



The Direct and Indirect Effects of the Justinianic Plague on the Urban Economy of Constantinople

Harry Brazier

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Supervisor: Dr M.j. Groen-Vallinga (Miriam)

Faculty of Arts

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Introduction

Emperor Justinian I was the ruler of the Eastern Roman Empire, also referred to as the Byzantine Empire, from 525 AD until his death in 565 AD. Justinian I oversaw an important period of Eastern Roman history, in that his reign saw the attempted reconquest of much of the territory of the former Western Roman Empire. Justinian's reign also entailed other achievements such as the creation of his Corpus Civilis law code. The capital of the Eastern Roman empire was Constantinople (the present-day city of Istanbul). It is a city that has greatly impacted the course of European history throughout its tenure as a Greek, Roman, Byzantine, Ottoman, and Turkic city. An example of this impact can be seen in the year 1453, the year the city fell to the Ottomans. The fall of Constantinople influenced events such as the Italian Renaissance and the discovery of the 'New World' by early European explorers. The city saw a lot of new architecture and change during the reign of Justinian I. A large event that occurred during the reign of Justinian was the plague that first appeared in the empire in the year 541 AD which is most commonly referred to by historians as the 'Justinianic Plague' named after the emperor. The Justinianic plague would ravage the Eastern Roman empire for many decades and devastate the empire's finances and population, with the most notable impacts being seen in the city of Constantinople. Constantinople was brought to prominence during the reign of Constantine I, being upgraded from a simple Greco-Roman town to the new capital of the East. The city was developed further by subsequent Eastern Roman emperors. By the reign of Justinian, Constantinople was the empire's largest and most important city for not only trade and the economy, but also for its administration. Throughout Constantinople's history as the Eastern

Roman capital, the city relied on the imports from elsewhere in the empire to ensure its continued prosperity. Therefore, this means that the conditions within Constantinople represent the general state of the empire, as if the wider empire cannot provide the necessary resources that Constantinople requires, then the city shall suffer and shrink. Without the administrative capital the wider empire shall suffer as it cannot function without Constantinople.¹

An important concept of analysing the changes within a city is the concept of 'Urban Economics'. Urban economics relates to the division of economics that focuses on urban environments.² An urban economy is how an urban environment functions and how an urban area is structured. A previous study on the urban economy was conducted by Angeliki Laiou and Cécile Morrisson. In their study they discuss the key groups active in the urban economy who they state are the: 'craftsmen, traders and their customers, the elite and the people, and the state representatives dealing with economic matters.'³ From these groups Laiou and Morrison discuss the roles they have and how they impact the urban economy.

The approach used in this thesis aims to move away from the discussion of the role of each individual group as there is not enough evidence from the plague to discuss that particular part of the urban economy. Instead, this thesis shall focus on the urban lay out of the city and important components that are vital to everyday urban life within the city such as money and taxation. The reason this approach has been chosen is that it can best demonstrate how urban life is changed by the plague using the best available evidence in the process. The selected approach is an improvement of the previous as it applies the

¹ Laiou, A., E., *'The Byzantine Economy'* Cambridge, 2007) 37.

² Ibid. 27.

³ Ibid. 71.

theory to a broader topic that allows greater discussion as it moves away from a narrower social structured base focus previously used. This approach also fills in a gap in byzantine urban economics that does not discuss change in the concept on a large scale.

With these previous points in mind, this thesis shall ask the question: *'What were the direct and indirect effects of the Justinianic Plague on the urban economy of Constantinople?'*. The thesis will focus on important factors that contribute to the urban economy, namely the population, economy, and structure of the city's urban environment and speak about the changes caused as a consequence of the changes but that an initial repossession of the caused change. The population and structure of a location decides if an area is 'urban', meaning a densely populated settlement. It is important to focus on the economy as it is the particular area the idea of urbanisation shall be applied to in the concept. Discussion of these areas shall highlight the changes the plague caused on these pillars of the urban economy.

The Justinianic Plague was widely considered by historians as a form of bacteria called *Yersinia Pestis*, more commonly referred to as the 'Bubonic plague', which was the same bacteria that caused the Black Death in the fourteenth century.⁴ The Justinianic Plague appeared in Egypt in the year 541 AD. According to the historian Procopius of Caesarea, the plague reached Constantinople in the spring of the year 542 AD.⁵ The plague subsequently spread throughout the late antique Mediterranean world, and was still present in some locations in the seventh century. The plague ravaged much of the Eastern Roman Empire

⁴ Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects' *Early Medieval Europe* 24:3(2016) 267-292 275; Eisenburg, M., Mordechai, L., 'The Justinianic Plague: an interdisciplinary review' *Byzantine and Modern Greek Studies* 43:2 (2019) 156-180; Gibbon., E., *'Decline and fall of the Roman Empire part 1'* (Chicago, 1990) 647.

⁵ *Procop, Wars*, II 22,6.

and the Mediterranean World, with the city of Constantinople being impacted the most by the plague.

The plague is considered to be one of the first major epidemics in history and is an event that changed both the economic health of Constantinople and the course of Justinian's reign. Constantinople before the plague in 541 AD had a thriving urban economy which boasted a large population, a diverse urban city plan, sizeable tax revenues and a strong citywide economy. The consequences of the plague coupled with other events, such as the lengthy war with the Sassanians, began to take its toll on the economy of the empire as well as Constantinople which led to the downsizing of the city in terms of population. It is important to study these changes as it can provide insights into how a city is impacted and changed by major events and what the consequences of those events are.

To demonstrate the impact the plague had on the urban economy of Constantinople, certain areas shall be discussed, namely, demography, numismatics, and taxation. The reason these topics have been chosen for discussion is that they represent a new approach to the discussion of the Justinianic plague that makes best use of available evidence to analyse important components of the urban economy.

The topic of demography will discuss the layout of Constantinople. This is an important aspect of the urban economy as by assessing the layout of the city before and after the plague, the key changes that appear can be assessed. Certain questions can be answered during this process. The first of these questions is did the plague have a noticeable impact on the population of Constantinople? It is important to consider this question as a plague is defined the amount of death it causes and a loss in population can drastically change the urban situation in any given environment. The second question discussed is if any

topographical changes occurred within the city during the period of the plague. It is important to ask if any physical changes occur in the city during the period of the plague such as a change in where the majority of economic activities change or if certain buildings or locations saw more use around the period. An analysis of these two aspects will combine these factors into a discussion on the demographic changes seen from the plague. The consequences of these will also be discussed. This shall be followed by a discussion of the economic factors of numismatics and taxation to hypothesise if these in combination resulted in a new set of circumstances in Constantinople's urban economy.

The second topic of this thesis to be discussed is numismatics. This topic will comprise the larger topic of economic factors effected by the plague. Numismatics analyses whether coinage saw any changes as a result of the plague. This topic shall ask what these changes suggest about the economic situation in Constantinople during and after the plague. This is an important point of discussion as coinage is a key component of both the urban and regular economy, as it is the tangible means by which an individual makes a transaction such as a payment. Therefore, an assessment of this area can highlight any changes the plague may have caused to the most important physical element in day to day monetary transactions.

The final topic that shall be discussed is taxation changes. Taxation was the largest source of revenue for the empire. Constantinople was one of the richest city in the empire, providing the most tax revenue to the empire compared to the other cities. The questions that shall be raised in this section are, was there a noticeable change to the amount of tax revenue received by the empire from Constantinople? And is any change linked to the damage the plague caused? The factors that determine the tax revenue of Constantinople shall be

analysed within this section and combined with the numismatical evidence so that both these two large areas of the urban and regular economy are discussed in a manner that makes best use of a large proportion of available evidence.

Status Quaestionis

The Justinianic plague has been a topic of scholarly debate and discussion for many years. In the early twentieth century, the study of the Justinianic plague was viewed only as a minor subject. This is because, to early authors on the reign of Justinian and the Eastern Roman Empire, the plague was something that could be dealt with in passing. The plague is not treated as a significant historical event, with the spotlight instead being placed upon Justinian's achievements and ambitions. This is in line with the Nineteenth-century approach to the study of history based on the lectures on leadership by Thomas Carlyle, favouring the impact of men over events, an approach coined 'the great man theory'.⁶ The great man theory is seen within the study of Wilhelm Schubert, for example, whereby the plague is not discussed in much detail. It is treated as a small bump on a journey from the beginning to the end of Justinian's reign. The account of Procopius of Caesarea, who was the primary chronicler of the emperor Justinian also created the basis for many discussions of the plague of Justinian during the same period. An example of this is the study of Edward Gibbon. Within his work, Gibbon dedicates only a small section to the outbreak of the plague which is based solely on the accounts given by Procopius. Gibbon largely recounts the story Procopius gives and treats the plague in the same manner he treats the earthquake that hit Constantinople in 557 AD. Gibbon does not question the plague's impact and how it would be different from the impact of the earthquake in 557. This is likely due to the primary aim of the work being the character and leadership of Justinian.⁷ Schubert and

⁶ Spector, B., A., 'Carlyle, Freud, and the great man theory more fully considered' *Leadership* 12.2 (2016) 250-260 250.

⁷ Schubert, W., 'Justinian und Theodora' (München, 1943); Gibbon, E., 'The Decline and Fall of the Roman empire' Griffith, T., (Hertfordshire, 1998) 774.; Gibbon, E., 'The decline and fall of the Roman Empire volume II' (Chicago, 1990) 70-71.

Gibbon are good representations of the state of the historiography during this period as they portray the prominence of the great man theory during the late colonial period.

Throughout this period, another prominent school of history was Whig history. The historians from the school of Whig history treat the study of history as a progression of time from the beleaguered and rough past to the enlightened better present. This approach is also represented by the study of Schubert as he describes the reign of Justinian in a linear way, starting from the beginning of Justinian's reign to the end primarily focused on Justinian's actions and their impacts, therefore, demonstrating both the great man theory and Whig history. What these two approaches have in common is that they do not discuss or take into consideration the impacts of events such as the Justinianic plague as they are too narrowly focused on the impact of the individual, in this case Justinian, and neglect factors outside this. In the case of Schubert, the linearity of his approach means that there is not enough consideration for the change caused by certain events that cannot be discussed in such a linear manner.

This trend continued until the 1960s and the 1970s. From this period onwards the Justinianic plague is analysed in greater detail than in earlier studies. The use of multiple literary sources became a common method of analysis and did not solely rely on the accounts of Procopius. One of the prominent historians to do this was Pauline Allen. Within her work, she focuses mainly on the text of John of Ephesus and emphasised the importance of his account as evidence of the devastation caused by the plague.⁸ Demography also became a

⁸ Alongside the addition of the account of John of Ephesus, Allen bases her assessments on evidence such as evidence of the symptoms and impact of the black death and subsequent bubonic plague outbreaks bringing in modern evidence on the types of plagues and their scientific features: Allen, P., 'The Justinianic Plague' *Byzantion International review of Byzantine Studies* 49 (1979) 5-20.

significant part of the discussion as studies theorised a large total percentage of population loss caused by the plague within the empire.

The debate was altered due to the argument presented by the French historian Jean Durliat in his 1989 study. Durliat argues that the literary sources that formed the basis of the previous discussions were too unreliable. Using evidence such as papyrological and archaeological studies, Durliat surmised that the plague had far smaller impacts than those previously suggested. His argument suggested that there is no evidence of long-term demographic effects caused by the plague from these sources, and as such, the plague should be viewed as a non-substantial event.⁹

The argument presented by Durliat was valuable to the historiographical debate as it presented the argument that non-literary sources should have an important place within the study of the plague. However, the article faced heavy criticism as historians believed that Durliat had been too critical of the primary evidence. Durliat's claims of non-literary evidence suggesting a minimal impact is based upon such arguments as the lack of epitaphs that mention the plague, indicating a lack plague related fatalities. A response to this approach can be seen in Mischa Meier's study. Meier claims that the lack of epitaphs cannot be used as suitable evidence as it is likely individuals were concerned more with a large amount of population loss and did not have the time to produce epitaphs.¹⁰

⁹ Durliat, J., *'La Peste du VI^e siècle: Pour un nouvel examen des sources byzantines'* (Paris, 1989) 107-119; Mordechai and Eisenburg provide a commentary on the work in English that summarises the arguments said and gives an overview of the study's importance in the debate of the Justinianic plague: Eisenburg, M., Mordechai, L., 'The Justinianic Plague: an interdisciplinary review' *Byzantine and Modern Greek Studies* 43:2 (2019) 163.

¹⁰ Meier also states that Durliat also blatantly neglected archaeological evidence in some cases and that these would have suggested heavy plague impact: Meier, M., 'The Justinianic Plague' 278-279 281.; Eisenburg and Mordechai note the impact of Durliat's study in their assessment but also state that subsequent articles argued for the opposite: Eisenburg, M., Mordechai, L., 'The Justinianic Plague: an interdisciplinary review' 167; Sarris uses the same analytical methods as Durliat within his study on the plague, however, he finds drastically different results: Sarris, P., 'The Justinianic Plague: Origins and Effects' *continuity and change* 17:2 (2002) 169-182.

