alexander D. Langmuir, et al., "The Thucydides Syndrome," *New England Journal of Medicine* 313 (1985) 1027-30.

36 Patrick Olson, "The Thucydides Syndrome: Ebola Déjà vu? (or Ebola Reemergent?) " *Emerging Infectious Diseases* 2 (Apr-Jun 1996) 1-23; Allison Brugg, "Ancient Ebola Virus?" *Archaeology* (Nov/Dec 1996) 28; Bernard Dixon, "Ebola in Greece?" *British Medical Journal* 313 (17 Aug 1996) 430; Constance Holden, "Ebola: Ancient History of 'New' Disease?" *Science* 272 (14 June 1996) 1591.

37 Cf. Thucydides, 11, 51, 5 and Procopius, *Wars* II, 22, 23.

38 For information on the plague reservoirs, see the Center for Disease Control Internet site <http://www.cdc.gov/ncidod/dvbid/plagen.htm>.

39 Bubonic plague is endemic to the central Asian steppes and to central Africa. Barker asserts the Justinianic plague spread from Asia because this is where the Black Death of 1348 originated; pp. 191-2. Allen agrees with this thesis, since Justinian did not steal silkworm eggs from the China until 552, p. 19. For information on the silkworm incident, see Procopius, *Wars* (Gothic War) IV, 17.

40 Procopius, *Wars*, 11, 22, 6; Evagrius, IV, 29.

41 Hans Zinsser, *Rats, Lice, and History* (New York, 1960) 145. Ethiopia, which was situated at the southern edge of the ancient known world, was the warmest place known to the Greeks and Romans. Thucydides also claimed the Athenian plague originated in Ethiopia.

42 Procopius, *Wars*, 11, 22. Modern scholars who support the Asian plague origin thesis believe trade brought the disease to Egypt.

43 Marcellinus comes, *Chronicon, sub anno* 543. Syria and Palestine were included in Oriens, a diocese established by Diocletian. It was the easternmost part of the Roman Empire.

44 Procopius, *Wars* 11, 24, 8-12.

45 Gregory of Tours, *History of the Franks* IV, 5; Allen, 15, on this speculation. Bede, *Ecclesiastical History of the English People*, III, 27, recorded the devastation of Britain and Ireland by the plague in 664.

46 See note 32.

47 Agathias, *Historia*, V, 10, 1-7.

48 Allen, 7. It may also have been the first pandemic disease. Philip Ziegler, *The Black Death* (Harmondsworth, 1970) discusses three historical pandemics: the Justinianic plague, the Black Death of 1348, and an ongoing contagion which began in Yunnan in 1892, pp. 25-6.

49 Evans, *Age*, 162.

50 The bubonic form was also the variety most active during the Black Death.

51 Agathias, V, 10, 3.

52 Ziegler, 20.

53 Procopius, *Wars*, 11, 22, 10; John of Ephesus, fragment 11, E.

54 Evagrius IV, 29.

55 Evagrius IV, 29.

56 Procopius, *Wars*, 11, 22, 17. Buboos appear near the lymphatic nodes area closest to where the individual was first infected with the disease; hence, the groin is a common site for buboes, since legs present an easy target for fleas.

57 Agathias, V, 10, 3; Evagrius, IV, 29; Gregory of Tours, IV, 31.

58 Procopius, *Wars*, 11, 22.

59 Procopius, *Wars*, 11, 22, 19-28; John of Ephesus, fragment 11, G. Boccaccio mentions similar spots in his description of the Black Death of 1348 in the Introduction to his *Decameron*. Zinsser, p. 109, takes this as evidence that a severe type of smallpox participated in both plagues, but this opinion has now been discounted by scholars, with no replacing theory as of yet.

60 Agathias, V, 10. Agathias does not offer any evidence as to why this statistic was true. It is possible that the previously healthy young men bore the burden of society during this time of sickness, perhaps increasing their susceptibility.

61 Procopius, *Wars*, 11, 22, 37.

62 Procopius, *Wars*, 11, 22, 29; Evagrius, IV, 29.

63 Procopius, *Wars*, 11, 22.

64 John of Ephesus, fragment 11, G. There is no mention in the sources, however, of the plague spreading to the livestock, an event which would certainly have increased the chaos in the countryside.

65 John of Ephesus, frgs. 11, E-G.

66 John of Ephesus, frgs. 11, E and G.

67 John of Ephesus, fragment, II, G; also Michael the Syrian, IX, 28.

68 John of Ephesus, fragment 11, E.

69 John of Ephesus, fragment 11, E.

70 Procopius, *Wars*, 11, 23, 20. Justinian would eventually recover from the plague. Incidentally, at this time Belisarius, the general under whom Procopius served, was ousted from power, for reportedly engaging in treasonous activities during the dark days of Justinian's illness. After this incident, we hear little of and from Procopius, indicating that his fortunes very likely took a downward turn with Belisarius' fall from imperial grace.

71 Theodore served as one of the *referendarii*, or legal secretaries, who handled and dispatched all of the emperor's correspondence; Procopius, *Wars*, 11, 23.

