

Fates of Romes*

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KYLE HARPER, *THE FATE OF ROME: CLIMATE, DISEASE, AND THE END OF AN EMPIRE*. Princeton/Oxford: Princeton University Press, 2017. Pp. xii + 417, illus. ISBN 9780691166834. £27.95/US\$35.00.

I CLIMATE AND DISEASES AS CULPRITS

Kyle Harper's book *The Fate of Rome* marks the thunderous entry of Nature into the world of ancient history of the twenty-first century. This is not the first book devoted to questions of climate and diseases in the ancient world, but its publication nonetheless represents a turning point. From now on, whether they work on political, social, economic, or even religious history, ancient historians will no longer be able to ignore these factors in their own writings. That is not to say that all the theses of the book, especially its natural determinism, should be accepted uncritically.

Published in 2017, *The Fate of Rome* seems to resonate as a warning of the dangers that threaten our own societies. There is no need to stress our contemporary preoccupations over climate change and global warming. As for diseases, the recent coronavirus epidemic has given us a taste of the disruptions provoked by much more deadly pandemics in the societies of the past. While almost everyone has long been aware of the threat of global warming, despite the alerts of the early years of this millennium many countries have been taken by surprise by the world-wide shock of the COVID-19 pandemic. H.'s book has proved unexpectedly timely, in more ways than one.

The impact of the book can be gauged by the number of reviews it has generated, well beyond the usual circles of ancient history. It was also immediately translated into Italian, French and German.¹ Furthermore, the book has provoked one of the most fruitful debates of recent years in the field, and this review will also engage with the discussion it has generated.² It should be underlined that, despite radically diverging opinions, the debate around *The Fate of Rome* has been remarkably fair and productive: this has been a model of scholarship at its best.

The argument of *The Fate of Rome* develops in seven chapters. Ch. 1 sets the stage for the drama that unfolds in those that follow. The basic idea is that new technologies now make it possible to bring out in an unprecedented way the climate crises or diseases that struck the Roman Empire. However, one should not take climate or diseases as purely exogenous factors. This warning will reappear as a *leitmotiv* throughout the book: if there is no doubt that a society can be the object of exogenous shocks, the specific environment that the society itself creates also plays a decisive role in determining how

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¹ *Il destino di Roma. Clima, epidemie e la fine di un impero* (Rome, 2019); *Comment l'Empire romain s'est effondré. Le climat, les maladies et la chute de Rome* (Paris, 2019); *Fatum. Das Klima und der Untergang des Römischen Reiches* (Munich, 2020).

² Among academic reviews, the most detailed and important are those of Haldon et al. 2018 and Sessa 2019.

it faces this challenge.³ The chapter ends with a summary of the various ecological crises that the Roman Empire had to suffer, and which (in H.'s view) played a major role in its demise.

Ch. 2 vigorously argues that the undeniable prosperity of the early imperial period was based on exceptionally favourable climatic conditions. This 'happiest age', starting in the first century B.C.E. and covering the first and most of the second century C.E., was that of a 'warm, wet, and stable climate regime rightly known as the Roman Climate Optimum' or RCO (40). The chronological coincidence between the RCO and the prosperity of the Han Empire in China is not a mere coincidence, but the product of the same causes. However, this golden age was not to last for ever.

Ch. 3, 'Apollo's Revenge', shows how the god who decimated the Achaean army before Troy was soon to take his vengeance. In the period from 165 to 172, with several recurring episodes in the following decades, the Roman Empire suffered a major shock, the so-called Antonine Plague. Epidemics and fevers were well known in the ancient world. But for H. the Antonine Plague (whose symptoms seem to correspond to those of smallpox) represented a blow of major significance. The disease spread all over the Empire, and struck the imaginations of contemporaries by the number of deaths it caused. In the ongoing debate over the losses provoked by the Antonine Plague, H. takes a middling position, with deaths at around 10 per cent of the total population of the Empire, itself estimated at 75 million (115).

Chs 4 and 5 aim at analysing the basic features of the environment of the Roman Empire between 200 and 500 C.E. While emphasising that climate and disease cannot explain everything, H. insists on their background role in defining the decisions of the political or social actors of the time. The happy times of the RCO were now gone. The period 200 to 350 C.E. was characterised by a cold, dry and unstable climate. It was also marked by a new devastating shock, the so-called Plague of Cyprian, which struck in the middle of the third century, with a likely rebound around 270 (136–45). There was, however, a recovery. The period 350–450 C.E. was even marked by an increase in precipitation in France and Germany, which may help explain the recovery of the Empire in the fourth century (169, figure 5.1).

