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Review of Harald Meller , Helge Wolfgang Arz , Reinhard Jung & Roberto Risch (ed.). 2200 BCE Ein Klimasturz als Ursache für den Zerfall der Alten Welt? 2200 BCA climatic breakdown as a cause for the collapse of the Old World? 7. Mitteldeutscher Archäologentag vom 23. bis 26. Oktober 2014 in Halle (Saale). 7th Archaeological Conference of Central Germany October 23-26, 2014 in Halle (Saale) (2 volumes). 2015. 861 pages, numerous colour and b&w illustrations, and tables. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte. 978-3-944507-29-3

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HARALD MELLER, HELGE WOLFGANG ARZ, REINHARD JUNG & ROBERTO RISCH (eds) *2200 BC—Ein Klimasturz als Ursache für den Zerfall der Alten Welt? 2200 BC—A climatic breakdown as a cause for the collapse of the old world? 7. Mitteldeutscher Archäologentag vom 23. bis 26. Oktober 2014 in Halle (Saale). 7th Archaeological Conference of Central Germany October 23–26, 2014 in Halle (Saale)*. 2015. Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte: Halle (Saale). 978-3-944507-29-3.

In 1993, Harvey Weiss and colleagues published a paper in the journal *Science* setting out evidence that the urban site at Tell Leilan had been abandoned at the end of the Early Bronze Age as a result of an unprecedented drought event. It was possible to link this rupture at 2200 BC to the end of one of the world's first empires – the Akkadian. Their study attracted wide interest, not least because of the "salutary lesson" it supposedly offered, namely that our modern civilisation could collapse in the face of rapid climate change too. Although not the first person to postulate a link between climatic instability and the end of the EBA world system, Weiss set in motion what has become something of a 4.2 kilo-year (ka) industry. It has included a NATO workshop meeting on 3rd millennium BC climate change and Old World collapse (published as Dalfes et al., 1997) and a study of cores from the Gulf of Oman by Heidi Cullen et al. (2000) – who later became a main presenter on the US TV Weather Channel. The edited two-volume work reviewed here is the latest offering in the burgeoning 4.2 ka production line. It results from a workshop meeting held in 2014 at Halle Museum, and includes no less than 42 separate papers, some with appendices containing ¹⁴C date lists or other raw data; most are written in English, with nine in German. The first volume focuses on the Mediterranean basin, while the second volume moves the geographical focus into central and northern Europe. The books, which weigh in at over 4 kg, are beautifully produced, with high-quality colour plates and they are admirably free of typographic, language or other mistakes – except, that is, for the book cover. On this there is a bizarrely distorted map of Europe apparently on fire and a mis-spelling of "cause" as "couse"! Notwithstanding this, it is very much to the editors' credit that they have produced and published these volumes so quickly to such a high standard.

The books start with a helpful preface by the editors (three archaeologists, one palaeoclimatologist), which sets out key research questions for the subsequent regional syntheses. They include, firstly, is there evidence for climatic changes between 2300 and 2100 BC, and secondly, what is the archaeological evidence that this had consequences for the societies in each region? As Jung and Weninger put it in their chapter, if the primary evidence is not compelling, then "many of the archaeo-climatological interpretations...may well be built on sand". So, how does the evidence stack up? The answer, almost inevitably, is mixed. There are certainly a few records, such as Renella cave in Italy, which show an abrupt, short-lived (i.e. multi-decadal) climatic anomaly at some point between 2300 and 1900 BC. However most of the 52 sites from the Mediterranean-Near East listed by Weiss in his chapter do not show such a clear pattern, and many show no pattern at all. That is not to say that the 4.2 ka climate event did not occur, but rather that in some environmental settings, its signal was amplified, as Arz et al clearly demonstrate in their study of cores from two contrasting settings in the Red Sea. The palaeoclimate evidence for a distinct and unique climate event at 2200 BC looks even less convincing for northern Europe. In the very last paper in volume 2, Baillie and McAnaney show that no less than six cool-wet "events" can be identified in

the northwest European tree-ring width data sets between 2350 and 1900 BC. So take your pick!

What about the archaeological record? 2200 BC undoubtedly represented a turning point for many Euro-Mediterranean cultures. It marked the end of a period of supra-regional networks and connections, corresponding to the final Neolithic in most of Europe, and a reversion to smaller, regional entities, often with distinctive material EBA cultures. They include the “Cetina” expansion across the Adriatic, Sicily and southern Greece (chapters by Pacciarelli et al. and by Recchia and Fiorentino), and the Argaric culture of southeast Iberia (Lull et al). Nine of the chapters in volume 1 are syntheses that integrate both palaeoenvironmental and archaeological data in specific regions from Anatolia to southern France. Most are excellent and conclude that climate change is likely to have played a role in prompting cultural evolution, but that societal responses and adaptations were not pre-determined. Eight further archaeological studies in the first (Mediterranean) volume include no direct reference to climate, but in some cases (e.g. Levant, Egypt, Aegean) invoke a shift in EBA chronologies that removes potential synchronicities with the 4.2 ka event, and therefore appear to falsify an hypothesised climatic causation.

Disappointingly, volume 2 largely loses the climatic thread, with 13 out of 19 chapters being straightforward archaeological accounts of the late 3rd millennium BC in temperate Europe, mainly Germany; however, a few authors do conclude that there was no cultural crisis during this transition that needs to be explained by climate or anything else. Overall, one is left with the sense that climate probably acted as a pacemaker for major societal restructuring in much of the Mediterranean during this time, but that the case for a similar role north of the Alps has yet to be made convincingly. So the 4.2 ka climatic event remains enigmatic. It has no convincing cause – Marie-Agnès Courty, who provided the original scientific evidence for drought at Tell Leilan, has subsequently re-interpreted it as due to an extra-terrestrial impact, a view supported in this volume by Mike Baillie. However, their explanation seems no more likely than a change in El Niño as proposed by Frank Sirocko in his chapter, even if he is surely correct in ruling out either a solar or a volcanic cause. If its cause remains obscure, its human consequences were not pre-ordained. As researchers such as Jason Ur (2015) have demonstrated, individual Bronze Age communities adapted in different ways to the 2200 BC climatic crisis. In the face of climatic adversity, the fate of these societies was ultimately in their own hands, and so is ours.

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