

Human Adaptations to the Last Glacial Maximum:

The Solutrean and its Neighbors

Edited by

Isabell Schmidt,

João Cascalheira,

Nuno Bicho

and Gerd-Christian Weniger

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INTRODUCTION

Research on the Last Glacial Maximum (LGM) in Europe reflects our ubiquitous interest in understanding humans cultural and economic responses to changing environmental conditions, the effects of spatio-temporal patterns of demographic dynamics, and the resilience of social networks... The list could become endless. The outstanding western European archaeological and paleoclimatic record of the Solutrean technocomplex provides insights into these processes. The present volume follows the 3rd International Conference on the Solutrean, held in October 2017 at the University of Algarve, Faro, Portugal. The conference brought together scientists from different countries and covering a rich range of archaeology-related expertise and their application to the LGM record. An eclectic range of topics was presented and discussed across several thematic symposia, including reports on recent site/context discoveries, paleoenvironmental studies, technological analysis, and investigations on art and ornaments.

We noticed, however, that the role of the LGM as one of the main focus of Western European prehistoric research has been, over recent years, somehow obfuscated by an exponential investment in other equally fascinating topics, such as the Neanderthals-Anatomically Modern Humans transition. In reality, however, it is rather clear that the rich cultural heritage and distinctive paleoenvironmental settings to which the Solutrean is associated has repetitively allowed the application, testing, and improvement of new theories and analytical methods, often serving as steppingstones for the construction of models applied in broader anthropological inquiries (e.g., the role of refugia in past human adaptations). In addition, the LGM is also in the focus of numerous climate modelling projects, so that a high-resolution data record is available, making this time slice very attractive for broader archaeological studies. So, the starting point for hosting the 3rd conference on the Solutrean was a shared belief amongst the organizers and editors of the present volume, that the focus on the Solutrean technocomplex and LGM-related cultures merits revitalization and a broad forum for interdisciplinary exchange and discussion.

Accordingly, the volume addresses readers with a background in archaeology as well as related disciplines, providing an overview as well as detailed insights into a broad array of current research topics and methods

applied in LGM contexts. The book constitutes a rich source for new data and interpretive models on human behavior.

One of the highpoints of the conference was the thematic session organized in honor of Prof. Lawrence Guy Straus, whose seminal and extensive work on the Solutrean adaptations in Northern Iberia has strongly influenced all developments in LGM studies across Iberia and beyond. Prof. Straus is now retired, but we hope that he can keep contributing for many years with his invaluable insights on the Late Pleistocene adaptations in Western Europe. He authored the first chapter of this book, and we gratefully dedicate the whole volume to him and his remarkable career.

The book is subdivided into five thematic sections, PART I to V, broadly following the structure of the conference. While PART II-V are centered on topics related to the Solutrean, PART I focused on what we called the Solutrean Neighbors. During the conference, general reviews but also new data reports on the LGM human ecodynamics across different regions of Europe and North Africa were presented. This broadening of the conference scope was a priority for us from the beginning, intending to discuss human adaptations to the LGM from a wider paleoanthropological perspective. Two of the original contributions to this symposium appear published in this book (PART I: THE SOLUTREAN AND ITS NEIGHBOURS), focusing on the LGM occupations in Northern Italy (Chapter 2) and its environmental and landscape settings, and Northern Morocco (Chapter 3), where researchers discovered a very different occupation history to what is known from Iberia.

Contributions of PART II “INSIGHTS FROM SITE CASE-STUDIES” focus on current excavations and the reinvestigation of old excavations across Western Europe. The report from Les Bossats provides an exceptional insight into the intra-site spatial organization of an extensively excavated Solutrean open-air-site at the northernmost fringe of known human LGM settlement (Chapter 4). Turning to the record from Iberia, contributions are sorted geographically, clockwise, starting with archaeological sites in the North of the Peninsula. An overview on multi- and interdisciplinary results on site formation processes and archaeological and archaeozoological finds from El Buxu, including art, is given in Chapter 5, much of which is published in English for the first time. The rediscovery of archaeological material from an old excavation at Cova Rosa – including finds and sediment samples – allowed deriving substantial new archaeological as well as palaeoenvironmental information on the occupation during the LGM (Chapter 6). The subsequent two contributions reach out into higher elevations and position new discoveries within a larger spatial framework. New dates and finds from Montlléu trigger a discussion of mobility and

contacts of populations across and around the Pyrenees during the LGM, taking typological similarities and differences between adjacent regions into account (Chapter 7). The report on ongoing excavations of an archaeological stratigraphy in the central Meseta Plateau challenges the longstanding model of humans avoiding the unfavorable interior of the Iberian Peninsula during long periods of the Upper Paleolithic (Chapter 8). New stratigraphic data and multidisciplinary results from current excavations at Ardales provide contextual information on a typologically indifferent assemblage, now dated to the LGM, supported by diagnostic surface finds in the cave (Chapter 9). The Gravettian-Solutrean sequence from Lapa do Picareiro in central Portugal is presented in Chapter 10, discussing implications for the (supra-)regional chrono-cultural sequence of this transition.

