Dossier

Climate change, vulnerability, and resilience in the medieval Mediterranean (presentation)

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Abstract: This article aims to present an overview of the historiography about climate change. Our focus is not on the changes themselves, but on how communities reacted to them. This has been the main object of the most recent reflections on the subject and, at the same time, the central point around which the authors of this dossier have written their articles. We intend to show that it is a mistake to attribute great vulnerability to climate phenomena to pre-modern communities, to the same extent that the resilience of contemporary societies to them is exaggerated. The climate emergency and its current impacts show that the old dichotomies between ancient and modern need to be challenged. In this sense, the communities of the Mediterranean basin in the medieval period provide an excellent laboratory for analysis.

Keywords: Climate change; Vulnerability; Resilience.

Mudanças climáticas, vulnerabilidade e resiliência no Mediterrâneo medieval

Resumo: Este artigo pretende apresentar um quadro geral da historiografia a respeito do tema das mudanças climáticas. Nosso foco não são as mudanças em si, mas a maneira como as comunidades reagiram a elas. Este tem sido o principal objeto das reflexões mais recentes sobre o tema e, ao mesmo tempo, o eixo em torno do qual os autores deste dossiê redigiram os seus artigos. Pretendemos mostrar que é um equívoco atribuir às comunidades pré-modernas uma grande vulnerabilidade em relação aos fenômenos climáticos, na mesma medida em que se exagera a resiliência das sociedades contemporâneas a eles. A urgência climática e os seus impactos atuais mostram que é necessário colocar em xeque as velhas dicotomias entre o antigo e o moderno. Nesse sentido, as comunidades da bacia do Mediterrâneo no período medieval fornecem um excelente laboratório de análise.

Palavras-chave: Mudanças climáticas; Vulnerabilidade; Resiliência.

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The aim of this dossier is to reinvestigate how the communities of the Mediterranean Basin and Europe reacted to climate change in late Antiquity and the Middle Ages. Why did some climate changes cause demographic and societal crises and others not? How is it that we are able to identify climate crises in the preindustrial period and how do we navigate the uncertainties that persist? How was late antique and medieval climate change perceived at the time or were there cultural histories of climate? These are some of the questions that have guided our special issue. The studies we have amassed engage directly with climate reconstructions but do not operate under the assumption that preindustrial populations were always and only unable to absorb or respond to climate change, or, in other words, that all climate change provoked societal crisis. We stress that climate change itself is not always a crisis. Rather, the inability of a society to cope caused crisis and it seems that in many times instances preindustrial societies could cope.

We proceed with comparative analyses of the models scholars use to investigate climate impacts and we emphasize differences between studies of resilience and studies of vulnerability. The frameworks we use to study climate change in the past and its impacts constitute a new perspective for understanding historical societies. The studies we have collected, therefore, help us understand the heterogeneous ways in which communities have responded to environmental crises, sometimes with positive results, sometimes with negative results. Resilience and vulnerability depend on how these societies solve their problems, their ability to preemptively, and quickly in the context of climate change, develop distinctive adaptation strategies.

What we also want to highlight is contribution of the interaction between societies and climate change to the processes of cultural, technical, and technological inventiveness; and thereby the way the environment has shaped the constitution of historical societies. Undoubtedly, the study of past crises has been influenced by our current crisis. At the same time, the way we write about the present crisis is often shaped by crises we have perceived in the past. We hope, therefore, that our dossier not only nuances our understanding of climate interactions with societies in the past but also that the novel histories of climate crisis and climate adaptation we collect influences the way we write of present-day climate change. We believe that we can privilege premodern societies as "laboratories" for testing hypotheses about the social impacts of environmental crises. At the same time, it must be underscored that our understanding of past societies has changed considerably in recent years, including in regard to their ability to effectively organize material life, especially in the contexts of food crisis or epidemic, (Cândido da Silva, Savy, p. 1-7). Any use of a premodern society as a laboratory becomes dated once our appreciation of that society appreciably evolves.

