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Pestilence and Penitence: The Cyprianic Plague and the Rise of Christianity

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Introduction

The Roman Empire's borders extended throughout the Mediterranean world and their connection beyond their frontiers brought them into contact with many peoples, including their religions and their pathogens. In the midst of the Third-Century Crisis, the Roman Empire faced multiple disasters that its central government struggled to overcome. At one point, the Empire was divided, with the succession of the Gallic Empire in the north and the Palmyrene Empire in the east. The political strife continued to mount until Diocletian's victory in 284. Romans also suffered from economic pressures, experiencing high inflation and debasement of their currency.[1] Despite the compounding political and economic hardships, a religious conflict also began growing. Christianity, a young mystery cult from the Province of Judea, had begun to grow and form a strong community in the larger cities of the Roman Empire. Roman authorities increasingly saw this community as a threat. In the midst of this, the Plague of Cyprian ravaged Roman Africa and eventually spread to other parts of the Empire. This lesser-known plague was likely brought to the Roman Empire through long-distance trade routes and its devastation crippled the Roman world, or so our sources indicate. The Cyprianic Plague bolstered the rapid rise of Christianity throughout the Empire, and especially in the African provinces. The frightening symptoms of this novel plague, and the deaths it caused, drew many Romans to a religion that promised comfort, salvation and the afterlife. This study examines this devastating plague and explores the ways in which it aided the rapid growth of Christian communities.

Societal trauma is a constant companion to all societies, whether they are thriving metropolitan empires, or collapsing agrarian states. Mass violence and death leave lasting

[1] Clifford Ando, *Imperial Rome 193-284: The Critical Century* (Edinburgh: Edinburgh University Press, 2012), 102-104.

damage and scars upon those who survive them.[2] They can also profoundly change political systems and obstruct the administrations of ruling authorities. Even those observers whose personal lives are not directly or substantially affected by the ongoing tragedies occurring around them carry with them the heavy weight of the impact of these traumatic events. Cyprian, the Bishop of Carthage who documented the Plague of Cyprian, was one of these individuals.[3] The plague, which he first described, brought additional pain and suffering, beyond that already present in several converging plights, to the struggling Roman Empire. This ancient pandemic exacerbated multiple ongoing political crises prompting a cascade of catastrophe and trauma for the Roman peoples throughout the Imperial territories.

At the beginning of the third century CE, the political situation within the Roman Empire became increasingly fractured and precarious.[4] During the third century, twenty-one emperors claimed rule over the Empire before Diocletian successfully solidified his hold. The Empire had at one point fractured into the Gallic Empire in the north, the Palmyrene Empire in the east, and the central Roman governing authorities holding the remainder of the Mediterranean possessions. Though these attempted secessions were short lived, the severity of the divisions threatened the survival of the central Roman government. Additionally, the Roman currency struggled to remain stable and was debased in order to fight a monetary shortage.[5] Throughout this century of strife and economic downturn, Rome also faced multiple foreign incursions and internal civil uprisings. These wars, and the further upheaval that accompanied them, crippled Rome's ability to govern its territories, leading to further deterioration of a singular, centralized authority.

[2] Peter Suedfeld, "Reactions to Societal Trauma: Distress And/or Eustress." *In Political Psychology,* 18.4 (1998).
[3] On Cyprian generally, see Brian J. Arnold, *Cyprian of Carthage: His Life and Impact* (Glasgow: Christian Focus Publication, 2017).
[4] Ando, *Imperial Rome*, 5-9.
[5] Ando, *Imperial Rome,* 102-104, 108.

However, these political setbacks were not the only devastating events to take place in the Empire during this period of time. A large natural catastrophe hit the empire in 249 CE: an illness affecting peoples across all social classes and political offices, prompting massive loss of life and even claiming the life of the Emperor Aemilius Aemilianus in 253 CE.[6]

The disease that ravaged the Roman Empire in the middle of the third century is, as of yet, undetermined. The turbulence of the Third-Century Crisis resulted in a mass loss of knowledge and records.[7] However, in recent years both interest and research into this less well-understood plague have increased, providing historians with far more material for analysis and study.[8] This new-found attention has yielded novel theories on what the disease was and its perplexing origin. These contemporary theories have the potential to change how the Third-Century Crisis is viewed and discussed.

The Plague of Cyprian, as it is often referred to, took place during the third century CE and presents a strange case of academic apathy within modern scholarship. Despite the recent increase in interest noted above, research into the epidemic, both archaeological and textual, remains notably sparse. Other disease outbreaks, such as the Justinianic Plague (527-565CE) have been studied extensively in the recent works of Merle Eisenberg and Mordechai Lee, and the Black Death has long featured prominently.[9] Objectively, the third century was plagued by dozens of adversities that threatened the stability of the entire Roman Empire. Yet, there still

[6] Aurelius Victor, *Liber De Caesaribus*, 31. Other sources claim that Emperor Aemilianus was killed by his solders, however, Victor states clearly that he died of disease. Because of the date presented for his death in Aurelius Victor it is likely that he died of Cyprianic Plague.
[7] Ando, *Imperial Rome*, 12-13.
[8] See, Amber Kearns, "A Plague in a Crisis: Differential Diagnosis of the Cyprian Plague and Its Effects on the Roman Empire in the Third Century CE" (MA diss., University of Arizona, 2018).
[9] For more on the Justinian Plague, see Michael Maas,. *The Cambridge Companion to the Age of Justinian* (Cambridge, UK: Cambridge University Press, 2006),148-156. For the Black Death, see more recently, Monica Green, ed. *Pandemic Disease in the Medieval World: Rethinking the Black Death* (Amsterdam: Arc Medieval Press & Amsterdam University Press, 2015) and, for an example of the classic scholarship, Michael W. Dols, *The Black Death in the Middle East* (Princeton: Princeton University Press, 1977).

seems to be a lack of scholarly curiosity about the Cyprianic epidemic. This outbreak may have been a contributing factor to the significant decline in Roman power as well as being the catalyst for many well-researched crises which followed: certainly, at the very least, it needs to be raised and studied as a contributing factor. Addressing this lack of interest raises critical questions regarding the reasons for this gap in historical knowledge. These questions force a new evaluation of the existing evidence regarding Africa and its trade throughout antiquity, and its influence on the Mediterranean world.

In this thesis, I will attempt to extrapolate and to determine, from existing sources and scholarly research, what this mysterious disease was, its origin, transmission, and its subsequent effects on the perception and growth of Christianity. Cyprian's Plague has the potential to be considered among the great catalysts for the political and religious upheavals that marked late antiquity. The effects of this pre-modern pandemic had far-reaching consequences throughout the Roman Empire, economically, politically, and religiously. Disease outbreaks, and an authority's response to those outbreaks, force the population which is affected by its devastating impact to question existing power structures, including the impact, or lack thereof, of their religious organizations and doctrines. The disease broke out at a time of great political unrest and disillusionment with existing power structures both governmental and religious. This means that the epidemic possessed a large capacity for change. The rise of Christianity itself might not have been possible if the plague had not struck when and with as much force as it did.

Throughout the devastation of the Third-Century Crisis, the rise of Christianity can be characterized by slow, unrelenting growth. Christianity grew especially well in Roman North Africa, a region that experienced less political and economic impacts of the Third-Century Crisis than the rest of the Roman world. This protected status was, at least partly, due to its economic

value to the Roman Empire. The province of Africa was critical to the grain and olive oil supply of Rome. Because of this, the Roman government sought to have the region continuously under their central authority.[10] The relative calm in North Africa allowed for the growth of Christianity to occur without the need for local authorities to carry out organized persecutions towards them in order to retain authority over the local populace.

This period of time saw relative calm and peaceful interactions between the Roman authorities occasionally interrupted by intermittent and non-committal persecutions intended only to demonstrate the control of the state. Even though persecutions of Christians did occur in Africa in the first half of the third century, they were not nearly as extensive or organized by the Roman authorities as popularized by Christian sources. Though the death penalty was rarely enforced, it did occur. Notably, the Roman women Perpetua and Felicity were executed in the arena during the reign of Septimius Severus in the early 200's CE. Tertullian, who was the bishop of Carthage during the Severan persecution and the first major Christian author to write in Latin, was not pursued by Roman authorities despite being the regional leader of the faith, indicating that the imperial authorities chose not to go after figures that they did not see as anti-Roman: at this point simply being Christian was not seen as necessarily opposing the state. After these events, "there is much less evidence of outbreaks of popular hostility against Christians in

[10] David Wilhite, *Ancient African Christianity* (New York: Routledge, 2017), 18-19. A representative piece of evidence for the importance of Roman North Africa to Rome is the accession of Emperor Gordian III. After the death of Emperor Maximinus the Roman senate appointed Gordian III Emperor. Gordian III was a Roman North African whose family had held extensive power in the North African region. This was in spite of the fact that the boy was just thirteen at the time. The Roman senate preferred a leader who could keep North Africa under Roman control, rather than an older more experienced general. Additionally, Africa was a senatorial province, meaning that it was under the direct administration of senate. The senate wanted to maintain control over these productive and wealthy lands, selecting a young boy who originated from the region would have given them a greater deal of leverage an influence within the North African elite circles.

the thirty-five years or so before 250."[11] The Decian Persecutions in 250 CE began after the Emperor wrote an edict that ordered every Roman to present a sacrifice to the Roman gods and the Imperial cult, something that Christians could not do. This "decidedly old-fashioned" order was designed to create uniformity under a new government and was not intended to harm Christians specifically.[12] However, the edict prompted wide-scale violence against Christians in Roman North Africa, a sharp departure from earlier tolerance. Why did this departure occur? Prior to this century, "as long as military authority was unchallenged and the society seemed stable, adherence to Christianity and non-participation in civic and Imperial cults could be ignored as a minor deviance."[13] However, it is possible this period of relative calm and tolerance was destroyed by the arrival of the Cyprianic Plague and the edict simply gave permission for them to be made into scapegoats. The disease's devastating symptoms were described in detail by Bishop Cyprian of Carthage:

> "Now, then, the bowels, loosened into flux, disembowel the strength of the body, then a fire [fever], catching in the marrow, boils forth among wounds in the throat, then the intestines are shaken by constant vomiting, then the eyes begin to glow with the violent force of blood, then for certain persons either the feet or any other portions of the limbs are cut off by the touch of the diseased rottenness, then, through losses and damages of the bodies, with faintness rushing, either

[11] Patout Burns and Robin Jensen, *Christianity in Roman North Africa: The Development of Its Practices and Beliefs* (Grand Rapids: William B. Eerdmans Publishing Company, 2014), 11. Peter Brown, *The Rise of Western Christendom: Triumph and Diversity, AD 200-1000, tenth anniversary revised edition* (Chichester: Wiley-Blackwell Publishing, 2013), 35-71
[12] Burns and Jensen, *Christianity in Roman North Africa*, 12-15.
[13] Burns and Jensen, *Christianity in Roman North Africa*, 39.

walking is impaired or hearing is blocked or the sight is blinded. This makes for a lesson of faith."[14]

The plague spread rapidly to Rome, Achaea in Greece, and Alexandria in Egypt.[15] The devastating persecution of Christians in Africa led to controversies within the community itself. After the persecutions began to slow, some of those who had abjured from Christianity, or the "lapsed," faced further difficulties from the Christian community when they sought to reenter church life. A ferocious debate arose about whether or not to allow their reentry, with Cyprian arguing for their readmittance, and the Novationists, led by Novatian, a presbyter in the African church, arguing against it. The debate eventually spiraled into the Donatist controversy, the name it would be given decades later when the issue would become a devastating schism as a result of the Great Persecution. The struggles and turmoil of Cyprian's era are at the heart of this later development.

The persecutions of the third and early fourth century created new opportunities for the early church to grow and expand its reach. It did this in many highly-noticeable ways, like monasticism and the cult of martyrs, but the reforms that Cyprian brought to the church in this period also form part of this. During the persecutions of the 250's, Cyprian ordered that all Christians who died during the persecutions, whether they were executed, tortured, or simply succumbed to the prison captivity were to have their names and the dates of their deaths

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[14] Cyprian, Bishop of Carthage. *De Mortalitate*, in *Sancti Cypriani Episcopi Opera, II*, Corpus Christianorum Series Latina III A, edited by M. Simonetti and C. Moreschini, 17-32. (Turnhout: Brepols, 1976), 14.1-6.
"Hoc quod nunc corporis uires solutus in fluxum uenter euiscerat, quod in faucium uulnera conceptus medullitus ignis exaestuat, quod adsiduo uomitu intestina quatiuntur, quod oculi ui sanguinis inardescunt, quod quorundam uel pedes uel aliquae membrorum partes contagio morbidae putredimis amputantur, quod per iacturas et damna corporum prorumpente languore uel debilitatur incessus uel auditus obstruitur uel caecatur aspectus, ad documentum proficit fidei." Translated by the author.
[15] *Scriptores Historiae Augustae: Gallienii, 5.5-6.* Dionysius of Alexandria preserved in Eusebius, *Letter 13: Return to Alexandria.*

recorded.[16] He also ordered that these dates were to be celebrated so that martyrs could be remembered by the community for their sacrifice. This small act, seemingly meant to console grieving families and unite a bereaved and despairing congregation, had an extensive and lasting impact on the identity of the Christian church. This order by Cyprian created a hero-system that demonstrated to the congregation how to serve God and showed outsiders a unique "contempt for death" that was attractive to those who lived in the violence and disease-stricken world of the third century.[17]

The Cyprianic Plague had a deep effect on the Christian communities in North Africa. As the region's communities were primarily urban-based, they bore the brunt of both the deadly plague and the persecutions.[18] The disease was novel and violent, likely adding to the fear of those who witnessed it, and caused a substantial mortality. The need for religious structure and purpose in the ever-present suffering allowed for Christianity's concepts of heaven and salvation to provide comfort for the grieving.

The pivotal nature of the third century provided compounding adversities. It was a period of great upheaval and turbulence. This framework of converging crises imparted greater importance and more impactful consequences to each individual event that occurred within this milieu of crisis. The Cyprianic Plague devastated Roman Africa and changed its communities. Exploring the relationship between disease and societies, and specifically how societies react to epidemics, can provide far-reaching conclusions that can help us to better understand a society's response to loss and grief in the modern world, and the role of religion in traumatic periods of intense struggle.

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[16] Cyprian, *Epistula,* 12.
[17] Rodney Stark, *The Rise of Christianity,* 165.
[18] Burns and Jensen, *Christianity in Roman North Africa*, 1-5.

Methodology

The third century is often seen only as a time of crisis and tribulation for the Roman Empire. While crisis and tribulation certainly did define this period of Roman history, the political fractures and foreign incursions at the heart of this disaster also allowed previously marginalized groups, particularly religious minorities, to flourish. The various crises allowed for differing responses that, in turn, created opportunities for the pursuit of new philosophies and previously unimaginable religious power. Religion, in particular, represented a significant sector for growth and development. In examining the Third-Century Crisis, or any such crisis, it is important to understand and address how crises can offer both positive and negative effects. In the present case, the *immediate* effects for the Roman Empire were overwhelmingly negative. It lost the obedience of its citizens and its ability to govern effectively. This convergence of crises crippled the Empire and sent it into a cycle that would fundamentally transform its structures and institutions. This chaotic spiral of conflict and crisis led also to altered perceptions around how Romans viewed their institutions. It forced Roman military institutions to restructure and reorganize. The army was able to regain its full strength under the rule of Diocletian and Constantine, but in an altered fashion. However, the military, which was a large economic driving force that provided stability to the Roman economy, was unstable for much of the third century and was unable to maintain its deeply crucial role in the Roman economy and their obligation to protect Roman citizens and territories. During the Third-Century Crisis, 236-284 CE, many emperors attempted to take control and stabilize the empire.[19] Throughout this rapid and dramatic deterioration in the cohesion of the Empire, Christianity demonstrated remarkable growth both in reach and influence. Yet, there are few records of widespread missionary work

[19] This can be seen in, for example, Aurelius Victor, *Liber De Caesaribus*, 27-30.

throughout the empire. Multiple persecutions during the first and second centuries, moreover, led existing churches, in some regions, to bar outsiders from church gatherings, permitting only baptized individuals with letters of recommendation.[20]

This thesis has two central goals: to identify this devastating plague and to examine how it operated as a catalyst within this wider context of upheaval. The conclusions arrived at will then be used to offer another method to help explain the increase in the presence of Christianity in the Roman Empire throughout the third century. The focus will be placed on how the Plague of Cyprian that began in the year 249 CE fueled the rapid expansion of Christianity. While the Plague of Cyprian was certainly not the only factor that influenced the aggressive expansion of the Early Church, it is often overlooked or merely treated as a footnote in the larger story.[21] Disease and epidemics have a profound effect on societies and people, and my argument aims to demonstrate that disease should be seen as a catalyst for change and upheaval, not as a bump in the road or a diversion from the narrative of history.

When discussing the rise of Christianity in the Roman Empire, historians often regard the Cyprianic Plague as an isolated event, deserving of a reference but not possessing the necessary impact to be included among the primary factors.[22] This assertion, in large part, goes unchallenged. Pestilence and disease were a common part of life in the ancient world, especially in urban and trade centers. Because of the prevalence of communicable disease, it is simple and easy to assume that, with few exceptions, disease did not occupy the same capacity to catalyze change as it does in the modern world, or rather, that this capacity acted as a constant, and thus

[20] Anne Marie Luijendijk, *Greetings in the Lord: Early Christians and the Oxyrhynchus Papyri,* HTS 60 (Cambridge, MA: Harvard University Press, 2008), chapter 4. via. Alan Kreider, *The Patient Ferment of the Early Church* (Grand Rapids: Baker Academics2016), 11.
[21] Kreider, *The Patient Ferment,* 1-15. Offers an excellent example of the short mention of the plague in context but presents nothing other than a mention.
[22] Kreider, *The Patient Ferment of the Early Church*, 13.

was never a novel catalyst. However, the appearance of plagues affects more than the individuals who succumbed to the illness. They have profound effects on how societies operate, on political stability, and on religious identity. These effects often must be inferred as disease operates as an instigating factor, removed from our basic concept of cause and effect. This thesis integrates a wide variety of disciplines in order to give a much larger and more complex picture of the rise of Christianity, which seeks to illustrate a holistic view of how disease contributed to this.

In 1974, William McNeill published his landmark work, *Plagues and Peoples.* This work attempted to criticize previous tellings of history by demonstrating the profound social and historical impact of disease. McNeill's work challenged the preexisting concept of how disease operated in society, and how it influenced history. The role of infectious diseases in history has often been overlooked and events attributed to other historical causes. McNeill took care to explain how settlement patterns affected disease pools and vice versa. This innovative approach allowed for a broad view of how disease affected societal change. For example, McNeill illustrates how disease moved quickly even in antiquity, by highlighting trade connections between Rome and the Indian subcontinent, and the trades from India to China. This allowed for a new perspective on how diseases moved in a globally connected world. It also allowed historians to draw connections between floods in China and India and subsequent disease outbreaks in the Mediterranean. [23] McNeill's approach highlighted how disease pools affected society in ways that previously had not been considered. This line of questioning is the guiding force behind how this thesis will approach the Cyprianic Plague's arrival into Roman Africa and its role in the explosive growth of Christianity.

[23] William H. McNeil, *Plagues and Peoples* (New York: Bantam Doubleday Dell Publishing Group, 1977), 127-130.

The first approach to understanding the disease that afflicted Rome in the third century is to examine the most detailed sources available. *De mortalitate* (*On Mortality)* is one the seminal treatises of Cyprian, the Bishop of Carthage. It details a plague that gripped the Roman Empire during his lifetime and records, in detail, how the plague affected its victims. It also provides insight and guidance for the congregation on how to deal with deaths occurring around them. *De mortalitate,* provides instructions for a grieving congregation trying to understand the loss that they are suffering, but it is also a political and, in a certain sense, a medical document. In order to understand how to interpret this work it is necessary to understand how Cyprian's work interacts with the religious, political, and medical environment surrounding him. The Christianity of his time was increasingly fraught with division and enmity. The persecution by the Roman authorities, while not always violent, destabilized the Christian community. Clerical and liturgical issues among the clergy were difficult to contend with, and, as a key figure in these debates, they strongly inform his writings. Because of this, the first analysis that must be conducted is that relating to the religious aspects of the work. A religion that relied largely on belief, doctrine, and spirituality was novel to many Romans during the period of expansion in the Early Church.[24] The *De mortalitate*, as well as other treatises by Cyprian, represents a wider body of work that illuminates the early Christian Church's views on spirituality and the afterlife. This importance merits an in-depth examination of how Cyprian's writing helped form the doctrine for the Early Church and the degree to which they formed a cultural identity and encouraged conversion. This will be done by examining how Cyprian deals with death in his community and how he uses those deaths to create a narrative that is unifying and hopeful.

[24] Henry, Chadwick. *The Early Church: The Story of Emergent Christianity from the Apostolic Age to the Dividing of the ways Between the Greek East and the Latin West, revised edition (*London: Penguin Publishing, 1967) 54-56.

Cyprian's sermons, or treaties as they are often referred, represent a unique form of late classical writings. Cyprian is writing at a period of transition within the church, and as a result combines the early sermon form, which focused primarily on teaching the scripture to those who already considered themselves Christians, and the post-Constantine form that centers around "scriptural commentary and moral exhortation."[25] Cyprian also embraced a newer literary style incorporating a great deal of poetic liberties within the languages that he uses. While entertaining to read, this presents difficulties in attempting to diagnose actual disease from his *De mortalitate*. However, using the descriptions of the disease as described by Cyprian, I will discern the symptoms that Cyprian is attempting to record. These symptoms will be used to deliver a differential diagnosis. This differential diagnosis will be a theoretical examination and determination of the most likely disease based on the symptoms present. This diagnosis will be discerned through an exploration of symptomatology, a process that validates or invalidates particular diseases based on a careful study of the unique complex of symptoms exhibited by patients. This process will be informed by scientific data on clinical symptoms which are known to be common culprits of historical disease. From this pool of diseases, I will determine the mostly likely disease that caused the lethal outbreak.

There remains, however, a further complexity that must be clarified. There are historians that contend that there are extensive limitations as regards what symptoms can actually be determined within historical medical descriptions. When addressing the presence of stated symptoms in ancient sources, Littman states clearly (in reference to the Antonine Plague and Galen's works), "one cannot argue out of hand that a sign or symptom was not present, simply because Galen does not describe it, unless that symptom would be an integral part of the specific

[25] Jaclyn Maxwell, "Sermons," in *A Companion to Late Antique Literature,* ed. by Scott McGill and Edward J. Watts (New York: Wiley, 2018), 344-346.

item Galen is describing."[26] Galen is considered the best physician of the classical period by many who study the history of medicine. Littman is arguing that it is not possible to state that symptoms absent from a given symptom complex were not present. He does add, somewhat contradictorily, that disease can only be ruled out if the diseases' symptom complex lacks essential distinguishing characteristics, like black buboes in the bubonic plague. This model for evaluating ancient texts, while certainly safe, is overly and unnecessarily cautious, and it restricts the application and utilization of historical texts when delivering a differential diagnosis. For this reason, I will be using a different theoretical framework. The differential diagnosis will rely heavily on the descriptions as recorded by Cyprian, and only as recorded. This is because, at no point, does Cyprian offer a reason to doubt his observations. His accounts are given in a sermon addressed to the exact same congregation that suffered from, and survived, this disease. The omission or addition of symptoms would likely jar to such an audience, who might well have been expected to object to such inaccuracy about their own recent, traumatic, experience. Additionally, other historical sources that recount the events of the epidemic will be considered as well. While no other sources offer a report of the symptoms, they do articulate the impact that the disease had. This will provide needed context for understanding the degree of devastation that the epidemic inflicted on the Roman Empire.

Further, in order to fully address this disease, it will also be necessary to understand its origin. Most of the diseases considered as possible candidates for the Cyprianic Plague originate in animal populations and reside in geographic regions foreign to known outbreak locations. Due to this fact, it is essential to delineate the process of zoonosis, both in general and how it applies to specific pathogenic cases. Zoonosis, or the transmission of pathogenic agents from animals to

[26] Robert J Littman, *Galen and the Antonine Plague,* 246.

humans, can have a devastating impact on any society and is a critical factor in understanding how disease outbreaks occur. The degree of novelty, or newness, of a disease which succeeds in jumping from an animal population can determine the seriousness of the disease and the dimension of its outbreak in humans. Diseases that pass from animals to humans do not rely on existing human endemic disease pools and can more easily move across vast distances carried in animal stowaways or in humans either asymptomatically or as unidentified, uncommon illnesses. A strong understanding of zoonosis is central to narrowing and eliminating possible disease options. While diseases are differentiated and identified through their signs and symptoms, zoonotic analysis is a technique for establishing the potential presence and prevalence of disease in a particular geographic location, based on known indigenous animal populations. Zoonosis is critical to isolating which pathogens are possible plague candidates because if a disease is determined to be restricted to a specific geographical region, the only way it could appear in a remote territory is if it was carried there.

Zoonosis and specific environmental ecologies also mandate evaluation of supplementary details. Throughout the existence of the Roman Empire, the movement of people and goods into and out of distant regions was regular, sustained and relatively easy along the major trade routes, both overland and seaborne, that connected the Mediterranean with Africa, Asia, and northern Europe. These were well-established, routine, and wealthy trade routes.[27] These patterns of well-established trade present excellent paths for non-native diseases to follow with unsuspecting traders and their human cargo as hosts. Exploring how trade routes supplied the Roman provinces, in terms of the quantity and type of goods, will inform the discussion on which diseases could have been mobilized and dispersed out of the region. Crucial to this discussion is

[27] Ando, *Imperial Rome 193-284*, 15.

the Roman slave trade and how the trade adversely impacted the Empire. This evidence will be used to narrow the possible diseases that are examined as possible culprits for the Cyprianic Plague.

The purpose of identifying the disease that caused the Cyprianic Plague and exploring its wider historical context is to gain insight into its psychological, humanitarian, and religious impact on Roman North Africa as well as the wider Roman Empire as a whole, and the implications of the conditions that caused it. During the third century, Christianity experienced such remarkable growth that it exploded from a single mystery cult among many to an officially recognized, and imperially endorsed, religion in 313 and then the state religion in 380. The plague that took place in the middle of the third century contributed to this dramatic growth. While many have sought to explain this expansion as the work of charismatic preachers, notable martyrs, and even a general inferred supremacy of the Christian doctrine and the inherent value and holiness of the church texts, this thesis will take a different approach. This disease triggered persecutions against the Christian community in the Roman Empire, and the Cyprianic Plague swept away countless more members. The Cyprianic Plague helped form the identity of the Early Church, in very real ways, through death. This thesis will look at how Christian clergy, specifically Cyprian**,** used the ongoing tragedy of the third century to create an institutionalized hero system. These hero systems created a fertile opportunity for Christians to transcend death. This hero system provided a foundation for the Christian community and acted as unifying force that also attracted converts who sought meaning for their suffering. By analyzing Cyprian's decisions during the plague and critiquing them through the hero system framework created by

Ernest Becker in *The Denial of Death*, it is possible to increase our understanding regarding the role that the Cyprianic Plague played in the wider movement towards Christianity.[28]

[28] Ernst Becker, *The Denial of Death* (New York: Free Press, 1973).