The results of Durliat are not sustainable due to flaws in his reasoning, such as his argument that the urban impacts were far more prevalent than those of the rural. The impacts were likely to have been present in urban and rural areas of the empire in equal measure, which can be seen from accounts such as those of John of Ephesus who, while likely exaggerating his accounts, still highlights a large impact caused by the plague in rural areas.¹¹ This can be coupled with similar accounts of Procopius who highlights the impact the plague had on the ability of rural areas to pay tax. The issues of exaggeration can be looked past by not taking the numbers suggested at face value and using other sources to suggest a more realistic total for any given statistic. The accounts of John and Procopius suggest some form of struggle in the rural areas and highlights that there is comparability in the circumstances between rural and urban areas that cannot be dismissed.¹² However, the impact of Durliat's use of non-literary evidence on the modern study of the plague cannot be understated and should be considered a much-needed change for the discipline.

It was not until the turn of the millennium that new developments in this particular debate would be produced. The first is the work of Greek historian Dionysus Stathakopoulos in his monographs on the epidemic and climate history. Within his work, Stathakopoulos analyses the plague using similar methods to those of Durliat. However, Stathakopoulos' study does well to demonstrate how the evidence shows the impact of the plague on human society. Within Stathakopoulos' study, he analyses both the textual and non-textual sources to assess the general trends and characteristics of plagues within history, including the comparison

¹¹ The account of John of Ephesus is found in a later reconstruction of his text written by the 9th century patriarch of Antioch Pseudo-Dionysius of Tel-Mahre :Pseudo-Dion, *Chronicle*, III, I.

¹² Procopius, *The Secret History*, Trans. Williamson, G., A., Sarris, P., 73-75; Meier discusses the issues of exaggeration further: Meier, M., *'The Justinianic Plague'* 271.

between rural and urban impacts.¹³ Different approaches to the plague have also been discussed since the year 2000, many of these discussions can be traced to a conference held on the subject in 2001, where the plague and many topics surrounding it were presented and discussed.¹⁴ The approaches that have arisen since this period are more narrowly focused and different from one another. Areas that have been recently studied in the context of the plague include subjects such as geography, epigraphy, and climate.¹⁵ The newer areas of focus for the study of the Justinianic plague have helped demonstrate the impacts of the plague across the Mediterranean.

Currently, there are gaps in the historiography of the Justinianic plague. A particular gap present is a focus on the impacts of the plague on the urban economy of both the empire and the capital Constantinople. While there are analyses on components of the urban economy, such as Walter Scheidel's brief reference to the plague's impact on both the demographic and economic circumstances in the Eastern Roman Empire, there are very few studies on the plague that focuses primarily on the topic of the urban economy.¹⁶ There are especially few

¹³ Dionysus Stathopoulos has conducted many studies on the plagues within history, the most frequently discussed arguments are found in: Stathakopoulos, D., *'Famine and Pestilence in the Late Roman and Early Byzantine Empire: A Systematic Survey of Subsistence Crises and Epidemics.'* (Aldershot, 2004); Other arguments are presented by Stathakopoulos in: Stathakopoulos, D., 'Traveling with the plague' *Travel in the Byzantine world* (2002) 99-106; Stathakopoulos, D., 'Death in the countryside: the effects of famine and pestilence.' *Antiquité Tardive* 20 (2012) 105-114; Other arguments can be found in various other publications by Stathakopoulos. However, they have been summarised effectively by Eisenburg and Mordechai: Eisenburg, M., Mordechai, L., 'The Justinianic Plague: an interdisciplinary review' 157-159.

¹⁴ Lester K Little published the transcripts of this conference in: Little, K., L., *'Plague and the end of antiquity: the pandemic of 541-750'* (Cambridge, 2007).

¹⁵ Henry Gruber studies evidence of the plague in the following years in the councils of Toledo: Gruber, H., 'Indirect Evidence for the Social Impact of the Justinianic Pandemic: Episcopal Burial and Conciliar Legislation in Visigothic Hispania' *Journal of late Antiquity* 11:1 (2018) 193-214; Robert Sallares compiles a discussion of the initial plague of 542 and outbreaks that followed through an ecological viewpoint, analysing its impacts and growth: Sallares, R., 'Ecology, Evolution and Epidemiology of plague' in *Plague and the end of antiquity: the pandemic of 541-750* (2007) 231-289; Kyle Harper studies the plague alongside climate and 'catastrophes' as a means to analyse the impact they had on the idea that there was a 'fall of the Roman Empire': Harper, K., *'The Fate of Rome: Climate, Disease, and the End of Empire'* (Princeton, 2017); Peter Sarris focuses on the location which the plague originates from: Sarris, P., 'The Justinianic Plague: Origins and Effects'.

¹⁶ Scheidel, W., *'Measuring sex, age and death in the Roman Empire : explorations in ancient demography'* (Michigan, 1996) 185; another example that studies similarly area is Tim Parkin, similar to Scheidel Park does not place too much attention on the impacts of the plague: Parkin, T., *'Demography and Roman society'* (Baltimore, 1992).

studies which address how the impact of the plague was present in Constantinople and what long-lasting impact the plague had past the year 542 AD.

There is also a lack of modern in-depth numismatic analysis of the coins produced in the reign of Justinian. This is not unusual for the study of Eastern Roman numismatics, as this is a subject that lacks a large number of studies on the topic after the 1990s. This is due in part to a lack of large coin collections and a lack of interest in the matter. The rare amount of books that do discuss Eastern Roman numismatics are written by antiquarians who had created their collection of coins, and as such are seen to have problematic observations as they do not possess a numismatic education and at times guess what they see. A prominent example of this is by the antiquarian David R Sear who authored a study called 'Byzantine Coins and Their Values' in 1974 in which he provides an analysis based more on his antiquarian thoughts than a numismatic education and is largely outdated. This stance is reflected by the references made to the work of Sear by other authors who describe his work as a 'collectors guide' as opposed to a numismatical analysis. Alongside this, there are very few reviews on Sear's work and very little discussion about his work. As such, the validity of the evidence presented by Sear should be questioned when used as many questions surround claims he makes.¹⁷ At present, the only available study on Eastern Roman numismatics are the Dumbarton Oaks Series. An issue with this is that the Dumbarton Oaks Series is slightly outdated as it was published in 1992, however, there have been no studies in Eastern Roman numismatics since 1992 and as such the Dumbarton Oak collections study

¹⁷ Sear, D., R., 'Byzantine Coins and Their Values' (London, 1987); another example of this point is the work of Warwick William Wroth who was in charge of the Byzantine coin collection at the British museum in the early half of the twentieth century acting as another antiquarian guide: Wroth, W., W., 'Imperial Byzantine Coins in the British Museum' (Chicago, 1908); Brumbaugh, R., S., Burnham, J., P., 'Coins and Classical Philosophy', *Teaching Philosophy* 12.3 (1989), 243-255 243; Morrisson, C., 'David R. Sear, Byzantine Coins and Their Values', *Revue Numismatique* 30 (1988), 284-285 284.

is still the most useful and up to date study.¹⁸ New studies that consider the numismatic factors of the plague are useful as they begin to utilise Eastern Roman numismatics in a new way and the addition of evidence such as coin finds and numismatic iconography can aid in the advancement of the study of areas like Eastern roman numismatics and the plague of Justinian as well as the urban economy, to reach a point whereby historiographical gaps are bridged and new questions are raised.

Taxation in the Eastern Roman Empire is a study that has followed similar lines to the previously mentioned historiographies of both demography and numismatics. As with the previous subjects, the topic was first dealt with in a more generalised manner. In his study, for example, Peter Sarris discusses at length the economic circumstances in the empire at the time of Justinian using evidence such as papyri from Egypt and the accounts of Procopius, using both to provide a deep and insightful study.¹⁹ Sarris does not focus largely on taxation and especially not the impact the plague has on it. At present, very few studies do focus on this.

Two prominent studies that do link the economic factors and the plague are the previously mentioned studies of Pauline Allen and Mischa Meier.²⁰ Both studies successfully demonstrate the economic consequences of the plague of Justinian. The coming thesis will progress studies such as Allen and Meier further to highlight the impact of the plague on the economics of Constantinople and the impacts this had on the urban economy.

¹⁸ Bellinger, R., A., *Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection, Volume 1* (Washington D. C., 1992).

¹⁹ Sarris, P., *Economy and Society in the age of Justinian* (Cambridge, 2006).

²⁰ Allen, P., 'The Justinianic Plague'; Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects'; Jonathan Harris is another example that can be given who discusses the economics of the city of Constantinople, much like Sarris his findings are more general as he does not focus specifically on the plague: Harris, J., *Constantinople: Capital of Byzantium* (London, 2009). Angeliki Laiou is also another example of the previous point: Laiou, A., E., 'The Byzantine Economy'.

A detailed study can help academics view the plague as more than just a simple event that impacted the empire for a brief moment of history. Therefore, the study can begin to present the Justinianic plague as an event that had longer-lasting impacts on the urban economy of Constantinople. This approach assumes that the circumstances in Constantinople mirror the circumstances of the wider empire, as the city is the administrative centre for the empire, where the power of the empire is concentrated.²¹ Therefore, this means any issues within Constantinople will also be present elsewhere in the empire, as the city relies on importing resources from elsewhere in the empire to prosper and will suffer if these imports are not available.²²

²¹ Miller, D., A., *'Imperial Constantinople'* (New York, 1969) 5.

²² Laiou, A., E., *'The Byzantine Economy'* 3.

Terminology and Sources

This chapter will clarify and discuss the terms used in the discussion. The first point is the clarification that the outbreak of *Yersinia Pestis* in 542 AD can be termed a 'plague'. A plague is defined as, 'a contagious bacterial disease characterized by fever and delirium, typically with the formation of buboes and sometimes infection of the lungs' as well as 'any contagious disease that spreads rapidly and kills many people'.²³ It is important to properly clarify the disease as a plague to ensure the connotations of the term are correctly applied within this discussion. The disease in 542 can be described as a plague, based on the evidence of both the accounts of the characteristics of the disease given by the eyewitness accounts of John of Ephesus and Procopius, as well as previous studies on the debate such as Allen's description of the variety of plagues and diseases.²⁴ The use of the term plague in contrast to a term such as a disease or bacterial infection suggests that the outbreak in 542 AD had been a devastating event comparable to events such as the Black Death which decimated Europe's population or the Plague of Athens that ravaged Athens during the Peloponnesian War. Other terms may indicate the outbreak of 542 AD was not as severe as it was in reality and can lead to incorrect views on the event.

The most commonly cited literary sources on the subject are eyewitness accounts of Procopius of Caesarea and John of Ephesus.

²³ Stevenson, A., '*Oxford Dictionary of English*' (Oxford, 2010).

²⁴ Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects'. 277-286; Allen, P., '*The Justinianic Plague*' 9-10; Procop, *Wars*, II, 22.6.

Procopius of Caesarea was the secretary of general Belisarius, and he first appears in historical records around the year 527 AD, when he became Belisarius' secretary.²⁵ He studied law in Beirut and was present on all of Belisarius' campaigns where he formed a close relationship with the general.²⁶ Given this, Procopius is a vital source of information for the life and campaigns of Belisarius. Procopius was in Constantinople on business in the year 542 AD, thus witnessing the effects of the plague on the city first-hand. The end of Procopius' life is not documented and he is last noted as being active around the late 550s AD. It is not known or suggested if he was alive during the reign of Justin II which began in 565 AD.²⁷

Procopius first wrote a series of texts titled *The History of the Wars* in which he recounts the reign of Justinian and the military campaigns he undertook from the Persian Wars until the Gothic Wars.²⁸ He also wrote a text called *Buildings* in which he discusses Justinian's building projects in Constantinople.²⁹ The final text credited to Procopius is the *Secret History*, sometimes referred to as the *Anecdota*, which discusses Procopius' thoughts on the reign of Justinian and the emperor and empress in which many different claims and negative accusations are made against the pair.³⁰ These texts are the main sources available on the reign of Justinian.

It must be noted that Procopius was an author who used a lot of techniques within his writing that require a reader to read between the lines to get some of the important

²⁵ Ibid. 1-9

²⁶ Cameron, A, *'Procopius and the sixth century'* (Los Angeles, 1985) 5-25.

²⁷ Averil Cameron states the latest date that he could have been alive is around the year 555 AD, she bases this date on the events which Procopius writes about and no event past the year 555 AD is noted in any of his works, but she states that this year is a best guess: Ibid. 12-15.

²⁸ Procop, *Wars*, I II.

²⁹ Procop, *Buildings*.