Our current global climate crisis has over the last two decades exercised profound influ-

ence over the way historians analyze the past. Classic themes, from the Fall of Rome to the Great Divergence to the colonization of the Americas, have been reconsidered through the perspective of our present-day environmental emergency. To take one example: in 2017 Kyle Harper proposed a new explanation for the demise of Rome, one ultimately based on late antique climate cooling that facilitated the emergence of novel disease spillovers, which in the context of intense Roman-era globalization, took on pandemic proportions (Harper, 2017). The argument has been criticized, but the themes of Harper's popular and influential book, we must recognize, remain very current today: "climate change", "pandemic disease" and "globalization"; these are the major concerns of our times. A plethora of scholarship in recent years has highlighted the interactions of local communities with their immediate environment as key to understanding social change. A concern for local circumstances is apparent, for instance, in Guido Alfani's 2013 monograph about disasters (natural and otherwise) and their impact on the early modern Italian Peninsula (Alfani, 2013), and in Daniel Curtis' *Coping with crisis*, in which he makes the crucial observation that different regions, cultures and communities are differently vulnerable to environmental stress (Curtis, 2014). More recently, Jean-Pierre Devroey's *La nature et le roi* has reflected on the relationship between Carolingian elites and the environment, emphasizing again importance of local circumstances (Devroey, 2019; 2024). The relationship between Carolingian power and nature is the subject of David Patterson's article, "Political climate in the Carolingian World". The author analyses the dissemination, in the Carolingian court during the 9th century, of a theory of kingship that he argues originated in early medieval England from a classical and biblical tradition, and which associated the emperor's behaviour with a cosmic sense, affirming that his conduct was intimately linked to the order of the natural world. Thus, long-term meteorological trends, a concept which, according to Patterson's argument, is similar to climate, would have been read by Carolingians, as he proposes was the case during the reigns of Louis the Pious and Charles the Bald, as a reflection of political stability or instability.

While a number of approaches have been pursued in preindustrial climate histories in recent years, from Harper's macro-history of a major shift in world history to Curtis' concentration on local histories in northern Europe, on the whole, we have not witnessed a return of climatic determinism, as advocated by Montesquieu and others long ago. Such determinism might simmer just below the surface of works like Harper's, but it rarely now features. We are, however, witnessing renewed interest in the history of climate and, in particular, in the stress climate change has put on past societies. In some of the more careful scholarship, we are also witnessing the rise of new methodologies, ones that skew local and aim to place climate change in specific cultural, demographic and economic contexts, a movement away from simply projecting contemporary explanatory models onto the past from a bird's-eye view.

In this sense, John Haldon's article, "Society, climate and history: a case study and its methodological challenges", poses an important question about the role of climatic factors on the organisation of societies, based on a case study of late Roman Arabia. Using hydroclimatic records from southern Arabia and its environs, including a new high-resolution stalagmite record from northern Oman, Haldon identifies an unprecedented drought with the most severe aridity taking place between approximately 500 and 530 CE. Haldon wonders to what extent these droughts contributed to undermining the resistance of the Himyarites, the dominant power in the region until then, and therefore to the environmental context of the emergence of Islam. Crucially, Haldon's interpretation does not adopt a deterministic perspective. He concludes, instead, that it is not possible to prove any direct connection between the major climate and societal changes. However, Haldon does show that the very severe and relatively prolonged drought must have caused some negative impacts on Himyarite agriculture, which probably exacerbated tensions between agrarian communities and pastoralists.

In another register, Kathleen Pribyl, in "Climate induced crisis: The 1430s in England, a difficult decade", shows a much clearer relationship between climate and crisis. This, in part, stems from the author's denser and more robust dataset for extreme weather conditions and their social impacts, which she has amassed from a wide variety of English sources. Pribyl argues that despite all the efforts of the central and municipal authorities to guarantee grain supplies for London and the royal family, extreme weather and harvest failures increased the death rate, a trend that must have been exacerbated by waves of plague and other epidemic diseases.

Our environmental crisis has impacted the way in which historians perceive crises in the past. A clearer understanding of the role of exogenous (such as solar and volcanic climate forcing, and greenhouse gas emissions) and endogenous (like fluctuations in oceanic and atmospheric circulation) factors in the variability of the contemporary climate system has understandably pushed historians to wonder about the effect of these phenomena on historical societies. Above all, scholars have investigated how different premodern societies reacted to climate change. This line of questioning is possible because we have more and better paleoclimate reconstructions today than we had even a decade ago; that said, scholars have speculated on historical vulnerabilities to climate change for generations, even when robust reconstructions of past climate were unavailable – such is the desire to understand human-climate relationships in the past. Natural archives of past climate and the proxies we build from them increasingly allow empirical qualification of past climatic conditions from biological, geochemical, or sedimentary indicators. Archive and proxy availability is widely variable over time and space, but for several regions of the Mediterranean and European peninsula several high- and low-resolution climate recon-

structions exist for the last two millennia. Some of these proxies, such as those based on pollen, speleothems and tree rings, make it possible to reconstruct the major climate shifts and anomalies that have affected Europe and the Mediterranean since the first centuries of the Common Era.