Review of the Literature

At the beginning of the third century, Christianity was one of a number of prosperous and flourishing mystery cults. Cults like Christianity and Mithraism became prominent religious groups in the third century as Romans began looking elsewhere for religious and spiritual guidance. The rapid growth of these cults was fueled by many factors including economic depression, political infighting, and civil war. This period of growth for Christianity brought many challenges within the Christian community. The political struggles for recognition of their faith by Roman authorities as separate from Judaism and the imperial religions were, by the time of Cyprian, unacknowledged and unaddressed. This situation resulted in additional persecutions that would occur after the end of the Decian Persecution. After decades of successive persecutions and steady governmental oppression, devastating rifts among distinguished members of the clergy added to the troubles that the Early Church had to face. The work of Cyprian is embedded in the beginnings of these struggles.[29] The early machination of the divide can be seen in his works as the disagreements within the clergy began to take shape. The politics and religious tensions of the time permeate his writings as he tried to unify an increasingly and bitterly divided congregation. These political and religious strains of the age are not the only contextual issues that must be considered when exploring his treatises in light of the Cyprianic Plague. Medicine and ancient medical concepts are woven through his discussion of the disease. An assessment of Cyprian's academic

[29] The impetus of the Donatist controversy that would take place in the fourth century had its seeds in the schism of the 250s, culminating in that between Cyprian and Novatian. This controversy split the Church in North Africa deeply, and Cyprian had, at one point, two rival bishops of Carthage. After initially embracing a rigorist stance, Cyprian ultimately argued for the readmittance of those who had given into the pressure of the Roman authorities during the Decian Persecution. Novatian argued that those individuals were not able to be forgiven and would corrupt the eucharist. For more see, David Wilhite, *Ancient African Christianity* (New York: Routledge, 2017), 144-145.

background and disciplinary knowledge are critical to understanding the language through which he discusses the disease and its devastating impacts.

The age of Cyprian saw great upheaval and uncertainty, not just for the authority of the Roman state, with its deepening economic troubles, and the wider Empire, but within the Church itself. For decades after the persecutions under Emperor Septimius Severus in the 210s CE, Christians lived in relative peace within the Roman system. However, this steady calm was upended when Emperor Decius demanded that all Romans (with the exception of Jews) make sacrifices to the Imperial Cult.[30] These offerings were important to the Roman state as the sacrifices demonstrated loyalty to Rome and its leaders. Christians could not offer sacrifices as the act conflicted with their religious teachings. This situation divided North African Christians into those who followed Roman law to preserve their safety and those who firmly adhered to Christian teachings, planting the seeds of a schism within the North African church, a split that would ultimately lead to a complete separation of the two groups at the end of Diocletian's Great Persecution. The Donatist hardliners believed that those who had lapsed, individuals that apostatized the faith or had committed sin by giving a sacrifice and others who had handed over the sacred texts to the authorities (*traditores*) out of fear, should not be allowed to re-enter the faith, or, at least, be re-baptized. The Donatists believed that their beliefs and actions were crucial to honor the martyrs that had died in the persecutions and that readily allowing those who had given into fear to return to the faith without penance would be an insult to the sacrifice of those who had been steady to the faith. In these hardline stances, the Donatists followed after their third-century

[30] Brown, *The Rise of Western Christendom,* 54-69.

antecedents the Novationists, who were the opponents of Cyprian, but also, in their version of events, Cyprian himself.

This controversy affected the Christian community in Roman North Africa for centuries, with the divide between the Donatist and the reconciliationists, Caecilianists as they would later be known, who sought to allow the lapsed and *traditores* to return to Christian life, only growing deeper. Cyprian, as the Bishop of Carthage, found himself in the center of the beginning of this religious crisis. This experience shaped how he approached his writings and his desperate attempts to bring members together in this time of hardship: the construction of a unified Church was central to his efforts. Cyprian's writings during this period predate the major conflict that would occur several decades later; however, he as a figure in the church, is centrally claimed by both the Donatists and Caecilianists, despite his opposition to Novationism.[31] Cyprian is considered by both groups to be a foundational figure for their respective religious beliefs. This fact demonstrates how structural he and his treatises were to the North African church and, given this context, it is important to evaluate how the religious persecution, and the subsequent growing religious divide, shaped his works.[32]

Modern Scholarship

The scope of this thesis will encompass a great deal of scientific, historic, and literary evidence in order to assess the cause and impact of the Cyprianic Plague. In order to properly address these subjects, it is necessary to adequately cover the existing

[31] The Donatist claims to Cyprian center on his initially rigorist approach to the controversy.
[32] *Donatist Martyr Stories: the Church in Conflict in Roman North Africa.* Translated, Introduction and notes by Maureen A .Tilley (Liverpool: Liverpool University Press, 1996), 1-10.

literature on each subject as it pertains to the Plague of Cyprian. For the purposes of this inquiry, modern scholarship on the works of Cyprian can be divided into two main types. The first body of scholarship centers around disease itself in the ancient world, and, specifically, the cause and role of the Cyprianic Plague in the Roman Empire. Many scholars and historians argue that the plague destroyed Rome's ability to recover, while only a few address the consequences it had on the early Church. The second are studies of the religious, liturgical, and historiographic impact of Cyprian's works, and represent the bulk of the scholarship on Cyprian. This body of research is imperative to understanding how Cyprian chooses to portray events and considers religious concepts. Both bodies of scholarship are important to understanding Cyprian's place in the formative years of the institution that was the early Christian Church.

Disease and illness in the ancient world have often been relegated as tangential subjects of investigation when compared to the broader history of the ancient world and early Christianity. The Cyprianic Plague is frequently mentioned only as a footnote or an odd occurrence when discussing Christianity in the third century, or as a relatively minor event within the Third-Century Crisis. Nevertheless, several notable historians have begun more critical examinations of this plague and its effects. One of the first was the founder of the field of historical epidemiology and medical history, William McNeill. McNeill's book, *Plagues and Peoples* is a seminal work in the field of historical medicine.[33] He was the first to study ancient disease pools, locations such as settlements and villages where the environment allowed a great number of people to cohabitate and spread disease, and thus, fuel outbreaks. He also concentrates a great deal of his work on

[33] William McNeill, *Plagues and Peoples* (Princeton: Princeton University Press, 1977)

how these diseases moved throughout the historical world and how they shaped it.[34] Significantly, his research also explored how identified disease outbreaks impacted the societies they afflicted. McNeill's discussion of the Cyprianic Plague is somewhat limited compared to his investigations of other more notable outbreaks, like the Black Death and the Justinianic Plague. Nevertheless, McNeill does address the critical role that the Cyprianic Plague played in the growth of Christianity stating, "Christianity was, therefore, as system of thought and feeling thoroughly adapted to a time of troubles in which hardship, disease, and violent death commonly prevailed."[35] This perspective remains one of the most profound and underrepresented concepts within the analysis of the Early Church. McNeill also inspired the work of other ground-breaking historians who investigated the Cyprianic Plague with an inquisitive and expansive view, like Kyle Harper.

The historian Kyle Harper has written the most extensively on the Plague of Cyprian. Harper and his work, however, have courted controversy: his scholarship is at times unreliable and hyperbolical, and his professional actions have cast doubt on his scholarly objectivity, specifically regarding racial bias.[36] Despite these issues, his work on the third century and the Cyprianic Plague represents one of the few direct treatments

[34] McNeill, *Plagues and People,* 109. McNeill offers a wonderful examination of how disease impacted the Indian sub-continent, "India's Political and military weakness made invasion and conquest relatively easy for a long succession of foreigners who came from the Northwest, where the protective mountain barrier was most easily penetrable. Indian diseases were, in fact, a more reliable protection against such intruders than organized human defenses, since troops from beyond the Himalayas were liable to very heavy die-off when they met the microparasite of the Northern Indian plains for the first time." This type of commentary was revolutionary and provided a new way of addressing how disease and outbreak affect historical events.
[35] McNeill, *Plagues and Peoples,* 136
[36] With regards Harper's scholarship - John Haldon, et al., "Plagues, Climate Change, and the End of an Empire. A Response to Kyle Harper's *The Fate of Rome* (2): Plagues and a Crisis of Empire." *History Compass,* 16.12 (2018). - With regards to his professional life - Colleen Flaherty, "Demanding a Provost's Resignation." In *Inside Higher Education,* February 28, 2020.

of the origins and impact of the outbreak, and so must be factored into the debate, if treated always with considerable caution.[37] *The Fate of Rome* presents a deep evaluation of how the Roman Empire, as an entity, failed. As part of this analysis, he portrays the Plague of Cyprian in a novel and innovative way which allows for further discussion on the identity of the disease as Ebola. He continues, like McNeill's work, to focus on how the disease affected and contributed to the fall of the Roman Empire. Kyle Harper's work is significant because it provides modern material on a plague that is chronically understudied. Additionally, Harper furnishes much needed research into how Christianity was affected by the ferocity of the outbreak. His work, however, lacks the depth and precision of the scholarship carried out by Lee Mordecai and Merle Isenberg, whose efforts in examining the later Justinianic Plague have moved the field of ancient disease studies forward considerably.[38] Nevertheless, Harper's work did inspire additional inquiry, like the body of research by Amber Kearns.

Kearns uses the work of Cyprian in an attempt to deliver a differential diagnosis. The *De moralitate* is the main focus of her analysis. She also includes works from other authors that record the aftermath of the epidemic and archaeological data on plague pits in Egypt that add strength to her argument. She concurs with Harper's conclusion that the disease responsible for the outbreak was, in fact, Ebola. Her research provides an excellent example of the best methods for differential diagnosis of plagues with limited evidence. However, her methodology focuses primarily on the literature and archaeology present in the region. She restricts her analysis of and engagement with modern medical

[37] Kyle Harper, *The Fate of Rome: Climate, Disease and the End of an Empire* (Princeton: Princeton University Press, (2017).
[38] Lee Mordechai, and Merle Eisenberg, "Rejecting Catastrophe: The Case of the Justinianic Plague." *Past & Present*, 244.1 (2019): 3–50.

science, preferring instead to center her arguments solely on the symptomatology described by Cyprian. Kearns, like Harper, concentrates her discussion on the pestilence's effect on the wider Empire. Kearns' dissertation, "A Plague in a Crisis," is a critically important work because it expands the limited scholarship focused on the Plague of Cyprian. Many of the methods applied in this thesis are derived from those Kearns herself established for her own differential diagnosis of the Cyprianic Plague. While I have altered her methodological approach to fit my specific research focus, it is her methodological contributions that make my analyses possible. Not only does Kearns' work contribute to my own research, it stands as a significant contribution to the study of historical medicine, in general, and the Cyprianic Plague, in particular.

For Patristics scholars, Cyprian and his works serve, in a way, as the bedrock of the last phase of the Early Church in Roman North Africa. David Wilhite's *Ancient African Christianity* portrays Cyprian as one of the key figures in the Early Church, "a figure who gives us more information about his context, beliefs, and practices than any of his predecessors."[39] Wilhite takes a deep dive into Cyprian's works which provides a substantive and expansive exploration of Cyprian and delivers a detailed view into Cyprian's role in the Early Church, including the events, controversies, and theological elements with which he was engaged. Wilhite's analyses also focus on the wider political situations that had begun to develop during his tenure as the Bishop of Carthage. As the persecutions wore on and took their toll on the Christian community, Cyprian's administrative and religious decisions sought to heal deep divides within the community.

[39] Wilhite, *Ancient African Christianity*, 141.

Similar to the writings of Wilhite, Burns and Jensen's massive work *Christianity in Roman Africa* supplies a wealth of information regarding the structure and customs of the North African church. Their work catalogues all the sermons, rites, beliefs, philosophy, and practices that were left behind by Cyprian. They also compare, in minute detail, the operation and structure of the church under three different influential bishops: Tertullian, Cyprian, and Augustine of Hippo. This three-way comparison between the bishops provides a novel and innovative way of viewing events that took place under their respective tenures. Cyprian's works are portrayed as part of the end of the apologetic period and the transition to a stronger, well-established bureaucracy within the church structure. It also offers a deeper understanding of the practices that solidified the church into a coherent organization. Burns and Jensen's text supplies a crucial perspective on how the Early Church operated prior to Christianity's adoption in 313 CE by Constantine. Their perspective is essential to fully appreciating Cyprian's works. Further, Burns' other work, *Cyprian the Bishop*, contributes tremendous insight into Cyprian's tenure as Bishop of Carthage.[40]

Edwina Murphy's "Death, Decay and Delight in Cyprian of Carthage" explores the themes and disposition present in Cyprian's *De moralitate*.[41] Her conclusion conflicts with pre-existing notions that the *De moralitate* is a somber and stoic evaluation of his current world. In opposition, she contends that the apocalyptic impression that Cyprian left in the world is not, "falling away from a once-golden age" but instead that "Cyprian eagerly awaits the inauguration of a new age, contrasting Christian vibrancy with the

[40] Patout Burns, *Cyprian the Bishop* (New York: Routledge, 2002).
[41] Edwina Murphy, "Death, Decay and Delight in Cyprian of Carthage." In *Scrinium*, 15 (2019); 79-88.

deterioration of the world."[42] This fresh approach highlights a relatively new interpretation of apocalyptic imagery in early Christianity. This more hopeful and optimistic outlook colors the *De moralitate* and the persecutions in a new light. This reading of his texts demonstrates a clear belief by Cyprian that, while there were pains and difficulties in the world, they were leading to a better future and a greater acceptance of Christianity. In more recent years, this perspective has become more accepted and has allowed for a richer discussion surrounding Cyprian's work to take place. Murphy's work is critical to a full understanding of Cyprian's motives and thoughts while writing the *De moralitate.*

Frend's landmark text, *The Rise of Christianity,* presents a great deal of historical context. Frend concentrated the majority of the book on recording the growth and expansion of Christianity. The Plague of Cyprian is mentioned but does not prominently feature. Though the plague itself is minimized, Cyprian's contributions to Christianity are covered extensively. Cyprian's liturgical, religious, and administrative practices and contributions are prominent in Frend's history of Christianity. Frend's work highlights the role and legacies of Cyprian's work within the church, making his survey of Christian history exceedingly influential in positioning Cyprian within the wider religious context. *The Rise of Christianity* also offers a vast wealth of material on outlining the historical events in which the Early Church was involved. Cyprian is stationed as an influential official that had an enduring impact on the church. The analyses conducted by Frend create a context for understanding how truly impactful Cyprian was to the church as a larger entity.

[42] Murphy, "Death, Decay and Delight in Cyprian of Carthage," 80.

With the devastation of the COVID-19 pandemic, interest in historical epidemics and their impacts will surely garner more attention from scholars. This thesis takes an innovative approach to the study of the Plague of Cyprian, in that it will address the history of the disease in two different ways. First, a differential diagnosis, similar to those delivered by Kearns and Harper, will be conducted. This analysis will address Cyprian's descriptions of the disease, its impact on the human body, and contemporary sources that recount the destruction and ensuing carnage the disease created, while also considering animal vectors and human trade routes that could have brought the disease to Roman Egypt and North Africa. This approach, while not completely new, builds on previous research conducted by Kearns and Harper regarding the identity of the ancient pandemic, particularly by incorporating modern medical research. Second, this thesis will investigate the plague's direct impact on Christian congregations. While likewise not a new concept, this thesis aims to take a fresh and novel approach within the multitude of existing scholarly work, exploring the plague within the context of Christianity's rapid growth during the third century. Specifically, it will consider the ways in which the plague impacted the Christian community from angles such as the severity of persecutions and, particularly, the hero systems it indirectly created. The combination of these two approaches will produce an in-depth picture of how severe diseases can bring sweeping changes to religious sects as well as the wider society. This thesis will also detail a new perspective on the effects that the Cyprianic Plague had on the Early Church.

Symptomatology

Diagnostic medicine is, even today, a challenging and complex discipline. It is not an exact science but a science-based art, relying heavily on intuition. While modern doctors have access to sophisticated tests and advanced diagnostic machines, the diagnosis of diseases, even with the assistance of advanced technology, can be plagued with uncertainty. Symptomatology is the study of symptoms reported by an individual, resulting from a chronic or acute medical condition or pathogenic infection.[43] Many symptoms, such as chills, fever, fatigue, and sweating, commonly occur with illness and infection, making them nonspecific and associated with a wide variety of conditions. Their presence, alone, is not indicative of any particular pathogen or disease. As a result, when delivering a differential diagnosis, the presence of specific and unique symptoms becomes critical to rendering a correct diagnosis. For example, the observation of buboes or scabs is crucial in order to differentiate between the plague and smallpox. For the purposes of analyzing the Cyprianic Plague, it is fortunate that Cyprian's historical records document the presence of disease symptoms in detail. These explicit descriptions are vital, as they provide essential information allowing for an accurate differential diagnosis.

Differential diagnosis is a process that physicians use to determine the cause of illness. The process focuses on the symptoms as felt by a patient, and on the signs as seen by a physician. The differentiation between signs and symptoms, put simply, is that symptoms are a subjective expression of a patient's experience of the effects of a disease, whereas signs are

[43] There are two similar concepts that are often confused and used interchangeably. *Symptomatology,* is the symptom complex or the aggregate of the symptoms that an infected individual experiences. *Symptomology*, is the study of symptoms and their causes, which can be infections, cancers, or other disease and conditions.

objective observations made by a physician regarding those patient experiences.[44] These symptoms and descriptions are the most important factor in evaluating what a disease might be; however, when analyzing historical disease outbreaks, it is not enough to evaluate the symptoms of a disease alone. The historical and environmental contexts are also critical to understanding the source and natural history of that disease. The presence and prevalence of diseases change, as people and animals move and relocate. For this reason, while conducting this differential diagnosis, I will also conduct a survey of Roman trade routes and connections that the disease could have followed bringing the people affected by the Cyprianic Plague into contact with distant peoples and pathogens. This additional analysis will provide greater context to the examination of the disease itself.

[44] See, Lester King, "Signs and Symptoms" *The Journal of American Medical Association*, 206.5, (1968): 1063-1065.

Symptoms of the Cyprianic Plague

Cyprian's descriptions of the plague he witnessed, and their significance, are often enigmatic and difficult to discern. Because Cyprian was not a trained physician, but instead taught rhetoric before entering the clergy, the vocabulary he uses is poetically ambiguous. For example, he describes one symptom as, "*oculi ui sanguinis inardescunt"* ("the eyes begin to glow with the violent force of blood"). The verb *inardeo* used by Cyprian is rather rare. The base meaning is to "to take fire" or "to become glowing" and is typically restricted to poetry.[45] While the form *inardeo* is not typically found in reference to eyes, its base from *ardeo*, meaning "to be on fire," is used frequently in this connection. For example, in Vergil's *Georgics* he writes, "*ardentes oculos"* (gleaming eyes).[46] This type of literary and poetry-adjacent Latin is used throughout the entirety of Cyprian's works (including the *De mortalitate*) and this usage of *inardeo* is broadly representative of Cyprian's style as a whole. As such, this usage of "inardeo" positions Cyprian's Latin within the more ornate form of literary Latin fashionable during late antiquity, rather than as language designed to be medically relevant. While Cyprian's text is thus not a medically descriptive exploration of symptoms and signs, it offers a visually graphic depiction, and operates within a somewhat standardized, and generally well-understood, intellectual framework. As such, with important caveats for ambiguity, the text remains a useful witness to the events it describes. This type of Latin is used throughout the entirety of Cyprian's *De mortalitate*.

For example, this particular description of the eyes by Cyprian, while vivid, leaves little that can be understood as a precise symptom. This poetic description of blood in the eyes could

[45] Vergil, *Aeneid* 8.62, Horace, *Epodes* 3.18, and Statius, *Thebaid*, 3.539 via Glare, P. G. W. *Oxford Latin Dictionary* (Oxford: Clarendon Press, 1968).
[46] Charlton T. Lewis and Charles Short. *Georgics* (Oxford: Clarendon Press, 1879) IV.451.

indicate several conditions, including conjunctivitis, a common inflammation that is often colloquially referred to as bloodshot eyes or pink eye. Additionally, his description seems to suggest that the redness and inflammation are restricted to the sclera (whites of the eyes). However, this account could also refer to hyphema, a condition caused by trauma or disease where blood accumulates between the cornea and iris, eventually filling the space and blinding its victim. While conjunctivitis is a nonspecific symptom, as it has many differing causes and is benign (it does not have any lasting negative effects on its own), hyphema, in contrast, has few causes and can lead to glaucoma and irreversible damage to the optic nerve causing permanent blindness. The term *inardeo* suggests that the eyes are starting to become red, likely with blood, but it is unclear if Cyprian is trying to state that the eyes are filling with blood or merely "glowing" in irritation. This example demonstrates the difficulty of using non-medical texts for medical diagnosis, particularly when dealing with idiomatic, artistically-motivated language like Cyprian's.

Nonetheless, the plague described by Cyprian in his *De mortalitate* has many unique qualities. While it is unlikely that any single individual who suffered from this pestilence would present with all the same symptoms, it is probable that Cyprian recorded the majority of symptoms experienced by those afflicted. However, Cyprian's text does present the disease as causing all of the described symptoms across all those collectively afflicted. This rich source of information contributes to the formulation of a possible differential diagnosis, despite carrying several challenges. While this source does not distinguish between normal or common signs and rare or possibly singular cases, or offer any real detail on the concurrence of symptoms, the broad range of reported symptoms may be used to narrow the pathogenic candidates which could be responsible for the presenting illness. Cyprian's description reads:

Hoc quod nunc corporis uires solutus in fluxum uenter euiscerat, quod in faucium uulnera conceptus medullitus ignis exaestuat, quod adsiduo uomitu intestina quatiuntur, quod oculi ui sanguinis inardescunt, quod quorundam uel pedes uel aliquae membrorum partes contagio morbidae putredimis amputantur, quod per iacturas et damna corporum prorumpente languor uel debilitatur incessus uel auditus obstruitur uel caecatur aspectus, ad documentum proficit fidei.[47]

*"*Now, then, the bowels, loosened into flux, disembowel the strength of the body, then a fire [fever], catching in the marrow, boils forth among wounds in the throat, then the intestines are shaken by constant vomiting, then the eyes begin to glow with the violent force of blood, then for certain persons either the feet or any other portions of the limbs are cut off by the touch of the diseased rottenness, then, through losses and damages of the bodies, with faintness rushing, either walking is impaired or hearing is blocked or the sight is blinded. This makes for a lesson of faith."

In this excerpt, there are multiple symptoms which are clearly depicted: diarrhea (*corporis uires solutus in fluxum uenter euiscerat)*, then high fever and sores/ulcers, and swelling in the mouth and throat *(quod in faucium uulnera conceptus medullitus ignis exaestuat)*, vomiting (*quod adsiduo uomitu intestina quatiuntur)*, hyphema or conjunctivitis, bleeding in the iris and cornea, *(quod oculi ui sanguinis inardescunt)*, putrefaction of the skin and the loss of limbs (*quod quorundam uel pedes uel aliquae membrorum partes contagio morbidae putredimis*

[47] Cyprian of Carthage, *De Mortalitate,* CCSL. 14.

amputantur), severe fatigue (*quod per iacturas et damna corporum prorumpente languor)* and loss of hearing and sight and the inability to walk (*uel debilitatur incessus uel auditus obstruitur uel caecatur aspecturs)*. Limb loss to the disease by amputation can also be inferred through the statement made referring to 'cutting off' the putrefied skin along with the inability to walk. However, it is possible that amputation and loss of ambulatory ability are actually two distinct issues, as they are separated within the Latin text itself. A more precise understanding of their relationship is difficult to discern, yet full knowledge of the victims' symptom profile is critical to the correct identification of the causative pathogenic agent.

The symptom complex described by Cyprian is atypical, as these signs rarely present together in a single ill patient caused by any disease that modern medicine has currently documented. This fact makes differential diagnosis less challenging as the profile of symptoms are unique and the disease candidates are relatively small in number. Nevertheless, differential diagnosis is a complex process, in that many diseases have overlapping signs and symptoms, with several diseases presenting similarly to those listed above. Thus, multiple diseases could fit the profile of Cyprian's descriptions. However, the documentation of vomiting, conjunctivitis, and loss of vision and hearing presenting together is an interesting and unique symptom complex which could potentially point in the direction of a likely pathogenic, etiological source.

Another valuable clue to the cause of the disease described by Cyprian is the fact that it has a devastating impact on the human body. Given this feature and its rapid transmission in human populations, it is likely that the etiological source of the disease is pathogenic (caused by an infectious microorganism) and zoonotic (originating and developing outside the human body). Because most pathogenic organisms cannot survive without in-host replication, natural selection favors pathogen genotypes or variants that can reproduce and transmit without or before killing

their hosts. Zoonotic infections have not evolved long enough within a human population to be parasitic; that is, they have not developed to the point of effectively reproducing in humans without killing their host.[48] Thus, non-parasitic, disease-causing pathogenic organisms require an additional animal host where they emerge and often become parasitic before infecting humans, a process known as zoonosis.

Understanding Zoonosis

At its most fundamental, zoonosis is a process of microscopic organism growth and spread from within a non-human animal population to human hosts. This process results in infectious pathogens incubating and proliferating in animal populations before spreading to susceptible human populations. Microscopic organisms and protein structures, including viruses, bacteria, prions, fungi, and parasites, live in and on the bodies of all animals. Largely invisible to the eye, these organisms are everywhere, and can be nonpathogenic (non-disease causing) or pathogenic (disease-causing). While most microorganisms are nonpathogenic, infectious diseases are caused by pathogenic microscopic organisms that enter and attack the host body.[49] The process of zoonosis can result in both nonpathogenic, harmless microbes and infectious, pathogenic microorganisms which can cause damage and visible illness in humans.

Infectious organisms can differ widely in their effects on the body and in their ease of spread between hosts. The virulence of a pathogen refers to its ability to cause disease, or damage the structure and function of the body with identifiable signs and symptoms. In other words, virulence can be defined as the severity or harmfulness of a disease, including secondary conditions called complications that aggravate the primary disease symptoms and process. The

[48] For more see, Martin Shakespeare, *Zoonoses* (Chicago: Pharmaceutical Press, 2009).
[49] Shakespeare, *Zoonoses*, 1-3.

ability of a pathogen to be passed between and infect living human hosts is referred to as transmissibility.[50] Virulence and transmissibility determine the impact that a pathogen can have on a human population. Thus, pathogens that are more virulent and transmissible pose greater risk to human populations and often serve as the genesis of epidemics.

When pathogenic microorganisms do cause disease, based on their virulence and transmissibility, they can affect human hosts in both minor and major ways. Minor cold and seasonal influenza outbreaks are common, and represent the largest portion of infectious illness occurrence.[51] While often highly transmissible or contagious, spreading easily between people, the virulence (intensity of symptoms; harmfulness) and severity (seriousness or impact the disease has on the function of the body) of these common illnesses is often mild to moderate.[52] Thus, these everyday infections result in a relatively small number of severe illnesses when compared to more aggressive and less common diseases, like bubonic plague, Ebola, COVID-19 or SARS, all of which are dangerous and often fatal. In addition to the obvious bodily damage caused by these more virulent diseases, they are highly contagious and can also be difficult to contain and eradicate. These characteristics of uncommon but aggressive pathogens are, in part, the result of their origin in zoonosis.

