New Rome
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The Empire in the East

Paul Stephenson

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In New Rome, Paul Stephenson looks beyond traditional texts and well-known artifacts to offer a novel, scientifically minded interpretation of antiquity’s end. It turns out that the descent of Rome is inscribed not only in parchments but also in ice cores and DNA. From these and other sources, we learn that pollution and pandemics influenced the fate of Constantinople and the Eastern Roman Empire. During its final five centuries, the empire in the east survived devastation by natural disasters, the degradation of the human environment, and pathogens previously unknown to the empire’s densely populated, unsanitary cities. Despite the Plague of Justinian, regular “barbarian” invasions, a war with Persia, and the rise of Islam, the empire endured as a political entity. However, Greco-Roman civilization, a world of interconnected cities that had shared a common material culture for a millennium, did not.”
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INTRODUCTION

Every schoolchild once learned that Rome fell to the Ostrogoths in AD 476, when Odoacer deposed the last legitimate western emperor, Augustulus, weedy ‘Little Augustus’. On that occasion, an embassy was despatched by the senate from Rome to Constantinople, a city straddling East and West, Europe and Asia (Map 2). The city of Byzantium had been refounded by Constantine I and dedicated to him as ‘the city of Constantine’, Constantinople. Now it became the seat of the sovereign emperor of all Romans, for the ambassadors carried the imperial insignia and an indication that Odoacer would rule Italy on the emperor’s behalf. In institutional terms, this is how the Roman empire came to be ruled from Constantinople. However, the empire in the fifth century was ruled not from any single city but by and from many cities, with greater authority – political and administrative, cultural and spiritual – concentrated in a few great metropoleis, ‘mother cities’, including Rome and Milan, Antioch and Alexandria, Carthage and Constantinople. This book sets out how this situation ended, and how many ancient cities fell or were transformed until the empire came to be ruled from a single great city, Constantinople, which was called New Rome.

A central theme of this book, that the end of the ancient city marked the end of antiquity, is hardly novel. There is no virtue in novelty that ignores decades of the finest scholarship. It is now clear that even where cities appear to have abrupt ends these were long in the making. In the view of Wolf Liebeschuetz, the ‘disintegration of the ideal and reality of the classical city’ was intimately linked to the transformative power of Christianity, which presented citizens with a compelling alternative world view to that which had united communities across the eastern Mediterranean. Christianity embodied a ‘different set of values, and one not
centring on the city and its political community. If change began even before the fourth century AD, it accelerated rapidly through our period. After more than three centuries, the cumulative effects of foreign invasion and destruction, rapid climate cooling and famine, plague and depopulation, the loss of taxation revenues and urban institutions, the erosion of Hellenic culture and municipal autonomy, and the increased wealth and prominence of the church and the rapid growth of monasticism, affected all cities to some extent, and many ceased to be cities in any recognisable way.1

Life across the empire was sustained and characterised not only by what was produced or manufactured locally, but by what was shared internationally, including, as we shall see, glazed ceramics and terracotta lamps, natron glass and diverse marbles, fish products, olive oil and wine from preferred regions, and grain shipped in bulk. If comestibles have not survived, or have done so only in traces and fragments, many more of their containers and some of the coins used to purchase them have survived – evidence for a transformed, impoverished material landscape. The singular standout is Constantinople, which preserved the institutions of Roman civic life and as much of its material culture as could be contained within its walls. The empire of New Rome would become something quite different without Rome, and still more so without Antioch and Alexandria, its partners and competitors in the east. The insights of new scientific data throw aspects of this well-established thesis, the emergence of the empire we call Byzantium, into sharper relief and elucidate much that was hitherto quite opaque.

