Neanderthals in Context: A Report of the 1995–1998 Excavations at Gorham's and Vanguard Caves, Gibraltar

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During the past few decades, research on Neanderthal behavior has been one of the most exciting issues in European prehistory (e.g., Mellars 2004; Teyssandier 2008). One of the main issues is to clarify which factors contributed to their resilience and subsequent disappearance in Western Eurasia. These phenomena have been commonly associated with two main scenarios: (1) rapid and dramatic climatic changes, such climatic oscillations had a major impact in faunal migrations to ecological refugia and regional extinctions, including those of humans (e.g., Muller et al. 2011); and, (2) demographic pressure due to the expansion of Anatomically Modern Human populations across Eurasia c. 45 cal BP (e.g., Roebroeks 2008). Regarding the first scenario it has been argued that during MIS 5 and 4, major climatic oscillations led Neanderthal populations to pursue low latitude territories as ecological refuges. In this scenario, the southern Iberia Peninsula has been seen as one of the last territories where Neanderthals lived prior to their disappearance c. 33 cal BP (d'Errico and Sanchez-Goñi 2003; Finlayson and Carrión 2007).

It is in this territory that Gorham's and Vanguard Caves in Gibraltar, with one of the most well preserved Middle Paleolithic chrono-stratigraphic records as well as important evidence of the last resilient Neanderthal populations, are situated (Finlayson et al. 2008). The volume edited by Barton et al., *Neanderthals in Context: A Report of the 1995–1998 Excavations at Gorham's and Vanguard Caves, Gibraltar*, is based on four years of archaeological excavations that, during 1995 to 1998, took place at Gorham's and Vanguard caves in Gibraltar. The main goal of this book is to present all data from a multidisciplinary research project conducted by the Natural History Museum in collaboration with the Gibraltar Museum.

From my perspective, the book is well-structured in five sections: (1) introduction (Chapter 1), (2) Gorham's Cave reports (Chapters 2 to 12), (3) Vanguard Cave reports (Chapters 13 to 22), (4) final and wider perspective conclusions (Chapters 23 and 24), and (5) appendices.

The first chapter by C. Stringer briefly reviews the history of the investigation in the archaeological sites of Gibraltar. Some sites provided important archaeological evidence of Neanderthal occupation, including human remains. The author introduces both Gorham's and Vanguard Caves and the main aims of the research project. Each site is summarized regarding their main initial goals, excavation areas, and brief description of archaeological contexts, with references to all previous published preliminary reports.

Chapters 2, 3, and 4 review geomorphological formation processes from Gorham's Cave using different methods and materials. Due to inconsistent data from previous excavations, the main objectives during the initial phase of excavation were to correlate the new excavation area with Waechter's reported stratigraphy. In Chapter 2, Collcutt and Currant review the cave's lithostratigraphy in detail, while in Chapter 3, Collcutt presents the lithological and lithogenetic patterns from the cave's sedimentary formation record. Using different data sets (e.g., marine erosion and speleothem formation), geological sequence events are analyzed in order to reconstruct sedimentary filling processes in the site. Chapter 4 by Golberg and Macphail analyses sediment micromorphology from Gorham's Cave in order to build the geological history of the cave; the same methodological approach was used at Vanguard Cave (Chapter 13). Results are presented unit by unit from the top to the bottom of the sequence. The authors show that cave sedimentary formation was homogeneous and that, at the time of the earliest occupation, the cave's entrance was likely to be morphologically different.

Chapters 5 and 6 review the chronology of the site using two different dating methods—radiocarbon and OSL dating. In Chapter 5, Higham et al. present radiocarbon samples and dates from all geomorphological units. One of the main aims was to correlate the chrono-stratigraphy with Waechter's previously reported sequence, testing the correlation between new radiocarbon results and those previously obtained, and building a modeled chronology for the site. Rhodes in Chapter 6 reports OSL dating results and does an excellent effort at correlating their stratigraphic order with the radiocarbon data from the Higham et al. chapter.

Chapters 7, 8, and 9 combine paleoenvironmental data from micro and macroscopic botanic analysis and microfaunal remains. Ward et al. in Chapter 7 clarify that, at Gorham's Cave, site preservation supported the conservation of macroscopic charcoal and charred seeds, and microscopic pytholiths. Analysis of these macro and micro botanic remains was used to reconstruct Late Pleistocene vegetation at the site, environmental oscillations, and human plant ex-

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ploitation. As a result, the authors argue that between MIS 5–4 and MIS 3 few paleoenvironmental changes were identified, and such evidence of environmental stability also is supported by archaeobotanical results. At the same time, using these results, the authors found evidence of low-density human occupation at the cave, also recognizable from other reports such as lithic analysis (Chapter 12). Regarding human diet, *P. pinea* seeds were identified as major evidence for human subsistence.