Zoonosis is the process by which "diseases and infections […] are naturally transmitted between vertebrate animals and man."[53] Simply put, zoonotic diseases are those pathogenic agents that have evolved, often to the point of parasitic status in an animal host, and are then passed on to humans. These infectious pathogens are able to 'spill-over' or be transmitted

[50] David Shapiro-Ilana et al., "Definitions of Pathogenicity and Virulence in Invertebrate Pathology," *Journal of Invertebrate Pathology,* 88 (2005): 1–7.
[51] Samantha Jacobs, et al."Human Rhinoviruses," *Clinical Microbiology Review,* 26.1 (2013):135-62.
[52] Jacobs, et al."Human Rhinoviruses", 136.
[53] Bruno Chomel, "Zoonoses." in *Encyclopedia of Microbiology.* Edited by Moselio Schaechter (Cambridge, MA: Academic Press, 2009), 820–829.

between the animal population and humans. A spillover event occurs when infected animal populations and humans, such as their caretakers, are in close proximity and the pathogen 'jumps' from the animal and infects the human. When a zoonotic disease spills over into the human population, it often brings disastrous consequences, leaving hundreds or thousands dead before the outbreak can be contained. These outbreaks tend to be especially hazardous when the diseases themselves originate in animal reservoirs, like bats and pigs, and then make the jump to humans.[54] Pathogens that originate in waterfowl and chickens can be especially dangerous, particularly to the individuals who are the first infected from the spillover event.[55] Despite the immediate risk of the pathogen to the individuals directly impacted by the spill-over event, it is relatively rare for any of these diseases to become widespread and epidemics in human populations.[56] Further, most diseases that originate in animals and jump into humans are nonpathogenic, with less than 1% capable of causing illness.[57] However, diseases that do jump are often more deadly to human hosts than to ancestral animal hosts because the pathogen is novel to the human's immune system. Human immune systems are vulnerable because they have not yet encountered the disease and had the opportunity to acquire immunity. Immunity is gained either after an individual's immune system has come into contact with a disease, or through hereditary immunity, meaning that immunity is passed down from an ancestor who had contact with the same or a similar pathogen. Without any protection from the disease, the pathogenic

[54] For more on diseases that originate in pigs and bats see, M.F. Ducatez, R.G. Webster, and R.J. Webby. "Animal Influenza Epidemiology." In *Vaccine*, 26(4) 2008: D67–D69.
[55] Diseases like Bird Flu (H5N1) have a high fatality rate among those infected but because the disease is not easily passed between humans, outbreaks have been limited. For more on H5N1 see, Zu-Qun Wu, et al. "Comparative Epidemiology of Human Fatal Infections with Novel, High (H5N6 and H5N1) and Low (H7N9 and H9N2) Pathogenicity Avian Influenza A Viruses" in the *International Journal of Environmental Research and Public Health* 14(3), (2017):263.
[56] Colin Parrish, et al., "Cross-Species Virus Transmission and the Emergence of New Epidemic Diseases" in *Microbiology and Molecular Biology Reviews,* September, 72(3) (2008): 457-470.
[57] Cody Warren and Sara Sawyer, "Host Genetics Dictates Successful Viral Zoonosis" in *PLOS Biology 17(4), (2019).*

organism can reproduce unchallenged until the infected individual's immune system either learns to create the antibodies necessary for defense or the individual dies.[58]

Zoonotic diseases can therefore be extremely dangerous to humans both individually and globally. Unfortunately, the identification of emerging diseases is daunting and laborious, as there are many scientific and logistic challenges in monitoring large animal populations. This fact places any timely and effective medical response to an outbreak at a disadvantage. Even in modern times, disease outbreaks can spread unchecked long before being noticed. Without the advantage of modern technology, premodern societies were ignorant of disease outbreaks until they had already inflicted widespread and devastating consequences. Nearly 75%-80% of novel diseases that are discovered and identified in humans are the result of zoonotic infections. Fortunately, while zoonoses occur constantly and account for a large proportion of new diseases in humans, there are actually very few cases in which the infectious agent is pathogenic to humans.[59] Nevertheless, zoonoses are difficult to predict because their presence is determined by a large number of diverse factors, including those created by human activities. Zoonoses occurrence "result[s] from various anthropogenic, genetic, ecologic, socioeconomic, and climatic factors."[60] Thus, zoonotic diseases are even harder to detect prior to their jump to humans, even though this type of early detection is critical to identifying possible spill-over pathogens and beginning to evaluate their epidemic potential. For example, after the 2003 outbreak of Severe Acute Respiratory Syndrome (SARS), a large study was conducted of *coronaviruses* in bat

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[58] Joao T. Marques, and Richard W. Carthew, "A Call to Arms: Coevolution of Animal Viruses and Host Innate Immune Responses," in *Trends in Genetics* 23(7), (2007), 359-364.

[59] 75% - Wondwossen A. Gebreyes, et al. "The Global One Health Paradigm: Challenged and Opportunities for Tackling Infectious Diseases at the Human, Animal, and Environmental Interface in Low-Resource Settings." in *PLOS: Neglected Tropical Disease,* November (2014).

80% - Shakespeare, Zoonoses, 4.

[60] Wondwossen A. Gebreyes, et al. "The Global One Health Paradigm: Challenged and Opportunities for Tackling Infectious Diseases at the Human, Animal, and Environmental Interface in Low-Resource Settings," Abstract.

populations in Africa, Asia, and Europe. As a result of this study over 3,204 *coronaviruses* were discovered.[61] Despite the identification of thousands of these viruses, the subsequent outbreak of COVID-19, which began a worldwide pandemic, demonstrates that even if diseases are discovered and identified before their first recorded spillover, the containment of the disease is not always possible. These viral spill-over events are difficult to predict and subsequent mutations of the pathogens in human populations can make them more transmissible.[62]

Zoonotic diseases can also differ in the mechanism of their transfer or transmission. The form that transfer takes depends greatly on the nature of the pathogenic agent itself.[63] The methods of disease transmission can include aerosol inhalation, contact with bodily fluids, ingestion or secondary vectors.[64] Diseases which are airborne, meaning that they disperse through small droplets that hang in the air and are inhaled, are difficult to contain as they can spread rapidly among a large group of individuals and within urban centers.[65] Newcastle disease is one such virus. This virus is transmitted through airborne particles and has devastated large poultry farms. However, the virus is also capable of spilling over into human populations but does not cause severe symptoms, nor do humans readily spread it to other humans. Not only does Newcastle disease spread by droplets, it can also be transmitted by fomites.[66] Fomites are objects that have been touched or contaminated with disease-causing particles. Particles from these infection-carrying materials enter an individual's body when they make contact with a mucus

[61] Simon J. Anthony, et al., "Global Patterns in Coronavirus Diversity," *Virus Evolution* 3.1, (2017).
[62] Warren and Sawyer, "Host Genetics Dictates Successful Viral Zoonosis," *How do we identify the animal viruses best poised to replicate themselves in humans?.*
[63] For more see, Madeline Drexler, "How Infection Works," in *What You Need to Know About Infectious Disease* (Washington, DC: National Academies Press, 2010). https://www.ncbi.nlm.nih.gov/books/NBK209710/
[64] Shakespeare, *Zoonoses,* 8.
[65] Binish Ather, Taaha M. Mirza, and Peter F. Edemekong. "Airborne Precautions." in *StatPearls*, 2020.
[66] Vienna Brown, and Sarah Bevins. "A Review of Virulent Newcastle Disease Viruses in the United States and the Role of Wild Birds in Viral Persistence and Spread." in *Veterinary Research* 48(68).

membrane, like the eyes, ears, mouth or nose.[67] Any object can act as a fomite if it comes into contact with bodily fluids that carry a disease-causing pathogen. Cholera, for example, is spread by consuming water that has been contained by fecal waste harboring the Cholera bacteria. Contaminated water, as well as infected fish, shellfish and waterfowl, can act as a vector for the Cholera bacteria and, if ingested, can cause severe intestinal distress, diarrhea and dehydration .[68] Fomite disease transfer can be a huge risk to humans given that fact that cholera and other diarrheal diseases contracted through water contamination account for the majority of deaths for children under the age of five worldwide.[69] For obvious reasons, the safe handling of contaminated objects and animals is critically important to disease control.

Examples of Epidemic Zoonoses

Zoonoses remain an essential and dangerously unpredictable contributor to disease outbreaks, even in modern societies. Among the existing zoonotic diseases, viruses present the greatest hazard. In fact, about three novel zoonotic viruses are discovered each year that are infectious and pathogenic to humans. These viruses can mutate, changing their genetic code quickly and unpredictably, causing shifts in the transmissibility, infectiousness and symptoms of

[67]Gerardo U. Lopez, Charles P. Gerba, Akrum H. Tamimi, Masaaki Kitajima, Sheri L. Maxwell, and Joan B. Rose. "Transfer Efficiency of Bacteria and Viruses from Porous and Nonporous Fomites to Fingers under Different Relative Humidity Conditions." *Applied and Environmental Microbiol*ogy 79.18 (2013): 5728-5734.
[68] Salvador Almagro-Moreno, Ronald K. Taylor. "Environmental Reservoirs and Impact on Disease Transmission." in *Microbiology Spectrum* 1.2 (2013).
[69] Eric J Nelson, Jason B Harris, J Glenn Morris Jr, Stephen B Calderwood, Andrew Camilli, Eric J Nelson, Jason B Harris, J Glenn Morris Jr., "Cholera Transmission: The Host, Pathogen and Bacteriophage Dynamic," *Nature Reviews Microbiology* 7.1 (2009): 693-702.

the resulting disease.[70] Zoonotic diseases are also risky because individuals who are infected, or are carrying infected animals with them, can unknowingly bring pathogenic diseases with them as they travel.

The most infamous zoonotic viral disease is rabies. Unlike other viruses, rabies does not easily spread from animals to humans and faces an even greater challenge spreading from human to human; nevertheless, it still manages to infect as many as 60,000 people each year.[71] Furthermore, unlike most other diseases, the mortality rate is greater than 99% after the onset of symptoms appear. Without extremely aggressive treatments, like the Milwaukee protocol (representing nearly all the survivors), the virus, even with treatment, is near universally deadly.[72] The disease is also considered one of the oldest on record; its presence in dogs was first recorded on cuneiform law tables from Mesopotamia from 1950-1850 BCE.[73] The symptoms of rabies are caused by the pathogen *Lyssavirus*, with its name derived from the Latin *rabere,* meaning "to rage or rave", and the Greek *Lyssa*, meaning madness. It is spread through bites from infected animals, contact with mucous membranes, and, "less commonly, aerosol inhalation."[74] Human to human transmission events have only been recorded a few times through corneal transplants.[75] Rabies symptoms typically begin with headaches, fatigue, agitation, sleep disturbance and delirium. The process escalates through hypersalivation, severe throat spasms at

[70] Ronald Rosenberg, "Detecting the Emergence of Novel, Zoonotic Viruses Pathogenic to Humans." *Cellular and Molecular Life Science* 72 (2015): 1115–1125.
[71] Anita Mahadevan, et al., "Perspectives in Diagnosis and Treatment of Rabies Viral Encephalitis: Insights from Pathogenesis." *The Journal of the American Society for Experimental Neurotherapeutics* 13.3 (2016):477-492.
[72] Mohd Nadeem, and Prasan K. Panda, "Survival in Human Rabies but Left Against Medical Advice and Death Followed - Community Education is the Need of the Hour," *Journal of Family Medicine and Primary Care* 9.3 (2020): 1736-1740.
[73] Arnaud Taranto, "Four Thousand Years of Concepts Relating to Rabies in Animals and Humans, Its Prevention and Its Cure." in *Tropical Medicine and Infectious Disease* 2(2). Toronto, CA: MDPI Publishing, (2017): 5.
[74]Mahadevan, et al., "Perspectives in Diagnosis and Treatment of Rabies Viral Encephalitis: Insights from Pathogenesis," 478..
[75] Mahadevan, et al., "Perspectives in Diagnosis and Treatment of Rabies Viral Encephalitis: Insights from Pathogenesis," 477-492.

the sight or hearing of water (hydrophobia) and failure of the nervous system, including uncontrollable muscle contractions and spasms.[76] Rabies is an example of a disease that has passed from animals to humans on numerous occasions without causing massive human outbreaks. Diseases like rabies require a local, endemic animal outbreak, making them regionally specific and frequently confined. Nevertheless, despite the absence of large human epidemics of rabies, the disease remains feared and, without early, aggressive intervention, universally fatal.

As demonstrated by the case of rabies, the origins of diseases often constrain them to specific regions. However, it is important to note that disease can move as a direct result of human intervention and action. The Marburg outbreak of 1967 provides an important example of how historically isolated diseases can be moved by human activities. Researchers in Marburg, Germany, received an order of green monkeys from Uganda. The Marburg virus, a *filovirus* which is in the same family as Ebola, caused an outbreak among the researchers, leading to severe illness in thirty-one and the death of seven. It was later discovered that, prior to their arrival in Germany, the green monkeys were kept in a holding facility that was infested with fruit bats.[77] Events such as the Marburg outbreak demonstrate that human interactions with animals and their environment, as well as human and animal movement, can lead to sudden and explosive outbreaks in regions where the disease is not native.

Finally, the deadly Ebola virus offers an exceptionally instructive example of the complexities and potentially far-reaching consequences associated with interactions between zoonotic processes and human actions and movement. The Ebola virus's natural reservoir, the

[76] Ron, Koury, and Steve J. Warrington, "Rabies." In *StatPearls,* January (2020), Pathophysiology.
[77] Michael, Oldstone, *Viruses, Plague, and History* (New York: Oxford University Press, 1998). 134. Shakespeare, *Zoonoses,* 220-1.

animal in which the disease naturally developed, is thought to be the Egyptian fruit bat.[78] If an individual touches or consumes an undercooked infected fruit bat, then the serious disease known as Ebola Virus Disease can result. Because zoonotic diseases, like Ebola, require an initial jump to humans to spark an outbreak, they are often constrained to the geographic location in which the host animal resides. The West African Ebola Outbreak of 2014-2016 was the largest and most devastating outbreak of the Ebola virus ever recorded. During the outbreak there were 28,616 cases and 11,310 deaths, a mortality rate of nearly 40%.[79] This outbreak is documented to have begun after members of a rural community consumed bushmeat, including bats and non-human primates. It was unique because it was the first time since the discovery of the disease that the virus managed to escape from the rural regions where it most commonly spills over. Up to this point, the rural setting provided natural isolation that prevented the disease from escaping to neighboring communities.[80] Despite jumping from the rural communities to cities, the disease was initially contained within the region of West Africa, until September 25th, 2014, when an individual, who did not know that they were infected, departed from Liberia and arrived in the United States. Fortunately, the subsequent outbreak was rapidly contained by the Centers for Disease Control (CDC), however, multiple people were infected and dozens more were placed in isolation.[81] This example clearly demonstrates that, given the right circumstances, diseases are capable of spreading great distances from their original endemic areas. This long-distance transmission is enabled by preexisting and well-established human routes that allow

[78] Miguel J. Martínez, et al., "Ebola Virus Infection: Overview and Update on Prevention and Treatment," *Infectious Diseases and Therapy* 4.4 (2015): 368.
[79] Center for Disease Control and Prevention. "2014 Ebola Outbreak in West Africa - Case Counts." (Washington, DC; United States Department of Health & Human Services, 2020).
[80] Jolie Kaner, and Sarah Schaack, "Understanding Ebola: the 2014 Epidemic." *Globalization and Health*, 12.1 (2016): 53.
[81] Michelle S. Chevalier, et al., "Ebola Virus Disease Cluster in the United States-Dallas County, Texas, 2014," *Morbidity and Mortality Weekly Report* 63.46 (2014): 1087-1088.

infected individuals to travel before displaying signs of illness. Thus, zoonotic diseases can travel vast distances in a relatively short amount of time. This fact makes them extremely dangerous because they can spread innocently and unwittingly to communities that have no immunity or natural protection from them. While this problem has become greatly exacerbated by modern technology and the pace of modern life, it is not solely an issue faced by the modern world. Trade routes in the pre-modern world were well-established and far reaching, and people were able to, and did, travel vast distances. Therefore, this movement of humans, animals and goods during early history, as in modern times, had the potential to bring new diseases to previously unexposed populations

Possible Pathogenic Agents

Y. Pestis/Plague

There are several diseases which share a symptomatology with the plague described by Cyprian. Plague, named specifically, is held to be responsible for the Black Death and also the Justinianic Plague and is caused by the pathogen *Yersinia pestis,* and is one potential candidate. This pathogen has likely been present in rodent populations for millennia, with the oldest known *Yersinia pestis* bacteria discovered in Siberia and found to be over 5,000 years old.[82] Beyond this fact, there are dozens of strains of the pathogenic bacteria that still circulate in human and animal populations today, and many more which have gone extinct. Researchers are not sure why the strain that caused the Black Death was so virulent in humans or why it spread so quickly among human populations.[83] Despite disputes around origins and virulence, the plague's effects on the

[82] Maria A Spyrou, et al. "Historical Y. Pestis Genomes Reveal the European Black Death as the Source of Ancient and Modern Plague Pandemics." *Cell Host & Microbe* 19.6 (2016): 874–81.
[83] Spyrou, et al. "Historical Y. Pestis Genomes," 874–81.

human body are well documented. Plague symptoms are devastating and painful for its victims as well as disturbing to those who witness its course. While the plague illness can present in three different ways in the human body, the disease-causing plague bacteria are the same in all three of the cases. Nevertheless, some of these presentations are deadlier than others and allow for easier transmission of the disease among human populations.

The first presentation, bubonic plague, is the most common of the three and usually presents with nonspecific symptoms: fever, headache, chills, and weakness (malaise), as well as one or more swollen, tender and painful lymph nodes. These inflamed lymph nodes often become black in color and are called buboes.[84] Bubonic plague results from an insect bite, usually a flea or mosquito, which, if left untreated, will kill an individual 50-60% of the time.[85] The second manifestation of the disease is septicemic plague, which occurs when the bacterial infection arrives in the bloodstream. Septicemic plague is usually the result of untreated bubonic plague.[86] In addition to the previous symptoms for bubonic plague, septicemic plague causes abdominal pain, shock, bleeding into the skin as well as tissue death (or necrosis) which turns the skin black, a symptom commonly seen on the fingers, toes and nose; this distinct symptom is the source of the disease's name "The Black Death." The third and most dangerous presentation is pneumonic plague which results from bacteria reaching and infecting the lungs; this sequela causes shortness of breath, chest pain, and cough.[87] Both septicemic and pneumonic plague are 100% fatal if left untreated.[88]

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[84] Ruifu Yang, "Plague: Recognition, Treatment, and Prevention." *American Journal of Microbiology*: *Journal of Clinical Microbiology* 56.1 (2017).
[85] A. Amber and M. Schaaf, "Plague." *World Health Organization Report on Global Surveillance of Epidemic-Prone Infectious Diseases.* (2000): 25-38.
[86] Yang, "Plague,".
[87] Yang, "Plague."
[88] Yang, "Plague. Amber, and Schaaf, "Plague," 25-38.

The reservoir, or original host, for the *Y. pestis* has long been believed to be black rats. However, new genome research has found that this long held assertion does not stand up to scrutiny. The Black Death, the largest recorded outbreak of this disease, has been found to have originated in Kazakhstani gerbils which are now thought to be the origin host species.[89] Nevertheless, *Y. pestis* is capable of infecting any mammal, especially rodents, with many serving as asymptomatic hosts, and evidence suggests that, while black rats (*Rattus rattus)* were not the original reservoir species, they did, along with Norwegian rats (*Rattus norvegicus*), play a critical role in spreading the disease throughout Europe. Thus, while black rats did play a large role in spreading the disease to humans in Europe, they were not the original hosts as once believed.[90]

The transmission of the plague typically requires a vector, like a flea carried by a rodent, for efficient dispersion, thus, person to person spread rarely occurs, except in the case of pneumonic plague.[91] Pneumonic plague, however, is caused by bacteria reaching and infecting the lungs, often by inhaling water droplets infected with *Y. pestis.*[92] The capacity to spread the pathogen directly between people makes pneumonic plague the most dangerous plague form, as "it can be transferred directly from human to human by airborne sputum or by fomites," infecting anyone who comes into close contact with a sick person.[93] In contrast, the bubonic plague form of early outbreaks cannot spread as rapidly, because it demands a large host population and

[89] Boris V. Schmid, et al., "Climate-Driven Introductions of Plague into Europe." *Proceedings of the National Academy of Sciences* 112.10 (2015): 3020-3025; DOI: 10.1073/pnas.1412887112
[90] Dennis, David and Mead, Paul. "Plague" in *Tropical Infectious Disease* (Second Edition), vol. 1, (London: Churchill Livingstone, 2006): 471-481.
[91] Nils Chr Stenseth, et al., "Plague: Past, Present, and Future," in PLoS Med 5(1), (PLoS Online, 2008).
[92] Amber, and Schaaf, "Plague." (2000): 25.
[93] Ynez O'Neill,and Jerry Stannard, "The History of Human Disease in the World Outside Asia: Disease of the Middle Ages & Diseases of Western Antiquity." in *The Cambridge World History of Human Disease*, (Cambridge, UK: Cambridge University Press, 1993), 278.
Amber, and Schaaf, "Plague." (2000): 25.

vector. Based on these patterns of plague disease transmission, any widespread epidemic, like the Black Death, would most likely require a period of sustained local outbreak, with both mobile infected host animals and vectors as well as person to person transmission.

Smallpox.

Another disease which shares symptomatology with the plague described by Cyprian and is caused by a commonly investigated pathogen is smallpox or *variola*. Before a vaccine was widely deployed in the twentieth century and the virus was effectively eradicated, smallpox killed almost three hundred million people.[94] Its origins are mysterious but it has been endemic in the human population since 10000 BCE, likely since the beginning of settled civilizations with urbanized communities.[95] There are currently two different types of smallpox infection. The first, *variola minor,* has a mortality figure of approximately 1% and is the less common form of the disease. *Variola major*, the second and more common form, holds a significantly higher mortality rate of around 30%. The symptoms of infection for both forms of the illness begin as a general or nonspecific infection with high fever, head and body aches, and sometimes vomiting.[96] The disease then progresses to the later stage, when a rash begins to appear on the tongue and in the mouth. As the sores and ulcers gradually break open in the mouth, large amounts of virus are expelled into the body. When this occurs, a rash starts to appear on the skin, originating on the face and neck, and quickly spreading to the arms and legs, and finally to the hands and feet, until it covers the whole body within twenty-four hours. While this stage of the disease is often considered the most painful, an infected individual may feel that their condition is nonetheless improving. However, by the fourth day, an opaque and viscous fluid fills the sores

[94] Oldstone, "Viruses, Plagues and History," 27.
[95] Oldstone, "Viruses, Plagues and History," 28.
[96] The standard non-specific symptoms that are common, and provide little evidence for an accurate differential diagnosis.

and the fever may return. For those who survive this disease, 65-80%, these scapes may eventually turn into scars once the infection has run its course.[97] These symptoms of smallpox are well established and documented. Even a hundred years before the plague of Cyprian, when the Antonine Plague struck Rome, Galen of Pergamum, one of the most prominent classical physicians, described the course of this disease in nearly perfect detail.[98]

The transmission mechanisms for the *variola* virus allows for its rapid spread in urban communities. Smallpox patients are contagious when the sores first appear in the mouth and throat. While the disease is not airborne and cannot be passed through small water droplets that can hang in the air for hours, the disease is usually passed through the respiratory system via exposure to coughing and sneezing in enclosed or confined spaces. Further, transmission often occurs before the appearance of the sores, when the red pustules, which are the defining feature of the disease, are not yet present. The disease is also passed through fomite transfer, whereby any surface or item touched by an infected and symptomatic person may be capable of infecting another individual if it is not handled properly.[99] This disease spreads expeditiously in urban environments moving quickly between individuals in large populations that frequently dwell in enclosed spaces. This swift transmission from person to person and high virulence in urban areas can have disastrous consequences for people living in close quarters. Smallpox is thought to be the cause of the Antonine Plague, which occurred nearly a hundred years before the Plague of Cyprian, and devastated the Roman Empire.[100] Smallpox is a unique virus and holds an unusual

[97] United States Army Chemical School. "Biological Agents and Their Properties." in *Multiservice Tactics, Techniques, and Procedure: Potential Military Chemical/Biological Agents and Compounds*. Fort Leonard Wood, Missouri: United States Military Joint Requirements Office, (2005). IV.20-28.
[98] Kearns, "A Plague in a Crisis," 31-32.
[99] Martin M. Weiss, et al., "Rethinking Smallpox," in *Clinical Infectious Diseases* 39(11), (Oxford; University of Oxford Press, 2004): Pages 1668–1673.
[100] Kearns, "A Plague in a Crisis: Differential Diagnosis of the Cyprian Plague and Its Effects on the Roman Empire in the Third Century CE," 31-32.

distinction, specifically, the *variola* pathogen "has no known animal reservoir; its infections are limited to humans."[101] This unusual characteristic provides an interesting area of exploration for historical epidemiologists. Because smallpox can only exist in humans and is not carried by any other known animal, no animal or insect vector can carry the disease to a new population. This fact suggests that the disease must exist at an endemic level in communities for outbreaks to occur, as humans are the only carriers. For this reason, whenever a disease emerges in a cluster within a human population, smallpox is almost always investigated as a viable cause of the outbreak. Thus, smallpox is frequently scrutinized as a culprit in historical outbreaks and the *variola* pathogen should be considered a possible etiology of any disease epidemic in the medieval and classical world.

Measles.

A third potential suspect illness for the Cyprianic Plague is measles. While the origin of the measles virus is not well understood, it has in the modern day, until recently, been kept under control by a vaccine. Despite this fact, the *Measles morbillivirus* began a reemergence in the 21st century.[102] It is believed that, although non-human primates can be infected and symptomatic from the virus, it is sustained by an "unbroken chain of human-to-human transmission." [103] Evidence indicates that, despite a distant relationship with cowpox (*vaccina*) and rinderpest virus (*Rinderpest morbillivirus*), the disease does not jump from animal to human without an infected human having first given it to an animal.[104] And while the exact origin of measles is unknown,

[101] Oldstone, "Viruses, Plagues and History," 27.
[102] For more on the rise of measles in the 21st century see, Adekunle Sanyaolu, et al.,"Measles Outbreak in Unvaccinated and Partially Vaccinated Children and Adults in the United States and Canada (2018-2019): A Narrative Review of Cases." *INQUIRY: The Journal of Health Care Organization, Provision, and Financing* 56, (2019).
[103] William J. Moss and Peter Strebel. "Biological Feasibility of Measles Eradication." *The Journal of Infectious Diseases* 204.1 (2011): S47.
[104] Moss and Strebel, "Biological Feasibility of Measles Eradication," S47.

its presence and effects on the human body have been thoroughly recorded since its first appearance in the historical record by Persian historian Abū Bakr Muḥammad ibn Zakariyyā al-Rāzī (Rhazes) in the ninth century.[105] The disease presents with only a few symptoms; "high fever, Koplik spots (white spots in the mouth that usually appear 2–3 d prior to the rash and last 3–5 d), malaise, loss of appetite, red eyes, runny nose, and sometimes cough."[106] However, the most distinct symptoms of measles are conjunctivitis, coryza (inflamed mucus membranes around the nose), cough and fever followed by rash. This symptom profile is curious as most of the symptoms unique to the measles are non-specific. Additionally, the case fatality rate (CFR, the percentage of people who die as a direct result of the pathogen) is difficult to calculate, especially before the production of the vaccine in 1963. Before 1963, nearly all children in the United States were infected by measles at some point. Because measles's symptoms are not unique, cases have not consistently been registered with health authorities as they have frequently been confused with other diseases or have not been severe enough to merit medical involvement. With these limitations on statistical estimates, the US averaged 500,000 reported cases and 500 deaths annually (giving a CFR of .1%), prior to 1963.[107] This statistical constraint has left the mortality data rather skewed, with modernized countries demonstrating a CFR for measles of as low as 0.1%. and the undeveloped world exhibiting a CFR as high as 30%.[108]

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[105] Yuki Furuse, Akira Suzuki, and Hitoshi Oshitani, "Origin of Measles Virus: Divergence from Rinderpest Virus Between the 11th and 12th Centuries," in *Virology Journal* 7(52), (2010). For more on Rhazes see, Samir S. Amr, and Abdulghani Tbakhi "Abu Bakr Muhammad Ibn Zakariya Al Razi (Rhazes): Philosopher, Physician and Alchemist." in *Annals of Saudi Medicine*, 27.4 (2007): 305–307.

