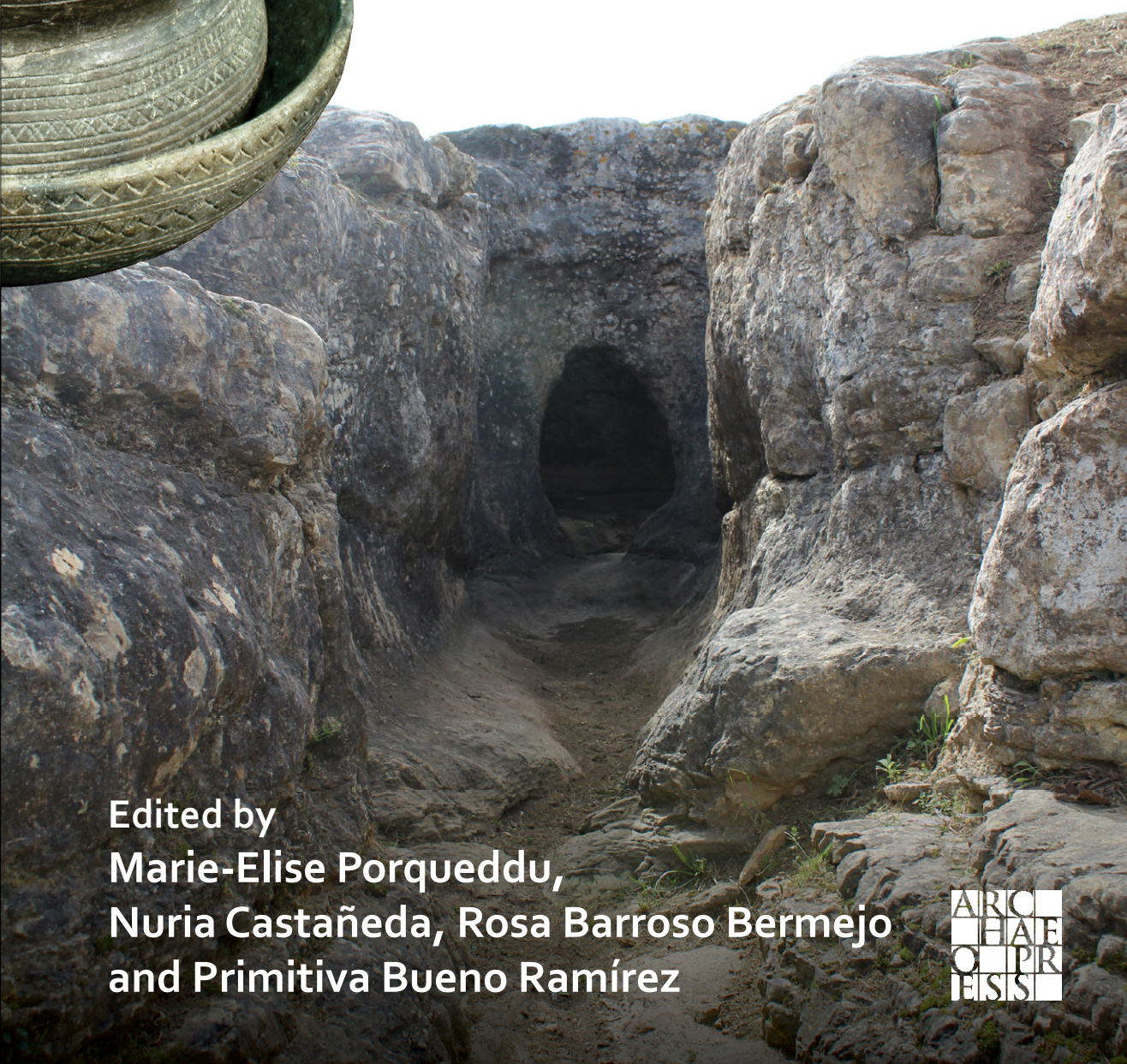




Building Death

Readings on French and Iberian Prehistoric Hypogea



Edited by
Marie-Elise Porqueddu,
Nuria Castañeda, Rosa Barroso Bermejo
and Primitiva Bueno Ramírez



Building Death

Readings on French and Iberian Prehistoric Hypogea

Edited by
Marie-Elise Porcheddu,
Nuria Castañeda, Rosa Barroso Bermejo
and Primitiva Bueno Ramírez

ARCHAEOPRESS ARCHAEOLOGY



ARCHAEOPRESS PUBLISHING LTD

13-14 Market Square

Bicester

Oxfordshire OX26 6AD

United Kingdom

www.archaeopress.com

ISBN 978-1-80583-289-8

ISBN 978-1-80583-290-4 (e-Pdf)

© the individual authors and Archaeopress 2026

Cover: Photograph of the entrance to a hypogeum in the Carenque necropolis (Amadora, Portugal). Photograph by M-E Porqueddu.
Bell-Beaker ceramics of Valle de las Higueras (Huecas, Toledo) Spain. Photograph A. Vázquez.

Funding :

The organisation of the conference was supported by the French Embassy in Spain's Call for Scientific Projects for 2023 and the University of Alcalá. The publication was made thanks to the project: Childhood in Prehistory 2022-T1/HUM-23889, funded by the Community of Madrid.



This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

This book is available direct from Archaeopress or from our website www.archaeopress.com

Contents

Contributors	ii
Introduction	1
Marie-Elise Porqueddu, Nuria Castañeda, Rosa Barroso Bermejo, Primitiva Bueno Ramírez	
The Hypogean Phenomenon in Alentejo, South Portugal (4th and 3rd Millennia BC). A Summary	6
António Carlos Valera	
The Necropolis of Valle de las Higueras, Huecas (Toledo). Cave 3 as a Case-Study for the Characterisation of the Use of Bell Beaker Hypogea in inland Iberia	26
Rosa Barroso Bermejo, Primitiva Bueno Ramírez, Rodrigo de Balbín-Behrmann	
Displaying power: burial structures in Humanejos cemetery (Parla, Madrid)	50
Rafael Garrido-Pena, Raúl Flores Fernández, Ana Mercedes Herrero-Corral, Rodrigo Paulos-Bravo	
Magdalena I: Funerary aspects in the Henares River lower valley (Madrid) during Late Prehistory	66
César Heras Martínez, Miriam Cubas Morera, Sergio Heras Bastida	
What's the relationship between hypogea and dolmens in the south of France? The example of the Fontvieille site in Provence	84
Xavier Margarit	
Final Neolithic ornaments and rock-cut tombs in south-eastern France	98
Laurine Viel	
Neolithic hypogea in the south-west of the Marne (France)	123
Rémi Martineau	
Prehistoric rock-cut tombs in the western Mediterranean: a global approach to local phenomena	141
Marie-Elise Porqueddu	
Flint Mining Know-How in the South European Neolithic	159
Nuria Castañeda	

List of Figures and Tables

Introduction

Figure 1. Distribution map of the various geographical areas with hypogea in France and throughout the Iberian Peninsula. *Design: Rosa Barroso Bermejo, Authors of this article.*2

The Hypogean Phenomenon in Alentejo, South Portugal (4th and 3rd Millennia BC).

A Summary

Figure 1. A. Location of South Portugal in Europe. B. Location of the hypogea in central and south Portugal, highlighting the ones in the Alentejo hinterland: 1-Sobreira de Cima, 2-Monte Malheiro 2, 3-Pedreira de Trigaches, 4-Barranco do Vale de Alcáida 4, 5-Vale Barrancas 1, 6-Carrascal 2, 7-Monte da Coelheira 2/3, 8-Quinta da Abóbada, 9-Estácio 6, 10-Monte da Comenda 3, 11-Cortes 2, 12-Monte da Guarita 2, 13-Outeiro Alto 2, 14-Monte do Marquês 15, 15- Pisões. C. Location of the hypogea in the Alentejo hinterland in relation to the regional megalithism. <i>Image: A. Valera.</i>	8
Table 1. Radiocarbon dates for Alentejo and Algarve hypogea (South Portugal).....	9
Figure 2. Bayesian model for chronology of the hypogea in Alentejo during the Neolithic and Chalcolithic (model of two contiguous phases, $A_{\text{model}} = 79.8$). <i>Image A. Valera.</i>	10
Figure 3. Typology for the main architectures of the Alentejo hypogea. <i>Image A. Valera.</i>	12
Figure 4. A. Deposition of amphibolite roughouts in the pit access to Hypogeum 1 at Sobreira de Cima. B. Deposition of animal phalanx and red pigments in the hypogea of Vale Barrancas 1. C. Structure with stelae in the passage to Hypogeum 5 at Sobreira de Cima. D. Plan and view of the foundation of a timber circle surrounded by hypogea in Outeiro Alto 2. E. Small stelae from Vale Barrancas 1. <i>Images by the author.</i>	14
Figure 5. A. Typical votive assemblages from Neolithic hypogea in Alentejo (Sobreira de Cima and Outeiro Alto 2). B. Introduction of pottery in Late Neolithic and Chalcolithic votive assemblages (Monte da Comenda 3 and Carrascal 2). <i>Images by the author and Era Arqueologia.</i>	16
Table 2. Number and classification by age and sex of the individuals present in Neolithic and Chalcolithic hypogea in the Alentejo hinterland.....	18
Figure 6. Bayesian model for the emergence of collective funerary practices in the Alentejo hypogea during the Neolithic, after Valera 2020b (model of two overlapping phases, $A_{\text{model}} = 88.6$).....	19
Figure 7. A. Primary depositions: 1. Barranco do Vale de Alcáida 4, 2. Quinta da Abóbada, 3. Carrascal 2. B. Monte da Guarita 2: 4. Phase of primary depositions, 5. Phase of secondary depositions. <i>Images by the author and Era Arqueologia.</i>	20

The Necropolis of Valle de las Higueras, Huecas (Toledo). Cave 3 as a Case-Study for the Characterisation of the Use of Bell Beaker Hypogea in inland Iberia

Figure 1. Position of the necropolis of Valle de las Higueras in the Iberian Peninsula, aerial view of the plateau where it is located and topography showing the location of the artificial caves (in red flint-mining). Photos of seven of the funerary caves with their structure numbers. <i>Photographs: authors.</i>	27
Figure 2. Distribution map of the main sites mentioned in the text. <i>Authors of the article.</i>	28
Figure 3. Plans of the hypogea in the Middle Tagus Valley. Photographs of the closures of structures: a) Closure of the hypogeum in the funerary area 1 at Camino de las Yeseras (from Liesau <i>et al.</i> 2020a: Fig. 7); b) Closure of Cave 5 at Valle de las Higueras (from Bueno <i>et al.</i> 2023); c) Closure wall of the LM461 hypogeum at Las Mayores (Barroso <i>et al.</i> 2015b).	30
Figure 4. Valle de las Higueras. a) Front of cave Cave 10 and its angled construction in the access; b) Top view of the external construction of Cave 10. <i>Photographs: authors.</i>	32

Figure 5. a) Building remains of Cave 3 and their spatial distribution; b) Photograph of the stone and mud closure remains of the central chamber; c) Section of the central chamber and Niche 3c; d) Recreation of the spaces of Cave 3. <i>Authors of the article.</i>	33
Figure 6. Excavation of the central chamber of Cave 3 with the location of the variscite finds. <i>Photograph and drawing: authors.</i>	34
Figure 7. View of Antechamber 3b during the excavation. <i>Photograph: authors.</i>	36
Figure 8. Distribution of individuals and associated grave goods Cave 3 at Valle de las Higueras. <i>Drawings and design: authors.</i>	38
Figure 9. Volumes in litres of the plain vessels from both chambers in the Cave 3. a) Plain and decorated bowls from the Niche 3b; b) Globular vessel and plate from the central chamber. <i>Authors of the article.</i>	39
Figure 10. Grave goods from the niches and chambers of Cave 3. <i>Photographs: authors.</i>	40
Figure 11. Calibration of dates from Cave 3 (OxCal v 4.4). <i>Authors.</i>	44

Displaying power: burial structures in Humanejos cemetery (Parla, Madrid)

Figure 1. Location of the site of Humanejos in Parla (Madrid) and distribution of the structures. <i>Authors of the article.</i>	51
Figure 2. Map showing the spatial distribution of the burial structures at Humanejos (Parla, Madrid) in relation to their chronology. <i>Authors of the article.</i>	52
Figure 3. Bell Beaker Grave 1 at Humanejos (Parla, Madrid). <i>Authors of the article.</i>	53
Figure 4. Bell Beaker Grave 5 at Humanejos (Parla, Madrid). <i>Authors of the article.</i>	54
Figure 5. Bell Beaker Grave 7 at Humanejos (Parla, Madrid). <i>Authors of the article.</i>	55
Figure 6. Bell Beaker Grave 9 at Humanejos (Parla, Madrid). <i>Authors of the article.</i>	58
Figure 7. Bronze Age Grave 31 at Humanejos (Parla, Madrid): a) disarticulated bones from the upper part of the body, b) lower part of the skeleton in anatomical connection, c) rib cage in anatomical connection and vertical position. <i>Authors of the article.</i>	60

Magdalena I: Funerary aspects in the Henares River lower valley (Madrid) during Late Prehistory

Figure 1. Location of La Magdalena site in its regional, national and European context.	67
Figure 2. The false hypogeum UT 4600. Left: the primary burial in the false hypogeum with alterations due to the retrieval of both skulls during the ossification phase, individuals 4598 and 4599; two women, an adult and mature adult. Right: two graphical representations of its two levels: in the upper corner the primary burial represented previously and in the lower corner a secondary burial of an adult female. A layer between the two levels acts like a seal.	70
Figure 3. The only single burial at the site, excavated shelter 4463. Below: a general view of the burial of a young adult female. Above left: the Chalcolithic-Bell Beaker bowl next to her head. Above right: a detail of the grave goods close to her arm, two <i>Sus scrofa</i> teeth and a copper awl.	72
Figure 4. Analyses performed on the samples from the Bell Beaker tombs. Above left: radiocarbon dating (Beta Analytic) of the young adult female in the single burial UT 4463. Left: the dating of one of the adult females from the main burial in the false hypogeum UT 4600. Below: a representation of the three remains from the site that were sent for genetic analysis (Olalde <i>et al.</i> 2018). The upper point represents an individual with clear steppe ancestry, the one in the lower part shows Iberian ancestry while the one in the middle reflects a mixture of both.	76
Figure 5. Grave goods recovered from the Bell-Beaker tombs. UT 4081 contained two beakers and a pot, a Palmela-style point and a quartzite pestle. UT 4463 contained a pot, two hemimandibles of a <i>Sus scrofa</i> with both its tusks, the copper awl and two ivory buttons, one V-shaped and other straight. UT 4600 yielded a large container and vase.	78
Figure 6. Ciempozuelos-style vessels, some of a rather poor quality, corresponding to vases and bowls, found in tomb UT 5001 and votive deposits 5205 and 5237.	79

What's the relationship between hypogea and dolmens in the south of France? The example of the Fontvieille site in Provence

Figure 1. Aerial view of the La Source hypogaeum in Fontvieille. <i>Image: Ministry of Culture, DRAC SRA, Hussy 1993.</i>	85
Figure 2. Map showing the location of the megalithic monuments in Fontvieille. <i>Image: X. Margarit 2024, IGN background.</i>	86
Figure 3. The Coutignargues dolmen. <i>Image: Ministry of Culture, DRAC SRA, Rouquette 1975.</i>	87
Figure 4. Plans and sections of the megalithic monuments in Fontvieille (Provence, France) <i>Hypogea: Ministry of Culture DRAC-SRA; Coutignargues dolmen: based on Sauzade 1976.</i>	90
Figure 5. A: Frontal elevation view of the headstone and dry-stone side walls of the Coutignargues dolmen in Fontvieille (Sauzade 1976), showing the deep pit dug to create the chamber. B: Attempt to superimpose the trapezoidal elevation profiles of the chamber of the Bounias hypogaeum, La Source and the Coutignargues dolmen (X. Margarit).	91
Figure 6. Extract from the 3D lasergrammetric model of the Bounias hypogaeum in Fontvieille. In the foreground, the remaining rubble stones of the original dry stone corridor elevation can be seen. By revealing its volume, the overall 3D model of the hypogaeum provides a better understanding of the morphological analogy between the Fontvieille hypogea and dolmens. <i>Image: X. Margarit and P. Barbuti 2025.</i>	93
Figure 7. View of two stones inserted between the top of the chamber wall and the base of the capstone in the Bounias hypogaeum X. <i>Image: X. Margarit 2016.</i>	94

Final Neolithic ornaments and rock-cut tombs in south-eastern France

Figure 1. Distribution map of the Arles-Fontvieille necropolis and the hypogea of the Drôme-Vaucluse group. <i>Design: M. É. Porqueddu.</i>	99
Table 1. Description of the different types of combinations in the composite ornaments.	101
Figure 2. Diagram of different ornament compositions. The order is hypothetical for monotype two-colour sets and two-shape two-colour sets. <i>Design: L. Viel.</i>	102
Figure 3. Photographs of different ornament elements from Layer 5 in Les Crottes hypogaeum. <i>Image: L. Viel.</i>	104
Table 2. Number and percentage of the ornamental elements in the different levels and concentrations	105
Figure 4. Distribution map of ornamental elements from Level 5-a-inf. <i>Design: L. Viel, A. Caraglio and B. Bizot.</i>	106
Figure 5. Distribution map and photographs of ornamental elements from Level 5-a-sup. <i>Design: L. Viel, A. Caraglio and B. Bizot.</i>	107
Figure 6. Distribution map and photographs of ornamental elements from Level 5-b. <i>Design: L. Viel, A. Caraglio and B. Bizot. Photograph: J. Courtin.</i>	109
Figure 7. Distribution map of ornamental elements from Level 5-c. <i>Design: L. Viel, A. Caraglio and B. Bizot.</i>	110
Table 3. Numbers and percentage of the different form-raw material combinations according to site	113
Table 4. Different types of ornament depending on the site	118

Neolithic hypogea in the south-west of the Marne (France)

Figure 1. Distribution map of hypogea of the Marne. CAO: L. Pillot and M. Imbeaux.	125
Figure 2. Distribution map of the sites of the <i>Néolithique récent</i> . CAO: M. Imbeaux. : 1. Bannay « Le Reclus », 2. Oyes « La Crayère/Le Gros Chêne », 3. Oyes « Au-Dessus du Moulin/La Butte du Moulin », 4. Oyes « Le Village », 5. Villevenard « La Craière », 6. Villevenard « Les Vignes Jaunes », 7. Villevenard « Les Ronces », 8. Villevenard « Le Chenail », 9. Villevenard « Tout y Brûle », 10. Villevenard « La Pente du Moulin », 11. Villevenard « Le Moulin Brûlé », 12. Villevenard « Les Houyottes/Le Trou Blériot/Le Trou de Renard », 13. Villevenard « Le Tas de Noyers », 14. Courjeonnet « Les Vignes Jaunes », 15. Villevenard « La Pierre Michelot », 16. Courjeonnet « Les Vignes Jaunes/Les Jaudelles », 17. Congy « Les Châtaigniers », 18. Congy « Les Hayettes », 19. Congy « Les Cornabeaux », 20. Congy « La Garenne », 21. Coizard « Lessard », 22. Coizard « Le Razet », 23. Vert-Toulon (Vert-la-Gravelle) « Les Marnières », 24. Vert-Toulon (Vert-la-Gravelle) « La Crayère », 25.	

Vert-Toulon (Vert-la-Gravelle) « Le Bois de la Gravelle », 26. Étoges « Le Four à Chaux », 27. Loisy-en-Brie « 56 Grande Rue », 28. Loisy-en-Brie « Les Gouttes d'Or », 29. Étrechy « Beau Regard », 30. Vertus « Grandval », 31. Le Mesnil-sur-Oger « Les Mournouards » II (3), 32. Avize « Les Dimaines », 33. Grauves « Les Poussements », 34. Chouilly « Les Ronds Buissons », 35. Chouilly « La Grifaine », 36. Plivot « Les Grandes Naux/La Grande Noue », 37. Val-des-Marais (Coligny) « Le Mont-Aimé » II, 38. Val-des-Marais (Aulnay-aux-Planches) « La Plaque », 39. Val-des-Marais (Morains-le-Petit) « Les Vordes », 40. Val-des-Marais (Morains-le-Petit) « Le Pré à Vaches », 41. Val-des-Marais (Morains-le-Petit) « Le Pré à Vaches », 42. Val-des-Marais (Aulnay-aux-Planches) « Au-Dessus du Chemin des Bretons », 43. Bannes « Le Village », 44. Broussy-le-Grand « L'Ourlet ».	126
Figure 3. The square funerary chamber of hypogeum 4 at Vert-Toulon (Vert-la-Gravelle) 'La Crayère' (Marne). <i>Photo: R. Martineau.</i>	129
Figure 4. Inside the funerary chamber of Coizard « Le Razet » 23 (Marne), view of the entrance with on either side the bas-relief sculptures of axes and deer antler axe sheaths with transverse handles. <i>Photo: R. Martineau.</i>	130
Figure 5. The burial chamber of Loisy-en-Brie 'Les Gouttes d'Or' after removal of the vault. 170 individuals were buried in this hypogeum. <i>Photo: B. Chertier et al. 1994).</i>	133
Figure 6. Tree geographical groups of hypogea based on architectural differences. <i>DAO: L. Pillot and R. Martineau.</i>	134

Prehistoric rock-cut tombs in the western Mediterranean: a global approach to local phenomena

Figure 1: Distribution map of the sites mentioned in the article. 1. Cerro de las Aguilillas (Ardales/Campillos, Málaga, Spain); 2. Cuesta de la Reina (Ciempozuelos, Madrid, Spain); 3. Camino de las Yeseras (San Fernando de Henares, Madrid, Spain); 4. Arles-Fontvieille (Fontvieille, Bouches-du-Rhône, France); 5. S'Elighe Entosu (Usini, Sardinia, Italy); 6. Cucurru S'Arriu (Cabras, Sardinia, Italy); 7. Cala Colombo and Cala Scizzo (Torre a Mare, Bari, Italy); 8. Calaforno (Giarratana, Sicily, Italy); 9. Hal Saflieni (Paola, Malta). <i>Design: M.E Porqueddu. Source map: https://www.arcgis.com/</i>	142
Figure 2: Entrance to the Castelet hypogeum in the Arles-Fontvieille necropolis (France). <i>Photograph: M. Orgeval.</i>	147
Figure 3: Two mallets from the Castelet hypogeum in the Arles-Fontvieille necropolis (France). The notches and grooves used to fit the tools are highlighted. <i>Photography and design: M.E. Porqueddu.</i>	149
Figure 4: Tool marks on the walls of a hypogeum in the Sas Concas necropolis (Sardinia, Italy). Marks of different shapes and sizes can be seen between the wall and the ground. <i>Photograph: M.E. Porqueddu.</i>	150
Figure 5: Testing an experimental limestone tool by direct percussion against a rock surface during the experimental protocol implemented for the study of the S'Elighe Entosu necropolis (Sardinia, Italy). <i>Photograph. M.E. Porqueddu.</i>	151

Flint Mining Know-How in the South European Neolithic

Figure 1: Spread of Neolithic flint mining and location of the sites mentioned in the text. <i>Drawing: N. Castañeda.</i>	162
Figure 2: Defensola A: Plan of the mine (drawing after Galiberti and Tarantini 2023).	163
Figure 3: Casa Montero: a) Plan of the mine (Casa Montero Project); b) cross section of one of the shafts (Casa Montero Project); c) opaline core showing poor level of knapping skill. <i>Photograph: N. Castañeda.</i>	167

Contributors

António Carlos Neves de Valera has a degree in History and in Archaeology, and a master's and PhD in Archaeology (Universities of Lisbon and Porto). He has carried out research since 1988 on the Neolithic and Chalcolithic in Central and South Portugal, focusing on enclosures and funerary practices. He coordinates the Global Archaeological Research Program at the Perdigões complex of ditched enclosures and integrates the research unit of Era Arqueologia Company and the ICAREHB research centre of Algarve University. He is the author of a vast list of publications and has been engaged with several editorial projects in Archaeology. **e-mail:** antoniovalera@era-arqueologia.pt; **ORCID:** 0000-0001-5492-3810

Rosa Barroso Bermejo is a Lecturer in prehistory in the History and Philosophy Department at the University of Alcalá, Spain. Her archaeological research focuses on the study of the funerary prehistory of inland Iberia during the fourth and second millennia BC with a special interest on the transition from the Chalcolithic to the Bronze Age. She has taken part in numerous projects in the National Plan studying the territories of megalith builders and post-Palaeolithic graphic symbols. **e-mail:** rosa.barroso@uah.es; **ORCID:** 0000-0003-3129-4497.

Primitiva Bueno Ramírez is a Professor of prehistory in the History and Philosophy Department at the University of Alcalá, Spain. She is an archaeologist specialising in Late Prehistory, with a long-standing research focus on Megalithism and Megalithic Art. The initial documentation of hypogean structures in the interior of the Iberian Peninsula, Valle de las Higueras, was achieved through her work. The first results opened new perspectives on traditional interpretations of Bell Beaker burials and the knowledge of artificial caves in the Tagus Valley. Her significant fieldwork in Spain, Portugal, Switzerland, and France should also be noted. She has worked on graphic symbols at such well-known sites as the French monument of Barnenez, Petit Chasseur in Sion or the Spanish megaliths of the Dolmens de Soto and Menga. **e-mail:** p.bueno@uah.es; **ORCID:** 0000-0001-8958-8928.

Rodrigo de Balbín Behrmann is an Emeritus Professor of prehistory at the University of Alcalá, Spain. He is a specialist in prehistoric art with extensive experience in the study of African and Iberian sites. It is worth highlighting his work documenting paintings and engravings in caves such as Tito Bustillo, La Pasiega, Los Casares and La Hoz, as well as his contributions to the current understanding of open-air Palaeolithic art. He is also a recognized specialist in post-Palaeolithic art, particularly in megalithic monuments. **e-mail:** babubera@movistar.es; **ORCID:** 0000-0002-5868-1107.

Rafael Garrido-Pena is an Associate Professor in the Department of Prehistory and Archaeology at the Universidad Autónoma de Madrid and leader of the project "Life and Death in Humanejos: archaeometry of an exceptional settlement and cemetery of the 3rd and 2nd millennia BC in the interior of Iberia" financed by the Spanish Ministry of Science (2020-2024). A prehistoric archaeologist, his research focuses on Neolithic and Chalcolithic societies, the processes of social change and how they are manifested in the domestic and funerary spheres, especially in the Iberian Peninsula. After gaining his PhD at the Complutense University (Madrid) in 1999, he was a post-doc researcher at the University of Valladolid (Spain). There

he conducted several research projects and excavations at Early Neolithic settlements in the Pyrenees and the Chafarinas Islands (North Africa) and also in megalithic graves, and Bell Beaker and Bronze Age sites in the interior of Iberia (Soria, Burgos). **e-mail:** rafael.garrido@uam.es; **ORCID:** 0000-0001-8263-2949

Raúl Flores Fernández finished his degree in History (Prehistory) in the Complutense University (Madrid). He has worked for over 30 years in commercial archaeology for both public institutions and private companies and has been a member of several national and international research teams working in the Soria Province in Spain but also outside Iberia in Africa (Sudan). He has collaborated in different projects with many universities and research centres (Universidad de Valladolid, CENIEH in Burgos). He was the director of the excavations at Humanejos and co-director of the research project at this site. **e-mail:** raulfloresfernandez@gmail.com; **ORCID:** 0000-0003-3384-2055

Ana Mercedes Herrero-Corral is a prehistoric archaeologist and physical anthropologist specialising in children's bone remains. Her main research focuses on the study of childhood in the past to understand the social role that children would have played in the processes of social hierarchization during the 3rd and 2nd millennia BCE. Since 2017 she has been part of the Humanejos research project. In parallel, since 2020 she has been actively involved in a supplementary research line on gender differences and sex-gender systems during the 3rd millennium BCE in Iberia. Since February 2023 she has been a Marie-Curie Postdoctoral fellow in the Prehistoric Identities Team at the Prehistory and WANA Archaeology department of the Austrian Archaeological Institute (Vienna) with her project "SKIN: social kinship and cooperative care" which aims to explore biological and non-biological kinship relationships between children and adults buried together in multiple graves during recent prehistory in Iberia. **e-mail:** anamercedes.herrerocorral@oeaw.ac.at; **ORCID:** 0000-0003-3536-1108

Rodrigo Paulos-Bravo is a PhD candidate in Prehistory in the Complutense University (Madrid). After completing his Master's degree in Prehistoric Archaeology he worked as a professional archaeologist, both in-company and freelance. He is currently a predoctoral researcher at the Complutense University with his thesis: "Bell Beakers of the Ciempozuelos style in Iberia: analysis of their economic, social and symbolic context". He is also working on a Computer Vision and Deep Learning research line applied to the study of prehistoric ceramic decoration and on the excavation of two Recent Prehistory sites in the south of Lugo (Galicia, Spain): A Muradella, a megalith from the early 3rd millennium BC and Vilarello, a walled Bronze Age/Iron Age settlement. He is also member of the research team in the project: "Life and Death in Humanejos". **e-mail:** rpaulos@ucm.es; **ORCID:** 0000-0002-4323-3379

César Heras Martínez: Doctorate in Anthropology, Archaeology, and History (1990), his research is closely tied to anthropological archaeology, funerary and forensic studies, and ceramics, having received various pre- and post-doctoral research grants and scholarships. He has combined his work along the coastal strip between southern Colombia and northern Peru with diverse projects in Spain (La Rioja, Castilla-La Mancha, Castilla y León, and primarily Madrid). Professionally, since 1997, he has combined over 200 excavations with the study of diverse archaeological and anthropological sites spanning from Ancient Prehistory to the Contemporary Age, including industrial archaeology and forensic archaeoanthropology. He has collaborated with the Interuniversity master's degree in Physical Anthropology:

Human Evolution and Biodiversity (UAM-UCM-UAH); the University Master's Degree in Police Sciences (IUICP-UAH); and the University master's degree in Forensic Dentistry (UAX). Currently, he holds the position of Associate Professor in undergraduate and master's degrees in Archaeology, History, and Science of Religions (UCM). **e-mail:** cesheras@ucm.es; **ORCID:** 0000-0002-2070-967X

Miriam Cubas Morera: A science-based archaeologist, her research interest focuses on material culture of prehistoric societies in Europe, especially related to the origin and spread of the earliest pottery. Her research experience is highly interdisciplinary and combines archaeological fieldwork and traditional artefact analysis (typology and technology) with Archaeological Science (organic residue analysis). She uses a broad range of analytical techniques to study past human-environment interactions, including subsistence strategies and technological innovations. Her expertise involves molecular and inorganic analysis of prehistoric pottery, and she is also experienced in morphological and technological analysis of pottery assemblages, contextual information, radiocarbon dating and statistical analysis. **e-mail:** miriam.cubas@uah.es; **ORCID:** 0000-0002-2386-8473

Sergio Heras Bastida: Archaeologist (UCM, 2020) with master's degrees in GIS (UAH, research specialization) and Archaeological Research (UCM). EUR ArChal fellow (CNRS-Sorbonne, 2023-2025). His work examines the sourcing and characterization of prehistoric lithic raw materials, combining material identification with spatial analyses of procurement zones and group territoriality. He collaborates with national projects, including teams at Torralba and Ambrona and the Multidisciplinary Project for the Study and Location of Tracer Flint in the Northern Peninsula, and participates in broader inter-institutional research networks. International fieldwork includes Melka Kunture (Ethiopia, since 2020) and Thiongo Korongo, Olduvai Gorge (Tanzania, since 2022). A professional archaeologist since 2020, he specialises in digitization, heritage databases, and field operations, and has managed over ten archaeological interventions across varied chronologies. **e-mail:** serghera@ucm.es; **ORCID:** 0000-0002-2929-1273

Xavier Margarit is Chief Curator at the Ministry of Culture, responsible for the National Centre for Prehistory in Périgueux (CNP, France). He was associate director of LAMPEA, the Mediterranean Laboratory for Prehistory, Europe and Africa in Aix-en-Provence from 2018 to 2024 (Aix-Marseille University, CNRS, Ministry of Culture). A specialist in the Neolithic period in southern France, he works on the architecture of late Neolithic dwellings and has also led a research programme on the megalithic burial site at Arles-Fontvieille. **e-mail:** xavier.margarit@culture.gouv.fr; **ORCID:** 0000-0003-3361-9806

Laurine Viel: A doctor in Archaeology since 2021, Laurine Viel is a specialist in late Neolithic ornamental elements in the south of France. She proposes to examine the relationships between material cultures, social dynamics and identities through a new approach. This investigation is carried out through the study of ornamental objects used by late Neolithic populations, particularly in their most personal aspects as described by the archaeology of funerary deposits. After teaching at Aix-Marseille University, she is now in charge of collections and documentation at the museum La Cité de la Préhistoire - Aven d'Ornac Grand Site de France. **e-mail:** laurineviel@outlook.fr; **ORCID:** 0000-0001-7296-5192

Rémi Martineau is a National Centre of Scientific Research (CNRS) Research Fellow at the ARTEHIS Joint Research Unit for Archaeology, Earth, History and Societies (CNRS, University of Burgundy, Ministry of Culture, French national Institute for Preventive Archaeological Research, Inrap). A Neolithic specialist and ceramologist, he specialises in the study of Neolithic ceramic raw materials, techniques and typologies. His work focuses mainly on Neolithic societies and on the spatial and chrono-cultural dynamics of the Late and Final Neolithic in the northern half of France (Champagne-Ardenne, Paris Basin, Touraine, Burgundy, Franche-Comté). This research is conducted as part of interdisciplinary collective programmes. Since 2010, he has been coordinating a research program on Neolithic occupations in the Saint-Gond Marshes region (Marne), supported by the Ministry of Culture, the French National Research Agency (ANR), the CNRS and the Universities of Burgundy and Franche-Comté. He is editor-in-chief of the *Revue Archéologique de l'Est* (RAE). **e-mail:** remi.martineau@u-bourgogne.fr; **ORCID:** 0000-0002-6087-5787

Marie-Élise Porqueddu is a doctor in Prehistory whose research focuses on the know-how and techniques involved in processing rocks and the underground world. With a particular interest in rock-cut tombs, architectures carved by human populations from the Neolithic period onwards, she is developing a technical approach to the *chaîne opératoire* involved in carving out and building these structures. The aim of her research is to analyse this fundamental stage in the 'biography' of these underground structures, namely their excavation and construction, a stage in which knowledge of both the technical and chronological aspects and the socio-cultural phenomena that accompany this practice is lacking. She was a member of the Casa de Velázquez (École des hautes études hispaniques et ibériques) in Spain between 2022 and 2024. **e-mail:** marie-elise.porqueddu@culture.gouv.fr; **ORCID:** 0000-0002-2086-3853

Nuria Castañeda is a doctor in Prehistory, Archaeology, and Heritage. Her research focuses on prehistoric childhood, through the analysis of flint-knapping learning processes. She specialises in identifying knowledge transmission between generations by studying technical errors and skill levels in lithic production. A key part of her work is the application of this methodology to Neolithic flint mining, examining whether mineral extraction and initial workshop knapping were activities that involved the participation and training of younger community members. She is currently a researcher under the Research Talent Attraction programme in the Department of Prehistory and Archaeology at the Universidad Autónoma de Madrid. **e-mail:** nuria.castanneda@uam.es; **ORCID:** 0000-0001-6563-5750

Introduction

Marie-Elise Porqueddu

Service Régional de l'Archéologie, DRAC Hauts-de-France, France

Nuria Castañeda

Universidad Autónoma de Madrid, Spain

Rosa Barroso Bermejo

Universidad de Alcalá, Spain

Primitiva Bueno Ramírez

Universidad de Alcalá, Spain

In the Mediterranean, the Neolithic period was a time of major cultural, societal and economic changes for human societies. These changes led to new burial practices, such as the advent of megalithic constructions and the adoption of collective burials. Megaliths were not the only funerary structures to appear during the Neolithic period. Dating back to the 4th millennium BC in the Iberian Peninsula and France, hypogea were underground tombs in which communities were able to express their funerary practices and skills. The coexistence of megalithic and hypogean architecture demonstrates refined mastery in the construction systems used for collective burial containers (Guilaine 1994, 2015; Le Roy and Recchia-Quiniou 2021).