Then came the age of desolation, described in the final two chapters. Ch. 6 is mainly devoted to the great plague that struck the Mediterranean region under Justinian. This time, as is now made certain from DNA analysis, the disease was the true plague, provoked by the bacterium *Yersinia pestis*. Coming from the east with rats in the ships carrying trade with India, the disease reached Pelusium in 541 and then infected the whole Mediterranean and beyond. The death rate was enormous, of a comparable order to that found in medieval Europe at the time of the Black Death. In a decade, the Justinianic Plague eliminated 50 per cent of the population of the Eastern Empire. The renewed outbursts of the plague until the mid-eighth century meant that there was no demographic recovery. The shock decisively weakened the empire, making it unable to levy taxes. In a world where the military formed the backbone of the state, the army found itself dangerously depleted.

But the plague was not the only difficulty that the Eastern Empire had to face. Ch. 7 shows that between the beginning of the sixth century and the second half of the seventh century, the Empire suffered from a period of marked global cooling, known as the 'Late Antique Little Ice Age' (LALIA). There seems to be a good chance that this cooling was provoked by a fall of solar output, which seemingly was even lower than during the Little Ice Age (LIA) of the late medieval and early modern period (255, figure 7.2). But in the sixth century the cooling was further aggravated by the consequences of two cataclysmic volcanic explosions of the years 535–536 and 539–540, as a result of

³ See also Harper 2018.

which the atmospheric temperature of the planet fell by 2.5° C or more, with a disastrous impact on crops.⁴ This was right before the outbreak of the Justinianic Plague. The succession of exogenous shocks deeply weakened the Eastern Empire at a decisive moment, and helps to explain its final defeat at the hands of Islam.

This is the story told by H. The glorious days of the early Principate — a prosperous and densely populated Empire covering the whole Mediterranean region — gave way to the dark age of an impoverished, depopulated rump state reduced to Greece and Asia Minor. In parallel, the Roman Empire experienced an initial period of climate optimum, followed by a series of both climate crises and pandemics of increasing scale. The close matching between the two sequences invites us to think that they were interrelated, and that climate and diseases played a fundamental role in the tragic fate of Rome. H. does not fall into the trap of arguing that every single historical development of the Roman Empire was narrowly related to a specific climate variation or epidemic. His thesis is rather that the combined action of climate and diseases was the driving force that over-determined the political, social and economic evolution of the Roman Empire.

One should emphasise that we have not here a purely factual presentation of a thesis. Beautifully written (a quality highlighted in many reviews), *The Fate of Rome* tells a story. It can be read as a tragic drama, with its innocent protagonists collectively unaware of their coming fate, a generation or even just a few years later. Thus the lavish celebration of the millennium of Rome in 248 was immediately followed by the Plague of Cyprian (starting in 249) and the crisis of the 260s, which almost saw the disintegration of the Empire (136–49). It also takes the form of a philosophical meditation on the human condition, as is suggested by the title of ch. 5, ‘Fortune’s Rapid Wheel’. And, like any good crime novel, it has its murderers (in fact mass murderers), above all the *Y. pestis* bacterium which killed millions under Justinian.

Anthropomorphising natural forces makes it easier for the reader to feel at ease with the situations described and to identify with the book’s protagonists (and, some might say, to accept the author’s theses uncritically). The style of writing is characteristic of books intended for a general audience, well beyond the limited circle of specialists who form the normal readership of ancient history. Still, it would be most unfair to dismiss *The Fate of Rome* as popular non-fiction with a trendy taste of science. H. is a very serious historian, author of two remarkable books: *Slavery in the Late Roman World, AD 275–425* (2011) and *From Shame to Sin: The Christian Transformation of Sexual Morality in Late Antiquity* (2013). *The Fate of Rome* has two appendixes of data, dense notes and sixty-two pages of bibliography; it shows an impressive knowledge of primary data and of debates relating to climate and diseases in antiquity. H. himself published, alone or in collaboration, a series of preliminary articles on the topic, and it is on this solid foundation that his book is built.⁵

II CLIMATE IN QUESTION

To my mind, the key question H.’s work provokes is whether we are to accept that climate and disease can be driving forces behind wider historical developments, or whether they are instead only two among many other factors influencing social and economic change. To start with, we might observe that H.’s book could just as well have been titled *The Fates of Romes*. It does not provide one fall narrative, but two. The first tells the story of the fall of the unified Roman Empire as created by Augustus; the second recounts the fall of the Eastern Empire, reduced to the territories of Greece and Asia Minor after the shock

⁴ On the second eruption, see now Dull *et al.* 2019.

⁵ Harper 2015a–b; 2016a–c; 2018; Harper and McCormick 2018; McCormick *et al.* 2012a–b.

of the Islamic invasions. Climate and diseases are proposed as the driving forces behind both collapses, but it should be clear that, although they follow one another, the two processes are fundamentally distinct. Although H. closely links the two aspects, for the sake of clarity I shall address climate first, then epidemics, in each case looking first at the fall of the unified Roman Empire and then the Eastern Roman Empire.

