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Naturalists, Catastrophic Pandemics, and the End of Rome in the Age of Re-Emerging Infectious Diseases*

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INTRODUCTION

The question of why Rome and the ancient world ended has occupied scholars since the event itself in the fifth century. Answers to this question have rarely, if ever, stopped being proposed over the ensuing 1,500 years, and scholars who have asked, and answered, this question never did so in a vacuum. Instead, their approaches were based upon a combination of their personal histories and the zeitgeist or mentalité of each period. As Ian Wood has demonstrated in his magisterial work, *The Modern Origins of the Early Middle Ages*, the historical contexts of each state and were central to their authors' explanation. Wood groups scholarship on Rome's end into three broad types: "Romanist" (internal problems caused the empire to end), "Germanist" (the barbarians attacked and destroyed the empire), and the triumph of Christianity (religious-cultural transformations originally examined by church historians, but by the late 20th century cultural historians of late antiquity following Peter Brown's work) (WOOD 2013; HALSALL 1999).[1]

The past few decades have added a fourth group to Wood's tripartite division, what we might call "naturalists." Instead of human changes (Roman failure, barbarian destruction or religion and culture), these historians look to naturalist explanations: environmental destruction, climate change, natural catastrophes, and, above all pandemic disease. These explanations use the seemingly banal natural world as drivers, but they are based on a catastrophic vision of the end of Rome as well. Naturalists almost never propose changes were complex and variable, but rather these natural changes point toward calamitous ends. Kristina Sessa has sketched out the recent scholarship of naturalist histories over the last fifteen years in her prescient article "The New

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[1] These groups are, of course, not monolithic closed entities, people can pick and choose various ideas from each group for specific circumstances, and the ideas of individual scholars are far more complex.

Environmental Fall of Rome" (SESSA 2019). Naturalist explanations for Rome's end, however, are not completely new or innovative, but were peripheral to the Germanist and Romanist explanations until recently (SIGERIST 1943, pp. 113–116; in more detail: EISENBERG, MORDECHAI 2020). Human induced climate change during the Anthropocene period (c. 1800-present) and re-emerging infectious diseases from the 1980s onward have made this explanation far more common, though.

This article sketches out this recent development in the end of Rome debate to situate this naturalist work within the broader field. It first reflects upon how environmental and disease questions previously were largely peripheral to questions of political, economic, and cultural change during the end of Rome, but have recently become central to answer similar questions given the shift in our contemporary perspective in which environmental issues pose an increasing threat today and thus the past. It then turns to my work and project, *Pandemics and History: the Plague Concept, Disease, and the End of Antiquity*, that has intervened in some of these large-scale naturalist explanations to explain their problems of explanation and scale. Finally, it looks toward the future to suggest ways a naturalist focus might be better integrated into history research and what the future may hold for pandemic and disease histories.

NATURALIST VIEWS ON THE END OF ROME: CLIMATE CHANGE AND PANDEMICS

Naturalist explanations for the end of the Roman Empire have a surprisingly long history, although contemporary late antique and medieval historians rarely discuss them. Valentin Seibel, for example, in the 19th century suggested the revolution of the earth created climatic changes that led to the end of Rome (SEIBEL 1857, pp. 7–19). While in the early 21st century, this revolution of the Earth theory is viewed as "unscientific," Seibel and others worked within existing scientific paradigms. Likewise, some of the earliest links between pandemics and either the end of Roman prosperity (the Antonine Plague, c. 165–180 CE) or the end of Rome (the Justinianic Plague, c. 541–750 CE) are relatively common in late 19th and early 20th century scholarship. Yet, these explanations are generally overlooked today for two reasons. First, the scholars who wrote these early histories were more likely to be either historical generalists, whose synthesizing histories are outdated, or medical doctors, who specialized in questions of disease and medicine and are ignored by late antique specialists today. And, second, in Anglophone scholarship, Edward Gibbon (1737–1794) looms large in histories of the end of Rome due to his *Decline and Fall of the Roman Empire,* which created a paradigm that remains popular today. Gibbon did not engage with naturalist explanations, leading Anglophone scholars from the early 20th century onward to overlook other works during the 19th century that had engaged with naturalist explanations (GIBBON 1994; WOOD 2013, p. 73 for scholarship not using Gibbon in the 19th century). Since Gibbon had not used naturalist explanations, few scholars seem to have gone looking for antecedents.