72 John of Ephesus, fragment II, E.

73 John of Ephesus, fragment II, G.

74 Procopius, *Wars*, 11, 23.

75 Evans, *Age*, 163, does not list his sources for this theory; however, the grain for the city of Constantinople came from Egypt, and the harvest may have been interrupted when the plague struck there in 541.

76 John of Ephesus, frgs. II, E and G; Procopius, *Wars*, II, 23.

77 *Novellae*, 122.

78 Procopius, *Secret History*, XXVI.

79 John of Ephesus, fragment 11, E.

80 Michael the Syrian, IX, 29. When possible, he related that some work was done with mules or horses; Evans, *Age*, (p. 164) suggests anthrax without offering any evidence for this theory. It seems possible, however, that the cattle may have fallen victim to the plague, if we accept John of Ephesus' statement that the plague affected dogs, mice, and even snakes; fragment 11, G.

81 J. Danstrup, "The State and Landed Property in Byzantium" *Classica et Medievalia* 8 (1946) 247.

82 Procopius, *Secret History*, XXIII, 15-22.

83 *Novellae* 128; cf. Bury, *Later Roman Empire*, Vol. II, p. 350. The *Novellae*, which comprise one-fourth of Justinian's *Corpus*, were issued by Justinian after the second edition of the Code in 534. The *Novellae* were written in Greek, instead of Latin like the rest of the *Corpus*. Toward the end of his life, Justinian finally accepted that the language of his empire's people was Greek; however, the use of Latin persisted in the army.

84 Philostorgius, XI, 7, wrote about the destruction of the military caused by the plague. Conscription was employed during the fourth century in the Roman empire. Because of 'draft-dodging' practices by large landowners, however, the draft was impractical. Justinian had a volunteer army, composed mostly of groups of barbarian tribes.

85 Procopius, *Secret History*, XVIII. "So while he (Justinian) was emperor, the whole earth ran red with the blood of nearly all the Romans and the barbarians. Such were the results of the wars throughout the whole Empire during this time."

86 Barker, 275.

87 Evans, *Age*, 164.

88 Evans, *Age*, 165; cf. J. W. H. G. Liebeschuetz "The End of the Ancient City" (1992), 5-6, in John Rich, ed., *The City in Late Antiquity* (London, 1992); cf. Russell (1968) who stated the plague ended a period of prosperity.

89 Procopius, *Secret History*, XVIII, 44.

90 Procopius, *Secret History*, XVIII.

91 Procopius must have died before this event occurred, for surely the collapse would have formed an important symbol in his evidence of the works of the "demon emperor." Hagia Sophia was later restored by the architect Isidore the Younger.

92 Procopius, *Wars*, II, 22.

93 "Luck/Chance" and "Fate"; see "Historiography in Late Antiquity: An Overview" *History and Historians in Late Antiquity*, Brian Croke and Alanna M. Emmett, eds. (Sydney, 1983) 5.

94 Procopius, *Wars*, VIII, 25, 13.

95 Zachariah of Mytilene, *The Syriac Chronicle*, X, 9.

96 *Vie de S. Symeon*, 69-70.

97 Gregory of Tours, IV, 5.

98 Procopius, *Wars*, 11, 22,1-5; Agathias, V, 10, 6.

99 Henry Knighton, *Chronicon Henrici Knighton*, trans. Mary Martin McLaughlin in *The Portable Medieval Reader*, James Bruce Ross and Mary Martin McLaughlin, eds. (London, 1977) 217.

100 John Malalas XVIII, 92; Zachariah of Mytilene IX, 9; and John of Ephesus, frgs. II, EH. Evagrius, 11, 13; IV, 8; IV, 29 mentioned this attitude, but claimed that no one could know the motives of God; cf. Evans, *Age*, 163.

101 Mark Whittow, *The Making of Byzantium, 600-1025* (Berkeley, 1996) 66.

102 See J. C. Russell, "That Earlier Plague" *Demography* 5 (1968) 174-184.

103 McNeill, 127.

104 Stein calculated a population of 571,429 for 542; Teall, c. 500,000 in 400, Jacoby, c. 375,000 in 542; Russell, 250,000 in 542; cited from Allen, 10.

105 John of Ephesus, fragment, II, G.

106 Procopius, *Wars*, 11, 23, 1; also John Malalas, XVIII, 92.

107 John of Ephesus, fragment, II, G.

108 For information on the mortality rate of the Black Death, see Ziegler, 232.

109 Evans, *Age*, 164; also Whittow, 66.

110 Agathias, V.

111 John of Ephesus, fragment II, G.

112 Until November of 1996, there had been no discovery of a plague pit in Athens, despite near continuous archaeological fieldwork within the city for the past two centuries. Historians did not expect to find one, since the Greeks usually cremated their dead. One should recall though that one of Thucydides' points of contention during the plague was that his fellow citizens were not following proper burial customs. DNA testing on the corpses is expected to take place sometime in 1997 to attempt to ascertain the cause for the Athenian plague. See Constance Holden, "Athenian Plague Probe," *Science* 274 (22 Nov 1996) 1307.

113 Whittow, 68.

114 *Novellae* 122.

115 Evans, *Age*, 164.

[Back to the 1996 Table of Contents](#)