H. considers the sequence of diseases and the climatic cooling which started around 200 C.E. as the driving force leading to the collapse of the unified Roman Empire at the end of the fourth and beginning of the fifth century. The consequence of the two natural shocks was a decline in population and a less productive economy. The Roman imperial state had to maintain the same level of levies and charges — or even increase them because of the growing barbarian pressure — in order to maintain an army able to defend the frontiers. H. does emphasise that the collapse of the Western Empire ‘was not in any simple sense the delayed consequence of unresolved tensions left in the aftermath of the third-century crisis’ (188). But, surprisingly enough, *The Fate of Rome* does not elaborate on this, focusing narrowly on diseases and climate (and also on political reorganisation) rather than on the long-term social and economic aspects of the crisis. There is also a missing link: if a period of cooling should be equated with lower overall productivity of the land, then the warmer period of the fourth century should have allowed the system to recover. This is, in fact, more or less what he claims to have happened, with the renewed prosperity of the fourth century contrasting with the difficulties of the previous period (167–72). But clearly the restoration of the state (in fact, its transformation into an authoritarian bureaucratic apparatus) was not accompanied by massive new demographic and economic growth. This, and only this, might have allowed the Empire to meet the new challenge that it would soon have to face: an unprecedented wave of invasions coming from deep in the hinterland of Eurasia. Thus a close reading of the book shows that natural factors can only be part of the equation of the fall, which is perfectly correct. But the heavy and repeated emphasis in the book on climate and disease, and the absence of in-depth treatment of the social and economic aspects of the crisis, will certainly leave most readers with the impression that natural factors determined all the rest, which is regrettable.

In assessing the possible role of climate as a driving force (and I do not pretend to have a ready-made answer to this complex question), one should take into consideration the *longue durée* history of the ancient world. First of all, in economic terms, the Roman Empire does not come out of nowhere. The Roman unification of the Mediterranean space represents only the final stage of a process of growth, accompanied by the development of states of increasing size.⁶ It began in the Archaic period and spanned the Classical and Hellenistic periods, an interval during which climatic conditions changed significantly several times.⁷ In other words, the overall process of growth and unification seems to have been independent of climatic conditions. Why should things have been different for the period of economic decline and fragmentation?

In fact, one should question the definition of the climate phases as ‘favourable’ (warmer) or ‘hostile’ (colder). The colder climate of the Archaic period, far from impeding economic development, may have contributed to the growth of early Greece. One needs to take into account the overall complexity of the process of climate change and the difference between northern and southern Europe. In Mediterranean regions, a significantly colder climate may increase precipitation and thus the productivity of the land. Conversely, a significantly warmer climate tends to limit precipitation and decrease land productivity. In northern Europe, by contrast, a significantly colder climate may limit precipitation and shorten the period of plant growth (a disadvantage particularly for cereal crops),

⁶ Bresson 2005.

⁷ Bresson 2014.

while a significantly warmer climate will increase precipitation. But even this description may be misleading, for a series of reasons. For instance, the experience of the LIA shows that colder temperatures may trigger higher precipitation in the western Mediterranean (Spain, Morocco) and less in the east (Greece, Turkey and the Levant), in an east-west climate see-saw effect.⁸

In the case of the Roman Empire, which at its height extended from northern Scotland to southern Egypt and covered a series of very different climate zones, it is simply impossible to define a favourable or unfavourable climate for the whole Empire. Furthermore, even if we posit that a typically Mediterranean agricultural production was still at the core of the Empire's prosperity, it is not obvious that warmer conditions, the so-called RCO, allowed a maximisation of yields in the Mediterranean regions and a boost to the prosperity of the Empire.⁹

The Eastern Roman Empire, which covered the eastern Mediterranean only, may seem different, as its extension both in latitude and longitude was much more limited than that of the unified Roman Empire. Being relatively more homogenous than the previous pan-Mediterranean Roman Empire (aside from Egypt, where the water supply originates in a different climate zone), it may have suffered more seriously from colder climate conditions — albeit only if a colder climate really meant overall diminished crop-yields, which remains to be proved. But even in this case, it is difficult to conclude that (beyond the catastrophic circumstances of the volcanic explosions of the 530s–540s) the colder weather led to an adverse period overall. One would need to demonstrate that the global balance was negative, with more regions negatively than positively affected, which, for now, seems difficult to achieve.

Beyond climatic issues, it is remarkable that Belisarius' great conquests, admittedly based on his exceptional talent as a general and also on much luck, took place precisely in the period 535–555. The Eastern Empire managed to conquer Africa, Italy and its neighbouring islands, and even part of southern Spain and Mauretania.¹⁰ This is hard to reconcile with a state on the verge of collapse: in the mid sixth century, the Roman Empire was more powerful than it had been since the end of the fourth century, before the collapse of the Western Empire. From 568, the Lombard conquest of Italy began to wear away the Byzantine territories, and similarly, starting in 584, Byzantine Hispania began to shrink under Visigothic assaults. But these setbacks can be attributed to the difficulty of waging war on many different fronts rather than to any overall weakening due to adverse climate conditions. The territorial losses of the Eastern Roman Empire and the collapse of the Sasanian Empire before the Arab armies can similarly be explained by the fierce and prolonged war between the two empires between 602 and 628, which left them exhausted and unable to resist the Arab onslaught.