[106]Hussein Y. Naim. "Measles Virus: *A Pathogen, Vaccine, and a Vector." Human Vaccines & Immunotherapeutics*, 11.1 (2015): 21-26.

[107] Paul Gastanaduy, Penina Haber, Paul A. Rota, Manisha Patel, and Centers for Disease Control and Prevention. "Measles." In *Epidemiology and Prevention of Vaccine-Preventable Diseases, ed. 13th,* edited by Jennifer Hamborsky, Andrew Kroger, and Charles Wolfe. Washington: Public Health Foundation, 2015.

[108] K Lisa Cairns, Robin Nandy, and Rebecca F Grais. "Challenges in Measuring Measles Case Fatality Ratios in Settings Without Vital Registration." In *Emerging Themes in Epidemiology*. 2010;7(1):4. doi:10.1186/1742-7622-7-4

Contributing further to the statistical challenge is determining exactly what caused these deaths, given that measles often demonstrates other harmful sequelae. Immunosuppression and other complications are very common signs in measles patients, especially those with risk factors. Measles virus-induced immunosuppression is a particularly threatening feature of the virus as it can leave ill individuals at risk for opportunistic infections.[109] This complication can leave patients vulnerable to further and more deadly pathogenic infections. From 1987-2000, 30% of measles cases in the United States were accompanied by a complication, ranging from diarrhea, otitis media (inflammation of the middle ear that can causes deafness), pneumonia, encephalitis, subacute sclerosing panencephalitis (brain inflammation), and death. [110]

Subacute sclerosing panencephalitis and encephalitis can cause a variety of problems for the afflicted. One of these is blindness. Even with modern medicine there are estimated to be 30 million measles infections per year in the developing world. This prevalence rate results in 15,000 to 60,000 cases of measles-related blindness each year. Thus, blindness is a serious complication that occurs relatively frequently in measles cases. [111] Another well-known complication of measles, otitis media, can cause lasting damage to the eardrum. Deafness as a result of measles infection is reported in 7%-85% of cases (the wide variation is caused by different levels of medical treatment, even within a single outbreak), although not all of these cases are permanent, its frequency is notable.[112] The complications are most severe and common in populations under five years of age and adults. Thus, complications of measles viral infections

[109] For more on the mechanics of the immune suppression see, S. Schneider-Schaulies and J. Schneider-Schaulies "Measles Virus-Induced Immunosuppression." In *Measles: Pathogenesis and Control,* edited by Diane E. Griffin and Michael B.A. Oldstone, 243-264. Heidelberg, Germany: Springer, 2009.
[110] Gastanaduy, Haber, Rota, Patel, and Centers for Disease Control and Prevention. "Measles," *Complications*.
[111] Richard D Semba, and Martin W Bloem. "Measles Blindness". *Survey of Ophthalmology: International Review Journal*, 49.2 (2004):243-55.
[112] Brandon E. Cohen, Anne Durstenfeld, Pamela C. Roehm, "Viral Causes of Hearing Loss: A Review for Hearing Health Professionals." *Trends in Hearing*, 18.10 (2014).

can leave-long lasting effects, complications which are similar to those observed in the population during the Cyprianic Plague. [113]

The transmission of measles is perhaps the most intriguing and disturbing aspect of the virus. Measles is sustained only through human-to-human transmission and does not have an animal reservoir, requiring the disease to have a sufficient population for new infections to occur. The measles virus spreads quickly and efficiently, requiring only limited interaction to be transferred between individuals. The disease is transmitted through droplets that are coughed into the air or aerosols, small viral particles that are produced by breathing.[114] This form of transmission is very efficient and difficult to prevent. The R_0, the average number of individuals to which an infected person will transmit the disease, varies from outbreak to outbreak, however, it averages between 12-18.[115] That means that one infected individual is able to spread the disease to at least 12 other people, perpetuating the outbreak. This makes the disease capable of quickly infecting small communities until, given the opportunity, a sick individual carries it to a new community where it reemerges. Measles' symptom, complication and transmission profile fits with the various descriptions of the Cyprianic Plague, along with its similar duration, having lasted almost fifteen years.[116] Because measles is one of the leading causes of death for infants worldwide, which is fueled by its virulence and rate of transmission, it can have a devastating impact on dense, urbanized and unvaccinated communities.[117] For these reasons, measles must be interrogated as a possible suspect responsible for the Plague of Cyprian.

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[113] Gastanaduy, Haber, Rota, Patel, and Centers for Disease Control and Prevention. "Measles," *Complications*.
[114] Naim, "Measles Virus: *A Pathogen, Vaccine, and a Vector,"* 21.
[115] Fiona M. Guerra, et al., "The Basic Reproduction Number (R_0) of Measles: A Systematic Review." In *The Lancet* 17(12), 2017.
[116] Harper, *The Fate of Rome,* 145-149.
[117] Sinead E. Morris, et al., "Modeling the Measles Paradox Reveals the Importance of Cellular Immunity in Regulating Viral Clearance." *PLOS: Pathogens* 14.12 (2018): doi.org/10.1371/journal.ppat.1007493.

Ebola

A fourth disease possibility which shares symptomatology with Cyprian's plague is viral hemorrhagic fever (VHF). VHFs are actually a class of viral illnesses that cause bleeding in the infected individuals, and interfere with their blood-clotting ability.[118] One example, Ebola, is a disease commonly found in Sub-Saharan Africa. This illness is characterized by its aggressive and horrific symptom complex. The mortality rate for Ebola is devastatingly high; the first outbreak in Zaire (later renamed the Democratic Republic of the Congo) had an 88% mortality rate, killing the vast majority of the infected individuals. [119] Ebola begins as a non-specific illness, mirroring infections like influenza, and can include: fever, headaches, sweating, aches and pains in the muscles in joints as well as the abdomen, weakness and fatigue, and diarrhea and vomiting. These early symptoms are general and difficult to differentiate. However, later symptoms give the disease its frightening reputation: severe abdominal pain, bleeding, unexplained bruising and hemorrhaging.[120] The progression of this disease leads to dehydration and blood loss. While only identified in 1976, this disease is, at the very least, seventeen hundred years old, and likely older.[121] Given evidence that suggests the existence of Ebola during the third century, as well as its similar symptom profile to the disease described by Cyprian, makes it a suitable candidate to consider for the Cyprianic Plague.

In addition, the transmission of the Ebola virus, like smallpox, is often explosive in urbanized populations, making it a ripe epidemic source. Ebola is passed from person to person by way of fomites and bodily fluids, which are the most common sources of infection. All fluids

[118] Rupinder Mangat, and Ted Louie. "Viral Hemorrhagic Fevers." in *StatPearls*, (2020).
[119] Oldstone, "Viruses, Plagues and History," 131.
[120] Mahmoud Tawfik Khalafallah, et al. "Ebola Virus Disease: Essential Clinical Knowledge." *Avicenna Journal of Medicine* 7.3 (2017): 96–102.
[121] Y.H. LI, and S.P. CHEN. "Evolutionary History of Ebola Virus." *Epidemiology & Infection* 142.6 (2013): 1138-1145. doi: https://doi.org/10.1017/S0950268813002215

from an infected body contain the virus, and even months after recovery from the disease the virus can live in the fluid of the eyes, the central nervous system, and the semen.[122] The virus is spread by entering the body through mucous membranes like the eyes, nose, and mouth. It can also be inhaled directly by way of droplets in the air when in confined spaces. Ebola acts fast and can be spread rapidly once symptoms appear. Worse still, the body continues to secrete virus after the victim has died, meaning that if the body is not handled properly, it can potentially infect everyone who comes into contact with it. These aspects of transmission facilitate the swift spread of the virus which kills the majority of those infected, even with modern treatments. This fact suggests that, if the disease reaches urbanized areas, as it did in the 2014-2016 West African Outbreak where over eleven thousand people died, the consequences can be catastrophic.[123]

The natural reservoir of Ebola, the animal in which the disease originally appeared, has not been definitively identified. While there is convincing evidence that fruit bats might be the culprit, the more worrisome reality is that many animals can currently serve as vectors.[124] All bats and nonhuman primates, like monkeys, gorillas and chimpanzees, are capable of spreading the virus.[125] This situation is problematic because bush meat, the nonhuman primates listed above and others, provide an essential food source, and a source of potential infection, for thousands in Sub-Saharan Africa. Furthermore, infection can be spread directly by the animals themselves. As noted above, in 1967, thirty-two scientists were infected with the previously

[122] Athena P. Kourtis, et al., "Ebola Virus Disease: Focus on Children," *Pediatric Infectious Disease Journal* 34.8 (2015): 893–897.
[123] Center for Disease Control and Prevention, "2014 Ebola Outbreak in West Africa - Case Counts," (2020). In the 2014-2016 West African Ebola outbreak, the intervention of a modern medical response the mortality rate was kept under 50%.
[124] Biek, Roman, Peter D Walsh, Eric M Leroy, and Leslie A Real. "Recent Common Ancestry of Ebola Zaire Virus Found in a Bat Reservoir." in *PLoS Pathogens* 2(10). (2006).
Allison Groseth, Heinz Feldmann, and James E.Strong. "The Ecology of Ebola Virus." in *Trends in Microbiology* 15(9), (2007).
[125] Suresh Rewar, Dashrath Mirdha . "Transmission of Ebola Virus Disease: An Overview,"in *Annals of Global Health 80*(6), (2014): 444-51.

unknown Marburg virus (another VHF that is closely related to Ebola) from imported African green monkeys.[126] Thus, the efficient, vector-fueled transmission which is common in VHFs like Ebola, the likely existence of Ebola during the third century, as well as the symptoms it has in common with those described by Cyprian, distinguish it as a highly plausible pathogenic source for this historic outbreak.

Lassa Fever

The final candidate disease which could be responsible for Cyprian's plague is another VHF known as Lassa Fever. Like Ebola, this disease is also endemic to Sub-Saharan Africa. This viral pathogen can be as aggressive and violent as Ebola, presenting with recognizable and identifying symptoms; however, its mortality rate is just 1% of the total infected population (10-60% of symptomatic patients[127]) and only 20% of infected individuals are symptomatic.[128] Nevertheless, fatality rates in contemporary outbreaks have been as high as 25.4% in recent years.[129] Early symptoms are again non-specific: fever, weakness, fatigue, headache, sore throat, muscle pain, chest pain, nausea, vomiting, diarrhea, swelling in the face and throat, cough and abdominal pain. While these symptoms are common, the most recognizable are its hemorrhagic and neurologic signs and complications: fluid accumulation in the lungs, bleeding in the nose and mouth, hearing loss (which occurs in 25% of cases) tremors, and encephalitis (brain swelling).[130] The complications (an atypical condition caused by the illness) of this disease are unique, including hearing loss, encephalitis, and others, and while they do not occur in every

[126] Masfique Mehedi, et al., "Clinical Aspects of Marburg Hemorrhagic Fever." in *Future Virology* 6(9), (2011). https://doi.org/10.2217/fvl.11.79
[127] Oldstone, *Viruses, Plague, and History,* 128.
[128] J Kay Richmond, and Deborah J Baglole, "Lassa Fever: Epidemiology, Clinical Features, and Social Consequences." in *BMJ* 327(7426), (2003):1271–1275. doi: 10.1136/bmj.327.7426.1271
[129] Rachel A. Sattler, Slobodan Paessler, Hinh Ly, and Cheng Huang, "Animal Models of Lassa Fever." in *Pathogens* 9(3), (2020):197. doi: 10.3390/pathogens9030197
[130] Richmond, and Baglole, "Lassa Fever: Epidemiology, Clinical Features, and Social Consequences," (2003).

symptomatic case of the disease, they present with enough regularity to be considered a reliable product of the infection.

The transmission of Lassa Fever operates similarly to that of Ebola, passing from person to person through fomites and bodily fluids. Lassa does not, however, have the ability to easily transmit person to person, making it less infectious than Ebola, and less likely to spread as quickly or as far. Most person to person transmissions today are nosocomial infections, which occur in a hospital setting usually between patients and physicians who are in close contact.[131] While this may run counter to the idea that Lassa fever can prompt a large-scale outbreak, it is still considered to be infectious and can prompt sustained community spread. This concept is important to understand because in order for a disease to cause an outbreak, it must have the capacity to effectively spread beyond the household within which the first individuals became ill.

The Lassa Fever virus (LASV) has a single known naturally occurring reservoir, the *Mastomys natalensis* rodent. Mastomys are found exclusively in the forests of western sub-Saharan Africa. People are infected when they come into contact with the urine, blood, and feces of these animals.[132] This rodent is the only vector for LASV, which means that the virus can only infect individuals that come into contact with the rodents. This fact constrains the disease to the region in which the mastomys inhabits. Thus, having knowledge about the habitat and migration/movement patterns of reservoir animals will help refine the causal disease candidates for the Cyprianic Plague.

In summary, analysis of disease symptomatology, zoonotic processes including animal hosts and vectors, habitat and movement, virulence and transmission mechanisms, as well as

[131] Andrei R. Akhmetzhanov, Yusuke Asai and Hiroshi Nishiura. "Quantifying the Seasonal Drivers of Transmission for Lassa Fever in Nigeria." in *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences* 374(1775), (2019). https://doi.org/10.1098/rstb.2018.0268

[132] Richmond, and Baglole, "Lassa Fever: Epidemiology, Clinical Features, and Social Consequences," (2003).

human activity patterns are all necessary to fully understand the impact of a disease. Insights into how disease outbreaks occur, their symptoms, and how they interact with their human environment are essential elements for delivering a coherent and well-informed differential diagnosis. The Cyprianic Plague, like all other outbreaks, is not restricted merely to the symptomatology present but is characterized by how it arrived and its effects on communities. This is information that will be taken into consideration when discussing a viable differential diagnosis for the Cyprianic Plague.

Differential Diagnosis

Symptoms

The difficulty in identifying epidemics of the past with specific pathogenic agents lies, not within the descriptions of the diseases, but rather with the integrity and reliability of the sources that reference the event and describe its impacts. Due to the devastating and turbulent nature of the Third-Century Crisis, there are relatively few sources that mention the Plague of Cyprian, and fewer still that are concurrent accounts and eyewitness testimonies of the disease. Many known references are found in texts from centuries after the events of the pandemic, like Zosimus and the *Historia Augusta*, and are often singular and solitary mentions of the disease. There is little to no discussion of the epidemic's symptoms and impacts, besides that which is present in the work of Cyprian. This lack of source material presents a rather challenging obstacle to overcome. This situation is in contrast to the Antonine Plague, for which the Roman physician Galen was present to record the symptoms and overall impacts of the disease, or the Justinianic Plague, which boasts a number of writers like Procopius and John of Ephesus.[133] The societal roles of these writers has given both gravity and credence to their claims and descriptions. This courtesy has been less willingly extended to the theologian Cyprian.

In order to identify the pathogen in the case of the Cyprianic Plague, the possible culprits must be narrowed and thoroughly examined. First, the symptoms of the disease must be established. According to Cyprian, the symptoms of the Cyprianic Plague seem to include diarrhea, high fever, sores/ulcers, swelling in the mouth and throat, vomiting, hyphema or conjunctivitis (bleeding in the iris and cornea), putrefaction of the skin, severe fatigue (malaise),

[133] Procopius, *History of the Wars,* trans. HB Dewing, (Cambridge: Cambridge University, 1914); Pseudo-Dionysius, "Pseudo-Dionysius of Tel-Mahre, Chronicle Part III." In *Translated Texts for Historians*. trans. by Witakowski. (Liverpool; Liverpool University Press, 1996); Parts of John of Ephesus's writings remain lost. However, his works were copied by Pseudo-Dionysius of Tel-Mahre.

loss of hearing and sight. As stated previously, these symptoms, as presented by Cyprian, are difficult to discern with complete accuracy. The language used is poetic and non-technical, the descriptions are written in a style to create an emotional impact on the reader, rather than as a truly faithful and detailed record of the symptoms.[134] One portion of the description in the *De mortalitate* deserves further investigation, "then a fire [fever], catching in the marrow, boils forth among wounds in the throat, (*quod in faucium uulnera conceptus medullitus ignis exaestuat).* This is a difficult report to fully understand, and leaves an incredible amount of ambiguity. This statement can mean a number of different things. The first possibility is that Cyprian is discussing ulcers in the throat, but this explanation is highly suspect as he does not refer to them in a typical way like, *anthrax* or *ulcus.* A second explanation is that this is referring to intense facial and throat swelling like that which Lassa fever can cause, "the most useful clinical predictors of Lassa fever are fever, pharyngitis, retrosternal pain, and proteinuria for diagnosis; and fever, sore throat, and vomiting for outcome."[135] Another possibility is that VHFs cause bleeding in the stomach, mouth, and nostril.[136] It is possible that Cyprian was seeing individuals vomiting or excrete blood from their mouths and thought that this was being produced in wounds in the throat. However, it is safe to assume that there was, at the very least, swelling in the throat and the presence of blood in some capacity, though beyond this anything else is speculation. This level of ambiguity makes it difficult to discern what exactly is taking place.

Despite this fact, there are a number of unique characteristics of the disease that can be isolated. The symptoms: high fever, swelling of the mouth and throat, and malaise are typical with any infection and should be considered non-specific, playing only a limited role in the

[134] See, **Possible Pathogenic Agents**
[135] J Kay Richmond, and Deborah J Baglole, "Lassa Fever: Epidemiology, Clinical Features, and Social Consequences," *BMJ*, 327.7426 (2003): 1274.
[136] Richmond, and Baglole, "Lassa Fever: Epidemiology, Clinical Features, and Social Consequences," Table 3.

examination of the disease. Because these symptoms are common and do not provide unique characteristics, they are not useful in providing a reasonable degree of distinction from other infections. The following symptoms remain and are those most informative for this analysis: diarrhea, vomiting, hyphema or conjunctivitis, putrefaction of the skin, malaise, loss of ambulatory movement, and loss of hearing and sight. These characteristics are critical for differentiation and they will allow for the disease to be effectively analyzed. Next, I turn to a consideration of each of the disease candidates and an analysis of their potential as the cause of the plague in question: a differential diagnosis of the Cyprianic Plague.

Y. Pestis Plague

The first of the possible pathogenic agents identified in this thesis as a potential cause of the Plague of Cyprian is the *Yersinia pestis* bacterium. Like many other infections, it presents with the non-specific symptoms described by Cyprian. The most unique characteristics of this disease are the swollen, tender, and painful lymph nodes. This symptom is representative of bubonic plague which was responsible for the Justinianic Plague in the sixth century and the Great Mortality in the fourteenth century. Pneumonic plague includes the additional symptom of severe cough (which Cyprian does not mention) and the septicemic plague contributes tissue necrosis (which Cyprian does mention). *Y. pestis* is an important disease to consider as a possible culprit for the Cyprian Plague because of the prevalence of rats, mice, and other rodents that densely populated ancient cities The symptoms alone, however, lead to this being an unlikely source. While victims of plague can have diarrhea and vomiting, this sign is typically rare and Cyprian's portrayal of these attributes of the disease seem to indicate them as a rather more

severe and predictably common condition than what plague produces.[137] There is one symptom, however, that gives credence to the possibility of the Cyprianic Plague being *Y. pestis* which is bleeding into the skin causing necrosis, shock and putrefaction. This symptom is indicative of the septicemic plague and is described by Cyprian, "then for certain persons either the feet or any other portions of the limbs are cut off by the touch of the diseased rottenness, then, through losses and damages of the bodies, with faintness rushing, either walking is impaired….", (*quod quorundam uel pedes uel aliquae membrorum partes contagio morbidae putredimis amputantur*)."[138] If this symptom alone is appraised, it does create a strong possibility and argument for *Y. pestis*. However, when the symptoms of hearing and visual impairment are considered, a major obstacle arises because plague is not known to cause these signs or complications. The loss of hearing and sight represent two unique characteristics observed by Cyprian that, if absent in a given disease candidate, make the possibility of that disease being the Cyprianic Plague unlikely. Because *Y. pestis* does not cause either of these two symptoms, it is highly doubtful that it is the pathogenic agent responsible for Cyprian's Plague.

Smallpox

Smallpox, or *variola major*, is a disease that has been responsible for multiple outbreaks in the pre-modern and modern periods prior to its eradication. Smallpox, like bubonic plague, ravaged human populations for millennia, and has been a scourge in settled communities since the beginnings of urbanization.[139] For this reason, it is often discussed when exploring the source of historical outbreaks, like the Cyprianic Plague. Smallpox does, however, have many symptomatic similarities to the Cyprianic Plague. To begin with, smallpox is associated with

[137] Cyprian of Carthage, *De Mortalitate,* CCSL. 14. "The bowels loosened (go) into flux [and] the strength of the body is disemboweled, (*corporis uires solutus in fluxum uenter euiscerat*)."
[138] Cyprian, *De Mortalitate,* CCSL. 14.
[139] Oldstone, *Viruses, Plagues, and History,* 27-29.

fever and characteristic sores and ulcers which cover the inside of the mouth and throat.[140] Cyprian also describes observing similar symptoms in his community, specifically, high fever, wounds (*uulerna*) in the throat, and swelling in the mouth and throat *(quod in faucium uulnera conceptus medullitus ignis exaestuat)*.[141] Smallpox's ability to move quickly through populations and sustain itself in smaller communities before igniting another epidemic is what made this pathogen such a danger in the pre-modern world.[142] Smallpox's complications are also similar to the neurological symptoms detailed by Cyprian, as smallpox can cause vision loss and damage in as many as 9% of cases.[143] However, its similarities to Cyprian's mystery disease quickly end as the most distinguishing characteristic, red pustules that form on the skin, are absent in Cyprian's description. Additionally, Cyprian makes no reference to coughing or the expelling of any fluids from the chest. These are two principal signs of the smallpox disease, and their absence from the list of symptoms decreases the possibility that smallpox is the culprit of the Cyprianic Plague.

While smallpox has been known since early antiquity, it was not distinguished from measles until Rhazes in the ninth century.[144] Further, McNeill seems to tacitly offer smallpox up as a possibility for the plague of Cyprian only because of the disease's prevalence in the pre-modern world.[145] Kearns, on the other hand, dismisses both smallpox and hemorrhagic smallpox, clearly stating that the characteristic disfiguring scars caused by smallpox's pustules are not present in Cyprian's work.[146] However, given the vagueness of Cyprian's description, it is

[140] See, Possible Pathogenic Agents
[141] Cyprian*, De mortalitate,* CCSL. 14.
[142] See, Possible Pathogenic Agent
[143] Semba, Richard. "The Ocular Complications of Smallpox and Smallpox Immunization." *Archives of Ophthalmology,* 121.5 (2003):715–719.
[144] See, Possible Pathogenic Agents
[145] McNeill, *Plagues and Peoples,* 132.
[146] Institute of Medicine (US) Board on Health Promotion and Disease Prevention. "Scientific Background on Smallpox and Smallpox Vaccination." in *Scientific and Policy Considerations in Developing Smallpox Vaccination Options: A Workshop Report*. Washington: National Academies Press (US), 2002.

potentially possible to read Cyprian's reference to putrefaction of the skin and the loss of limbs (*quod quorundam uel pedes uel aliquae membrorum partes contagio morbidae putredinis amputantur)* in this light. Kearns is correct to point out the absence of such an important symptom, but this ambiguous statement could be a possible reference to the hemorrhagic scaring. Nevertheless, the loss of limbs and the putrefaction of the skin is not a description that is associated with the aftermath of smallpox.[147] Eusebius presents an excellent example of how smallpox would have been recorded,

> "This was an ulcer, on account of its fiery appearance, appropriately called anthrax. This [ulcer] crept over the whole body and caused the sufferers serious danger, but especially against the eyes did it direct its greatest attack, and it deprived countless men, together with women and children, of their sight."[148]

This description clearly depicts a red rash, and states that ulcers were directly responsible for the loss of sight. Additionally**,** Eusebius also states, "Now, the customary rains and showers of the winter season which then prevailed were withholding their usual downpour upon the earth, and an unexpected famine came upon us, and besides these a plague, and an outbreak of another disease – this was an ulcer."[149] Harper believes that Eusebius makes this comparison in direct contrast to the Cyprianic Plague, though the true meaning of the comparison is ambiguous.

Jean Pascal Zanders. "Addressing the concerns about smallpox," *International Journal of Infectious Diseases,* r (2009): 9-13. Raymond Gani, and Steve Leach, "Transmission Potential of Smallpox in Contemporary Populations." In *Nature,* 414 (2001): 748–751. Hemorrhagic Smallpox has not been covered extensively in this thesis for a number of reasons. First, it occurs in only 3-5% of all symptomatic cases of smallpox (not nearly enough as we are operating under the assumption that Cyprian is recording the symptoms present in the majority of cases) and has a CFR of between 95-100%. It is a relatively rare complication of smallpox. Additionally, assuming an R_0 of between 3.5-6 the disease would have wiped out entire cities and caused a standstill of the entire Empire (no records support this happening as wars continued throughout the outbreak). It is included here as the systems are similar to Cyprian as they include subdermal bleeding (putrefaction). However, the disease can be dismissed for the same reasons ordinary smallpox major as they are the result of the same virus.

[147] Kearns, "A Plague in a Crisis," 42-43.

[148] Eusebius, *Historia Ecclesiastica*, 9.8

[149] Eusebius, *Historia Ecclesiastica*, 9.8; Harper, *The Fate of Rome,* 141.

Without the presence of its most notable symptoms, and in light of a contemporary description of the disease which is quite different from Cyprian's, smallpox is an improbable culprit as a cause of the Cyprianic Plague. [150]

Measles

Another disease advanced by McNeill and others as a candidate for the Cyprianic Plague is measles. Measles has a relatively narrow band of distinguishing symptoms. Its most common symptoms are fever, malaise, red eyes, cough and Koplik spots.[151] These symptoms are similar to those described by Cyprian, including fever, (*conceptus medullitus ignis exaestuat)* and red eyes (*quod oculi ui sanguinis inardescunt).* Koplik spots are possibly referenced as well as ulcers or sores *(quod in faucium uulnera),* though as discussed previously, this reading would represent a stretch.[152] The presence of these descriptions suggests that measles is a strong potential candidate for being the plague culprit. Lending further credence to this hypothesis that measles is the disease source are the various complications known to result from a measles virus infection. Neurological complications, like encephalitis and corneal ulceration, are severe and common, occurring in almost 30% of cases.[153] Cyprian does explicitly mention observing such neurological symptoms in the disease victims of his community, stating that hearing is blocked, and sight is blinded, (*uel auditus obstruitur uel caecatur aspectus*).