If specialists tended to ignore naturalist explanations for Rome's end by the mid-20th century, historians of medicine and scientists made them central to their grand narratives. Henry Sigerist, one of the founders of the history of medicine in the United States, argued that the Justinianic Plague caused the end of Rome, not very different from the arguments of some current scholars (SIGERIST 1943, p. 114; for the background: ROSEN 1958, p. 508). Sigerist was hardly alone, though. While these views were based on mid-20th century needs — namely efforts at securing power, money, and prestige for their scientific research — and cited little late antique empirical evidence to back up their claims, their writings would gain wider acceptance in popular narratives (EISENBERG, MORDECHAI 2020).[2] Disease, as Sigerist in this brief case study has shown, was a popular explanation for Rome's end when historical pandemics were useful to demonstrate the power of modern medicine in the early 20th century, but served less of a need thereafter. Presentist ideas shaped how frequently these explanations appeared (WOOD 2013). Given that late antique specialists today rarely read these early 20th century medical and scientific histories, the recent emergence of naturalist explanations for the end of Rome makes such recent writings seem groundbreaking. They are instead the result of forgetting earlier scholarship (they do appear among the 210 reasons why Rome ended see, DEMANDT 1984).

After medical historians created this causal connection between disease and the end of Rome in the first half of the 20th century, naturalist explanations became less important in historical narratives for the same reason that disease had initially become popular: changes in the role of disease and the environment in daily life. Humans viewed themselves during the mid-20th century as having overcome the natural environment through progress, reason, and science that had seemingly banished infectious diseases and pandemics from the present and thereby from historical writing as well (HAYS 2009; ZIMMER 2017; but see: PECKHAM 2020). Scholarship on the topic never disappeared entirely, of course. In some cases the work was pioneering, such as Jean Biraben and Jacques Le Goff's 1969 article on the Justinianic Plague that catalogued outbreaks of plague across more than two centuries. Biraben and LeGoff identified the Justinianic Plague not as the cause for the end of Rome, but rather as simply increasing the disease burden (i.e. the constant number of disease deaths that are rarely noticed) of early medieval society (BIRABEN, LE GOFF 1969). From the 1970s onward, scholarship on the Justinianic Plague continued to appear, but typically resulted in standalone articles (ALLEN 1979; BRATTON 1981; SARRIS 2001). The synthesis history books of the mid-1990s through the mid-2000s — Mark Whittow's *The Making of Orthodox Byzantium*, Michael McCormick's *Origins of the European Economy*, and Chris Wickham's *Framing the Middle Ages* among others — either dismissed the role of disease (Whittow and Wickham) or did not make it a central driver in historical change (McCormick) (WHITTOW

[2] More work is needed to understand the how and why this change happened, since my work has just sketched out the key moments in this process (see below for further suggestions moving forward).

1996; MCCORMICK 2001; WICKHAM 2005). Naturalist explanations for Rome's end paled in number compared to political, economic or cultural answers (HEATHER 2005; WARD-PERKINS 2005; SMITH 2005).

While most large synthesis histories through the first decade of the twenty-first century ignored this topic, specialist scholarship, on disease and the environment slowly became more common and coincided with the late 20th century concerns about climate change, environmental destruction, and re-emerging infectious diseases following the HIV/AIDS pandemic that began in the 1980s. Dionysius Stathakopoulos's book *Famine and Pestilence in the Late Roman and Early Byzantine Empire* in 2004 was the first late antique foray into the topic of disease and remains key, since it offers a catalogue of disease outbreaks and famines during late antiquity. Later studies are now written from its baseline (STATHAKOPOULOS 2004; and his historiographical survey on the Justinianic Plague is: STATHAKOPOULOS 2000). Just a few years later, the only published book on the Justinianic Plague (an edited volume by Lester Little) appeared, while Mischa Meier's detailed work on the reign of Justinian emphasized the plague as a key factor in the cultural changes of the mid-6th century (LITTLE 2007; MEIER 2003).[3]