Despite these reservations, there remain two ways to argue for a link between climate conditions and the difficulties for the unified Roman Empire and the Eastern Roman Empire in facing their 'barbarian' enemies. First, we could posit that climate change affected the Empire and its enemies differently. We could argue that, while central Europe and the eastern Mediterranean experienced a decline of land use due to adverse conditions, the Arabian peninsula saw an expansion of land use: more soldiers could thus be mobilised against the Sasanian and Roman Empires.¹¹ But it remains the case that both empires had been weakened by their recent fight to the death against one another. In other words, climate conditions may well have favoured the Arab conquest,

⁸ Roberts *et al.* 2012.

⁹ On the lack of a proven connection between the RCO and the prosperity of the early Principate, see also, with different arguments, Haldon *et al.* 2018 (1).

¹⁰ Moorhead 2008.

¹¹ Büntgen *et al.* 2016: 235.

but it seems difficult to argue that it was the primary cause of the Byzantine and Sasanian defeats.

Secondly, we could argue more generally that complex societies suffer more from exogenous shocks. Complex societies are far more effective under normal conditions, but their very complexity creates fragility, rendering them unable to resist unexpected blows: in disrupting one element in social and state structures, exogenous shocks could undermine the whole and weaken its capacity to fight external enemies. By contrast, the unsophisticated ‘barbarian’ enemies were both deeply segmented and constituted a series of highly flexible states. These states could collapse overnight, but could regenerate in another form under the leadership of some new tribe and a new charismatic leader almost as quickly as they had disappeared. The magnitude of the shocks that hit the Roman Empires is not in doubt, and their structural difference from their enemies seems a valid argument. But even if so, this would be a matter of specific social organisation, rather than natural shock only.

My point is certainly not to negate the role of climate and climate change on social, economic and political history. It is clear that climate crises could have a major impact on the short term. For the Ptolemaic period, episodes of low flood discharges provoked by volcanic eruptions were also responsible for poor crops and, in turn, for revolts.¹² For Egypt in the medieval period, low Nile flood discharges triggered terrible famines.¹³ Whether or not these shocks could lead to epoch-making political changes is another story. For Egypt, the major historical turns represented by the conquests of Alexander, Augustus or the Arabs cannot be linked to any specific climate crisis that would have triggered a new and specific episode of conquest. In the *longue durée*, unless climate change is so radical as directly to threaten the organisation of society and production, it appears to be only one of several factors driving social change; there is no reason to attribute to it the role of driving force.

III THE IMPACT OF PLAGUE

So far, the focus has been on climate, but H. also puts a strong emphasis on diseases, leaving the impression that diseases in fact had the primary role in the falls of the Roman Empires, although he is admittedly careful to link the two factors (218–20).¹⁴ The logic is that as climate crisis decreased the productivity of the land, the quantity and quality of available food dropped, which in the end provoked a demographic decline. The diseases, too, had a direct demographic impact by eliminating a fraction of the population. Climate crisis and diseases also have a more direct link, as less well-fed and less prosperous populations are weaker and less able to resist an epidemic (174–5). Nonetheless, even with this link established between the two aspects, it is still true that diseases with an exogenous origin (such as a bacterium) can be treated as a wholly separate factor.

The impact of diseases involves two intertwined questions: the capacity of the demographic losses to trigger significant social transformations, and the actual level of the losses. The level of the losses is not in itself a fixed indicator, and the same level of losses may have different impacts on societies according to their social complexity or

¹² Manning *et al.* 2017.

¹³ Hassan 2007.

¹⁴ More rain in the semi-arid regions of Asia, the reservoir territory of the *Y. pestis* bacterium, triggered a proliferation of rodents and the dissemination of the disease. On the potential link between climate and plague, see also Newfield 2018 (who also makes the link between climate crises and other diseases, such as malaria) and Moreland 2018: 106, n. 5, for other references.

capacity for resilience. However, all things being equal, the heavier the blow, the deeper the impact.

From this perspective, determining the demographic impact of the Antonine Plague, the Plague of Cyprian or the Justinianic Plague is not an ancillary question: it becomes a crucial first step in any reasoning concerning their possible social consequences. Each of the three epidemics mentioned by H. has been the object of long and heated debates, and clearly there is still no consensus.¹⁵ For two reasons, the emphasis here will be on the Justinianic Plague. First, according to H., despite the heavy losses provoked by the first two epidemics, it is the third that had by far the most devastating consequences, directly triggering the end of the ancient world. Second, in opposition to H.'s view, this plague has recently been the object of a fundamental re-evaluation, suggesting a radical diminution of its proportions and denying it any serious consequence for the society of the time. Of the three epidemics, it is the Justinianic Plague that provides the best possible case study.