³⁰ Procop, SH.

information.³¹ The existence of the *Secret History* also raises questions on the validity of the statements within the *History of the Wars* as there are contradictions in certain statements within the texts found in the *Secret History*, this is important as in one source he will praise the emperor and in the other he shall criticise hi, this means that there is a limited use for Procopius when discussing his account of the plague, however, this shall not greatly impact this thesis as his discussions of events during the plague shall be used to confirm that these events happened which can be seen from the fact he references them alone.³²

John of Ephesus was a monk from Syria, born around 507 AD, becoming a deacon in Amida in 529 AD. He was a Monophysite Christian, which at the time was considered heretical, and he travelled to the imperial court to seek the aid of Empress Theodora, who was sympathetic to the Monophysite cause. Theodora sent John to convert the pagans of Asia Minor, a task he was efficient in. However, John was banished by Justin II for his beliefs and died in Chalcedon during Justin's reign around the year 587 AD.³³

John wrote a historical text recounting events from the life of Julius Caesar until his own time, focusing mainly on the lives of Eastern Saints mixed with accounts of his journeys in the Eastern Roman Empire. Of the three books that he wrote only the third is available to modern historians. John's account of the plague was discussed in his second book, and as such, John's account comes to modern historians through reconstructions provided by later historians who use his second book within their work. The first part of John's second book

³¹ Anthony Kaldellis goes into great detail about all the techniques used by Procopius and what they mean in his book on the author: Kaldellis. A , *Procopius Of Caesarea: Tyranny, History, And Philosophy at the end of antiquity* (Philadelphia, 2004).

³² There is at present a debate on the nature and aims of Procopius as an author between Averil Cameron and Anthony Kaldellis, in which Cameron views Procopius as a Christian classicist and greatly criticises the work of Kaldellis and his views. Kaldellis paints Procopius more as a non-religious Platonist disillusioned with Justinian's regime for their impact on ending the classical pagan institutes, Kaldellis also criticises the work of Cameron and her claims. The studies of the pair both provide a lot of depth on the current historiography and views of the author and provide good insight into how Procopius writes: Cameron. A, '*Procopius and the sixth century*'; Kaldellis. A , *Procopius Of Caesarea: Tyranny, History, And Philosophy at the end of antiquity*.

³³ Ginkel, J., J., '*John of Ephesus : A Monophysite Historian in Sixth-Century Byzantium*.' (Gronigen,1995).

can be found in the chronicle of Michael the Syrian also known as Michael 'the Great'.

Michael was a patriarch of the Syriac Orthodox Church in the twelfth century located in the modern Turkish city of Madrin.³⁴ The rest of John of Ephesus' second book is reconstructed

in the text of Pseudo-Dionysius of Tel-Mahre known as the Zuqnin chronicle. Pseudo-

Dionysius was a Patriarch of Antioch and head of the Syriac church in the ninth century.³⁵

John's account of events are important eyewitness accounts of the rural life within the

empire.³⁶ Similar to Procopius, John writes in such a way that requires you to read between

the lines and apply caution as usually the writing techniques have an ulterior aim that is not

always obvious. The reason this is the case can vary from an author having a patron such as

an emperor or wealthy noble who paid for their work meaning that the author must portray

them favourably, or they want to portray someone in a good light to try and gain favour that

can be used to gain something such as a position of power. Another ulterior motive relates

to the idea of the Eastern Roman belief of the superiority of Eastern Roman and Hellenic

cultures, and this belief leads to the authors placing other cultures and cultural groups in

categories such as 'barbarian' in order to project the superiority of the Eastern Romans.³⁷

While the texts of Procopius and John of Ephesus are highly valuable and insightful, they

are not without their problems. In the case of Procopius, his standpoint within

Constantinople during the outbreak of the plague is vital for the discussion, but there are

some clear irregularities. One example of this is that Procopius' account of the plague is

based on the narrative model of the text of Thucydides' account of the Plague of Athens

³⁴ Michael the Syrian, *Chronicle*, 48.

³⁵ Pseudo-Dion, *Chronicle*, III, 1-3.

³⁶ John's third book starts with a brief summary of some events that happened towards the end of the 540s: John of Ephesus, *Lives of the Eastern Saints*.

³⁷ Allen, P., 'The Justinianic Plague' *Byzantion*, International review of Byzantine Studies 49 (1979) 5-20.

during the Peloponnesian War.³⁸ Procopius adheres to the 'rhetorical writing tradition'.

What this entails is an author who is using the same writing methods as their ancient Greek predecessors, which allows the author to portray their story using selective language and create a complex and layered narrative. This method can be used to achieve a myriad of aims, such as conveying a message that only certain individuals in the audience can understand by using selective terms and events. By using both of these in combination an author can convey a message that people unfamiliar with the term or event are not even aware is being said. The audience that can understand this message depends on the reader's education as the message could relate to a certain classical text that only a few people have read. An author using these methods can also coerce an audience into believing their argument is the only logical outcome of a situation. These are just a few examples of the many aims an author can achieve with these methods.³⁹ Therefore, a modern reader of the text can miss certain pieces of information hidden by these techniques. In the case of this thesis, the issues with the rhetorical writing tradition shall not provide much of a problem. As in most cases his account shall be used to primarily highlight that an event occurred, this does not require a deep analysis of the text. In the cases that a deeper analysis is required the language and methods used shall be explored to hypothesis on all possibilities that they suggest. The same method shall be applied in the case of John of Ephesus.

³⁸ Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects'; The account of Thucydides and the plague of Athens is taken from his History of The Peloponnesian war: Thuc. 2.47-2.48.

³⁹ The first of these two methods is used by Procopius when discussing the Nika riots, in which he accounts that the empress Theodora states that when the advisors suggest Justinian should flee the city that she thought 'I approve a certain ancient saying that royalty [Also read as the word purple] is a good burial shroud' to an average reader this appears as if it were an inspiration message, but in actuality it is a play on an old statement made by the Roman author Diodorus Siculus whereby he talks about an evil tyrant of Syracuse who states 'Tyranny is a good burial shroud' before eventually callously murdering his own people. Procopius in using this quote to speak to the educated audience who understand this second quote and that by linking these two figures Procopius is calling Theodora a murderous tyrant: Procop, *Wars*, Books I and II, 24.32; The coercion method is present throughout various texts but is commonly associated with Thucydides who throughout his text provides you information in a manner that is very leading and with language that makes you believe there is only one logical solution to the situation he describes, most famously shown with Brasidas and how he portrays the Spartan general as formidable as an explanation for his eventual loss to the general at the battle of Amphipolis in 422 BC, due to Thucydides being the only source for this event it can be very hard to dispute his argument.

Another issue present in the writing of Procopius is his ideologies, as the language he uses and the statements he makes, especially in the *Secret History*, indicate that Procopius holds negative views of the emperor going as far as to claim he was one of the cruellest men ever to have lived, and calls him a demon.⁴⁰ There are many reasons behind the negative view held by Procopius towards Justinian, such as his resentment towards Justinian for closing the Neoplatonic schools in Athens and the dissolution of many classical institutions. The impact this has on his accounts of the plague is great, as during certain points the plague is used as a tool to tarnish Justinian's reputation as well as place the blame for the plague upon him, alongside exaggerating the loss of life caused by the plague to make the event seem more apocalyptic. Therefore, when using Procopius' account of the plague in Constantinople, questions about his accuracy must be raised.

John of Ephesus is the alternative eyewitness account of the plague. Much like Procopius, John's work can be prone to exaggeration. John discusses topics such as the impact of the plague on rural villages, as these were the areas he visited on his travels. The lack of a large number of credible sources for comparison to the claims made by John, however, is problematic as it raises questions about the credibility of his claims. Therefore, this can limit the extent to which the accounts of John of Ephesus can be used when discussing the plague.⁴¹

To avoid the problematic figures and issues within the eyewitness accounts, historians have resorted to using other forms of evidence when discussing the impact of the plague. Their

⁴⁰ Procopius repeatedly claims the evils of Justinian throughout the *Secret History* and attributes the bad events that happen in his lifetime also to Theodora, Belisarius' wife, however the brunt of the accusations are laid upon Justinian. In one quote Procopius states, 'saw a strange demonic presence in his [Justinian's] place' before shortly going on to claim he would walk around headless during the evening. This demonstrates the views Procopius has on Justinian in the *Secret History*: Procop, *SH*, 18.1.

⁴¹ Pseudo-Dion, *Chronicle, III*; 1-3 Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects' 271-272.

methods use sources ranging from burial sites to epigraphy.⁴² These alternate sources have rectified some of the issues with the lack of accuracy, alongside other pieces of evidence in a discussion they have done well to bridge many gaps left by the primary sources. The sources available still do not provide historians with the full scope of the impact of the Justinianic plague. As such this thesis shall aim to analyse the urban economy of Constantinople, using evidence such as population numbers taken from grain shipment numismatic and known laws and notes from authors, such as Procopius. In the event a problematic source, such as Procopius and John of Ephesus, is used they shall be accompanied by other evidence as well as historiographical discussions in an attempt to combat the problematic nature of their statements.

⁴² Ibid. 278-279.

Demography

Demography is defined as the study of the changing structure of human populations. When applying this study to Constantinople a few things should be considered. Firstly, an investigation into its population is required as a starting point. Population sizes can be used to speculate upon taxational income capacity and economic capabilities alongside economic limits of the population of the city and its facilities. This approach is demonstrated in the study of the plagues impact in Hispania by Henry Gruber. In this study, Gruber discusses how the loss of population seen in the region during the plague leads to a loss of taxational income and loss of livestock.⁴³ Gruber uses this approach to great effect within his study and it aids in the illustration of his argument that Hispania was impacted by the plague.

Constantinople during the sixth century was Europe's most active commercial hub. The Eastern Roman Empire gained power and influence from its position on the Silk Road and within the European trading networks. The year 542 AD was at the end of a period of heavy conflict in Italy, and shortly after 542, a campaign would be launched against the Sassanians in Lazica. The financial requirements for warfare were high and having a strong economy was pivotal. Alongside this, Justinian had spent a lot of the empire's money on his building projects in Constantinople, by improving the city's infrastructure, improving Constantinople's ability to trade, and reorganising the empire's taxation system by making sure there were fewer people evading tax payments. Justinian's main project was building the Hagia Sophia alongside rebuilding the damage caused to the city by the Nika Riots in 532 AD.⁴⁴ Constantinople stood unchallenged as the most active trade city in Europe as it

⁴³ Gruber, H., 'Indirect Evidence for the Social Impact of the Justinianic Pandemic: Episcopal Burial and Conciliar Legislation in Visigothic Hispania' 280.

⁴⁴ Laiou, A., E., 'The Byzantine Economy' 27; Sarris, P., 'Economy and Society in the age of Justinian' 4.

bridged the trade networks of the East and West, receiving enormous amounts of wealth as a result. This revenue was a vital lifeline for the empire during this expensive period.

By analysing the demographic layout of the city, the ways in which the plague altered the city's economic capabilities during this period of high pressure on the economy can be assessed.

Before the discussion on the demographical impacts of the plague, two points must be discussed, the first being the population of Constantinople before the plague and the second being the loss the population suffered as a result of the plague. This is an important step as a population estimate lays the groundwork for exploring a city's economic capabilities, as a loss in population meant less revenue from taxation or trade as there were fewer people to pay taxes, and fewer workers to operate the trade locations within the city. An estimation of the losses sustained during the plague can provide insight into how the city may have changed as well as potential economic impacts and struggles. Another important enquiry to make is if the plague affected the system of trade and daily life within the city.

Historians have suggested different figures for the population, and these estimations range in the area between 400,000 and 600,000.⁴⁵ Discussion of a likely population bracket is required to analyse the impact of the plague as it is important to clarify the population for later use in discussion of the plagues impacts. Therefore, this thesis plans to choose as accurate estimation bracket as possible based on available evidence. A final point that must be raised is the composition of the population. What is meant by this is how

Constantinople's population looked in terms of social classes. The social hierarchy of the

⁴⁵ Allen discussed her theory for a population ceiling in Constantinople during 542 at a total of 400,000, and is based on the infrastructure within Constantinople and the population it could logically sustain: Allen, P., 'The Justinianic Plague' Byzantion, International review of Byzantine Studies 10-12; Glenville Downey states his belief for the population of the city to be closer to the 600,000 figure, he bases his estimate on the urban layout of the city and locations such as cafés and shops and what these suggest about how many people lived in the city at the time : Downey, G., *Constantinople in the age of Justinian* (Oklahoma, 1960) 21.

empire could be grouped into three groups; the higher classes represented by the aristocracy and the important families of the empire, the lower classes which included people ranging from merchants to labourers, and the other groups such as the clergy, slaves, eunuchs, women and children.⁴⁶ While this thesis shall not have a heavy focus on social factors in the discussion, the role and size of the lower class shall have an important position in the subsequent discussion as this lower class represents a large percentage of the overall population of Constantinople and was the main group found in the city's urban areas, therefore, they were the city's main urban population. This class also represents the majority of the working population of Constantinople, the individuals who had the largest role in the day-to-day operation of the city and had the greatest impact on the economic framework of the city.⁴⁷ It is important to analyse the impact the plague had on this group as they were the class hit worst by the plague as they lived in the most densely populated part of the city and were active in the areas that were at the forefront of the spread of the plague. This method aims to provide a bracket of estimation for the population of Constantinople using the grain dole. The grain dole was the system of social aid set up by the Eastern Roman administration within Constantinople that ensured the supply and availability of grain to the citizens of the city at the cost of the Empire's treasury.⁴⁸ The reason the grain dole is an important tool for population estimation is that, by calculating the amount of grain the city is receiving compared to the amount of grain an individual on average needed

⁴⁶ Judith Herrin discusses the Byzantine Social Hierarchy in more detail in her book on Byzantium but she highlights a key aspect of the hierarchy is dependent on whether an individual is born to an aristocratic family or not, in her views the higher members of this rigid social hierarchy looked down on anyone no matter their occupation or wealth unless they had a correct and noble birth, while there were some means of social mobility and climbing, Herrin states it was rare for an individual to actually rise in social standing: Herrin, J., *'Byzantium The surprising Life of a Medieval Empire'* (Bury St Edmonds, 2007) 163 225.

