Review of: Riede, F. (2017). Splendid Isolation: The Eruption of the Laacher See Volcano & Southern Scandinavian Late Glacial Hunter-Gatherers. Aarhus: Aarhus Universitetsforlag. 214 pages, 80 figures, 39 tables, 7 formulae, Audited radiocarbon database of the Allerød period in southern Scandinavia. ISBN 978 87 7124 127 3.

Annabell Zander

The Late Glacial bridges the gap between the height of glaciation, the so-called Last Glacial Maximum (LGM), and the beginning of our current warm period, the Holocene. The archaeological record of this period, which has been subdivided into a number of alternating stadial (colder) and interstadial (warmer) phases, reveals a complex picture with a variety of different archaeological traditions. The Allerød interstadial, generally dated between 12,000-10,800 cal BC, is associated with the spread of hunter-gatherer groups equipped with different types of curved-backed points throughout large parts of Northwestern and Central Europe which are summarised under the broader term Federmessergruppen (FMG). Towards the end of the Allerød a regionally distinct technocomplex, the Bromme culture, emerges in Northern Europe which diverges from the general trend of cultural homogeneity and longevity which can be observed throughout Europe during this time. The emergence and fate of this Bromme culture has been under debate for more than a century with Becker (1971, 136) stating *"we cannot solve the problem of the Bromme's origin"*.

During the Late Glacial hunter-gatherer populations expanded into the previously depopulated regions of Northern Europe. These newly inhabited peripheral regions were often only occupied episodically with a potential staggering of settlement phases dependent on climate oscillations and different landscape types (Conneller, 2007; Pettitt, 2008). At times these ephemeral regions featured unique cultural changes which have been attributed to their remoteness (e.g. Housley et al., 1997). In this well-presented volume Felix Riede presents a problem-oriented analysis of the emergence of the Bromme culture in southern Scandinavia which Riede links to the cultural isolation of this ephemeral region as a result of the eruption of the Laacher See volcano at around 13,000 BP.

The book is organised into seven chapters and opens with an elaborate introduction to the Late Glacial recolonisation of Northern Europe (Chapter 1: Splendid Isolation). The opening chapter also includes an interesting sub-section on the use of the idiom *"splendid isolation"* in the title of this book (and indeed the title of the first chapter) which highlights the long history of this idiom to describe the dynamics of social isolation and contact and the causal relations that influence cultural change. Riede clearly articulates the main objective of his work to provide a new perspective on the impact of social isolation and contact among Late Glacial hunter-gatherers in southern Scandinavia using an evolutionary theoretical framework based on recent developments in evolutionary archaeology (e.g. Shennan, 2000; 2002; 2011).

The remaining part of the chapter is dedicated to a critical discussion of the various hypotheses for the origins of the Bromme culture which have been put forward over the last century. These hypotheses range from interpreting the Bromme culture as a functional/seasonal facies of the FMG (Bokelman, 1978) over suggesting that the Bromme culture represents a third pioneering phase (Madsen, 1996; Brinch Petersen, 2009) to a proposed continuity from the previous Hamburgian to the Bromme culture (Larsson, 1993; Madsen, 1983). Riede (2017, 27) summarises the general debates as a game of 'Typological Top Trumps' whereby Late Glacial artefact elements, such as the Federmesser arch-backed points or 'Lyngby points', *"hold different diagnostic value depending on different research traditions"*. For instance, in the Netherlands or Germany Federmesser and large tanged points are seen as characteristic of the FMG (e.g. Houtsma et al., 1981; Richter, 2001) whereas in more eastern regions the presence of these artefact types has been attributed to the Bromme culture (e.g. Sinitsyna, 2002).