Like those of his predecessors who share his view on the catastrophic impact of the plague, H.'s reasoning is based first of all on the apocalyptic descriptions provided by Procopius, John of Ephesus, Gregory of Tours (for Gaul) and other accounts (220–30).¹⁶ But it is also based on the epigraphic and archaeological evidence, especially that of mass graves and the impact of the plague on prices.¹⁷ For the death toll of the plague, H. draws an explicit parallel with the Black Death and its successive outbreaks.

Concerning this analogy, although all specialists on the Black Death agree that the death rates were extremely high, there is a debate on the level of losses. For Europe and for the Black Death proper, Ole Benedictow suggests an average loss of 60 per cent of the population.¹⁸ While admitting that in some regions the death rate could reach 60 per cent, other specialists favour overall losses between 30 and 50 per cent.¹⁹ In the Middle East, the Black Death killed over 40 per cent of the population, and in some regions mortality could also reach 60 per cent.²⁰ After the Black Death, a series of new plague waves hit Europe and the Middle East, in some regions until the end of the early modern period. The overall demographic consequences of the Black Death and the successive plague waves were substantial, and it took at least two centuries (depending on the country) for the population to recover its pre-plague level.²¹

For the Justinianic Plague and the successive plague outbursts until *c.* 600 C.E., as compared to the population of the Eastern Roman Empire before 541, H. suggests a fall of 50 per cent for the initial outburst (the Justinianic Plague), with the population falling from thirty to around fifteen million inhabitants. Successive outbursts until *c.* 600 C.E. would have taken the lives of another five million people. The total population would have fallen to around ten million inhabitants, around a third of its pre-plague level (226, 244–5).

However, other analyses provide a picture that differs radically from this catastrophic description. Chris Wickham had already defined the main lines of a counter-argument. For him, the plague has left no archaeological trace in the east, nor does it appear in the papyrological data from Egypt. In the west, there is evidence for demographic decline, but in a very uneven way, according to the region. Demographic decline had begun as

¹⁵ Antonine Plague: Harper 98–115. Plague of Cyprian: 136–7.

¹⁶ Testimonia in Stathakopoulos 2004: nos. 102–12 and 114–18. 'Amplification events of the First Pandemic': Harper 304–15. Lists of plagues and sources: Mordechai *et al.* 2019: appendix 3–10; and Keller *et al.* 2019: appendix 18–23.

¹⁷ Harper 2016b. For mass graves, see McCormick 2015 and 2016. For prices, see Harper 2016a.

¹⁸ Benedictow 2004: 345–84, with 383, table 38, for the 60 per cent rate.

¹⁹ Biraben 1975: 156–84; Christensen 2009.

²⁰ Borsch and Sabraa 2017.

²¹ McCants 2015: 125.

early as the fifth century, and the late sixth and maybe the seventh are more centuries of slow recovery than of decline.²² For Wickham, the Justinianic Plague would thus have had a negligible impact, and would certainly not justify the denomination of ‘First Pandemic’ that has recently been attached to it.

More recently, several studies have followed the same line of argument.²³ According to them, the plague cannot have hit all the regions of the Mediterranean. A quantitative approach to literary sources, papyrological, epigraphic and numismatic evidence, as well as land occupation (on the basis of pollen analysis), shows no trace of collapse after 541 C.E.²⁴ The existence of multiple burials from late antique British and Bavarian cemeteries is not proof of hasty burial in an epidemic context: it was simply a form of cultural practice established well before the outbreak of the plague. The existence of a plague epidemic is made certain by DNA analyses from England, France, Germany and Spain. But this does not require us to think of an impact similar to that of the Black Death, the Second Pandemic, since the First Pandemic strain was far less prevalent than the second one. In fact, it is better compared to the Third Pandemic of the end of the nineteenth and the early twentieth century, which never had a significant demographic impact: India was the country that was the most heavily struck by the plague, but in Bombay, the city that was the most severely affected, the percentage of deaths never exceeded 3 per cent.²⁵ To sum up, the ‘First Pandemic’ would simply not deserve its denomination.

The two hypotheses, that of the ‘maximalists’ and that of the ‘minimalists’, are both built on large bodies of data, well argued, and absolutely contradictory. We seem to have a choice between two solutions only, the ‘high count’, with the fall of the ancient world as its consequence, and the ‘low count’, which posits perfect continuity in the late antique world. But this oversimplifies the debate. The ‘minimalists’ insist that the ‘maximalists’ do not provide valid proof for the very high level of the demographic losses they propose, the estimates of the maximalists being simply derived from the losses of the Second Pandemic (232–4). In this they are right, although this does not in itself prove that the maximalists’ estimate is wrong. They are also right to put the emphasis on the structural continuity of the society of the late antique world. But in order to prove their case they believe they have to deny a strong impact for the Justinianic Plague. In fact, continuity can be reconciled with a significant impact of the disease.

