Book reviews - Buchbesprechungen

Demographische Untersuchungen zu Bevölkerungsdichten, Mobilität und Landnutzungsmustern im späten Jungpaläolithikum.

Inga Kretschmer, Kölner Studien zur prähistorischen Archäologie; Band 6. Rahden/Westf.: Verlag Marie Leidorf GmbH. 2015. Hardcover; 368 pages, including 90 figures, 28 tables, four catalogues, and 40 appendices.
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Past demography has long been a major concern of prehistorians from Cologne University. Over many years, Andreas Zimmermann, his colleagues and students have, as part of the LUCIFS (Land Use and Climate Impacts on Fluvial Systems during the period of agriculture) project, developed a detailed data-driven method that draws on geo-statistical methods to reconstruct population densities at different spatial scales from local to super-regional. These efforts have traditionally had their starting point in the remarkably well preserved and extensively investigated archaeological record of the Aldenhover Platte and had their focus on agricultural societies from the Neolithic onwards (e.g. Zimmermann et al. 2009).

Inga Kretschmer's publication on demography and land-use patterns in the Late Upper Palaeolithic can be seen as a natural – and highly welcome – extension of this methodology into the Pleistocene. In this book, her doctoral thesis, she makes a valiant attempt to circumscribe the demographic boundary conditions and changes from the Early Magdalenian to its Final phases (20'000-14'000 cal BP) in Western, Northern and Central Europe. As is noted in the volume's preface, Kretschmer's monograph is the third in a series of doctoral publications arising from the Collaborative Research Centre (CRC) 806 'Our Way to Europe', a long-term interdisciplinary research initiative funded by the German Research Foundation (DFG) and aimed at better understanding successive migratory pulses of *Homo sapiens* in Europe throughout the Pleistocene. The previous two publications include Katsuhiro Sano's (2012) work on regional settlement patterns in the Rhineland and its surroundings, and Andreas Maier's (2015) work that addresses super-regional variability and diversity in the Central European Magdalenian. The latter publication in particular has laid the empirical foundation for Kretschmer's bottom-up approach to reconstructing Late Pleistocene forager population dynamics. She has, however, added substantially to Maier's database and works with a total of 1700 find localities, divided into three and when possible four time slices: Early, Middle, Late, and Final Magdalenian. These data are presented in a series of extensive catalogues and appendices, although – and this is a general remark rather than a specific critique – the utility and not least user-friendliness of such large amounts of data presented in printed form seem rather limited. Luckily, however, much if not all of the CRC's data and outputs are also available in digital formats at http://crc806db.uni-koeln.de. Kretschmer's extensive archaeological dataset is coupled with a carefully selected suite of ethnographic forager groups and their associated environmental and subsistence parameters taken from Binford's (2001) monumental *Frames of Reference*. By applying understandably narrow ecological and economic criteria for selecting suitable ethnographic analogues, by referencing her large archaeological dataset, and by drawing on the tried-and-tested Zimmermann-approach to demographic up-scaling, Kretschmer makes a genuine effort to free herself from the interpretative shackles of the much bemoaned 'tyranny of ethnographic record' (Wobst 1978).

Did she succeed? And what have we learned? Kretschmer's main results are fully in line with previous models for the Magdalenian expansion from its south-western refuge area into Europe at large: The suggested population densities for all regions except south-western France range from 0.001 to 0.011. These are at the lower end compared to some previous suggestions, but fully within the expected range. Unsurprisingly, populations appear densest and best connected in the Franco-Cantabrian core area. An interesting finding is that even though populations are clearly expanding in space, mean population densities in each region seem to be capped at a threshold value around 0.036 persons/km^2. This has potentially interesting implications for our understanding of the drivers for expansion. Once this invisible demographic ceiling is reached, ecological and/or social factors may have motivated further expansion episodes. Perhaps the internal complexity and conflict potential of Magdalenian societies (cf. Schwendler 2012), and the influence of only few individuals' choices on whether and where to move (cf. Rowley 1985) have so far been underestimated as a driver of territorial expansion. Kretschmer's results also firmly underline the astounding finding that had