⁴⁷ Angeliki Laiou states that the backbone of the urban economy was built upon the craftsmen of the lower classes and their importance in the production of goods for trade and their role in the process of transactions in trade: Laiou, A., E., *'The Byzantine Economy'*²⁷

⁴⁸ The grain dole is a continuation of the same system that had been in place in the city of Rome since the time of the Gracchi and the Roman Republic in the second century BC. The system in the city of Rome required vast amounts of transportation and organisation and heavily relied on the grain produced in the Egyptian provinces, as well as both systems being a vital system for the peoples of Rome and Constantinople.: Rickman, G., E., *'The Grain Trade under the Roman Empire'* Commerce of Ancient Rome: Studies in Archaeology and History 36 (1980) 261-275.

to consume, then an estimated population that reasonably could be sustained by the grain dole can be theorised. It must also be noted that this estimate is restricted as it does not account for any grain reserves the city already has as there is not enough evidence available from the period that discusses this. Before this can commence, a few facts must finally be noted, the first being that during the 550s AD the grain dole is solely supplied from the Egyptian provinces, which is in contrast to the empire-wide supply of the grain dole of the city of Rome during the imperial period.⁴⁹ This is shown by the grain dole's discontinuation after the loss of Egypt in the wake of the Islamic conquests during the seventh century, thus demonstrating the system's reliance on Egypt in the sixth century.⁵⁰ The second fact that must be noted is that the use of the grain dole as a means of daily food consumption was limited, as certain members of the social hierarchy, mainly the higher classes, did not depend on the grain dole as a means of receiving food. Therefore, the grain dole method can only suggest a population consisting of the lower classes of Constantinople with certainty, with the resultant non-grain dole population being estimated through other means. Due to the lack of concrete evidence of this group they shall be estimated based on the studies of historians such as Allen and Downey. This approach allows for the application of the theory of the plague's impact on the city to account for both a lower and higher population.⁵¹ The first step to discuss is the average grain intake of an individual in the sixth century. On average, an individual ate 28.73 litres of grain per month (3 and 1/3 modii, modii was the

⁴⁹ During the Roman imperial period the main areas that grew and supplied grain were Egypt, North Africa, and Sicily. With the loss of the western empire this left only Egypt to supply grain to Constantinople: Sarris, P., *'Economy and Society in the age of Justinian'* 2.

⁵⁰ Ibid.: Paul Magdalino also discusses the impacts the loss of Egypt had on the empire in detail within his work on Constantinople's topography going as far as to say the loss of Egypt destroyed the idea of Constantinople as an antique Megalopolis: Magdalino, P., *'Studies on the History and topography of Byzantine Constantinople'* (Aldershot, 2007) 19.

⁵¹ In order to ascertain the resultant population of Constantinople the figure shall be compared against already present population estimates for Constantinople during the period and a likely resultant population will be selected upon this basis.

roman unit of measurement) rounded to a singular decimal.⁵² The amount of grain sent to Constantinople in the year 536 AD was 8,000,000 artabas (36 million modii). This meant a total of 310,400,000 litres of grain when the figure is multiplied by 38.8 litres which was equivalent to an artabas.⁵³ Therefore, during this period, the city of Constantinople imported enough grain to feed around 10,802,784 people when divided by the 28.73 litres of grain an individual needs each month. While this figure is large, it does not account for resultant population that did not use the grain dole. Nevertheless, it indicates a total number of 900,232 people could be fed through the grain dole each month throughout a year when dividing the 10,802,784 by twelve. While these numbers seem unrealistic, even a less exaggerated version of this number informs us that a large population closer to the higher estimation of 600,000 could possibly be sustained yearly by the grain dole.

Taking this further, there is evidence to help create a clearer number, the first of which is discussed in Peter Sarris' book on the Byzantine economy and Egypt. Inside his study, Sarris lists some locations in Egypt and the grain they shipped to Alexandria to later be sent to Constantinople and other cities within the empire. This was a process that would happen yearly during the reign of Justinian. The first three settlements that Sarris noted were the centres of Tirgyu, which he notes as being one of the major suppliers, sent a total of 10,224 L (263 ½ artabas), and the second settlement of Lukiu sent a total of 4985 L (128 ½ artabas), the third settlement of Tarusebt sent a total of 6150 L (158 ½ artabas). The much smaller

⁵² The 28.73 figure is recurring; the grain per month figure is taken from G.E. Rickman; however, Rickman gives his amount in the form of 3 and 1/3 Modii, a modii was a form of measure for dry commodities in the Roman republic period, it is likely the dietary requirement were the same during the reign of Justinian. The reason for the choice of litres as the unit of measurement is due to the fact the Byzantine grain shipments are measured in the Ptolemaic artabas which is complicated to directly convert into modii due to an inconvenient ratio of conversion, as such the simplest common unit for the discussion is the metric litre. The figure is calculated based on the fact that a single modii is equivalent to 8.62L, while the artabas is equivalent to 38.8l which is suggested by Rathbone: Rickman, G., E., *'The Grain Trade under the Roman Empire'* 263; Wilson, A., Bowman, A., *'Quantifying the Roman Economy: Methods and Problems'*(Oxford, 2009) 301.

⁵³ Bagnall's book on Byzantine Egypt discusses how a near occurrence of a riot in 536 is the cause for the shipment of the grain, in which he states the 8,000,000 artabas was shipped into the city as a result: Bagnall, R.S., *'Egypt in the Byzantine World, 300- 700'* (Cambridge, 2007) 244; Litres shall from here onwards be represented as the letter L..

settlement of Kimonos is said to have sent a total of just 155 L (4 artabas). Finally, the large settlements of Cynopolis and Oxyrhynchus sent a total of 13,580,000 L (350k artabas).⁵⁴ Not every major centre of cereal production in Egypt is listed in these examples, as evidence is not available in this depth for all of the locations.

⁵⁴ The figures referenced are taken from the study of Peter Sarris in which he discusses Papyri and an influential Egyptian family from the Justinianic period called the Apions, the papyri he studies recounts a selected number of settlements and what they are said to have contributed, the grain shipments are recorded alongside items such as taxes and specialist equipment. Sarris uses this evidence to illustrate the evidence of the influence of Egypt and the Apion family: Sarris, P., *'Economy and Society in the age of Justinian'* 31- 34.

Year	Unit of Measurement			
	Unit:	Ptolemaic Artaba	Roman Modii	Metric Litre
	536 AD	8,000,000	36,000,000	310,400,000

Table 1: The figure for the Constantinople grain shipment in 536 AD when considering the conversion rate between the Ptolemaic artaba, Roman modii and metric litre.

Amount of grain in artaba and litre			
Location sent from	Ptolemaic Artaba	Metric Litre	
	Trigyu	263.5	10,224
	Lukiu	128.5	4985
	Tarusebt	158.5	6150
	Kinomos	4	155
	Cynopolis + Oxyrhynchus	350,000	13,580,000
	Total:	350,554.5	13,601,514

Table 2: The average amount of grain (in artaba and litre) exported annually from Egyptian settlements.

The figures presented by Peter Sarris represent the average export of these Egyptian settlements each year as Sarris does not indicate any unique circumstances that would impact the numbers, indicating they are yearly figures. The figures suggest the settlements in Egypt produced a total yield of 13,601,514 L. When this figure is divided by the total amount an individual needs to eat a month, the settlements would sustain a population of

473,371 people for a single month, or 39,448 people for a month over twelve months.

Therefore, what this calculation shows is that a small amount of cereal production in Egypt can sustain a population of nearly 40,000 people a year, which is a large number for just a small amount of production locations. This suggests that when this method is applied on a larger scale that a population within the 400,000 to 600,000 bracket is possible when factoring in the non-grain dole population and the other locations that may have had the grain sent to them. At the very least this evidence suggests the ability of Egypt to sustain large scale grain production.

The next step of the discussion is to narrow the figure within this bracket to as concise a number as possible. To do this the figures produced from Egypt in the Imperial period from around 27 BC until the 300s AD shall be consulted, as these provide a more accurate figure for the entirety of Egypt compared to the figures in the sixth century AD. Geoffrey Rickman states in his book on the Roman Imperial period that Egypt could produce a total of 112,060,000 L of grain (13,000,000 modii) which means that Egypt could in this period sustain a population of 325,000 per year, however, similar to the sixth century this only represents the population who used the grain dole for their daily food.⁵⁵ It is likely the production capability of Egypt during the Roman and Byzantine periods was vastly similar as there is very little change to the province between these periods. The estimate of 325,000 represents the lower class population who uses the grain dole, or at least a figure closer to this when taking into consideration that not all the grain may have gone to Constantinople.

⁵⁵ Geoffrey Rickman discusses the locations of the Roman empire during the imperial period Rickman in which he states the capabilities, within this section he discusses the availability of evidence from areas such as Sicily, North Africa and others and mentions that in the imperial period Egypt could produce the 13,000,000 modii figure discussed in the text stating Egypt is the place that has the most evidence available. Rickman also discusses the methods by which the city of Rome transported the grain to the city and many of which are similar to the methods of Constantinople as such the same figure is applicable to the reign of Justinian: G., E., 'The Grain Trade under the Roman Empire' *Commerce of Ancient Rome: Studies in Archaeology and History* 36 (1980) 261-275 264.

The evidence of grain imports from 536 AD states that 8,000,000 artabas were imported from Egypt, which shows that there is evidence to support the lower-class population of 325,000, as it provides more evidence that the city was supplied by a large amount of grain. If the population that did not require the grain dole are considered alongside those who did, a good estimation of the population of Constantinople in the 530s and 540s was between 400,000 and 500,000 people.⁵⁶

The estimation of a population of 325,000 alongside an extra population of close to 75,000 to 175,000 in the non-grain dole population aligns closely with the study of Pauline Allen. Within her study, Allen states that the figure of 400,000 is the upper limit of the static population of the city. However, Allen adds that on top of this there is what she refers to as a 'floating' population which were the individuals that came to Constantinople for commerce or diplomacy.⁵⁷ Therefore, a population estimation of between 400,000 and 500,000 would represent both the aforementioned floating population of Allen, the 325,000 imperial estimations, as well as leaving room for both a lower and higher possible population estimation that cannot be accurately calculated due to lack of concrete evidence. It is also important to note that while the figure of between 400,000 and 500,000 is only a slight difference from the initial 325,000 figure, it is a key differentiation as it is important to demonstrate the plague's impact as accurately as possible.

The next important stage of this debate is to discuss the population losses caused by the plague.

⁵⁶ The extra population of between 75,000 and 175,000 is suggested as it is tough to estimate the extra population due to issues with evidence, this figure was suggested as it allows for a lower estimation of this population but also a higher estimation as this population represent two of the three social classes within the city as well as the possibility for groups such as migrants and those who rely on the city for employment but not accommodation.

⁵⁷ While Allen gives the figure of 400,000 she also references the figures of Hollingsworth which estimates a population of 508,000 that is then used to estimate a loss close to half the population of the city in 542: Allen, P., 'The Justinianic Plague' 9-11.

The best place to begin this assessment is the eyewitness accounts of Procopius and John of Ephesus, as the pair provide accounts of the suffering during the plague. Procopius and John's estimation form a basis of many conversations on the total mortality rates of the plague. They portray contrasting scenarios in their works, with Procopius focusing on Constantinople and John of Ephesus focusing on the rural countryside. John of Ephesus describes instances where entire villages were wiped out as well as recounting how boats filled with the dead would appear on the shores, while Procopius mentions the inabilities of authorities to deal with the large number of dead bodies that had amassed.⁵⁸ While it is likely there was a high mortality rate, it is also likely that the figures suggested by both Procopius and John of Ephesus are exaggerated figures created to enhance their narratives to make them seem more apocalyptic and make their survival a greater triumph. This is because they are mimicking the methods of Thucydides' account of the plague of Athens that exaggerated the suffering caused by the plague as a means to partly justify the Athenian's misfortune against the Spartans.⁵⁹ The figures suggested by Procopius indicate a daily mortality rate of 5,000 eventually rising to a figure of 10,000. John of Ephesus similarly suggests a daily mortality rate of 5,000, although he estimates a greater rise in population loss than Procopius, estimating an eventual mortality rate of 16,000. Historians agree that the figures are exaggerated.⁶⁰ There is not enough non-literary sources directly from the period of the plague to compare to these figures, however, these figure can at least indicate a large amount of death caused by the plague. It can be noted that there are other eyewitness accounts that similarity suggest a large death toll caused during the plague. The historians

⁵⁸ Procop, , Wars. II, 22.18; Pseudo-Dion, *Chronicle*, III, 1-3; Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects' 277 278 283 290.

⁵⁹ Thuc. 2.47-2.48.

⁶⁰ Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects' 278; Sarris, P., '*Economy and Society in the age of Justinian*' 218; Allen, P., 'The Justinianic Plague' 10.