From the mid-2000s onward, literature to support naturalist claims became ever more frequent and began to use new scientific evidence to make broad claims. On the climate side, late antiquity was defined as a cold period, a little ice age, which led to an assumed chain of events: lower crop yields, reduced population, a lower tax base, and a weaker economy that all led to less capable and sophisticated political structures (BÜNTGEN et al. 2011; BÜNTGEN et al. 2016). On the disease side, proof of the pathogen of the Justinianic Plague, *Yersinia pestis*, was confirmed through ancient DNA analysis (HARBECK et al. 2013; WAGNER et al. 2014; KELLER et al. 2019). By the 2010s, late antique historians had both begun to center naturalist explanations for Rome's end because of the presentist realities of the world and had new scientific tools to "prove" that the past had experienced similar problems as today.

Kyle Harper's *Fate of Rome* in 2017 tied together both naturalist mechanisms — climate and disease — along with the new scientific evidence to make these into an explanation for the end of the Roman Empire. His work offers a holistic, comprehensive explanation for the end of Rome based on a series of naturalist catastrophes (HARPER 2017). While Harper is careful to lay out a case against environmental determinism — the end of Rome was not inevitable due to naturalist changes — the catastrophic impact of climate and, more importantly, disease still meant the glory of antiquity faded into the obscurity of the early middle ages. Compared to Wickham's view that plague did little to change state structures, Harper massively increased the role of natural events. Whatever the specific proportion

[3] There was also a popular history by William Rosen in 2007, *Justinian's Flea*. It is popular among scientists and broader audiences, but historians have dismissed it.

Harper might attribute to climate and to plague, the question Harper pursues still finds a similar answer: the Roman Empire collapsed amidst catastrophe, but instead naturalist catastrophe rather than political crises (HARPER 2017, pp. 271–287; for critiques: SESSA 2019; HALDON et al. 2018). The 6th century remains the key final moment that divided antiquity and the middle ages (for other examples: HALSALL 2007; HEATHER 2018). Catastrophic thinking remains central, but now the force of catastrophe shifts from a series of political and military events to climate change alongside pandemics.

Harper's book is a direct outgrowth of broader trends in the 21st century understanding of what diseases do. His book is reflective of the obvious point that the pre-modern past is examined through a contemporary lens. As disease has increasingly taken on a greater role in contemporary thought as a key factor in shaping our lives, it does so in the past as well. Past and present problems now reinforce one another. An acute climate crisis and emerging infectious diseases are now central to our world in the 21st century and they have now become the explanatory features for the end of the ancient world as well. The assumption that an unknown infectious disease would cause a global pandemic began during the AIDS pandemic and continued to build explanatory power with the emergence of Ebola in the mid-1990s (LEDERBERG 2000; HAYS 2009, pp. 283–314; SNOWDEN 2008). The early 2000s witnessed few signs that the power of disease would slow, since fears of bioterrorism following the 9/11 attacks along with potential global pandemics, such as SARS and MERS, continued to feature prominently in daily life (WALD 2008; WASHER 2014). 2018 also marked the centenary of the 1918 Influenza Pandemic, the most infamous modern pandemic, which killed at least 50 million people around the world. While its effects on society are uncertain, its place as a key historical event has accelerated since the late 1980s and Covid will likely continue this trend. In popular imagination, the 1918 Pandemic had become a key warning from the past of what might happen in the future. Simply put, pandemics will continue to happen and they might well kill millions just like a pandemic had done in the past (CROSBY 1989; BRISTOW 2012; SPINNEY 2017; MILNE 2018; BEINER 2021).

RESPONDING TO NATURALIST CLAIMS ABOUT THE END OF ROME

My work with Lee Mordechai began at this precipitous moment, January 2018, just as Harper's explanation for the end of the Roman Empire exploded into late antique studies. Our initial decision to begin work had no particular plan, other than a general dissatisfaction with catastrophe as an explanation for the end of antiquity, specifically the role of plague. Given my own separate research interests on the end of Rome, I was frustrated that the old focus on "why Rome fell" had returned in another form. My other projects have sought to understand not "why," but instead ask questions about the process of transformation itself, including how people living at the time

used their resources to shape a distinctly post-Roman order (EISENBERG 2019; EISENBERG 2020). What Mordechai and I sought was to provide a brief response to the narrative of catastrophe via plague. For me, it was a way to move the ongoing and never-ending debate over the end of antiquity into new questions, such as the lived experience of people during these events.