already emerged out of Maier's earlier work, namely that the Magdalenian settlement of Europe was fragmented into quite distinct regional pockets of human presence that are interspersed with at times expansive tracts of no-man's land. If, however, one should say something critical of Kretschmer's work, then it is that, the realisation that past human presence cannot be assumed to have been spatially homogeneous let alone continuous, is – unfortunately, in this reviewer's opinion – not extended into the chronological dimension. It is here Martin Wobst's ethnographic tyrant rears its ugly head once more: Despite the fact that Kretschmer's method repeatedly flags up population values substantially below viability (or, rather, substantially below what we know from ethnographic hunter-gatherers), she has chosen to reject these as methodological artefacts rather than indicators of population densities that indeed often trended towards 0 at chronological scales below the broad time slices used in her study. Yet, we do know of population crashes reported for hunter-gatherer societies; we do know of hunter-gatherer groups that have disappeared. Kretschmer explicitly and quite sensibly adopts a meta-population perspective for the Magdalenian, but does not sufficiently take on board one of the key properties of meta-populations: local extinction and replacement. The possibility that local Magdalenian groups went extinct relatively often or that these hunter-gatherers had developed non-analogue strategies allowing them to survive and thrive at population densities below those we know from ethnographic forager groups is not seriously considered. Especially for peripheral regions such as Northern Europe or the British Isles where people faced the dual challenge of at least initially low population densities and of network marginality, the possibility of local extinction is not at all unrealistic (Riede 2014).

In working with her 1700 find localities Kretschmer assumes contemporaneity within the respective chronological envelopes. These envelopes are wide, however, and it remains unclear how evenly these sites are distributed in time within each envelope. Late Pleistocene environments were demonstrably non-analogue. They were characterised by climatic fluctuations of amplitudes and magnitudes significantly greater than those of the Holocene as well as by unstable plant and animal community compositions. Perhaps the adaptation strategies of contemporaneous hunter-gatherer groups also find no good match anywhere in the ethnographic record. While it may ultimately be impossible to fully avoid the use of ethnographic analogues in tackling past hunter-gatherer demographics, we should perhaps be more prepared to at least model the stochastic fluctuations of past forager populations around the mean values and trends presented by Kretschmer. And in doing so, we should not *a priori* rule out that these values reach 0 from time to time, i.e. that groups went extinct and that colonisations proceeded through successive but occassionally also unsuccessful pulses. Binford (2001) and others have shown a strong connection between temperature and forager population density. Modelling Magdalenian demographic dynamics could thus be structured around the existing temperature proxy records available for the Late Pleistocene. Such modelling exercises could, for instance, be inspired by distribution modelling in palaeoecology, especially when coupled with agent-based approaches that would also allow us to feed such models with behavioural parameters directly derived from the archaeological record.

Demography does *not* provide an explanatory panacea for past cultural changes (Vaesen et al. 2016). Yet, it does underwrite all evolutionary change, including cultural evolutionary dynamics (see Metcalf & Pavard 2007). Kretschmer's overall excellent work makes an outstanding empirical and methodological contribution to our understanding of Late Glacial hunter-gatherer demography. Several empirical and methodological avenues forward offer themselves and many of Kretschmer's findings can be readily turned into productive hypotheses for future research. First, the notion of empty spaces between Magdalenian settlement pockets can in principle be tested through targeted field investigations in these regions. Second, the multi-scalar method for reconstructing past forager demographics could be applied in other parts of the world and in other periods in order to test its validity as a general approach. Notably, and as a proof-of-concept, such an extension could even include case studies from more recent periods where actual census data or at least some indications of population numbers – including local extinction events – are available (e.g. the Arctic). Third, the collated data could be fed into so-called species distribution models where 'species' should be understood more generically as denoting any operational taxonomic unit. Maier's different regional variants of the Magdalenian could come into play here as such units. By integrating high-resolution temperature proxies as modulators for population density into such models we may be able to arrive at a more dynamic picture of past demographics at generational scales directly relevant for cultural transmission and hence culture change as reflected in the archaeological record. Finally, genetic methods based either on inference models (i.e. reconstructions based on modern DNA patterns) or those drawing directly on ancient DNA data could be brought into the debate. Kretschmer's monograph has set the scene beautifully for such investigations.