The use of climate proxies is not altogether new among historians of antiquity and the Middle Ages. For example, Georges Duby devoted the first pages of his 1973 *Guerriers et paysans* to a discussion about how climatic variations in the early Middle Ages – as they could be perceived in the early 1970s – influenced the economic growth of the period. In order to do so, Duby used data on the advance and retreat of alpine glaciers (Duby, 1973, p. 13-19). These are the same data that Emmanuel Le Roy Ladurie used in his history of the climate since the year 1000 published a decade earlier (Le Roy Ladurie, 1967). The study of past climate, however, has moved on. The proxy data available is ever-increasingly more plentiful, high-resolution and robust. Yet, while the scientific data is hardly finite, the written sources are and historians have been busily collecting written evidence relevant to the study of past weather and climate for many years now. Some of the most complete surveys of such evidence for climatic phenomena in medieval Europe are Fritz Curschmann's work published more than a century ago (Curschmann, 1900), Pierre Alexandre's *Le climat en Europe au Moyen Âge* (Alexandre, 1987), and, at least for the ninth and tenth centuries, the doctoral thesis of Timothy Newfield (2010), and most recently the EPIFAME Project, built in partnership between the Centre de Recherches Histoire, Arts et Culture des Sociétés Anciennes, Médiévales et Modernes (SOCIAMM) of the Université Libre de Bruxelles and the Laboratório de Estudos Medievais (LEME) da Universidade de São Paulo.[1]

From the point of view of paleoclimate data, the picture has changed dramatically over the past ten years. The growing interest of paleoclimatologists in late antique and medieval climate variations, and the advancement of paleoclimatological methods, has produced an unprecedented volume of data and new classifications of climate variability. At the same time, broad-stroke climate regimes identified in the twentieth century, such as the 'Roman Climatic Optimum' and 'Medieval Warm Period', have been called into question, nuanced and redefined. Multiproxy studies are now the norm in paleoclimatology and meaningful collaborative interdisciplinarity, where historians write climate histories with paleoclimatologists, is increasingly common (Degroot, Anchukaitis, Bauch, 2021; Haldon, Mordechai, Newfield, 2018). Such thoroughly interdisciplinary histories now exist for the four overarching climate periods or classifications of the Middle Ages: the LALIA (Late Antiquity Little Ice Age, c.535-c.660), the DACP (Dark Age Cold Period, c.660-765), the MCA (Medieval Climate Anomaly, 900-1200) and the LIA (Little Ice Age, 1250-1700). It

[1] See http://epifame.fflch.usp.br/.

should be noted that the duration of the LALIA has been questioned, and many now adopted a narrower time frame, one limited to the sixth century (Helama, Jones, Briffa, 2017). Many episodes (or short-term climate anomalies, like that following the Eldgjá eruption of 939-940) within these overarching classifications have also now been studied. The data are such that now we are able to differentiate between anomalies by their degree of intensity. As more paleoclimate data becomes available, our understanding of which crises were the most severe and which were the longest lasting and most spatially significant is improving greatly. Thus, for example, between 1315 and 1317, during the LIA, Northern Europe was hit by season after season of flood-intensity rain, the most significant pluvial of the millennium in the region, but the same rains did not then occur in Southern Europe or Mediterranean. However, Southern Europe was not spared from exceptional climate anomalies in the early fourteenth century, as Guido Alfani and others have shown. These increasingly robust and numerous data allow us to construct chronologies and geographies of climate crises, the sort that will form the basis of our current dossier.