However, measles, like smallpox, presents with multiple characteristics that are not mentioned. First, a wide-spread, distinctive rash covering the entire body is a classic sign of

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[150] Robert J Littman, *Galen and the Antonine Plague,* 246. This issue of recorded vs presented symptoms is thoroughly discussed in the Methodology section of this thesis.
[151] See, Possible Pathogenic Agents
[152] Koplik spots are small white dots on top a red rash, usually in the throat or other mucus membrane. They are often described as, "grains of salt on a red background."
Jain Prachi, and Manu Rathee, "Koplik Spots." In *StatPearls*, July 2020.
[153] See, Possible Pathogenic Agents.
Hussein Y. Naim. "Measles Virus: *A Pathogen, Vaccine, and a Vector." Human Vaccines & Immunotherapeutics*, 11.1 (2015): 21-26.

measles infection. Cyprian does not explicitly mention such a rash or reddening of the skin, which is an essential occurrence in the progression of measles. Further, at no point does Cyprian specifically refer to observing profuse coughing. Measles is a respiratory disease that relies on droplets and aerosolized viral particles to spread. Cyprian explicitly describes other symptoms that would typically be part of a "fever" illness, like fever, malaise, and swollen throat, without mentioning cough. It is possible that coughing was assumed to be a part of any "fever" illness, a rather ambiguous description often used by ancient and medieval authors, though there is no conclusive evidence that Cyprian is using this terminology.[154] Thus, from his descriptions one would not naturally assume that coughing was observed in the sick of his community Also, as Amber Kearns points out, "it seems unlikely that Cyprian would leave out mentioning of a large rash, especially as this easily could be used in religious propaganda as an exterior signal of internal moral decay."[155] Taken together, this evidence strongly suggests that Cyprian intentionally left out these defining symptoms because they were not present. Thus, measles, while being a strong candidate, is unlikely to have been the cause of Cyprian's Plague.

Ebola

The Ebola virus, another potential candidate the Cyprianic Plague, is heavily favored by the historians Amber Kearns and Kyle Harper. Harper and Kearns both point out that the symptom complex (symptomatology) and the array of symptoms closely match viral hemorrhagic fevers (VHF). A high fever, severe gastric distress, ulcers in the throat, bloody eyes,

[154] For more on the ambiguity and discussion of "fever" illnesses see, Nutton, *Ancient Medicine,* 32. Nutton does not argue that coughing can be inferred in a "fever" illness, instead her discussion points out that this was a common description that requires a broader approach to discover what other symptoms might be present. For example, a "fever" illness that takes place near a low-lying marshland is likely to be malaria, knowing that you can infer the symptoms that this writer would consider part of a normal "fever." It is my argument that it is possible, though improbable, that coughing was inferred by Cyprian.
[155] Kearns, "Plague in Crisis," 43-44.

and tissue death (as a result of putrefaction) are all symptoms of a VHF, "these signs fit the course of an infection caused by a virus that induces a fulminant hemorrhagic fever."[156] Kearns also confirms these assertions, "the best option, which I believe to be a type of VHF caused disease similar to Ebola virus disease."[157] Additionally, Harper states his belief that the disease thrived in the winter season, "the seasonality of the Plague of Cyprian points to a germ that thrived on close interpersonal contact and direct transmission,"[158] However, he does not include any evidence to justify why he believes this to be the case, indeed, the account of Dionysius of Alexandria, related by Eusebius, places the outbreak at Eastertide.[159] Harper's assertion that the disease described by Cyprian spreads quickly within households and to caregivers, however, is supported by Dionysius' account.[160] Ebola's symptoms fit closely with those presented by Cyprian. Ebola can cause putrescence of the limbs as well as loss of sight and hearing. The Cyprianic Plague also adheres to patterns of transmission that would be expected of an Ebola outbreak.[161] Ebola aligns well with a majority of symptoms present in the Cyprianic outbreak. Therefore, Ebola is a strong candidate for being the pathogenic source of the Cyprianic Plague.

Lassa Fever

Lassa fever is a relatively new arrival in the discussion surrounding the Plague of Cyprian. As a viral hemorrhagic fever, like Ebola, it possesses many of the same characteristics as the Cyprianic Plague. It also has a high incidence of neurological complication, specifically loss of sight and hearing. Lassa fever is usually dismissed as a candidate for Cyprian's Plague

[156] Harper, *The Fate of Rome,* 142.
[157] Kearns, "Plague in A Crisis," 37.
[158] Harper, *The Fate of Rome,* 142. Presumably says this in reference to the passage in Eusebius 9.8 recorded above. From this passage he infers that the disease is communicable in close quarters because it spreads during the winter months.
[159] Eusebius, *Historia Ecclesiastica, 7.22*
[160] Harper, *The Fate of Rome,* 144.; Eusebius, *Historia Ecclesiastica*, 7.22
[161] Harper, *The Fate of Rome, 136-145*.

because its reservoir, the *Mastomys,* is endemic to sub-Saharan Africa. Another major factor contributing to its dismissal is its relative lack of human-to-human transmission. Direct transmission of Lassa fever from *Mastomys* to humans is far more common. Because of this, it is usually only mentioned in passing and is not taken up as a serious possibility. Nevertheless, both Harper and Kearns dismiss Lassa fever for another reason. They are critical of Lassa because of its presence only in sub-Saharan Africa, with Harper stating, "the speed of travel and scale of the outbreak would be unlikely for an arenavirus," and Kearns, "it is, however, doubtful this could be our answer for a number of smaller reasons: one, the primary animal reservoir for the virus is the mouse genus *Mastomys*, enzootic in sub-Saharan and West Africa, making the spread from East to West a bit less likely."[162] However, these particular points fail to take into account the increasing activity along the southern trade routes through the Sahara and along the Nile.

Initial Conclusions

The pathogen responsible for the Cyprianic Plague is most likely a virus. It is a disease that moves quickly and efficiently in urban areas and has the ability to sustain its infection rate to continue for fifteen years.[163] The disease's symptoms are aggressive and cause devastating illness to the infect individual. The specific combination of symptoms, wounds in the throat, conjunctivitis, diarrhea, vomiting, and a putrefaction of the skin, indicates that this is a virus that causes massive amounts of bleeding throughout the body. A VHF illness, like Ebola and Lassa, cause bleeding throughout the body. However, in order to fully address and diagnosis the Cyprianic plague, it is necessary to explain how a disease infects a non-endemic area. This

[162] Harper, *The Fate of Rome*, 143.; Kearns, "Plague in Crisis," 45.
[163] Orosius. *The Seven Books of History Against the Pagans,* VII.22.

justification is critically important, as, while a disease's physical symptoms may match exactly, a non-endemic disease is unlikely to infect a novel population without a facilitating factor.

Geographical Origin

Another major factor in accurately identifying this novel disease described by Cyprian is to determine its geographical origin. Without further archaeological work on the third-century plague pits and scientific study of discovered remains, the exact origins of the plague will likely remain a matter of debate for the foreseeable future. Kyle Harper asserts that mass graves found outside of the Egyptian city of Thebes point to a dramatic death toll.[164] These mass graves were covered in lime to dissolve the bodies, a practice that was relatively uncommon in Egyptian sites. Later archaeological publication indicated that the site dates after the "second century AD."[165] As Haldon states, Harper "uncritically accepts" the earlier reports, and does not address the three lime kilns and relatively "few" bodies found at the site.[166] These facts indicate that the site is unlikely to be a result of the Cyprianic Plague. Additional research will be required to confirm these findings. However, Harper's analyses of these archaeological reports are used in order to confirm the statements made by Dionysus Bishop of Alexandria, which is likely why Harper has

[164] Harper, *The Fate of Rome*, 143.; Kearns, "Plague in Crisis," 137.
[165] Haldon, *Response to Kyle Harper's The Fate of Rome,* 3.2 The Cyprianic Plague.
[166] Haldon, *Response to Kyle Harper's The Fate of Rome,* 3.2 The Cyprianic Plague. "The first excavation report thus does not support the dating of the bodies to the mid-third century CE. Several excavation seasons later, the bodies were redated to "after the second century AD" (Tiradritti, 2014). Harper accepts uncritically this 2014 report, which confidently connects the site to the Cyprianic plague. Third-century pottery and third–fourth century oil lamps narrowed the date of the interred Egyptians, but they do not support the claim that the three lime kilns also reported at the site, which likely burned all day and night (hence the lamps), were producing slaked lime in order to cover the bodies of large numbers of disease victims. These were supposedly thrown onto the bonfire that was excavated at the site in 2010, at the time of the Cyprianic plague. How many corpses were incinerated, whether or not they were diseased, and when they died we cannot know. The small number of skeletons found at the site so far, whether or not it corresponds to the Cyprianic plague, cannot be interpreted as a mass grave."

not altered his position to account for more recent archaeological data, as the previous reports confirmed his assertions.[167]

Plague pits aside, there are aspects of Roman trade that can be examined in attempting to elucidate the disease's arrival. Many possible paths existed that could have been responsible for the arrival of the Cyprianic Plague into the Mediterranean world. The vast scale of Roman trade routes throughout Europe, Africa, the Middle East and beyond, while highly profitable, created numerous opportunities for previously localized diseases to spread outside their normal ecology. Many of the most vulnerable trades were those to the east, routes to what was the Han dynasty and the Indian subcontinent, and south to the forests of sub-Saharan Africa. These centers of exchange were exceptional places of wealth, culture, luxury goods, and, likely, also disease. The trade routes that linked Rome to the world beyond its frontiers were extensive.[168]

The Garamantes conducted long distance trans-Saharan trade from their cities, including Garama, that connected the frontiers of the Roman Empire to the forested region south of the Sahel. Liverani asserts that trans-Saharan trade between the Romans and sub-Saharan Africa was substantial.[169] He addresses significant archaeological data that suggests that the Kingdom of the Garamantes' prosperity was directly linked to the strength of the Roman Empire. This fact implies that trade with the Romans represented key sources of money and opportunities for commercial expansion of the Garamantes.[170] The Garamantes were an important group because they controlled the trans-Saharan routes not just from north to south, but also east and west. The Garamantes were the "middle-men" of the trans-Saharan trade, and facilitated the movement of

[167] Haldon, *Response to Kyle Harper's The Fate of Rome,* 3.2 The Cyprianic Plague.
[168] Raoul McLaughlin, *Rome and the Distant East: Trade Routes to the Ancient Lands of Arabia, India and China* (London: Bloomsbury Publishing, 2010).
[169] Mario Liverani, "The Garamantes: A Fresh Approach," *Libyan Studies,* 31 (2000). 25-27.
[170] Mario Liverani, "The Garamantes: A Fresh Approach," 25-27.

commodities like gold, salt, ivory, gemstones, and slaves. [171] The eastern route through the Sahara connected the large urban center of Alexandria to the resource rich lands in the south, and this is the reason that Roy Deferrari speculates that the disease described by Cyprian struck Alexandria first.[172] The movement of these valuable commodities, and the significant number of enslaved persons, necessitates a well-established trade route. The Garamantes facilitated the continuance of this trade until the East Roman empire reconquered North Africa which was held by the Vandals.

Existing records indicate that the Cyprianic disease outbreak had the most severe impact on Roman North Africa, the province of Egypt, and the city of Rome itself.[173] This fact strongly suggests that first contact between the Roman world and the illness occurred somewhere along the African frontier region. While the disease was capable of spreading over vast distances, it would have found an epicenter in the location near where it first appeared. The extent of Roman disease control is thought to have been relatively poor. While they understood that human waste and rubbish should be removed from within the *urbs* so that it would not contaminate anything else, this was the extent of their knowledge of sanitation. [174] The sewer and rubbish systems were advanced for the period, however, it was not an adequate intervention to stem the tide of devastation caused by transmissible diseases. Due to a lack of knowledge and the ability to apply

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[171] Andrew Wilson, "Saharan Trade in the Roman Period: Short-, Medium-, and Long-distance Trade Networks." *Azania: Archaeological Research in Africa,* 47(4) 2012; 413.
Elizabeth Fentress, and Andrew Wilson. "The Saharan Berber Diaspora and the Southern Frontiers of Byzantine North Africa." In *North Africa under Byzantium and Early Islam*. Edited by Susan T. Stevens and Jonathan P. Conant, 41-63. (Washington, D.C.: Dumbarton Oaks, 2016), 56. Between 5,000-10,000 moved from sub-Saharan African into the Roman Empire.
[172] Cyprian, *Saint Cyprian: Treatises,* trans. Roy J. Deferrari, (New York: Fathers of the Church Corporation, 1953) See Footnote on 123. [172] This remains highly speculative as we do not know when exactly the disease broke out in the North.
[173] Scattered texts such as letters and biographies seem to indicate that the disease impact was highly concentrated in the southern Mediterranean region the worst. (Cyprian, *De moralitat*e – North Africa), (Eusebius, *Historia Ecclesiastica,* VII.21 – Egypt), (–, *Historiae Augustae*: *Gallieni Duo,* IV, 3. – Rome)
[174] Koloski-Ostrow, Ann Olga. "Ita Pestilens Est Odore Taeterrimo: Reading Roman Sanitation from the Sources." *The Classical Outlook,* 93,2 (2018): 53-61.

it, the Roman Empire did not have an effective method of dealing with disease outbreaks. The diseases would instead fester and spread within the first urban centers to which they were brought, especially if those diseases are transmitted through bodily fluids which could contaminate water sources. Thus, it is likely that the disease originated in Africa as these regions were especially hard hit. The lack of sanitation would have then allowed the illness to infect a large population in an urban setting, essentially diffusing across all social classes, before spreading unabated throughout Roman territories, no matter how remote.

Harper and Kearns' dismissal of Lassa fever ignores the immense scope and frequency of Roman trade with sub-Saharan Africa. Lassa fever can spread human-to-human, even if its transmissibility among humans is lower than that of Ebola. It is unlikely, however, that an individual infected by the Ebola virus could have initiated the arduous journey and survived long enough along the long route between villages, oases, and urban centers that sustained this physically demanding route through the desert, with often weeks between waypoints. In contrast, only about 20% of Lassa fever cases are symptomatic, meaning that the disease could propagate without notice, particularly in the slave populations that were being transported across the desert.[175] If Ebola were to have spread in this manner, it would have likely killed all of those who had been travelling in the slave caravan. For this reason, Ebola would have had much greater difficulty crossing the Sahara via human host than Lassa fever.

Additionally, it is important to examine other ancient textual sources and their descriptions of the impact that the Cyprianic outbreak had on the Empire. While notoriously unreliable in many ways, the *Scriptores Historiae Augustae* recounts that, "for so great a

[175] See, **Possible Pathogenic Agents**

pestilence, too, had arisen in both Rome and the cities of Achaea that in one single day five thousand men died of the same disease."[176] Pontius, who is a much more reliable source, wrote:

> "later in Cyprian's life there broke out a dreadful epidemic and the devastation of an abominable disease great beyond measure. Countless people were seized daily in their own homes by a sudden attack; one after another the homes of the trembling crowd were invaded. Everyone shuddered, fled to avoid contagion, wickedly exposed their dear ones, as if along with the person who was about to die from the plague one could also shut out death itself. Meanwhile, throughout every district of the city there lay no longer the dead bodies, but many diseased and dying people who asked the pity of the passers-by."[177]

Aurelius Victor states, "thereafter a plague broke out and while it raged ever more violently Hostilianus died but Gallus and Volusianus won popular favor because they meticulously and assiduously arranged the burials of all the poorest folks."[178] Orosius relates,

> "Where the edicts of Decius for the destruction of churches circulated, to those places a pestilence of incredible diseases extended. Almost no Roman province, no city, no house existed which was not seized by that general pestilence and laid bare." "Galienus unhappily remained in power for fifteen years, while the human race had little relief from an unusually continuous and severe pestilence…a great pestilence harassed the entire Roman Empire." [179]

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[176] Trebellius Pollio, *The Scriptores Historiae Augustae: Gallieni Duo,* trans. by David Magie, (Cambridge: Harvard University Press, 1968), 4.3.
[177] Pontius, *Life of Cyprian,* 9 (13-14).
[178] Aurelius Victor, *Liber de Caesaribus,* 30.
[179] Orosius, Paulus. *The Seven Books of History Against the Pagans.* Translated by Roy J. Deferrari. (Washington: Catholic University of America Press, 1964). VII.21 and VII.22.

Eusebius recounts, “after these events, when war succeeded pestilential disease…now all is lamentations, and all are mourning, and wailing re-echo daily throughout the city because of the multitude of the dead and the dying,”[180]And the late Roman author Zosimus says: “A plague afflicted cities and villages and destroyed whatever was left of mankind: no plague in previous times wrought such destruction of human life, ” “a plague struck Valerian’s troops, carrying off the majority,” and,

> “when Illyricum was in extreme danger from the Scythians’ invasion and the whole Roman Empire was tottering towards destruction, an unprecedented plague struck the cities. This made the disasters suffered at the hands of the Barbarians seem mild in comparison and led those struck down by the disease to consider themselves fortunate.”[181]

These apocalyptic descriptions provide important information about how the plague was viewed both by contemporary sources (Pontius and Eusebius) and later sources (Victor, *Historiae Augustae,* and Zosimus). They recount the traumatic toll that the disease took on local populations.

Among the diseases considered for this differential diagnosis, only two have stood with reasonable plausibility. Ebola and Lassa fever hold similar symptomatologies to the disease recorded by Cyprian; however, the nature of their impact differs considerably. For this reason, to gain more clarity, it is necessary to investigate other textual sources that discuss the outbreak. Many historical sources, particularly those of political or religious origin such as Zosimus,

[180] Eusebius, *Historia Ecclesiastica*, VII.22. Chapter 22 is a letter from Dionysus of Alexandria that was written during the outbreak and preserved. It is filled with colorful descriptions of the events that transpired in Alexandria during the outbreak. Though it is far to extensive to cover here, I recommend a full reading of this incredible account.
[181] Zosimus, *New History*, trans. Ronald T. Ridley (Boston: Brill, 1982); I.26, I.36, I.37.

Orosius, and others, embellish and amplify the severity of circumstances. These sources have vested interests in portraying the outbreak as more acute and devastating that the events truly were. This portrayal either demonstrates moral failings of the Roman Empire because of their embracing of Christianity, in the case of Zosimos or because of the persecutions targeting Christianity, in the case of Orosius.[182] It is certainly likely that the outbreak was truly horrific and novel to those who endured it, but it is important to be especially critical of sources that seek to portray events as divine justices.[183]

Both Kyle Harper and Amber Kearns assert that Ebola is the most likely Cyprianic Plague candidate. These scholars take the statements made by Cyprian in a vacuum, calling on only a limited number of other viable sources, or from an investigation into Roman trade. Neither of these authors take into account the descriptions provided by other ancient sources or extensively consider the patterns of movement that could have facilitated the movement of a sub-Saharan disease into the Mediterranean. Instead, they relied solely on the account of the illness laid out by Cyprian, and their own reading of it. This approach is, however, not adequate to establish a differential diagnosis. Environmental factors such as location and interpersonal contacts are important aspects of modern differential diagnosis and should be integral to historical diagnoses as well. Additionally, it is vital to explore the broader consequences of the disease on the communities afflicted, because, in cases like the Cyprianic Plague where there is limited information about the disease itself, the cultural impact that it inflicts could be just as significant as the symptoms it presents. Kearns and Harper cite only those sources which are

[182] Zosimus, *New History* (Boston: Brill, 2017) xi. "he was renowned for his militant paganism."
Roy J. Deferrari, "Introduction," *The Seven Books of History Against the Pagans, xv-xx.*
[183] Orosius, *The Seven Books of History Against the Pagans,* vii.21. "Vengeance for the violation of Christian name spread out and where the edicts of Decius for the destruction of churches circulated, to those places a pestilence of incredible diseases extended."

directly referring to the plague itself, without a discussion of these secondary sources regarding trade and cultural shifts, there are two dangerous assumptions that need to be made in order to make a viable differential diagnosis. First, the ancient sources are factual and accurately depict the extent of the devastation. Second, they have not over emphasized the damage to the Empire caused by the disease for political and religious purposes. Neither of these assumptions can be adequately be addressed or verified which makes any conclusions drawn, based on them, highly suspect.

The strongest piece of evidence which historians have used to support their position for Ebola as the Plague of Cyprian is its high case fatality ratio.[184] As the 2014 West African Ebola outbreak demonstrated, even today with modern medicine and organized contact tracing systems, the Ebola virus is incredibly difficult to contain. In the pre-modern world, it would have been next to impossible to stop. This transmissibility, coupled with a mortality rate of between 40%-88%, would have caused mass panic and death. Rome, which the *Historia Augusta* states as having had an outbreak, would have been all consumed by the disease. Five-thousand deaths a day would have been a low estimate if the disease was indeed Ebola, and it is likely that over a quarter of the city would have been killed by the end of the outbreak.[185] Yet, while the city was devastated, it remained an important ceremonial and trade center in the Empire. Later writers simply reference the disease as severe but only in passing, and not as an all-encompassing force that brought the Empire to its knees, which Ebola would almost have certainly done. Both

[184] Harper, *The Fate of Rome,* 143-144; Kearns, "A Plague in a Crisis," 50-51.; Stange, Natasha, "Politics of Plague: Ancient Epidemics and Their Impact on Society" (2021). 2021 Claremont Colleges Library Undergraduate Research Award.

[185] Trebellius Pollio, *The Scriptores Historiae Augustae: Gallieni Duo,* trans. by David Magie, (Cambridge: Harvard University Press, 1968), 4.3. Assuming a modest CFR of 50% and a herd immunity of 52.6% (average of 42.2-63.0% with modern treatment), Ebola would claim ~ 26.3% of the population. Kimberly Gittings and Kelly Matson, "Establishing Herd Immunity Against Ebola Through Vaccination." In *Vaccine*, 34.24 (2016): 2644-2647.

Harper and Kearns wrote before the contemporary COVID-19 outbreak, where a mere 3% case fatality ratio has had a catastrophic impact for those experiencing it. The current situation with COVID-19 demonstrated that even a disease with a mere 1% mortality rate overall, like Lassa (in the modern period with disease specific drugs), can still have a devastating impact on lives.[186]

While there are significant criticisms of how Harper and Kearns have reached their conclusions, I understand their rationale for determining that Ebola was responsible for the Cyprianic Plague. Despite the fact that Ebola is less likely to cause neurological complications, its similar symptom profile is difficult to dismiss. Ebola would certainly have been capable of inflicting the devastation described by Cyprian and the other sources. Importantly, the R_0 of Ebola is between 1.36-1.83 whereas Lassa fever's R_0 is between 1.22-1.33.[187] Thus, the transmissibility for Lassa is lower than Ebola. However, it is still consistent with the seasonal influenza virus with an R_0 of 0.9-2.1 (mean of 1.3), which is highly transmissible.[188] This quality of the Ebola virus would have allowed the disease to continue to spread rapidly and disperse without serious limitations on its circulation. Many textual sources that are available are unreliable, as they use the impact of the disease to further their philosophical and religious arguments and, in so doing, likely distort the true impact of the disease. But it would be unwise to dismiss that fact that even two and three centuries after the outbreak, it was still remembered as one of the greatest outbreaks that Romans had ever endured. This situation indicates that either some sources overstate the extent of the damage the disease caused, or that, in fact, it was

[186] See, **Possible Pathogenic Agents**
[187] Shi Zhao, et al. ""Large-scale Lassa Fever Outbreaks in Nigeria: Quantifying the Association Between Disease Reproduction Number and Local Rainfall." *Epidemiology and Infection*, 148.4 (2020). G. Chowell, N. W. Hengartner, C. Castillo-Chavel, P.W. Fenimore, J.M. Hyman. "The Basic Reproductive Number of Ebola and the Effects of Public Health Measures: the Cases of Congo and Uganda." In Journal of Theoretical Biology, 229.1 (2004):119-126.
[188] Chowell G, Miller MA, Viboud C. "Seasonal Influenza in the United States, France and Australia: Transmission and Prospects for Control." Epidemiology and Infection, 136, no. 6 2007: 852-864.

severe enough to be remembered, and recorded, for generations. While this evidence makes an excellent case for the Ebola virus as a candidate for the disease described by Cyprian, there is a serious obstacle to it being the culprit that has not yet been addressed. If Ebola is the cause of this plague, it would have had to have crossed the Sahara.

Ebola's crossing of the Sahara remains difficult to reconcile. Both Ebola and Lassa fever would have had to move from sub-Saharan Africa to the Roman Empire. The disease was most likely brought north into the Roman Empire through the Saharan trade routes, rather than along the Nile. As previously discussed, these trade routes were controlled by the Garamantes, from their Capital of Garama in the Fezzan region (located just south of the Roman province of Tripolitania and in the southern region of modern Libya). The routes were extensive and physically demanding, "the main trans-Saharan routes were from Chad and Agades northward via Fazzan, along which a slave trade seems to have developed in the first to third centuries AD that may have rivalled in importance that of the medieval period."[189] It is through these slaves that the disease would most likely have been brought to Rome because, "although slaves, and in Late Antiquity some gold, were trafficked across the Sahara from south to north, very few other goods made the same crossing."[190] At the peak of the ancient trade route's usage, between 5,000-10,000 slaves were transported from sub-Saharan Africa to Rome each year.[191] Additional evidence for the disease crossing by way of these trans-Saharan routes lies in the volume of trade between the Garamantes and the Romans: "The peak of this trade […] was between the late first and the third or early fourth centuries, after which there was a clear downturn in the late Roman

[189] Andrew Wilson, "Saharan Trade in the Roman Period: Short-, Medium-, and Long-distance Trade Networks." *Azania: Archaeological Research in Africa,* 47(4) 2012; 441.
[190] Wilson,"Saharan Trade,"441.
[191] Elizabeth Fentress, and Andrew Wilson. "The Saharan Berber Diaspora and the Southern Frontiers of Byzantine North Africa." In *North Africa under Byzantium and Early Islam*. Edited by Susan T. Stevens and Jonathan P. Conant, 41-63. (Washington, D.C.: Dumbarton Oaks, 2016), 56.

period."[192] This downturn began during the third century crisis because less trade was being conducted as a result of instability; however, despite the reestablishment of central authority in Rome under Emperor Diocletian in 284, trade continued to decline from the middle to late third to the sixth century. This decline is attributed by Wilson to widespread infighting as more fortified settlements are found to have been built during this period.[193] While the presence of the forts is highly suggestive of internal conflict, it is possible that the strife was triggered by a shock to the systems of authority in the third century. The presence of the Cyprianic Plague could have served as such a shock to the social and political structure of the region and explains the difficulty in long-term recovery. The possibility of this being the case is further substantiated by exploring how the disease would have moved in the desert caravans. The desert crossing took a minimum of three months.[194] Ebola is a dramatic disease with highly aggressive symptoms. It would have killed anyone who displayed symptoms in the desert and arid regions, as the caravans strategically moved to have access to a water source at least every ten days.[195] If an individual became symptomatic with Ebola between water sources, there would have been little chance of survival. Ebola's incubation ranges from 1-21 days, and symptoms usually appear in 5-9 days.[196] This fact suggests that the disease would likely have appeared with the caravans after they departed from Gao or Chad. The visually terrifying symptoms would have caused the others in the caravan to flee but they too would have had difficulty finishing the journey as well. As the healthy and infected would have been drinking from the same water and, because they were slaves, they would have been close together and shared food, water, and other resources,

[192] Wilson,"Saharan Trade,"441.
[193] Wilson,"Saharan Trade,"437.
[194] David Mattingly, et al., *Trade in the Ancient Sahara and Beyond*. (Cambridge: Cambridge University Press, 2017), 20.
[195]Mario Liverani, "The Libyan Caravan Road in Herodotus IV.181-185," In *Journal of the Economic and Social History of the Orient,* 43.4 (2000): 499.
[196] Nicholas J Beeching, Manuel Fenech, and Catherine F Houlihan, "Ebola Virus Disease." In *The BMJ,* 2014: 349.

the rate of infection would have been terrifyingly high. Ebola would likely have consumed the entirety of the caravan before they reached a more stable and supportive environment. Because of Ebola's high mortality rate, it is highly doubtful that an infected caravan would have been able to successfully finish the crossing of the Sahara.