Agathias and Evagrius Scholasticus both note in a small section of their texts that the plague had a devastating toll on the population. However, there is not a concrete amount of non-literary evidence that can indicate the extent of the loss caused by the plague, which does hinder the study of the event.⁶¹

The next step for the calculation of mortality would then be to use other available sources that are not necessarily from the period of the plague. The first would be the account of Theophanes, the seventh-century chronicler of the reign of Constantine V. Johannes Koder estimated that during this period Constantinople had a population of close to 300,000 people based on the description of the agricultural production capacity in the year 747 AD written by Theophanes. Theophanes discusses the area of the city that contained vegetable gardens, orchards, and vineyards.⁶² Koder estimates based on these descriptions and the size of the city that 2 to 3 kilometres of land inside the Theodosian Walls was available for agricultural means. Koder also states that based on evidence such as diets and available food supplies that there was a possibility that at certain points, the population of Constantinople could have reached as low as 100,000 although he is not so certain when and merely states before the year 1204 AD which was the year of the Fourth crusade when the city fell to the Venetians. Therefore, the population estimate of 300,000 people is the more likely figure at the end of the plague as there is more certainty from Koder that the evidence of agricultural production provided by Theophanes provides a figure close to this total.⁶³ There are a couple of factors to consider when discussing Theophanes' account. Firstly, the figure of 300,000

⁶¹ Anthony Kaldellis discusses the other literary sources for the plague past Procopius and John of Ephesus, he states in his work that they are less valuable than the former sources as Evagrius was only 6 years of age at the time of the plague and Agathias was a student of Procopius so likely mimics and copies the author in a lot of what he says: Kaldellis. A , Procopius Of Caesarea: Tyranny, History, And Philosophy at the end of antiquity 211-213; Evag. Sch, H.E, 2.22.3-5; Agath, His.2.16.3

⁶² Theoph. Cont., Chronicle, 424.

⁶³ Mango,C., Dagron, G., et al, '*Constantinople and it's hinterlands*' (Aldershot, 1993) 49-54.

people represents the loss of population of the plague in its entirety and not solely the 542 AD outbreak, which was the first and most vicious instance. Secondly, Theophanes is a member of the Macedonian Dynasty and thus a member of a noble dynasty that became the head of the empire during the coming centuries. The Macedonians were also rivals of the Isaurian dynasty that Constantine V was a member of, meaning there is likely an ulterior motive with Theophanes' writing as he may want to discredit Constantine V, however, it is unlikely this bias impacted the figure of 300,000 as there would be no reason to do so as the figure is not used as a means to attack Constantine V. What these estimates represent is a population loss of between 200,000 and 400,000 people when compared to the population estimate of between 400,000 and 500,000 people, as by having a 200,000 bracket for error it accounts for both a lower and higher exaggeration from Theophanes.

There are a few more sources that can be consulted to compare to the work of Theophanes. Pauline Allen states within her study, 'While bubonic cases have a mortality rate estimated between 68.6 % and 78%, death is not necessarily rapid. The sixth-century plague was, however, a particularly intense variety, for Evagrius says that victims could die in two or three days.'⁶⁴ Allen's assessment lends a similar mortality rate to the 200,000 to 400,000 bracket. Allen believes a total of 57% of the population of the city at some point caught the plague. This equates to roughly 256,500 cases of the plague when calculating 57% of 450,000 (acting as the mean of the population estimate of between 400,00- 500,000) and a rough total loss of 187,245 people when applying the mean percentage of 73% to the 256,600 figure.⁶⁵

⁶⁴ Allen, P., 'The Justinianic Plague' 9.

⁶⁵ Ibid. 11.

Two final factors must be considered. Firstly, according to John of Ephesus, the officials within Constantinople stopped counting around a total of 230,000 losses, while this could again be exaggeration from the author, the study of Allen indicates that this is likely not the case as her estimation is also close to 200,000. However, the account of John of Ephesus does not indicate how much further than 230,000 the amount of dead reached and there are no records that can be consulted to confirm this story from the author.⁶⁶ Secondly, Constantinople had the conditions that suited the transmission of the disease such as a large population condensed into a small and densely populated area, alongside the depositing of human waste into the Golden Horn. The Golden Horn was not drained by currents of water and was only connected to Bosphorus straits. This same water was also used as the drinking water in the city. What this meant was that the conditions within the city lend to the possibility of such a large mortality rate.⁶⁷

Based on the accounts of Theophanes and the work of Allen, an appropriate figure for population loss in Constantinople ranges between 160,000 and 250,000 at a rate between 40 – 50% during the year 542 AD. The reason for an estimation between 160,000 and 250,000 people is that the evidence available cannot suggest a higher or more accurate figure than this. The bracket suggested allows for the possibility of Allen's lower estimation of close to 187,000 people and the higher figures just outside the eyewitness accounts that suggest a number closer to between 200,000 and higher. The figure allows the consideration of the impact of the loss to incorporate both the higher and the lower estimations, while not being

⁶⁶ Pseudo-Dion, *Chronicle*, III, 3.

⁶⁷ Allen, P., 'The Justinianic Plague' 11; Magdalino, P., 'Studies on the History and topography of Byzantine Constantinople' 218.

too far apart that the impacts seen on the urban economy would not be too vastly different depending on which side of the bracket is used.

	Percentage:	Total:
Allen:	57%	187,245
Brazier:	40-50%	160,000-250,000

Table 3: Estimation for total mortality based on a mean population of 450,000 people.

Now that the population loss has been established at between 160,000 and 250,000 people, the impact these figures had on the urban economy can be discussed. A vital aspect of the demographical implications is Constantinople's role as the empire's central trade hub. This is an important piece of information to consider as trade is what initially brought the plague to Constantinople. The plague had travelled from Egypt on the trade vessels on the rats and those who manned the vessels.⁶⁸ As a result, the trading sectors of Constantinople were the origins of the plague within the city. Before the Justinianic Plague, the main location for trade within Constantinople was the Neorion Port (Figure 1: label 1) and the Golden Horn (Figure 1: label 2).⁶⁹ The plague had devastating impacts on the north-eastern section of the city as west of this port was the most densely populated housing within the city.⁷⁰ This area

⁶⁸ Micheal McCormick's study goes into depth about rats and their affinity for ships, citing that nearly half of all rat remains found from the ancient period were located close to ports and rivers which he argues testifies to their links to boats, McCormick also states that it is due to these rats migrating from Africa that the plague spread in the manner which it did : McCormick, M., 'Rats, Communications, and Plague: Toward an Ecological History' *the Journal of Interdisciplinary History* 34.1 (2003) 1-25 11 21: Sarris, P., 'The Justinianic Plague: Origins and Effects' 19.

⁶⁹ Magdalino, P., 'Studies on the History and topography of Byzantine Constantinople' 218.

⁷⁰ Magdalino states that this area was the most densely populated which he bases off the Notita Urbis Constantinopolitae of Theodosius II created between 425 and 440 AD , he also states his belief that the city had not changed much between the 440s and 550s AD. The particular Notita referenced is 7.13.8.19 which states the area has the highest density of normal housing. Magdalino adds to this that the water in the area likely aided to the spread of the virus due to it being stagnant and containing a large amount of human waste: Ibid.

was home to the lower classes and the densely populated housing was the perfect conditions for the rats to survive and infect those who lived there.⁷¹

Procopius highlights during his account of the siege of Rome in 537 AD, that there was frequent looting due to the inability of the empire to afford the soldier's wages.⁷² This demonstrates that even when Constantinople had its pre-plague population of between 400,000 – 500,000 people there were financial issues related to the empire's military. Being the capital of the empire means that the city is one of the central components of the empire's economy. Therefore, the loss of between 160,000 and 250,000 individuals undoubtedly impacted the empire's financial capabilities, especially as a large proportion of these losses were the urban poor who were the class that was vital to economic output. With the loss of a proportion of this class came the loss of a large proportion of the city's labour force and with them the city's working population. The impact of this loss in population is evidenced by the change of the city's main commercial port, from the Neorion Port to the Port of Julian which occurred after the year 542 AD as the port of Julian was renovated during this period (Figure 1: label 3).⁷³ The commercial shift had a demographical impact on the city. As the economic focus shifts from the area between the Neorion Port and the heart of the city in the Augustaion (Figure 1; label 4), to the area between the Port of Julian and the Augustaion. Therefore, this change resulted in a relocation of many of the city's economic locations in this direction, moving closer to the locations such as the Hippodrome and Hagia Sophia. This integrated the economic locations with the important monuments in the city moving away from the urban and poor centre in the lowlands of the city. The transformation is a

⁷¹ McCormick, M., 'Rats, Communications, and Plague: Toward an Ecological History' 1-9.

⁷² Procop, *Wars*, V, 18.

⁷³ Magdalino, P., '*Studies on the History and topography of Byzantine Constantinople*' 53.

consequence of the loss of population, as fewer urban poor lead to a smaller workforce available, that meant less commercial activity was possible leading to a small location where commerce took place. Add to this the large amount of plague related incidents in the poorer area, which aided to the idea of the area close to the Neorion port being polluted with bad air that caused the plague. This meant it would be safer and financially sensible to relocate to commercial port to the Sea of Marmara where the plague was less present and trade would not see as much interruption.⁷⁴

By the seventh century, the only economic port in Constantinople was the Port of Julian, with the others now being for military usage. This indicates that the initial relocation to this port had been successful.⁷⁵ The wholesale food market had also been relocated from close to the Neorion Port to the Port of Julian. This demonstrates the consequences of that initial change of port as it is more logical to move an important commercial market close to the main port of the city to ensure that the city's main commerce are closely linked, a consequence of this is now that the location of the urban poor is no longer closely linked to the commercial locations of the city.⁷⁶ The relocation of the commercial centre of the city is evidence of a shrinking of the city's economy to accommodate the new scenario the city faces with a lessened population. As commercial activity occurs in fewer locations with less workers and is centralised to a smaller area within the city, this means there are less opportunities for those in the poorer urban areas as well as devaluing their property. The Neronian port was no longer a viable option for the cities commercial port as the plague was able to spread more prolifically in the stagnant water that surrounded it. Alongside this, the

⁷⁴ Paul Magdalino states in his work that the Neorion port was seen in texts such as John of Ephesus and Theophanes with Magdalino noting that Theophanes believed in the way that he described the plague that the causes were spiritual, as it was believed that due to works such as Hippocrates and Galen that plague was caused by bad air and as such the area would have appeared to be a spot of bad luck that caused the plague. Ibid.218.

⁷⁵ Ibid. 10 20.

⁷⁶ Ibid.20..

vast amount of human waste being sent to the water as well as the corpses that had been thrown in the water that were later be ingested by the inhabitants through the city wells.⁷⁷ The relocation to the Port of Julian was significant as the port was in the Sea of Marmaris, a body of water that naturally flooded and washed away, meaning it was a safe location for the commercial port. Subsequently, the Neorion Port became the key military port for Constantinople, impacting the future of the city, as the port would be vital during sieges in 717 AD, 1204 AD and 1453 AD, all of which relied heavily on the Eastern Roman navy and the protection they received with the defensive chain and the Golden Horn.

The infrastructure inside Constantinople was designed for a population of potentially 500,000 but now had a total population of 250,000. As a result of this deficit, a large portion of the city was left in a near-abandoned state, resulting in demographic attrition. This attrition was also be caused by the loss of the urban poor being disproportionate to the losses faced by the higher classes. This is caused by the lower classes located in the area that facilitated a greater spread of the plague, while the plague did reach the highlands of the city, the lack of density in the housing in this area and the ability of the higher classes to withdraw themselves from the wider society led to this class being impacted less by the plague. This raises the question of what was done with the newly available land? To answer this question we can look into the chronicle of Theophanes where he discusses the production of agricultural products within the city. Theophanes states that in the year 747 AD, the city had many cisterns, vineyards, and orchards within the old city walls, which Johannes Koder estimates represents that an area of 2 to 3 kilometres was available for agriculture. Koder also uses the evidence from the account of Odo of Deuil in which it is

⁷⁷ Ibid. 218.

stated that one part of the city contained open land with vegetable gardens, Koder combines these two accounts to create his estimate for agricultural land.⁷⁸ Koder also believes the food produced by this land could sustain a total of 300,000 people, and including other produce grown elsewhere in the empire a total population of 500,000 could have been sustained.⁷⁹ This is important to note as by 639 AD, the conquests of Ibn Al Walid had occurred and the empire had lost Egypt, meaning the empire had lost access to the areas that produced the most food during Justinian's reign and was the bread basket of the empire.

It is important to consider how much of this situation is aided by the urban changes caused by the plague, as these losses allowed for the availability of the land within the city that was relied upon to produce the food needed to sustain its population in 643 AD. If the population of the city had not been drastically reduced, the empire will have faced the challenge to feed a population close to 500,000 with none of the provinces that could produce the large quantity of food required for this task. And while it could be suggested that if the empire had not lost so much of its population it may have been able to stop the loss of Egypt, this argument is an impossible discussion, as regardless of the occurrence of the plague, the empire would have continued the continual wars with the Sassanian's that ultimately aided the losses against Ibn Al-Walid.