Our first response was published in *Past & Present* as "Rejecting Catastrophe: the case of the Justinianic Plague." We researched and submitted this article in the spring and early summer of 2018 and published it in the August 2019 issue (online in July 2019). The title speaks for itself. The article could only superficially cover the major literary and non-literary sources on the plague (MORDECHAI, EISENBERG 2019). What we wanted was a response to one set of naturalist explanations, strictly focused on what we called "maximalist" interpretations of the Justinianic Plague. Maximalist views take a variety of forms, but they all make plague a vital explanation for the end of Rome and thus the end of antiquity. "Rejecting Catastrophe" could not engage with the problematic question of why Rome ended, although we mention current cultural biases, such as environmental determinism as driving these explanations (MORDECHAI, EISENBERG 2019, pp. 49–50). "Rejecting Catastrophe" had a specific, singular aim: to push back on the common and growing maximalist view of the Justinianic Plague. The plague had become a mid-6th century black box that changes the world because we all seemingly know that is what pandemics "do." As the Roman world ended, all other types of change could now be placed in the box as a way for scholars to bypass the key intermediary question: how?

We had intended that "Rejecting Catastrophe" would be a standalone article refuting the maximalist view of the Justinianic Plague, rather than inaugurating a broader project. But what we came to realize during the course of our research was how much evidence of catastrophe or even just change was linked to plague without any proof. People had just made this connection over and over again without evidence other than references to earlier articles that similarly lacked any evidentiary basis. Scholarship often assumed what was linked to plague, when in fact there was no secure link (or at least not plague induced change), which created the conditions for further explorations. Not only was the analytical late antique evidence ripe for scrutiny due to maximalist overuse, but the conceptual assumptions that pandemics necessarily lead to massive, uniform societal level outcomes seemed hardly tenable. The broader project, now entitled *Pandemics and History: the Plague Concept, Disease, and the End of Antiquity*, has proceeded along parallel historical paths: one late antique and the other modern.

In early summer 2018, Mordechai and I wrote "The Justinianic Plague: An Interdisciplinary Review" for *Byzantine & Modern Greek Studies*, which was an update of a similar historiography that Stathakopoulos had published in 2000 in the same journal. Our article appeared in September 2019 (EISENBERG, MORDECHAI 2019; updating: STATHAKOPOULOS 2000). Given that we had read everything published on the Justinianic Plague since 2000 for the *Past & Present* article it was

a matter of organizing this second article into a coherent format. "The Justinianic Plague: An Interdisciplinary Review" has become a useful introduction to the field, since it is complete for everything published through the first half of 2019. It allows researchers to get up to speed on recent debates in the field, while it aims to be neutral, hopefully allowing scholars to form their own views. This historiographic article led us to reflect upon how the maximalist narratives of plague and societal transformation were created. These readings catalyzed our view at the end of the first article: namely that ideas about plague changing late antique society were linked to broader changes going on throughout from the late 1980s onward. What we began to realize was that there were pieces of the Justinianic plague puzzle that had been attached together and never scrutinized thereafter because once evidence of the plague's impact is accepted, it is just cited enough times in secondary work to become a "fact" and never undergo scrutiny again.