In Chapter 8, Gleed-Owen and Price analyze amphibians and reptiles from Gorham Cave's sequence. Even if most remains are from the Mousterian context, the authors' efforts in sampling all the sequence in order to test diachronic paleoecological and paleoenvironmental reconstructions is noticeable. Results show evidence of species diversity similar to that found in the modern southern Iberia landscape and this is likely related to climatic stability through time. In Chapter 9, Cooper documents Late Pleistocene avifauna from Gorham's Cave. Results are discussed regarding taphonomic processes, paleoenvironment, and human paleoecology. Even being one of the most excellent avifauna assemblages from Western Eurasia, the authors note that remains are not present in all of the chrono-stratigraphic sequence, compromising a diachronic perspective.

Chapters 10 and 11 focus on data from small and large faunal remains from Gorham's Cave. In Chapter 10, Price uses small game evidence as a proxy to reconstruct environmental setting and human activity at the site. Thus, data is presented and organized by each unit, and results are discussed according to taphonomy and environmental considerations. Once more, results show significant stability throughout the cave sequence with no evidence of a cold environment, even if, as the author has highlighted, cold episodes could be responsible for erosive processes in sediment deposit. Chapter 11 is divided in two parts. The first one, by Currant and Price, reports the small and large mammal assemblage from the 1990's campaign at Gorham's Cave, and the second, by Stringer, is the publication of the Sutcliffe report on faunal analysis from Waechter's excavations in the 1950's. New data is organized by chrono-stratigraphic unit focusing on ecological and taphonomic observations, while Stringer describes old data by taxa, due to the poor information about stratigraphic provenience.

The last chapter concerning Gorham's Cave is Chapter 12 with the description of lithic assemblages by Barton and Jennings. Lithic analysis is organized by stratigraphic unit following the classical technological sub-division. Middle and Upper Paleolithic assemblages are documented, even if the richest collections are from the Mousterian horizons. Lithic industries with Early Upper Paleolithic affinities were recovered from two horizons. The small number of remains and few clear diagnostic retouched tools within each assemblage led the authors to assign those assemblages to the Gravettian and poorly characterized Initial Upper Paleolithic. Middle Paleolithic lithic assemblages were identified and recovered from 22 individual beds. No major variability was recognized between and within assemblages.

Finally Barton and Collcutt do a great job at integrating data from all reports from Gorham's Cave with special attention to three main topics: (1) stratigraphy and dates, summarizing the radiometric chronology and sedimentary processes from all of the sequence, (2) paleoenvironmental reconstruction, where climatic and environmental considerations are made based on faunal and botanic elements; and, (3) archaeological evidence, in particular from large faunal remains and lithic artifacts from two techno-cultural phases, the Middle and Upper Paleolithic.

The second part of the book, dedicated to Vanguard Cave, is organized in nine chapters. Chapter 13 by Macphail et al. reviews Vanguard Cave sediments and soil micromorphology from different sediment types (e.g., hearths) from both excavation areas. The authors do a great job combining results from depositional and post-depositional processes with geogenic, biogenic, and finally anthropogenic phenomena. Such effort reveals that sedimentary studies are essential for the interpretation of site formation and human activity, with interesting data for the latter, in terms of reuse of combustion features at the site.

Rhodes, in Chapter 14, provides the available OSL chronometric dates for the Vanguard Cave sequence in all excavation areas. With the results, the author ran a complementary statistical Bayesian model the results of which demonstrate internal chrono-stratigraphic sequence consistency.

Chapter 15 by Ward et al. discusses the archaeobontical analysis in order to test Late Pleistocene vegetation at site location. Macro (i.e., charcoal and charred seeds) and micro (i.e., phytoliths) analyses were carried out from two different contexts. Results follow those identified for Gorham's Cave, with evidence of warm climatic stability and similar human diet choices.

Faunal remains from Vanguard Cave are discussed in Chapters 16, 17, and 18. In Chapter 17, Gleed-Owen and Price review herpetofaunal data. Even if few elements were present and few species identified, the authors argue that the same range of species are present in Gorham's and Vanguard Caves. The species diversity corroborates the remarkable environmental stability already mentioned. Late Pleistocene avifauna from Vanguard Cave is reviewed in Chapter 17 by Cooper, looking for evidence of human activity, taphonomy, and the paleoenvironmental setting. Once again the author mentions the presence of species in Gorham's Cave that bear strong affinities to modern-day southern Iberian communities. Little evidence of human modification on avifaunal remains is present, even if consumption is likely.

Currant et al. in Chapter 18 describes large mammal remains, which reveal little variation throughout the stratigraphic sequence, as mentioned for Gorham's Cave.