The second chapter (Chapter 2: Vulnerability, events and cultural evolution) generally deals with the theme of disaster and catastrophe in an archaeological and historical context. Riede re-emphasises the need to move towards an interdisciplinary science of past disasters to provide a long-term perspective on the investigation of natural hazards which in turn can aid our understanding of vulnerabilities in the deep past (cf. Riede, 2014). Moreover, Chapter 2 offers definitions of the terms 'vulnerability' and 'resilience' in relation to 'adaptation' and 'adaptability' which are key elements in understanding human responses to extreme events. According to Riede (2017, 37) 'resilience' can be defined as the capacity *"to cope with and withstand catastrophes"*. Here, Riede rightly points to the existing problem of linking 'resilience' and 'vulnerability' with 'adaptation' and 'adaptive capacities'. 'Adaptation' sensu stricto is the product of a diachronic evolutionary process that matches

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an organism or population to its environment or organisms changing their environment to their respective needs. In material culture studies the term should therefore only be used to describe changes in a specific trait that happened over time and due to selection. As Riede (2017, 38) summarises, while 'resilience' *"references flexibility, adaptability and future events"*, 'adaptation' reflects the *"end-result of a process and thus references the past"*. Riede develops his argument further by suggesting 'adaptation' can therefore be defined as *"a form of evolved resilience"*, an interesting interpretation which deserves attention in future work on cultural change in relation to environmental change (Riede, 2017, 49).

In Chapter 3 (Explosive volcanism and the Laacher See eruption) Riede turns to the theme of volcanic eruptions and their impact on different communities. The first part of the chapter gives an easily accessible introduction to volcanism in general while the second part introduces the anatomy of one explosive eruption in particular, the Laacher See Event (LSE). Located in present-day western Germany the Laacher See volcano is part of the East Eifel volcanic field. The eruption which took place around 200 years before the onset of the Younger Dryas cold snap was a very intense volcanic event with a minimum calculated eruption magnitude of M=6.2. Due to the thick cover of tephra a number of nearby sites have been sealed and preserved allowing a unique insight into a 13,000-year-old Prehistoric landscape. Riede provides a detailed table of sites with traces of Laacher See tephra (LST) collated from a range of different disciplines. The data illustrates the spatial distribution of LST across Europe, including as far north-east as Russia and Lithuania. Riede's efforts to collate the 622 known LST data points from 13 different countries (!) certainly aid the reconstruction of the magnitude of the eruption.

Chapter 4 (Before the eruption – the Federmessergruppen) then turns to the archaeological evidence, starting with the Federmessergruppen (FMG) prior to the eruption. These small hunter-gatherer groups were widespread on the North European Plain when the LSE took place. Riede opens the chapter with a clear summary of the origin of the FMG discussing the general terminology and its link to the Final Magdalenian. The remaining chapter addresses the economy and social structure of the FMG with an interesting section on FMG population dynamics. Here, Riede estimates human population densities for the Late Glacial hunter-gatherers of the Allerød based on Morin's (2008) model which focuses on the relationship between faunal diversity and forager density. According to Riede, based on this model the population density for southern Scandinavia was probably very low suggesting an overall low density in the Late Glacial across large parts of northern Europe. In addition, the general lack of evidence of a link of these southern Scandinavian FMG sites into a wider network of trade could indicate that these sites reflect pioneering settlements which are generally more vulnerable to unexpected disturbances (cf. Alexander, 2000, 17). The chapter is further supplemented with a catalogue of Magdalenian/FMG sites with large tanged points which serves as a useful reference.

Chapter 5 (The progression of vulnerability and the impact of the Laacher See eruption) relates the impacts of the Laacher See eruption on flora, fauna and contemporaneous communities. The opening section of the chapter discusses definitions of the terms 'disaster' and 'hazard'. To the author, *"natural disasters are ultimately social phenomena causally related [...] to natural hazards"* (Riede, 2017, 109). The Laacher See eruption resulted in a number of hazards which had various impacts on past communities at different distances of the eruptive centre which Riede divides into 'Near-field', 'Mid-field' and 'Far-field' hazards. Riede draws on a comparative database of other eruptions in the recent and deep past and their impacts on the environment and contemporaneous communities to assess the potential effects of the LSE. He places the data of the Laacher See eruption within Wisner and colleagues' (2004) Pressure-and-Release (PAR) and Access Models which can be described as tools to understand how disasters occur when vulnerable communities are affected by natural hazards and how these hazards impact current and future livelihoods. On the basis of these models Riede argues that the regions in northern Europe affected by tephra fallout were probably largely abandoned with foragers decisively moving into an already known area, namely southern Scandinavia. This region was probably largely unaffected by the LST fallout and may have even experienced additional warming in the aftermath of the LSE. Additionally, big game, such as elk and giant deer, was available as well as other important resources, including high-quality flint nodules and amber (cf. Mortensen et al., 2014).