These "pieces of plague" formed the basis for a further exploration of the increased power of the plague narrative over the last 125 years. This resulted in our third article "The Justinianic Plague and Global Pandemics: The Making of the Plague Concept," which was published in December 2020 in *The American Historical Review*. Our goal was not just to reveal how little direct late antique evidence of plague's impact exists, since our close reading of the sources had made plain to us that the medium and long term impact of the plague was uncertain. But we also noted that there were few pieces of new evidence. After all, few direct pieces of evidence for the Justinianic Plague have been found (aside from ancient DNA) over the last 25 years despite the massive increase in scholarship. Rather debates that were never resolved in the first half of the 20th century have simply re-emerged as supposedly new evidence. "Groundbreaking" articles have simply recycled old, forgotten debates (i.e. a plague in England in the early 20th century: BONSER 1944; rediscovered by MADDICOTT 1997). But more important than revealing this re-cycling of old evidence, the article aims to show the conceptual power that the plague has accrued over time, as our contemporary zeitgeist has placed disease as more prominent in shaping history by the turn of the 21st century. As I have noted about the place of naturalist explanations more generally, it is vital to pay attention to the 20th century context. Our contemporary ideas of climate change and re-emerging infectious diseases have shaped our contemporary arguments about the Justinianic Plague. If the evidence has not changed, our assumptions based on how we live today have radically altered. This paradigm shift has made plague feature more prominently in pre-modern histories that are written today. Too often dismissed as mere historiography, pre-modern historians must learn to understand the historical situations of earlier writers, who (obviously) wrote within their own historical contexts (WOOD 2013).

At the same time we wrote early drafts of the *AHR* article, Mordechai and I also began to accumulate large datasets. In December 2019, we published these datasets, along with others, in the science journal *The Proceedings of the National Academy of Sciences* as "The Justinianic Plague: An Inconsequential Pandemic?"

(MORDECHAI et al. 2019). Our *PNAS* paper and the *Past & Present* article should be read together as quantitatively and qualitatively responding to maximalist claims. To be clear, data sets are only as good as the data from which they are collected and ancient world data (or data from any time period) has inherent limits and biases. Ancient data is dependent on survival, its interpretation, and its placement in online repositories. All of these factors (and others) make the creation of large datasets from ancient data extremely difficult to find, collect, and interpret. It is also why many ancient historians tend to be wary of any large datasets, since they can be deconstructed to demonstrate their problematic nature, and why many would prefer qualitative analysis as central to any argument.

The aim of the *PNAS* article was not to invent new datasets that would quantitatively overcome the limits of qualitative analysis. As our *Past & Present* article showed, qualitative work must be at the heart of analyzing sources from the 6th century (MORDECHAI et al. 2020). Instead, we sought to gather together data, and build datasets, based on sources that other scholarship on the Justinianic Plague had claimed was linked to plague. These data included inscriptions, new laws, papyri, and mass graves among others, most of which have no links to plague but have been assumed to be plague related. For example, epigraphy (inscriptions) has been cited anecdotally both as increasing in total number due to the plague (more people dying means more funerary inscriptions) and as decreasing due to the plague (more people dying means fewer people to carve inscriptions). At the same time, single inscriptions during the mid-6th century were used to create evidence for a massive plague outbreak. For example, the entire evidentiary basis for assuming a massive plague outbreak in Sicily is from a single inscription that cannot be dated to the 540s nor does it tell us the people who died had the plague. These anecdotal uses of inscriptions were never compared against the number of inscriptions from earlier or later to know if any pattern existed. The *PNAS* article put together these large datasets of inscriptions to try to understand if there were any patterns, but we could not find support for anything in any direction. Rather, whatever patterns existed before the plague outbreak simply continued afterward through the end of the 6th century. Similarly, scholarship had argued that the number of laws the Emperor Justinian issued decreased once the plague broke out in Constantinople with simple "before and after 542" as the cut off. The assumption seemed to be that the government was under stress and could not function in a "normal" way. Our analysis did not discuss government duress, but simply showed that if you used an annual scale the drop off in new legislation occurred a few years before 542 (MORDECHAI et al. 2020). The decrease in the number of laws is probably far more likely to reflect the completion of the Justinianic legal corpus and the chance survival of laws, rather than anything to do with plague. Our goal was to test a hypothesis others had suggested, and we found it lacking.