New scientific approaches are transforming our understanding of all past civilisations. It is impossible today to write a general history of any polity, society or culture without considering the natural world in which it emerged, developed and fell. To explain the end of the western Roman empire, among the thorniest of historical problems, historians have now turned to natural and environmental science, highlighting the roles played by climate and pandemic disease, supporting older hypotheses and undermining others. The consequences of climate change have been noticed and applied to the movement of ‘barbarian’ peoples from the increasingly arid lands of inner Eurasia, for example the Huns driving the Goths into the empire, and others following in their wake. Such considerations now precede explorations of what those barbarians destroyed and what they inherited and transformed of Roman civilisation. As people travelled, so
they brought new pathogens and spread diseases unknown to the Romans, which devastated the citizens of Rome’s myriad, densely populated and unsanitary cities. Any account of the decline of cities, the foundation for the Roman imperial system where Roman culture was generated and taxes were collected, must now take account of disease transmission, but also seismic and volcanic activity, climate forcing and pollution.

These compelling, urgent, novel concerns do not yet and likely never will offer scientific certainty and data in place of historiography and conjecture. Certainly, they help us answer older questions in different ways and force us to ask new questions. But ‘scientism’ cannot replace solid historical research, and to have lasting value scientific data must be integrated properly with more traditional approaches to the study of the past. Political, social and economic history, intellectual and religious history, and cultural and art history all still matter and deserve our careful attention, as do the insights offered by archaeology and the study of material culture. This book will attempt to integrate newer and older insights, to explore the environment of the eastern Roman empire and attend to the natural disasters that affected it, charting local, regional and cumulative impacts and human responses. Attention will be paid to metallurgy and health, magic and medicine, volcanoes and climate forcing, plague and earthquakes, historical climatology, geophysics and epidemiology. However, the book will also offer a political and cultural narrative based principally on written sources and works of art, integrating human responses to a range of phenomena, including warfare and religious disputes, developments in engineering and architecture, the rise of apocalypticism in literature and art, and developments in the imperial image.

Weaving these threads together into a fabric that has coherence and integrity presents a major challenge. The loom, being the parameters of this study, is AD 395 to c.700, and encompasses the last tranche of Roman antiquity, from an apparent division of empire at the death of Theodosius I between eastern and western emperors in their respective capitals of Milan and Constantinople, to the conquest of the Near East and Mediterranean by the forces of Islam. The warp of the fabric, the first yarns stretched out across the loom, are the themes and focus of the book: environmental and material concerns, informed by archaeology and the new science of Roman history. Through these subjects, other threads, thicker and thinner, lighter and darker, will be woven, introducing far greater detail and higher resolution in some parts than others, reflecting
the nature of surviving sources. By design, a tapestry will emerge that has style and form, presenting imagery, history, in three registers or bands. Inevitably, this composition has many flaws and gaps, holes into which fingers will be jabbed. Like almost all ancient textiles, its colours will fade quickly, its edges will fray, its connecting threads will prove weak and will snap. It will disappear sooner than its maker imagined possible during the decade it took to complete as scholarship moves on and new interpretations are offered.

Works of art in three registers were popular in the Roman world and many have survived. If tapestries are rarely preserved, things fashioned of more enduring materials remain, including the Barberini ivory and the largest of nine silver David Plates, both of which will be discussed in the book. If the central register, the second part of the book, is a political narrative, full of detail and intrigue, then the upper and lower registers present the wider contexts in which this story might be understood, broadly conceived as the before and after. Urban and imperial themes, material and ideological, dominate the first part of the book. However, the focus is on people, the Romans who lived and died, suffered and worked, traded and were traded. The earliest chapters sketch out life at the end of the ‘Lead Age’, the natural world and environment, and faith and family. A commonwealth of cities is described, their streets teeming with life – human and faunal, floral and microbial – defining and delimiting the civilised world, linked by effective communications, dominating productive hinterlands, and ruled by wealthy families known as decurions. These families owed, and ostentatiously professed, allegiance to, and collected taxes for, administrators located in the greatest cities of Rome, Antioch, Alexandria, Carthage, and eventually above all others Constantinople, the New Rome. The last chapters depict the rise of Islam and its aftermath. Cities still dominate the landscape in this period, although there are fewer and many are transformed, while others are ruined or displaced. An inventory informed by archaeology demonstrates that the wide world of linked cities had become something else, something narrower and less urban, a new world founded on new ideas about government and God, art and war, and much else besides. The final chapter recaps and evaluates the emperors at New Rome, seeing them as they wished to be seen through three centuries, but also as they did not, their power constrained, their sovereignty contingent, their lives ended often violently, their reputations destroyed.
PART 1