What can be seen is that the population loss caused by the plague demonstrates an urban economic cycle, similar to what is known as an economic cycle, which states that an economy goes through four stages: expansion, which is a period of growth, peak when

⁷⁸Mango,C., Dagron, G., et al, '*Constantinople and it's hinterlands*' (Aldershot, 1993) 53.; Theoph. Cont., *Chronicle*, 424; Odo of Deuil. *De profectione Ludovici VII in Orientem*,, 64.

⁷⁹ It is important to note that there is very little evidence for the agricultural practices mentioned by Theophanes occurring before 747 AD and while they likely had been happening for some years before this date they were not occurring further than an individual's vegetable garden in the reign of Justinian and the year 542 AD, therefore, this demonstrates that the amount of land required for Koder's higher estimated of 500,000 requires the use of the habitable land that a portion of this figure would need to inhabit thus creating a scenario that is unlikely to result in a population size close to pre plague standards: Mango,C., Dagron, G., et al, '*Constantinople and it's hinterlands*' 54.

growth is at its maximum rate, contraction when the growth slows and stagnates, and trough when the economy hits a low point and begins to recover.⁸⁰ The peak and contraction stages are represented in the empire in the sixth century, as in the period before the plague the empire had enough money to fund projects such as the Hagia Sophia as well as a yearly tribute payment to the Sassanian's for peace referred to as the 'Eternal Peace'. With the advent of the plague, the economy entered into the contraction stage, as due to issues such as a lower tax income. This contraction during the reign of Maurice in the latter half of the sixth century, as the main area to suffer during his reign was the economy, which is shown by Maurice cutting the wage of the military in 588 AD. This would lead to a mutiny by the army and ultimately Maurice's execution by the hands of his general Phocas.

The cycle means that the large population of the city requires a vast amount of resources to sustain itself that have to be imported from external sources, similar to the peak stage of the economic cycle. This is followed by an event that reduces the population of the city. In the case of the plague in 542 AD, the large population was a factor in the plague spreading effectively, which is similar to the contraction stage of the economic cycle. The loss of population allows for conditions such as the availability of lands that necessitates the conditions for population recovery, similar to the trough stage of the economic cycle. The economic shift to the Port of Julian is also evidence of the cycle, as it represents the shrinking of the economy that coincides with the shrinking of population, both evidence of contraction within these areas. It is only when the population can recover that the economy within the city begins to do so, as the labour force and taxable population within the city begin to recover in size.

⁸⁰ Wendt, S., 'The Business Model' *Economic analysis and policy* 39.2 (2009) 205-234 205-206.

The plague of 542 AD represents an event that causes the contraction phase of the economic cycle as growth both economically slows and stagnates and the population declines. Further studies should be conducted to inquire about whether this cycle can be observed after events such as the Siege of 1204 when Constantinople when the city loses population again, as by doing so the urban economic cycle can be better understood and its relationship to the economic cycle can be explored in greater detail. Studies can also be conducted to contrast Constantinople to other large- and small-scale cities to see if this urban economic cycle is limited to Constantinople or if it is present elsewhere and discuss which factors influence the process.

In conclusion, the demographical impact of the Justinianic plague of 542 AD was that the plague resulted in a loss of between 40 to 50% of the population of Constantinople that had been around 400,000 to 500,000 people. A large percentage of these losses came from the lower urban classes due to the locations in which they lived having conditions that better spread the plague. The plague also led to the relocation of the city's commercial centre from the Neorion Port to the Port of Julian. Therefore, the plague caused a change to the city's urban economic situation, as there were fewer workers for the city's production and to perform the essential tasks within the city's economic system. Alongside this, the plague changed the urban layout and life of the city, as it caused an urban downsizing and severed the link between the economic and urban locations within the city. The separation meant that the pre-existing systems had to change to adapt to new circumstances. Therefore, this centralised the city's important areas into a smaller location with less people in the city, this resulted in a different day to day routine for the inhabitants of the city, changing the demographic situation. This new situation represented the damage the city's urban life had suffered, as it no longer had the means to support the way of life that was present in earlier

years, such as the Roman period. Therefore, this would create a new urban nucleus within the city as new locations functioned as urban hubs, such as the newly built Hagia Sophia.⁸¹ Beyond this, the loss of population lessened the consequences of the loss of Egypt during the seventh century. The loss of grain from Egypt would have been far more devastating if the population in Constantinople had numbered at the estimated 400,000-500,000 inhabitants before the plague. The economic shift within the city was followed by wider consequences, as by making the Port of Julian the sole commercial port of the city and subsequently centralising the commercial centre to a smaller location the economy of the city shrinks as a result. This led to a decrease in funds that the empire could spend on its needs. It should also be noted that it is only when the city starts to see some recovery of its population and a return to the growth stage of the urban economic cycle that the area close to the Neorion Port (figure 1: label 1) saw commercial activity again. However, this is due to the Italian city-states creating their commercial quarters in the city, with Venice the first to be given special trading privileges during the reign of Alexios I Komnenos from 1081-1118 AD.⁸²

⁸¹ Magdalino has a similar discussion on the changing situation within Constantinople and discusses such points as the new Nuclei, he adds that the situation changes from one where there are no longer any programmes of public benefaction meaning that the urban layout of the city does not see any change until eighth century, and that the resources available were used to keep the city in good condition, essentially stating that the inhabitants lived in a city that relied heavily on the urban centres made in Justinian's building projects, such as the Hagia Sophia. Magdalino also states that this changed the from an Ancient city to a Medieval city as the cities in the rest of the former Roman Empire also experienced a sizeable urban downsizing as a result of the state they now belonged to no longer having the same amount of resources available as the Romans did when they initially built the cities: Magdalino, P., *'Studies on the History and topography of Byzantine Constantinople'* 54.

⁸² This is followed by the Pisan, Genoese and Amalfitans setting up their own commercial quarters within the city during the same years. This was an important factor in the relations between the Italians and the Romans which resulted in the massacre of the Latins in these quarters in the year 1182 during the reign of Andronicus I, this had a role in worsening relations between the East and West that reached a new low when the crusaders led by the Venetians conquered and sacked the city during the fourth crusade in 1204. Anna Komnene notes that the concession of the area was made by Alexios Komnenos to the Venetians in 1182 in: An. Komn., *The Alexiad*, 134.

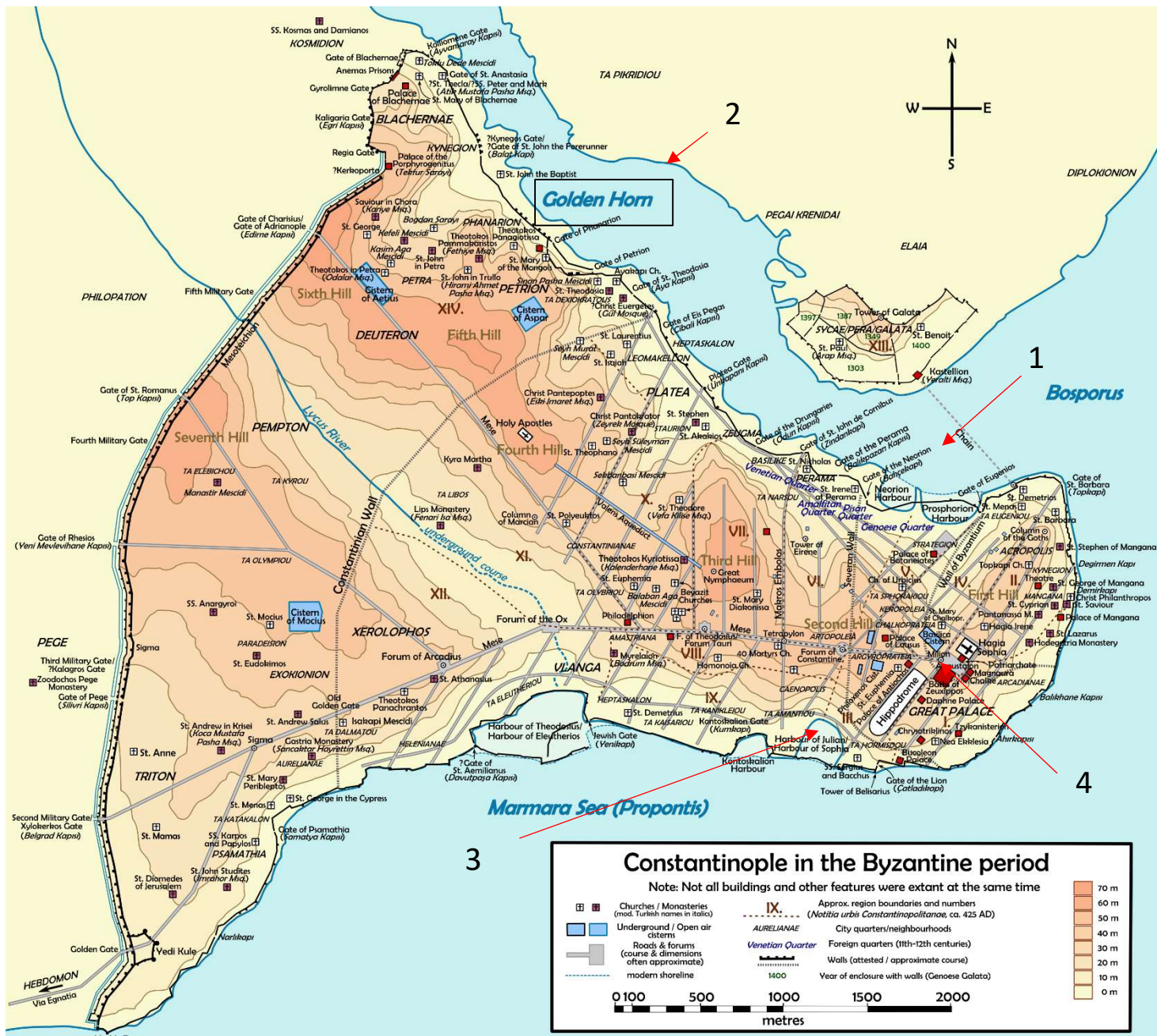


Figure 1: A map showing Constantinople and its main ports in the Byzantine period. 1. Neorian Port; 2. Golden Horn; 3. Port of Julian; 4. Augustaion.

Numismatics and Taxation Changes

The next part of the discussion shall focus on the numismatic and taxation impacts of the plague on the urban economy of Constantinople. To demonstrate these impacts, this section shall be divided into these two topics. The first of these topics shall be the numismatic impacts of the plague. The reason for this is that changes to the coinage struck in Constantinople can yield physical evidence of the impact of the plague on the empire's economy. The second topic that shall be discussed is the taxational impacts of the plague. This is an important point of discussion because taxation is the biggest form of revenue for the empire. By assessing the changes in the taxation of the empire, the impact of the plague can be further assessed. These two factors shall be combined in the final part of this section, this shall be done to highlight the negative impacts the plague had on the empire's economy.

Numismatics

The economic system of the Eastern Roman Empire during the sixth century was intricate.

The coins of the empire played an integral role in this system, as such, it is important to consider the changes to the coinage before and after the plague. The coins are analysed in descending, from the highest value coin, the *solidus*, to the lowest value coin, the *folles*.

When studying the impact of the plague on coinage, there are two factors to consider: the physical features such as the weight and metal type, and the iconographic details such as the images and letters on the coin. However, this second discussion shall only receive a brief mention, this is due to there being fewer notable changes to the iconography that can display the plague's impacts.

During the reign of Justinian, a total of fourteen coin mints were in operation around the empire. The initial mints were those in use before Justinian came to power, which was located in Constantinople, Thessalonica, Kherson, Nicomedia, Cyzicus, Antioch and Alexandria. The second group consists of those mints that were created during the reign of Justinian, many of which were created after his reconquests, and were made to meet the heavy demands placed on the economy. The mints in this group consist of Carthage, Constantine-in-Numidia, Rome, Ravenna, Perugia, Salona, and a mint that cannot be accurately placed that was located somewhere within Spain. Alongside these, there was one unidentified mint that cannot be placed in either group due to its unknown identity.⁸³ In the upcoming discussion on numismatics, the changes in coinage produced within Constantinople shall be the primary focal point. This is because throughout the reign of

⁸³ Bellinger, R., A., 'Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection, Volume 1' (Washington D. C., 1992) 62-63.

Justinian the mint in Constantinople was the primary mint within the empire, meaning that the important changes to all coinage were decided at this mint.⁸⁴ Constantinople's mint can be seen as representative of all mints used within the empire at any given period. Francois Delamare and Pierre Montmitonnet discuss the importance of the mint of Constantinople in their study. Delamare and Montmitonnet analyse the quality of the *solidi* coins and the process of striking coins in order to stamp the necessary information on to them, as well as analysing the differences between the mints of Carthage and Constantinople. From their study, the pair state that based on observations of the seventh-century *solidi* minted in both cities, there was no noticeable difference between them, except for the marks on coin that indicates the mint they were made at. Therefore, it can be stated that the coins made in Constantinople and coins made in other mints are similar enough to discuss them in a similar manner.⁸⁵

The largest denomination of coin during the reign of Justinian was the *solidus*. The *solidus* was a golden coin type that weighed around 4.5 grams or 24 Greco-Roman carats before the plague.