In contrast, Lassa fever is a somewhat milder VHF, despite the fact that the death rate for symptomatic patients who receive no medical treatment at all can still reach a staggeringly high 26%.[197] However, Lassa fever can present in a mild manner, with many "asymptomatic" cases who are infected but experiencing mild enough symptoms that they are not noticeably ill. In addition, Lassa also has a much longer incubation period of 6-21 days and the virus can often be detected in the urine up to nine weeks after recovery and three months in the semen of an infected individual.[198] The combination of milder symptoms, longer incubation periods, and the ability to infect people long after symptoms have dissipated make it more plausible that Lassa could have crossed the desert.

A disease candidate for the plague described by Cyprian with an incredibly high mortality rate like that of Ebola is, somewhat paradoxically, a problem. For example, during the highly precise and organized crossing of the desert caravaneers would undoubtedly have noticed the high number of deaths that were taking place among the human cargo. In contrast, a disease with a lower mortality rate where only a few under-fed and poorly treated slaves died over the course of the grueling trans-Saharan passage would have been expected and the cause would likely have been overlooked. Further, if Ebola was responsible for the outbreak, it would have brought life in the Mediterranean region to a complete standstill and, like the Black Death over a

[197] O. Ogbua, E. Ajuluchukwub & C.J. Unekec. "Lassa fever in West African Sub-region: An Overview." In *Journal of Vector Borne Diseases* 44, 2007: 7.
[198] Richmond and Baglole, "Lassa Fever: Epidemiology, Clinical Features, and Social Consequences." in *BMJ* 327(7426), (2003).

millennium later, would have taken centuries for the population to recover.[199] Yet, wars like that of the Emperors Gordian III and Valerian against Persia, and Emperor Gallenius's wars against the Alemanni and the Goths, were still continuing to occur. Given that these events took place concurrently with the outbreak, it is possible to assume that this is not a disease with a mortality rate of between 40%-80%, as major campaigns continued to take place that would have been halted if 40% of the population was killed or sickened.[200] Further, the Cyprianic plague only produced a few contemporary sources like Cyprian and Dionysus of Alexandria. If the Cyprianic Plague did have a mortality roughly equivalent to the Black Death (30%-70%), it seems unlikely that one sermon and a few scattered mentions in letters would be our only contemporary sources.[201]

Finally, the symptoms of Lassa are more similar to those described by Cyprian. Below is the official World Health Organization statement on Lassa fever's symptoms intended for a general audience and to be only a brief explanation of symptoms, followed directly by the description of Cyprian:

> "The onset, when it is symptomatic, is usually gradual, starting with fever, general weakness and malaise. After a few days, headache, sore throat, muscle pain, chest pain, nausea, vomiting, diarrhoea, cough, and abdominal pain may follow. In severe cases facial swelling, fluid in the lung cavity, bleeding from the mouth, nose, vagina or gastrointestinal tract and low blood pressure may develop...

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[199] Siuda Fabian, and Sunde Uwe. "Disease and Demographic Development: The Legacy of the Plague." *Journal of Economic Growth* 26, no. 1, (2021).: 1-30,

[200]Maria D. Van Kerkhove, et al., "A Review of Epidemiological Parameters from Ebola Outbreaks to Inform Early Public Health Decision-making." In *Scientific Data,* 2 (2015).

[201] Stenseth, "Plague: Past, Present, and Future," The Plague Eco-Epidemiological System.

> Shock, seizures, tremor, disorientation and coma may be seen in the later stages. Deafness occurs in 25% of recovered patients." [202]

> "Now, then, the bowels, loosened into flux, disembowel the strength of the body, then a fire [fever], catching in the marrow, boils forth among wounds in the throat, then the intestines are shaken by constant vomiting, then the eyes begin to glow with the violent force of blood, then for certain persons either the feet or any other portions of the limbs are cut off by the touch of the diseased rottenness, then, through losses and damages of the bodies, with faintness rushing, either walking is impaired or hearing is blocked or the sight is blinded. This makes for a lesson of faith."[203]

The symptom profiles between the modern delineation of Lassa fever and Cyprian's description of the plague in his community are remarkably similar. Thus, the disease that afflicted the Roman Empire in the third century was, most probably, Lassa fever. The Cyprianic Plague presents a symptomatology that is more closely aligned with Lassa fever than any of the other likely candidates considered here. The Lassa fever's incubation and severity would have allowed it to make the passage through the Sahara successfully. Lassa fever is also devastating enough that people would have remembered its impact a century later, yet not catastrophic enough to bring the Mediterranean world to a standstill, as Ebola almost certainly would have. In conclusion, the Cyprianic Plague was most probably caused by the Lassa virus and, thus, Lassa fever is the best disease candidate for the outbreak described by Cyprian in the *De mortalitate.*

[202] World Health Organization, "Lassa Fever Symptoms," July 2017. https://www.who.int/news-room/fact-sheets/detail/lassa-fever
[203] Cyprian of Carthage, *De Mortalitate,* CCSL. 14.

Growth of Christianity in the Third Century

Part of Christianity's allure during the Cyprianic Plague was its structure and purpose, offering people a degree of routine and comfort in the wake of overwhelming loss.[204] The destructive force of the Cyprianic Plague was felt by all Romans, both Christian and non-Christian. Disease outbreaks are a unique form of acute crisis as they are capable of touching all communities regardless or religion, wealth, political status, and even distance. Because of the arbitrary and indiscriminate nature of disease, it carries a frightening psychological impact. The effects can drive desperate individuals to seek solace and meaning for their suffering anywhere they can find it. Roman religion was institutional and essentially secular, meaning that its purpose was to provide pragmatic and structural support for the government authorities, while offering relatively few opportunities to pursue philosophical or religious outlooks or perspectives.[205] Nonetheless, Roman religion permeated every aspect of society, from public games and feasts to sacrifices and prayers. The Roman world divided the religious observances, *res sacrae* (sacred things), and the governmental authority, *res publica* (the public things), as a way of "legitimizing" Roman authority.[206] Stoicism furnished a framework for understanding ethical behavior but tendered little consolation to victims in crises or their families. Cyprian also introduced Stoic elements into his practice of Christianity, encouraging his congregation not to grieve publically.[207] The actions taken and beliefs proclaimed by Christians created a legitimate and potent path for both mourning and supporting others in their loss and grief. Christians were instructed by Cyprian to help all people, regardless of whether they were Christian or not, even

[204] Rodney Stark, T*he Rise of Christianity: How the Obscure, Marginal Jesus Movement Became the Dominant Religious Force in the Western World in a Few Centuries,* 193-194. Stark refers to this a "religious economy."
[205] Michael Lipka, *Roman Gods: A Conceptual Approach*. (Boston: Brill, 2009), 168-185.
[206] Ando, *Imperial Rome AD 193 to 284*, 55-58.
[207]Cyprian, *On Mortality,* Chapter 20.

in the middle of persecutions.[208] The model of empathetic response to the sick demonstrated by Christians during the plague likely aided greatly in the mass conversions which took place in the third century. Additionally, Christians demonstrated a strange fearlessness and disregard towards death, exemplified best by the martyrs that died in the persecutions. Exploring the Christian response to this crisis offers a new path of inquiry into how organizations grow and thrive through crisis. I will analyze the actions taken by Christians in response to the crisis and examine how these actions led to a more positive view of Christianity among Romans as well as a greater number of conversions.

During the third century the Roman Empire struggled to maintain its political and social cohesion. The previously constructed power systems, namely the military, government, and religious structures weakened significantly, leaving Roman authority vulnerable. While these traditional structures survived the uncertainty of the Third-Century Crisis, they were fundamentally altered in their function and identity. The traditional power structures lost credibility due to decades of mistrust, poor administration, and the rise of new faiths that challenged the central authority of the Roman Empire. During the tumult of the Third-Century Crisis, a unique mystery cult with Jewish origins, Christianity, was able to grow substantially. Christianity entered the third century with an estimated congregation of just under 218,000 members; by the year 300 CE the population is estimated to have been just over 6,000,000.[209] Death was universally pervasive in the third century. It was brought by war and its consequences, persecution, and a devastating disease. Death surrounded and terrified the citizens of Rome. Christianity was able to achieve its extraordinary rate of growth partly because it was

[208] Cyprian, *On Mortality,* Chapter 26. And Stark, *The Rise of Christianity,* 83-88.
[209] Stark, *The Rise of Christianity*, 5-7. This calculation seems to be made using various accepted sources. These sources include the widely accepted figures for the year 200 and year 300. With this information Stark estimated an 43% growth rate per decade.

seen as a path to overcome death and as a direction for certainty in uncertain times. Christianity addressed the uncertainty that plagued Rome's traditional power structures and provided a path to transcend death.

The Roman persecutions of Christian communities varied throughout the Empire and their extensiveness in some parts of the Empire allowed Christianity to establish an identity as being a faith in opposition to the state. Emperor Nero is often credited as the first Roman Emperor to conduct a persecution against the Christian community, and notably being responsible for the execution of Saint Paul and Saint Peter in Rome. While there exists no solid evidence that this targeted persecution ever took place, by the time of Tertullian, Bishop of Carthage in 190 CE, this idea of the 'Neronian Persecution' had become mythologized and a core part of the Christian identity of North Africa.[210] This mythologizing of the Neronian Persecution was likely because Tertullian was witnessing the persecution of Christians in his own community. After Emperor Septimius Severus came to power, laws regulating Christian behavior became more widely enforced. Because of this change in approach, and departure from the local proconsular authority, the first organized persecution of Christian began.[211] The Severan Persecution was relatively brief, though memorable to those who endured it. During this persecution both men and women were executed for their faith. Two of the most famous of these martyrs were Felicity and Perpetua. These women were captured after being discovered in the possession of the Christian religious texts, and later executed for refusing to renounce their beliefs.[212] This situation is unique as there does not seem to have been wide scale violence

[210] Brent D Shaw, "The Myth of the Neronian Persecution." *The Journal of Roman Studies* 105 (2015): 73-100.
[211] Frend,*The Rise of Christianity,* 272.
[212] Burns and Jensen, *Christianity and Roman North Africa,* 8-11; Jennifer Rhea, and Liz Clarke, *Perpetua's Journey: Faith, Gender, & Power in the Roman Empire* (New York: Oxford University Press, 2018).

against the Christian community organized by the Roman authorities prior to this persecution.[213] Additionally, Tertullian states that Christians were, "a great multitude of men – almost a majority in every city."[214] While this is no doubt hyperbole, it does suggest that the Christian population represented at least a substantial minority in urban centers. This fact leads to an important point when discussing the extent and severity of persecutions throughout the Empire. Because the authority and administration of laws were left to the local governors and proconsuls, the laws and regulations were not applied evenly throughout the empire, and, in fact, those imprisoned for religious transgressions often were not put to death. The passing of a capital sentence was often dependent on the emotions and mood of the crowds at the trial.[215]

This standard of practices changes with later persecutions in North Africa. The next major persecution begins under the authority of Emperor Decius (249/250CE). Decius's usurpation and accession to imperial power was hard won at the Battle of Verona in 249. As a result, he wanted to ensure a strong central allegiance to Rome so as to reinforce his newly acquired authority. To demonstrate this, he required that all citizens of the Empire give a sacrifice to the Imperial cult, with an exemption offered to the Jews.[216] This edict of a *vota solemnia* (sacred offering), was not unique to Decius as it was required not infrequently to shore up power for the Roman state.[217] However, this 250CE edict had a different and unexpected effect.[218] Local governors, especially in North Africa and Egypt, began forcible implementation of these sacrifices, going so far as to issue official *libelli* or receipts for a sacrifice.[219] The

[213] Ando, *Imperial Roman AD 193 to 284,* 134-140.
[214] Tertullian, *To Scapula*, trans. R. Arbesmann (New York: Fathers of the Church Incorporated, 1950), *2.*
[215] Burns and Jensen, *Christianity and Roman North Africa,* 8-11.
[216] Patout Burns, *Cyprian the Bishop* (New York: Routledge, 2002), 17.
[217] Ando, *Imperial Roman AD 193 to 284,* 134-140.
[218] Burns and Jensen, *Christianity and Roman North Africa,* 12-14.
[219] Ando, *Imperial Roman AD 193 to 284*, 135, n. 135. On *libelli.*
There were other locations in which large scale persecutions took place; however, nowhere in the Empire was it as severe as Roman North Africa.

reasons for this sharp change in policy are varied. Historians, like Clifford Ando, suggest possible superstition surrounding the one thousandth year after Roman's founding, another common claim is instability in the Empire and the desire of local authorities to maintain order in their respective provinces. [220]

Frend relates Eusebius' suspicion that Decius chose to issue an edict that did not exempt Christians from sacrifice, out of spite toward Philip whom he had defeated at Verona.[221] Before Decius's victory at Verona in October of 249, Emperor Philip had been exceptionally tolerant of Christianity. Philip's wife, Otacilia Severa, was rumored to have corresponded with the Christian theologian Origen.[222] Many died in the Decian Persecution including: Babylas of Antioch, Alexander of Jerusalem (died in prison before trial), Origen, Pionius of Smyrna and Fabian, Bishop of Rome, whose trial and execution were overseen by Decius personally. Lay people in the community were also targeted. The issuance of *libelli*, receipts for sacrifices, was instituted to prove individuals had fulfilled their legal mandates. These acts caused mass sacrifices from the Christian community out of fear. This event was no doubt catastrophic to the Church, causing a crisis over the legitimacy of the *lapsi*'s return to community life. Frend states that, "the Christian Church practically collapsed."[223] Yet, prominent members of the faith, and not the larger body of the faithful, represented the main target of the persecution. The Christian community was assaulted by local authorities but when individuals like Cyprian of Carthage, Dionysius of Alexandria, and Gregory the Wonderworker fled, they were not pursued. If the persecution was indeed as severe as authors like Frend argue, the persecution of Valerian five years later would have been unnecessary and could have been expected to crush what was left of

[220] Ando, *Imperial Rome AD 193 to 284,* 134-135.
[221] Frend, *The Rise of Christianity,* 318; Eusebius, *Historia Ecclesiastica,* VI.39.
[222] Frend, *The Rise of Christianity,* 322.
[223] Frend, *The Rise of Christianity,* 318.

the Church quickly. Additionally, what Frend describes as evidence for "collapse" under the Decian Persecution could instead, perhaps, be more accurately portrayed as pressure and the democratizing of power within the church. Frend argues that "the gap between educated and uneducated, cleric and laity was widening."[224] He points to figures who were influential in the Church, Soliassus the mule-keeper and Paula the mat-maker, as evidence for a decline in the Church.[225] These events may be more accurately viewed, not as evidence of a collapse in the Church, but of deeper change. The power in the Church transferred from the aristocrats, who were the primary targets of the persecutions, to the common lay people who were not seen as prominent enough for the Roman authorities to prosecute.[226] However, there is severe disagreement on this topic. Burns argues that Cyprian's tenure as bishop was notable for its pursuit of a rigid social class structure, as the elites retained power with the Church hierarchy.[227] It is possible that both perspectives are true. The aristocratic power structures were under direct pressure from the Imperial authorities. As a result, non-aristocrats were beginning to gain higher status in the Christian clergy; however, there remained enough aristocratic power that Cyprian was able to create a more rigid class structure and utilize violations of that structure as evidence for the severity of the persecution.

An important additional piece of this complex puzzle is the fact that the Plague of Cyprian began to appear in the early 250's. While highly speculative, it is certainly possible that the disease was already ravaging within the Roman Provinces in Africa, and could have triggered, at least in part, the vicious persecution.[228] It was clear from the outset that the imperial

[224] Frend, *The Rise of Christianity,* 322.
[225] Frend, *The Rise of Christianity,* 322.
[226] Frend, *The Rise of Christianity*, 312-230.
[227] Patout Burns, *Cyprian the Bishop,* 67-77.
[228] This remains highly speculative as we do not know when exactly the disease broke out in the North.

authorities cared little about which gods the sacrifices were made to so long as each citizen did so.[229] Whatever caused the change in policy, by the time Decius died in 251 the persecution had already begun to wane.[230] It must be noted that although the policy became significantly more militant towards those who would not sacrifice, Roman authorities often did not pursue punishment against individuals who refused and did not pursue retribution against members of the wider Christian community. An excellent example of this is Cyprian himself. Origen of Alexandria was captured and died in prison.[231] Yet, Cyprian, Bishop of Carthage, was able to escape into exile without being pursued by authorities.[232] Additionally, the Valerian Persecution, which took place under Emperor Valerius (r.253-260) from 257-259, was begun after the end of the Decian Persecution, meaning that whatever the purpose of the religious violence of Decius was, the Decian Persecution ended with Decius's death campaigning against the Goths likely leaving his purpose unfulfilled.[233] The Valerian Persecution was severe and claimed the life of many clergy members, including Cyprian of Carthage. The severity seems to have been a surprise even to the senators in Rome, who requested that Emperor Valerian clarify his harsh edict. Burns and Jensen offer an excellent summary:

> "Christian bishops, presbyters, and deacons were to be executed immediately. High ranking layman were initially to lose their status and property, and to be executed if they persisted (being Christian). Matrons were to be disposed of and

[229] Ando, *Imperial Roman AD 193 to 284,* 137.
[230] J. H. D. Scourfield, "The De Mortalitate of Cyprian: Consolation and Context," *Vigiliae Christianae* 50.1 (1996), 23.
[231] Eusebius, *Historia Ecclesiastica,* VI.39.
[232] Burns, *Cyprian of Carthage,* 1-2.
[233] Frend, *The Rise of Christianity,* 322.

exiled. Members of the imperial staff were to lose their property and sent to work as prisoners on agricultural estates."[234]

However, the period of persecution was ended immediately by Emperor Gallienus, son of Emperor Valerian, who took power in 260, and a period of peace toward the Christians began, referred to as the Peace of the Church or Peace of Gallienus.[235] This much more aggressive approach to the Christian community, the Decian Persecution that ended five years earlier is considered to be the beginning of organized persecutions.

The Decian Persecution is a significant watershed moment not so much because of its severity or the extent of the violence, but due to its novelty. This point does not minimize the persecutions of Decius and Valerian which were horrific in the scope of violent acts, but the severity of these persecutions is up for debate.[236] As Pontius states, these persecutions brought an unusual level of aggression that had not been experienced by the Christian community prior to the Decian Persecution: "The unusual and fierce rioting of a violent persecution was ravaging the people."[237] The persecution under Diocletian, the Great Persecution, would follow the Peace of Gallienus and would be much more violent, and pervasive.

Emperor Diocletian ascended to the Imperial seat of Rome in 284 after defeating Emperor Carinus. Upon taking Imperial office, Diocletian immediately set out to try to unify the Roman Empire both politically and religiously. This desire to centralize Roman authority again turned, unavoidably, to the religious sphere as well as the political world. Though, for the majority of his reign, the Emperor did not expressly persecute Christians, in 303 Diocletian

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[234] Burns and Jensen, *Christianity in Roman North Africa,* 24. This is an excellent summarization of Cyprian, *Epistula,* 81.1.2.
[235] Paul Keresztes, "From the Great Persecution To the Peace of Galerius." *Vigiliae Christianae*, 37.4 (1983): 379-399.
[236] This is further elaborated below in *Cyprian's Curious Martyrdom*
[237] Pontius, "Life of Cyprian," 13.

began issuing edicts that compelled Christians to participate in Roman civic-religious life.[238] The first year of the persecution started by targeting just the upper clergy, but by the second year the authorities had moved to targeting community members.[239] They also ordered Christian holy scriptures to be seized and burned. Additionally, all churches were to be razed and those who still persisted in the faith were to be "deprived of their liberty."[240] Diocletian's pursuit of stability throughout the Empire caused local officials to suppress any acts that were perceived as rebellious to the Roman state or authorities. The Christian community refused to offer sacrifices to the Imperial Cult (a stand-in for the state itself) and refused to turn over religious texts. These defiant acts led to severe persecution and oppression by Roman governors. The persecution was "carefully planned and the consequence had been weighed."[241] The persecution, according to Lactantius, was supposed to occur without bloodshed as Diocletian recognized the power of martyrs among the Christian community.[242] However, Diocletian either underestimated the zealous hatred towards the Christians or Lactantius is incorrect, and Diocletian was intent on breaking the Christian Church through lethal force. Either way, the goal of reestablishing the pagan faith, which was the foundation of the Roman Empire when it was at its height, as the unifying force in the Empire was largely unsuccessful, despite the harshness and ferocity of the repression.[243] The persecution of Christianity only ended with Constantine's victory at the Battle of the Milvian Bridge and the subsequent issuing of the Edict of Milan.[244]

Perhaps the most intriguing evidence that these various persecutions present is that they occurred at all. In addition to the mythologized Neronian Persecution, the Decian, the Valerian

[238]Burns and Jensen, *Christianity in Roman North Africa,* 84
[239] Eusebius, *Martyrs of Palestine, 3.1* (Edict 4, 304)
[240] Eusebius, HE, VIII.2.4-5
[241] Frend, *The Rise of Christianity,* 457.
[242] Lactantius, *On the Deaths of the Persecutors*, XI
[243] Frend, *Rise of Christianity,* 452-463.
[244] Lactantius, *On the Deaths of the Persecutors*, 48.2-12

and Diocletian Persecutions existed in a world seeking unity. The Emperors that came to power did so on the strength of arms and political influence. Religion and religious practice were essential to maintaining their power, and particularly the consensus that supported it. The numerous persecutions indicate that their implementation was either a demonstration of power, not intended to stop the growth of Christianity, or (perhaps most likely) simply unsuccessful, due to the administration by local and regional governance. Ironically, these persecutions likely added to the growth of Christianity rather than slowing it. These persecutions created an important aspect of the Early Church: the role of martyrs. These individuals who sacrificed themselves for the faith provided an example to Romans both inside and outside Christianity of the possibility of transcending death, both through eternal life in heaven and in the living memory of the community.

Cyprian's Curious Martyrdom

Cyprian's martyrdom is a strange event among Roman trials. It put on full display how the local Roman administration attempted to avoid the application of religious policy as it was dictated by the Emperor. The local authorities often showed reluctance to implement punishment against Christian communities despite outside pressures from Imperial officials. This reluctance of Roman authorities can be seen in Cyprian's biography as during the Decian Persecution, "by repeated requests [from the imperial authorities], he was demanded for the lion."[245] This description by Pontius indicates that the central Imperial authorities, or other powerful groups in the Imperial establishment, had ordered him to be executed multiple times, yet these demands went unfulfilled, showing that the local Roman authorities had the discretion and strength to

[245] Pontius, "Life of Cyprian," in *Early Christian Biographies.* trans. Sister Mary Magdeleine Muller and Roy Deferrari, (New York: Fathers of the Church Incorporated, 1952), 11.

refuse on multiple occasions. It seems likely that during the Decian Persecutions high ranking members of the clergy were the primary targets, especially those in the public consciousness. However, the persecution of non-clergy and non-aristocrats that did occur, was focused mainly on Alexandria in Egypt and, to an extent, Roman North Africa.[246] The executions that did take place were carried out because of refusals to offer sacrifices, a symbol of objection to Imperial unity, and for holding Christian assemblies despite clear orders from the Proconsul. The severity of the Decian Persecution is often overstated, as indicated above, with some commentators (e.g. WHC Frend) arguing that it caused "the Christian Church [to] practically collapse."[247] Despite such assertions, the Decian Persecutions did not cause the collapse of Christianity. While there was an increase in violence compared to previous suppression *attempts,* changing the identity of the Early Church, the persecution was not a protracted and on-going event.

This situation changed when Emperor Valerian came into power. The Valerian Persecution was much more extensive and violent than the previous Decian Persecution. Nonetheless, despite the official orders made by Emperor Valerian, their wide-spread implementation is again largely suspect as there are relatively few accounts of official executions.[248] Cyprian's execution was conducted reluctantly by Proconsul Galerius; again, putting the reluctance of the local Roman authorities on full display.

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This idea of a "reluctant executioner" in hagiographies is a trope that arises frequently. Should we accept this as more than a literary device? Roman authorities were, after all, professional statesmen, governors, and lawyers, and could be expected to have dispensed justice without reluctance. Alternatively, these factors might lead us to accept the narrative, as indicative

[246] Frend, *The Rise of Christianity,* 320-328.
[247] Frend, *The Rise of Christianity, 318-321*
[248] Cyprian, *Epistule,* 81.1.2. Cyprian details the orders that the Roman authorities received from the Emperor.

of their understanding the situation on the ground. Cyprian represented an important test case, as the effective leader of the Church in North Africa. While it was normal for authorities to target the leading figures during a persecution, Cyprian had, in the years following the beginning of the Decian Persecution, created a martyr system that was driving these Christians to seek their own executions, as will be discussed later. The proconsul would likely have been aware of this and would have sought to limit its growth. This would have likely resulted in him resisting the execution of Cyprian so that he would not be making the leader of the martyrdom movement into a martyr himself.

The reluctance of the proconsul's tribunal went as far as to confirm Cyprian's request to delay his execution, as stated by Pontius, so that he could put his affairs in order, demonstrating a desire to find any reason available to postpone following through with the official orders. Pontius himself admits that he does not know the reason Cyprian was not executed immediately stating: "Perhaps someone will ask the reason for his return to the officer's house from the praetorium [courthouse]? Evidently, someone wished it, asserting that on his part the proconsul did not want it." [249] This hesitation suggests that the proconsul did not want to execute Cyprian and instead gave him a night, after his death sentence was confirmed, to change his mind. This line of reasoning seems to be confirmed by Pontius when he states, "A kings guard [praetorian], however, had charge of him the one night when he was taken and placed in an officer's house, so that we, his associates and friends, were in his company as usual," and "in the meantime, many eminent people of highly illustrious rank and family came to him, as well as nobles of worldly renown, who repeatedly urged his withdrawal [from the sentence] on the grounds of an friendship with him."[250] These events indicate that Cyprian was respected enough to be allowed

[249] Pontius, "Life of Cyprian," 21.
[250] Pontius, "Life of cyprian." 21.

to reside in an officer's home, to be allowed to receive visitors, and those visitors that Cyprian received urged him to not allow himself to be executed. Further, these events suggest several interesting motives. Pontius clearly states why Cyprian asked for a delay from his execution, yet Pontius contradicts himself by saying that no one will truly know why this reprieve was given, meaning that it is likely his account of the reason is subject to doubt. Second, it points to the local Roman Proconsul Galerius attempting to find a way out of executing Cyprian, allowing him a stay of execution and visitors so that they could convince him not to go through with the execution. Finally, Pontius believes that this was done because of the "proconsul's laziness or aversion in matters divinely effected."[251] It can be inferred here that Pontius is attributing the Proconsul's hesitation to Cyprian's divine status. It is far more likely that the Proconsul understood the power that executing Cyprian would have in his community and was trying to deny him that power. The request of Cyprian's friends alone demonstrates that other nobles and high-ranking individuals saw the execution as Cyprian's choice. The conclusion that can be arrived at illustrates that local Roman authorities did not want to implement Imperial religious suppression and actively attempted to avoid it. This fact is likely the reason why the persecutions that took place before the Diocletianic persecution were so localized. The local governors had discretion in their implementation.

