Contours of Environmental Change and Human Response in Late Antiquity

Kyle Harper

The Mirror of Crisis

In his magisterial book, *The Great Transition: Climate, Disease and Society in the Late-Medieval World*, Bruce Campbell traces in remarkable detail the progress of an environmental crisis that unfolded from the *ca. AD 1270s* to the *1350s* across western Eurasia. From the *AD 1270s*, the favourable climate regime known as the Medieval Climate Anomaly sputtered to an end, and a colder, more variable climate arrived. Subsistence crises became more common. Animal panzootics devastated livestock herds on a continental scale. And then, upon a fragile society fell the worst biological disaster in recorded history, the Black Death. Detailed, critical work has tended only to confirm or even revise upwards the worst mortality estimates. The first wave of the pandemic might have killed *ca. 50%* of the entire population of Europe. The environmental crisis established a new economic, demographic, and geopolitical equilibrium across the old world.

Given that Late Antiquity was also a period of major change in the global climate, and suffered from the introduction of the same biological agent that caused the Black Death, Campbell’s study is provocative for those of us who labour in the fields of the 1st millennium. We can only envy the much thicker documentary record of the Late Middle Ages, but what lessons might be drawn from the parallels and differences between these dynamic periods of environmental history? I would highlight just three points here.

First, Campbell’s account is enriched because it takes a long perspective, launching centuries before the crisis. During the ‘efflorescence’ of the High Middle Ages, from *ca. AD 1000–1270*, the environment was an ‘enabling’ force, enhancing agrarian productivity and facilitating demographic increase. So, too, the period of Late Antiquity followed a long phase of intensification against the background of a favourable climate in the early Roman empire. Below, I will suggest that the middle of the 2nd c. AD marked a point of inflection; not the onset of an irreversible crisis quite as dramatic as the one Campbell describes, but a moment of transition between a regime of geographically widespread intensification supported by less extreme environmental conditions, to a more complex, unstable, and regionally-differentiated period.

Second, Campbell’s study underscores that pre-modern societies were socially and demographically dynamic. The population of Europe went from *ca. 36.5 million* in the year 1000 to *ca. 82 million* on the eve of the Black Death, and then suddenly fell by half. In Italy, down to the Black Death, the population grew more than two-and-a-half-fold and then collapsed. In short, the Late Middle Ages remind us that pre-modern societies were ‘springy’; that is to say, dynamic over both short and long time-scales. Campbell’s work prepares us for the possibility of major waves of expansion and contraction in the pre-modern context.

Third, Campbell is subtle and compelling when it comes to the issue of environmental determinism. Inspired by his work, I would propose that late antique historians consider a model in which human and natural systems are locked in a series of two-way relationships (fig. 1). This is with the caveat that in the pre-modern world, the climate was purely autonomous, not influenced by human activity but rather controlled by solar activity, volcanism, and internal variability (see also Labuhn *et al.*).

Within this framework, the relationship between the natural environment and demography is a particularly important lever of change. In a recent book, I argue that the climate was a factor of change at critical moments of late antique history, but that its impact on agriculture was mediated by powerful systems of resilience. The impact of climate was more intensely felt via its influence on, and in synergy with, biological events. Ancient societies were only thinly buffered against catastrophic mortality; ancient Mediterranean populations were capable of 0.1–0.2% per annum growth under optimal conditions, so the levels of surplus mortality, often im-

---

1 Campbell (2016).
4 Such regional diversity is highlighted as a major theme of this volume by Izdebski in his conclusion.
5 Campbell (2016) 59.
6 Campbell (2016) 89. In England, a population of 1.71 million in AD 1086 multiplied into one of 4.75 million by 1290.
puted to pandemic events, could offset decades or even centuries of growth. Recovery was concomitantly slow.

Thus, I would suggest that we cannot shy away from attributing a powerful determining force to natural factors such as the arrival of *Yersinia pestis*, even as we must keep in mind that the outcome of events was always shaped by human factors too. This was both in deciding the course of natural history (e.g. preparing the ecological platform for the plague) and in responding, sometimes very effectively, to environmental challenges (e.g. the state’s overriding role, as outlined by Mordechai and Haldon). In fact, perhaps the most striking difference between Campbell’s work and the treatment of environmental history throughout these pages, is the overwhelming importance of the State in the Roman and late antique periods. A model that places the State within interlocking systems of social and environmental factors might turn out to be particularly helpful in explaining the rhythms of decline suggested in many of the chapters of this volume. I will suggest that the century between about AD 540–640 was a phase of environmental crisis that weakened the Roman state, while the actual moment of State failure in the mid 7th c. registers across many proxies as a point of systemic transition.

Late antique historians interested in these themes are by necessity resourceful, using interdisciplinary methods to bring pollen and pot sherds and other proxies into a conversation where the documentary evidence is thin. The exiguous written record—compared to the documentation for the Late Middle Ages—means that the study of environmental history in Late Antiquity will inevitably feature a much greater degree of reasonable doubt and spirited disagreement about the timing, magnitude, and dynamics of change. But, as this volume makes clear, the proxy records offer tremendous promise, and are already starting to enrich a picture that varies region by region. In what follows, I briefly offer an overview of how a Campbell-like account that foregrounds the role of natural, especially biological, dimensions of change might draw some of the main chronological contours of Late Antiquity. In this space I can do no more than lay out a framework, while highlighting some of the main points of agreement and tension with various environmental records, in the hope that a provocative model will suggest questions or motivate empirical research to clarify our understanding of nature’s role in these centuries.

**Contours of Change in Late Antiquity**

The two centuries leading down to the reign of Marcus Aurelius (AD 161–80) might be considered the Roman ‘efflorescence’, similar in its dynamics to the expansionary phase running *ca.* 1000–1270 in the Middle Ages. The population under Roman rule expanded from maybe *ca.* 60 million to *ca.* 75 million over these years, so that maybe one in four humans on the globe lived inside the empire at its height. More remarkably, the societies inside the empire seem to have enjoyed *per capita* income growth over this same span. Gains from trade and technological deployment were more than sufficient to offset Malthusian diminishing returns to land and labour. Roman institutions, Roman peace, and the Roman monetary regime fuelled an economic intensification that led to real income growth. In northern Europe, the Romans may have built on the agrarian systems that preceded their imperial expansion (see Woodbridge *et al.* or Rippon and Fyfe), but even so, patterns of intensification are detectible across wide parts of the empire in palaeoenvironmental records (e.g. López-Sáez *et al.* on the western Mediterranean or Dark for northern Britain) as well as in settlement patterns (e.g. Chavarria *et al.*).

Just as in the High Middle Ages, the end of the Roman efflorescence was marked by a transition in which an ‘enabling’ climate turned less favourable due to exogenous environmental factors. There is no evidence that the Romans induced a crisis by overrunning their carrying capacity, although the enormous population probably put a strain on some landscapes and resources (the

---