Hypogea are entirely or partially carved out of rock by human groups and can be isolated or grouped together in necropolises. These structures also cover a wide variety of architectural forms and practices. Their study can offer many insights into funerary customs and help us understand the challenges and strategies of human populations in terms of territorial organisation and raw material supply.

Unlike megalithism, few studies focus on interregional relations and a more comprehensive approach to prehistoric hypogea. Various initiatives in the western Mediterranean, most often in the form of national and international conferences, have offered researchers the opportunity to meet and discuss the subject. This was notably the case of the symposium *L'Ipogeismo nel Mediterraneo: origini, sviluppo, quadri culturali* held in Sardinia in 1994 (Melis 2000), and more recently, in 2020, the symposium *Ipogei La vita, la morte, i culti nei mondi sotterranei* (Negroni Catacchio *et al.* 2022), also held in Italy. Although these events bring researchers together, they very rarely include recent interregional and international comparative analyses and remain closely focused on the Italian Peninsula. Naturally, this is correlated with the long history of research on hypogea and rock-cut tombs in Italy.

The conference *Façonner la mort: rencontres franco-ibériques autour des hypogées préhistoriques / Construyendo la muerte: encuentros ibero-franceses sobre los hipogeos prehistóricos* was part of a

broader effort to promote international encounters and collaborations. Before it, no meetings had been organised between French researchers and researchers from the Iberian Peninsula on this topic. Made possible by partnerships and support from several French and Spanish institutions: Universidad de Alcalá, Universidad Autónoma de Madrid, Casa de Velázquez - EHEI, Ambassade de France en Espagne, Comunidad de Madrid, it was held on 23 November 2023 in Alcalá de Henares, Spain.

This unprecedented encounter had several aims, the first of which was to compare different geographical areas. Some of these areas have long been known for this type of funerary architecture such as France (Arnal *et al.* 1953; Bailloud and Brezillon 1968; Leroi-Gourhan *et al.* 1962), and the Lisbon and Setúbal peninsulas and Algarve littoral platform in Portugal (Cartailhac 1886; Leisner *et al.* 1964, 1969; Saque Delicado 2017). In other contexts, the presence of hypogea is only a recent discovery. The interior of the Iberian Peninsula is a prime example here (Bueno Ramírez *et al.* 2005). New data on rock-cut tombs in the south-west of the Iberian



Figure 1. Distribution map of the various geographical areas with hypogea in France and throughout the Iberian Peninsula. Design: Rosa Barroso Bermejo, Authors of this article.

Peninsula also provides a new perspective on these sites (Valera and Filipe 2012) (Figure 1). These different backgrounds and accounts of discoveries shape each region's history of research and study practices in relation to these sites. A conference bringing together French, Portuguese and Spanish researchers offers a unique opportunity to examine these hypogea and share experiences.

This book contains contributions from several participants at that event. The selection of chapters seeks to provide an overview of the latest geographical, chronological and construction developments in hypogean structures in Iberia and France. Above all, it aims to present a picture with more similarities than traditionally accepted, while also revealing the remarkable character of some of these complexes.

New developments in the south of Portugal are discussed by António Carlos Valera in his contribution on the Alentejo region. It is only in the last two decades that rock-cut tombs have been documented in this region thanks to rescue archaeology. His chapter provides a comprehensive overview of the hypogea in this area, discussing their various characteristics, spatial distribution and chronology.

Three contributions are from burial sites in the interior of the Iberian Peninsula. Valle de las Higueras was the first necropolis identified on the interior Plateau at the end of the last century and the only one so far studied in the region within the framework of a research project. Its topography, chronology, number of burials as well as the kind of constructions, with chambers excavated in the rock and external features such as typically megalithic corridors or tumular reinforcements, make it a peculiar necropolis. The case of Cave 3, the most complex one, is presented in detail for the first time, comparing it with other regional contexts, in the work by Rosa Barroso Bermejo, Primitiva Bueno Ramírez, and Rodrigo de Balbín-Behrmann.

The increasing number of these necropolises in inland Iberia, with collective architecture that had a very powerful phase with Bell Beaker deposits, brings Mediterranean and Iberian chronologies closer together, suggesting a longer interpretation of collective rituals in one of the most emblematic areas of the Iberian Bell Beaker culture.

In recent years, new necropolises have been identified in the interior of the Iberian Peninsula within open settlements excavated by preventive archaeology. Humanejos is undoubtedly one of the best-preserved sites, presented in this volume by Rafael Garrido-Pena, Raúl Flores Fernández, Ana Mercedes Herrero-Corral, and Rodrigo Paulos-Bravo. The extensive chronology of the site, spanning from the Late Neolithic to the Bronze Age, enables the observation of changes in funerary practices. In contrast to simple pit graves, hypogea appeared during the Bell Beaker period, displaying complex and diverse constructions. The authors focus more specifically on these tombs, whose select group of individuals, associated with significant grave goods, reflect incipient social hierarchization within the settlement.

The third study, by César Heras Martínez, Miriam Cubas Morera and Sergio Heras Bastida, describes the results obtained at a context of notable interest, La Magdalena. The site once again comprises both individual and collective burials within a variety of tombs opened in the ground, as well as providing valuable chronological and DNA reports on the buried individuals.

Three articles are dedicated to French sites and specific areas. Rémi Martineau's contribution discusses the largest known group of hypogea in France, located in the south-west of the Marne department (north-east France). This exceptional cluster, which includes at least 166 hypogea spread across 44 necropolises, has been known and documented since the early 19th century. Rémi Martineau offers new insights into these hypogea, some of which feature painted and sculpted elements. Their symbolism – menhir statues and axes engraved in relief on the walls – is shared with the megalithic gallery necropolises in the Marne. This reflects complex mortuary practices and territorial organisation over time, with megaliths and hypogea coexisting in the same area, although the former were used over a long period of time and the latter for a shorter period.

The south of France is also widely known for its rock-cut tombs. At Fontvieille, in the Bouches-du-Rhône department, there is a quite unique necropolis with outstanding architectural features. The monuments at Fontvieille are remarkable, measuring up to 40 metres in length, and most importantly feature a cavity carved into the rock, crowned by megalithic slabs and a cairn. Xavier Margarit's contribution explores these structures as well as the relationship between hypogea and dolmens in southern France.

Finally, Laurine Viel takes an in-depth approach to the hypogea in southern France through the artefacts they contain, particularly ornaments. Her analysis focuses on the Drôme-Vaucluse hypogea group. The ornaments from three sites are compared: Layer 5 in the Crottes hypogeum, Layer 2 in the Capitaine hypogeum and the Boileau hypogeum.

This volume also includes two chapters that do not focus exclusively on France, Portugal and Spain, but offer reflections and perspectives on the wider Mediterranean context. Marie-Élise Porqueddu's work concentrates on the possibilities of a more comprehensive study of rock-cut tombs, going beyond traditional typological and chronological analyses. Addressing the difficulties of studying such a vast area, due to the great variability of hypogea in it, she proposes to establish other criteria, focusing more specifically on the techniques involved in the creation of these underground structures and their *chaînes opératoires*.

This common thread running through the techniques discussed by various authors in this book leads us to consider other underground man-made structures with which parallels can be drawn. Consideration of the know-how associated with flint extraction in the Mediterranean is thus provided by Nuria Castañeda. By examining the oldest flint mines in Europe, dating back to the 6th millennium BC, she offers a detailed review of the techniques and architecture employed, while also discussing how those techniques were passed down.

Bibliography

- Arnal, J., J. Latour and R. Riquet 1953. Les hypogées et stations néolithiques de la région d'Arles-en-Provence. *Études Roussillonnaises* III(1): 28-69.
- Bailloud, G. and M. Brezillon 1968. L'hypogée de l'Homme-Mort à Tinquex (Marne). *Bulletin de la Société préhistorique française* 65(2): 477-504.
- Bueno Ramírez, P., R. Barroso Bermejo and R. Balbín Behrmann 2005. Ritual campaniforme, ritual colectivo: la necrópolis de cuevas artificiales del Valle de las Higueras, Huecas, Toledo. *Trabajos de Prehistoria* 62(2): 67-90.

- Cartailhac, E. 1886. *Les âges préhistoriques de l'Espagne et du Portugal*. Paris.
- Guilaine, J. 1994. *La Mer Partagée. La Méditerranée avant l'écriture 7000-2000 avant Jésus-Christ*. Paris: Hachette.
- Guilaine, J. 2015. *Les hypogées protohistoriques de la Méditerranée*. Arles et Fontvieille. Arles: Éditions Errance.
- Leisner, V., A. Paço and L. Ribeiro 1964. *Grutas artificiais de Sao Pedro do Estoril*. Lisboa: Memórias dos Serviços Geológicos de Portugal.
- Leisner, V., G. Zbyskiwski and O. da V. Ferreira 1969. *Los monuments prehistoriques de Praia das Maças e Casainhos*. Lisboa: Serviços Geológicos de Portugal.
- Leroi-Gourhan, A., G. Bailloud, M. Brezillon and C. Monmignaut 1962. L'hypogée II des Mournouards (Mesnil-sur-Oger, Marne). *Gallia préhistoire* 5(1): 23-133.
- Le Roy, M. and J. Recchia-Quiniou (eds). 2021. *Grottes et dolmens*. Préhistoires Méditerranéennes 9(2).
- Melis, M.G. (ed.). 2000. *L'ipogeismo nel Mediterraneo: origini, sviluppo, quadri culturali: atti del congresso internazionale Sassari-Oristano, 23-28 maggio 1994*. Sassari: Università degli Studi - Facoltà di Lettere e Filosofia.
- Negroni Catacchio, N., C. Metta, V. Gallo and M. Aspesi 2022. *Ipogei: la vita, la morte, i culti nei mondi sotterranei : ricerche scavi : atti del quindicesimo incontro di studi, Valentano (VT), 11-13 settembre 2020*. Centro studi di preistoria e archeologia.
- Saque Delicado, C. 2017. História das investigações dos hipogeus em Portugal, in J. M. Arnaud and A. Martins (eds) *Arqueologia em Portugal 2017 Estado da Questão*: 75-85. Lisboa: Associação dos Arqueólogos Portugueses.
- Valera, A.C. and V. Filipe 2012. A necrópole de hipogeus do Neolítico Final do Outeiro Alto 2 (Brinches, Serpa). *Apontamentos de Arqueologia e Património* 8: 29-42.

The Hypogean Phenomenon in Alentejo, South Portugal (4th and 3rd Millennium BC). A Summary

António Carlos Valera

ERA-Arqueologia S.A. / ICArEHB-U. Algarve, Portugal

Abstract

Known for a long time on the Algarve coast and in the Portuguese Estremadura, the documentation of hypogea in the interior of the country, namely in the Alentejo region, is a relatively recent novelty. However, over the last two decades, several cemeteries or seemingly isolated hypogea have been identified and excavated in the interior of the Beja district, always in the context of rescue archaeology. This work has shed new light on these rock-cut constructions and the associated funerary practices, largely due to their good contextual preservation, especially of the human osteological remains.

In this paper, a general characterization of the available data covers from the Late Middle Neolithic (when hypogea started to be carved out in the region) until the Late Chalcolithic, leaving aside the construction and use of hypogea during the Bronze Age. The focus will be in their spatial distribution, architectural characteristics, chronology, aspects of associated rituality and processes of collectivization of the funerary ritual.

Key words: Hypogea, Neolithic and Chalcolithic, South Portugal interior, funerary practices, collective burials, chronology.

Introduction

Until 2006, the record of funerary hypogea in the Recent Prehistory of western Iberia was restricted to the coast, in the Portuguese Estremadura (peninsulas of Lisbon and Setúbal) (Gonçalves 2003; Jordão and Mendes 2006/7; Soares 2003) and in the Algarve littoral platform (Valera and Evangelista 2024). In that year, the discovery and excavation of the Sobreira de Cima cemetery (Valera 2013) marked the archaeological emergence of this funerary architecture in the interior of Alentejo (Southern Portugal) (Figure 1). Since then, numerous hypogea have been identified, apparently isolated or organized in cemeteries, covering a chronological spectrum between the end of the Middle Neolithic and the Bronze Age (3600-1500 BC), with occasional extensions up to the Late Bronze Age. The proliferation of this funerary architecture in the southern interior of Portugal raises several questions regarding its articulation with regional megalithic monuments during the Neolithic and Chalcolithic and with cist cemeteries during the Bronze Age. However, its greatest contribution to the knowledge of funerary practices in the region is contextual preservation. Specifically, the preservation of human remains (rare in megalithic monuments for taphonomic reasons), the associated votive assemblages, and the intra-tomb spatial organizations provide a set of new observations on the complexity and diachronic behaviour of these practices. This brief

synthesis will address aspects of spatial distribution, architecture typologies, chronology, and characteristics of rituality. It focuses on the Neolithic and Chalcolithic hypogea in this interior region, distributed across 15 sites (Figure 1B) and a total of 35 hypogea: Sobreira de Cima (Valera 2013), Vale de Barrancas 1 (Valera and Nunes 2020), Pedreira de Trigaches (Baptista *et al.* 2013), Outeiro Alto 2 (Valera and Filipe 2012), Monte do Marquês 15 (Baptista *et al.* 2013), Monte do Malheiro 2 (Melo and Silva 2016); Quinta da Abóbada (Valera *et al.* 2017), Estácio 6 (Pereiro 2014), Barranco do Vale do Alcaide 4 (Ramos 2015), Monte da Comenda 3 (Fernandes 2015), Pisões 5, (Bargão and Soares 2015), Carrascal 2 (Neves and Silva 2018; Neves 2019; Valera *et al.* 2014; Valera *et al.* in print), Monte da Coelheira 3 (Valera *et al.* 2015), Cortes 2 (Tomé *et al.* 2013; Valera *et al.* 2014), and Monte da Guarita (Miguel and Simão 2017; Valera *et al.* 2016).

Spatial distribution

The current density of funerary contexts in hypogea in the Alentejo demonstrates unequivocally that this burial solution was of relevance in the region, where, indeed, it appears with some of the oldest chronologies known for this type of tomb in Portugal. Its concentrated distribution south of the Serra de Portel (or Mendro), in the Beja district, reveals a spatial distancing from orthostatic megalithic monuments, which in that region are scarce, excluding the tholoi, which are regionally well represented. On the other hand, hypogea are absent north of that mountain range, where the large concentration area of Alentejo megalithic monuments begins (Figure 1). This contrast between the north/centre and the southern Alentejo cannot be neglected or diluted in generalist approaches on a regional scale. Instead, it must be explained, and two possibilities that are not mutually exclusive have been put forward, (Valera 2013; Valera and Nunes 2020).

The first considers the existence of a knowledge gap rather than a specific historical circumstance. It is possible that the contrast is the result of insufficient research, partly due to the difficulty in detecting this type of structure and the absence of research projects specifically oriented towards them, as well as the dependence on the execution of large enterprises for their identification, which have mainly taken place in the south, in the Beja district.

The second emphasizes a specific historical-geographical situation, highlighting the difference in geological characteristics between the two areas. If in the centre/north of Alentejo granite and schist areas dominate, in the southernmost area where hypogea occur soft and altered rocks predominate, whereas stone for orthostatic constructions is rarer or non-existent. This is a conditioning factor that would be articulated with variables of a cultural nature, leading to hypogeal burial becoming a long-lasting tradition in the interior of Baixo Alentejo for almost two and a half millennia, reaching the Late Bronze Age (as demonstrated by the site of Monte da Ramada 1 - Baptista *et al.* 2018). In fact, it is in this southern area of the Alentejo that we also have a larger concentration of sites with negative structures, like ditched enclosures or sites with pits. Nevertheless, it is highly probable that, in the near future, hypogea will also be identified further to the north, to be precise, associated with some of the ditched enclosures known in central and northern Alentejo.

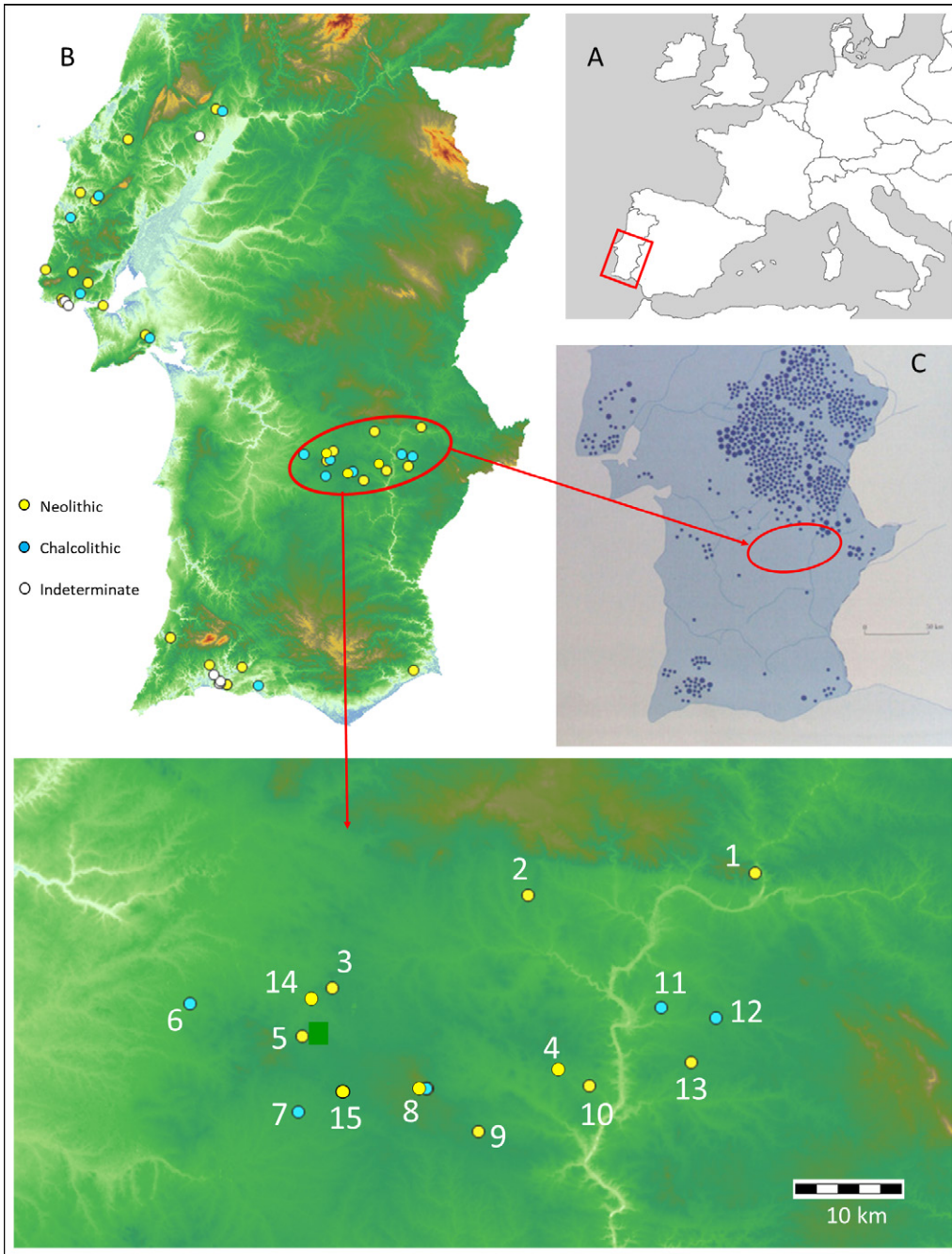


Figure 1. A. Location of South Portugal in Europe. B. Location of the hypogea in central and south Portugal, highlighting the ones in the Alentejo hinterland: 1-Sobreira de Cima, 2-Monte Malheiro 2, 3-Pedreira de Trigaches, 4-Barranco do Vale de Alcáida 4, 5-Vale Barrancas 1, 6-Carrascal 2, 7-Monte da Coelheira 2/3, 8-Quinta da Abóbada, 9-Estácio 6, 10-Monte da Comenda 3, 11-Cortes 2, 12-Monte da Guarita 2, 13-Outeiro Alto 2, 14-Monte do Marquês 15, 15- Pisões. C. Location of the hypogea in the Alentejo hinterland in relation to the regional megalithism. *Image: A. Valera.*

Table 1. Radiocarbon dates for Alentejo and Algarve hypogea (South Portugal).

Region	Site	Hypogeum	Lab. Ref.	Date BP	Date Cal 2 σ	Bib. Ref.
Alentejo	M. Marquês	1	Sac-2634	4810±90	3776-3371	Baptista <i>et al.</i> 2013
		8	ICA17B/0423	4720±40	3631-3373	
		9	ICA17B/0415	4690±40	3624-3368	
	Vale Barrancas	2	ICA17B/0416	4630±40	3521-3346	
		1	ICA17B/0418	4620±40	3522-3193	
		1	ICA17T/0419	4610±40	3520-3125	
		2	ICA17T/0422	4570±40	3496-3101	Valera 2020
		3	ICA17B/0414	4560±40	3491-3101	
		3	ICA17B/0417	4310±40	3073-2878	
		9	Beta-474676	4650±30	3516-3365	
		6	Beta-474680	4670±30	3519-3370	
	Barranco Vale Alcaide 4	1	17B/0420	4690±40	3624-3368	Valera 2020
	Q. Abóbada	1	Beta474679	4770±30	3638-3386	
			ICA15B1255	4690±40	3624-3368	
			ICA16B/0938	4680±40	3621-3366	Valera <i>et al.</i> 2017
			ICA16B0303	4500±30	3352-3096	
	Sobreira de Cima	1	Sac-2261	4500±70	3482-2930	
		1	Wk-36003	4601±26	3501-3193	
		1	Sac-2260	4530±50	3482-3033	
		1	Wk-36005	4566±30	3491-3103	Valera 2013
		3	Beta-231071	4670±50	3625-3359	
		4	Sac-2256	4520±35	3361-3099	
	Outeiro Alto 2		17B/0421	4590±40	3514-3104	Valera 2020
	Monte da Comenda 3	1	SANU-50014	4406±27	3265-2916	
			SANU-50015	4362±27	3081-2906	
			SANU-50016	4384±27	3092-2914	Valera 2020
			SANU-51724	4365±30	3087-2905	
	Monte da Guarita 2	1- Phase 1	SANU-50011	4252±29	2916-2706	
		1- Phase 1	SANU-50010	4206±26	2896-2676	
		1 - Phase 3	SANU-50012	4059±26	2838-2476	
		1- Phase 1	SANU-50013	4094±26	2857-2500	Valera 2020
		1- Phase 1	SANU-51723	4105±35	2868-2501	
		1 - Phase 1	SANU-51729	4365±30	3087-2905	
	Cortes 2	1	Beta-318382	4050±30	2837-2472	
			Sac-2574	3920±50	2569-2209	Valera <i>et al.</i> 2014
			Sac-2575	3970±70	2842-2209	
	Carrascal 2	2	Beta 311234	4170±30	2883-2632	
		2	Beta 311233	3930±30	2561-2299	Neves and Silva 2018
		1	Beta 307802	3980±30	2576-2356	
		Ditch/atrium	SANU-53035	4140±25	2874-2586	
		Ditch/atrium	SANU-53036	4225±25	2904-2701	Valera <i>et al.</i> 2025

Region	Site	Hypogeum	Lab. Ref.	Date BP	Date Cal 2σ	Bib. Ref.
Algarve	Barrada	Hypogeum 1	CNA-30008.1.1	4489±33	3346-3034	Odriozola <i>et al.</i> 2020
	Quinta dos Poços	Sep. 1	FTMC-PB57-1	3862±30	2460-2207	Valera and Evangelista 2024
		Sep. 1	FTMC-PB57-2	3998±29	2576-2465	
		Sep. 1	SUERC-108445	4345±25	3021-2901	
		Sep. 3	FTMC-PB57-5	4540±32	3368-3102	
		Sep. 2	FTMC-PB57-3	4762±29	3636-3383	
	Monte Canelas 1	Phase 1	ICEN-1149	4460±110	3379-2881	Silva and Parreira 2010
		Phase 1	OxA-5514	4370±60	3290-2880	
		Phase 1	OxA-5515	4420±60	3340-2900	
		Phase 2	Beta-290364	3620±30	2117-1894	Morán and Parreira 2015

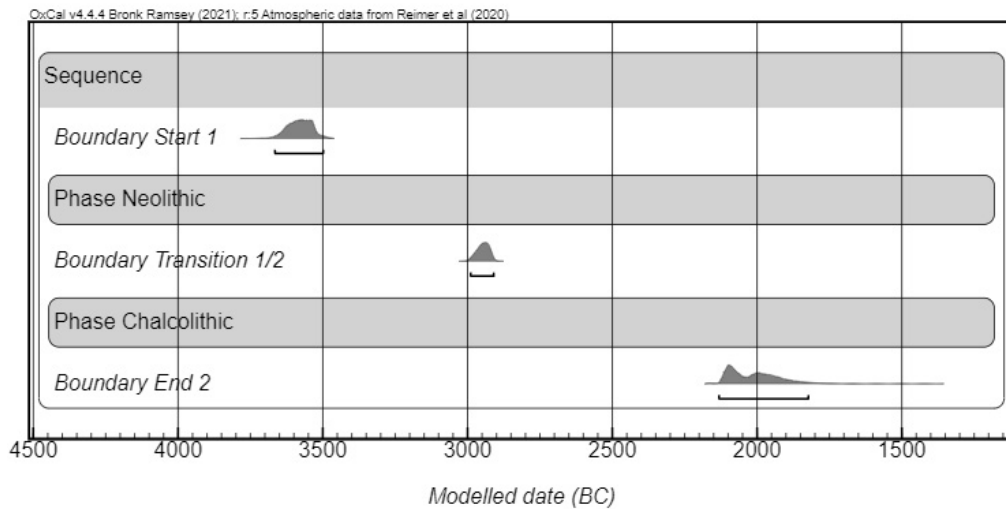


Figure 2. Bayesian model for chronology of the hypogea in Alentejo during the Neolithic and Chalcolithic (model of two contiguous phases, $A_{\text{model}} = 79.8$). Image A. Valera.

Absolute chronology and diachrony of use

Due to the good preservation of osteological remains, and largely thanks to the dating program developed by the Archaeological Research Centre of ERA Arqueologia, the hypogea in the interior of Alentejo now present the largest set of radiocarbon dates available in Portugal for this type of structure (Table 1). This set of dates, exclusively carried out on human bones, together with those compiled for the Algarve, places the emergence of hypogeal construction in southern Portugal at the end of the first half of the 4th millennium BC (c. 3600). This initial phase of Neolithic construction and use extends until the beginning of the 3rd millennium BC (c. 2900), when hypogea with Chalcolithic funerary contexts begin to appear, with this phase developing until the last quarter of that millennium (Figure 2).

Regarding the diachronies of use, we do not yet have enough tomb-specific dating to establish their duration of use, particularly those with collective use with several dozen individuals. However, we can underline that in Alentejo, there are no documented reuses of Neolithic hypogea during the Chalcolithic period, nor reuses of Chalcolithic hypogea during the Bronze Age. This circumstance constitutes another difference that is established between this hypogean world in southern Alentejo and the orthostatic megalithic monuments, where reuse of monuments after their Neolithic construction is common, both in the Chalcolithic and in the Bronze Age (Mataloto 2010, 2017). In fact, many of the hypogea in the region, from the Neolithic to the Bronze Age, have sealed entrances (compacted using a mixture of clay and beeswax - Frade *et al.* 2012), reinforced by the clay fillings of the access spaces which, once completed, would make access to the burial spaces difficult. In other words, it may have been the very nature of the architectures of these hypogea and their final sealing forms that justified their non-reuse later on, which could be associated with some kind of taboo. This leads us to an intention of 'final closure' or 'condemnation', which deliberately aimed at putting an end to the use of these tombs at a certain point. Note that in several of the larger ones, the available space to accommodate more bodies or remains was far from exhausted (e.g., Hypogeum 1 at Sobreira de Cima or Hypogeum 3 at Vale de Barrancas 1), so, regardless of their collective nature, with numerous individuals, there was a moment when, for reasons not related to space, it was decided to definitively close the structures; a circumstance also known in megalithic monuments in different Iberian regions (Cruz 1988; García Sanjuán 2008; Tejedor Rodríguez 2014). However, in some cases (like the Neolithic site of Outeiro Alto 2 and the Chalcolithic Carrascal 2), openings cut into the chamber roof suggest practices of reutilization after closure, or at least after the initial access had been blocked by the accumulation of bodies. But those later uses are within the same general periods. In contrast, the locations of cemeteries are sometimes reoccupied at later times, constituting places of long-term sacredness. An example is found at Outeiro Alto 2, where, on the same hill in which the Neolithic hypogeal cemetery is located, a later Chalcolithic ceremonial ditched enclosure was built, followed by a new Bronze Age hypogean cemetery (Valera and Filipe 2010). Several centuries encompass these periods of use of the hill, indicating some sort of continuity and transmission of the symbolic meaning of the place.

Indeed, not all these cemeteries would have functioned in the same way. In places like Sobreira de Cima or Outeiro Alto 2, small hills were monumentalized by the installation of cemeteries, with the hill itself emerging as an architectural and symbolic element with some prominence in the local landscape. This helped to generate processes of sacralization over a long period, particularly evident in the case of Outeiro Alto 2. This situation, where a prominent topography adds visibility to the monuments built on it, does not occur in the other cemeteries, which are located in flat areas with slightly undulating topography and without prominence in the landscape. Interestingly, though, in several of these sites, structures of different chronologies - prehistoric and historic - clearly mix spatially and even overlap on some occasions. This represents a form of successive appropriation of sites that takes on characteristics distinct from what is observed in Outeiro Alto 2, and which is not yet adequately understood in terms of its processes and meanings.

The architectures

It is not always easy to achieve a good characterization of the architectures of Neolithic hypogea in Alentejo, since they are often subject to collapses and obliterations. Based on available data, the architectural variability recorded can be classified into four generic types (Figure 3).