A new type of coinage that was introduced around the outbreak of the plague was called the lightweight *solidus*. This new lightweight *solidus* came into circulation alongside the regular standard weight *solidi*, however, while the lightweight *solidus* was also made from gold, it was of lower weight than the regular *solidus*. Bellinger estimates that these new coins

⁸⁴ Bellinger lists all the changes made in these other mints and due to the vast quantity of changes available an entire other study is required to demonstrate how these other mints represent the same changes such as loss of coin weight and small iconographic changes. The other mints are listed from the following page onwards in Bellinger's study: Ibid.104.

⁸⁵ Delamare and Montmitonnet base their assessment on a comparison of six coins taken from both cities where they assess many attributes such as coin weight, width, the amount of energy required in their creation, diameter and many more attributes and factors which they present in many different graphs and tables. Their assessment is that there is no noticeable difference in the coins they study: Delamare, F., Montmitonnet, P., 'Mechanical analysis of coin striking: Application to the study of byzantine gold *solidi* minted in Constantinople and Carthage' *Journal of Mechanical working technology* 10.3 (1984) 253-271 286.

entered circulation in the year 545 AD, which is three years after the plague had arrived in Constantinople.⁸⁶

While the regular *solidus* weighed between 4 and 4.50 grams, the new lightweight *solidus* weighed between 3.50 and 3.75 grams, indicating a reduction of between 1 and 0.25 grams. The lightweight *solidus* was also comprised of between 20 and 23 *siliquae* (unit of value that represents 1/24 of a *solidus*) compared to the value of 24 *siliquae* in the regular *solidus*, meaning that less *siliquae* went into the lightweight *solidus*.⁸⁷ The lightweight *solidus* also had a new type of iconography.

The obverse of the coin (see Figure 2) does not have many important changes of note.⁸⁸



Figure 2: Obverse of the gold *solidus* of Justinian I, Constantinople

However, the coin reverse depicts Victory facing forward wearing a tunic and pallium. Victory holds a long cross with pellets in their right hand and a Globus Cruciger in their left hand. In the right field of the coin, a star can be seen next to the inscription 'CONOB', which stood for *Constantinopoli obyrzum*, which indicates the coin was minted in Constantinople and made of 1/72 of a pound of pure gold. A separate inscription, 'Victoria' can also be seen

⁸⁶ It is useful to note at this point that within his study Bellinger does not note the amount coins found by the amount of different coin types. Therefore, it is hard to state how many coins of a particular type have been found, as his estimation is based on the combined collection of Dumbarton Oaks and the Whitmore collection. It should be noted that Bellinger states a total of 7 variations in the coin types he found for the lightweight solidus: Bellinger, R., A., 'Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection, Volume 1' .72.

⁸⁷ Philip Whiting notes that each lighter weight solidus had a mark to note its value in *siliquae* but was unsure as to the purpose of these marks although he hypothesizes that it is related to their use outside the empire: Whiting, P., D., 'Byzantine Coins' (London, 1973) 46-47

⁸⁸ Bellinger, R., A., 'Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection, Volume 1' 67.

on the coin on the left side with the last a being seen on the top of the right inscription. The phrase 'AVCCCIA' can be seen on the right side the AVCCC stands for 'To the victory of emperors' which is also sometimes referred to as 'AVGVSTORVM', and the 'IA' is a form of numbering given to coins (See Figure 3).⁸⁹



Figure 3: Reverse of the gold *solidus* of Justinian I, Constantinople

While the inscriptions and the Victory stay the same on both the regular and lightweight *solidi*, Victory instead holds a staff with a Chi-Rho in the right hand and a Globus in the left hand.⁹⁰ (See Figure 4).



Figure 4: Reverse of the lightweight *solidus* of Justinian I, with Chi-Rho, Constantinople

⁸⁹ Ibid.; Whiting, P., D., 'Byzantine Coins' 98.

⁹⁰ Bellinger, R., A., 'Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection, Volume 1' 72.; Whiting, P., D., 'Byzantine Coins' 46.

Many observations can be made from both the physical and iconographic changes. The lower coin weights demonstrated an attempt by the empire to fix a financial problem, as the lower weight coin meant that less gold was used overall, which is no doubt due to less gold being available due to the high cost the empire was facing. This coinage is evidence of the potentially beginning point of the decline of the Eastern Roman economy, the transition from the peak stage to the contraction stage of the economic cycle. Angeliki Laiou states that in the coming years after the reign of Justinian the Eastern Roman economy begins to decline as trade occurs less and the Eastern Roman economy becomes less specialised, meaning the empire has less means of gaining income. The lightweight *solidus* can be seen as one of the first pieces of evidence that this change is beginning to take place in the wake of the plague.⁹¹

The lower weight of 3.5 grams is a significant deviation from the regular weight standard, which has used the imperial roman weight standard of 4.5 grams since the imperial age. Delamare and Montmitonnet make a similar observation as they state that from the fifth until the ninth century that the mint in Constantinople reduced the quality of their gold found in the *solidi*. In Carthage during 668 AD the mint had improved their minting techniques, the aim of this improvement was to make better coins that were more durable so that less materials were used over time. Delemare and Montmitonnet concluded that these facts were linked to financial issues within the empire.⁹²

In regard to the importance of the iconographic changes, the addition of the Chi-Rho suggests that the plague was stopped by divine aid from god. Slawomir Bralewski

⁹¹ Laiou, A., E., 'The Byzantine Economy' 39-42.

⁹² Delamare, F., Montmitonnet, P., 'Mechanical analysis of coin striking: Application to the study of byzantine gold solidi minted in Constantinople and Carthage' *Journal of Mechanical working technology* 269-270.

conducted a study on the Chi-rho and the Labarum that in the texts of Eusebius of Caesarea, a prominent eye witness on the reign of Constantine I. Eusebius writes that the Chi-Rho was most commonly associated with the idea of Salvation and Triumph amongst other things during the fourth and fifth centuries.⁹³ This change is important to note as the Chi-Rho appears on coinage after the plague in 542 AD, this indicates that the message of salvation was again important during this period and that the plague is linked to the idea of divinity. This idea is seconded by the perception about the bad air caused by the plague at the Port of Neorion.

The next point of discussion shall be the coins made from silver. During the reign of Justinian, the type of silver coinage being used was the *miliaresion*. The *miliaresion* was a coin that had been used in the Eastern Roman Empire from the fourth century until the seventh century where it underwent a series of reforms. One *solidus* is worth twelve *miliaresion* and one *miliaresion* is worth one thousand *nummus* (a type of copper coinage).⁹⁴ There is very little evidence available for the *miliaresion* during the reign of Justinian and no change was likely made to the coin until the reign of Heraclius.⁹⁵

Two other types of silver coinage used during the reign of Justinian were the *siliqua* and double *siliqua*. A single *solidus* was worth twenty-four *siliquae*. Similar to the *miliaresion*, there is an issue with the available evidence. While there are a few of the regular and double *siliqua*, there is not enough to say with accuracy if they are representative of the use of silver coinage during the reign of Justinian. The coins we do have date from 527-565 AD for the *siliqua*, which was the entire reign of Justinian, and 527-538 AD for the double *siliqua*. Based

⁹³ Bralewski, S., 'The Labarum- from Crux Dissimulata and Chi-Rho to the Open Image cross' *Studia Ceranea* 10 (2022) 243-258 244-248; Euseb. *Vita Constantini*, I.40 I.32.3 .

⁹⁴ Whiting, P., D., 'Byzantine Coins' 47.

⁹⁵ *Ibid.*

on these dates and limited facts, it is tough to accurately discuss the coins in the context of the plague, as only the *siliqua* evidence from the year 542 AD.

Part of this apparent lack of evidence could be explained by apparent disinterest in the use of silver coinage during the period. Philip Grierson states that due to the fluctuation of the coins' value compared to gold meant that it was tough to effectively mint silver coinage.⁹⁶

Therefore, any silver coin that was used during this period likely retained its value as it was made during a more stable period of the empire. This had the benefit of maintaining some form of stability in the empire's economy.

The final type of coinage is Copper coinage. The primary copper denominations were the *follis* and half *follis*. Both the *follis* and half *follis* had a large number of examples available and each of them can be dated due to the 'ANNO' and symbols following indicating which year the coin was produced. The obverse of the *follis* can be seen in Figure 5 and the reverse in Figure 6 which was made in the year 549/550 AD due to the X III indicating the 23rd year of Justinian's reign. This particular coin is from Carthage, but the Constantinople versions were the same. Unlike the *solidus*, both the *follis* and the half *follis* saw very few noticeable changes directly before and after the outbreak of the plague in Constantinople. Neither the design nor the characteristics see any noticeable changes. However, during the 550s AD, the weight of the *follis* and half *follis* is lowered, although this is too long after the plague's outbreak in 542 to draw a direct connection between them. This does, however, lend evidence to the idea that this period was the beginning of the decline of the Eastern Roman economy that was suggested by the lightweight *solidus*, as the gradual decline in the weight

⁹⁶ Grierson, P., 'Byzantine Coinage' (Washington, 1999) 12.

of the follis suggests characteristics of contraction within the economy as the coin type begins to suffer from just after the plague onwards.⁹⁷



Figure 5: Obverse of the *follis* of Justinian I, Carthage



Figure 6: Reverse of the *follis* of Justinian I, Carthage. From 549/550 AD.



Figure 7 (left): Obverse of the half *follis* of Justinian I, Constantinople



Figure 8 (right): Reverse of the half *follis* of Justinian I, Constantinople

⁹⁷ Bellinger notes a total of 32 different coin types for the Follis all of which have very small variations in either rotation or weight. These changes are merely due to the fact the mint will not replicate a coin perfectly each time. For the Half Follis Bellinger notes a total of 7 different coin types that have similar differences to the types of the Follis: Bellinger, R., A., 'Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection, Volume 1' 78- 81.

It must also be noted that the lack of change shown by the *follis* and half *follis* is also displayed with the copper *decannumium* coin type, but similar to these coins the weight of the *decannumium* decreases gradually after each year. Therefore, this coin can be considered as evidence for the idea that the economy was facing decline in the years following the plague.⁹⁸

To consider some additional information about copper coinage, the exchange rate between copper and gold coinage was altered around the time of the plague. This meant that the number of copper coins that equated to a single *solidus* was altered. This means that more copper coins were needed to equal the same value as a singular gold coin. Whiting notes that during the reign of Justinian, inflation completely removed value from the smallest copper coins.⁹⁹ It must also be noted that copper coinage is commonly used every day by the population for most transactions compared to gold or silver coinage which is used for larger transactions. Copper coinage was the money used by an everyday citizen to purchase their food.¹⁰⁰ Therefore, the changes in the copper coinage after the plague suggest that the economy of the empire was changing as more copper coinage was now required to equate to golden coinage and smaller copper coinage was no longer in use. This means that the consequences of the demographic changes such as the reduction of Constantinople's economic capabilities meant that was enough evidence to suggest the beginning of economic decline.

⁹⁸ Bellinger notes a total of 31 types for this coinage, and these types only have changes that are due to the mints not being able to perfectly replicating the coinage. The coin does lose weight in the 550's but again this is too long after the plague to indicate it is related to it: Bellinger, R., A., *Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection, Volume 1* 98.

⁹⁹ The changes in copper coinage are discussed in more detail by Meier who discusses the loss of stability and by Sarris who discusses the issues with the exchange rates: Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects' 280; Sarris, P., *Economy and Society in the age of Justinian* 218 203.; Whiting, P., D., *'Byzantine Coins'* 55.

¹⁰⁰ Laiou, A., E., *'The Byzantine Economy'* 39.

To summarise the numismatical evidence, the introduction of a new lighter weight *solidus* suggests the beginning of the transition to the contraction stage of the economic cycle and the beginning of economic decline. This also indicates the use of less material in the production of gold coins, therefore, the gold coins reflected decline in value compared to the regular *solidus*. However, the iconography of the coin still presents a message of salvation and triumph in the use of the Chi-Rho iconography, while the weight and physical aspects of the coin suggests decline of the value of the coin. The copper coinage also suggests economic decline and a similar transition of stages. While silver maintains stability due to a lack of real interest in the coin. The lightweight *solidus*, *folles*, and half *folles* indicate a decline in the economy as the gold coinage is of a lesser weight, and the copper coinage was altered in a negative way.