In Chapter 19, Macphail and Golberg provide a small report about coprolite micromorphology from both caves. Data from both sites show that not only humans and birds occupied the caves, but also carnivores (e.g. wolf, hyaenas, and big cats).

Barton discusses, in Chapter 20, lithic assemblages from

Vanguard Cave, and like in Gorham's Cave, both Middle and Upper Paleolithic assemblages were recovered. Thus, the assemblage is characterized by a small number of blade fragments with no diagnostic tool-types, and led the author to assign such materials to the Early Upper Paleolithic. Middle Paleolithic assemblages show little variation over the sequence, characterized by low density of raw materials and tool diversity (also mentioned for Gorham's Cave).

In Chapter 21, taphonomy of the fossil bone assemblages from Vanguard Cave is tested by Cáceres and Fernández-Jalvo, in order to examine human activities and mammal resources exploitation. Besides the clear action of destructive taphonomic agents, evidence of human modification is identified in large (including marine specimens), medium, and small animals.

Marine resources exploitation and human seasonality from Vanguard Cave is reviewed by Douka and Higham in Chapter 22. Here the authors explore human subsistence and landscape adaptations by testing growth-ring method in shell remains. This method allows estimating the season of death of marine mollusks in order to examine the presence of patterns associated with a seasonal human exploitation.

The section dedicated to Vanguard Cave ends with a final summary, where Barton and Collcutt discuss major data from the reports on stratigraphy, dating, paleoenvironment. and archaeological materials.

The fourth section of the book consists of two chapters (23 and 24) that review the Gibraltar archaeological sites in a wider regional perspective with particular attention on paleoenvironmental data and human occupation patterns. Chapter 23 by Jennings reviews all the paleoenvironmental data from Gorham's and Vanguard Caves. Using climate modeling, the authors show that southern Iberia was characterized by warm and humid Mediterranean stable climate, used as refugium by Neanderthal populations due to global climate changes during MIS 5 and 4/3.

In Chapter 24, Barton et al. do an excellent job using all data (chronometric, environmental, subsistence, and technology) to reflect Late Pleistocene human occupation of Gorham's and Vanguard Caves. Site sequences are dated from the various sub-stages of MIS 5, from which the much better preserved layers are AMS and OSL dated from c. 45 ka cal BP. During the last decade, dating of the Gorham's youngest Middle Paleolithic deposit has been argued to be one of the earliest examples of the Middle Paleolithic from Western Eurasia (Finlayson et al. 2006). Zilhão and Petitt (2006) refute this idea, pointing to inconsistencies between the stratigraphy and archaeological contexts, and showing that it is most likely that the youngest Middle Paleolithic is dated c. 32–30 ka BP. The AMS dates presented in this volume show that the upper Middle Paleolithic layer "*in this area of the cave described here* can be no younger that 34,000–33,300 calBP" (Barton et al.: 292). Archaeobotanical analysis and herpetofaunal remains analysis show that in Gibraltar MIS 5 was characterized by a stable interglacial climate, with evidence of vegetation similar to the modern landscape, including fauna and typical Mediterranean species. Ecological richness at Gibraltar is proposed due to faunal species reported from the archaeological record, including a variety of different terrestrial and marine mammals, fish, birds, and shellfish, in a subsistence strategy that followed seasonal resource availability. In this chapter, the author also focuses on the implications of the research at these sites to the regional and global discussion, providing new approaches for future research at the sites.

Finally, the fifth section comprises the appendices with informative tables organized by chapter, with special attention to the detailed lithostratigraphy report, micromorphology samples description, dating methods, and full description of faunal remains (bird taxa) by stratigraphic unit.

In summary, I think the volume is well organized and balanced, including specific reports and broad perspective summaries for each site at the end of each respective section. The organization of each chapter within each site section is well presented, leading to a continuous presentation of the sites and their data. Paleoenvironmental data reported here corroborates the idea that climactic stability made Southern Iberia an ecological refugium for Neanderthal populations. Faunal remains and lithic technology data is similar from both sites, revealing a intensive occupation in this territory through time and of seasonal exploitation of resources. Thus, this volume represents an important framework about Neanderthal ecological behavior. However, in my opinion, it still lacks a wider discussion of the data from both sites and other Neanderthal occupations of Southern Iberia (e.g., Bajondillo, El Palomar, and Abrigo de la Quebrada). This approach might be fundamental to the knowledge of the Middle Paleolithic in this region.

The Barton et al. research project represents, at this moment, the most complete multidisciplinary report for Gibraltar Pleistocene caves, and, for this reason, this volume represents a reference of interest to a wide range of archaeologists and paleontologists from different research areas. Thus, this volume is an important contribution to a broader knowledge of one of the most important regions for the technological, cultural, and subsistence behavior of Neanderthal populations in Western Eurasia.

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