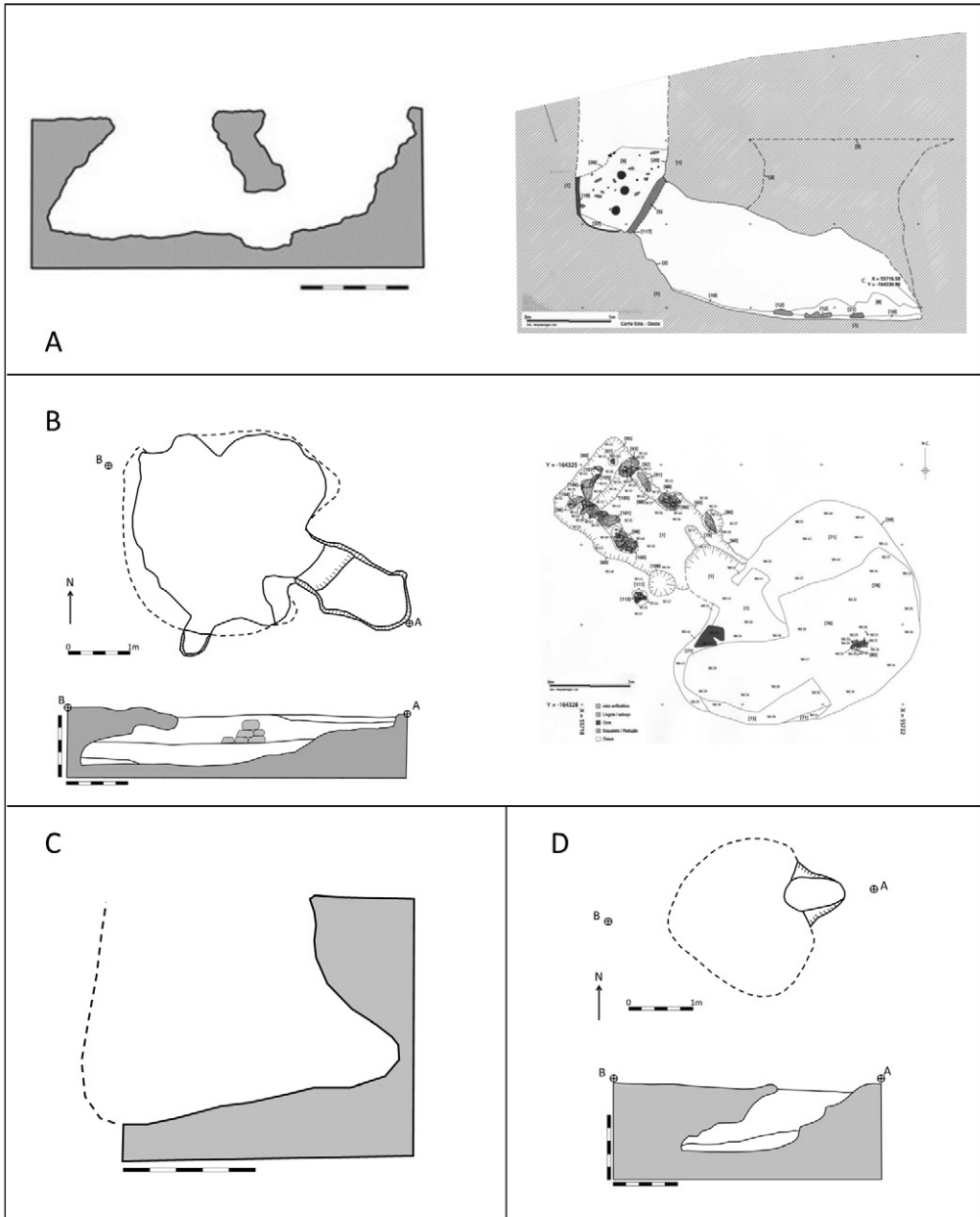


Figure 3. Typology for the main architectures of the Alentejo hypogea. *Image A. Valera.*

The first corresponds to hypogea with chambers with subcircular or oval plan (diameters between 1.3m and 3.5m) with a well-differentiated access through vertical lateral pits and a small passage connecting the two spaces (Figure 3A). This morphology is seen in Hypogea 1 and 2 at Sobreira de Cima, Hypogeum 3 at Vale de Barrancas 1, hypogea at Quinta da Abóbada, the three hypogea at Outeiro Alto 2, and the two hypogea at Monte Malheiro 2. Some cases also reveal openings through the chamber ceiling (e.g., Hypogeum 3 at Vale Barrancas 1, Hypogeum 4/5 at Outeiro Alto 2, Hypogeum 1 at Carrascal 2). A second type, apparently less common, corresponds to hypogea also with wide chambers (3.2m to 4m in diameter) and a subcircular or oval plan but with access through short corridors (cases of Hypogea 2 and 8 at Vale Barrancas 1 or Hypogeum 5 at Sobreira de Cima), although they may also have an entrance through the chamber ceiling (Figure 3B). The third type includes pit structures with a small lateral crypt (around 1m wide) at the base (e.g., Monte do Marquês 15 or Barranco do Vale do Alcaide 4) (Figure 3C). Finally, there are hypogea with well-defined chambers with a subcircular or oval plan (2.3m to 3.4m in diameter) with stepped access (e.g., Hypogea 5, 6, 7, and 9 at Vale de Barrancas 1) (Figure 3D). In one case, the stepped access is flanked by two stone walls incorporating small orthostats (Monte da Comenda 3). As a unique case, in Carrascal 2, a set of hypogeum chambers (around 2m in diameter) are aligned next to a ditch, which functions as an atrium with several levels of interior circulation that provides access to these chambers through passages opened in one of its walls. The ditch-atrium itself was used for secondary depositions of cremated and non-cremated human remains (Valera *et al.* 2025).

In general, these typologies are closer to the ones known in western Andalusia (Rivero Galán 1988) and Algarve (Valera and Evangelista 2024) than the ones in Estremadura, namely in the area of Lisbon and Palmela, although the hypogea with short passages may show some resemblance.

The typologies with lateral pits (Type A) and short corridor access (Type B) and the unique case of Carrascal 2 seem to be associated with more recurrent and prolonged uses over time and with truly collective use (although they also occur with a reduced number of individuals). On the contrary, there seems to be a connection of Types C and D to deposits of a more restricted number of individuals (one or two). Thus, we may consider that the intention of a recurrent use of the tombs materialized not only by the size of the chambers but also by the architectural design of the entrances themselves. Access via a pit or a short corridor can be constituted as a space for votive deposits, oriented towards collective rather than individual use, as happens in Hypogea 1, 2, and 5 at Sobreira de Cima or in some of the tombs of Vale de Barrancas 1. Equally important for understanding the functioning of these hypogean cemeteries is their apparent invisibility. In several cases, however, there is evidence of strategies for visibility (Figure 4). In Hypogeum 5 at Sobreira de Cima, the corridor was lined with small orthostats and ended with the negative of a stela, with a large stela over two metres high recorded on the surface. In Outeiro Alto 2, the three hypogea and a funerary pit are distributed around an approximately circular set of pits. Their diversity based on sizes displays a pattern suggesting the existence of a timber circle around which the hypogea were arranged. In Vale de Barrancas 1, a set of small, scattered monoliths was recorded on the surface, concentrated in the area where the Neolithic hypogea were located. This evidence indicates the existence of positive markers that would facilitate the identification of the cemeteries, and which time made disappear. They would be less invisible than might be thought. These circumstances may also help to explain the aforementioned reoccupation of the locations of some cemeteries through time

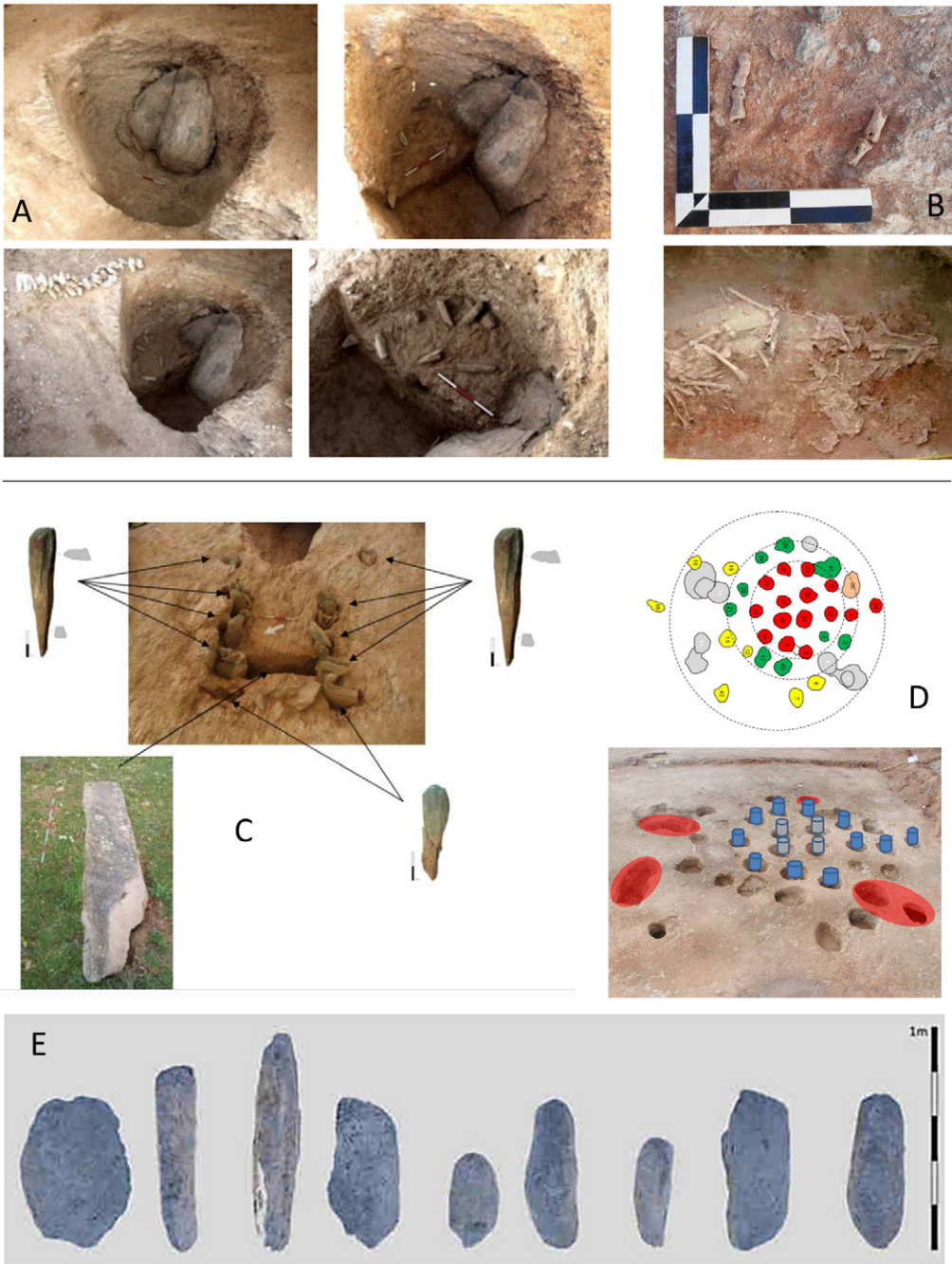


Figure 4. A. Deposition of amphibolite roughouts in the pit access to Hypogeum 1 at Sobreira de Cima. B. Deposition of animal phalanx and red pigments in the hypogea of Vale Barrancas 1. C. Structure with stelae in the passage to Hypogeum 5 at Sobreira de Cima. D. Plan and view of the foundation of a timber circle surrounded by hypogea in Outeiro Alto 2. E. Small stelae from Vale Barrancas 1. *Images by the author.*

and the constitution of spaces of long-term sacredness, at the same time as it reinforces the idea of some sort of prescription regarding the reuse of the hypogea themselves.

Aspects of rituality: votive assemblages

Votive material displays recurrences that indicate some normative in the ritual with a diachronic expression, but also some absence of patterns in certain aspects. Firstly, the number of votive objects deposited in the tombs does not correlate with the quantity of buried individuals. Some hypogea show no votive material, and their chronological attribution has been made through the dating of human remains or contextual circumstances. Examples include Neolithic Hypogea 4 and 6 at Vale Barrancas 1, hypogeum at Monte do Marquês 15, Hypogeum 2 at Monte Malheiro 2, one of the hypogea at Pisões 5, and the Chalcolithic hypogeum of Cortes 2. Some only provided one or a few artefacts, as seen in Hypogea 5 and 9 at Vale Barrancas 1 or the one at Quinta da Abóbada. On the other hand, other hypogea may contain between a few units and several dozens of pieces. However, there is no correlation between the minimum number of buried individuals and the number of votive objects present, indicating the difficulty in deducing the former from the latter when there are no well-preserved human osteological remains. Regarding the type of objects that comprise the votive assemblages, there is a set of prescriptions with diachronic expression. Neolithic votive sets dating from 3600-3200 BC exclude ceramics and are characterized by the presence of polished stone axes and adzes, microliths used as projectile points, some adornment elements such as necklaces, bracelets in ivory, shells or schist, bone awls or pins, and flint blades or bladelets (Figure 5). Ceramics only begin to appear in the final phase of the Neolithic, becoming frequent during the Chalcolithic (Figure 5), while polished stone loses prominence; arrowheads emerge, replacing geometric points, and the first ideotechnical objects appear, namely decorated schist plaques, as in Monte da Guarita 2, or shaped and decorated phalanges and zoomorphic and idoliform figurines, as in Monte da Comenda 3.

Other aspects of ritual with diachronic expression relate precisely to the use of animal phalanges and of red pigments (Figure 4). During the Neolithic, depositions of predominantly ovicaprine (sometimes swine) phalanges, often juvenile, were recorded in hypogea such as 1 and 5 at Sobreira de Cima (Valera and Costa 2013), Quinta da Abóbada, and those of Vale Barrancas 1, Outeiro Alto 2, and Monte Malheiro 2. In the case of Hypogeum 5 at Sobreira de Cima, a large number of these phalanges were associated, inside a large ossuary, with a set of human phalanges. From the Late Neolithic (at Monte da Comenda 3) and during the Chalcolithic, these small phalanges would tend to be replaced by phalanges of cervids and equids, which were used raw or shaped and shaped/decorated. As for the use of red pigments, both ochre and cinnabar - the latter analytically identified in Sobreira de Cima, Vale Barrancas 1, and Quinta da Abóbada - are especially frequent in Neolithic hypogea. As a unique feature, a large quantity of amphibolite roughouts was deposited exclusively in the deposits sealing the entrances of three hypogea - Hypogea 1, 2, and 5 - and in the structuring of the passage leading to Hypogeum 5 at Sobreira de Cima (Figure 4). Given the proximity of the cemetery to a source of this raw material, where similar roughouts were also identified, this circumstance was interpreted as a particular case of identity association of a community with the exploitation and circulation of that raw material, which would be present almost more as a member than as a votive material (Valera 2009). In summary, we can consider that votive sets until the end of the Neolithic show significant standardization and the absence of



Figure 5. A. Typical votive assemblages from Neolithic hypogea in Alentejo (Sobreira de Cima and Outeiro Alto 2). B. Introduction of pottery in Late Neolithic and Chalcolithic votive assemblages (Monte da Comenda 3 and Carrascal 2). Images by the author and Era Arqueologia.

certain artefact categories - notably ceramics and ideotechnical objects - and that from the 4th/3rd millennium transition onwards there is a diversification of materials used in votive depositions, accompanied by changes in the frequency of previous categories, such as the reduction of polished stone, disappearance of geometric elements, predominance of blades over bladelets, and preference for cervid/equid phalanges. Another interesting observation regarding some Neolithic hypogea is related to the spatial distribution of votive artefacts within the tombs. They rarely appear directly associated with specific individuals. In the tombs of Sobreira de Cima, axes and adzes, large blades, and bone awls are deposited in sets on each side of the chamber entrances, and only a few individuals have a microlith directly associated with them. The same situation occurs at Quinta da Abóbada, where the microliths are associated with two individuals. In Outeiro Alto 2, the pattern observed corresponds to the deposition of a bladelet in the access zone to the chambers. This emphasis on entrances and the rare association of materials with individuals, especially when they are more numerous, reinforce the notion of collectiveness, which is reaffirmed during the known Chalcolithic hypogea. The dilution or integration of the individual into the collective is not only through the sharing of funerary space but also by the way offerings are deposited within that space.

In addition to these issues more directly related to funeral rituals, these artefact assemblages provide a new perspective on the problem of transregional interaction, particularly in sets with chronologies around the mid-4th millennium BC. In fact, they show the start of the participation of the southern Alentejo inland region in large-scale circulation networks of exotic goods made of raw materials sourced over long distances; one of the most relevant variables in the process of social complexity that will develop in the Late Neolithic and especially during the Chalcolithic period. With dates from the mid-4th millennium BC, there are ivory objects at Sobreira de Cima and Barranco do Vale de Alcaide 4, and by the end of that millennium, at Monte da Comenda 3. According to current data, Sobreira de Cima and Barranco do Vale de Alcaide 4 correspond to the oldest evidence of ivory objects in the prehistory of present-day Portugal (Valera 2020a). The presence of cinnabar in several of the mentioned hypogea also reveals integration into circulation networks of this product, and isotopic analyses available for Sobreira de Cima revealed various provenances, including Almadén, in the southern Spanish plateau (Emslie *et al.* 2015, 2019). Other elements external to the region are marine shells, such as *Glycymeris*, *Trivia*, *Dentalium*, *Oliva*, *Pecten maximus*, and flint, particularly oolitic flint as recorded in Sobreira de Cima, which may have origins in the Baetic mountain range, where important sources that supplied the circulation networks of this raw material are reported throughout the late 4th and 3rd millennium BC.

Aspects of rituality: from individual to collective

One of the main informative assets of the Alentejo hypogea lies in the good preservation of human remains, allowing approaches that are impossible in many megalithic monuments in the region, where these remains are scarce and often not contextualized due to violations and old excavations with poor records. Bioanthropological studies, although absent for several contexts or incomplete/unpublished for others, are able to address questions regarding the number and type of individuals present in terms of age and sex (Table 2).

The first aspect to emphasize is the larger number of individuals per tomb generally recorded in Chalcolithic hypogea, where there may be several tens or even more than a hundred, when

Table 2. Number and classification by age and sex of the individuals present in Neolithic and Chalcolithic hypogea in the Alentejo hinterland.

Period	Site	Hypogeum	MNI	Non-Adult	Adult	Male	Female
Neolithic	Vale Barrancas 1	Hypogeum 1	9	5	5	2	2
		Hypogeum 2	6	2	5	1	1
		Hypogeum 3	13	9	6	2	2
		Hypogeum 4	4	1	3		
		Hypogeum 5	5	2	4		
		Hypogeum 6	2	1	1		1
		Hypogeum 7	4	1	3	1	
		Hypogeum 8	8	3	6	1	
		Hypogeum 9	2	1	1		1
	Quinta da Abóbada	Hypogeum 1	3		3	1	1
	Vale de Alcaide 4	Hypogeum	1		1		1
	Outeiro Ato 2	Hypogeum 14	5	2	3		1
		Hypogeum 4/5	23	16	7		
		Hypogeum 16/17	17	8	9		
	Monte do Marquês 15	Hypogeum	1		1		1
	Pedreira de Trigaches 2	Hypogeum	2		2		
	Monte Malheiro 2	Hypogeum 1	5	2	3		
		Hypogeum 2	4	2	2		
	Monte da Comenda 3	Hypogeum 1	12	7	5		
	Sobreira de Cima	Hypogeum 1 *	22	4	18	1	4
		Hypogeum 5 *	16	Present	16		
	Estácio 6	Hypogeum 32	2	1	1?		
Chalcolithic	Cortes 2	Hypogeum 1	4	1	4		1
	Carrascal2	Hypogeum 1	71	22	49	3	21
		Hypogeum 5	48	7	38	5	6
	Monte da Guarita	Hypogeum 1	34	13	21	6	9

compared with the Neolithic ones, especially the earlier ones, reflecting the clear assertion of the collectivization of funerary practices. The second is the fact that current chronological series, associated with good osteological preservation, are starting to define the moment when this process of collectivization began in the south Alentejo interior; the mid-4th millennium BC (Valera 2020b) (Figure 6).

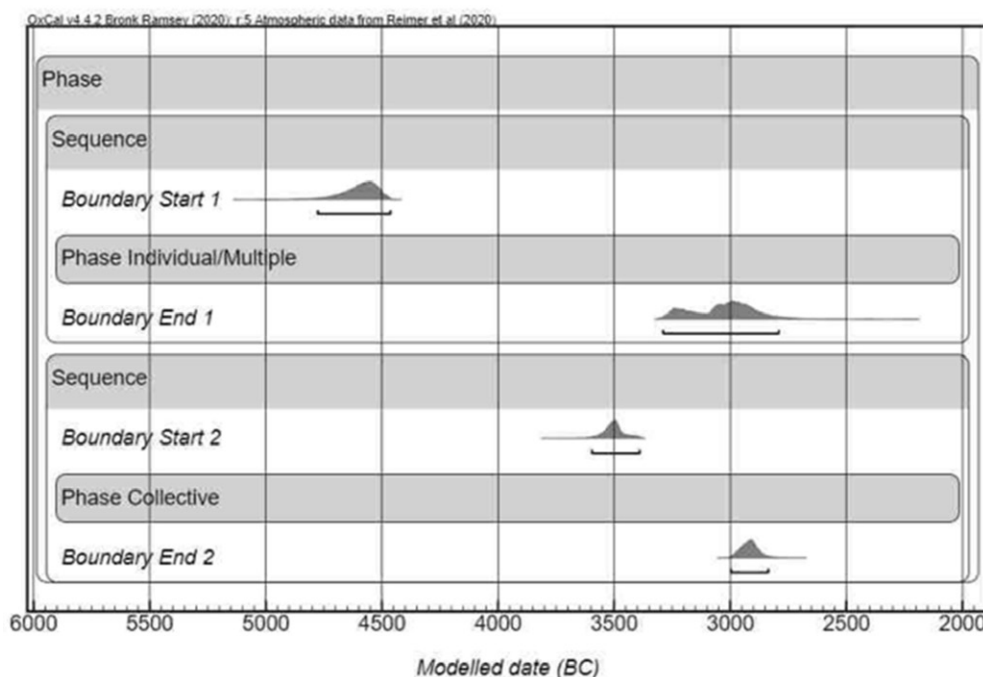


Figure 6. Bayesian model for the emergence of collective funerary practices in the Alentejo hypogea during the Neolithic, after Valera 2020b (model of two overlapping phases, $A_{\text{model}} = 88.6$).

Considering contexts with only three or fewer individuals as single or multiple depositions (see Valera 2020b for criteria) (Figure 7), these occur in seven cases: Hypogea 6 and 9 at Vale de Barrancas 1, Hypogea 1 at Quinta da Abóbada, hypogea of Vale do Alcaide 4, hypogea of Monte do Marquês 15, hypogea of Pedreira de Trigaches 2, and Hypogea 32 at Estácio 6. Barranco de Vale do Alcaide 4 and Monte do Marquês 15 are the only ones with a single individual, in both cases adult and female. In the remaining five cases, we have two situations with only adults: Pedreira de Trigaches 2 with two adult females and Quinta da Abóbada with three adults, one female and one male. In the other three cases, there are one adult - two in the case of Hypogea 4 at Vale Barrancas 1 - and one non-adult, and when it is possible to determine the sex of the adults - Hypogea 6 and 9 at Vale de Barrancas 1 -, they are females. That is, these individual or multiple hypogea with an MNI of up to three inhumations present exclusively adults in more than half of the cases and one or two adults and one non-adult in the remaining cases. In situations where it was possible to make a sexual diagnosis of adults, five are female individuals and only one male, with non-adults associated with female elements. This proportion of the presence of a non-adult together with an adult - in one case two adults - and their association, when sexual diagnosis was possible, with female adults reinforces the possibility that these contexts correspond to burials of closely related individuals. This situation of single or multiple burials characterizes the initial moment of hypogea construction in the Alentejo interior, continuing the tradition of single burials from the initial and oldest phases of the Neolithic. This begins to change from the mid-4th

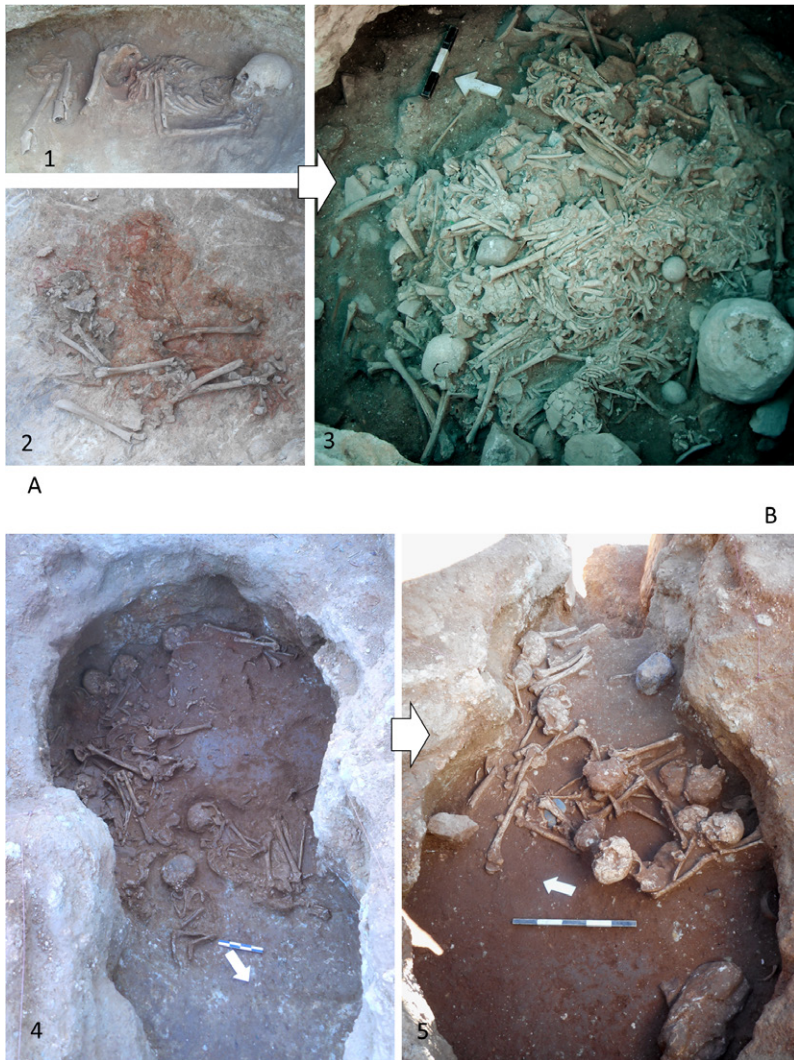


Figure 7. A. Primary depositions: 1. Barranco do Vale de Alcáida 4, 2. Quinta da Abóbada, 3. Carrascal 2. B. Monte da Guarita 2: 4. Phase of primary depositions, 5. Phase of secondary depositions. *Images by the author and Era Arqueologia.*

millennium BC onwards. Although single or multiple burials continue throughout the second half of the 4th and during the 3rd millennium BC, their number decreases, giving way to hypogea with an increasingly larger number of individuals, already reflecting a true funerary practice of collective nature, which surpasses the narrower family scope and represents natural populations of a community or sectors of communities (Figure 7).

When the MNI exceeds four, the presence of non-adults is always recorded, and in some situations, they even outnumber the adults present: cases such as Hypogeum 3 at Vale

da Barrancas, Hypogeum 4/5 at Outeiro Alto, or the hypogeum of Monte da Comenda 3. Nonetheless, the trend for the presence of a larger number of women persists, and in the case of Hypogeum 1 at Carrascal 2, the disproportion is quite pronounced. However, this situation will need to be nuanced, considering the typically low rate of sex identification. Finally, it is during the 3rd millennium BC that the use of hypogea for secondary depositions, understood as transfers of human osteological remains, begins to be recorded in the region, at Monte da Guarita 2. Whereas during the Neolithic the formation of ossuaries within the hypogea is a practice that seems to result essentially from the management of the internal funerary space, during the Chalcolithic there are formations of ossuaries with selected bones brought from other locations. At Monte da Guarita 2, after a first level of primary depositions, a second moment of use is characterized by the secondary depositions constituted mainly by skulls and long bones (Figure 7). This practice accompanies the progressive contextual diversification of the manipulation of human remains during the 3rd millennium BC, which also intensifies in other types of sites, such as ditched enclosures (Evangelista and Valera 2019). In fact, during the 3rd millennium BC the region exhibits abundant evidence of the linking of different sites through the circulation of human bones, creating more ambiguous and permeable borders between the living and the dead, and some hypogea became part of these itineraries of the deceased.

Final Remarks

The hypogeal phenomenon in the interior of Alentejo south of the Serra de Portel covers the time immediately before and the initial onset of the trajectory of social complexity that developed through the second half of the 4th and much of the 3rd millennium BC. Representative and agent of this historical context, it demonstrates some of the aspects that will be central to the process. Among them is the emergence of the collective in funerary discourse, possibly grounded in the consolidation of ideologies of ancestry, which occurs shortly after the first hypogea began to be constructed. A transformation that is manifested in the architecture of the tombs themselves, notably in the way their accesses were structured. The temporal proximity of the emergence of this collectivization of funerary practices exhibited by the hypogeal phenomenon and the appearance of ditched enclosures in the region, which, according to currently available absolute dating, date back to at least 3400 BC, will not be a coincidence. Rather, it establishes a connection with the practices that progressively emerge in the development of those enclosures, particularly regarding the increasing ideological expressions of the collective in ceremonial practices and the role that human remains play in them, as evidenced by the contexts of the Perdigões enclosure or the cemeteries around the Porto Torrão enclosure. In the same line, the construction of these hypogea integrates, on a supra-regional level, a process of diversification of funerary solutions, encompassing also natural caves, pit depositions, and megalithic monuments, to which we can associate, although not as a funerary expression, the practice of manipulating human remains in ceremonial contexts present in numerous ditched enclosures. Simultaneously, they constitute an architectural tradition that, in the Baixo Alentejo, extends until the end of the Bronze Age, while always maintaining the practice of not reusing hypogea from earlier periods. This distinguishes them from megalithic monuments, notably in how the past is incorporated into the discourses of each present. Their main difference, however, is of archaeological rather than historical nature. It lies in the better preservation of their contents, particularly at the

level of osteological remains, which has allowed for a broader scope of scientific inquiry into the type and quality of responses regarding the funerary world in the region during that time.

Bibliography

- Baptista, L., L. Oliveira, A.M. Soares and S. Gomes 2013. A construção da paisagem nas bacias das ribeiras do Álamo e do Pisão nos III^o e II^o milénios a.C., in J. Jiménez Ávila, M. Bustamante Álvarez and M. García Cabezas (eds) *Actas do VI Encontro de Arqueologia do Sudoeste Peninsular (Villafranca de los Barros, 4-6 de octubre de 2012)*: 791-827. Villafranca de los Barros: Ecmo. Ayuntamiento de Villafranca de los Barros (Badajoz).
- Baptista, L., A.M. Soares, Z. Rodrigues, N. Vale, R. Pinheiro, S. Fernandes and P. Valério 2018. Os hipogeus funerários do Bronze Final do Sudoeste do Monte da Ramada 1 (Ervidel, Aljustrel). Estudo preliminar, in *Actas do VIII Encontro de Arqueologia do Sudoeste Peninsular (Serpa-Aroche, 24, 25 e 26 de outubro de 2014)*: 265-288. Serpa: Câmara Municipal de Serpa.
- Bargão, P. and A.M. Soares 2015. Pisões 5: um sítio de fossas nos barros de Beja, in N. Medina Rosales (ed.) *Actas do VII Encontro de Arqueologia do Sudoeste Peninsular (Aroche-Serpa, 29, 30 de noviembre, y de diciembre de 2013)*: 65-87. Aroche: Ayuntamiento de Aroche.
- Cruz, D. 1988. Expressões funerárias e culturais no norte da Beira Alta (V-II milénios a.C.). *Estudos Pré-Históricos* 6: 149-166.
- Emslie, S.D., R. Brasso, W.P. Patterson, A.C. Valera, A. McKenzie, A.M. Silva, J.D. Gleason and J.D. Blum 2015. Chronic mercury exposure in Late Neolithic/Chalcolithic populations in Portugal from the cultural use of cinnabar. *Scientific Reports* 5(14679). <https://doi.org/10.1038/srep14679>
- Emslie, S.D., A. Alderman, A. McKenzie, R. Brasso, A.R. Taylor, M. Molina Moreno, O. Cambra-Moo, A. González Martín, A.M. Silva, A.C. Valera, L. García Sanjuán and E. Vijande Vilai 2019. Mercury in archaeological human bone: biogenic or diagenetic?. *Journal of Archaeological Science* 108. <https://doi.org/10.1016/j.jas.2019.05.005>
- Evangelista, L.S. and A.C. Valera 2019. Segmenting and depositing: the manipulation of the human body in ditched enclosures seen from Perdigões, in A.C. Valera (ed.) *Fragmentation and depositions in Pre and Proto-Historic Portugal*: 47-69. Lisboa: NIA-ERA.
- Fernandes, S. 2015. *Monte da Comenda 3 (Beja), Relatório Final*. Porto. Omniknos. Unpublished report.
- Frade, J.C., A.M. Soares, A. Candeias, M.I.M. Ribeiro, T. Nunes da Ponte, M. Serra and E. Porfírio 2012. Beeswax and propolis as sealants of funerary chambers during the Middle Bronze Age in the South-Western Iberian Peninsula, in *Proceedings of the 39th International Symposium for Archaeometry (28 May - 1 June 2012 Leuven, Belgium)*: 141-145. Leuven: Leuven University Press.
- García Sanjuán, L. 2008. Muerte, tiempo, memoria. Los megalitos como memoriales culturales. *PH Boletín del Instituto andaluz del Patrimonio Histórico* 67 Especial: 34-45.
- Gonçalves, V.S. 2003. Sítios, “Horizontes” e Artefactos. Cascais: Câmara Municipal de Cascais.
- Jordão, P. and P. Mendes 2006/7. As grutas artificiais da Estremadura Portuguesa: uma leitura crítica das arquitecturas. *Arqueologia e História* 58/59: 43-78.
- Mataloto, R. 2010. Paisagem, memória e identidade: tumulações megalíticas no pós-megalitismo altoalentejano. *Revista Portuguesa de Arqueologia* 10(1): 123-140.