LIFE IN THE LATER ROMAN WORLD
In the last decades of the fourth century, an octagonal imperial mausoleum was constructed at Mediolanum (Milan), which had supplanted Rome as the western imperial capital. Today known as the Chapel of Sant’Aquilino, the mausoleum housed the remains of Gratian and Valentinian II, sons of Valentinian I. The mausoleum abutted the Church of St Lawrence, today San Lorenzo Maggiore, a mighty edifice built using materials from Mediolanum’s abandoned amphitheatre. Ambrose, bishop of Milan from AD 374 to 397, presided over both of their Christian burials. Above him, in the cupola of the mausoleum, was a figure in a chariot streaking across the sky in the style of a solar god (Plate 1). This was Elijah, the Old Testament prophet borne to heaven on a chariot of fire (2 Kings 2). It was an appropriate image for a mausoleum, alluding to the apotheosis of a Roman emperor, traditionally shown ascending to the heavens on a *quadriga*, a chariot pulled by four horses. However, now it announced the triumph of Christianity and the certainty of resurrection for the faithful. According to Malachi (4:1–5), the last book of the Christian New Testament, for Christians like Gratian and Valentinian, ‘the sun of righteousness will rise with healing in its rays’, raising them to heaven, even as it burned others to ashes. ‘See, I will send the prophet Elijah to you before that great and dreadful day of the Lord comes.’

Ambrose was a sophisticated commentator on scripture, and he took
care to draw out all meanings from a sacred text or image. Having gazed upon Elijah’s fiery chariot, he offered a further layer of interpretation, a gentler solar metaphor. Before his prophesied return, Christ would be the true sun, a constant source of grace, whose radiance cascaded from heaven in sanctifying beams upon his followers. Ambrose composed a hymn of enduring beauty now known to English speakers as *Splendour of God’s Glory Bright*.

> O splendour of God’s glory bright,
> O Thou that bringest light from light,
> O Light of light, light’s living spring,
> O day, all days illumining.
> O Thou True Sun, on us Thy glance,
> Let fall in royal radiance,
> The spirit’s sanctifying beam,
> Upon our earthly senses stream.

Our physical sun, in contrast, is an erratic provider of energy. Variations in the earth’s tilt, the way it wobbles on its own axis, and the path of its orbit around the sun lead to more or less solar radiation reaching the earth’s surface. This has resulted in very long periods of far higher or lower temperatures, including the last glacial maximum that lasted for eighteen millennia, between c.33,000 and 15,000 years ago. The sun also releases larger and smaller amounts of energy over shorter periods of hundreds of years. Greater solar emissions, which directly heat the earth’s atmosphere, are indicated by an increase in the number of solar flares and the duration of sunspots. Periods of very intense solar activity are known as solar maxima and those of very little activity are called solar minima. The last solar minimum, the Maunder Minimum, took place between AD 1645 and 1715, coinciding with the ‘Little Ice Age’. Finally, the sun has a natural short-term cycle, with eleven years between small peaks and troughs in the amount of energy released. The sum of the energy emitted by the sun that reaches earth, solar irradiation, can be measured through proxies known as cosmogenic radionuclides, which are radioactive isotopes. These are formed in the upper atmosphere when stable isotopes collide with cosmic rays and fall to earth to be dispersed by aerosol deposition in snow and rain or by photosynthesis. Counter-intuitively, greater solar activity results in the production of fewer radionuclides like carbon-14.
(radiocarbon), which is preserved in organic matter including the wood of ancient trees, and beryllium-10, which is trapped in glacial ice. Measurements of deposited radionuclides demonstrate that from c. AD 360 until c.690 the earth experienced a long period of declining sunlight, culminating in a solar minimum of a magnitude that had not been seen for more than a millennium, and would not be seen again until the ‘Little Ice Age’.2