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Cyprian was ultimately executed by beheading after repeated requests by the proconsul to perform the religious rites. It is important to note that the issue at hand in this case relates to Emperor Valerian's order to execute all the heads of the church, yet the local authorities tried on multiple occasions to evade this result in regard to Cyprian, including exiling him and his

[251] Pontius, "Life of Cyprian," 21.

attendants to Curubis. The following trial transcript recounts Cyprian's trial and sentencing, after he was recalled to Carthage from exile:

> "Galerius Maximus: Are you Thascius Cyprianus?
>
> Cyprian: I am.
>
> Galerius Maximus: The most sacred emperors have commanded you to conform to the Roman rites.
>
> Cyprian: I refuse.
>
> Galerius Maximus: Take heed for yourself.
>
> Cyprian: Do as you are bid; in so clear a case I may not take heed.
>
> Galerius, after briefly conferring with his judicial council, with much reluctance pronounced the following sentence: 'you have long lived an irreligious life… Valerian and Gallienus, and the most noble Caesar Valerian, have endeavored in vain to bring you back to conformity with their religious observances… 'it is the sentence of this court that Thascius Cyprianus be executed with the sword.
>
> Cyprian: Thanks be to God."[252]

This interaction between the judge and Cyprian demonstrates clearly that Cyprian wants to be executed. It also shows that the judge is trying to avoid this outcome, though in the end he is compelled to follow law. Both individuals understand the power that martyrdom holds in the Christian community. For this reason, Cyprian refuses to acquiesce to the commands of the proconsul and the judge resists his duty to follow Roman law.

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[252] ---, *"Acta Proconsularia* of Cyprian, CSEL, III. 3, CX-CXIV." In *A New Eusebius: Documents Illustrating the History of the Church to Ad 337, New Edition*. Translated by James Stevenson. Edited by William H.C. Frend. Cambridge: Cambridge University Press, (1987). 247.

In conclusion, it is important to point out that both the Decian and Valerianic Persecutions were violent as they did claim the lives of many high-ranking members of the clergy. The rapid creation of martyrs had the opposite effect that the Roman authorities were trying to achieve. The Christian community grew at a significant pace through the third century with some scholars estimating a four percent annual growth rate.[253]

[253] Stark, *The Rise of Christianity*, 3-27.

The Creation of the Christian Hero Systems

The explosive growth of Christianity between the years of 200CE and 313CE has been ascribed to a variety of causes, from gifted pastoral figures, to the martyrs, and even to general suggestions about the primacy of the Christian faith. The expansion of Christianity during this period was remarkable, especially when religious violence and organized persecution against the faith were frequent. Because of this systematic oppression it is difficult to understand the full extent of the growth, or even how many were part of the faith. However, it was clear that the Decian and Valerianic Persecutions, including Cyprian's martyrdom, ushered in a new era for the Church. This period, until the Edict of Milan in 313, would be characterized by a new Christian identity that focused on religious purity and devotion to the Church, and the ultimate expression of these in martyrdom, which would come into full view during the Diocletian Persecution.[254] The period of persecutions, and the death that came with them, formed a system of martyrdom. Much work has been done to characterize this martyr system, particularly by Peter Brown, and particularly as developed in the era of the Diocletianic Persecution.[255] Following the evidence put forward in this thesis regarding the intersecting crises that hit Carthage in the 250s, and Cyprian's response to them, I put forward another characterization: Ernst Becker's concept of hero-systems.

During these persecutions, a key part of the Christian identity began to form, martyrdom. Martyrs, those Christians executed explicitly because of their adherence to their faith and their

[254] Patout Burns, *Cyprian the Bishop,* 17-15.
[255] Peter Brown, *The Cult of the Saints: Its Rise and Function In Latin Christianity.* (Chicago: University of Chicago Press, 1987). Peter Brown's work surrounding the Cult of the Saints is perhaps the most in depth and well-constructed currently available.

refusal to give public sacrifices, began to gather prestige within the community as symbols of resistance and devotion. Christians widely viewed martyrdom as the ultimate act of devotion, especially as it emulated the sacrifice of Jesus and his apostles.[256] The persecution in Roman North Africa during the reign of Septimius Severus in the very early third century stationed two women as defining archetypes for this religious act. Felicity and Perpetua, two young Romano-African women, one a young mother from a prominent family, the other a pregnant servant, were arrested for possessing copies of the Christian texts, and later executed for refusing to renounce their beliefs. The women were executed by lions for Septimius Severus's son's birthday celebration.[257] These deaths would form part of the core identity of the Christian community in North Africa. Additionally, new ideas began to form around what it meant to become a martyr. These sacrifices for the faith were believed to provide instant ascension into heaven and the promise of eternal life after death.[258] Cyprian definitively asserts this stating, "As to the fact that meanwhile we die, we pass by death to immortality, nor can eternal life succeed unless it has befallen us to depart from here. This is not an end, but a passage and, the journey of time being traversed, a crossing over to eternity."[259] Such a promise of eternity in heaven is a powerful motivator for the conversion to Christianity, especially if death is a constant concern, as heaven could be acquired by anyone who converted to the faith. This concept of life after death drove a rapid increase in the number of martyrs during times of intense persecutions, as Justin the Martyr states, "I watched them stand fearless in the face of death and of every other thing that was considered dreadful."[260]

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[256] Rodney Stark, *The Rise of Christianity,* 184-188.
[257] Burns and Jensen, *Christianity in Roman Africa,* 8-11.
[258] Thomas Heffernan, *The Passion of Perpetua and Felicity,* (Oxford: Oxford University Press, 2012), 29.
[259] Cyprian*, De Mortalitate*, 22.
[260] Justin Martyr, "2nd Apology," in *Writings of Saint Justin Martyr, trans. T B. Falls* (New York, 1948), 132.

Cyprian's conception of martyrdom, however, changed during the Decian Persecution. Over the course of the Decian and Valerianic persecutions, and the years in between, he carefully sculpted and shaped his concept of what martyrdom was and how it should be viewed by the community. Cyprian chastised soon-to-be martyrs while in prison because they spoke out against those who had lapsed in the Christian community.[261] Those individuals seeking martyrdom believed that they had the exclusive right to forgive the lapsed (*lapsi*). Cyprian, however, was able to sufficiently establish himself as the ultimate authority for Christians in North Africa, while still in exile (that is, while avoiding martyrdom himself). With his authority as bishop of Carthage, he began to admit the *lapsi* back into the community by Easter 251.[262] Using the power of his position, and his skill as a religious leader, Cyprian carefully endeavored to exert control over the martyrs and what martyrdom meant, despite considerable opposition from the Novationists, who opposed the readmission of the *lapsi*. In so doing, Cyprian aimed to maintain a strong Church unified against the Roman authorities. Nevertheless, Cyprian took his attempts at unity even further. In response to the deaths of those who had awaited but not attained martyrdom, Cyprian ordered his clergy to record the death dates of all the Christians who had died:

> "Let very willing vigilance and care be bestowed, moreover, upon the bodies of all who, although they may not have been tortured, yet departed the prison by the glorious exit of death. Neither their valor nor their honor is less that they themselves should not be included among the blessed martyrs…in the eyes of God, the one who offered himself to torments and to death suffered whatever he was willing to suffer…they endured even onto death, faithful and steadfast and

[261] Burns, *Cyprian the Bishop,* 30-34.
[262] Frend, *The Rise of Christianity,* 323

> invincible, when to our wish and our confession in prison and in chains is added also the end of dying, the glory of martyrdom is consummated.
>
> And of these finally, take note of the days on which they die the day that we may be able to celebrate their commemoration among the memorials of the martyrs…and, for their commemorations, let there be celebrated here by oblations and sacrifices which, with protection of the Lord, we shall celebrate soon with you."[263]

Cyprian delivered this order so that the memories of the martyrs would be held by the community after their deaths.[264] These martyrs represent titular heroes for the Christian faith. Cyprian's directive to record the death of Christians recognized the power of the act of martyrdom, and sought to institutionalize that power through the collective remembrance of the individual martyrs after death. This action consciously created a hero-system in the North African church. Death by persecution, however, was not the only source of excess mortality for this Christian community: as we have seen, plague also dominated the 250s.

In addition to acts of martyrdom, many Christians (and also non-Christians) died as the Cyprianic Plague swept through the Roman Mediterranean. As we have seen, this disease possessed frightening symptoms. As it hit Roman North Africa, Cyprian observed the indiscriminate nature of the plague:

> "this disease carries off our people equally with the pagans," and "this mortality is a bane to the Jews and pagans and enemies of Christ; to the servants of God it is a salutary departure. As to the fact that, without any discrimination in the human race, the just are

[263] Cyprian, *Letters (1-81),* trans. Sister Rose Bernard Donna, (Washington: The Catholic University of America Press, 1964), 12.1-2.
[264] Burns and Jensen, *Christianity in Roman Africa,* 499.

> also dying with the unjust, it is not for you to think that the destruction is a common one for both the evil and the good. The just are called to refreshment, the unjust are carried off to torture."[265]

Loss of life was a common feature of premodern life, but persecutions, civil war, and plague suffocated Rome in death. It was necessary for them to find a way to understand the suffering and find meaning in existence.

Christianity provided Romans with a philosophy that could help them grapple with the trauma of these mass casualty events. Death is a massive catalyst for human decisions, as Ernest Becker points out: "of all the things that move man, one of the principal ones is his terror of death."[266] Christian belief served to strip death of its terror. The period of upheaval and mortality laid bare the difficulties of maintaining a cohesive state under extreme pressure. The execution of the Christian martyrs gave the community an identity of resistance that bound them together. Under these circumstances, heroes and heroism played a key role in the attractiveness of the Christian faith. The acts of martyrdom were recorded and preserved by the orders of Cyprian so that the community could recognize the individuals as extraordinary through visible communal ceremony. This seemingly minor decision created a "social-hero system" within the Christian church. A hero system is a view constructed by a community regarding which acts it views as heroic.[267] As Becker points out, this concept is introduced at a young age: "the social-hero system into which we are born marks out paths for our heroism."[268] Essentially, Cyprian's decision to make the recognition of official martyrs a church observance created the ideal path for the creation of new Christians. As Becker states, "heroism is first and foremost a reflection of

[265] First quotation: Cyprian, *De Mortalitate*, 8. Second quotation: Cyprian, *De Mortalitate,* 15.
[266] Ernest Becker, *The Denial of Death,* (New York: The Free Press, 1973), 11-12.
[267] Becker, *The Denial of Death,* 82-83.
[268] Becker, *The Denial of Death,* 83.

the terror of death." We admire most the courage to face death; we give such valor our highest and most constant adoration." [269] To Becker, the construction of heroism is a response to death and our attempts to escape it. Cyprian, like Becker, emphasizes the fear of death in his argument:

> "Let him certainly be afraid to die who, not having been reborn of water and the spirit is delivered up to the fires of hell. Let him be afraid to die who is not listed under the cross and passion of the Christ. Let him be afraid to die who will pass from this death to a second death. Let him be afraid to die who, on departing from the world, the eternal flame will torment with everlasting punishments. Let him be afraid to die to whom this is granted by a longer delay, that his tortures and groans meanwhile be deferred."[270]

Principally, Cyprian is showing that a belief in God and a devotion to Christ make the fear of death unnecessary. With this exhortation, Cyprian is using martyrs as the symbols of what bravery towards death looks like. It is instructing the rest of the congregation to challenge their fear of death caused by the plague raging around them, by drawing on the actions of the martyrs and their heroism. The achievement of heroism through martyrdom provides the individual with eternal life, as they know that their sacrifice will be remembered and praised, giving them a symbolic victory over death, and encouraging others to follow and be unafraid of death. Crucially, the concept of heroism was not solely constrained to the martyrs, but also to those who died trying to help those suffering

[269] Becker, *The Denial of Death,* 11-12.
[270] Cyprian, *De mortalitate,* 14.

during the epidemic. Cyprian encouraged Christians within his congregation to help all those who were ill regardless of their religion.[271]

As the plague hit, the residents of Carthage were put to a grave test. Pontius describes the scene in Carthage,

> "There broke out a dreadful epidemic and the devastation of an abominable disease great beyond measure. Countless people were seized daily in their own homes by a sudden attack; one after another the homes of the trembling crowd were invaded. everyone shuddered, fled to avoid contagion, wickedly exposed their dear ones, as if along with the person who was about to die from the plague one could also shut out death itself. Meanwhile, throughout every district of the city there lay no longer the dead bodies, but many diseased and dying people who asked the pity of the passers-by." [272]

These scenes of devastation are intended to display an intense degree of selfishness and fear among the Romans. Indeed, they demonstrate a fundamental breakdown of the social order. While we may doubt that scenes of this kind were widespread during the outbreak, this image created by Pontius is used to create a deep contrast between how Christians on the one hand, and the Roman authorities and non-Christian Romans on the other, faced the fear of death. Pontius states clearly that, "indeed, a man would only become perfect if he did more than the publican or heathen, by overcoming evil with good and by the exercise of a divine-like clemency, loving

[271] Pontius, *Life of Cyprian, 9;* Cyprian, *De mortalitae,* 20.; Krieder, *Patient Ferment of the Early Church, 67-68.* Alan Krieger makes a convincing argument that these passage from Cyprian and Pontius are instructions to help even those outside the community; McNeill, *Plagues and Peoples,* 135-137.; Gary Ferngen, *Medicine and Health Care in Early Christianity,* (Baltimore: Johns Hopkins University Press, 2009), 113-114.
[272] Pontius, *Life of Cyprian,* 9

even his enemies, and by further praying for the Salvation of his persecutors."[273] Eusebius' description of the plague in Egypt reinforces this account:

> "at any rate, most of our brethren, through their surpassing love and brotherly kindness being unsparing of themselves and clinging to one another, fearlessly visiting the sick and continually ministering to them, serving them in Christ, most cheerfully departed this life with them, becoming infected with the affliction of others and drawing the sickness from their neighbors upon themselves and willingly taking over their pains…the best, at any rate, of the brethren among us departed from life in this manner, some presbyters and deacons and some of the laity who were praised exceedingly, so that this form of death, which had its origin in much piety and strong faith, seemed to be little short of martyrdom…but the action of the pagans was entirely the opposite. They would thrust away those who were just beginning to fall sick, and they fled their dearest; they would cast them upon the roads half dead, and would treat the unburied bodies as vile refuse, shunning the communication and contagion of the death,"[274]

The hero system being constructed in these texts not only exalted Christians who remained faithful even in the face of death, but it also purposely and precisely undermined the pagan Roman sense of identity. Stoic bravery in the face of danger and duty (*pietas*) to one's family, were key characteristics of Roman self-definition, yet in these descriptions they are portrayed as so fearful of the death which the plague brings that they are literally throwing their loved ones on the street. These actions in response to fear would have been considered cowardice

[273] Pontius, *Life of Cyprian, 9*
[274] Eusebius, *Historia Ecclesiastica,* 7.21.

in the eyes of most Romans. Cowardice was considered one of the most reprehensible character flaws.[275] There is another interesting detail in this Eusebius quote, namely, that "which had its origin in much piety and strong faith, seemed to be little short of martyrdom," an idea which Cyprian actually incorporated into his hero-structure. It is clear in the writings of Cyprian that many Christians wanted to participate in the hero system by becoming martyrs, but were precluded because the plague was killing them before they could be arrested and executed:

> "Now in the present mortality this is a source of sorrow to me that I have prepared for confession and had dedicated myself with my whole heart and with all my courage to the endurance of suffering, I am deprived of my martyrdom, since I am being forestalled by death." In the first place, martyrdom is not in your power but in the giving of God, and you cannot say that you have lost what you do not know whether you deserve to receive…."[276]

Here, Cyprian is seen facing one of the central tensions of the martyr/hero system. The close association of martyrdom with salvation, amplified by the formation of this hero system, has led his congregation to despair: they have come to see martyrdom as the sole source of salvation. Gregory of Nazianzus even states that, "In fact, through his letters he single-handedly inspires almost more people to suffer martyrdom than did all those who were with them at the time of their ordeal..."and "arming them for the fray with words and sentiments like these, Cyprian raised many to martyrdom."[277] These members of the congregation are trying to achieve "freedom from the terror of death" and immortality, but, because of the plague, they are being

[275] For more on Roman views of courage see, Jon Coulston, "Courage and Cowardice in the Roman Imperial Army," *War in History*, 20.1 Special Issue on Courage and Cowardice in Wartime (2013): 7-31.
[276] Cyprian, *De mortalitate,* 17.
[277] Gregory of Nazianzus, *Oration* 24, Gregory clearly saw that Cyprian's greatest contribution to the Church was his ability to facilitate the creation of new martyrs.

denied this privilege , as they have come to associate heaven solely with martyrdom.[278] So Cyprian had to modify perceptions surrounding deaths caused by the plague. First, he highlights the fact that the congregation has already achieved freedom from death:

> "Although this mortality has contributed nothing else, it has especially accomplished this for Christians and the servants of God, that we have begun gladly to seek martyrdom while we are learning not to fear death. These are trying exercises for us, not deaths; they give to the mind the glory of fortitude; by contempt of death, they prepare to wear the Crown."[279]

Cyprian then expands the hero system to embrace those who had perished in the plague:

> "In the first place, martyrdom is not in your power but in the giving of God, and you cannot say that you have loosed what you do not know whether you deserve to receive…Just as in that instance [Cain's murder of Able] the evil thought and pernicious design was foreseen by a provident God, so also in the case of the servants of God among whom confession is contemplated and martyrdom is conceived in the mind, the intention dedicated to good is crowned, with God as judge. It is one thing for the intention to be lacking for martyrdom; it is another thing for martyrdom to have been lacking for the intention.[280]

This passage from Cyprian discusses those who have been denied their martyrdom because they have died of the plague. Cyprian refines the value of their deaths to better fit a wider criteria. Simply, Cyprian is stating that if you are devoted to God and have the intention to die for your faith without fear, God recognizes the intent in the individual, rather than the mechanism of the

[278] Cyprian, *De mortalitate,* 24
[279] Cyprian, *De mortalitate,* 16.
[280] Cyprian, *De mortalitate,* 17.

death. As Kyle Harper says, "Cyprian tried to ennoble the victims of the disease, likening their strength in pain and death to the heroic intransigence of the martyrs."[281] While it is important to note that Cyprian is not declaring them full martyrs, by placing them adjacent to the martyrs and apostles who are the heroes of Christianity in heaven, he is implying to his congregation that they will be received as heroes by God.

The Christian martyr was the idealized hero of Cyprian's hero system. This hero system drew people into the faith and precipitated the growth in Christianity. The argument that Christian martyrdom led to its expansion is relatively common.[282] This hero system aimed not only to glorify the martyrs, but to transform the perception of Christians as un-Roman: here, on the one hand, pagans following Roman religious practices acting with total disregard for Roman values versus Christians, despite being actively killed by the Roman state, embracing and embodying the highest values of Roman identity. By upholding the virtues that Romans prized, like bravery, *pietas*, and stoic resilience, they flipped the narrative, establishing themselves as true Romans. [283] This type of stoic approach was attractive to the Romans because it provided them with a path to access immortality and the transcendence of death and had moral and social attributes that already conformed to their view of strength. This heroic reframing of the Christian faithful drove conversions in the Church, and, soon enough, the Cult of the Saints, which venerated the martyrs as the perfect embodiment of the Christian faith, began to solidify.[284] The willingness to convert to the new religious practice and its philosophy required an acceptance of the preexisting hero system, and was also facilitated by it.

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[281]Harper, *Fate of Rome,* 138
[282] Starks, *The Rise of Christianity,* 163-190.
[283]Cyprian, *De mortalitate,* 20. Cyprian encourages his congregation not to grieve for any of those who had died in the epidemic. His reasoning for this is that he believes it is hypocritical to Roman eyes that Christians should weep for their lost loved ones while simultaneously claiming they are "living with God."
[284] Peter Brown, *The Cult of the Saints: Its Rise and Function In Latin Christianity*, 3-8.

The turbulence of the third century caused a massive loss of life. The civil wars consumed generations of men, persecutions put religious violence in the public sight, and the Cyprianic Plague brought death regardless of faith and social status. Death loomed increasingly as an all-encompassing figure for those living in the Roman Empire, with some Christian leaders believing that the end of days had arrived.[285] The hero system that Cyprian institutionalized helped create a path for individuals to transcend death by performing heroic acts, and not simply through martyrdom. Christian belief in the afterlife also provided the possibility of escape from death and suffering for lay people. Many variables convened and conspired to facilitate Christianity's exceptional growth in the third century. Yet, it was Christianity's philosophical response to these crises that solidified its survival and fueled its rise.

[285] Cyprian himself actually believed this; however, his beliefs centered around a larger change for the betterment of Christianity. For more see, J. H. D. Scourfield, "The De Mortalitate of Cyprian: Consolation and Context."

Conclusion

It is difficult to overstate how significant the third century truly was for both the early Christian Church and the Roman Empire. Converging disasters fueled mass unrest and instability throughout the Empire. The mounting political strife weakened Rome's institutions and, prior to the accession and reforms of Diocletian, prevented the establishment of a long-lasting and secure government. While these political and military crises were ongoing, new problems, like disease, began to arise in the empire. A catastrophic health crisis emerged in Egypt and North Africa, involving a novel illness which spread throughout the empire and greatly enhanced the volatility of the existing Roman social climate. Additionally, Christianity began to gain popularity with the people, and its growing numbers and stature were sufficient to merit concern from imperial authorities about its escalating power and influence on the Empire. These plights and calamities constitute the core of the Third-Century Crisis which I have discussed in this thesis.

The Cyprianic Plague has, historically, been an understudied and obscure event, relegated to the footnotes in the story of Christianity and Roman history more broadly. The purpose of this thesis was to examine and establish the likely cause of the Cyprianic Plague and how the identity of this pestilence shapes our understanding of Roman contact with West Africa. Additionally, this research fronts the discussion of Christianity's identity formation through the events that took place at the institution's emergence. The Cyprianic Plague was caused by a novel virus, at least for those within Roman borders, brought to the empire from the forest and Sahel regions of sub-Saharan Africa. This disease was transported north into Roman territory via the trans-Saharan slave trade conducted by the Garamantes. After the outbreak began in Roman Africa, trade with the Garamantes declined greatly. The presence of fortresses and fortified towns indicates that internal social strife was present, discord that was likely the result of a traumatic

event within the society. It is with this evidence that I contend that the disease passed through the Garamantian lands and devastated their oases and villages which depended on trade between Roman and sub-Saharan Africa. Based on careful consideration of the evidence, I argue that Lassa fever was the source of this outbreak. The symptoms that it produces are nearly identical to those described by Cyprian in his work *De mortalitate*. Additionally, its incubation and production of mild-disease cases allowed its transit across the desert. Lassa fever's ability to also inflict intense illness on those infected presented a malady that was visually frightening and novel to the Romans who suffered greatly during the outbreak, but not so catastrophic that society fundamentally collapsed.

While thousands died throughout the empire as a result of the Cyprianic plague, a central push for Roman solidarity led to Christian persecutions in the North African city of Carthage. At the time, the Christian Church there was under the direction of Cyprian, the Bishop of Carthage. When Emperor Decius defeated Emperor Philip at Verona in 249, Decius became the sole, uncontested Emperor of the Roman Empire. In a bid to reestablish Roman authority and foster unity throughout the Empire he ordered that every citizen be required to offer a sacrifice to any Roman god, deliberately failing to exempt Christians from participation. This action caused a legal problem as Christians were unable to tender an offering as their religion did not allow it. Further, local authorities throughout the Empire were left to implement these laws within their region. In the case of Carthage, Cyprian himself was allowed to go into exile without being pursued by the local authorities. Others, however, were not as fortunate. The edict prompted wide-scale violence against Christians in Roman North Africa, Egypt, and other regions, a sharp departure from the earlier tolerance that the authorities had shown towards this religious community. While it is unclear if the Cyprianic Plague directly precipitated persecutions of the

Christians in the Empire, the outbreak certainly contributed to their severity, as a succession of Roman Emperors attempted to reestablish central control over the Empire by introducing what they considered to be unifying measures. As the Decian Persecution ended, a fierce debate broke out with the Church between the Cyprianists and the Novationists on the subject of the *lapsi*. The *lapsi* were those Christians that had handed over sacred texts, offered sacrifices, or renounced their faith and now sought to reenter church life; in other words, they were those who violated their faith in an attempt to avoid martyrdom. The martyrs, those who held to and so died for their faith, were held up as heroes to those in the Christian community. Cyprian institutionalized their acceptance and carefully crafted the identity of martyrs as the perfect Christians. The recordings and celebrations of their deaths, as enacted by Cyprian, created a hero-system.

The construction and institution of this hero-system within the Church was incredibly successful. In fact, by the time of the Valerianic persecution in 257, Christians, including Cyprian himself, actively sought out their own martyrdom. The system had become so ubiquitous that, in the darkest days of the epidemic, the congregants who had desired to become martyrs were deeply distressed as the disease was taking their lives before the Roman state had the chance. Premature death by plague became such a problem that Cyprian acted to expand the hero-system to include those who had not survived until actual martyrdom. Thus, those who cared for the sick and dying, and died themselves, were given the same social status, if not the same institutional status, as martyrs. Cyprian also publicly compared those who suffered as victims of the epidemic to those who suffered tortures at the hands of the Roman authorities, positing them as confessors, a heroic identity adjacent to the level of the martyrs. This system worked to unify and galvanize the Christian community in North Africa and beyond. The hero system also attracted new converts who sought to find meaning in their suffering, overcome fear

and transcend death. The image of the martyrs and confessors, as framed by Cyprian, imposed an enduring legacy that is still evident in the modern Catholic Church.

The Cyprianic Plague, like most epidemics, acted as an incredibly powerful catalyst, facilitating enormous change both directly and indirectly. The neglect of and lack of academic interest in this event is strange given that historic plagues have frequently been explored as powerful forces behind societal transformations that follow. While the scope of effects caused by the Cyprianic Plague are not always readily visible, its consequences were just as significant and extensive as other historic disease epidemics, like the Justinianic Plague, which would rage only two centuries later. The documented scale of Lassa fever movement highlights the high volume of trans-Saharan traffic that was taking place during the Roman period and its capacity to drive epidemics. The plague's impact on local Garamantian trade is remarkable, as commerce did not reach comparable levels until after the Islamic conquest of North Africa. The outbreak's destabilizing effects explain why no Emperor, until Diocletian, was able to establish an effective government. Furthermore, the Cyprianic Plague was instrumental in the flourishing of the Church during the period following the Decian Persecution. It could be argued, in fact, that the Church's exponential growth could not have occurred without the plague event recorded by Cyprian. Its presence enabled the construction and acceptance of a hero system in the Early Church that continues to exist into the present. The Lassa fever virus, which exacerbated the chaos and suffering of the Third-Century Crisis, profoundly altered the Roman world and laid the bedrock for the practice of Christianity in the Middle Ages, shaping the Christian identity for centuries to come.

Bibliography

---, *"Acta Proconsularia* of Cyprian, CSEL, III. 3, CX-CXIV." In *A New Eusebius: Documents Illustrating the History of the Church to Ad 337, New Edition*. Translated by James Stevenson. Edited by William H.C. Frend. Cambridge: Cambridge University Press, (1987): 247.

Akhmetzhanov, Andrei R., Yusuke Asai and Hiroshi Nishiura. "Quantifying the Seasonal Drivers of Transmission for Lassa Fever in Nigeria." *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences,* 374, no. 1775, (2019). https://doi.org/10.1098/rstb.2018.0268

Almagro-Moreno, Salvador, and Taylor, Ronald K. Cholera "Environmental Reservoirs and Impact on Disease Transmission." *Microbiology Spectrum* 1, no.2 (2013): doi:10.1128/microbiolspec.OH-0003-2012.