A FUTURE OF PLAGUE STUDIES

Our *PNAS* article did confirm the importance of our modern plague work in the *AHR*. The article, with its datasets, graphs, and straightforward message in a science journal, received considerable press and public attention.[4] Mordechai and I had put together a significant press plan in the months leading up to the publication. While rarely in the purview of historians (or any academics), in this case a well-crafted press plan resulted in significant reporting on the topic (KALDELLIS 2021). Yet, the press resulting from the *PNAS* article also demonstrated how the media writes narratives based upon the ideas of our own time. Our article, after all, was framed as a counter-narrative to the mainstream view that plague brought down the Roman Empire. Given the presence of the contemporary maximalist approach to plagues, it was perhaps inevitable that the media would frame our article within that context.

Interest in plague and pandemics as massive events have picked up significantly over the course of the Covid-19 pandemic. Early hypotheses assumed that Covid might mirror assumptions of what had happened during the Justinianic Plague (or other pandemics) and lead to the collapse of economic systems and governments. Some scholars even argued that reduced income inequality might occur after Covid, citing the Justinianic Plague as one of their primary examples. These predictions were walked back within a few months (SCHEIDEL 2020a; SCHEIDEL 2020b; EISENBERG 2021; and now: VAN BAVEL, SCHEFFER 2021). What seems apparent as of this writing is that Covid has had a comparatively lower number of deaths than ancient and medieval pandemics. This allows us to assume people today have somehow "done better" than sixth-century people during the Justinianic Plague (LEPAN 2020; ROSENWALD 2021). These narratives of modern success, in order to justify this position, then re-create maximalist narratives of Rome's end as a way to play up modern progress and technology. "Look at our progress," they seem to shout when compared with the Justinianic Plague. Yet, this sense of superiority is misplaced, since we have the knowledge to prevent deaths through "modern" science and public health measures, but they have not, in the U.S., mitigated the effects of Covid. As of this writing, the U.S. has had approximately twenty percent of global total Covid deaths and ranks in the top fifteen of deaths per capita, despite all the necessary scientific, technological, and planning practices available. In contrast, New Zealand and Australia, where deaths have been far lower, implemented these measures more competently (EISENBERG 2021; on early reflections

[4] Our *PNAS* (*Proceedings of the National Academy of Sciences*) article has been discussed in over 90 news publications, for example. As another metric, as of March 29, 2021, the *PNAS* article has been viewed 54,993 times, while the *Past & Present* article has been viewed 6,401 times despite a publication date five months earlier. The *PNAS* article has been open-access the entire time, but *Past & Present* was also open-access for the first few months of Covid, which exponentially increased its views.

about New Zealand: RICE 2020). The number of deaths today — at least in North America and Europe — are far more damning because we do know a lot more than people who lived during Justinian's reign.

The increased interest in pandemics during Covid has led to three further expansions of the *Pandemics and History* project. First, we are building upon the foundation of the *AHR* article to expand our research on modernity. If research on the plague over the course of the 20th century is central to how historians wrote about the Justinianic Plague, then we must understand a lot more about how the narrative was created. Our *AHR* article examined the creation of the story within its broad 20th century story, but it focused on published works from leading figures. What is missing are the connections between these developments over the course of the 20th century. Two questions among others come to mind. Why did modern narratives about pandemics influence specific historians? How did scientific and humanities education intertwine to create new narratives?

The second expansion of the project is to examine the plague in popular culture as integral to expectations of disease. We need to take seriously how much popular media has shaped how people read academic work, which in turn shapes how future academics write their histories. The understanding of our *PNAS* article is one such example. Working alongside a film studies Robert Alpert, Mordechai and I are writing a book on the pandemics in popular culture using film as a lens. Films from the 1950s to the present witness a similar change over time story that we reveal in the *AHR* article: conquest of disease to the inevitability of a global pandemic in the future. Academic and popular culture in late antique studies tend to be considered separately, given who studies each medium, but this book makes clear how tied together they are. Separating disciplines inhibits our understanding.