An initial question is that of the reliability of literary texts. Procopius is suspected of exaggerating the consequences of the disease deliberately to tarnish Justinian’s image.²⁶ But what about John of Ephesus, who, although he was a Monophysite, found a form of compromise with the Chalcedonian emperor Justinian?²⁷ Yet, like other contemporary accounts, John also insists on the catastrophic character of the plague, as does Gregory of Tours, whose description can hardly be connected to the intricacies of the court at Constantinople. The convergence of our literary sources is so impressive that it seems hardly possible to challenge their significance.

In addition, we now have DNA analyses from late antique cemeteries which, in accordance with literary sources, confirm the long-term presence of the bacterium *Y. pestis* in Spain, Gaul, Britain and Germany.²⁸ It is only the difficulty of accessing similar archaeological material that, for the time being, prevents us from testing necropolises

²² Wickham 2005: 548–9.

²³ For a survey of the debate, see Eisenberg *et al.* 2018, 31–2, and Eisenberg and Mordechai 2019.

²⁴ Mordechai and Eisenberg 2019; Mordechai *et al.* 2019.

²⁵ Mordechai and Eisenberg 2019: 39–44 (comparison with the Third Pandemic); Echenberg 2002 on the Third Pandemic itself.

²⁶ Mordechai *et al.* 2019: 25, 547.

²⁷ van Ginkel 1994: 326–7; Menze 2008: 256–8.

²⁸ Keller *et al.* 2019: 12, 366, fig. 1 map.

from the southern or eastern Mediterranean. There is thus no reason to doubt that the plague that struck at Clysma and Pelusium in 541 quickly spread over the whole Roman and post-Roman world and then returned periodically, with major regional outbursts. Biraben identified twenty outbreaks over two centuries, of which eighteen hit the East and eleven the West.²⁹ The exact number of later outbreaks has been debated, but it remains roughly at this level.³⁰ In summary, the universal character of the late antique plague cannot seriously be called into question.

But the most difficult question remains that of the lethality of the Justinianic Plague. It is now certain that the ‘Three Pandemics’ all originated with the *Y. pestis* bacterium, but the Third Pandemic was much less lethal than the Second, perhaps reflecting the lower virulence of the bacterium;³¹ could not the First likewise have been ‘milder’ than the Second? Different forms of *Y. pestis* may have different degrees of virulence, the reasons for which are still not fully understood. The specific genomes of the bacterium of the First Pandemic have been the subject of debate, particularly the observed deletion of a portion of the genome containing two virulence factors in a specimen dated to the later phase of the First Pandemic. The original publication concluded: ‘it is reasonable to assume that the deletion may not have reduced the bacterium’s virulence. Moreover, it affects a number of cell surface proteins — remnants of the motile lifestyle of *nonpestis Yersinia* — so the deletion might have even facilitated immune evasion’.³² Immune evasion is ‘a strategy used by pathogenic organisms and tumours to evade a host’s immune response to maximize their probability of being transmitted to a fresh host or to continue growing, respectively’.³³ The difference with the modern strains of *Y. pestis* might correspond to an adaptation to the European-Mediterranean niche. In other words, this deletion might either have increased or decreased the lethality of the virus: for now, it is impossible to decide.

On the basis of this analysis, the minimalists favour attenuation, which could have minimised the impact of the plague, but have to admit that the question must remain open.³⁴ Consequently, at least for now, it seems impossible to conclude that the decay of a portion of the genome of the bacterium must have attenuated its virulence, and to use this as an argument for the low lethality of the First Pandemic.

Another argument against major impact is the ‘minuscule number of known cases (~45)’ of analyses definitely proving the presence of the *Y. pestis* bacterium from late antique graves.³⁵ However, these absolute numbers are hardly meaningful. The most recent DNA analysis is based on a set of twenty-two grave sites from Britain, France, Germany and Spain, dated broadly to the late antique period.³⁶ Eight have provided cases which test positive for *Y. pestis*. In fact, two of the sites can be dated before 450 and one after 850, before and after the Pandemic (which ended before 800), and should be excluded from the statistical analysis. Eight of the remaining nineteen sites (42 per cent) have produced at least one positive result. The ratio of positive results to actual tested cases, roughly corresponding to the period of the plague, is 34:191 = *c.* 18 per cent. The percentage of positive cases per site varies widely, from 1:36 (2.7 per cent) in Valencia, Spain, to 5:7 (71.4 per cent) in Unterthürheim, Germany. The choice of grave sites was selective (it was based on the presence of graves with multiple burials), but does not constitute a representative sample, making it impossible to calculate directly the

²⁹ Biraben 1975: 27–42. See Stathakopoulos 2004: 113–24.

³⁰ Newfield 2018: 274; Mordechai and Eisenberg 2019: 8.

³¹ This is the hypothesis of Mordechai *et al.* 2019: 25,551–2.

³² Keller *et al.* 2019: 12,369.

³³ Definition of immune evasion: <https://www.nature.com/subjects/immune-evasion>.

³⁴ Mordechai *et al.* 2019: 25,551–2.