Amr, Samir S., and Abdulghani Tbakhi. "Abu Bakr Muhammad Ibn Zakariya Al Razi (Rhazes): Philosopher, Physician and Alchemist." *Annals of Saudi Medicine*, 27, no.4 (2007): 305–307. https://doi.org/10.5144/0256-4947.2007.305.

Anthony, Simon J., Christine K. Johnson, Denise J. Greig, Sarah Kramer, Xiaoyu Che, Heather Wells, Allison L. Hicks, Damien O. Joly, Nathan D. Wolfe, Peter Daszak, William Karesh, W. I. Lipkin, Stephen S. Morse, Jonna A. K. Mazet, Tracey Goldstein, "Global Patterns in Coronavirus Diversity," *Virus Evolution*, 3, no.1 (2017). https://doi.org/10.1093/ve/vex012.

Ather, Binish, Taaha M. Mirza, and Peter F. Edemekong. "Airborne Precautions." in *StatPearls*, 2021. https://www.statpearls.com/articlelibrary/viewarticle/41609/.

Ando, Clifford. *Imperial Rome AD 193 to 284: The Critical Century*. Edinburgh: Edinburgh University Press, 2012.

Arnold, Brian J. *Cyprian of Carthage: His Life and Impact.* Glasgow: Christian Focus Publication, 2017.

Aurelius Victor, *Liber De Caesaribus.* Edited and translated by H.W. Bird. Liverpool: Liverpool University Press, 1994.Becker, Ernest. *The Denial of Death*. New York: The Free Press, 1973.

Biek, Roman, Peter D Walsh, Eric M Leroy, and Leslie A Real. "Recent Common Ancestry of Ebola Zaire Virus Found in a Bat Reservoir." *PLoS Pathogens* 2, no.10 (2006).

Brett, Michael and Elizabeth Fentress. *The Berbers.* Oxford: Blackwell Publishing, 1996.

Burns, J. Patout and Robin M. Jensen. *Christianity in Roman North Africa: The Development of Its Practices and Beliefs*. Grand Rapids: William B. Eerdmans Publishing Company, 2014.

Brown, Peter. *The Rise of Western Christendom: Triumph and Diversity, A.D. 200-1000;10th Aniversary Rev. Ed.* Oxford: Blackwell Publishing Limited, 2013.

Burns, Patout. *Cyprian the Bishop.* New York: Routledge, 2002.

Brown, Vienna, and Bevins, Sarah. "A Review of Virulent Newcastle Disease Viruses in the United States and the Role of Wild Birds in Viral Persistence and Spread." *Veterinary Research* 48, no.68 (2017). doi:10.1186/s13567-017-0475-9.

Cairns, Lisa K., Robin Nandy, and Rebecca F. Grais. "Challenges in Measuring Measles Case Fatality Ratios in Settings Without Vital Registration." *Emerging Themes in Epidemiology*, 7no.1 (2010): 4. doi:10.1186/1742-7622-7-4.

Center for Disease Control and Prevention. “2014 Ebola Outbreak in West Africa - Case Counts.” Washington, DC; United States Department of Health & Human Services, (Updated February 19, 2020). http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html. Accessed 2/19/2021.

Chadwick, Henry. *The Early Church: The Story of Emergent Christianity from the Apostolic Age to the Dividing of the ways Between the Greek East and the Latin West, revised edition.* London: Penguin Publishing, 1993.

Chevalier, Michelle S., Wendy Chung, Jessica Smith, Lauren M Weil, Sonya M Hughes, Sibeso N Joyner, Emily Hall, Divya Srinath, Julia Ritch, Prea Thathiah, Heidi Threadgill, Diana Cervantes, David L Lakey, Centers for Disease Control and Prevention (CDC). “Ebola Virus Disease Cluster in the United States--Dallas County, Texas, 2014,” in *Morbidity and Mortality Weekly Report* 63(46). Washington, DC; United States Department of Health & Human Services, (2014): 1087-1088. [Published correction appears in *Morbidity and Mortality Weekly Report* 63(48), (Dec 5,2014):1139].

Chomel, Bruno. “Zoonoses.” in *Encyclopedia of Microbiology.* Edited by Moselio Schaechter, 820-829. Cambridge, MA: Academic Press, 2009.

Choron, Jacques. *Modern Man and Mortality*. New York: The MacMillian Company, 1964.

Chowell, G., N. W. Hengartner, C. Castillo-Chavel, P.W. Fenimore, J.M. Hyman. “The Basic Reproductive Number of Ebola and the Effects of Public Health Measures: the Cases of Congo and Uganda.” *Journal of Theoretical Biology*, 229, no.1 (2004):119-126.

Chowell G, Miller MA, Viboud C. “Seasonal Influenza in the United States, France and Australia: Transmission and Prospects for Control.” Epidemiology and Infection, 136, no. 6 2007: 852-864.

Cohen, Brandon E., Anne Durstenfeld, Pamela C. Roehm, "Viral Causes of Hearing Loss: A Review for Hearing Health Professionals." *Trends in Hearing*, 18, no.10 (2014). doi.org/10.1177/2331216514541361

Cyprian, Bishop of Carthage. *De Mortalitate*, in *Sancti Cypriani Episcopi Opera, II*, Corpus Christianorum Series Latina III A, edited by M. Simonetti and C. Moreschini, 17-32. Turnhout: Brepols, 1976.

Cyprian, Bishop of Carthage. *Saint Cyprian: Treatises*. Edited and translated by Roy J. Deferrari. The Fathers of the Church: A New Translation. New York: Fathers of the Church Incorporated, 1958.

Dennis, David and Mead, Paul. "Plague" in *Tropical Infectious Disease (Second Edition), vol. 1*. Edited by Richard L. Guerrant, David H. Walker and Peter F. Weller. London: Churchill Livingstone, (2006). 471-481.

Donatist Martyr Stories: the Church in Conflict in Roman North Africa. Translated, with introduction and notes by Maureen A .Tilley. Liverpool; Liverpool University Press, 1996.

Drexler, Maduline. "How Infection Works," in *What You Need to Know About Infectious Disease*. Institute of Medicine. Washington, DC: National Academies Press, 2010. https://www.ncbi.nlm.nih.gov/books/NBK209710/

Ducatez, M.F., R.G. Webster, and R.J. Webby. "Animal Influenza Epidemiology." *Vaccine*, 26, no.4 (2008): D67–D69.

Eusebius of Caesarea. *Eusebius Pamphili: Ecclesiastical History (Books 1-5).* Translated by Roy J. Deferrari. Washington, D.C.: Catholic University of America Press, 1953.

Eusebius of Caesarea. *Eusebius Pamphili: Ecclesiastical History (Books 6-10).* Translated by Roy J. Deferrari. Washington, D.C.: Catholic University of America Press, 1955.

Fabian, Siuda and Sunde Uwe. 2021. "Disease and Demographic Development: The Legacy of the Plague." In *Journal of Economic Growth* 26, no. 1: 1-30.

Ferngren, Gary B. *Medicine and Health Care in Early Christianity*. Baltimore: Johns Hopkins University Press, 2009.

Flaherty, Colleen. "Demanding a Provost's Resignation." *Inside Higher Education,* February 28, 2020.

Frend, William H.C. *The Rise of Christianity*. Philadelphia: Fortress Press, 1984.

Furuse, Yuki, Akira Suzuki, and Hitoshi Oshitani. "Origin of Measles Virus: Divergence from Rinderpest Virus Between the 11th and 12th Centuries." *Virology Journal,* 7, no.52 (2010). doi:10.1186/1743-422X-7-52

Garcia-Ballester, Luis. *Galen and Galenism: Theory and Medical Practice from Antiquity to the European Renaissance.* Aldershot; Ashgate, 2002.

Gastanaduy, Paul, Penina Haber, Paul A. Rota, Manisha Patel, and Centers for Disease Control and Prevention. "Measles." In *Epidemiology and Prevention of Vaccine-Preventable Diseases, ed. 13th,* edited by Jennifer Hamborsky, Andrew Kroger, and Charles Wolfe: 209-230. Washington: Public Health Foundation, 2015.

Gebreyes, Wondwossen A., Jean Dupouy-Camet, Mélanie J. Newport, Celso J. B. Oliveira, Larry S. Schlesinger, Yehia M. Saif, Samuel Kariuki, Linda J. Saif, William Saville, Thomas Wittum, Armando Hoet, Sylvain Quessy, Rudovick Kazwala, Berhe Tekola, Thomas Shryock, Michael Bisesi, Prapas Patchanee, Sumalee Boonmar, Lonnie J. King. "The Global One Health Paradigm: Challenged and Opportunities for Tackling Infectious

Diseases at the Human, Animal, and Environmental Interface in Low-Resource Settings." *PLOS: Neglected Tropical Disease,* (2014). https://doi.org/10.1371/journal.pntd.0003257

Gregory of Nazianzus. *Selected Orations*. Translated by Vinson Martha Pollard. Washington, D.C.: Catholic University of America Press, 2004.

Groseth, Allison, Heinz Feldmann, and James E.Strong. "The Ecology of Ebola Virus." *Trends in Microbiology,* 15, no.9 (2007).

Goldsworthy, Adrian. *Pax Romana: War, Peace, and Conquest in the Roman World.* New Haven: Yale University Press, 2016.

Green, Monica, editor. *Pandemic Disease in the Medieval World: Rethinking the Black Death*. Amsterdam: Amsterdam University Press, 2015.

Guerra, Fiona M., Shelly Bolotin, Gillian Lim, Jane Heffernan, Shelley L. Deeks, Ye Li, and Natasha S. Crowcroft. "The Basic Reproduction Number (R_0) of Measles: A Systematic Review." *The Lancet,* 17, no.12 (2017). doi.org/10.1016/s1473-3099(17)30307-9.

Haldon, John**,** Hugh Elton, Sabine R. Huebner, Adam Izdebski, Lee Mordechai, Timothy P. Newfield. "Plagues, Climate Change, and the End of an Empire. A Response to Kyle Harper's *The Fate of Rome* (2): Plagues and a Crisis of Empire." *History Compass,* 16, no.12 (2018).

Harper, Kyle*. The Fate of Rome: Climate, Disease, and The End of an Empire.* Princeton: Princeton University Press, 2017.

Heffernan, Thomas. *The Passion of Perpetua and Felicity.* Oxford: Oxford University Press, 2012.

Henri Irenee, Marrou. *A History of Education in Antiquity*. Translated by George Lamb. Madison: University of Wisconsin Press, 1982.

Institute of Medicine (US) Board on Health Promotion and Disease Prevention. “Scientific Background on Smallpox and Smallpox Vaccination.” in *Scientific and Policy Considerations in Developing Smallpox Vaccination Options: A Workshop Report*. Washington: National Academies Press (US), 2002.

Jacobs, Samatha, Daryl Lamson, Kristen St George , Thomas Walsh. “Human Rhinoviruses.” *Clinical Microbiology Review,* 26, no.1 (2013): 135-62.

Justin Martyr. *Writings of Saint Justin Martyr.* Translated by. T B. Falls New York: Christian Heritage, 1948).

Kaner, Jolie & Schaack, Sarah. “Understanding Ebola: the 2014 Epidemic.” *Globalization and Health*, 12, no.1 (2016): 53. doi:10.1186/s12992-016-0194-4.

Kearns, Amber, “A Plague in a Crisis: Differential Diagnosis of the Cyprian Plague and Its Effects on the Roman Empire in the Third Century CE,” MA Diss., University of Arizona, 2018.

Keresztes, Paul. "From the Great Persecution To the Peace of Galerius." *Vigiliae Christianae*, 37, no.4 (1983): 379-399.Khalafallah, Mahmoud Tawfik, Omar Ali Aboshady, Shaban Ahmed Moawed, and Menna Said Ramadan. “Ebola Virus Disease: Essential Clinical Knowledge.” *Avicenna Journal of Medicine*, 7, no.3 (2017): 96–102.Kimberly Gittings and Kelly Matson, “Establishing Herd Immunity Against Ebola Through Vaccination.” *Vaccine*, 34, no.24 (2016): 2644-2647.

Kourtis, Athena P., Kristie Appelgren, Michelle S. Chevalier, and Anita McElroy. “Ebola Virus Disease: Focus on Children,” *Pediatric Infectious Disease Journal*, 34, no.8 (2015): 893–897.Koury, Ron, and Warrington, Steve J. “Rabies.” StatPearls*,* 2020. https://www.ncbi.nlm.nih.gov/books/NBK448076/

Kreider, Ian. *The Patient Ferment of the Early Church.* Grand Rapids: Baker Academics, 2016.

Lactantius. *On the Deaths of the Persecutors*. Translated by Mary Francis MacDonald. Washington: The Catholic University of America Press, 1965.

LI, Y.H. and S.P. CHEN. "Evolutionary History of Ebola Virus." *Epidemiology & Infection*, 142, no.6 (2013): 1138-1145. doi: https://doi.org/10.1017/S0950268813002215

Lipka, Michael. *Roman Gods: A Conceptual Approach*. Boston: Brill, (2009).

Liverani, Mario. "The Garamantes: A Fresh Approach." *Libyan Studies* 31. (2000): 17-28.

Lopez, Gerardo U., Charles P. Gerba, Akrum H. Tamimi, Masaaki Kitajima, Sheri L. Maxwell, and Joan B. Rose. "Transfer Efficiency of Bacteria and Viruses from Porous and Nonporous Fomites to Fingers under Different Relative Humidity Conditions." *Applied and Environmental Microbiol*ogy, 79, no.18 (2013): 5728-5734. doi:10.1128/AEM.01030-13

Maas, Michael, editor. *The Cambridge Companion to the Age of Justinian*. Cambridge: Cambridge University Press, 2006.

Mahadevan, Anita, M.S. Suja, Reeta S. Mani, Susarala K. Shankar. "Perspectives in Diagnosis and Treatment of Rabies Viral Encephalitis: Insights from Pathogenesis." *The Journal of the American Society for Experimental Neurotherapeutics*, 13, no.3 (2016):477-492. doi:10.1007/s13311-016-0452-4.

Mangat, Rupinder, and Ted Louie. "Viral Hemorrhagic Fevers." StatPearls, 2020. https://www.statpearls.com/articlelibrary/viewarticle/116027/.

Marques, Joao T., and Carthew, Richard W. "A Call to Arms: Coevolution of Animal Viruses and Host Innate Immune Responses." *Trends in Genetics*, 23, no.7 (2007): 359-364.

Martínez, Miguel J., Abdulbaset M. Salim, Juan C. Hurtado, and Paul E. Kilgore. “Ebola Virus Infection: Overview and Update on Prevention and Treatment.” *Infectious Diseases and Therapy*, 4, no.4 (2015): 368. doi: 10.1007/s40121-015-0079-5.

Mattingly, David. J., V. Leitch, C. N. Duckworth, A. Cuénod, M. Sterry, and F. Cole. *Trade in the Ancient Sahara and Beyond*. Cambridge: Cambridge University Press, 2017.

McNeil, William H. *Plagues and Peoples.* New York: Bantam Doubleday Dell Publishing Group, 1977.

McLaughlin, Raoul. *Rome and the Distant East: Trade Routes to the Ancient Lands of Arabia, India and China*. London: Bloomsbury Publishing, 2010.

Mehedi, Masfique, Allison Groseth, Heinz Feldmann, and Hideki Ebihara. “Clinical Aspects of Marburg Hemorrhagic Fever.” *Future Virology*, 6, no.9 (2011). https://doi.org/10.2217/fvl.11.79.

Mordechai, Lee, and Merle Eisenberg. “Rejecting Catastrophe: The Case of the Justinianic Plague.” *Past & Present*, 244, no.1 (2019): 3–50.

Morens, David, Gregory Folkers, and Anthony Fauci. “What is a Pandemic?” *The Journal of Infectious Disease* (2009): 1018-1021.

Morris, Sinead E., Andrew J. Yates, Rik L. de Swart, Rory D. de Vries, Michael J. Mina, Ashley N. Nelson, Wen-Hsuan W. Lin, Roger D. Kouyos, Diane E. Griffin, and Bryan T. Grenfell. “Modeling the Measles Paradox Reveals the Importance of Cellular Immunity in Regulating Viral Clearance.” *PLOS: Pathogens* 14, no.12 (2018) doi.org/10.1371/journal.ppat.1007493.

Moss, William J. and Peter Strebel. “Biological Feasibility of Measles Eradication.” *The Journal of Infectious Diseases*, 204, no.1 (2011): S47-

S53. https://doi.org/10.1093/infdis/jir065.Nadeem, Mohd, and Panda, Prasan K. "Survival in Human Rabies but Left Against Medical Advice and Death Followed - Community Education is the Need of the Hour." *The Journal of Family Medicine and Primary Care*, 9, no.3 (2020):1736-1740. doi:10.4103/jfmpc.jfmpc_1079_19.

Naim, Hussein Y. "Measles Virus: A Pathogen, Vaccine, and a Vector." *Human Vaccines & Immunotherapeutics*, 11, no.1 (2015): 21-26.

Nelson, Eric J, Jason B Harris, J Glenn Morris Jr, Stephen B Calderwood, Andrew Camilli. "Cholera Transmission: The Host, Pathogen and Bacteriophage Dynamic." *Nature Reviews Microbiology,* 7, no.1 (2009): 693-702. doi:10.1038/nrmicro2204

Novatian the Presbyter. *Novatian: The Trinity, The Spectacles, Jewish foods, In Praise of Purity, Letters.* Translated by Russell Desimone. Washington; The Catholic University of America Press, 1974.

Nutton, Vivian. *Ancient Medicine.* Second edition. New York: Routledge Publishing, 2013.

O'Neill, Ynez and Stannard, Jerry. "The History of Human Disease in the World Outside Asia: Disease of the Middle Ages & Diseases of Western Antiquity." In *The Cambridge World History of Human Disease*, edited by Kenneth F. Kiple, 278-86. Cambridge, UK: Cambridge University Press, 1993.

Ogbua, E. O. Ajuluchukwub & C.J. Unekec. "Lassa fever in West African Sub-region: An Overview." *Journal of Vector Borne Diseases* 44 (2007):1-11.

Oldstone, Michael. *Viruses, Plague, and History.* New York: Oxford University Press, 1998.

Orosius, Paulus. *The Seven Books of History Against the Pagans.* Translated by Roy J. Deferrari. Washington: Catholic University of America Press, 1964.

Parrish, Colin R., Edward C. Holmes, David M. Morens, Eun-Chung Park, Donald S. Burke, Charles H. Calisher, Catherine A. Laughlin, Linda J. Saif, Peter Daszak.“Cross-Species Virus Transmission and the Emergence of New Epidemic Diseases.” *Microbiology and Molecular Biology Reviews,* 72, no.3 (2008): 457-470.

Pontius. "Life of St. Cyprian by Pontius." In *Early Christian Biographies*. Edited by Roy J. Deferrari, 3-24. Washington, D.C: Catholic University of America Press, 1952.

Jain Prachi, and Rathee, Manu. “Koplik Spots.” StatPearls, 2020. https://www.statpearls.com/articlelibrary/viewarticle/23948/.

Rewar, Suresh, and Dashrath Mirdha . “Transmission of Ebola Virus Disease: An Overview.” *Annals of Global Health*, 80, no.6 (2014): 444-51.Rhea, Jennifer A, and Liz Clarke. *Perpetua's Journey: Faith, Gender, & Power in the Roman Empire*. New York: Oxford University Press, 2018.

Rosenberg, Ronald, “Detecting the Emergence of Novel, Zoonotic Viruses Pathogenic to Humans.” *Cellular and Molecular Life Science* 72 (2015): 1115–1125. DOI 10.1007/s00018-014-1785-y.

Richmond, J Kay, and Deborah J Baglole, “Lassa Fever: Epidemiology, Clinical Features, and Social Consequences.” *BMJ,* 327, no.7426 (2003):1271–1275. doi: 10.1136/bmj.327.7426.127.

Sattler, Rachel A., Slobodan Paessler, Hinh Ly, and Cheng Huang, “Animal Models of Lassa Fever.” *Pathogens*, 9, no.3 (2020):197. doi: 10.3390/pathogens9030197.

Schmid, Boris V., Ulf Büntgen, W. Ryan Easterday, Christian Ginzler, Lars Walløe, Barbara Bramanti, Nils Chr. Stenseth. “Climate-Driven Introductions of Plague into Europe.”

Proceedings of the National Academy of Sciences, 112, no.10 (2015): 3020-3025. DOI: 10.1073/pnas.1412887112.

Schneider-Schaulies, S, and J. Schneider-Schaulies "Measles Virus-Induced Immunosuppression." *Measles: Pathogenesis and Control,* edited by Diane E. Griffin and Michael B.A. Oldstone, 243-264. Heidelberg, Germany: Springer, 2009.

Semba, Richard. "The Ocular Complications of Smallpox and Smallpox Immunization." *Archives of Ophthalmology,* 121, no.5 (2003):715–719. doi:10.1001/archopht.121.5.715.

Semba, Richard D., and Bloem, Martin W. "Measles Blindness." *Survey of Ophthalmology: International Review Journal*, 49, no.2 (2004):243-55. doi: 10.1016/j.survophthal.2003.12.005. PMID: 14998696.

Shakespeare, Martin. *Zoonoses.* Chicago: Pharmaceutical Press, 2009.

Shapiro-Ilana, David I., James R. Fuxab, Lawrence A. Laceyc, David W. Onstadd, Harry K. Kayae. "Definitions of Pathogenicity and Virulence in Invertebrate Pathology." *Journal of Invertebrate Pathology* 88 (2005): 1–7.

Shaw, Brent D. "The Myth of the Neronian Persecution." *The Journal of Roman Studies*, 105 (2015): 73-100.

Spyrou, Maria A, Rezeda I Tukhbatova, Michal Feldman, Joanna Drath, Sacha Kacki, Julia Beltrán de Heredia, Susanne Arnold, Airat G Sitdikov, Dominique Castex, Joachim Wahl, Ilgizar R Gazimzyanov, Danis K Nurgaliev, Alexander Herbig , Kirsten I Bos, Johannes Krause. "Historical Y. Pestis Genomes Reveal the European Black Death as the Source of Ancient and Modern Plague Pandemics." *Cell Host & Microbe*, 19, no.6 (2016): 874–81.

Snowden, Frank. *Epidemics and Society: From the Black Death to the Present*. London: Yale University Press, 2019.Stark, Rodney. *The Rise of Christianity: How the Obscure, Marginal Jesus Movement Became the Dominant Religious Force in the Western World in a Few Centuries*. Princeton: Princeton University Press, 1996.

Sanyaolu, Adekunle, Chuku Okorie, Aleksandra Marinkovic, Oladapo Ayodele, Abu Fahad Abbasi, Stephanie Prakash, Jessica Gosse, Sadaf Younis, Jasmine Mangat, and Henry Chan. "Measles Outbreak in Unvaccinated and Partially Vaccinated Children and Adults in the United States and Canada (2018-2019): A Narrative Review of Cases." *INQUIRY: The Journal of Health Care Organization, Provision, and Financing,* 56 (2019).

Stange, Natasha, "Politics of Plague: Ancient Epidemics and Their Impact on Society" (2021). 2021 Claremont Colleges Library Undergraduate Research Award.

Stenseth, Nils Chr, Bakyt B Atshabar, Mike Begon, Steven R Belmain, Eric Bertherat, Elisabeth Carniel, Kenneth L Gage, Herwig Leirs, and Lila Rahalison. "Plague: Past, Present, and Future." *PLoS Med*, 5, no.1 (2008)**.**

Suedfeld, Peter. "Reactions to Societal Trauma: Distress And/or Eustress." *Political Psychology*, 18, no.4 (1997): 849-61.

Tarantola, Arnaud. "Four Thousand Years of Concepts Relating to Rabies in Animals and Humans, Its Prevention and Its Cure." *Tropical Medicine and Infectious Disease*, 2, no.2 (2017): 5. doi:10.3390/tropicalmed2020005.

"Trebellius Pollio." *Historia Augusta, Volume III: The Two Valerians. The Two Gallieni. The Thirty Pretenders. The Deified Claudius. The Deified Aurelian. Tacitus. Probus. Firmus, Saturninus, Proculus and Bonosus. Carus, Carinus and Numerian.* Translated by David Magie. Loeb Classical Library 263. Cambridge, MA: Harvard University Press, 1932.

Tertullian, *To Scapula*. Translated by. R. Arbesmann. New York: Fathers of the Church Incorporated, (1950).

United States Army Chemical School. "Biological Agents and Their Properties." in *MultiserviceTactics, Techniques, and Procedure: Potential Military Chemical/Biological Agents and Compounds*. Fort Leonard Wood, Missouri: United States Military Joint Requirements Office, (2005). IV20-28.

Warren, Cody and Sawyer, Sara. "How Host Genetics Dictates Successful Viral Zoonosis." *PLOS Biology*, 17, no.4 (2019).

Weiss, Martin M., Peter D. Weiss, Glenn Mathisen, and Phyllis Guze. "Rethinking Smallpox." *Clinical Infectious Diseases*, 39, no.11 (2004): 1668–1673.

Wilhite, David E. *Ancient African Christianity: An Introduction to a Unique Context and Tradition*. New York: Routledge Publishing, 2017.

Wilson, Andrew. "Saharan Trade in the Roman Period: Short-, Medium-, and Long-distance Trade Networks." *Azania: Archaeological Research in Africa,* 47, no.4 (2012): 409-449.

World Health Organization, Amber A, and Schaaf M.. "Plague." in *World Health Organization Report on Global Surveillance of Epidemic-Prone Infectious Diseases.* Edited by M. Anker and D. Schaaf. Geneva: World Health Organization, (2000): 25-38.

Wortmann, Jennifer H., Crystal L. Park, and Donald Edmondson. "Trauma and PTSD Symptoms: Does Spiritual Struggle Mediate the Link?" *Psychological Trauma: Theory, Research, Practice and Policy*, 3, no.4 (2011): 442–452. https://doi.org/10.1037/a0021413.

Wu, Zu-Qun, Yi Zhang, Na Zhao , Zhao Yu, Hao Pan, Ta-Chien Chan, Zhi-Ruo Zhang, She-Lan Liu,. "Comparative Epidemiology of Human Fatal Infections with Novel, High (H5N6 and H5N1) and Low (H7N9 and H9N2) Pathogenicity Avian Influenza A Viruses." *International Journal of Environmental Research and Public Health,* 14, no.3 (2017):263. doi:10.3390/ijerph14030263.

Yang, Ruifu. "Plague: Recognition, Treatment, and Prevention." *American Journal of Microbiology*: *Journal of Clinical Microbiology*, 56, no.1), (2017). doi**:** 10.1128/JCM.01519-17

Yarnold, Edward, *The Awe-Inspiring Rites of Initiation: Baptismal Homilies of the Fourth Century.* Second edition. Slough, UK: St. Paul Publications, 1994.

Zanders**,** Jean Pascal. "Addressing the concerns about smallpox," *International Journal of Infectious Diseases* (2009): 9-13.

Zhao, Shi, Salihu S. Musa, Hao Fu, Daihai He, and Jing Qin."Large-scale Lassa Fever Outbreaks in Nigeria: Quantifying the Association Between Disease Reproduction Number and Local Rainfall." *Epidemiology and Infection*, 148.4 (2020).

Zosimus. *Historia Nova*. Translated by Ronald T. Ridley. Boston: Brill, (2017).