- Mataloto, R. 2017. We are ancients, as ancient as the Sun: campaniforme, antas e gestos funerários nos finais do III milénio AC no Alentejo central, in V. Gonçalves (ed.) *Sinos e Taças. Junto ao oceano e mais longe. Aspectos da presença campaniforme na Península Ibérica*: 58-81. Lisboa: Estudos e Memórias 10.
- Melo, L. and A.M. Silva 2016. Os hipogeus 1 e 2 do sítio do Monte do Malheiro 2 (Selmes, Vidigueira, Beja, Portugal) do neolítico final/calcolítico: práticas funerárias e estudo antropológico dos restos ósseos humanos exumados. *Estudos do Quaternário* 15: 91-98.
- Miguel, L. and P. Simão 2017. *Monte da Guarita 2. Relatório dos Trabalhos Arqueológicos*. Porto. Omniknos. Unpublished report.
- Morán, E. and R. Parreira 2015. El Calcolítico Final en el entorno territorial de la bahía de Lagos (Algarve, Portugal): cambios en la cultura material y evidencias de transformación en la formación económico-social clasista inicial. *Revista Atlántica-Mediterránea* 16: 95-105.
- Neves, M.J. 2019. *O contributo da arqueotematologia para a compreensão das práticas funerárias nos 4º e 3º milénios A.C. no sul de Portugal. Os hipogeus de Monte Canelas I (Portimão, Faro) e Monte do Carrascal 2 (Ferreira do Alentejo, Beja)*. Unpublished PhD dissertation. University of Coimbra.
- Neves, M.J. and A.M. Silva 2018. Acerca da biografia dum sepulcro colectivo do Neolítico Final / Calcolítico: o Hipogeu 2 do Monte do Carrascal 2 (Ferreira do Alentejo, Beja, Portugal). *Estudos do Quaternário* 18: 35-52.
- Odrizola, C., J.A. Garrido-Cordero, C. Santos, E. Barradas and A.C. Sousa 2020. The stone beads from Barrada's hypogeum 1 (Aljezur, Algarve, Portugal). Greenstone distribution patterns in the Iberian Southwest late Neolithic. *Journal of Archaeological Sciences: Reports* 34(102667). <https://doi.org/10.1016/j.jasrep.2020.102667>
- Pereiro, T. do 2014. *Quinta do Estácio 6 (Beja). Relatório Final*. Porto. Omniknos. Unpublished report.
- Ramos, R. 2015. *Barranco do Vale do Alcaide 4 (Beja), Relatório Final*. Porto. Omniknos. Unpublished report.
- Reimer, P., W. Austin, E. Bard, A. Bayliss, P. Blackwell, C. Bronk Ramsey, M. Butzin, H. Cheng, R. Edwards, M. Friedrich, P. Grootes, T. Guilderson, I. Hajdas, T. Heaton, A. Hogg, K. Hughen, B. Kromer, S. Manning, R. Muscheler, J. Palmer, C. Pearson, J. van der Plicht, R. Reimer, D. Richards, E. Scott, J. Southon, C. Turney, L. Wacker, F. Adolphi, U. Büntgen, M. Capano, S. Fahrni, A. Fogtmann-Schulz, R. Friedrich, P. Köhler, S. Kudsk, F. Miyake, J. Olsen, F. Reinig, M. Sakamoto, A. Sookdeo and S. Talamo 2020. The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon* 62. <https://doi.org/10.1017/RDC.2020.41>
- Rivero Galán, E. 1988. *Análisis de las cuevas artificiales en Andalucía y Portugal*. Sevilla: Colegio Universitario de La Rábida.
- Silva, A.M. and R. Parreira 2010. O Hipogeu I de Monte Canelas: caracterização antropológica dos enterramentos *in situ* e das conexões anatómicas, in V. Gonçalves. and A.C. Sousa (eds) *Transformação e mudança no Centro e Sul de Portugal: o 4º e o 3º milénio a.n.e.*: 421-428. Cascais: CMC.
- Soares, J. 2003. *Os hipogeus pré-históricos da Quinta do Anjo (Palmela) e as economias do sagrado*. Setúbal: Museu de Arqueologia e Etnografia do Distrito de Setúbal.
- Tejedor Rodríguez, C. 2014. Reconstruyendo 'biografías megalíticas': algunos ejemplos de alteraciones estructurales en monumentos megalíticos del valle del Duero/Douro, in J. Honrado Castro, M.Á. Brezmes Escribano, A. Tejeiro Pizarro, Ó. Rodríguez Monterrubio

- (eds), *Investigaciones Arqueológicas en el valle del Duero: Del Neolítico a la Antigüedad Tardía Actas de las segundas jornadas de jóvenes investigadores del valle del Duero (León, 2012)*: 67-86. Valladolid: Glyphos Publicaciones.
- Tomé, T, A.M. Silva and A.C. Valera 2013. Biaoantropologia da Pré-História Recente do Baixo Alentejo: dados complementares do estudo de um conjunto de séries osteológicas humanas da região de Brinches (Serpa), in J. Jiménez Ávila, M. Bustamante Álvarez and M. García Cabezas (eds) *Actas do VI Encontro de Arqueologia do Sudoeste Peninsular (Villafranca de los Barros, 4-6 de octubre de 2012)*: 853-875. Villafranca de los Barros: Ecmo. Ayuntamiento de Villafranca de los Barros (Badajoz).
- Valera, A.C. 2009. Estratégias de identificação e recursos geológicos: o anfibolito e a necrópole da Sobreira de Cima, Vidigueira, in A. Bettencourt. and L.B. Alves (eds) *Dos montes, das pedras, e das águas. Formas de interacção com o espaço natural da Pré-história à actualidade*: 25-36. Porto: CITCEM/APEQ.
- Valera, A.C. 2013. *Sobreira de Cima. Necrópole de hipogeus do Neolítico (Vidigueira, Beja)*. ERA Monográfica 1. Lisboa: Nia-Era.
- Valera, A.C. 2020a. Interação e recursos exóticos na Pré-História Recente: a circulação e consumo de marfim em Portugal, in R. Vilaça. and R.S. Aguiar (eds) *Mobilidades na Pré-história. Pessoas, recursos, objetos, sítios e territórios*: 135-181. Coimbra: Imprensa da Universidade de Coimbra.
- Valera, A.C. 2020b. Absolute chronology of Vale de Barrancas 1 cemetery and the transition to collective burials in the neolithic of South Portugal, in A.C. Valera. and T. Nunes (eds.) *Vale de Barrancas 1. A necrópole de hipogeus neolítica (Mombeja, Beja)*: 31-43. Era Monográfica 4. Lisboa: Nia-Era.
- Valera, A.C. and C. Costa 2013. Uma particularidade ritual: a associação de falanges de ovinos-caprinos a falanges humanas nos sepulcros da Sobreira de Cima, in A.C. Valera (ed.) *Sobreira de Cima. Necrópole de Hipogeus do Neolítico (Vidigueira, Beja)*: 63-70. Era Monográfica 1. Lisboa: NIA-ERA.
- Valera, A.C. and L.S. Evangelista 2024. O mundo funerário hipogeico no 4º e 3º milénios a.C. no Algarve, in P. Bueno Ramírez and J. Soler (eds.) *Ídolos. Miradas milenarias desde el extremo suroccidental de Europa*: 255-269. Huelva: Junta de Andalucía.
- Valera, A.C., M. Fernandes and P. Simão 2017. Os hipogeus da Pré-História Recente da Quinta da Abóbada. *Apontamentos de Arqueologia e Património* 12: 15-22.
- Valera, A.C. and V. Filipe 2010. Outeiro Alto 2 (Brinches, Serpa): nota preliminar sobre um espaço funerário e de socialização do Neolítico Final à Idade do Bronze. *Apontamentos de Arqueologia e Património* 5: 49-56.
- Valera, A.C. and V. Filipe 2012. A necrópole de hipogeus do Neolítico Final do Outeiro Alto 2 (Brinches, Serpa). *Apontamentos de Arqueologia e Património* 8: 29-42.
- Valera, A.C., R. Godinho, E. Clavo, F.J.M Berrequero, V. Filipe,V and H. Santos 2014. Um mundo em negativo: fossos, fossas e hipogeus entre o Neolítico Final e a Idade do Bronze na margem esquerda do Guadiana (Brinches, Serpa), in 4º *Colóquio de Arqueologia do Alqueva. O plano de rega (2002-2010)*: 55-73. Memórias d'Odiana, 2ª Série 14. Évora: Edia/ Direcção Regional de Cultura do Alentejo.
- Valera, A.C.; Lourenço, M.; Evangelista, L.S. (2025), Rituals of fire in the 3rd millennium BC: the funerary depositions in the ditch/atrium of Carrascal 2 (Porto Torrão, Ferreira do Alentejo). CUPAUAM. 51(2): 51-58. <https://doi/10.15366/cupauam2025.51.2.002>

- Valera, A.C., L. Miguel, P. Simão and R. Wood 2016. O Hipogeu Calcolítico do Monte da Guarita 2 (Pias, Serpa). Notícia Preliminar, Paper presented to the *IX Encontro de Arqueologia do Sudoeste Peninsular*. Tróia: Setúbal.
- Valera, A.C. and T. Nunes 2020. *Vale de Barrancas 1. A necrópole de hipogeus neolítica (Mombeja, Beja)*. Era Monográfica 4. Lisboa: Nia-Era.
- Valera, A.C., R. Ramos and P. Castanheira 2015. Os recintos de fossos de Coelheira 2 (Santa Vitória, Beja). *Apontamentos de Arqueologia e Património* 10: 33-45.

The Necropolis of Valle de las Higueras, Huecas (Toledo). Cave 3 as a Case-Study for the Characterisation of the Use of Bell Beaker Hypogea in inland Iberia

Rosa Barroso Bermejo
Primitiva Bueno Ramírez
Rodrigo de Balbín-Behrmann

Department of History and Philosophy, Area of Prehistory. University of Alcalá, Spain.

Abstract

The necropolis of Valle de las Higueras forms one of the most notable groups of hypogea in the interior of the Iberian Peninsula. This study provides a brief contextualization of the site within the broad group of Chalcolithic necropolises in the middle Tagus Valley that have been discovered in recent years. The contrast of its topography, chronology, number of burials and type of constructions makes Valle de las Higueras a peculiar necropolis. The case of Cave 3 will be discussed in detail. This collective tomb exhibits a carefully planned organization of its funerary space, segregating burials with and without Bell Beaker pottery. The burials and their associated grave goods will be analysed and compared with extensive case studies in the region. The wide variability of funerary practices reflects the social complexity of the time.

Key words: Iberian Plateau, Copper Age, artificial cave, collective burials, Bell Beaker.

Introduction

The presence of hypogea in the interior of the Iberian Peninsula is a recent discovery even though the existence of human remains and artefacts in artificial caves or small holes dug in the terrain had been noted in the late 19th century, when the emblematic site of Ciempozuelos was excavated (Riaño *et al.* 1894: 437). That necropolis was discovered when a road was being made from Cuesta de La Reina to San Martín de la Vega, which might explain the little importance attached to the structures, which were reduced to pits in the bibliography (Blasco 1994: 79).

The major significance of Valle de las Higueras within the necropolises of artificial caves in inland Iberia is precisely due to it being the first that alerted to the presence of hypogea. Not only was it comparable with those that have long been known in the western area of Lisbon (Leisner *et al.* 1961; Soares 2003) but it also enabled new interpretations of the small caves discovered many years before at Ciempozuelos (Bueno Ramírez *et al.* 2000). The necropolis, in the Province of Toledo, includes several hypogea made in different ways, both excavated and built up with stone and mud. They contain individual and collective burials dated in the third and second millennia BC (2889-1508 cal BC: IntCal20-2 sigma), although their maximum use

coincides with the Bell Beaker phenomenon at the site (Bueno Ramírez *et al.* 2005, 2008, 2012, 2017, 2019a, 2023).

The vertical or horizontal excavations in rock and clay that are called hypogea or artificial caves (Bueno Ramírez *et al.* 2023) constitute the main novelty in mortuary archaeology in inland Iberian in recent years. First, their grouping in necropolises allowed true cemeteries to be associated for the first time with inhabited areas, as in the south-east and south-west of the peninsula. Second, their frequent association with Bell Beaker grave goods makes them the most ostentatious burials in the middle Tagus valley. Gold, variscite, ivory, amber and seashells are found in them, connecting the communities with a large area that notably reached as far as the Atlantic seaboard.

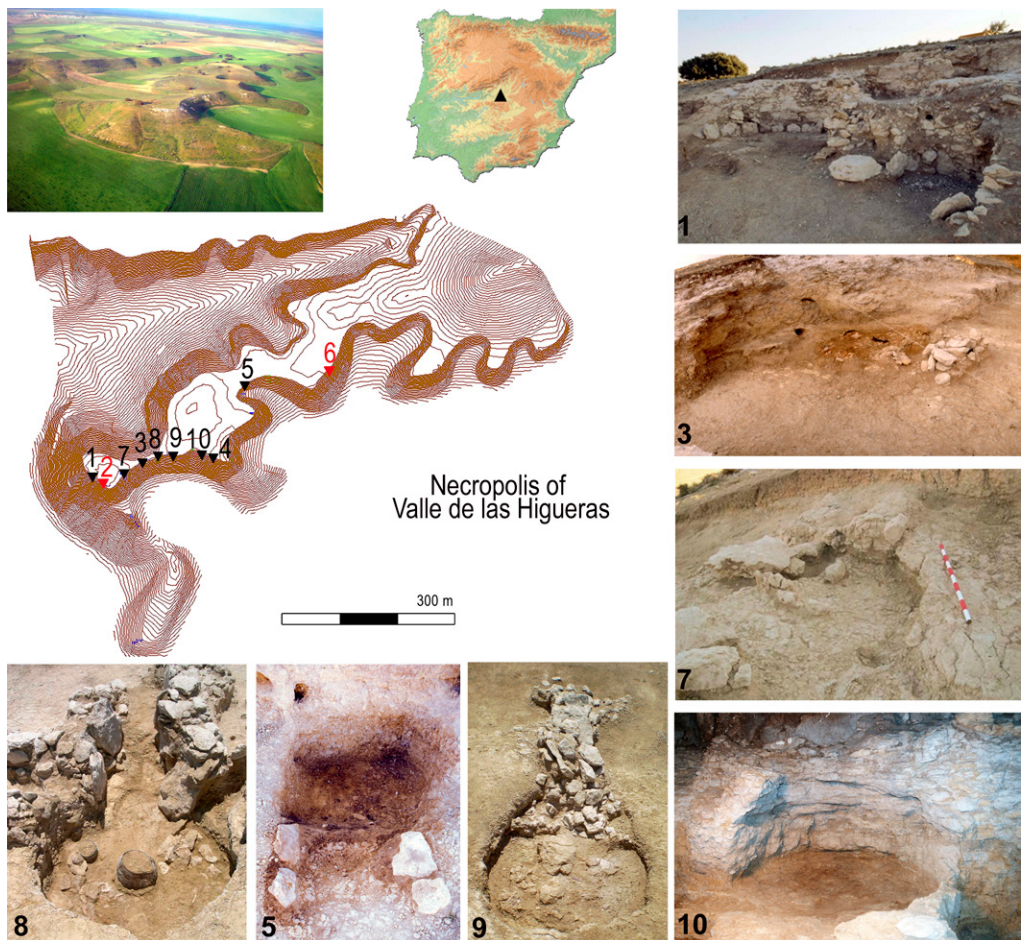


Figure 1. Position of the necropolis of Valle de las Higueras in the Iberian Peninsula, aerial view of the plateau where it is located and topography showing the location of the artificial caves (in red flint-mining). Photos of seven of the funerary caves with their structure numbers. *Photographs: authors.*

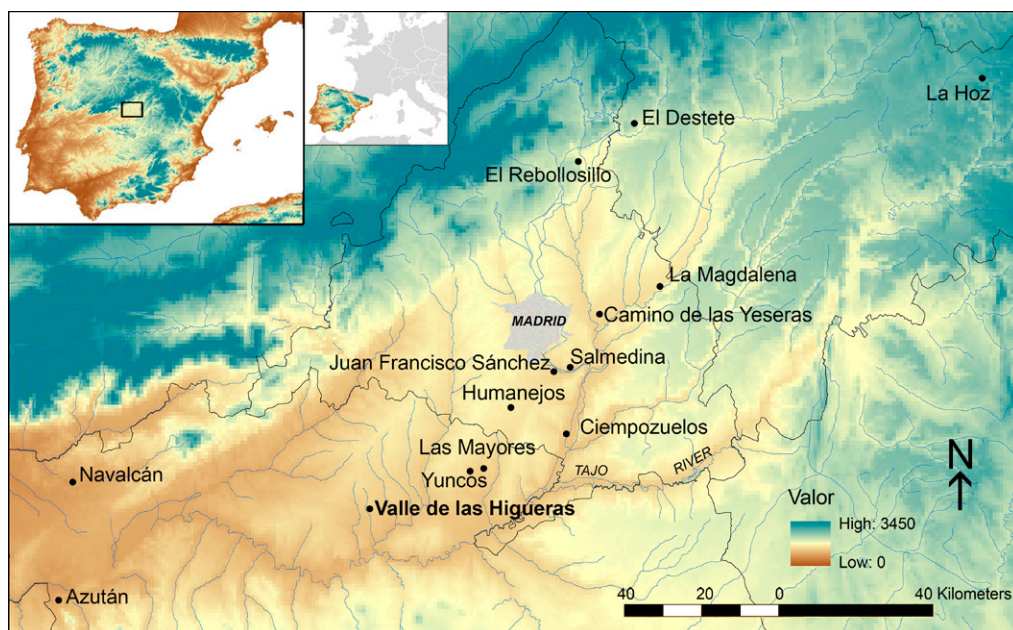


Figure 2. Distribution map of the main sites mentioned in the text. *Authors of the article.*

In the Tagus valley, the necropolis of Valle de las Higueras is located in one of the limestone plateaux that stand next to and above the valley of Huecas, the small village it belongs to. It was excavated from 1999 to 2009, when surveying and geophysical studies alternated with the excavations. It comprises ten caves dug into the valley limestone, two of them linked to flint-mining and the others used for burials. The eight mortuary caves are distributed successively and systematically along the upper part of the plateau. They are located at similar distances one from the other, which suggests that they remained in use during the life of the cemetery despite them not being coetaneous. They are mixed structures, dug in the rock and built with stones and mud. Their floor plans vary from simple chambers, like Cave 10, to spaces with a passage entrance, like Caves 5, 8 and 9, and hypogea with chamber and antechamber, such as Caves 1 and 3 and possibly Cave 4, which was badly deteriorated by the time of its excavation (Bueno Ramírez *et al.* 2005, 2008, 2012, 2019a, 2023) (Figure 1).

Several other necropolises have been added in recent years in the provinces of Madrid and Toledo, between the Jarama and Guadarrama valleys. These finds have made the third millennium BC, and especially the Bell Beaker period, a subject of great interest in the prehistory of the Southern Meseta. Since some of these necropolises are included in the present volume, in this chapter Valle de las Higueras will be briefly contextualised in its archaeological setting among inland hypogea. Then one of its most interesting structures, Cave 3, and the questions it poses will be described in detail.

Valle de Las Higueras in the context of the inland necropolises

Valle de las Higueras is located in an area with funerary and habitation sites dated from the Neolithic onwards. Houses and storage structures were distributed on both sides of the Huecas valley in the Neolithic, Chalcolithic and Bronze Age. Their remains are found in the surroundings of El Castillejo tumulus and in the settlements of Los Picos and Las Vegas (Barroso *et al.* 2015a; Bueno Ramírez *et al.* 1999a, 2002a, 2012). The proximity to the stream and its wetlands may have changed under the different climate conditions. These must have been drier in the second half of the third millennium BC, as the record left by Las Vegas is located a few metres from the current watercourse.

Compared with the occupations in the valley, the funerary constructions that mark the same territory sought good visibility. Thus, the collective burial of El Castillejo is situated on a limestone outcrop on the right bank of the stream. Tumulus 1 in Valle de las Higueras occupies a position halfway up the hillside and finally the necropolis studied here was built on the edge of the upper surface of one of the plateaux. Valle de las Higueras is to date the only high-altitude third millennium cemetery, possibly like Ciempozuelos, that has been excavated systematically in the region. Surveys and the layout of the terrain itself suggest that there may be a series of groups of tombs in the similar plateaux facing the valley towards the north. The possibility of several funerary groups needs to be confirmed (Bueno Ramírez *et al.* 1999a, 2012, 2019a).

The high location of Valle de las Higueras is different from that of the settlements to the south of Madrid and in the Province of Toledo. They are open settlements, larger or smaller in their size, although their full extension has not been determined. Some of the largest, such as Humanejos and Camino de las Yeseras, cover more than 20ha and possesses ditched enclosures and thousands of underground structures with a domestic and funerary use that seem to nullify the idea of a cemetery (Garrido-Pena *et al.* 2019; Liesau *et al.* 2008). In other smaller open sites, like La Magdalena, of 5ha (Heras *et al.* 2014), and Las Mayores (Barroso *et al.* 2022), of less than 3ha, the tombs are grouped in the central part of the site. In any case, as they have not been excavated completely, the cemeteries cannot be considered well-delimited. Large Iberian sites, such as Perdigões (Valera *et al.* 2014) and Valencina de la Concepción (García Sanjuán 2013), display a complex organisation of the burial areas that is not an obstacle to them being regarded as true necropolises. As remarked above, even in the small Huecas valley the existence of more necropolises cannot be ruled out (Figure 2).

The size of the excavated area directly influences the number of structures found, but so far, the Bell Beaker cemeteries are small. The group of two hypogea at La Salmedina (Berzosa and Flores 2005) and the three burials at Ciempozuelos (Riaño *et al.* 1894) seem to be partial references. Where larger areas have been excavated, the number of Bell Beaker tombs does not amount to more than ten, as in Valle de las Higueras. Eight tombs are known at Camino de las Yeseras, all in the south-east of the site (Liesau *et al.* 2018) and nine at Humanejos, together with six contemporary burials without Bell Beaker pottery (Garrido-Pena *et al.* 2019). Seven tombs were found at Las Mayores, six of them with Bell Beaker material. Moreover, in addition to the increase in information about the Bell Beaker period, better knowledge has been achieved about the whole population in the third millennium BC, as ample documentation has been obtained about pre-Bell Beaker burials in the area (Blasco and Liesau 2019; Díaz del Río *et*

al. 2017). This aspect is again highlighted in Valle de las Higueras. Its group of eight funerary structures, dated from the early third millennium BC, allow the emergence of the Bell Beaker phenomenon, which is found in five caves, to be established in the collective burials within an evident earlier megalithic tradition (Bueno Ramírez *et al.* 2005; 2008; 2017, 2023).

In the Bell Beaker period, we are accustomed to a very diverse typology of burials, and this variability is perceived even in the necropolises themselves. Bell Beaker burials are found in natural caves, like Cueva del Destete (Jiménez 1997) and La Hoz (Bueno Ramírez *et al.* 2002b), dolmens such as Azután (Bueno Ramírez *et al.* 2004) and Navalcán (Bueno Ramírez *et al.* 1999b), and in chambers adjoined to tumuli, as at El Castillejo (Bueno Ramírez *et al.* 1999b), as well as the traditional burials in pits (Blasco 1994; Oñate *et al.* 2001) that sometimes can be reinterpreted as more complex structures. That is the case of the burial at Juan Francisco Sánchez, a double burial of adult and infant dug in gypsum and sealed with stones (Blasco 1994). The range of funerary containers now includes hypogea and artificial caves that have

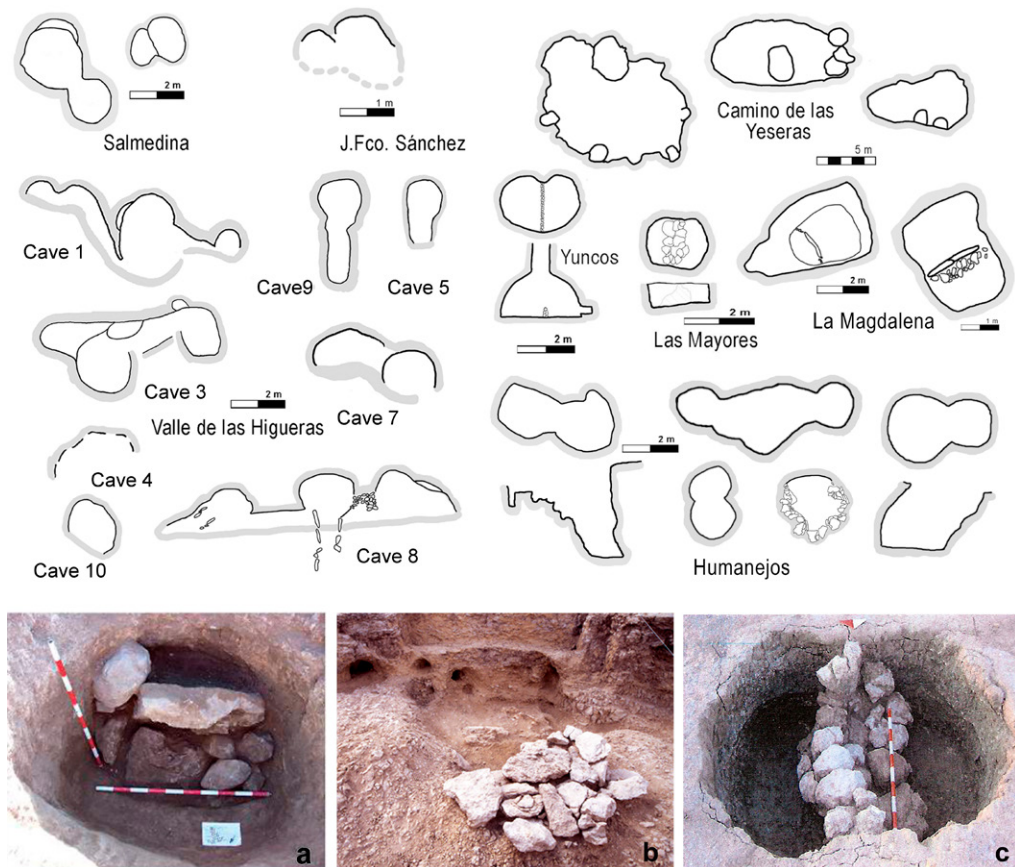


Figure 3. Plans of the hypogea in the Middle Tagus Valley. Photographs of the closures of structures: a) Closure of the hypogeaum in the funerary area 1 at Camino de las Yeseras (from Liesau *et al.* 2020a: Fig. 7); b) Closure of Cave 5 at Valle de las Higueras (from Bueno *et al.* 2023); c) Closure wall of the LM461 hypogeaum at Las Mayores (Barroso *et al.* 2015b).

often lost part of the structure of their roofs and are difficult to define in their original form. It is usual to find geminated structures formed by a chamber and antechamber with a ramp or steps in the entry to the funerary space. At La Salmedina, Yuncos and Las Mayores they are no more than 2.8m long. The narrow central gap enabled the pre-planned closure of the construction, either with a dry-stone wall or with large stones (Barroso *et al.* 2018; Berzosa and Flores 2005; Ruiz Fernández 1975). At Humanejos and Camino de las Yeseras, some structures are longer and reach up to 3.5m in depth with steps cut into the bedrock or with stone steps (Garrido-Pena *et al.* 2019; Liesau and Blasco 2015).

Aspects characteristic of the megalithic style, such as orthostats or masonry structures are so far only known in Valle de las Higueras. They were used in making Cave 1 and in the passages of Caves 5, 8 and 9 (Barroso *et al.* 2015b; Bueno Ramírez *et al.* 2008, 2019a, 2023) although it is clear that the same tradition is behind large stone structures as in the hypogea at La Magdalena and Tomb 1 at Humanejos (Garrido-Pena *et al.* 2019; Heras *et al.* 2014). At that site only one of the structures preserved the roof of the bedrock in which it was dug, but the various postholes suggest the use of vegetal covers (Garrido-Pena *et al.* 2019: 31). Access from an upper area has only been proposed at Yuncos. The reconstruction indicates vaulted chambers about 1.5m in height with niches open into the walls (Ruiz Fernández 1975). Few examples of these ledges dug into the walls, which we called niches, are known apart from at Valle de las Higueras, possibly because of the difficulty in identifying them in the deep parts of the structures (Figure 3).

The floor plans of the three funerary areas at Camino de las Yeseras are peculiar as they delimit collective spaces in which more restricted burials of one to three individuals are grouped. They are semi-excavated oblong spaces between 30 and 60m² in size, with funerary chambers in their banks or central areas. Their use would be for banquets or feasting rituals (Liesau and Blasco 2015). In this delimitation of areas outside the tombs which were used for meetings or movements between them, the remains at Valle de las Higueras are exceptional as the grouping of structures defines a veritable funerary landscape. There is continuous stone walling between the constructions, paths laid out and even stone plinths, perhaps originally facades, that delimit the access to the chambers, as seen in Cave 10 (Bueno Ramírez *et al.* 2008, 2012, 2023) (Figure 4).

Despite the variability in their construction, the tombs are usually closed, sometimes on a monumental scale. This work to seal off the access is usual in most of the cemeteries. The closures aimed to protect the sepulchral deposits and perpetuate the visibility of the tombs in the cemetery (Bueno Ramírez *et al.* 2005: 75). They may even have formed part of the funerary ritual and its symbology (Barroso *et al.* 2014), especially if we bear in mind that the collapse produced at the end of the use of some constructions (Garrido-Pena *et al.* 2019: 20) would make sealing off the entrance unnecessary. The closure must have been one of those solemn moments in death that reinforce bonds among the living (Chapa 2023). Some necropolises in Madrid contain stone closures over a metre in size (Barroso *et al.* 2014; Bueno Ramírez *et al.* 2023), sometimes dismantling the construction itself (Garrido-Pena *et al.* 2019: 20) or transporting large stones. In Valle de las Higueras, large pieces of tabular flint or limestone were brought to the hill, as seen in the stone closure in the form of a door in Cave 9 (Barroso *et al.* 2015b). At Yuncos and Las Mayores, the work was more constructive as walls were raised



Figure 4. Valle de las Higueras. a) Front of cave Cave 10 and its angled construction in the access; b) Top view of the external construction of Cave 10. Photographs: authors.

with stones and mud that could hold up a vaulted roof (Barroso *et al.* 2022; Ruiz Fernández 1975) (Figure 3c).

Cave 3 at Valle de las Higueras

The cave occupies a central position on the edge of the upper plateau of the hill. It faces south-east, towards the Huecas valley. From it, the other caves in the sector would be visible: Cave 7 to the west and Caves, 8, 9, 10 and 4 to the east in the semi-circular shape of the hillside. Only Caves 1 and 5 would be out of the line of sight.

It is an artificial cave whose construction was mixed, with a floor excavated in the rock whereas the frontage and part of the walls were built with stone and covered with clay plaster, possibly with the use of timber props. It comprises two chambers: a circular one in the middle and a rectangular one on the side (Antechamber 3b). They were joined by the same access area (Bueno Ramírez *et al.* 2005). Three niches dug in the wall above the chambers complete its complex inner space. Antler picks and polished axes might be related with the excavation work of digging out the tomb. A fragment of a polished stone axe was found on the surface of Cave 3, and they have also been found among the remains abandoned in other caves.

Cave 3 is barely 3m deep and its frontage is 7m long, only shorter than that of Cave 1 in the necropolis. The **central chamber** is about 2.5m in diameter. Its floor was dug slightly in the clay of the ground and had been prepared with a stone pavement on which the deceased were laid. Its southern wall was built with a wall of limestone slabs and mud that must have formed a slope. Thus, its collapse covered the remains of the chamber and, together with the section of the closure, result in a tumulus-like ruin that was clearly visible at the start of the excavation (Figure 5).