³⁵ Mordechai *et al.* 2019: 25,551.

³⁶ Keller *et al.* 2019.

proportions of deaths provoked by the epidemics. The case would justify a Bayesian analysis, but these raw numbers are sufficient to show that the presence of *Y. pestis* is in fact surprisingly high.

A last and major challenge is that of the demographic impact of the plague. We know that the Black Death had a major impact on European medieval populations; can we observe a similar impact with the First Pandemic? Unfortunately, late antique demography is still clouded in much uncertainty, even in the west.³⁷ For Chris Wickham, if some regions like northern Gaul and east Britain experienced a fall of 50 per cent in their population level in the fifth century (which does not mean that such a dramatic decrease was the rule), the situation in the sixth and seventh centuries remains less clear. For Wickham, only the central Mediterranean region, Italy and Africa, experienced a population drop in the sixth century; the western regions experienced a low plateau, with a new population increase starting already in the seventh century.³⁸

The situation in the east seems different. Syria and Palestine show a boom of activity in the sixth century.³⁹ But pollen analyses of seven regions in Greece, Bulgaria and Turkey show a massive decrease of cereal agriculture between 500–700 in three regions; the other four more or less plateau, with three showing a very small increase, the fourth a slight decrease. All the curves correspond to *longue durée* trends and there is no specific break after c. 541.⁴⁰ Remarkably, two of the regions that present a profile of exceptionally strong and continuous decrease between 400 and 800 C.E. are northern Greece and south-west Turkey, which had been among the most prosperous parts of the Hellenistic and early imperial world. However, the decrease started well before 541, and the period corresponding to the plague shows no acceleration (or slowing down) of the negative growth trend.

To sum up, even if much remains obscure, the populations of the territories of the former Roman Empire (and somewhat beyond) experienced a varied evolution in the late antique period. A minority of regions, like Syria and Palestine, seem to have fared well. But most saw their population at best maintaining its previous low level, while others experienced the continuation of the decline that began as soon as the unified Roman state had entered its process of collapse. Nonetheless, even if the beginning of this decline was linked to political factors, why should we not imagine that the plague played a role in its continuation?

This varied situation invites us to seek a different and more nuanced approach to the impact of the First Pandemic. The model of the Second Pandemic is not limited to the exceptionally high death ratios of its earliest stage, the so-called Black Death. The case of Tudor and early Stuart England illustrates a different experience. The various subsequent plague waves killed significant proportions of inhabitants of the city of London: 20 per cent in 1563, 3.5 per cent in 1578, 8.5 per cent in 1593, 18 per cent in 1603, 13 per cent in 1625, 3.5 per cent in 1636–37, 12 per cent in 1665.⁴¹ However, the countryside was less heavily impacted than the cities.⁴² Thus, during the seventeenth century, England and Wales saw a cumulative loss of 8–10 per cent of their populations due to the plague, as compared to the level of 1600. In the same period, Italy, the country that experienced the heaviest population losses due to the plague, saw a cumulative population loss of 30–35 per cent in the north and 30–43 per cent in the south.⁴³

³⁷ Eisenberg *et al.* 2018: 31–2.

³⁸ Wickham 2005: 547–50.

³⁹ Mordechai and Eisenberg 2019: 26. But see, however, Kennedy 2006, who sees difficulties after 540 (although not all can be attributed to the plague).

⁴⁰ Mordechai *et al.* 2019: 25, 550, fig. 10.

⁴¹ Slack 1985: 62, 85, 151, 174.

⁴² Durliat 1989 posits a similar contrast for the First Pandemic.

⁴³ Alfani 2013: 411–13.

However, despite the plague, the population of several European countries increased in the seventeenth century, by up to 33 per cent in the Netherlands and 22 per cent in England (admittedly the population of Italy remained unchanged).⁴⁴ The demographic impact of the plague should not be neglected: without the plague the European population would obviously have experienced much more vigorous growth. Yet, although they were violently hit by a series of plague waves (of various levels according to the country), European populations could recover and social structures remained largely unchanged – or if they changed, it was not only as a consequence of the plague. Thus between the initial catastrophic shock of the Second Pandemic (the Black Death, 40–60 per cent of the population in most regions), and the low level of the Third Pandemic (below 3 per cent), the period of the end of the Second Pandemic offers us another model. We see here populations experiencing repeated and comparatively high-level plague waves, but showing a remarkable (although variable) resilience despite their sufferings. We should bear this parallel in mind for the demography of the late antique period.⁴⁵

The parallel with the early modern period has obvious limits. This was a period when Europe benefitted from new and very favourable trade opportunities; it also began to benefit from the plants of the New World. Without maize, the tomato and the potato, it is hard to believe that Italy could have maintained its population level in the seventeenth century despite its very high levels of losses due to the plague.⁴⁶ The Eastern Roman Empire and its western neighbours did not enjoy these favourable conditions. Even if some regions experienced the opposite movement, the overall population levels apparently decreased under the repeated assaults of the plague, although in what proportions still remains to be determined.