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Solutrean Points of the Iberian Peninsula: Tool making and using behavior of hunter-gatherers during the Last Glacial Maximum.

Isabell Schmidt, BAR International Series 2778, Oxford, 2015, 206 pages, paperback, List price £40, ISBN 978 1 4073 1470 9

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Schmidt's monograph focuses exclusively on variability in Solutrean points, the most diagnostic lithic implements manufactured during that period of the Last Glacial Maximum, from c. 25-20'000 calibrated years BP in the Iberian Peninsula. Her archaeological sample is geographically broad, comprising data from northern and southern Iberia, including major prehistoric human settlement regions in Vasco-Cantabria, the Ebro Basin, southern Mediterranean Spain, and the Estremadura area of coastal central Portugal. Thus, Schmidt's study is among the largest, most comprehensive investigations of Solutrean points ever made, integrating 273 datasets from 170 archaeological sites, including analyses of artifacts and published materials.

Iberian Solutrean points appear in several distinct forms – concave base, shouldered, etc. – that permit archaeologists to examine aspects of prehistoric historic hunter-gatherers' mobility, economy, social interaction networks, and technological organization during the Last Glacial Maximum, a period of climatic and environmental stress in western Europe. Each of these artifacts preserves its own life history – a biography that can provide researchers information about lithic raw material procurement and manufacture; tool design, use, maintenance, and recycling; and artifact discard. Each of these components reflects the lithic technological organization strategies that prehistoric groups used to adapt to local and regional environmental circumstances within the context of their cultural traditions. Schmidt applied the technological organization approach to an extensive archaeological sample, which enabled her to qualitatively and quantitatively explore Solutrean toolmaking and using behavior at varying scales across the Iberian Peninsula, and to isolate geographic, and perhaps also cultural, similarities and differences in lithic strategies.

The book is divided into five parts. Parts I-III establish the foundation for Schmidt's research, including a concise summary of the Solutrean with information about technocomplexes, lithic raw material availability, Iberian topography, and the coastline, climate, and vegetation that characterized the Last Glacial Maximum. Schmidt situates the Solutrean in climatic, environmental, and geographic context with a clarity that any new student to this Upper Paleolithic period would undoubtedly appreciate. These sections also present the sample Schmidt uses in her study and outline the analytic methods that were applied to describe Solutrean point biographies. Part IV divides the Solutrean point sample into five techno-morphological types – concave base points, shouldered points from northern Iberia, shouldered points from southern Iberia, stemmed and winged points, and leaf-shaped points – and presents a chapter for each. These sections mirror each other, each assessing the same questions: (1) which organizational strategies were used to produce the points; (2) how standardized or variable the tool design and morphology was; (3) how the points were used, based on macroscopically visible wear traces; (4) how the points may have been hafted; and (5) how the points indicated variability and/or diversity in functional, morphological, or technological attributes on regional spatial and temporal scales. Each chapter concludes with a succinct summary of a point type's major attributes. Finally, Part V situates the attributes of each Solutrean point type in context and compares artifacts from northern and southern Iberia.

Schmidt observes the geographic distribution of different kinds of Solutrean points. Concave base points were mainly recovered from sites in Atlantic coastal Iberia (Vasco-Cantabria), while stemmed and winged points were more abundant in southern Iberia. Abruptly retouched shouldered points have been located throughout the Iberian Peninsula; leaf-shaped points were also widely distributed, however, they are uncommon finds. Schmidt's comparison of Solutrean point biographies supports a hypothesis that Solutrean hunter-gatherers living in northern and