# The Central European Magdalenian: Regional Diversity and Internal Variability

Andreas Maier
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*The Central European Magdalenian: Regional Diversity and Internal Variability* is an ambitious volume for which its author, Andreas Maier, should be congratulated. It boasts a tremendous amount of data gathered from a meticulous and critical combing of the [multi-language] literature. The book concludes with an alternative explanation for the post-Late Glacial Maximum (LGM) re-colonization of Central Europe by Magdalenian foragers. As someone who has worked on both prehistoric hunter-gatherer colonization and artifact diversity and variability, I was particularly intrigued by this tome, and was invigorated after my reading of it.

While the question of re-colonization of post-LGM central Europe is present from the very start of the volume (page 5), Maier bounces back and forth between an inductive and deductive approach. The sheer amount of information provided—artifactual, radiocarbon, landscape, environmental—illustrative of the former approach and critically vetted by the author, leaves no doubt of his mastery of Magdalenian material culture. Yet, this reviewer, who personally prefers a deductive approach, especially appreciated the four, clear test predictions ("objections", Chapter 8) involving colonization and their subsequent testing with the archaeological record. Indeed, the testing of these four predictions suggested to Maier that central Europe was re-colonized from two directions (east and west), rather than from just one direction (west). While the reader may disagree with the predictions themselves, their presence provides a structure to the overall work that can be difficult to achieve via induction alone.

Much of *Central European Magdalenian* is focused on how artifact types, artifactual traits, or inferred behaviors, are distributed geographically. Although the word "diversity" is in the book's title and used throughout the text, it should be noted that diversity is not explicitly assessed in terms of class richness or evenness. Five regional groups are compared in terms of land-use patterns, raw material usage, artifact types, geometric symbols, and artistic representations. There is a plethora of figures and maps—all clear and detailed—and 28 tables to help the reader picture and quantify the archaeological record being assessed. The 162 pages (!) of data appendices are very welcome and will assuredly be used by researchers and students alike to both re-examine Maier's conclusions and investigate new questions.

Overall, Maier has put together a welcome addition to the literature, one that should be read by archaeologists and anthropologists interested in the Late Pleistocene, hunter-gatherers, hominin colonization, quantitative methods, and material culture of stone and bone. This reviewer, however, had two primary suggestions for further research. The first involves the data used in the artifact analyses. For a literature-based study, Maier should in no way be faulted for using, for example, reported stone artifact "types." Indeed, as he writes, "types are the basic analytic unit of Paleolithic archaeology" (page 38). The question, of course, is whether they should be the basic analytical unit for all questions when more objective and replicable procedures exist for creating analytical units, such as paradigmatic classification (Dunnell 1971). Re-evaluating Magdalenian tool diversity using paradigmatic classification might be a profitable exercise.

The second avenue for future research would be to better integrate Maier's study within the hunter-gatherer colonization literature in general and that of North American colonization in particular. Much work has been done on how human foragers should and do colonize new and unfamiliar landscapes. Beyond the odd reference to Jochim et al. (1999), Kelly (2003), and a few other individuals, much of this literature is ignored (e.g., Anderson and Gillam 2000; Boulanger et al. 2015; Hamilton and Buchanan 2007; Kelly and Todd 1988; Lycett 2008, 2009; Meltzer 2002, 2003, 2004, 2009; Moore 2001; Surovell 2000, 2003; etc., to name but a few). Again, there should be no blame assigned to Maier, as his work is voluminous enough as it is! But, integration of this literature may help reframe some of the predictions and conclusions in the future. For example, Maier states "if a unidirectional expansion [from the west] is assumed, sites should gradually become younger the farther away they are located from the source area in the direction of the assumed expansion." While this prediction is true, we have learned in recent years that hunter-gatherer colonization can be—indeed, *should* be—exceptionally fast. Thus, the presence of 18,000 cal B.P. dates in both western and eastern Europe *could* mean that there was a bi-directional colonization of central Europe (Maier, page 233) or it could mean that a unidirectional colonization across Europe from the west was exceptionally fast and we do not have the archaeological resolution to see the temporal cline from west to east. In other words, radiocarbon contemporaneity may not be representative of actual prehistoric contemporaneity. In another example, Maier states that "in the case of a unidirectional expansion into unsettled areas, innovations which are unique to the expanding group should be

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present only within this group and should not be found outside of the colonized territory" (Maier, page 235). No references are provided for this prediction, and I am not entirely convinced that innovations would not necessarily be transmitted back to the parent population of the founders. And speaking of founders, an assessment of founder effect via Magdalenian artifact variability would be a potentially cracking study (e.g., Lycett and von Cramon-Taubadel 2008).

These avenues of future research should not be taken as criticisms, but instead as enthusiasm and thought fuel spurred on by a well put-together book. Although prehistoric hunter-gatherer colonization can be notoriously difficult to untangle archaeologically, Maier's monolithic contribution has helped to point the way forward in the study of Magdalenian archaeology.

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