Turning to Part III: LITHIC TECHNOLOGY IN CONTEXT, contributions (again geographically sorted) reflect the broad spectrum of available methods in lithic analysis. It starts with an innovative approach combining results of spatial analysis and technological description, conducted for Solutrean layers of Las Caldas (Chapter 11). The subsequent chapters provide comprehensive techno-economic studies of assemblage from sites in southern Iberian, which synthesize results from studies of raw-material, techno-typology, reduction processes, tool-manufacture, and use; focusing on the discussions on the regional chrono-cultural context (Chapter 12), site function and mobility networks (Chapter 13), and the value of open-air sites for investigating human presence on the landscape (Chapter 14). Experimental data on Solutrean shouldered points from southern Iberia is presented in Chapter 15, reconstructing a use of these implements in a bow-and-arrow hunting technology – a claim repeatedly raised for these Solutrean point types. Finally, Chapter 16 provides an original study on lithic raw material of sources and archaeological contexts from Portugal, observing a tool-specific raw-material-usage behavior during the LGM. It is a general tendency that raw-material provenience has by now become an integral part of many studies in Iberia, this book providing numerous references to such data.

Contributions of Part IV: HUMAN-ENVIRONMENT INTERACTION DURING THE LGM operate at different spatial scales and use a variety of proxies (animal, plant, and cultural remains) to understand the interaction of humans with their biotic environment and climatic conditions. A spatially-explicit statistical study (Chapter 17) on up-dated information about faunal assemblage composition from northern Iberia innovatively tests observations already made by L.G. Straus during an early stage of his career. The following two chapters are dedicated to a still underrepresented source of information from the archaeological record of the Late

Pleistocene: charred plant remains. Using evidence from two well excavated and comprehensively sampled sites, La Boja Rock-Shelter and Cova de les Cendres, anthracological and carpological data are used to understand humans' interaction with the specific vegetation of the LGM. Chapter 18 exemplifies the rich information derived by anthracology from combustion features; and Chapter 19 provides an exceptional case study and demonstrates how charred remains can be used to open up insights into past climate, landscape structure, intra-site organization and the daily life of hunter-gatherers.

A large-scale overview on fish-remains along the Mediterranean coast of Iberia (Chapter 20) shows that they are more than just another species on the LGM menu - set into context of changing paleoshorelines and the archaeological record, a complex picture emerges which demands further explanation. Chapter 21 takes an innovative approach by firstly testing the relationship between environment and archaeological faunal remains through a species distribution model, and secondly exploring potential relationship by adding data from artistic expressions at the respective sites. The last chapter of Part IV takes a closer look on paleo-environmental proxies (Chapter 22). The final Part V of the book is on RESEARCH ON ARTISTIC AND SYMBOLIC EXPRESSIONS. Three contributions present evidence for rock art, including new data and interdisciplinary approaches to its analysis and documentation: A comprehensive overview is provided on the dense panels at Cueva de Ambrosio, a site also known for its rich Solutrean stratigraphy (Chapter 23). At Malamuerzo Cave, also known for numerous paintings, reported excavations demonstrate the sealing of newly discovered motifs by Magdalenian deposits, providing an *ante-quem* date for this artistic expression (Chapter 24). Potential evidence of Solutrean art from Gibraltar is presented and discussed in the light of local, site-specific conditions, e.g., accessibility of the cave, and within its regional context of archaeological evidence (Chapter 25). Finally, Chapters 26 and 27 presents, respectively, results from an analysis of a newly discovered set of perforated shells from a Proto-Solutrean context and two Solutrean engraved slabs at the site of Vale Boi, southern Portugal.

We would like to express our gratitude to all people who assisted during the physical realization of the book: Nina Avci, Tom Noack, and Lutz Hermsdorf-Knauth for their input to the formal editing process; Dr. Jayson Orton and Geneviev de Waal for their outstandingly thorough and vigilant work on the English language; and Dr. Werner Schuck for providing full support on any matter of the accounting.

We thank all colleagues who contributed to the conference, making it an inspiring and successful event through presentations, posters, and discussions. Last but not least we would like to acknowledge the scientific committee and the essential work of the reviewers, who have provided their long-standing expertise on the archaeological and environmental record of the Last Glacial Maximum.