Finally, we have expanded the project into our own 21st century popular media, podcasting, which seeks to talk with academics in adjacent fields about their work. Starting in March 2020, Mordechai and I founded and host the *Infectious Historians* podcast where guests talk about various diseases and pandemics from the ancient world to the 21st century, along with thematic topics such as race, public health, and popular culture. Given our own interests that span from antiquity to the present, we came to realize that few people (given knowledge limitations) work across time periods, but that different chronological and geographic periods have much to offer each other. Other fields methodologically answer and even ask different questions about disease. What our guests have convincingly demonstrated is that naturalist assumptions about why Rome ended, and even tying disease to such a big political question, are not replicated in any other field of disease history. Guests have dismissed the notion that the Black Death led to the end of political regimes, so why do we make the Justinianic Plague answer that question? Or even ask it as a question. There is a significant need, therefore, to integrate histories of disease back into the broader methodological fields from which they arose. Ancient and medieval historians should look not only to their own chronological fields for new questions, although ancient and medieval historians

are not alone in their narrow focus. Without engaging with other chronological fields, we risk reifying our own questions without asking new ones.

Our project uses these three explorations as a foundation to examine questions of the plague's impact in late antiquity that we preliminarily answered in the *Past & Present* and *PNAS* articles. The project traces out this history by telling the story of what the plague did — and just as importantly did not do — in the late antique world, along with how and why we think the plague had such a profound impact over the last 125 years. We show that the plague's impact was highly variable depending on time, place, and even how people reacted to it. The story cannot just be asking the same question: did something bad happen to Rome? Contextualizing the impact of a disease is, after all, the basic bedrocks of the social history of medicine for the last half century (ROSENBERG 1987; ROSENBERG 1989; CHARTERS, MCKAY 2020).

These ideas of death and destruction (implicitly) draw from debates about the changes humanity has done to our natural world in the Anthropocene. This is the period in which we live today and in which we have reshaped the Earth in various ways. Missing from the analysis of the ancient world is a key question of Anthropocene work: what is the role of humans in reshaping the world, along with when and how did they? (MIKHAIL 2016). When naturalist ideas are applied to the end of the ancient world, humans are stripped of their agency in this process and simply become helpless, dare I say medieval, people who bear the burden of catastrophe and then pick up the pieces. This lack of agency would not be used to explain other ancient phenomenon, so why plague?

We also cannot assume the same impact of a disease or disaster across the entire Mediterranean, let alone the Eurasian world. Instead, we should focus on local and regional evidence to understand when (or even if) plague had a significant impact and where it might have been part of broader processes. The new model of Rome's end shifts the debate from "why" Rome ended to how the then contemporary world changed over time with plague. It moves the discussion from Plague (with a capital P as a black box entity) to plague effects (lower case and two words). The processes of resilience, decline or other changes need to be examined based on how certain locations were affected (WICKHAM 2005; HALDON 2017; DEGROOT et al. 2021).

In effect, the new story of plague effects is not a story about plague, but of human responses to plague and other changes in society during the course of the later and post Roman Empire. The problem with studying plague as the primary lens is that it reifies the idea that plague should and must change the world in particular plays, as if following a script (ROSENBERG 1989; and for reflections: FISSELL et al. 2020 along with the other articles in the volume). If the bacterium may follow a largely similar, but not identical, script in how it biologically invades human bodies, human reactions to what is happening around them do not follow a script. To suggest otherwise is to prioritize biology and to treat every plague pandemic as if

they are the same (EISENBERG, MORDECHAI 2020). After all, Mordechai along with my former colleague Lauren White have used disease modeling to understand the impact of the plague in Constantinople. While these results removed some possibilities of what plague did during the first 542 outbreak, the parameters of the model were completely unclear so extrapolating results is difficult. How many people lived in the city? What was the urban density? How many rodents spread the disease? What was the temperature of the city during the outbreak? (WHITE, MORDECHAI 2020). These are just some of the basic assumptions that any scientific model has to make before trying to deduce the mortality in a single location, let alone trying to understand economic or political effects. This means that human decisions and human agency are central, which can determine how a pandemic strikes a particular location. As Mordechai and I have made clear, we believe historians — and historical questions — should center humans and how plague effects them above all else (MORDECHAI, EISENBERG 2020).