The subject of the relationship between palaeoclimatic data and written texts is addressed in the article by Néri de Barros Almeida and Vinicius Marino Carvalho, "Written narrative and natural proxies in the face of crises in the context of climatic variation", which analyses the records of the great flood of Florence in 1333. The authors emphasise that historians have been wary of establishing too close a relationship between climatic variation defined on the basis of natural proxies and data extracted from written testimonies. They propose to highlight the positive aspect of the issue, assuming that the facts of climate variation can hardly be dissociated from crises in the context of climate deterioration. However, this is hardly a problem exclusive to ancient societies. Néri Almeida and Vinicius Carvalho argue that, until contemporary times, societies generally responded only to meteorological accidents, being little or not at all sensitive to general, overarching climate change or climatic oscillations spanning decades.

Although we have privileged climate anomalies in this dossier, we, again, are not adopting the position of those many natural scientists, archaeologists, and historians, who use climate proxies to monocausally explain historical cultural, political and socioeconomic change. Many scholars, in a number of relevant fields, have assumed preindustrial people in the Mediterranean and European regions were largely unable to absorb climate anomalies or mount a response to the challenges climate change posed. In other words, premodern societies tend to be viewed pessimistically due to their poor (by modern standards) technical ability. That preindustrial populations were more vulnerable than industrial populations, however, is debatable. The focus of this dossier is not the climate anomalies we can now identify per se, but rather their effects on populations, the perceptions of those effects, and the responses to those effects across different communities of the

Mediterranean and Europe. Our histories of past climate must not boil down to a set of proxies, they must engage with the concrete social experiences, such as societal unrest and hunger, that climate change generated, and also involve conceptual formulations of these experiences. Further, the history of climate cannot simply be one of crisis. Not only might some climate changes, like slightly weather Mediterranean summers, have benefitted pre-industrial populations, but even in times of crisis some would have benefitted albeit at the expense of others.

References

ALEXANDRE, Pierre. *Le climat en Europe au Moyen Âge: Contribution à l'histoire des variations climatiques de 1000 à 1425, d'après les sources narratives*. Paris: Éditions de l'École des Hautes Etudes en Sciences Sociales, 1987.

ALFANI, Guido. *Calamities and the economy in Renaissance Italy: The grand tour of the Horsemen of the Apocalypse*. Basingstoke: Palgrave Macmilan, 2013.

CÂNDIDO DA SILVA, Marcelo; SAVY, Pierre. Medieval economic rationalities. *Varia Historia*, v. 39, n. 80, e23204, 2023. Disponível em: http://dx.doi.org/10.1590/0104-87752023000200004.

CURSCHMANN, Fritz. *Hungersnöte im Mittelalter: Ein Beitrag zur deutschen Wirtschaftsgeschichte des 8. bis 13. Jahrhunderts*. Leipzig: B. G. Teubner, 1900.

CURTIS, Daniel R. *Coping with crisis: The resilience and vulnerability of pre-industrial settlements*. Farnham: Ashgate, 2014.

DEGROOT, Dagomar et al. Towards a rigorous understanding of societal responses to climate change. *Nature*, v. 591, n. 7851, p. 539-550, 2021.

DEVROEY, Jean-Pierre. *La nature et le roi: Environnement, pouvoir et société à l'âge de Charlemagne (740-820)*. Paris: Albin Michel, 2019.

DEVROEY, Jean-Pierre. *De la grêle et du tonnerre: Histoire médiévale des imaginaires paysans*. Paris: Éditions du Seuil, 2024.

DUBY, Georges. *Guerriers et paysans, VIIIe-XIIe siècles. Premier essor de l'économie européenne*. Paris, Gallimard, 1973.

HALDON, John et al. History meets palaeoscience: Consilience and collaboration in studying past societal responses to environmental change. *Proceedings of the National Academy of Sciences*, v. 115, n. 13, p. 3210-3218, 2018.

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

HELAMA, Samuli; JONES, Phil D.; BRIFFA, Keith R. Dark ages cold period: A literature review and directions for future research. *The Holocene*, v. 27, n. 10, p. 1600-1606, 2017.

LE ROY LADURIE, Emmanuel. *Histoire du climat depuis l'an mil*. Paris: Flammarion, 1967.

NEWFIELD, Timothy. *The contours of disease and hunger in Carolingian and early Ottonian Europe (c.750-c.950 CE)*. Tese (Doutorado em História e Estudos Clássicos), McGill University. Montreal, 2010.