MNI=11 individuals were found inside the cave. The remains were placed one above the other, mixed up, and the characteristic movement of their disarticulation in an empty space made it difficult to individualise them. However, the predominance of a flexed position and the south and east orientations of the skulls, occasionally very close together, could be clearly

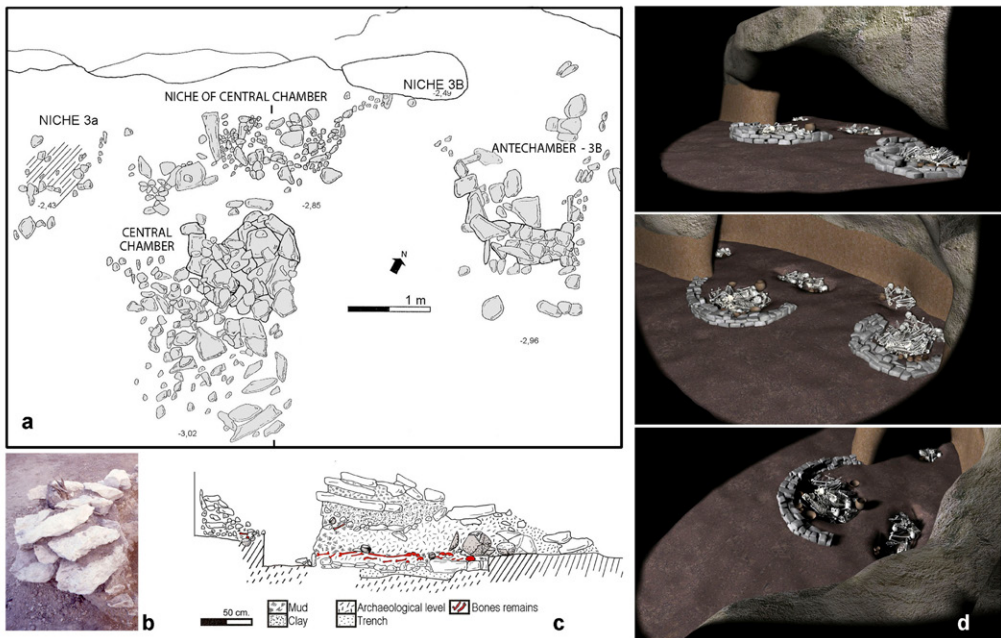


Figure 5. a) Building remains of Cave 3 and their spatial distribution; b) Photograph of the stone and mud closure remains of the central chamber; c) Section of the central chamber and Niche 3c; d) Recreation of the spaces of Cave 3. Authors of the article.

seen. Together with a juvenile with an age of death of 15 to 21 years, there were nine adults, including three mature individuals. One of them displayed arthrosis and wear of molars and premolars despite the absence of caries. A male was dated (GX-29950: 3650±40 BP; Bueno Ramírez *et al.* 2008, 2012). Another adult individual near him gave a recent date for the stratigraphic position he occupied (Beta 157733: 2940±40 BP). In a lower position to the north of the chamber, a mature female individual was quite complete, flexed on her right side, with her head towards the south and facing east. She differed from the others by the presence of caries and her personal grave goods. She wore a necklace with green beads around her neck and had a small dark pebble and *Margarita auricularia* shell at the height of her arms (Figure 6). She provided a third date for the chamber (Beta-205141: 3860±40 BP; Bueno Ramírez *et al.* 2005: 74). The sex of four individuals was determined: two men and two women. The anthropological study also identified the teeth of another infant, with an age of death of 1.5 ± 0.5 years, who was not identified in the field.

The bodies were not placed directly on the ground but on a pavement prepared for them. This surface was divided into two ovals 'beds', 1 x 0.8m in size, made with flat limestone slabs. The western one was better made with stones that fitted together perfectly and a small lip that made its height stand out. The second one was smaller and levelled the access to the chamber that was finally closed with a wall made with medium-sized stones and mud. The collective grave goods were placed around the chamber. They were formed by a dozen plain ceramic vessels, five arrowheads together in the northern sector and four copper awls on the eastern

side of the chamber. Some of the vessels are large and were placed one on top of another or on the osseous remains, which suggests a successive accumulation during the time of use of the construction. The space became gradually smaller until bodies and deposits of pottery were piled up. Only one vessel was found incomplete, possibly because of the introduction of what we interpreted as the last individual to be buried. Its poor state of conservation next to the closure did not allow it to be dated. The closure, made with larger stones, enables the access to be estimated in a section of about one metre (Figure 6).

Cinnabar impregnates all the bones and is especially visible on the individuals in a lower position, such as the woman with the necklace. It is therefore possible that it was spread at different times with the addition of new burials.

Niche 3c was dug into the limestone wall at the back of the cave, opposite the central chamber at a height of only 0.40m. It is a rectangular space, 1.4m long and 0.6m deep. On a slightly sunken surface, apparently unprepared, an adult female was placed in a flexed position on her left side with her head oriented towards the south-east. Two children were placed next to her. The skull and osseous remains of a child of 7 ± 2 years of age were located by her hip. A few remains of metatarsals and phalanges of the feet and a few teeth were only preserved of the second of 3 ± 1 years of age. It is difficult to determine whether these are in a primary position and badly preserved or it is a secondary burial. Around the woman's head, by the south-east wall of the niche, three plain vessels were placed in hardened clay. This trio consisted of a Bell Beaker, in a horizontal position, a carinated bowl and a hemispherical bowl. Cinnabar was sprinkled over all the remains. A radiocarbon date was obtained from a fragment of the adult's skull (Beta-157730: 3810 ± 40 BP; Bueno Ramírez *et al.* 2005). The stones that delimited the niche and covered the remains at the start of the excavation, some of them medium-sized, suggest the area was sealed off after the bodies were deposited.

Access to **Niche 3a** was by a 0.70m corridor from the central chamber. It was located to the west, in the deepest part of the cave and 60cm above the central chamber. A quadrangular

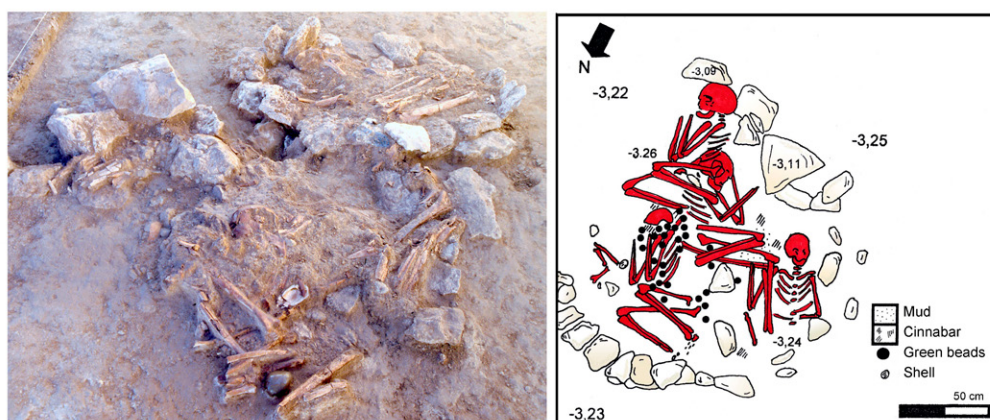


Figure 6. Excavation of the central chamber of Cave 3 with the location of the variscite finds. *Photograph and drawing: authors.*

space of 0.80 x 0.80m was dug in the limestone and some small stones were left to delimit it. Two children were deposited inside, of which only one of them could be identified in primary position. It was flexed with the head oriented towards the south-west. Of 5-9 years of age, he had a necklace of bone beads around its neck. Next to it there were a few remains of a younger child, 2-4 years old, forming a double burial, possibly a primary one and a secondary one (Bueno Ramírez *et al.* 2005). The necklace was represented by 22 bone beads, four of them broken because of their extreme fragility.

Three flat stone on the floor extend the corridor from the central chamber to the east, where **Antechamber 3b** was located. This is rectangular, 2.5 x 1.5m in size, with the floor excavated into the limestone on the hill and a frontage built as a stone and mud wall. It is higher than the chamber and is therefore somewhat independent from it. This suggests a possible vertical entrance or preparation of the ground with steps. Neither of those possibilities could be confirmed owing to the existence of burrows on the inner side, which hindered the reconstruction of the floor plan in that sector (Figure 7).

From the start of the excavation, notable differences were detected in comparison with the central chamber. Initially, the space was only used on the northern side and no osseous deposits were found in the southern sector, where a large vessel was placed. The continued use of the antechamber went beyond that delimitation, and burials were superimposed one on another and occupied the whole space. Unlike in the central chamber, it was difficult to individualise personal grave goods, which appeared mixed with the osseous remains. From the start, groupings of long bones were observed, some of them on pottery vessels. These might result from the regrouping of individuals that had been buried in a primary position or from the introduction of secondary burials. This was definitively confirmed when a bone was found with defleshing marks. Honestly, the MNI of 12 individuals that were determined in the field may include an over-representation of adults. In any case, the anthropological study has demonstrated the association of adults and sub-adults, with a perinatal individual of 9 ± 3 months, and three children: 1 to 4 years of age, 3 ± 1 years old, and less than 10 years old. The sex of two men and one woman was identified.

A total of 17 vessels were deposited with the individuals. Of two of them, only a half was found, which had been placed vertically as if separating the osseous remains. The other vessels were preserved practically whole. A copper awl and needle, two flint arrowheads and three bone rods, of which one was only represented by the apex, were also found. Adornments were especially noteworthy. Although the determination of associations is difficult, two adults and a child were grouped with a large number of green beads, *Trivia arctica* shells and an amber bead. The copper awl was next to the post-cranial skeleton of one of the adults, perhaps acting as a pin fastening some type of cloth or shroud. A radiocarbon date was obtained for one of the adults, a male (Beta-157732: 3830 ± 40 BP; Bueno Ramírez *et al.* 2005: 76). Some flat stones at the base of the structure resemble those used to prepare the floor in the central chamber, without forming such a compact delimited pavement as in the chamber.

At the back of the antechamber, **Niche 3b** was located on a small ledge in the terrain and at the same height as Niche 3a; 0.6m. It was affected by a burrow and therefore its contents represent the only deposit that cannot be confirmed as sealed off. The bone remains belong to two adult individuals, one young and the other mature with significant tooth wear. An incised



Figure 7. View of Antechamber 3b during the excavation. *Photograph: authors.*

Bell Beaker bowl and plain bowl were associated with the remains, as well as two fragments of a Bell Beaker and a piece of a large plain vessel.

Grave goods in Cave 3: raw materials and objects

The grave goods in Cave 3 include food and weapons deposited in an organised and collective funerary ritual. Personal adornments undoubtedly demonstrate the degree of ostentation of the individuals in the structure.

First, pottery is seen in two main varieties. Bell Beaker pottery appears in its characteristic forms: Beaker, carinated bowl and bowl, both plain and decorated. They were found in the niches, whereas there is no Bell Beaker pottery in the chamber and antechamber. The beaker assemblages correspond to the more or less traditional trios, as the carinated bowl was replaced by a bowl in Niche 3a, and Niche 3b possibly contains plain and decorated vessels, although that group was not determined for certain. In the case of the assemblages in Niches 3c and 3a, there is no reason to question their deliberate production for their deposit in the tomb. The latter stands out for the good quality of their finish and the decoration of incised and impressed motifs. They are small, in harmony with the age of the children buried there (Bueno Ramírez *et al.* 2005). The radial motifs around the bases demonstrate the good decorative skill compared with Bell Beaker pottery that displayed increasingly diverse forms as it became more common in the region. The Beaker production in Cave 3 does not show the

excessive speed in firing the pottery that has been noted at proximate funerary sites (Barroso *et al.* 2022; Blasco *et al.* 2005: 460; Garrido-Pena *et al.* 2019) (Figure 8)

The plain pottery in the central chamber is headed by a large vessel with a capacity of 28 litres that must have been awkward to introduce because of the narrow accesses to the structure. This is very evident in passages, as in Cave 8, where also a large pot was placed in the chamber (Bueno Ramírez *et al.* 2008). Like that example, the vessel in the central chamber, 0.30.8cm high and 25cm in diameter in its mouth, remained standing just as it had been left. A plate leaning next to it must have been its lid. The other vessels were also the right way up, one over another or supported by small stones and mud. The use of lids and their vertical position suggest that their contents possessed a special value in the tomb. For this reason, residue analyses were performed and the range of food types was found to include cereals and animal fats (Bueno Ramírez *et al.* 2019a: Figure 6). Unlike in the Bell Beaker assemblages, the container does not appear to have been the most valuable thing. In fact, some of the pots had been repaired, indicating a life before they were brought to the tomb. The surfaces were smooth, and burnish marks are only observed on the smaller pots. The only decoration is plastic, with rows of lugs applied to the wall of one pot and holes that might have been used to hang up the vessels.

In the antechamber, no spatula marks are seen on the pots and some of them were even fired deficiently. Altogether, the pottery in the two chambers displays a varied typology. Globular shapes, soft carinated profiles and hemispherical forms predominate, which are especially noteworthy in Antechamber 3b. Inverted rims are abundant except in the less vertical vessels that finish in everted rims. These are plates of very different sizes that can be placed on top of other vessels as lids, as mentioned above. There are more vessels than buried individuals, and they are most numerous in the antechamber. There is also a significant difference in their sizes. Compared with the large vessels in the chamber, in the antechamber 66% have a capacity of less than one litre, which may indicate variations in the food deposited there or in their preparation (Figure 9).

The diversity in the two chambers is also seen in the compositional characterization of the pottery. Sampling by X-ray fluorescence of a part of the ceramic assemblage at Valle de las Higueras (n=25) included 15 samples of plain pottery from Cave 3. The results demonstrated three different compositions, in which the clay was procured in different places in the area or processed in a different way. Moreover, any relationship between the pottery in the domestic area of Las Vegas and the vessels deposited in the caves was ruled out (Barroso *et al.* 2015a). This productive difference in common craft products made with local raw materials is another reason supporting the presence of further contemporary burials in other hills in the surroundings of Valle de las Higueras.

Although weapons - two copper daggers and a Palmela point - were found in Caves 1 and 4 (Bueno Ramírez *et al.* 2005), the most common metal objects at the site are awls. Six bi-pointed tools with a square cross-section and of variable sizes were recovered. The lengths vary from 9.9cm, in the case of a needle with an eye broken by its use, to a little over 3cm. The functions proposed for metal awls are very varied, from work with textiles, hides and wood and in pottery decoration and as stilettos (Liesau *et al.* 2015; Montón-Subías 2010) to the use as pins in clothing and hair. They may also have been used for specialised work such as goldworking,

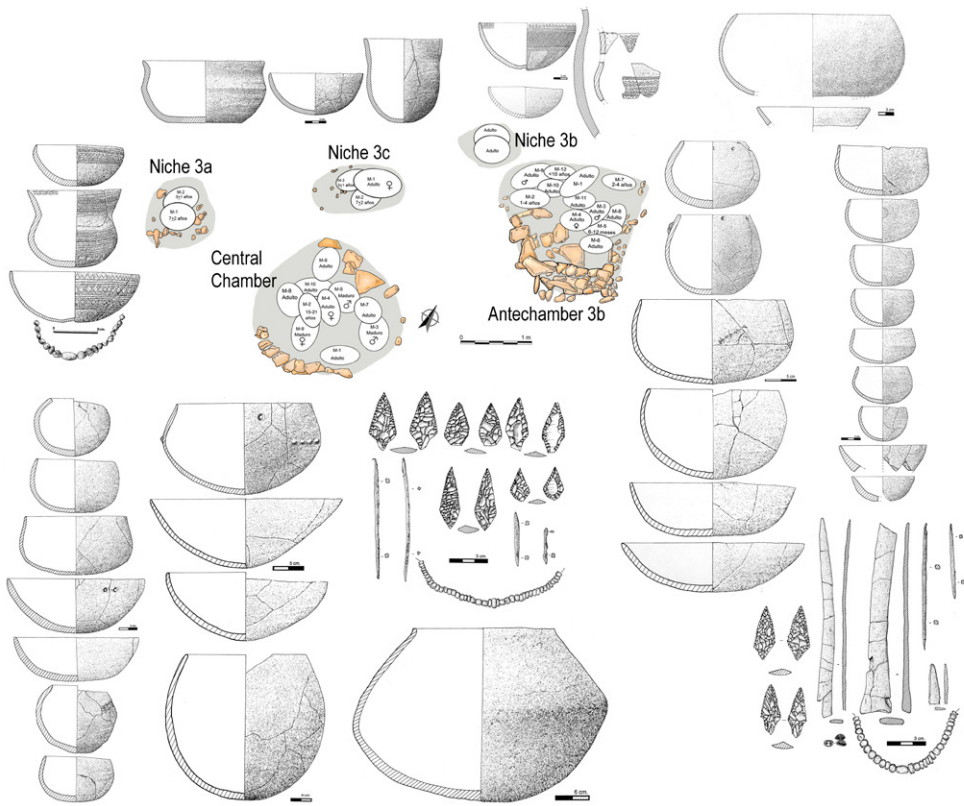


Figure 8. Distribution of individuals and associated grave goods Cave 3 at Valle de las Higueras.
Drawings and design: authors.

as remarked by Dr I. Montero when he observed the smallest specimen with a flat end from the central chamber. Copper resources are well documented in the Province of Toledo and the Sierra de Madrid (Barroso *et al.* 2003). Therefore, it is feasible that local veins were worked, possibly in a diversified way, as appreciated at other necropolises (Blasco *et al.* 2016; Montero and García Vuelta 2019) (Figure 10).

The same mining work used for copper ore may be behind the procurement of cinnabar, but in this case no regional resources were available. The mines at Almadén, over 150km away, were its possible source. This was therefore not only an element used in funerary rituals but also a product that was acquired and exchanged like many other raw materials and valuable items (Bueno Ramírez *et al.* 2019b, 2020).

The adornments in the cave are equally of interest. Green beads appeared in both chambers. Their morphological study and the wear on some of them show that they were used as beads in necklaces. Thus, 43 green beads were located around the neck of the mature woman near the

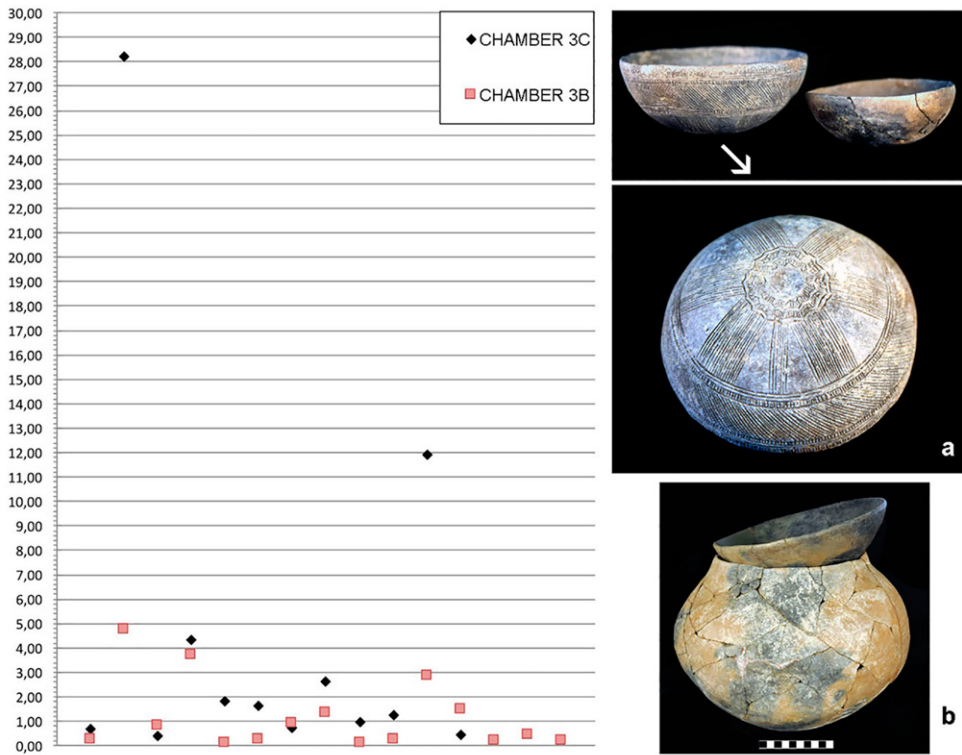


Figure 9. Volumes in litres of the plain vessels from both chambers in the Cave 3. a) Plain and decorated bowls from the Niche 3b; b) Globular vessel and plate from the central chamber. *Authors of the article.*

base of the central chamber. Since when threaded they would have measured 14cm in length, it might be thought that they would only form the central part of a necklace, or that there would be knots or beads made from organic material between them. In Antechamber 3b, the association with an individual is not clear, but the beads display great similarity in their well-rounded edges, which may indicate that they were shaped together. Their diameters are similar (about 6.9mm) and holes are larger than average, which would again suggest a homogeneous necklace. The presence of a single piece made of clinocllore is interesting because that is regarded as a local raw material, from deposits in the Toledo Mountains (Barroso *et al.* 2021: 185). In contrast, variscite comes from specific places in the Iberian Peninsula (Odriozola 2014). One of them, La Peña de Quiruelas in Zamora seems to be the most plausible source for the beads in Valle de las Higueras. Whatever the case, the absence of proximate variscite mines shows that they reached the necropolis as exchange goods, very possibly associated with other items, like marine shells and amber. The dates show that their appearance at Valle de las Higueras is one of the most recent records as the use of variscite tended to die out during the Bronze Age (Barroso *et al.* 2021). The only amber bead is cylindrical, 13mm long, with a hole 2mm in diameter and it came from Sicily (Murillo-Barroso *et al.* 2018). Over a hundred marine shells were found distributed all around the antechamber, with some concentrations that might form part of necklaces. Considering the two holes they display, it might also be



Figure 10. Grave goods from the niches and chambers of Cave 3. *Photographs: authors.*

proposed that they formed part of adornments sewn to clothing (Bueno Ramírez *et al.* 2005) (Figure 10).

The bone beds in Niche 3a are quite varied, possibly because of the raw material with which they were made. The largest oval bead, 11mm in size, occupied the central position. The others become gradually smaller, between 9 and 6mm, are oval or bi-conical and have a central hole. One of them preserves relief with small incisions that might have been decorative. It is interesting that the raw material used for this child's necklace was bone, when variscite is found the structure itself. The raw material or its colour might be associated with a particular age. Bone was also the raw material of the flat rods found in the antechamber, which were

made from a bovid rib. The longest and thinnest of them is 15.5cm in length. Its position next to an individual's head suggests once more that it was a personal adornment, possibly a hairpin. These types of objects are not common in other tombs in the region. Only smoothers and spatulas have been found in the mortuary areas at Camino de las Yeseras, always in the sediment filling the tombs and not associated directly with the burials (Cabrera-Taravillo and Liesau 2023: 233) (Figure 10).

The lithic assemblage comprises seven flint arrowheads shaped bifacially with simple, flat pressure-retouching. The most striking aspect is their variability, as noted in other structures in the necropolis, such as Cave 7, and in the domestic site of the Los Picos settlement. There are rhomboidal arrows and triangular ones with a flat or pointed base, made in good quality flint. They may have been made locally as examples of the operational chain of lithic reduction and flint outcrops are known in the valley (Bueno Ramírez *et al.* 2012) although this needs to be proved by an analytical study.

Some points for discussion

Cave 3 attests many of the points that have changed our concept of the Bell Beaker phenomenon in inland Iberia in recent years.

From the point of view of their construction, together with Cave 1 it can be regarded as one of the most complex funerary structures currently known. Not because of its size, 21m², but owing to its spatial organisation structured in two well-prepared chambers and three interior niches, of which there are few comparative structures in the region. Stone, clay and timber was used to build it, as seen in other necropolises (Garrido-Pena *et al.* 2019). The stones were selected as the larger and more solid stones in the closures are clearly different from those used in the walls of the chambers. The central chamber and Antechamber 3b with their closures were not left outside that closing ceremony that can be extended to the construction as a whole, with or without Bell Beaker remains. The same is true of the cinnabar, which is present both in the niches and in the chamber, where the same ritual of staining the bodies with red was performed (Bueno Ramírez *et al.* 2019b). This selective character and the prestige of the colouring stand out in many other Bell Beaker burials in the region (Liesau *et al.* 2020b).

The number of bodies in the construction is another important aspect. Seven individuals were identified in the niches and 23 in the chamber and antechamber. As noted above, the adults might be over-represented, but a rapid quantification of the other constructions speaks for itself. Cave 3 contained the most bodies in Valle de las Higueras, with the handicap of the lack of information about Cave 1, the most monumental, which was badly altered when the excavations began (Bueno Ramírez *et al.* 2005, 2019a). The other tombs, such as Cave 8 with five individuals are undoubtedly more modest. Tombs like LM256 at Las Mayores with six individuals, Grave 2-3 at La Salmedina with primary and secondary deposits of seven individuals, and funerary Area 3 at Camino de las Yeseras also with six individuals are the constructions with the largest number of bodies (Liesau *et al.* 2020a). The same situation is seen in overall calculations, such as the 19 individuals in the Bell Beaker necropolis at Humanejos, or about thirty if the rest of the population at that time is included (Garrido-Pena *et al.* 2019); 21 at Las Mayores (Barroso *et al.* 2022); and similarly at Camino de las Yeseras, where there

are fewer than twenty individuals associated with beakers, although about fifty without them (Liesau *et al.* 2018).

The proposal of secondary deposits together with primary burials as evidenced in Cave 3 (Bueno Ramírez *et al.* 2005) has been ratified in all the cemetery of hypogea. Not only were bodies reduced to make space, but complex behaviour involving the movement of remains has also been detected (Liesau *et al.* 2018, 2020a). On the other hand, the collective chambers and the niches with double and triple burials in Cave 3 display a reality that leaves no room for doubts. The individual and also collective nature of Bell Beaker burials in inland Iberia is evident, like also the inclusion of women and children in the tombs (Barroso *et al.* 2018; Bueno Ramírez *et al.* 2005, 2017; Liesau *et al.* 2015). However, the casuistic is quite broad. Fully normalised associations are not easily found and instead what seem to be responses to diverse circumstances at the time of the deaths. At Las Mayores the most important tomb corresponds to a woman (Barroso *et al.* 2018). There are individual tombs, while the ones with the most individuals contain five or six, including adults and children, as in Area 21 at Camino de las Yeseras. At Humanejos, the most numerous tomb contains five individuals, and the four single burials in the necropolis are of women and children, as the latter are excluded from the tombs with more than one individual (Garrido-Pena *et al.* 2019: 225). The criteria for the internal individualisation or association in each tomb are not easy to determine either. However, genetic studies have shown that the presence of an adult female and an infant does not guarantee that they are a mother and child (Liesau *et al.* 2020a). It would therefore not be right to assume a relationship between the woman and the children in Niche 3c. There may or may not be direct kinship between them. However, their association demonstrates the importance of the woman in the social reproduction of the group to the extent of occupying a reserved space in the construction.

The most interesting aspect posed by Cave 3 is undoubtedly the distribution pattern of the grave goods. In the cave with a collective use, the materials are distributed among the individualised and non-individualised burials. In order to assess them, it is necessary to bear in mind the unequal distribution of objects in Bell Beaker grave goods at Iberian and regional scales and even within the internal dynamics of each necropolis, since interesting variations are seen.

One of them concerns metal, which is traditionally given priority in Bell Beaker goods and whose behaviour is quite arbitrary. To date, the necropolis with the most copper artefacts is Humanejos. It not only stands out for its 16 metal objects but also because some of them are quite heavy, such as a halberd and a flat axe. Palmela points are the most common in this Madrid necropolis, with seven items. Five of them were found in Tomb 7. In it, only one Palmela point was associated with the two individuals, who were relatives according to the DNA analysis, that were found in the entrance hall of the tomb, separate from the individuals in the chamber. They lacked the cinnabar documented on the burials inside and, so far, genetic studies have ruled out kinship between them and the others (Garrido-Pena *et al.* 2019, 2022). In Valle de las Higueras, although weapons are found, awls and needles are the most common metal objects. The six specimens in Cave 3 were not associated with the individuals accompanied by Beakers. Another scenario is seen in Hypogeum 2-3 at La Salmedina, where no metal was found together with the four individuals in the chamber associated with Beakers. The awl and dagger in that structure were next to the woman with Beakers who occupied

a reserved niche (Berzosa and Flores 2005). The scarcity of copper at Camino de las Yeseras should also be noted, as only Funerary Area 3 contained an awl and there were no weapons. In contrast, gold played a very significant role at that site (Blasco *et al.* 2016).

Awls might be regarded as simple objects, but even so they appear in tombs with outstanding goods. An example is Hypogeum LM322 at Las Mayores, with a Bell Beaker bowl, a long awl, three buttons and an ivory comb (Barroso *et al.* 2018). Similarly, in several cases in the region, awls are associated with women (Garrido-Pena *et al.* 2019) in a relationship traditionally established with the Bell Beaker culture (Clarke 1970: 235) that Cave 3 weakens. In the central chamber, the objects display a clear peripheral and collective character. Their variety and use are suggestive of craftwork that did not differ between men and women and in which both were involved.

Another original aspect of Cave 3 is observed in the presence of flint arrowheads as evidence of archery. Arrowheads are traditionally associated with the Bell Beaker period in the Iberian Peninsula and Europe (Delibes 1977; Nicolas 2012). However, except for Valle de las Higueras, where they appear in half the excavated caves, they are absent in inland necropolises (Ríos 2016). The difficulty in categorising archery items is evident. No archer's wrist-guards or bracers have been found in Valle de las Higueras, contrasting with other necropolises (Barroso *et al.* 2023; Garrido-Pena *et al.* 2019). This indicates different ways of symbolising archery and consequently defence and hunting, which would be a traditional rather than a routine activity. It has also been proposed that flint arrowheads had been replaced by Palmela points (Bailly 2014). However, flint tanged and barbed arrows and metal points were found together in Cave 1 at Valle de las Higueras. It is clearly difficult to assess the criteria for the choice of one or other kind of object and we do not always find what would usually be expected in Bell Beaker grave goods. Thus, a mortar and grindstone were found in Funerary Area 3 at Camino de las Yeseras (Blasco *et al.* 2005), which is also associated with contemporary burials (F-492) without Bell Beakers (Blasco and Liesau 2019).

Plain ware has always been given less importance in Bell Beaker sites, but it is beginning to be more common than was thought. It forms part of pre-Bell Beaker and Bell Beaker burials in the region, although it is interpreted apart from the grave goods as kit of commensality rituals (Garrido-Pena *et al.* 2019: 163; Liesau and Blasco 2015). Cave 3 suggests it was related to deposits of food and drinks for the dead. Cave 5 shows that it is different from the ceramic assemblages outside the closures of the tombs (Bueno Ramírez *et al.* 2008) whose function might have been both as commensality and as containers for offerings. The inclusion of large vessels was demonstrated in the chamber of Cave 8 (Bueno Ramírez *et al.* 2008), which was used before Cave 3, and the tradition appears to have lasted during the whole third millennium BC in the necropolis. The association of collective plain ware with personal items such as the adornments is able to highlight specific individuals, at least in the central chamber.

Chronologically, Valle de las Higueras is the oldest necropolis of hypogea in the area, dated from the first quarter of the third millennium cal BC until well into the Bronze Age (2889-1508 cal BC: IntCal20-2 sigma; Bueno Ramírez *et al.* 2023). Perhaps with more dates, it might reach more clearly the chronology of the late Neolithic in the caves with a more prolonged use like the Portuguese constructions (Sousa and Gonçalves 2019). It should be borne in mind that not all the caves were open for much time. In fact, Cave 9 contains a single burial. In the case of

Site/Cave 3	Ref. Lab.	Material	Date BP.
VH-Cave 3c- M-9	Beta-205141	Bone	3860±40
VH-Cave 3- Antechamber	Beta - 157732	Bone	3830±40
VH-Cave 3 - Niche 3c	Beta- 157730	Bone	3810±40
VH-Cave 3c- M-5	GX-29950	Bone	3650±40

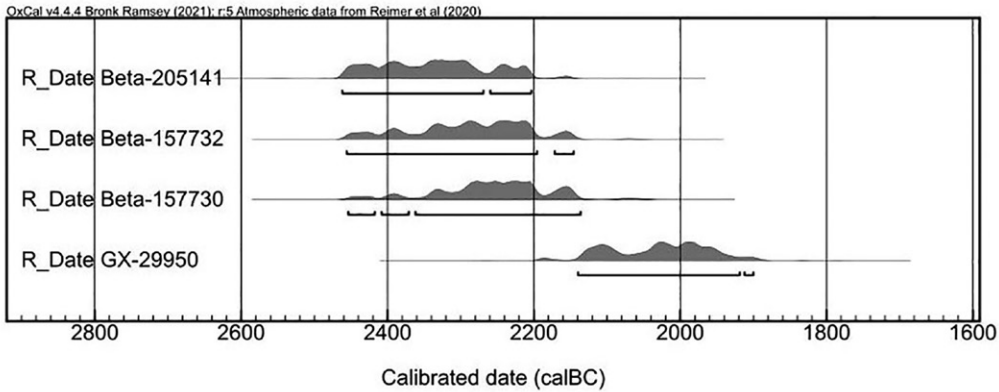


Figure 11. Calibration of dates from Cave 3 (OxCal v 4.4). *Authors.*

Cave 3, five dates have been obtained from the remains of four individuals: one in Niche 3c, three in the central chamber and one in the Antechamber 3b (Figure 11). This is evidently a small number as only 16% of the individuals have been dated. If the most recent is omitted, as the laboratory itself reported issues with the date, the cave may have been in use for nearly 400 years. Probably at the peak of the Bell Beaker period, burials were being made in the niches and both chambers. Currently, the use of the central chamber seems to have been longer and clearly reached the Bronze Age. A similar recent date was obtained in Cave 9 at Humanejos (Garrido-Pena *et al.* 2019), coinciding also with many other Chalcolithic megalithic monuments with levels of destruction and reuse throughout the Bronze Age (Linares 2022).