In Chapter 6 (After the eruption – the Bromme culture) Riede turns to the Bromme culture focusing in particular on Becker's (1971) 'Bromme problem' which describes the question of this culture's origin and fate. The account of the Bromme technology, economy and population dynamics in this chapter shows certain continu-

ities and discontinuities between the FMG and Bromme culture. There is a general continuity of tool forms, such as large tanged points and burins, and certain aspects of the technology, including straightforward knapping of local raw materials, also suggest a continuity. However, to the author, the Bromme culture also differs from the FMG in several aspects, namely the Bromme culture being geographically restricted, short-lived, exhibiting a simplified toolkit with the disappearance of slender arch-backed points typical of the FMG and an increase in large and heavy tools.

The chapter also addresses the interesting lack of 'non-utilitarian', exotic objects in Bromme assemblages which may reflect social isolation of the hunter-gatherer groups in southern Scandinavia following the LSE. On the basis of technological analyses, Riede proposes a focus on dart-points in the Bromme sample which he argues can be explained with the loss of the bow-and-arrow technology among these peripheral hunter-gatherer groups, probably as a result of the social isolation. In the remaining part of Chapter 6 Riede persuasively argues against adaptationist and gradualist scenarios whereby the change in material culture is seen as reflecting an adaptation to a changing environment (cf. Fischer et al., 2013). To the author, the *"technological and typological poverty"* of the Bromme culture should be seen as reflecting a significant demographic impact on the social transmission of cultural knowledge through social isolation (Riede, 2017, 146). Concluding the chapter, Riede offers his answer to the 'Bromme problem' stating that the Bromme culture should not be defined as a separate culture but rather as a short-lived variant of the FMG which came to an end in the early parts of the Younger Dryas.

The final Chapter 7 (Natural hazards and traditional societies past and present) draws the various strands neatly together providing an up-to-date account of the 'Laacher See hypothesis'. As discussed throughout the book, this hypothesis suggests that the Laacher See eruption set off significant demographic fluctuations along the northern peripheral areas of Late Glacial hunter-gatherer territory which in turn resulted in change in the material culture. The root cause of cultural change is seen in *"the complex interplay between ecological and societal constellations"* of these communities (Riede, 2017, 147). The updated hypothesis also includes a review of the Perstunian culture, originally proposed to reflect a development in the wake of the LSE mirroring the Brommean. It is here convincingly argued that the large tanged points found in Perstunian assemblages which were previously seen as diagnostic of the Bromme culture probably rather represent a FMG or Ahrensburgian context (cf. Serwatka & Riede, 2016 on the notion that large tanged points should not function as culturally diagnostic marker artefacts).

In the remaining sections of the chapter, Riede proposes a complementary 'extreme event archaeology' alongside Van de Noort's (2011) 'climate change archaeology'. This would certainly be a welcome addition to the current discourse of fear around the topic of climate change which tends to focus on global narratives instead of historically informed resilience strategies in specific regions (cf. Hulme, 2008). A transdisciplinary archaeology of climate change and of extreme events would certainly go a long way in offering long-term perspectives on human adaptations and resilience to a rapidly changing environment.

Overall, this volume provides a 'splendid' summary of more than ten years of Riede's and colleagues' research that directly links the cataclysmic eruption of the Laacher See volcano to cultural change. Riede's *"Laacher See hypothesis"* is supplemented with various tables detailing primary and secondary data (including an audited radiocarbon database of the Allerød period in southern Scandinavia) which allow the reader to develop their own interpretations and allow for further research into this topic. While Riede himself remarks that his hypothesis has not gone unchallenged (e.g. Sørensen, 2010; Weber et al., 2011), he is also very clear that *"the Laacher See hypothesis remains just that, a hypothesis"* (Riede, 2017, 152). Therefore, although some might not agree with Riede's interpretations, his work nevertheless reflects an important evolutionary theoretical perspective on the drivers of cultural change during the Late Glacial period.

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Annabell Zander M.A.
Department of Archaeology, University of York (UK)
PhD Candidate, funded by Studienstiftung des deutschen Volkes and White Rose College of the Arts and Humanities (AHRC - WRoCAH)
annabellzander@hotmail.com

https://orcid.org/0000-0002-2817-0242