This centuries-long period of declining solar irradiation corresponds to the period of our study. It followed a sustained period of far more sunlight initiated by a solar maximum in c.270 BC, the so-called ‘Roman Warm Period’. Also known as the ‘Roman Climate Optimum’, it coincided with a protracted phase of Roman imperial expansion and general economic prosperity. In contrast, our period included what has been called the ‘Late Antique Little Ice Age’ and culminated in the low point of Roman power and prosperity. Quite what impact increased or decreased solar activity had on the emergence or decline of the Roman empire, a complex civilisation that encompassed the whole Mediterranean and much of Europe, cannot fully be ascertained. In the simplest terms, more sunlight and higher temperatures allow more land to be brought under cultivation. The zone in which vines and olives can be grown extends further north as the sun shines, and retreats south as sunlight dwindles. Lowland trees like the beech might grow higher up slopes, and then retreat back down them. Alpine glaciers will move in the opposite directions. By one estimate, in Roman Italy alone an increase in temperature of a single degree Celsius would have brought five million additional hectares of land under cultivation, feeding more than three million more people. Consequently, for each degree that temperatures declined, towards the solar minimum that marked the end of our study, it might be expected that as much cultivable land was lost.

To those living across the Mediterranean world in late antiquity, whether it was slightly hotter or colder was ultimately less important than whether it was significantly wetter or drier. Without adequate precipitation lands became not additional fields feeding millions but parched wastelands. Levels of historical precipitation can be measured approximately in tree rings and cave mineral deposits like stalagtites, which show, broadly speaking, that the ‘Roman Warm Period’ delivered rain sufficient to support a significant expansion in agriculture across the empire, whereas from around the middle of the fourth century in the eastern Mediterranean, two centuries before the posited onset of the ‘Late Antique
Little Ice Age’, there was generally less rain. Since there was great regional variability in rainfall across the Roman world, scholars have yet to reach agreement on the data and how or whether this should be aggregated to produce a global picture.³

At the regional and local levels, much evidence is clear and compelling. For example, a wetter and warmer period allowed for greater cultivation of large parts of Anatolia, in modern Turkey, in the fourth and fifth centuries AD. The plain around Iconium (modern Konya), in south central Anatolia, was far more heavily settled at that time than before or after, and olive trees were planted and cultivated in the Anatolian interior. As more arid, cooler conditions arrived in the sixth to seventh centuries, olive cultivation stopped. Similarly, in Syria and Palestine, climatic conditions in the period before the sixth century allowed the cultivation of lands that had hitherto been marginal and uneconomic, for example the Judean hills and slopes above the Dead Sea, where olives and cereals were grown. This ended in the seventh century, after which the climate became much drier. Olive production, like all forms of arboriculture, requires a heavy initial investment and patience as trees mature, taking decades to produce an economic yield. It implies confidence that rural communities will endure, that there will be sustained demand supported by political and economic stability, and that efficient trade networks will deliver products to local markets or further afield. This confidence was lost by the end of our period.⁴

**Metallurgy and the early Anthropocene**

If the impact that a constantly changing natural environment had on the fate of the Roman empire is now under careful scrutiny, the impact Rome had on its environment and nature has barely been considered. However, this can be measured with remarkable precision. As our study begins, an age of industry and pollution, of mining and smelting, and of long-distance shipping of metals, minting of millions of coins and large-scale building of infrastructure was ending. Roman metallurgy has left signals across northern Europe and the northern Atlantic world in the form of anthropogenic heavy metal contamination of soil, sediment and ice. Contamination is so substantial and significant that it has been identified as the start of the Anthropocene, the period through which we are living,
a discrete chapter of the Holocene, our current geological epoch. Lake beds, peat bogs, salt marshes and ice fields produce very reliable pollution records. Cores extracted from Irish and Swedish lake beds, an Icelandic salt marsh, Faroese peat bogs and Arctic glaciers all show the same sudden and dramatic rise in the deposition of atmospheric lead pollutants between c.100 BC and AD 100. Lead is released by the smelting of a range of metallic ores, including those mined for copper and gold, tin, zinc and silver, and from lead itself. In each location the levels of lead pollutants fall away rapidly towards AD 400, only beginning to rise again after 800, and not reaching Roman levels until c.1700. In none of these locations is there any evidence for contemporary mining and smelting of metallic ores, which would have produced the contamination.