Conclusions

The Bell Beaker period was not a homogeneous phenomenon either in material culture or in the social organisation of the populations that are associated with it. Valle de las Higueras is a good example of that. Its high location differentiates it from other necropolises. A clear megalithic tradition can be detected in the design of the hypogea and collectiveness was sought in the constructions more than in other necropolises in the region.

The way in which some structures, such as Cave 3 but not all the tombs, were compartmentalised was methodical and premeditated, especially as regards the position of the individuals buried with Beakers. Since the other individuals in the chambers were buried with objects that are traditionally viewed as valuable, like cinnabar, metal or adornments made from exotic materials, it seems that the difference between the two cannot be solely economic. There must have existed social categorisation of greater transcendence, acquired in the case of

young children. The dead buried in the niches and the chambers share many elements; it is the same cave and even if the select pottery appears in specific spaces, the deposits of food and the other items, except the adornments, appear to be collective within a tradition that is clearly reminiscent of megalithic tombs.

It should be stressed that we still know very little about the communities that lived in the interior of the Iberian Peninsula in the second half of the third millennium BC. Much still needs to be studied about their ways of life, but at least the ostentatious and varied Bell Beaker grave goods enable a consideration of the social differences between the buried individuals. Cave 3 indicates that those differences cannot be restricted to a mere dichotomy between people with or without Bell Beaker materials, rich and poor. Far from it, these were more complex and diverse societies but not necessarily more hierarchized. In them, the kinship or lineages, in a very wide sense, possessed value. It is possible that the work that lay behind the procurement of cinnabar, metallurgy, and the transactions and exchanges required to acquire the array of artefacts and raw materials in Cave 3 would have involved many men and women of different ages. This raises doubts about a rigid management of production and resources carried out by just a few individuals who possessed Bell Beakers (Barroso *et al.* 2018; Bueno Ramírez *et al.* 2019b).

Bibliography

- Bailly, M. 2014. Discordance des temps, concordance des espaces ? Remarques sur les armatures de flèches en contexte campaniforme. De L'arc jurassien à l'isthme européen, in R.M. Arbogast and A. Greffier-Richard (eds) *Entre archéologie et écologie, une Préhistoire de tous les milieux. Mélanges offerts à Pierre Pétrequin*: 355-385. Besançon: Presses Universitaires de Franche-Comté.
- Barroso, R., P. Bueno Ramírez and R. Balbín de 2003. Primeras producciones metálicas en la cuenca interior del Tajo: Cáceres y Toledo. *Estudios Pré-históricos* 10: 87-107.
- Barroso, R., P. Bueno Ramírez, R. Balbín de, A. Vázquez and A. González 2014. Nekropolen des 3. Jahrtausends v. Chr. im Zentrum der Iberischen Halbinsel. *Madrider Mitteilungen* 55: 1-28.
- Barroso, R., P. Bueno Ramírez, A. González, R. Balbín de and J.M. Rojas 2018. Tumbas, materialidad y maternidad en los enterramientos de mujeres con Campaniforme: Dos casos de estudio del valle medio del Tajo. *Complutum* 29(2): 319-337.
- Barroso, R., P. Bueno Ramírez, A. González, M. Sáez and J.M. Rojas 2022. Prácticas funerarias del Calcolítico y Bronce en poblados del interior peninsular: el yacimiento de Las Mayores, Numancia de la Sagra (Toledo), in M.J. Sanches, M.H. Barbosa and J. de C. Teixeira (eds) *Romper Fronteiras, Atravessar Territórios (Breaking Borders, Crossing Territories)*: 393-410. Oporto: CITCEM.
- Barroso, R., P. Bueno Ramírez, A. Vázquez, A. González and L. Peña 2015b. Enterramientos individuales y enterramientos colectivos en necrópolis del megalitismo avanzado del interior: la cueva 9 de Valle de las Higueras, in L. Rocha, P. Bueno Ramírez and G. Branco (eds) *Death as Archaeology of Transition: Thoughts and Materials*: 165-176. (BAR International Series 2708). Oxford: Archaeopress.
- Barroso, R., P. Bueno Ramírez, A. Vázquez, C.P. Odriozola, D. Uribe Larrea, O. López Jiménez and J. Yravedra 2015a. Campaniforme no funerario en la provincia de Toledo: el yacimiento de Las Vegas. De nuevo el Valle de Huecas. *Trabajos de Prehistoria* 72(1): 145-157.

- Barroso, R., F. Martínez-Sevilla, M.A. Rodríguez Barbero, O. Cambra-Moo, P. Bueno Ramírez and J.M. Rojas 2023. Reconstructing the Biography of Children's Stone Bracers in the Iberian Peninsula. *European Journal of Archaeology* 26(2): 124-146.
- Barroso, R., C.P. Odriozola, P. Bueno Ramírez, R. Villalobos, R. Balbín de and J.A. Martínez Blanes 2021. Mineral adornments at Chalcolithic sites in inland Iberia: variscite beads at Valle de las Higueras (Huecas, Toledo), Spain. *Mediterranean Archaeology and Archaeometry* 21(3): 177- 203.
- Berzosa, R. and M. Flores 2005. El conjunto funerario de "La Salmedina" (Distrito de Vallecas, Madrid), in M. Rojo, R. Garrido and I. García-Martínez (eds) *El campaniforme en la Península Ibérica y su contexto europeo*: 481-494. Valladolid: Universidad de Valladolid-Junta de Castilla y León.
- Blasco, C. (ed.) 1994. *El horizonte campaniforme de la región de Madrid en el centenario de Ciempozuelos*. Madrid: Universidad Autónoma de Madrid. Departamento de Prehistoria y Arqueología.
- Blasco, C. and C. Liesau 2019. Mundos paralelos: la convivencia de otras prácticas funerarias con los rituales campaniformes, in *¡Un brindis por el príncipe! el vaso campaniforme en el interior de la Península Ibérica (2500-2000 AC)*: 340-363 Madrid: Museo Arqueológico Regional.
- Blasco, C., C. Liesau, G. Delibes, E. Baquedano and M. Rodríguez 2005. Enterramientos campaniformes en ambiente doméstico: el yacimiento de Camino de las Yeseras (San Fernando de Henares, Madrid), in M. Rojo, R. Garrido and I. García-Martínez (eds) *El campaniforme en la Península Ibérica y su contexto europeo*: 457-472. Valladolid: Universidad de Valladolid-Junta de Castilla y León.
- Blasco, C., I. Montero and R. Flores 2016. Bell Beaker funerary copper objects from the centre of the Iberian Peninsula in the context of the Atlantic connections, in E. Guerra and C. Liesau (eds) *Analysis of the Economic Supporting the Social Supremacy the Beaker Groups, Proceedings of the XVII UISPP World Congress*: 19-35. Oxford: Archaeopress Publishing Ltd.
- Bueno Ramírez, P., R. Balbín de and R. Barroso 2000. Valle de las Higueras (Huecas, Toledo, España). Una necrópolis Ciempozuelos con cuevas artificiales al interior de la Península. *Estudios Pré- históricos* VIII: 49-80.
- Bueno Ramírez, P., R. Balbín de, R. Barroso, J.J. Alcolea, R. Villa and A. Moraleda 1999b. *El dolmen de Navalcán. El poblamiento megalítico en el Guadyerbas*. Toledo: Servicio de Arqueología de la Diputación de Toledo.
- Bueno Ramírez, P., R. Balbín de, R. Barroso, J.M. Rojas, R. Villa, R. Félix and S. Rovira 1999a. Neolítico y Calcolítico en término de Huecas (Toledo). *Trabajos de Prehistoria* 56(2): 141-160.
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2004. El dolmen de Azután a la luz de las últimas investigaciones, in A. Caballero and J.L. Ruiz (eds) *Investigaciones arqueológicas en Castilla - La Mancha 1996-2002*: 25-34. Toledo: Junta de Comunidades de Castilla - La Mancha.
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2005. Ritual campaniforme, ritual colectivo: la necrópolis de cuevas artificiales del Valle de las Higueras, Huecas, Toledo. *Trabajos de Prehistoria* 62(2): 67-90.
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2008. Campaniforme en las construcciones hipogeas del megalitismo reciente al interior de la Península Ibérica. *Veleia* 24-25: 771-790.
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2012. *5000 años atrás. Primeros agricultores y metalúrgicos del valle de Huecas (Huecas, Toledo)*. Toledo: Castilla - La Mancha - Diputación provincial de Toledo.
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2017. Redefining Ciempozuelos. Bell-beaker culture in Toledo?, in *Sinos e taças: junto ao oceano e mais longe: aspectos da presença*

- campaniforme na Península Ibérica. Bells and bowls: near the ocean and far away: about beakers in the Iberian Peninsula: 324-341. Lisboa: Universidade de Lisboa.*
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2019a. Ritual y arquitecturas en los hipogeos colectivos con campaniforme Ciempozuelos. La necrópolis de Valle de las Higueras, Toledo, España, in *¡Un brindis por el príncipe! el vaso campaniforme en el interior de la Península Ibérica (2500-2000 AC): 207-227. Madrid: Museo Arqueológico Regional.*
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2019b. Funerary red (cinnabar versus ochre) and megalithic rituals in the central Iberian Peninsula. The hypogean necropolis of Valle de las Higueras, Huecas, Toledo, Spain. *Bulletin de la Société préhistorique française* 116(1): 73-93.
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2020. Rojo de cinabrio en contextos funerarios del Sur de Europa. Tradición megalítica y significado social del color en los hipogeos del interior peninsular, in M. Zarzalejos, P. Hevia. and L. Mansilla (eds) *El “oro rojo” en la antigüedad. Perspectivas de investigación sobre los usos y aplicaciones del cinabrio entre la prehistoria y el fin del mundo antiguo: 225-250. Madrid: UNED.*
- Bueno Ramírez, P., R. Barroso and R. Balbín de 2023. Hipogeos colectivos en el megalitismo del interior ibérico. La necrópolis de Valle de las Higueras (Huecas, Toledo) como caso de estudio. *Menga monográfico* 05: 219-238.
- Bueno Ramírez, P., R. Barroso, R. Balbín de, M. Campo, F. Etxeberría, A. González, L. Herrasti, J. Juan, J.A. López, J.C. Matamala and B. Sánchez 2002a. Áreas habitacionales y funerarias en el Neolítico de la cuenca interior del Tajo: la provincia de Toledo. *Trabajos de Prehistoria* 59(2): 65-79.
- Bueno Ramírez, P., P. Jiménez and R. Barroso 2002b. Culturas productoras y culturas metalúrgicas en Guadalajara: estado de la cuestión, in *Actas del Primer Symposium de Arqueología de Guadalajara. Sigüenza: 229-276. Sigüenza: Asociación de arqueólogos de Guadalajara y Excma. Diputación de Sigüenza.*
- Cabrera-Taravillo, C. and C. Liesau 2023. La industria ósea sobre costillas de mamíferos del yacimiento calcolítico de Camino de las Yeseras (San Fernando de Henares, Madrid). *Archaeofauna* 32(1): 225-240.
- Chapa, T. 2023. Muerte, ritos y tumbas: una perspectiva arqueológica. *Vínculos de Historia* 12: 125-143.
- Clarke, D.L. 1970. *Beaker Pottery of Great Britain and Ireland*. Cambridge: Cambridge University Press.
- Delibes, G. 1977. *El Vaso campaniforme en la Meseta Norte Española*. Valladolid: Studia Archeologica 41.
- Díaz del Río, P., S. Consuegra, J. Audije, S. Zapata, O. Cambra, A. González, A. Waterman, J. Thomas, D. Peate, C. Odriozola, R. Villalobos, P. Bueno Ramírez and R.H. Tykot 2017. Un enterramiento colectivo en cueva del III milenio AC en el centro de la Península Ibérica: El Rebollosillo (Torrelaguna, Madrid). *Trabajos de Prehistoria* 74(1): 65-85.
- García Sanjuán, L. 2013. El asentamiento de la Edad del Cobre de Valencina de la Concepción: estado actual de la investigación, debates y perspectivas, in *El asentamiento prehistórico de Valencina de la Concepción. Investigación y tutela en el 150 aniversario del descubrimiento de La Pastora: 21-59. Sevilla: Universidad de Sevilla.*
- Garrido-Pena, R., R. Flores and A.M. Herrero Corral (eds) 2019. *Las sepulturas campaniformes de Humanejos (Parla, Madrid)*. Madrid: Comunidad de Madrid, Dirección General de Patrimonio Cultural.

- Garrido-Pena, R., R. Flores, A.M. Herrero, P. Muñoz, C. Gutiérrez and R. Paulos 2022. Atlantic Halberds as bell beaker weapons in Iberia: tomb 1 of Humanejos (Parla, Madrid, Spain). *Oxford Journal of Archaeology* 41(3): 252-277.
- Heras, C.M. V. Galera and A.B. Bastida 2014. Enterramientos y ritual funerario en una necrópolis calcolítica con campaniforme en la submeseta sur: El Yacimiento de “La Magdalena” I (Alcalá de Henares), in *Actas de las novenas jornadas de Patrimonio Arqueológico en la Comunidad de Madrid*: 213-227. Madrid: Museo Arqueológico Regional de la Comunidad de Madrid.
- Jiménez, P.J. 1997. El campo tumular de la Mestilla-Abadón (Anguita, Guadalajara), in R. Balbín and P. Bueno (eds) *II Congreso de Arqueología Peninsular vol. II: Neolítico, Calcolítico y Bronce*: 333-346. Zamora: Fundación Rei Afonso Henriques.
- Leisner, V., G. Zbyszewski and O. da V. Ferreira 1961. *Les Grottes Artificielles de Casal do Pardo (Palmela) et la Culture du Vase Campaniforme*. (Memória 8, N.S.). Lisboa: Serviços Geológicos de Portugal.
- Liesau, C. and C. Blasco 2015. La diversidad campaniforme en el mundo funerario: algunos ejemplos de la Cuenca Media/Alta del Tajo en el interior peninsular. *Arpi* 3 extra: 272-286.
- Liesau, C., C. Blasco and P. Ríos 2020b. El cinabrio, un color para las élites. Su presencia en los contextos funerarios campaniformes en la región, in M. Zarzalejos, P. Hevia and L. Mansilla (eds) *El “oro rojo” en la antigüedad. Perspectivas de investigación sobre los usos y aplicaciones del cinabrio entre la prehistoria y el fin del mundo antiguo*: 201-224. Madrid: UNED.
- Liesau, C., C. Blasco, P. Ríos and R. Flores 2015. La mujer en el registro funerario campaniforme y su reconocimiento social. *Trabajos de Prehistoria* 72(1): 105-125.
- Liesau, C., C. Blasco, P. Ríos, J. Vega, R. Mendiña, J.F. Blanco, J. Baena, T. Herrera, A. Petri and J.L. Gómez 2008. Un espacio compartido por vivos y muertos: El poblado calcolítico de fosos de Camino de las Yeseras (San Fernando de Henares, Madrid). *Complutum* 19 (1): 97-120.
- Liesau, C., P. Ríos and C. Blasco 2020a. Bell Beakers in central Iberia: keeping the ancestors’ memory alive. *Préhistoires Méditerranéennes* 8. <https://doi.org/10.4000/pm.2386>
- Liesau, C., P. Ríos, C. Blasco and I. Ortíz 2018. Dentro y fuera de las tumbas campaniformes en Camino de las Yeseras: ¿una segunda vida para los muertos?, in *Homenaje a la profesora Isabel Rubio de Miguel*: 141-52. Anejos a Cuadernos de prehistoria y Arqueología de la Universidad Autónoma de Madrid 3, Madrid: Departamento de Prehistoria y Arqueología UAM.
- Linares, J.A. 2022. Radiocarbon chronology of dolmens in the Iberian southwest: architectural sequence and temporality in the El Pozuelo megalithic complex (Huelva, Spain). *Radiocarbon* 64 (5): 989-1064.
- Montero, I. and O. García Vuelta 2019. Metales en las tumbas campaniformes de Humanejos (Parla, Madrid), in R. Garrido-Pena, R. Flores. and A. Herrero-Corral (eds) in *Las sepulturas campaniformes de Humanejos (Parla, Madrid)*: 284-294 Madrid: Dirección General Patrimonio Cultural de la Comunidad de Madrid.
- Montón-Subías, S. 2010. Muerte e identidad femenina en el mundo argárico. *Trabajos de prehistoria* 67(1): 119-137.
- Murillo-Barroso, M., E. Peñalver, P. Bueno-Ramírez, R. Barroso, R. Balbín and M. Martiñón-Torres 2018. Amber in prehistoric Iberia: New data and a review. *PLoS ONE* 13(8), e0202235. <https://doi.org/10.1371/journal.pone.0202235>
- Nicolas, C. 2012. Des pierres précieuses ? les pointes de flèches du campaniforme et de l’âge du bronze ancien en bretagne (2500-1700 avant notre ère), in G. Marchand and G. Querré (eds) *Roches et Sociétés de la Préhistoire entre Massifs cristallins et Bassins sédimentaires* : 205-222. Rennes: Presses Universitaires de Rennes.

- Odrizola, C. P. 2014. A new approach to determine the geological provenance of variscite artifacts using the P/Al atomic ratios. *Archaeological and Anthropological Sciences* 7: 329-350.
- Oñate, P., M. Sánchez, E. Penedo and J. Sanguino 2001. Hallazgo de un enterramiento campaniforme en la iglesia catedral de Santa María Magdalena de Getafe (Madrid). *Bolskan* 18: 349-356.
- Riaño, J.F., J. Rada y Delgado and J. Catalina 1894. Hallazgos prehistóricos en Ciempozuelos. *Boletín de la Real Academia de la Historia* XXV: 436-350.
- Ríos, P. 2016. The role of flint arrowheads in Bell Beaker groups of the Central Iberian Peninsula, in E. Guerra and C. Liesau (eds) *Analysis of the Economic Supporting the Social Supremacy the Beaker Groups, Proceedings of the XVII UISPP World Congress*: 111-128 Oxford: Archaeopress Publishing Ltd
- Ruiz Fernández, F. 1975. Una necrópolis de la Edad del Bronce en Yuncos (Toledo). *Sautuola* I: 117-133.
- Soares, J. 2003. *Os hipogeus da Quinta do Anjo (Palmela) e as economías do simbólico*. Setúbal: Museu de Arqueologia e Etnografia do Distrito de Setúbal.
- Sousa, A.C. and V.S. Gonçalves 2019. Presencia del campaniforme en las cuevas artificiales de las penínsulas de Lisboa y Setúbal, in *¡Un brindis por el príncipe! el vaso campaniforme en el interior de la Península Ibérica (2500-2000 AC)*: 179-204. Madrid: Museo Arqueológico Regional.
- Valera, A.C., A.M. Silva, C. Cunha and L.S. Evangelista 2014. Funerary practices and body manipulations at Neolithic and Chalcolithic Perdigões ditched enclosures (South Portugal), in A.C. Valera (ed.) *Recent Prehistoric Enclosures and Funerary practices*: 37-57. (BAR International Series 2676). Oxford: Archaeopress.

Displaying power: burial structures in Humanejos cemetery (Parla, Madrid)

Rafael Garrido-Pena

Universidad Autónoma de Madrid, Spain

Raúl Flores Fernández

Independent Scholar. Madrid, Spain

Ana Mercedes Herrero-Corral

Austrian Archaeological Institute. Vienna, Austria.

Rodrigo Paulos-Bravo

Universidad Complutense de Madrid, Spain

Abstract

This paper provides evidence about the emergence of social elites in the interior of Iberia, mainly during the second half of the 3rd millennium BC when Bell Beakers appeared and spread, in connection with the burial sequence at Humanejos. The excavation of this cemetery revealed a significant number of graves (around 100), radiocarbon dated to a long period between 3300 and 1400 BC. During the pre-Beaker period, both in the Late Neolithic (3300-2900 BC) and in the Early Copper Age (2900-2500 BC), as well as in the Bronze Age (2000-1400 BC), the graves are quite simple and homogeneous, consisting only of small circular pits of varying depth. However, during the Bell Beaker phase (2500-2000 BC), the graves are much more complex and varied. The first hypogea appear, but also stone chamber structures and complex pits with an antechamber and large postholes connected to a vegetal roof. They were all finally closed and sealed at the end of their useful life, sometimes with the accumulation of considerable quantities of stone blocks. During these closing ceremonies, certain pottery ‘commensality sets’ were deposited. This increase in the structural complexity of burial structures and rituals is also accompanied by a clear increase and concentration of grave goods with few individuals. This also coincides with a period of profound economic, social and ideological change, when the first signs of social hierarchisation appeared and were displayed in some of these burials.

Key words: Bell Beakers, Chalcolithic, Bronze Age, burials, social hierarchisation, ritual

The Humanejos site: location, archaeological excavation and burial sequence

The archaeological site is located about 20 kilometres south of Madrid (Figure 1), in the town of Parla, next to the Humanejos stream, in a flat valley with small, gentle slopes that has been greatly transformed by agricultural work and, more recently, by industrial activity. It was originally an area rich in small streams and ponds, which were drained during the 20th century. Although it was discovered during a survey of medieval sites in 1981 and the first sondages were made in 1982, it was not until 2008-2012 that very intensive and extensive fieldwork was carried out as part of a rescue excavation led by Raúl Flores, due to the construction



Figure 1. Location of the site of Humanejos in Parla (Madrid) and distribution of the structures. *Authors of the article.*

of the PAU5 industrial park. As a result, almost 20 hectares of the site have been excavated, although it extends further south in the Parla and Torrejón de la Calzada areas. More than 2000 structures have been documented, mainly concentrated in the eastern part of the site, which is less densely occupied in the west, belonging to different periods from the Late Neolithic to the Iron Age. However, the Chalcolithic phase is the best represented, especially in the central and northern parts of Humanejos, with more than 1700 structures (Figure 2). They are all circular pits dug into the rock, of different sizes and depths, the typical prehistoric site in the interior of Iberia. Most of them are domestic structures, such as postholes and possible silos, but others have no practical function and even the larger ones could be parts of huts. There is also a small horseshoe-shaped ditched enclosure of only 0.12 hectares, open to the south.

Only 19 of these domestic pits yielded Bell Beaker pottery, mostly of Ciempozuelos style (80%), distributed in different parts of the site. This contrasts with the importance and richness of the nine Beaker graves in the same site (Garrido-Pena *et al.* 2019), which in turn reflects the complex interpretation of domestic Beaker contexts in central Iberia (Garrido-Pena 2019). In addition to these domestic structures, up to 106 graves with 168 individuals of different typology and chronology have been excavated. They are distributed all over the site, with occasional concentrations, making it one of the richest and most spectacular burial sequences of Copper and Bronze Age Iberia.

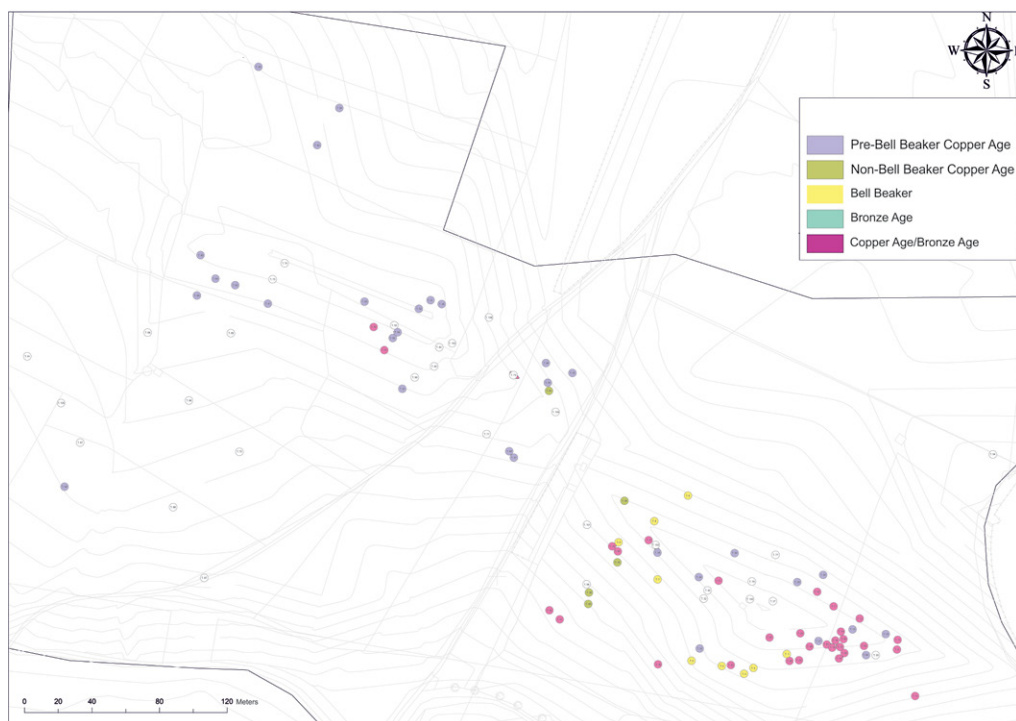


Figure 2. Map showing the spatial distribution of the burial structures at Humanejos (Parla, Madrid) in relation to their chronology. *Authors of the article.*

Almost all these graves have been radiocarbon dated, forming a rich and continuous burial sequence dating from the last quarter of the 4th millennium BC to the middle of the 2nd millennium BC. 42 of them, with 81 individuals, belong to the pre-Beaker period: 15 to the Late Neolithic (3300-2900 BC) with 28 individuals and 27 to the Early Copper Age (2900-2500 BC) with 53 individuals. Only nine graves, with 16 individuals, contained Bell Beaker inhumations (2500-2000 BC), but we have also identified seven non-Bell Beaker graves that are contemporary with them. Finally, 36 graves with 50 individuals belong to the Bronze Age (2000-1400 BC), and 12 are still undetermined.

Their spatial distribution by phase is varied. They were clearly dispersed in the pre-Beaker burials but more closely grouped during the Bell Beaker period, and especially during the Bronze Age, when the burial evidence is so concentrated in the south-east of the site that we could really speak of a real cemetery, close to the agglomeration of domestic structures with the same chronology.

Late Neolithic and Early Copper Age burial structures (3300-2500 BC)

During this period, the burials were very simple and homogeneous, consisting of small pits dug into the rock, very similar and close to other dwellings with the same external appearance.

They all form the so-called ‘pit fields’ that are so characteristic of prehistoric Holocene sites in the interior of Iberia before the Iron Age. These graves do not have postholes or any other auxiliary structures, but we know for sure that some of them were used for a certain period of time, since they contain human inhumations in both primary and secondary positions. Together with the discovery of several anatomical displacements of bones during the process of decomposition, this shows that many of these tombs were open and accessible until they were finally closed and sealed with sediment. At the same time, however, the human remains were probably protected by some sort of vegetal structure that left no trace in the archaeological record. Perhaps they functioned as a sort of house for the dead, like those of the living, which were eventually dismantled and covered when their usefulness was over. In addition, in several graves, some large pots were deposited next to the deceased and their offerings, perhaps the remains of some final rituals in which the participants ate and drank, with the vessels used in the ceremony being finally deposited inside the burial chamber. Even in the case of Tomb 49, a multiple burial of an adult male and three children accompanied by an abundance of grave goods (plain pottery, copper tools, stone beads), a small pot was found inside a large storage vessel placed next to the bodies, beside the southern profile of the chamber.

There are single, double and multiple burials, but the grave goods are practically absent or scarce until 2700-2500 BC, consisting only of flint tools (arrowheads, a dagger/knife), polished axes or bone awls, with only one complete pot. After 2700-2500 BC they increase spectacularly in volume, with the first copper objects appearing (Garrido-Pena *et al.* 2020) and a significant

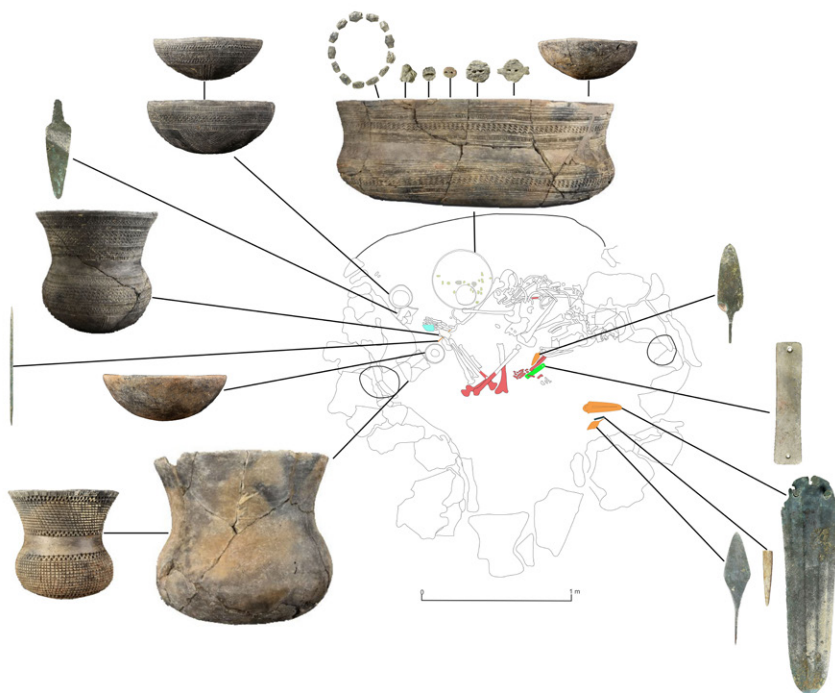


Figure 3. Bell Beaker Grave 1 at Humanejos (Parla, Madrid). *Authors of the article.*

set of 160 stone beads, mainly made from exotic raw materials such as variscite (Odriozola *et al.* 2017). Although the structures are very similar, the contents are quite different, with striking differences between individuals and even rich infant and adolescent graves contain copper tools, ceramics and variscite stone beads. Adults predominate but there is an important and unusual number of children and males are clearly more abundant than females in those graves.

The burial structures during the Bell Beaker period

This trend towards complexity developed extraordinarily and increased in the second half of the 3rd millennium, when the Bell Beaker tombs appeared. There is no single type of Beaker grave, but rather a great diversity, since they are generally different from each other (Figure 3-6). This diversity is also linked to a spectacular increase in structural complexity, as the tombs possess different chambers and antechambers, postholes and the occasional use of stone slabs to define the perimeter of the chamber or even to build complex features such as an authentic staircase to reach a very deep chamber 3 metres below the surface in Tomb 9 (Figure 6). There is even a hypogeum (Tomb 5), also with postholes to support the natural roof (Figure 4).



Figure 4. Bell Beaker Grave 5 at Humanejos (Parla, Madrid). *Authors of the article.*

The antechambers

The presence of antechambers, as in Tombs 3 or 7 (Figure 5), is also characteristic of this site during the Bell Beaker period. These features may be related to public attendance to the performance of funerary rituals or ceremonies prior to entering the chamber where the bodies were deposited. In Tomb 3, a single inhumation of a female accompanied by a Ciempozuelos-style ceramic set, a copper awl and ivory beads, the antechamber was practically on the same level as the chamber, but they were clearly marked and separated.