Numismatical evidence can be used as evidence to suggest that the plague was an 'economic turning point' for the empire as suggested by Angleki Laiou as the changes seen on the coins shows the beginning of the economic decline that persisted and gradually worsened in the coming centuries reaching the trough stage of the cycle around the age of Constantine V.¹⁰¹ The importance of Eastern Roman coinage in Mediterranean trade during the sixth century can also not be ignored, as the coinage acted much the same as the American dollar in modern society, meaning it was the main currency for trade in the Mediterranean.¹⁰² Therefore, any changes made to the Eastern Roman economic system rippled to the trading networks within the Mediterranean world. The numismatic and demographic impacts both highlight change caused by the plague and suggest that the economy of the empire began to decline during the period after the plague. The changing

¹⁰¹Harris, J., 'Constantinople: Capital of Byzantium' (London,2009).112; Laiou, A., E., 'The Byzantine Economy' 38

¹⁰² Ibid.23; Harris, J., 'Constantinople: Capital of Byzantium' (London,2009).112.

circumstances within Constantinople coupled with the changes in coinage impacted the population in Constantinople as the currency had drastically changed and there were fewer people in the city to stimulate its economy and help in its recovery after the plague.¹⁰³ Both the *solidus* and lightweight *solidus* would stay in circulation until be discontinued by emperor Alexios I in favour of the new Hyperion in 1092 AD as the coinage had lost a large amount of value and needed to be changed. The period of decline that began with the plague would not recover to the levels of pre-plague Constantinople until the period of the Macedonian dynasty in the eleventh century¹⁰⁴

¹⁰³ Laiou states that the plague reduced both production of many things and the demand for them which would lead to a reduction in the imperial finances, which is evidenced when the empire could do little to stop the advance of the Slavs and Avars in the 560's leading to a weakened Danubian frontier which would later become a factor that lead to the siege of Constantinople by these two groups and the Arabs in 628 AD: Laiou, A., E., 'The Byzantine Economy' 24.

¹⁰⁴ Ibid. 24 85 148.

Taxation Changes

In this section, the taxation changes caused by the plague will be discussed. For taxation analysis, it is important to consider two factors, population loss and the economic demands the empire faced. The reason that these points are important is due to their impact on the urban economy of the empire, as this dictates the revenue available that the empire could use. As noted in the numismatic discussion, evidence such as the creation of the lightweight *solidus* as well as the collapse of the exchange rate between gold and copper coinage suggests that the empire was facing the beginning of economic decline. This can also be observed from the empire's taxation.

As previously noted, the city of Constantinople saw a loss of between 160,000 and 250,000 people during the outbreak of the plague in the year 542 AD. This meant a loss of nearly 40-50% of the taxable population, most of which was the labour force of the city.¹⁰⁵ The various building projects in the city meant that a lot of revenue was required to fund them.¹⁰⁶ This is also alongside a yearly tribute paid to the Sassanians, due to the Eternal Peace signed in 532 AD, the Eastern Romans had to pay 11,000 pounds of gold each year until 540 AD.¹⁰⁷ Justinian's campaigns in Italy during the Gothic Wars and upcoming conflict in Lazica were also very expensive affairs, meaning the financial burden on the state was high.¹⁰⁸ When the plague arrived in the empire and removed nearly half the taxable population this left the empire with a gap in their largest means of income. There is evidence that suggests just how vicarious this situation was from both Procopius and the legal documents called the *Novellae*

¹⁰⁵ Downey, G., 'Constantinople in the age of Justinian' 34-36.

¹⁰⁶ Laiou states that over one million *solidi* alone was spent on the construction of the Hagia Sophia: Laiou, A., E., 'The Byzantine Economy' 27; Downey, G., 'Constantinople in the age of Justinian' 41.

¹⁰⁷ Procop, Wars, I, 22.17.

¹⁰⁸ Sarris, P., 'Economy and Society in the age of Justinian' 218.

Constitutiones. In both his *History of the Wars* and his *Secret History*, Procopius discusses the ongoing issue of taxation during the reign of Justinian. He heavily criticises the policies of taxation that are put in place as a result of the plague, such as the lack of financial relief afforded to landowners who were greatly affected by the plague.¹⁰⁹ Procopius also bemoans the fact that the abandoned property left behind by dead owners killed by the plague was still being taxed, with those who had survived the plague having to pay this cost regardless of if they used the land in any way.¹¹⁰ It must be noted that Procopius is an ally of this higher class of landowners so will likely be against any form of tax placed on this class. However, the sheer amount of accusations Procopius makes about the issue suggests that it was a problem for some sections of society at the time.

Procopius highlighted an issue related to taxation, especially the taxation of land. Procopius also highlights other issues with taxation in the *Secret History*, stating that the wealthy classes were unfairly taxed for other non-land related issues.¹¹¹ He also heavily criticises the policies in place by the tax officials appointed by Justinian and their handling of the economy.¹¹² The *Novellae Constitutiones* also suggested the presence of issues within the system of taxation. This is important as the *Novellae* was created by individuals paid by Justinian and the emperor dictated what was said in the text, which means that the biases of Procopius are not present in these texts as the person Procopius had an issue with is the emperor so the *Novellae* provides the other side of these biases. One particular *Novellae*, the

¹⁰⁹ Procopius dedicates an entire section of the *Secret History* to lambaste Justinian for bringing the landowning class to ruin. Meier also discusses Procopius views on taxation: Procop, SH, 23; Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects' 279.

¹¹⁰ Procop, SH, 23 ;Sarris, P 93; Meier, M., 'The Justinianic Plague : the economic consequences of the pandemic in the Eastern Roman Empire and its cultural and religious effects' 281.

¹¹¹ Ibid.; Laiou, A., E., 'The Byzantine Economy' 39.

¹¹² One particular individual who Procopius attacks is the tax official appointed by Justinian by the name of Peter Barsymes who he accuses of corruption and theft from the soldiers, he accuses Barsymes of being unholy and selling old and traditional positions to the highest bidder: Procop, SH, 22; Sarris, P., 'Economy and Society in the age of Justinian' 218.

128th, discusses tax payments within the empire. The 128th *Novellae* is one of the longest in the text and dedicates twenty five chapters to reforming the process of taxation which is claimed to be for the benefit of the empire's tributaries. The larger size of this *Novellae* shows that there was a need to change the system of taxation in the empire to make it more efficient as if this was the case before the text was made such an extensive change would not be required. A section of this *Novellae* states that, in the case of an owner of the property not being found or present, 'anyone should be found who is legally entitled to receive the superindiction, it shall be transferred to him.'¹¹³ What the quote shows is discussion of the clause mentioned by Procopius which meant that people had to pay the tax for their deceased family. The use of the word 'anyone' instead of 'family' indicates that the cost of the due rent could also be spread about the community, this idea is also suggested by Williamson in their editorial notes for the translation of the *Secret History*.¹¹⁴ What this shows is an apparent need for the empire to generate the income that had been lost due to the deaths within the plague.

Other things that can be noted from the *Novellae Constitutiones* are that there was a concern about the inability of some people to pay the amount of debt they had amassed over a period of many years. In the 147th *Novellae*, there is evidence of law to rectify the issues with tax by offering some individuals tax relief. A remission of arrears (a tax gap) for those cities that had been captured in 565 AD is mentioned in this *Novellae*.¹¹⁵ An important quote from this section can be seen when it is stated: 'We release from unpaid tribute those persons who, being in arrears, have presented petitions to Us, and have made Us acquainted with

¹¹³ The text is Latin and has been translated into English, the Latin translation comes from: Nov., 128

¹¹⁴ Procopius, *The Secret History*, Trans. Williamson, G., A., 94

¹¹⁵ Sarris, P., '*Economy and Society in the age of Justinian*' 4-5; Nov. 147

their wretchedness'.¹¹⁶ What this states is that the issue of unpaid taxes amassing had become such a common issue that many people appealed to the empire to rectify this issue. This indicates that the financial situation at the time was very tough for many people in the empire, and while this is not made until after the year 565 AD it still suggests a further decline of the empires economy into the contraction stage of the economic cycle that had begun around 542 AD, as people had issues paying their taxes each year.

Procopius and the *Novellae Constitutiones* suggest that the issues with taxation within the empire were seen by all classes within Constantinople. Together, these two sources portray a situation where the empire requires money to fund its needs, but the population cannot afford these taxes. Procopius' issues with the taxation is coupled by the tax remission which suggests that the empire understood these issues and the fact that people could not to pay the taxes. Procopius' text shows an attempt to find the necessary revenue to fix this issue from the rich land-owning classes and the *Novellae* shows that as the empire had lost a large percentage of its taxable population, the burden of tax is delegated to the survivors to meet the empire's financial requirements. Due to Constantinople seeing such a large percentage of loss as a result of the plague, the city was greatly impacted by these issues.

This evidence also suggests that the treasury of Constantinople was in decline as less revenue is being obtained compared to before the plague, this is also shown as no further building projects were undertaken in Constantinople until the eighth century.¹¹⁷ Returning to the idea of the urban economic cycle this suggests that the decline of the economy is linked to the decline of the population. Without population the empire cannot make large

¹¹⁶ Ibid.; The 122nd *Novellae* discusses the issue of grain tax and artisans who demand to be paid more for their services than what was the cost in the ancient times: Nov. 122.

¹¹⁷ Magdalino, P., 'Studies on the History and topography of Byzantine Constantinople' 3.

amounts of revenue and only when the population begins to increase again so does the money available for the empire to use. The evidence of Procopius and the *Novellae Constitutiones* shows that a shrunken population cannot maintain the rate of taxation that a population of between 400,000 and 500,000 could fulfil. Someone who survived the plague saw the higher demands placed upon them, as the empire begins to contract and lose economic growth. The survivors did not see the appearance of new infrastructure being paid for by these taxes. They also saw the economic capabilities of the city shrink, as the economic centre of the city, moved away from the area close to the majority of the urban poor, meaning this area loss value.

Therefore, considering numismatical and taxation evidence together, the evidence suggests that the plague caused a decline in the economy of the empire. As the golden coinage now weighed less and the value of the copper currency, the common currency used in the empire, had been lessened with the lowest valued copper coins now having no value. The taxes of the empire were no longer providing as much revenue as they had previously, and the previous demands placed on a population of 400,000 to 500,000 could no longer be sustained in Constantinople by a population of close to half of that number. This indicates the beginning of the economic decline that Angeliki Laiou states resulted in severely reduced levels of trade and an economy that no longer contained specialised markets, this meant the ability of the empire's economy to generate had been severely weakened and prices of items in Constantinople will have likely risen as a result.¹¹⁸ This weakened economic situation required a long period of time to recover, which only began to happen once the population had regained some of its numbers.

¹¹⁸ Laiou, A., E., 'The Byzantine Economy' 42.

Conclusion

In conclusion, the urban economic impacts of the plague on Constantinople is that it progresses the city from the peak stage of both the economic and urban economic cycle into the stage of contraction. This is a helpful tool to use when discussing this change as it demonstrates how the demographic and economic changes caused by the plague impacted the city in both the short and the long term. Constantinople during the plague was a city designed to accommodate between 400,000 and 500,000 people. At this point the city experienced an event that greatly reduced this number and caused the city to adapt to a circumstance where this city designed for 400,000 to 500,000 people now only had a population of around 200,000 to 300,000. The city begins to see economic decline couple with the population decline as the empires currency and revenue began to suffer. And it is only when the population begins to recover that the economy does as well.

Three areas were analysed to demonstrate the impact of the plague: demographic factors, numismatic factors, and taxation changes. The research question this thesis wishes to answer is 'What were the direct and indirect effects of the Justinianic Plague on the urban economy of Constantinople?'. What can be said about this question is that the plague directly caused a significant loss of population within Constantinople. Topographically, there was a shift in the economic heart of the city from the Neorion Port to the Port of Julian. Alongside this, the loss of close to half the city's population meant that a lot of urban space became available within this city. This space was used for agricultural land that aided in the eventual repopulation of the city. The demographic changes caused by the plague resulted in the city

adapting to a smaller population and a smaller economy, suffering from demographic attrition in the process.

The direct impacts numismatically were the creation of a new lightweight gold *solidus* alongside a change in the amount of copper coinage was equal to a single gold *solidus* which is some of the earliest evidence of economic decline, as well as a loss of the smaller value copper coinage. These provide evidence of economic decline as the value of the most commonly used coins in the empire is changing at a time that prices are increasing. The evidence provides physical examples of the situation in the city of Constantinople during the aftermath of the plague, and the changes seen by the coinage tell historians that change is indeed occurring which would go on to have many indirect consequences later on as the economy worsens.

The changes in taxation tell a story of a high financial burden placed on the state and its citizens. It also evidences the issues the population of cities such as Constantinople had paid these high taxes. Evidence such as Procopius and the *Novellae Constitutiones* show acknowledgment from the empire that there were issues present with the taxation in the empire as people were unable to pay each year and in many cases required aid to do so. This evidence shows that the economy of the empire was indeed declining as there was less revenue being generated, meaning that less things could be paid for, as well as demonstrating that the change in the urban environment and decline in population caused by the plague influenced this economic decline.

The indirect causes of the plague for the city of Constantinople were that the plague began this period of economic decline progressing to the stage of contraction and economic stagnation, whereby, there is very minimal economic growth. These issues were most

commonly present in Constantinople due to the city's place as the capital of the empire. As the effects of the plague in the capital rippled to other parts of the empire. And in the future when large parts of the empire and the resources provided were lost the ripple effect returned to the city, as the economic decline continued and the city suffered urban economic attrition was less people and resources available, while the demands for aid request to the city were still enormous as many of the empires other larger cities were lost.

The economy of Constantinople and its trading capabilities eventually recovered and eventually, the city flourished again. However, without the ability to regain the population the city had lost this was not possible and was a gradual process. This paints a picture of the vast and long-lasting impacts of the losses caused as a result of the outbreak of the Justinianic plague in 542 AD.

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