Roman-age pollution in the north Atlantic world is the direct result of fluctuations in the intensity of smelting that took place thousands of kilometres to the south, releasing into the atmosphere lead aerosol particles that were conveyed great distances within the northern hemisphere’s atmospheric transport system and deposited by precipitation. The origin of the lead in Greenlandic ice has been confirmed by geochemistry (isotope analysis). Spain was the source of up to 70 per cent of the heavy metal pollution at its peak in the first century AD (see Map 1).5 Contamination is far greater the closer one gets to its source. In an ice core taken from the Col du Dôme glacier in the French Alps, the magnitude of lead contamination is one hundred times greater than that recorded in Greenland in the first century BC, reaching a lower peak in c. AD 100, before falling steadily and dramatically to its lowest point in the sixth century.6

The rapid rise in atmospheric lead pollution mirrored the rise of the Roman silver denarius, the coin minted in the greatest numbers and at the peak of its fineness (at almost 98 per cent silver, considered pure by the mints) from the time of Augustus in the first century AD. Careful analysis of Roman silver coinage supports the notion that far less silver was smelted after AD 100. From the reign of Nero onwards, Roman silver coinage was increasingly debased. The ratio of silver to copper alloy decreased, and the amount of recycled silver used, obtained by melting down older coins, increased. The Roman silver denarius had a fixed exchange rate with the aureus, a gold coin. During the Republican period this was largely notional, but from the time of Julius Caesar gold coins were produced in greater numbers. This too appears to be reflected in the environmental record.7
Gold production produced copious contamination. The largest known Roman gold-mining operation was located at Las Médulas in north-western Spain (Map 1). A sediment core extracted from a small glacial lake around thirty-five kilometres from the mines shows evidence for the first gold metallurgy at Las Médulas in around 300 BC, with a rapid increase in lead contamination from around 100 BC, a peak in c. 15 BC, and a decline to background (pre-300 BC) levels by c. AD 120. At the same time there were dramatic increases in both antimony and arsenic. The peak of pollution corresponds with that identified in the Greenland ice core, but the concentration of lead, being so close to the smelters, is far greater. Around 150 kilometres to the north of Las Médulas, a peat bog saw an increase in lead pollution that was thirty times greater than its local background level in c. AD 100, which had fallen back to the baseline by c. AD 500.8

Silver and gold were noble and rare metals, whereas lead was a dull, base metal, the plastic of its age, and was employed in quantities and for purposes unknown before and since. It has been suggested that the Roman period should be called the ‘Lead Age’, an archaeological successor to the ‘Iron Age’. Lead was used extensively in Roman construction, because it is malleable and resists corrosion when in contact with air and water. Molten lead was poured around iron clamps to join column drums together, and to secure marble facades to blockwork. Lead sheets and solder were used to form and seal waterproof joints. Most famously, lead was used in Roman waterworks: to form pipes that transport water at pressure, to plumb fountains and baths, for rain gutters and roofs, and as tanks to store water, including potable water, for various purposes. It has been determined that the piped water of the city of Rome may have contained up to forty times the lead of natural spring water before AD 250, falling to a multiple of fourteen by the year 500, as pipes became choked with scale, cracked and failed, and the broader water system fell into disrepair.9

In addition to its uses in construction and for waterworks, lead was used as a bulking agent in copper alloys, appearing in volume in later Roman copper coins. Lead tokens, and occasionally coins, were struck in great numbers. Because it was heavy, lead was used to form weights and also to give heft to bronze steelyard weights. Because it was easy to shape, lead sealings were used to secure and verify pouches, bags and letters. Lead bungs stoppered liquids and lead labels were attached to sacks, with letters scratched into the soft metal. Its low melting point (327°C) and physical properties meant that lead was used in the extraction and refining of silver
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