This is even clearer in Tomb 7 (Figure 5), where there is a significant difference between the level of the antechamber and that of the chamber, which was accessible by a ramp 1 metre below. Moreover, the nature of the evidence found in the two tombs is strikingly different, since in the upper antechamber only scattered bones of two males aged 25-35 years were found, together with a copper Palmela point. These two males were closely related (2nd-3rd generation) and one of them had a large trepanation in the skull. In contrast, the other individuals found in the main chamber were two undetermined adults and one adolescent male (according to DNA), in primary position, but modified by different reorganisations of the grave goods. They had a large number of Beaker offerings, such as several decorated pots of an earlier style, two stone wrist guards, copper weapons (a tanged dagger and four Palmela points) and gold jewellery (three small plaques). It seems, therefore, that the antechambers could have been the scene of funeral rites before the bodies were deposited in the burial chambers,

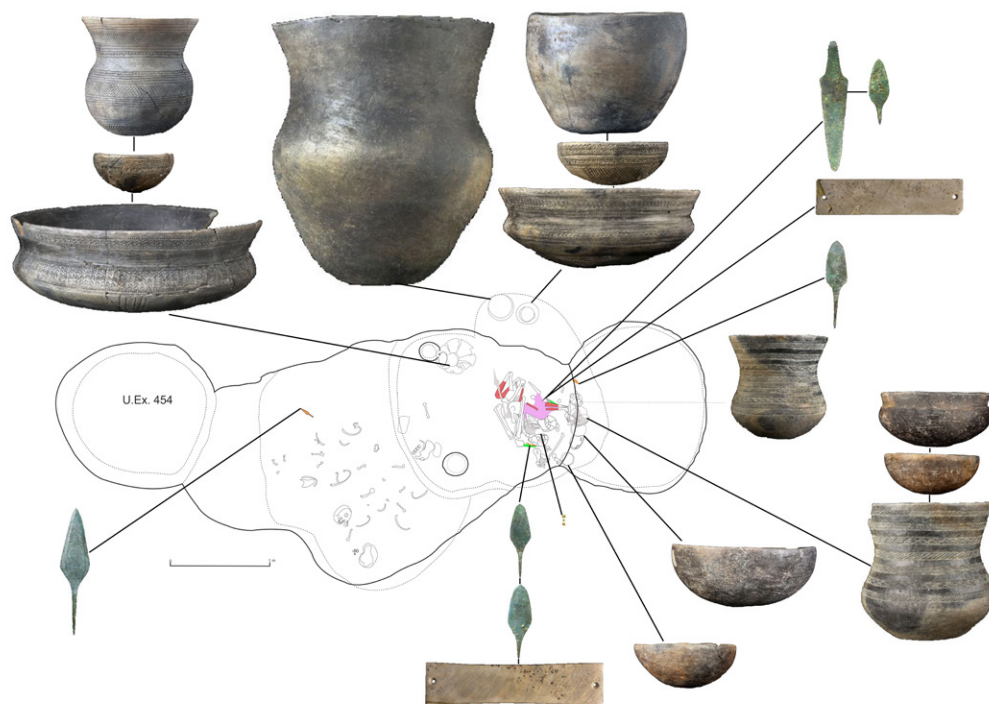


Figure 5. Bell Beaker Grave 7 at Humanejos (Parla, Madrid). *Authors of the article.*

and the attendants could have participated in those and witnessed them. At the same time, they could also have played a key role in the closing ceremonies, at least in this example, where these bodies appeared in a secondary position. In addition, a ceramic set of four pots (a large storage vessel and a deep bowl, as well as two decorated beakers, a carinated bowl and a bowl) were found in this tomb, nestled against one of the walls of the burial chamber, but away from the bodies. These could be the remains of one of the burial ceremonies, possibly the last one, or the final closure of the tomb. In fact, the decorated vessels are of Ciempozuelos type, a later local Beaker style. Other Beaker tombs in Humanejos have these sets of pots, such as Tomb 4, where five plain vessels were placed one inside the other against one of the walls of the chamber, but clearly separated from the body of a woman, accompanied by excellent Beaker grave goods (pottery and gold and ivory ornaments).

Body and object movements inside the grave

Most of the Beaker tombs on the site were used for a period of time, as some of them are double or even multiple, and different bodies were introduced during the sequence of use. The movement of grave goods and bones can be clearly seen in several examples, such as this Beaker Tomb 7, where not only the bones of the first burials in the chamber have been moved, but also several pottery items. For example, one of the decorated vessels found near the wall of the burial chamber is missing a large fragment of the rim, which was found in its original position near one of the bodies. This vessel, and probably the other one found in the same place, was originally placed next to the bodies and later moved to this final location.

In Beaker Tomb 1 (Figure 3), the body of a male individual was accompanied by a large quantity of grave goods, including several Ciempozuelos-style beakers, a stone wrist guard, and copper weapons such as a tanged dagger, two Palmela points, and a spectacular Atlantic halberd (Garrido-Pena *et al.* 2022a). This last inhumation displaced and altered the bones and grave goods of an earlier female individual, which were moved towards the northern wall of this tomb. It seems, therefore, that most Beaker graves were accessible during a period when they were visited to introduce new bodies and perhaps to celebrate ceremonies in memory of these ancestors. In fact, many of the Beaker tombs in Humanejos have large postholes on either side of the chamber, indicating that they were covered by vegetal roofs when they were used as burials (for example, Tombs 1, 2, 3, 4, 5, 7), until they were finally closed, sometimes even with significant accumulations of stones. Three tombs had this type of stone seal at the entrance, such as Tomb 4, but especially Tomb 5, a hypogeum, and Tomb 1, a stone chamber, where these stones were visible on the surface as a 2.70m x 2m pile.

Humanejos is not the only example of this type of stone closure in the Beaker burials of the middle Tagus Basin, as it has been widely documented in the artificial caves of Valle de las Higueras (Bueno *et al.* 2005: 80), the hypogea and pits at Camino de las Yeseras (Liesau *et al.* 2008: 111-112; Ríos Mendoza 2010: 481 and 487-88; Vega *et al.* 2010: 656 and figure 10A), La Magdalena (Heras Martínez *et al.* 2011: 19; 2014: 217 and figure 5 and 220) and Salmedina (Berzosa and Flores 2005; Flores Díaz and Berzosa 2003).

Other types of graves

However, the Beaker tombs at Humanejos also show other types of complex structures. This is the case of the aforementioned Tomb 1 (Figure 3), which is a rectangular but irregular stone chamber (2.1m x 2m and 1.2m deep) with no clear parallels in the Iberian Beaker burial world. It is built with small vertical flint slabs, but it is not a true megalithic structure. It also has two large postholes, 20cm in diameter and 60cm deep, on either side of the entrance to the chamber, which would have supported a vegetal roof. Tomb 2 is a large circular pit (3.5 x 3.75m and 1.6m deep), like Tomb 4 (3.2m x 3.54m and 1.6-1.73m deep), also with two large postholes 40cm in diameter and 42cm deep, one on each side, again belonging to a vegetation roof. The peculiarity of this case, however, is that no human remains were found and the entire 'grave goods', a set of four complete Beaker vessels in the Comb Geometric Style, appeared fragmented inside one of the postholes. It appears that the structure was dismantled and closed, with the grave goods deliberately destroyed and deposited in this posthole. Was this the cenotaph of someone who had died elsewhere? It is impossible to know, but it was a unique and exceptional case at Humanejos. Nevertheless, other Beaker sites in the interior of Iberia show similar examples of possible cenotaphs, with rich grave goods and no human remains (Rojo *et al.* 2014).

Tomb 5 at Humanejos is a hypogeum excavated in the rock (Figure 4), with a vestibule/ antechamber or entrance facing south-west, in the shape of an oval pit (1.8 x 1.4m), and an underground burial chamber to the north-east, measuring 2.5m in diameter and 2.4m high in the centre. There was a small step in the southern wall of the antechamber, which undoubtedly formed part of the entrance to the tomb. Inside the burial chamber, two large postholes (20cm in diameter and 22cm deep) were discovered, aligned on an east-west axis, on either side of this chamber, in the central area, but close to the entrance. Another smaller pit (20cm in diameter and 12cm deep) appeared in the frontal area of the chamber but outside the roofed part of the tomb, close to the border with the antechamber, perhaps the support of the vegetal roof of this entrance to the tomb. Inside the sediment that fills this tomb, a strangely worked stone block was found near the wall and close to this last posthole, but in a different layer. It was clearly polished, oval in shape, 35cm high, 28cm wide and 15-16cm in diameter in the upper part, where a clear border had been carved. The lower part was unworked and irregular, perhaps because it was buried when the block was used as a kind of base for a wooden post. Similar hypogea are known in the middle Tagus Basin from recent excavations, such as in Salmedina (Berzosa and Flores 2005; Flores Díaz and Berzosa 2003) and La Magdalena (Heras Martínez *et al.* 2011; Heras Martínez *et al.* 2014).

Finally, another unique Beaker tomb at Humanejos is Tomb 9, a very deep hypogeum or pit grave with a stone staircase leading to a deep burial chamber 3.5 m below the surface (Figure 6). The staircase was built of limestone and flint blocks, organised in four large rectangular steps, and reached a semicircular chamber measuring 1.8 x 1.3m. The remains of human bones and Beaker grave goods appeared fragmented and scattered in the sediment filling this pit-grave. No post-Beaker material was documented, and therefore it appears that this grave was deliberately destroyed in the Beaker period, perhaps in the context of social power struggles, as a kind of 'damnatio memoriae' (Flores Fernández and Garrido-Pena 2014).



Figure 6. Bell Beaker Grave 9 at Humanejos (Parla, Madrid). *Authors of the article.*

Two infantile Beaker burials (Tombs 6 and 8) were also discovered in Humanejos, both simple pits of small diameter (around 1m). This type of burial is exceptional in the middle Tagus Basin area (Herrero-Corral *et al.* 2019), but not unique, as other infantile Beaker burials are known at nearby sites, such as Las Mayores or Valle de las Higueras in Toledo (Barroso *et al.* 2018a; Bueno *et al.* 2012).

Thanks to the extensive radiocarbon sampling of the Humanejos cemetery, we have been able to identify burials contemporaneous with the Bell Beaker period, but without this kind of elite material and ritual. There are six graves (14 individuals) with very simple burial structures; mere pits of varying sizes. The grave goods are usually absent or very modest (just plain pottery) and, interestingly, these individuals display much more pathological evidence in their bones than those accompanied by Bell Beaker in the more complex structures described above.

The Bronze Age burial structures at Humanejos

In this cemetery 36 graves with 50 individuals belong to the Bronze Age (2000-1400 BC). They are all pits of varying size and depth, so this seems to be a return to the structural simplicity of the pre-Beaker period, but now with a complete lack of grave goods, apart from a few

exceptions accompanied by scarce pottery. Adult individuals and children are almost equally represented in these graves and again males clearly predominate over females. The bodies are mostly found in primary position, but there are examples in secondary position and others with both, again suggesting that several graves were accessible during a period when different bodies were introduced. There is no evidence of postholes or other foundations for the vegetal structures that would have been used to protect the bodies during these periods. There is also a predominance of single burials (26 tombs), but double (7 graves) and multiple burials (3 tombs) are also present.

There are two exceptions to this structural simplicity, the first being the so-called ‘pithoi’ or pottery jars containing inhumations, such as Tomb 36 of an adult, Tomb 42 of an 8-year-old child and Tomb 80 with another non-adult. This is a type of Bronze Age burial widely known in the region in very nearby sites such as Tejar del Sastre (Madrid) (Quero 1982), La Loma del Lomo in Guadalajara (Gusi and Lujan 2011: 177-78; Valiente 1992) or Las Mayores in Toledo (Barroso *et al.* 2018b) and elsewhere in other parts of the Iberian Peninsula (Barroso *et al.* 2018b: 24-5 and table 2), such as the Argar (Gusi and Lujan 2011: 155-70 and 191-95; Lull *et al.* 2004), La Mancha or Motillas (Gusi and Lujan 2011: 174-76; Nájera *et al.* 2010), for example. Interestingly, this is a peculiar burial type that is also known in other archaeological groups in Europe, such as Unetice (Moser 2024), and finally in the eastern Mediterranean, as in Bronze Age Crete (Vavouranakis 2014).

The other exception is a very peculiar and special burial, Tomb 31 at Humanejos (Herrero-Corral *et al.* 2020) (Figure 7). It is a single inhumation of a young man between 15 and 18 years of age in a circular pit excavated in the sandy brownish natural rock, with a diameter of about 1.35m and a depth of 1.3m in the centre. Inside this tomb, a single inhumation was found in the centre of the pit, in a sitting position, a clearly atypical posture. The upper part was found disarticulated, but the lower part, from the chest to the feet, was intact, in perfect anatomical connection. The size of the structure is clearly larger than necessary to hold this seated individual, who was carefully placed in the centre, giving the impression that the tomb was perhaps not made for this specific purpose, but was reused. It had been redesigned to accommodate a seated individual, as the bottom of the pit was surprisingly adapted to accommodate both the bottom and the feet of this body, by digging a small space in the middle measuring approximately 55cm x 40cm, with two small steps, the first at a depth of 20cm for the bottom, and then another 5-7cm deeper for both feet. Only one complete flint arrowhead was found in the area of the disarticulated bones of the upper body. The wear analysis showed signs of use as a projectile. In conclusion, it seems that this body was deposited in a sitting position and was exposed for a period of time during which it was only partially covered by sediment. The upper part of the body was accessible and visible inside the pit, although this structure was certainly protected, otherwise it would have been altered by animals during the decomposition process. However, careful taphonomic examination of the bones did not reveal any traces of such post-depositional modification (gnawing). The pit was probably covered or protected, but at the same time we can conclude that it was also accessible, as it would make no sense to leave an exposed body inside a completely closed structure. In this sense, it would be a case of corpse exposure and therefore a secondary ritual, as documented in the ethnographic record in many parts of the world, sometimes even with seated bodies, as among the Berawan of Borneo (Metcalf and Huntington 1991: 92 and figure 4).



Figure 7. Bronze Age Grave 31 at Humanejos (Parla, Madrid): a) disarticulated bones from the upper part of the body, b) lower part of the skeleton in anatomical connection, c) rib cage in anatomical connection and vertical position. *Authors of the article.*

Was the flint arrowhead used to kill this person? Was it associated with some kind of funeral ceremony (sacrifice to the gods, public punishment?). Examination of the bones did not reveal any signs of a possible wound caused by the arrowhead, but it is quite possible that the point only penetrated the flesh and not the bone, damaging a critical organ or blood vessel and causing death. No signs of violence were found in the bones of this individual. What was so unique about this individual that he was given such a strange burial? Was it a special elite burial? Other seated burials in different areas of Europe have been attributed to elite/shamanic or privileged individuals within their societies (Herrero-Corral *et al.* 2020). However, isotope analyses have shown that his protein intake was low (below 9 $\delta^{15}\text{N}$ ‰), which might suggest he was not particularly privileged in the social ranking of his community. However, the diet of shamans often differs from that of the rest of the group in which they live. None of these possible interpretations is entirely satisfactory, and we will probably never know the main reason for this peculiar burial until new discoveries of similar patterns appear at other sites.

The social and ideological context of Humanejos burial structures

The analysis of the burial structures at Humanejos reflects the tortuous and discontinuous trajectory of social and ideological change experienced by the societies living in the interior of Iberia during this period. During the Late Neolithic (3300-2900 BC), the burials are simple pits with almost no grave goods. Burial ceremonies show that several graves were accessible at the same time and that secondary rituals were celebrated with the bones of the ancestors, combined with faunal offerings (sometimes whole dogs). There are no significant differences in grave goods or treatment of the bodies that could be related to social hierarchies. During the Early Copper Age (2900-2500 BC) the burial structures remain the same, simple pits, but especially from 2700-2500 BC there is a significant change in the contents of the tombs, with an explosion of copper and exotic grave goods (mainly variscite necklace beads). During this period, important differences in the contents of graves are documented, as even copper and variscite objects are associated with infant burials. Copper tools such as knives/daggers, flat axes, awls or a chisel are concentrated in a few graves of a few individuals, while others are almost completely devoid of offerings. All these innovations could be linked to an increase in social hierarchisation, in a general context of emerging social complexity in many regions of Iberia. Nevertheless, the extent and intensity of this process in the interior of the Spanish Meseta and at Humanejos cannot be compared with other areas, such as the southeast or southwest, where there were also significant changes in settlements, with huge population agglomerations, the appearance of fortified villages and extensive ditched enclosures (Díaz-del-Río 2023).

This trend towards complexity and hierarchy culminates in our region and site during the Bell Beaker period, when these differences, which had developed in the immediately preceding period, developed in scale and intensity and became particularly visible in the burial record. The funerary structures at Humanejos display these striking differences in a very visible and ostentatious manner. Grave goods were extremely rich and abundant, new exotic raw materials such as ivory or cinnabar reached these new social elites, and copper production also expanded in quantity and technical quality. At the same time, the funerary structures grow spectacularly in diversity and complexity, indicating that not only the contents of these tombs were important, but also the structures, since they were constantly visible in the landscape of the settlement and the cemetery of Humanejos. They were the scenes of ceremonies and rituals in which the whole community participated and, in the framework of that social and ideological display, the different lineages in conflict probably tried to maintain their position and prestige in the group. In this sense, it is quite interesting to note that the graves of the rest of the people in Humanejos were very simple and modest, merely pits without any grave goods or with few offerings, such as plain pottery (Garrido-Pena *et al.* 2019, 228-29). This is also the case at other sites in Madrid, as, for example, El Perdido (Serio Tejero *et al.* 2018) or Camino de las Yeseras (Gómez *et al.* 2011: 102 and 104-5 and 111-12). In this last example some quite modest graves are also contemporary with others, rich in Beaker paraphernalia (Liesau *et al.* 2008).

All these valuable items were clearly concentrated in a few hands, only visible in some graves, and associated with certain individuals, both men and women, and even children. It seems

that certain lineages or families sought to perpetuate the leadership of their communities, and these differences are conspicuously displayed in their burials. The Bell Beaker infant burials suggest that these groups fought to perpetuate the power they had gained in their conflict and struggle with others, but it seems that they did not ultimately succeed. The settlement archaeology of this period shows no major changes in terms of hierarchy or centralisation (Garrido-Pena 2019). Moreover, if we analyse what happened afterwards, during the Bronze Age, in the interior of Iberia and at this site, the picture clearly shows that this whole process of increasing complexity just collapsed and disappeared (Díaz-del-Río 2023; Garrido-Pena 2023).

In fact, there is a complete absence of grave goods in the tombs at Humanejos during the 2nd millennium BC, in the post-Beaker period. This pattern is not so strange, since most of the tombs of this period in the interior of Iberia and in this site do not contain any offerings. Even in its regional context, the upper and middle Tagus basin, grave goods appear in only 18% of the tombs. They are mostly associated with adult male individuals and consist mainly of plain pottery, faunal offerings and rarely simple and small metal objects (awls) (Pérez-Villa 2014: 422-30 and figure 62). Parallel to this pattern, the burial structures are simple pits in the vast majority of cases, except for the pithoi burials and the singular case of Tomb 31 at Humanejos. This situation has been widely interpreted as the result of the complete disappearance of any sign of social hierarchy, which contrasts with the situation in other areas of Iberia, such as the Argaric southeast.

However, this picture could also be exaggerated by the circumstances of the current archaeological record, since certain finds, such as several spectacular swords without context, in different locations in the interior of Iberia, could perhaps belong to elite burials that have disappeared or been destroyed (Garrido-Pena 2023). Recent discoveries in marginal areas of the Meseta, such as the south-east of the province of Soria (Garrido-Pena *et al.* 2022b), suggest that a fully established bronze metallurgy arrived in these places earlier than previously thought. In any case, in Humanejos during this Bronze Age phase, the burial structures, grave goods and body treatments do not show significant differences between individuals, and the overall picture is very similar to the pre-Beaker period. In conclusion, the burial structures in Humanejos were the container and the scenario of these inhumations and ceremonies for almost two thousand years, and silent witnesses of a long and irregular trajectory of social and ideological transformations experienced by the local population, their beliefs and their hopes.

Acknowledgements

This article was supported by the Ministerio de Ciencia e Innovación (Spain) Research Project PID2019-105690GB-I00. ‘Vida y muerte en Humanejos (Parla, Madrid), Arqueometría de un asentamiento y necrópolis excepcional del III y II milenios cal AC en el interior peninsular’. We would also like to thank the Museo Arqueológico Regional de Madrid and the Dirección General de Patrimonio Cultural de la Comunidad de Madrid for all their help and support in this research.

Bibliography

- Barroso Bermejo, R., P. Bueno Ramírez, A. González Martín, R. De Balbín Behrmann and J.M. Rojas Rodríguez 2018a. Tumbas, materialidad y maternidad en los enterramientos de mujeres con campaniforme: dos casos de estudio del valle medio del Tajo. *Complutum* 29(2): 319-337.
- Barroso Bermejo, R., P. Bueno Ramírez, R. Balbín Behrmann de, A. González Martín and J.M. Rojas Rodríguez-Malo 2018b. Inhumaciones en urna cerámica de la Edad del Bronce en la cuenca media y alta del Tajo: una perspectiva comparativa. *Spal* 27(1): 13-30.
- Berzosa, R. and M. Flores 2005. El conjunto funerario campaniforme del Vertedero de La Salmedina (Distrito de Villa de Vallecas, Madrid, in M., Rojo, R. Garrido and I. García-Martínez (eds) *El campaniforme en la Península Ibérica y su contexto europeo*: 481-494. Valladolid: Universidad de Valladolid-Junta de Castilla y León.
- Bueno Ramírez, P., R. Barroso Bermejo and R. De Balbín Behrmann 2005. Ritual campaniforme, ritual colectivo: la necrópolis de cuevas artificiales del Valle de las Higueras, Huecas, Toledo. *Trabajos de Prehistoria* 62(2): 67-90.
- Bueno Ramírez, P., R. Barroso Bermejo and R. De Balbín Behrmann 2012. *5000 años atrás: primeros agricultores y metalúrgicos del Valle de Huecas (Huecas, Toledo)*. Toledo.
- Díaz-del-Río, P. 2023. Qué sucedió en la Edad del Cobre. *Boletín del Seminario de Estudios de Arte y Arqueología* LXXXVII: 164-243.
- Flores Díaz, M. and R. Berzosa Del Campo 2003. *Informe definitivo de excavación arqueológica efectuada en el yacimiento 9, finca "La Salmedina" (distrito Villa de Vallecas, Madrid)*. Exp 2002/53.
- Flores Fernández, R. and R. Garrido-Pena 2014. Campaniforme y conflicto social: evidencias del yacimiento de Humanejos (Parla, Madrid), in *Actas de las novenas jornadas de Patrimonio Arqueológico de la Comunidad de Madrid*: 159-168. Madrid: Comunidad de Madrid.
- Garrido-Pena, R. 2019. Living with Beakers in the Interior of Iberia, in A. Gibson (ed) *The Bell Beaker Settlement of Europe. The Bell Beaker phenomenon from a domestic perspective*: 45-66. Prehistoric Society Research Paper 9. Oxford: Oxbow Books.
- Garrido-Pena, R. 2023. Más allá de "El Argar": periferia y margen de una singularidad prehistórica. Comentario a Peres y Risch. *Trabajos de Prehistoria* 80(2), e25. <https://doi.org/10.3989/tp.2023.12339>
- Garrido-Pena, R., R. Flores Fernández and A.M. Herrero-Corral 2019. *Las sepulturas campaniformes de Humanejos (Parla, Madrid)*. Madrid: Dirección General de Patrimonio Histórico. Comunidad Autónoma de Madrid.
- Garrido-Pena, R., R. Flores Fernández and A.M. Herrero-Corral 2020. La necrópolis prehistórica de Humanejos (Parla, Madrid), in A. Carretero and C. Papí (eds) *Actualidad de la investigación arqueológica en España I (2019-2020). Conferencias impartidas en el Museo Arqueológico Nacional*: 9-27. Madrid: Museo Arqueológico Nacional.
- Garrido-Pena, R., R. Flores Fernández, A.M. Herrero-Corral, P. Muñoz Moro, C. Gutiérrez Sáez and R. Paulos Bravo 2022a. Atlantic Halberds as Bell Beaker weapons in Iberia: tomb 1 of Humanejos (Parla, Madrid, Spain). *Oxford Journal of Archaeology* 41(3): 252-277.
- Garrido-Pena, R., A. Sánchez Polo, C. Tejedor Rodríguez, Í. García Martínez de Lagrán and M. Rojo Guerra 2022b. *La Edad del Bronce en el sureste de la cuenca del Duero: el valle de Ambrona (Soria) durante el II milenio AC*. *Studia Archaeologica* 103. Valladolid: Universidad de Valladolid.

- Gómez, J.L., C. Blasco, G. Tranco, P. Ríos, I. Grueso and M^a.S. Martínez, 2011. V.1. Los protagonistas, in C. Blasco, C. Liesau and P. Ríos (eds) *Yacimientos calcolíticos con campaniforme de la región de Madrid: nuevos estudios*: 101-132. Madrid. Manero Digital SL.
- Gusi, F. and J. Luján 2011. Enterramientos infantiles y juveniles durante la edad del bronce peninsular: una aproximación cuantitativa. *Quaderns de Prehistòria i Arqueologia de Castelló* 29: 153-208.
- Heras Martínez, C.M., V. Galera Olmo and A.B. Bastida Ramírez 2011. La fase Campaniforme del yacimiento de La Magdalena (Alcalá de Henares, Madrid), in C. Blasco, C. Liesau and P. Ríos (eds) *Yacimientos calcolíticos con campaniforme de la región de Madrid: nuevos estudios*: 17-21. Madrid. Manero Digital SL.
- Heras Martínez, C.M., V. Galera Olmo and A.B. Bastida Ramírez 2014. Enterramientos y ritual funerario en una necrópolis calcolítica con campaniforme en la submeseta sur El yacimiento de “La Magdalena I” (Alcalá de Henares), in *Actas de las novenas jornadas de Patrimonio Arqueológico de la Comunidad de Madrid*: 213-230. Madrid: Comunidad de Madrid.
- Herrero-Corral, A.M., R. Garrido Pena and R. Flores 2019. The Inheritors: Bell Beaker children tombs in Iberia and their social context (2nd half of the 3rd millennium cal. BC). *Journal of Mediterranean Archaeology* 32.1: 63-87.
- Herrero-Corral, A.M., R. Garrido-Pena, R. Flores Fernández, C. Gutiérrez Sáez, A. González Martín, P. Held and K.W. Alt 2020. A special body: Exposure ritual of a Bronze Age seated cadaver from the cemetery of Humanejos (Parla, Madrid, Spain). *Journal of Archaeological Science: Reports* 33: 102517.
- Liesau, C., C. Blasco, P. Ríos, J. Vega, R. Mendiña, J.F. Blanco, J. Baena, T. Herrera, A. Petri and J.L. Gómez 2008. Un espacio compartido por vivos y muertos: El poblado calcolítico de fosos de Camino de las Yeseras (San Fernando de Henares, Madrid). *Complutum* 19(1): 97-120.
- Lull, V., R. Micó, C. Rihuete and R. Risch 2004. Las relaciones de propiedad de la sociedad argárica. Una aproximación a través del análisis de las tumbas de individuos infantiles. *Mainake* XXVI: 233-272.
- Metcalfe, P. and R. Huntington 1991. *Celebrations of Death. The anthropology of Mortuary Ritual*. Cambridge University Press.
- Moser, A. 2024. Sepulturas en pithos. Una forma especial de enterramiento infantil de la cultura de Unetice de Alemania central, in J.A. López Padilla, R. Risch, and J. Dani (eds) *Dinastías. Los primeros reinos de la Europa prehistórica*: 347-351. Alicante. Museo Arqueológico Regional de Alicante.
- Nájera, T., F. Molina, S. Jiménez, M. Sánchez Romero, I. Al Oumaoui, G. Aranda, A. Delgado and Z. Laffranchi 2010. La población infantil de la Motilla del Azuer: Un estudio bioarqueológico. *Complutum* 21-2: 69-102.
- Odriozola, C., R. Villalobos, P. Bueno, R. Barroso, R. Flores and P. Díaz-Del-Río 2017. Late Prehistory Body Ornaments. Exchange and social dynamics in the Middle Tagus Basin, in M. Bartelheim, P. Bueno and M. Kunst (eds) *Key Resources and Sociocultural Developments in the Iberian Chalcolithic*: 59-87. Tübingen: Ressourcen Kulturen 6 (Tübingen Library Publishing).
- Pérez-Villa, A. 2014. *Prácticas funerarias de la Edad del Bronce en la cuenca media-alta del Tajo*. Unpublished PhD dissertation, UNED.
- Quero, S. 1982. *El poblado del Bronce medio de Tejar del Sastre (Madrid)*. Estudios de Prehistoria y Arqueología Madrileñas 1. Madrid: Museo Municipal.

- Ríos Mendoza, P. 2010. *Territorio y sociedad en la Región de Madrid durante el III milenio AC: el referente del yacimiento de Camino de las Yeseras*. PhD Dissertation. Universidad Autónoma de Madrid.
- Rojó, M., R. Garrido-Pena, I. García and C. Tejedor Rodríguez 2014. Beaker Barrows (not) for the dead: El Alto I & III, Las Cuevas/El Morrón and La Perica (Soria, Spain). *Cuadernos de Prehistoria y Arqueología de la Universidad Autónoma de Madrid* 40: 31-40.
- Serio Tejero, I., C. Heras Martínez, V. Galera Olmo and A. Bastida Ramírez 2018. El enterramiento colectivo de “El Perdido” (Torres de la Alameda-Madrid): paleodemografía y paleoauxología. *Complutum* 29(2): 299-317.
- Valiente, J. 1992. *La Loma del Lomo II, Cogolludo (Guadalajara)*. Patrimonio y Arqueología 5. Toledo: Junta de Comunidades de Castilla-La Mancha.
- Vavouranakis, G. 2014. Funerary Pithoi in Bronze Age Crete: their Introduction and Significance at the Threshold of Minoan Palatial Society. *American Journal of Archaeology* 118(2): 197-222.
- Vega, J., C. C. Blasco, C. Liesau, P. Ríos, J.F. Blanco, R. Menduina, R. Aliaga, E. Moreno, T. Herrera, A. Petri and J.L. Gómez 2010. La singular dualidad de enterramientos en el poblado de silos calcolítico de Camino de las Yeseras (San Fernando de Henares, Madrid), in J. Fernández-Eraso and J.A. Mujika (eds) *Actas del Congreso Internacional sobre Megalitismo y otras manifestaciones funerarias contemporáneas en su contexto social, económico y cultural*: 648-662. MUNIBE Suplemento 32.

Magdalena I: Funerary aspects in the Henares River lower valley (Madrid) during Late Prehistory

César Heras Martínez

Unidad Docente de Arqueología, Dpto. de Prehistoria, Historia Antigua y Arqueología.
Universidad Complutense de Madrid

Miriam Cubas Morera

Área de Prehistoria, Dpto. de Historia y Filosofía. Facultad de Filosofía y Letras-Universidad de Alcalá

Sergio Heras Bastida

Facultad de Geografía e Historia-Universidad Complutense de Madrid

Abstract

The archaeological site of La Magdalena, which preserves an extensive chrono-cultural sequence, presents in its earliest phases of occupation a Chalcolithic Bell Beaker necropolis [2150–1850 BC]. It is situated within a landscape dominated by several watercourses draining into the Henares River, where the medium-sized funerary area was identified. This area comprises two tumuli, a pseudo-hypogeum, and three rock shelters, as well as three votive deposits associated with the latter. The burial record includes both single and multiple interments, encompassing primary and secondary inhumations. Directly related to these contexts, we identified various grave goods and items of personal adornment, together with evidence of dress and a set of objects with clear votive significance. Chronological, stylistic, and genomic analyses place this necropolis in the final phase of the Bell Beaker period, specifically the Ciempozuelos phase. They also indicate the presence of individuals with direct steppe ancestry, others reflecting processes of admixture, and still others of clearly local origin.

Key words: Bell-Beaker-Ciempozuelos, Genomic studies, Funerary ritual, Grave goods, Southern Plateau.

Introduction

On the right bank of the lower Henares River, before it flows past Alcala de Henares, the area of study is located in the ‘El Encín’ industrial estate. This area covers about 15 hectares, with almost two-thirds identified as the archaeological site now called La Magdalena. Of these, 6 hectares have been systematically excavated. Various archaeological sites are distributed among the neighbouring plots: to the east is the Equinox site, featuring a necropolis from the Late Antiquity and Hispano-Visigothic periods (Martín Ripoll *et al.* 2006); to the west is the Avón site, associated primarily with a Bronze Age settlement (Cantalapiedra Jiménez *et al.* 2019), with residual elements from it also found in La Magdalena (Figure 1).

The left bank of the Henares is formed by gullies and ravines, with the prominent hills of Ecce Homo and San Juan del Viso standing out, while the right bank features a series of gentle

terraces. The site, La Magdalena, is located on the first of these terraces (Heras Martínez and Bastida Ramírez 2022: 321). The surrounding area near Alcalá de Henares has calcisol and luvisol-type soils (FAO, Ministry of Environment and Spatial Planning 2007). These soils are mostly basic in their pH levels, contain carbonates, and have a similar stratigraphy to that of most of the river valleys in this region (Cabrera-Jiménez *et al.* 2014: 128). The archaeological excavation, conducted by the scientific team of the Trébede Group, in collaboration with the Physical Anthropology Section of the Department of Life Sciences at the University of Alcalá, and with the participation of several public research centres, including the Complutense University of Madrid (UCM) and the Geological and Mining Institute (CSIC), took place between 2008 and 2016, leading to the identification of distinct chronological periods.