More broadly, comparison between the Pandemics shows similarities, but also differences. Both the First and the Second Pandemic began with a devastating global outburst and were followed by a series of deadly waves. But the First hit a population that was already at a low point, which may have limited the number of deaths, whereas the Second struck a world that was comparatively over-full, which may have maximised the losses. This might explain why the overall impact of the First Pandemic (although not negligible) seems to have been less severe than that of the Second.

Overall, then, the minimalist view of the First Pandemic must certainly be rejected, while the maximalist model, with a population reduced by two-thirds, is unlikely, the archaeology providing no basis for such a conclusion. Yet even if the level of losses was not as extreme as for the Black Death, it was certainly high. The hypothesis of perfect continuity, with the plague bringing almost no modification to the demography of the late antique world, is not likely. One should rather examine the capacity of late antique societies to absorb and recover from the various shocks that hit them so badly.⁴⁷ The causes of their resilience, even though they were certainly weaker, and possibly significantly weaker, after the plague than before, should now be at the forefront of research.

IV OLD QUESTIONS AND NEW PERSPECTIVES

We can now return to our initial question: was the Justinianic Plague, in combination with the ‘cold wave’ of the sixth century, responsible for the fall of the Eastern Roman Empire? Although perhaps he does not lay enough emphasis on it, H. provides an indication that is

⁴⁴ Alfani 2013: 424.

⁴⁵ Although not drawing the parallel with the early modern period, Mordechai and Eisenberg (2019: 36–9) are perfectly correct to insist on the capacity of late antique populations for demographic recovery.

⁴⁶ For New World plants in Italy, see Gentilcore 2017: 200–3.

⁴⁷ See Mordechai 2018 for the case of Antioch (even if he believes that plague could only have had a minimal impact on the population of the late antique world), and Izdebski 2018.

crucial for this line of thought: surviving accounts indicate that the world of the nomads was not hit by the plague (230–2). We also know that a colder climate may be favourable to rain in the Arabian peninsula.⁴⁸ We might have here a crucial ecological and demographic advantage that could have proved to be of decisive help for the Arab invasion. In that case, climate and disease would indeed be a decisive factor of historical change, especially in terms of the history of states and the history of cultures. The Eastern Roman Empire eventually lost all its southern Mediterranean possessions, from Syria to Africa, a blow from which in the long run, as an empire, it would never recover. The Christian–Byzantine synthesis was bound to be replaced by a Muslim–Arab synthesis.

Does this mean that the factors of social evolution now play only an ancillary role in the dialectic? The armies of the ‘Roman Empire’ that met the Sasanian and Arab armies in the early seventh century were those of a state that had experienced fundamental transformations since the time of Augustus. This was properly speaking another society. The Eastern Empire had indeed been weakened by a climate crisis and by the plague. But the society that proved unable to resist the Islamic invaders was first and foremost the product of social evolution, and not an ever-unchanged ‘Roman society’. Besides, natural conditions cannot explain the specific religious explosion, itself the product of centuries of interaction between pagan religion, Judaism and Christianity, that took place following Muhammad’s mission. An ideological mutation can be explained *a posteriori*, but it is as unpredictable as that of a biological one. Without Muhammad, the Eastern Roman Empire might have had the chance to recover from its demographic losses.

To sum up, interactions between societies are also factors of long-term social evolutions, alongside internal ones. Rather than seeing ecology and diseases as primary drivers of change, we should rather integrate them in a complex dialectic of explanatory factors.⁴⁹ But we should also fully acknowledge their role, and for this *The Fate of Rome* will provide a landmark. John Moreland has recently masterfully described the oscillations between explanations ‘which put either Nature or Man at the heart of the historical process track’.⁵⁰ Since at least Gordon Childe and Rhys Carpenter, historians have been regularly tempted to find in Nature a key to social and economic development, each ‘bout of explanation by nature’ being followed by a backlash when explanations based on social factors prevail again.

This time, however, we might predict that things will be different, for two apparently contradictory reasons. First, the alternative between Nature or Man as a driving force is looking increasingly unhelpful. Natural factors must be integrated in multifactorial explanation, and while their role should be fully acknowledged, there is no reason to give them a driving role behind historical development (the present essay is only one among many studies following the same view). But second, as observed by all specialists, science provides tools of ever increasing sophistication, which allow us to investigate and solve questions that no one could have even imagined asking one or two generations ago. Physical and biological science have themselves become producers of data for historical analysis. New forms of historical research are emerging, with historians and archaeologists directly collaborating with specialists in physics or biology. Soon, it is to be hoped, the old debates will be behind us. For putting natural science firmly at the top of its agenda, *The Fate of Rome* fully deserves the praise it has received.

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⁴⁸ See above, n. 11.

⁴⁹ In this I fully agree with Haldon *et al.* 2018.

⁵⁰ Moreland 2018: 97–9.

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