CONCLUDING THOUGHTS

This article has sketched out the background to existing debates about the impact of natural events at the end of the Roman Empire, which I have called "naturalist." In particular, I have focused on the Justinianic Plague, which is perhaps the naturalist event *par excellence* in driving a changed view of an historical era through "maximalist" scholarship that believes plague ended the Roman Empire (or at least contributed significantly to its decline). I have then discussed the development of my published work, along with my colleague Lee Mordechai, over the last few years on the Justinianic Plague alongside present and future avenues of research in the field. Even before the Covid Pandemic, Justinianic Plague debates had become "hot" (in a relative sense, of course) field of study, which will only increase due to the amplified focus on disease, epidemics, and pandemics now that the entire globe is living through a "similar" event (i.e. the special issues introduced by: CHARTERS, MCKAY 2020; FISSELL et al. 2020).

What seems clear at this stage in research are two key ideas: one within the field of history and one more broadly. First, late antique historians must begin to think with the methodologies that modern histories of disease use. By too often refusing to read modern work, we have failed to notice the assumptions we have carried into our own work from scholarship of the last 125 years and how this has shaped the answers, and even the questions, we ask. We have also separated ourselves in how we think about disease from all other fields, leading to assumptions that the ancient and medieval worlds, and specifically the people who lived during these periods, were always struck worse by disease. In effect, we have made our actors into passive, primitive people who were incapable of responding adequately and were victims of biological circumstances that they could not control. While late antique humans did not know

a bacterium was killing them, it is not as if the knowledge that a virus is killing people during Covid means that every place has been struck the same. How humans react has been key to Covid in different countries around the globe and was certainly key to the Justinianic Plague's impact. Moreover, even today with all of our scientific knowledge, why Covid (and the plague in fact as well) has higher infection and case fatality rates in different places within countries is poorly understood. We know so little about the late antique disease burden, yet this does not foreclose the need for us to focus on plague effects rather than as an effect.

Second, historians must stop assuming that science will provide the answers to our questions. Just because we learn about the importance of scientific reasons for diseases — such as the evolution of *Yersinia pestis* as a bacterium — does not mean we can conclude based upon such scientific explanations that we have exhausted the reasons for the plague's historical impact (MORDECHAI, EISENBERG 2020). If we want our historical questions asked and answered, we need to work with scientists — not just ingest their results — and we must also understand the uncertainties of science and not prop up simplistic and outdated historical narratives that scientists have used to frame their own conclusions. We must, therefore, concentrate on plague effects and not assume the Plague as a block box explanation. Scientific narratives that support this thinking are themselves often based upon outdated histories written across the last 125 years. We can and should use scientific evidence, but it must be to ask (and hopefully) answer our own questions and not repeat what has not changed for the last century. In other words, if late antique historians learn about the changes to how pandemics in the past have been framed during our own lifetime, then it would give us a more useful way to read science articles as not just introductions and conclusions, but learn to read the data itself, which is far messier.

The entire world has now lived through our own horrific pandemic that has killed millions globally and, as of this writing, the end of this pandemic (whatever that even means) is uncertain. Tens of thousands more will continue to die and even when the pandemic seems over in the U.S. or Europe, it will almost certainly continue with awful consequences in the Global South, which presently does not have fast, cheap access to vaccines. But what I hope we have learned is that science alone has not saved us. In the U.S., the basic science of how the virus works has long been clear. We knew how the virus spread relatively quickly (within months) and had planning that governmental officials could have used to reduce the number of people who died, especially in minority and lower socio-economic communities. Various people at all levels of society from the federal government down to individuals simply chose not to use the science to solve the problem or even explain it well. Why should science alone solve how a pandemic affected people in the past either?

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Summary

This article reviews recent scholarship on the Justinianic Plague (c. 541–750 CE) and places these publications within the intellectual framework of how we think about disease in the contemporary world. Given increased focus on climate change, environmental destruction, and pandemics in the twenty-first century, it is not surprising that scholars have arrived at what I call here "naturalist" explanations for the timeless question: why did the Roman Empire fall? After discussing connections between naturalist explanations and contemporary ideas about disease, the article then discusses the background to my ongoing work on the Justinianic Plague since 2018. At the end, it offers a future for plague studies that suggests scholars must engage more critically with these contemporary ideas about disease during the twentieth and twenty-first centuries alongside collaborations and critical engagement with modern historians of disease as a way to learn how to ask new questions of ancient and medieval pandemics.