The site has revealed the following chrono-cultural phases: In Magdalena I (Heras Martínez *et al.* 2014a, 2014c), attributed to Late Prehistory, we identified two distinct phases. The first (A) consists of a Bell Beaker-tradition Chalcolithic necropolis [2150–1850 BC], and the second

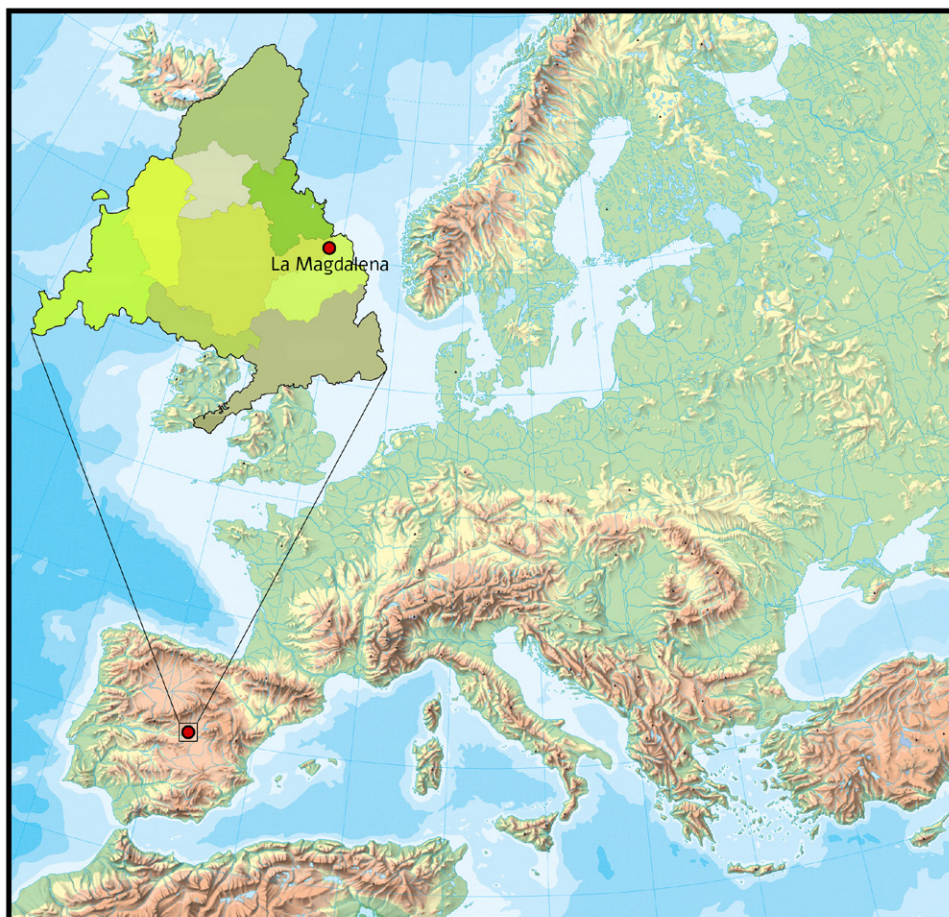


Figure 1. Location of La Magdalena site in its regional, national and European context.

(B) includes a funerary area with habitation evidence from the Middle Bronze Age [1780–1650 BC]. After a long temporal gap, Magdalena II also encompasses two phases. The first (A) was focused on pottery and metallurgical production, together with habitation and funerary evidence, in the Julio-Claudian period [AD 25–68] (Heras Martínez and Bastida Ramírez 2019). The second (B) involved the distribution of goods and services, as well as the development of habitation and funerary spaces, in the Flavian-Severan period [up to AD 235] (Bernal-García *et al.* 2021; Heras Martínez and Bastida Ramírez 2022). In Magdalena III, during the late imperial and late Roman periods, agricultural and livestock structures appeared. However, the most significant feature is a large funerary area [AD 235–450] (Bernal-García *et al.* 2021; Heras Martínez and Bastida Ramírez 2022). Around the mid-4th century [AD 340–360], a seismic event left a noticeable mark on the archaeological record, despite ongoing activity (Rodríguez-Pascua *et al.* 2016). Magdalena IV shows marginal agricultural activity and a shift in construction techniques, with semi-excavated houses built into the terrain and covered with vegetation. Small burial areas, likely family-based, also appear, within the late antiquity context [AD 470–585] (Heras Martínez and Bastida Ramírez 2022). Magdalena V, dated in the Hispano-Visigothic period [AD 586–720] (Heras Martínez and Bastida Ramírez 2022), presents a small village, possibly consisting of a single-family group, engaged in residual agriculture and marked by a burial site supporting the extended family structure. After another hiatus, the Christian medieval period introduces the Magdalena VI phase. The area turns into a rainfed agricultural zone with vineyards. This continues into the modern period, but in the contemporary era, the land use shifts entirely to cereal and legume cultivation (Magdalena VII and VIII).

The occupation of space in “La Magdalena”: Late Prehistory

The motivation for the existence of a burial site like La Magdalena in this region likely stems from the area’s strategic location. As Blasco *et al.* (2019: 252) suggest, the largest concentration of Bell Beaker settlements and burials are found in the middle and lower basins of the region’s main rivers, known as the Jarama-Manzanares-Henares complex. The tombs are often linked to large sites with causewayed enclosures integrated within domestic spaces, as seen in sites like Camino de las Yeseras in San Fernando de Henares (Liesau *et al.* 2008) and Humanejos in Parla (Flores Fernández and Garrido Pena 2014), two of the most representative examples. The occupation of La Magdalena, as previously mentioned, begins during the Bell Beaker period and is solely associated with a necropolis. Despite extensive archaeological and urban development work across the surrounding area, no nearby habitation elements have been found. The hypothetical settlement area might have been located south of La Magdalena, in a region heavily transformed for agricultural purposes, as in the case of the Roman period settlement, resulting in the loss of both archaeological sites.

The initial necropolis at La Magdalena has been dated to the late 3rd millennium and early 2nd millennium cal BC. A similar situation seems to have occurred during the Bronze Age (second half of the 2nd millennium cal BC), but the discovery of certain material remains at the southwest edge of the site, in addition to the excavation of a settlement in a neighbouring plot (Cantalapiedra Jiménez *et al.* 2019), has reshaped the understanding of this area’s occupation during Late Prehistory. The tombs excavated at La Magdalena follow a model described as ‘newly made, traditional, or innovative type’, featuring various designs. These tombs share

a common characteristic: their closure is marked by accumulations of stones forming small, modest mounds (Blasco *et al.* 2019: 255).

The Bell Beaker necropolis (Magdalena)

Based on preserved features, the site would have originally been located in a gently terraced landscape with various undulations, crossed by several streams near the mouth of the Henares River. The position of the funerary area may have been chosen for its shallow, slightly elevated plains, situated between two streams at their confluence with the Henares, which were free from the direct influence of water currents. The Bell Beaker necropolis occupies scattered structures at the southeastern end of the site, within a polygon measuring approximately 60m x 10m (Cabrera-Jiménez *et al.* 2014: 127), with a general NE-SW orientation. The structures include two mounds, a false hypogeum, and three cave shelters. Associated with two of these shelters are three votive deposits, suggesting various functions linked to funerary rituals, which will be explored in more detail below. The site contains both individual and multiple burials, featuring primary and secondary inhumations. In total, ten individuals have been identified, with associated grave goods, personal adornments, and clothing, as well as items with clear votive significance (Heras Martínez *et al.* 2011; Heras Martínez *et al.* 2014c). As only one of the burials is individual, we are unable to extrapolate our model to the rest of the region, as we feel a single tomb is insufficient to create a pattern.

Bell Beaker burial mounds

One of the mounds (UT 4081) was well-preserved, while the other (UT 4131) was heavily altered, first by the intrusion of two late Roman burials and later by two seismic events. The first earthquake occurred during the Middle Bronze Age, and the second took place in the mid-4th century AD (Rodríguez-Pascua *et al.* 2016a). Only some human bone fragments and a plain spatulate ellipsoidal bowl were recovered from UT 4131. The mound UT 4081, oriented NW-SE, consists of medium- and large-sized local quartzite stones, either dry-stacked or held together with mud. It retains dimensions of 2.4m x 2m x 0.84m. The final shape of the structure was altered by a High Imperial Roman silo/votive deposit and three Late Roman burials. The original Bell Beaker structure featured several layers of quartzite cobbles, with some limestone, which helped solidify the mound. In both the lower and middle sections, there is a stone-free area containing the remains of buried individuals and various grave goods.

In the lower section, a secondary assemblage consisted of isolated remains of an adult, possibly male (2250–2120 BC), without anatomical connection. These remains were accompanied by grave goods, including a large Ciempozuelos-style bowl associated with a cup and a smaller bowl of the same style (Heras Martínez *et al.* 2011: 19, 2014c: 189-94 and 214-16), a small Palmela-type point made of high-purity arsenic copper from the south, a quartzite pestle, a small local flint blade, and two fragments of a bone needle without a tip. In the upper section, there was an inhumation of an infant (2150–2035 BC). The remains were disturbed during the Roman period (Julio-Claudian phase) when the tumulus was identified. Upon superficial excavation, the lower quarters of the body were lost. Subsequently, a silo/votive deposit was constructed, lined with fragments of a dolium and a base made of tegulae fragments. The deposit initially held the remains removed from the burial. Once covered with more tegulae

fragments, it included a plate, a common ceramic bowl (possibly containing solid and liquid food remains), and a Claudian as (AD 41–54).

The false Hypogeum

The second funerary structure (UT 4600) is a false hypogeum (as it is the only structure in our site with these characteristics, we will use both ‘false hypogeum’ and ‘hypogeum’ unequivocally), which was affected by the collapse of its brow and cover, made of medium-sized limestone gravel (Heras Martínez *et al.* 2011: 19). This collapse was partly due to seismic activity, though a slight brow remains intact. The hypogeum was also altered by the presence of two late Roman tombs nearby. We call it a false hypogeum as it is an underground tomb, but not excavated in rock, but in the upper clay and sand layers of the terrain, cutting into the underlying gravel bed. The result was a similar structure but not quite enough to be called a hypogeum, as it is not like those found in the necropolis of Valle de Higuera (Huecas, Toledo) (Bueno *et al.* 2023).

Oriented SW-NE and measuring 3.38m x 1.72m, the hypogeum has a trapezoidal shape, reaching the natural gravel levels of the excavation, which also serve as its base. It cuts

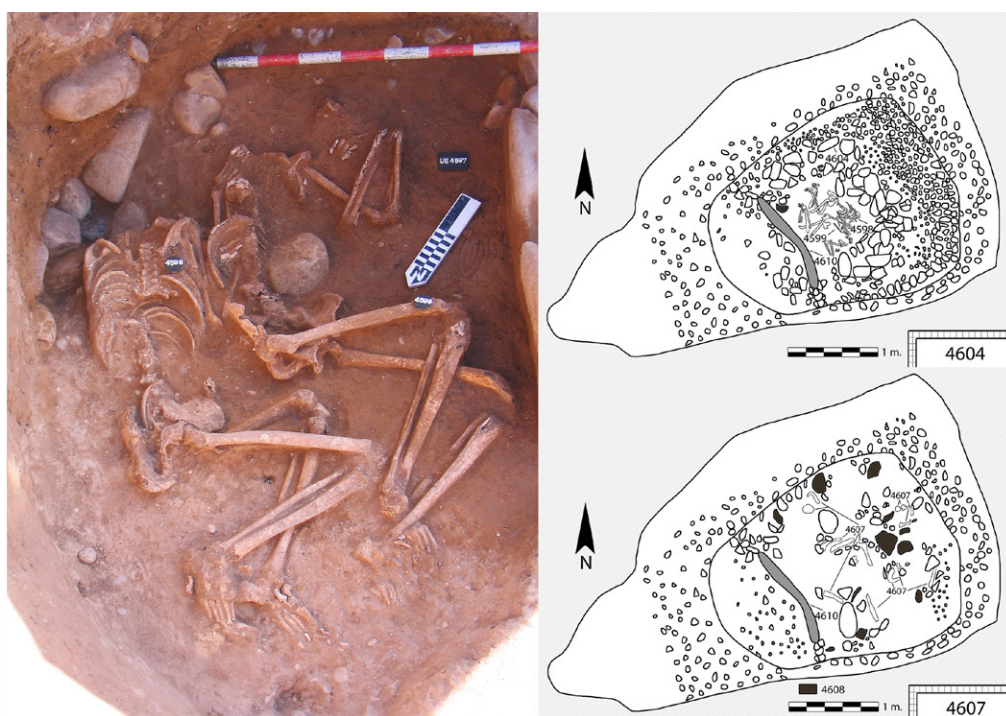


Figure 2. The false hypogeum UT 4600. Left: the primary burial in the false hypogeum with alterations due to the retrieval of both skulls during the ossification phase, individuals 4598 and 4599; two women, an adult and mature adult. Right: two graphical representations of its two levels: in the upper corner the primary burial represented previously and in the lower corner a secondary burial of an adult female. A layer between the two levels acts like a seal.

through sandy and clayey layers. Access is provided through a hallway with a step formed from the geological level itself. After descending four steps, there is a large, nearly square orthostat of micaceous schist, embedded in the natural terrain. This stone marks the entrance to the burial chamber, where two individuals were buried at different times, as shown in the figure 2. The upper level contains a double primary burial, with both individuals anatomically connected and directly related. They consist of one adult and one mature female. Both women were buried in a semi-flexed position, lying on their left sides, with the adult appearing to embrace the mature individual. Notably, the skulls and the C1 and C2 vertebrae of both women are missing. The lack of pre- or post-mortem trauma suggests that the skulls were removed at a later stage, possibly after the bodies had decayed or during ossification. This points to the tomb being reopened on at least three occasions, with the final reopening likely involving the symbolic removal of the skulls.

Before the upper double burial, the walls of the hypogeum were reinforced, likely because of humidity, causing the walls to yield. This reinforcement involved lining the walls, which narrowed the central space reserved for the placement of the two bodies (Heras Martínez *et al.* 2014c: 217). Beneath a seal made of medium-sized quartzite cobbles and a thick layer of ashes, another burial was discovered. This secondary burial contained incomplete remains, mainly parts of the lower body, and appears to belong to an adult female. This individual is associated with grave goods, which include a large Ciempozuelos-style decorated vase, a large plain pot with a partially spatulate shape, and a quartzite smoother showing clear signs of use (Heras Martínez *et al.* 2014b: 197).

The excavated shelters

To conclude the discussion on the funerary structures associated with burials, we must highlight three soil-cut chambers (UT 4463, UT 5005, and UT 7100). The first two exhibit a clear spatial relationship, connected by a semi-excavated passage in the natural terrain, and are directly linked to the three votive deposits located nearby. The third tomb, while maintaining formal similarities with the previous two, is positioned further south from the group. All these tombs follow an ellipsoidal or circular pattern, partially cut into the gravel layers, like the other funerary structures. They are primarily covered with medium to large-sized quartzite stones and some limestone. These materials are bound by a brownish-maroon, highly plastic, sandy-clayey layer (Heras Martínez *et al.* 2011: 20).

The cave (UT 4463) is the best-preserved structure of its type, with a slightly ellipsoidal shape (1.6m x 1.5m) and a slight bell-shaped indentation at its northern end, which houses the entrance on the S-SE side. The structure was used only once, for the primary burial of a young adult woman, positioned on her left side with extremely flexed legs. She, along with the infant from mound UT 4081, is one of the few individuals to retain the skull. One notable feature is the ochre pigmentation found on the young woman's body, extending from the neck to the pelvic area (Heras Martínez *et al.* 2014a: 38; 2014c: 217-19). The tomb contains a complete set of grave goods that can be seen in their original position in the figure (Figure 3): a plain ceramic pot with zonal spatulation, a double-pointed arsenical copper awl (likely originally placed in her left hand), two African ivory buttons—one triangular with a V-shaped perforation near the neck, possibly used as a cloak fastener, and the other rectangular—as well as tusks and



Figure 3. The only single burial at the site, excavated shelter 4463. Below: a general view of the burial of a young adult female. Above left: the Chalcolithic-Bell Beaker bowl next to her head. Above right: a detail of the grave goods close to her arm, two *Sus scrofa* teeth and a copper awl.

the lower jaw of a wild boar (Heras Martínez *et al.* 2014b: 188-97; Heras Martínez and Bastida Ramírez 2022: 325).

The passage (UE 5208, which connects UT 4463 and UT 5005), which can be defined as a small trench, 9.26m in length and 0.25m to 0.4m in width, runs opposite the access area of both chambers. It is slightly irregular, with an estimated depth of 0.2m to 0.34m. The trench is entirely devoid of cultural material. However, its direct connection to the entrances of the rock-cut chambers indicates a functional association, likely serving as a pathway between the two chambers and two nearby votive deposits (5001 and 5205), which we will discuss below.

Like the previous one, cave UT 5005 is elliptical in shape (1.75m x 1.4m) and features a large, partially sunken brow that extends beyond the entrance, which is marked by a large, laminated, and fragmented micaceous schist slab. The tomb is heavily eroded, with its closure—made from micaceous schist, as in earlier examples—collapsed, broken, and disturbed. It contains the remains of two individuals buried at different times. Initially, an adult female was buried, and during the second burial, which involved an adult male, the already ossified remains of the female were displaced and accumulated in a disordered manner. In a third instance, possibly during the removal of the skulls, the remains were further disturbed, with the female's bones mostly on the right side and the male's, in a more articulated state, located centrally and on the left.

Regarding the grave goods, it is difficult to determine which materials are associated with each individual. Items found include a small, polished hemispherical bowl located behind the access door; several fragments of a pot, possibly similar to the previous one; traces of copper rings, evidenced by dye on three phalanges of the right hand; several small, indeterminate flakes; a fragment of a boat-shaped granite grinder; a flake and a flint core; and small pieces of ochre mineral, likely associated with dyeing both bodies (Heras Martínez *et al.* 2014c: 219-220). As in the previous tomb, though the evidence is less clear, traces of ochre suggest that parts of both individuals were dyed, though the exact details are unclear.

This final cave (UT 7100) is circular to elliptical in shape (1.9m x 1.8m) and cuts through the lower gravel level, as seen in previous cases. It is severely altered due to a crack caused by a seismic event, which left a scar of fine sands from the liquefaction phenomenon (Rodríguez-Pascua *et al.* 2016b) that cuts through the funerary structure. The tomb is oriented SE-NW, with its brow completely lost and partially altered by the presence of a late Roman tomb. Despite being cracked, a large slab of micaceous schist, remains practically vertical and serves as the tomb's closure. The structure has been heavily affected, with only a few phalanges remaining of the buried individual, likely those farthest from the seismic damage. This makes it impossible to determine the sex or age of the individual. The grave goods found include fragments of a plain pot and what may have been a decorated Ciempozuelos-style vase (Heras Martínez *et al.* 2014c: 220).

The votive deposits

As mentioned above, there are three votive deposits. Two of them (DV 5001 and DV 5205) are located between tombs UT 4463 and UT 5005, and one (DV 5239) is slightly further from the latter tomb. In each case, we find small pits (no deeper than 0.25m) that we associate with funerary rituals (Heras Martínez *et al.* 2014c: 220).

Votive deposit VD 5001 is a small oval pit, measuring 0.6m x 0.44m with an average depth of 0.3m, located east of UT 5005. Inside the pit, a bowl and a small Ciempozuelos-style Bell Beaker vase were found, both placed upside-down. Due to the shallowness of the pit, both vessels are quite fractured, with some missing pieces, though their original shapes remain discernible (Heras Martínez *et al.* 2014c: 220).

Votive deposit VD 5205 is located east of the previous pit and facing UT 4463. Similar in size (0.6m x 0.5m x 0.22m), this second pit contains heavily fragmented remains of a Ciempozuelos-

style bowl, with the lower half intact and the upper part, particularly the rim, fragmented. Unlike the previous vessels, this one was originally found the right way up, unless it was overturned during a post-depositional process, which could explain the observed damage to the rim (Heras Martínez *et al.* 2014c: 222).

The last deposit (VD 5239), located west of cave UT 5005, is 0.7m x 0.5m x 0.3m in size and contained an upside-down bowl and a small vase, both attributable to the Ciempozuelos Bell Beaker style. However, they exhibit some differences in decorative motifs compared to the previous pieces. Both vessels are fractured at the base, with minor losses in the bowl and more significant damage to the vase, which has since been reconstructed in the laboratory (Heras Martínez *et al.* 2014c: 222).

Bronze Age necropolis (Magdalena IB)

Associated with the Early Bronze Age, La Magdalena features four dispersed burials located near the Chalcolithic-Copper Age burial complex, positioned to the east of it along a north-south line. These burials are simple pits containing bodies in a flexed lateral position, without any accompanying grave goods. Each grave was dug with a thick covering of medium-sized compact quartzite stones that nearly covers the entire area of the pit. The pits cut through the upper brown clayey-sandy layer and extend into the second, sandier level, but unlike the earlier funerary ensemble, they do not reach the gravel layer.

Grave (US 4054), excavated in the natural terrain near the Bell Beaker mound UT 4134, does not reach the gravel level. The elliptical pit measures 1.6m x 1.4m with an average depth of no more than 0.32m and is oriented NE-SW. It features a thick cover of medium-sized, compact quartzite stones, slightly smaller than the pit itself. Inside the pit, an adult individual of indeterminate sex (21–39 years old) was buried in a flexed position on their right side. The remains have been significantly affected by post-depositional processes and bone dissolution, which have compromised the preservation of the individual (Heras Martínez *et al.* 2014a: 35, 2014c: 222).

Like the previous case, a burial pit, grave US 4423, is cut into the anthropized/natural brown clayey-sandy levels and extends into the sandy layers. It features a robust quartzite cover arranged in three rows over the central part of the grave, forming an almost circular shape with a diameter of 0.85m. The pit has an ellipsoidal, tub-like shape (1.3m x 1m) with very rounded short sides. The individual, like others from this period, is in poor condition. It is a young adult of indeterminate sex (several markers suggest male) between 21 and 30 years old, positioned SW-NE (facing NW) in a flexed lateral position. Notable red ochre staining is visible, especially on the long bones (Heras Martínez *et al.* 2011: 21 and 35, 2014c: 222).

Very similar to the previous burials, grave US 4497 displays a strong quartzite cover with some ellipsoidal limestone. Although heavily altered, it preserves two rows of medium-sized quartzite laid dry, which have been significantly affected by disturbances in the surrounding area. These disturbances include an undetermined negative structure from the Julio-Claudian period and a waste tip from the late Antonine or Severan period. The grave is oriented NNE-SSW, with dimensions of 1.9m x 1.2m and a depth not exceeding 0.28m. This burial contains the remains of a mature male individual (40–60 years old), placed in a lateral decubitus position

on his left side, facing southeast. Although the human remains are heavily altered, they have not been disturbed (Heras Martínez *et al.* 2011: 35, 2014c: 222).

Parallel to the previous tomb, toward the east, lies the last of the funerary structures attributed to the Bronze Age, grave US 4777. It is covered by a thick layer of medium to large quartzite and limestone, arranged in three to four rows, oriented SW-NE, covering an area of 0.95m x 0.67m, with a depth of 0.3 to 0.35m. Upon removing the cover, a pit measuring 1.04m x 0.95m x 0.6m was revealed. Inside, a mature male individual (40–60 years old) was buried in a lateral decubitus position, flexed on his left side, facing NW. The torso was straight, and the legs were bent toward the chest. The remains were found in a reasonably good state of preservation (Heras Martínez *et al.* 2011: 21, 2014c: 224).

Analyses conducted

Due to the large number of archaeological structures at the La Magdalena site and the nature of the excavation being classified as ‘professional’ archaeological work, all the analysed samples were either collected to address specific research questions posed by the management or integrated into a broader scientific project—an international one in this case. Both approaches were applied here, leading to the acquisition of significant insights.

The tests conducted were radiocarbon dating (C14-AMS), mitochondrial DNA analysis of selected individuals from the Bell Beaker period, and spectral analysis of the pigments used to colour individuals from both the Bell Beaker period and Bronze Age. For radiocarbon dating, the samples were analysed in collaboration with Prof. Concepción Blasco from the Autonomous University of Madrid. Of the initial seven samples, two were inconclusive due to contamination. However, three samples provided reliable results for the period relevant to this study:

- Individual 4313 from mound UT 4081; an adult male found in the lower level. The upper left first premolar was used for analysis.
- Individuals 4598 and 4599 from the false hypogeum UT 4600; two females (one adult, one mature) found embraced in the upper level. Due to the absence of their skulls and C1 and C2 vertebrae, samples were taken from well-preserved bones: the tarsus and proximal phalanx of the right foot of the adult, and the right tibia of the mature individual.
- Individual 4467 from excavated shelter UT 4463; a young adult female. A fragment of the occipital bone was analysed due to the poor condition of the dental remains.

The two-sigma calibration places these burials between 2500 and 1800 BC. Individual 4313 was the oldest, while the female individuals from the false hypogeum were the most recent. DNA analysis was also conducted as part of Iñigo Olalde’s research. Three samples were sent, revealing a variety of genetic results. Some individuals showed clear Iberian ancestry, while others had mixed ancestry. Notably, individual 4313 exhibited typical Pontic steppe ancestry, with a probable genetic link to the Yamnaya culture (Olalde *et al.* 2018) (Figure 4).

Lastly, pigment analysis was performed using X-ray diffraction, which revealed high concentrations of iron, indicating the use of ochre. However, the specific source of the pigment remains unknown. The Bronze Age burials remain undated, as most of them exhibit

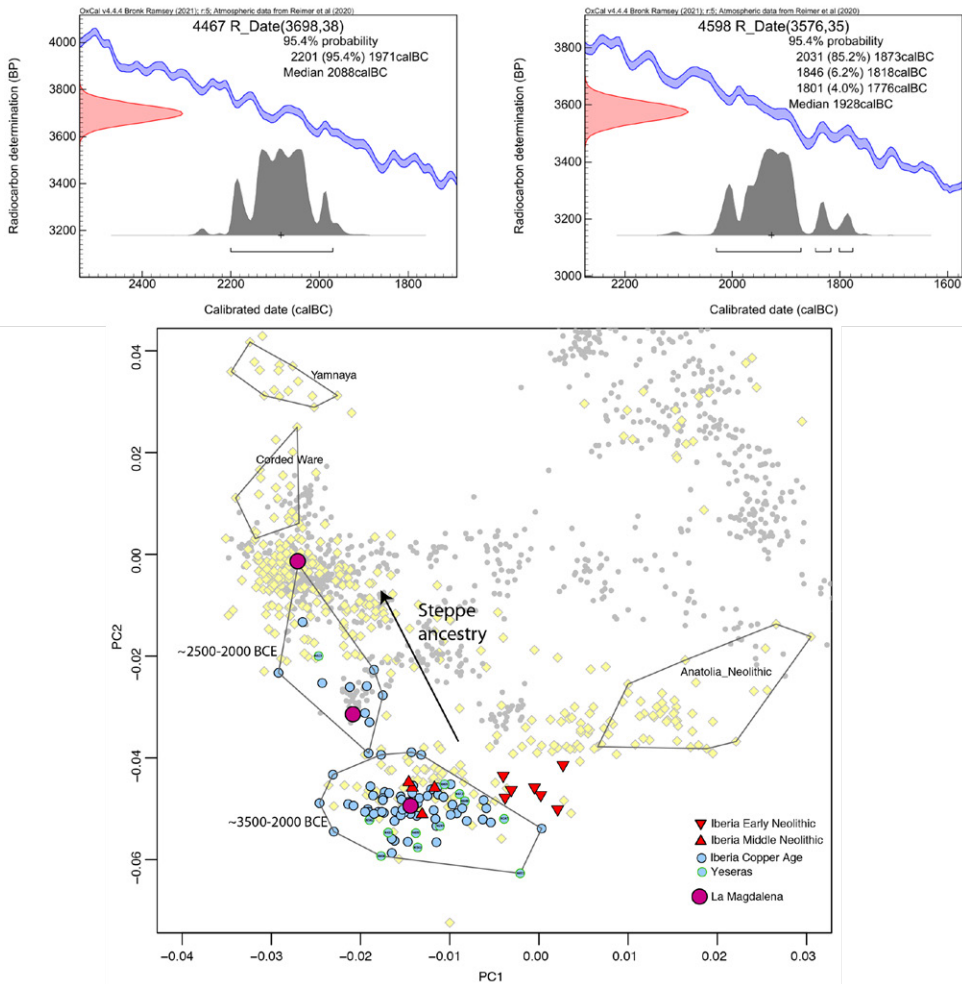


Figure 4. Analyses performed on the samples from the Bell Beaker tombs. Above left: radiocarbon dating (Beta Analytic) of the young adult female in the single burial UT 4463. Left: the dating of one of the adult females from the main burial in the false hypogeum UT 4600. Below: a representation of the three remains from the site that were sent for genetic analysis (Olalde *et al.* 2018). The upper point represents an individual with clear steppe ancestry, the one in the lower part shows Iberian ancestry while the one in the middle reflects a mixture of both.

poor preservation, rendering them unsuitable for radiocarbon dating, even including the use of teeth. This level of degradation has made it difficult to obtain reliable samples for accurate dating. No analyses have been performed on the ochre and cinnabar remains found in Bronze Age tombs.

Immateriality and materiality: from funerary rituals to grave goods, clothing, ornaments and votives

The present context does not lend itself to an in-depth discussion on the transition from collective Chalcolithic burials to individual Bell Beaker tombs (Guilaine 2019: 23-24). However, it is important to acknowledge the contemporaneous existence of these two funerary practices. A clear example of this is the collective Chalcolithic tomb at El Perdido, Torres de la Alameda, which contained up to 78 individuals (Serio *et al.* 2018), located near the Bell Beaker funerary area at La Magdalena (Heras Martínez and Bastida Ramírez 2022), which is the focus of our discussion.

The immanent, ritual significance

A clear shift from pre-Bell Beaker collectivism to individualism is discernible, encompassing not only individuals but also small familial groups interred in singular tombs, potentially connected to other funerary structures. This is evident in the case under examination. As R. Garrido Pena (2014: 97-8) notes, recent studies of the Bell Beaker period reveal distinctive burials marked by a concentration of significant grave goods, indicating high social value. Furthermore, research highlights a strong tradition of manipulating both human remains and grave goods, with parts being transferred and rearranged not only within tombs but also across different sites. 'Skulls and long bones disappear, and some accompany other primary burials within the same funerary context' (Liesau and Blasco 2019: 185, 198), a practice clearly tied to funerary rituals. This phenomenon has been documented in several tombs at La Magdalena. Regarding the ritual aspects, limited information exists, leading to many hypotheses. The general positioning of bodies suggests the use of shrouds or binding materials to maintain a lateral decubitus position with full flexion, or at least of the legs. It appears that bodies were moved only after being prepared in this position for burial. Additionally, bedding, possibly made of vegetal and/or floral materials, seems to have been arranged beforehand (Blasco *et al.* 2019: 261).

In most cases, except for rare instances like the UT 4463 excavated shelter, tombs were reopened, usually to extract specific body parts, primarily skulls. This practice has been confirmed in the UT 4600 hypogeum and the UT 5005 excavated shelter, where a mandible has been preserved. Further exceptions include the UT 4081 tumulus, where the structure was expanded to inter an infant (Individual I). In both the hypogeum and excavated shelter, primary burials underwent skeletonization in open spaces, allowing for visual access and manipulation, which often led to alterations in the grave goods (Gómez-Moreno 2017). Unlike at Humanejos (Flores Fernández and Garrido Pena 2014: 166), no evidence of intentional tomb destruction has been found at La Magdalena. The alterations in two tombs are attributed to seismic activity rather than deliberate action.

The sprinkling of ochre on bodies is observed in two instances: on the female individual in UT 4463, where colour was preserved between the neck and pelvic area, and on some bones in UT 5005, although the specific individual could not be identified. The presence of a pot and a cup within another large pot may be interpreted as evidence of funerary feasting (Blasco *et al.* 2019: 263), followed by a deposition process and covering with quartzite, contributing to the raising of the tumulus. A key aspect to consider is the potential relationship between



Figure 5. Grave goods recovered from the Bell-Beaker tombs. UT 4081 contained two beakers and a pot, a Palmela-style point and a quartzite pestle. UT 4463 contained a pot, two hemimandibles of a *Sus scrofa* with both its tusks, the copper awl and two ivory buttons, one V-shaped and other straight. UT 4600 yielded a large container and vase.

the various types of tombs, the individuals interred within them (their gender and number), and the items typically known as grave goods. Grave goods clearly reflect variables such as gender, age, and social status. Equally important are the considerations of attire, personal adornments, items of prestige, and those intended for the deceased's use in the afterlife, as well as objects used for funerary rituals, both at the time of burial and during subsequent commemorations (Figure 5).

The world of the material culture

Pottery: Analysis of ceramic pastes reveals a predominance of local production, with some vessels potentially originating from nearby regions. Based on macroscopic technical characteristics, the ceramic assemblage can be divided into two main groups: plain ceramics (n=6 vessels) and decorated ceramics (n=9 vessels). These ceramics contain large non-plastic inclusions, ranging from 0.5mm to 3mm, with alternating firings being more common than



Figure 6. Ciempozuelos-style vessels, some of a rather poor quality, corresponding to vases and bowls, found in tomb UT 5001 and votive deposits 5205 and 5237.

oxidizing firings. The surfaces of the ceramics display smoothing with abundant traces of spatulation (Heras Martínez *et al.* 2014b: 189).

Among the plain ceramics, prominent vessels include those found in the UT 4600 hypogeum: a large pot with a flat base, narrow neck, and rounded morphology, accompanied by a small hemispherical bowl. In the excavated shelters, UT 4463 yielded a smaller pot like the former, though affected by humidity, while UT 5005 contained a small, solid hemispherical bowl that had been displaced from its original position, together with fragments of a pot. The UT 4134 tumulus produced a fragmented ovoid-shaped plain bowl, also showing traces of zonal spatulation.

The decorated ceramics group is exclusively associated with the Ciempozuelos style, consisting of vessels of the vase, pot, and bowl trinity. Vases are the most represented ($n=4$), followed by bowls and pots ($n=3$ each). These vessels typically feature a sinuous profile, rounded or pointed morphology, and flat bases. The pots exhibit a pronounced, closed carinated profile, like the vase rims, with slightly convex bases. The bowls, which are the most affected by degradation, have globular bodies ranging from hemispherical to one-third of their diameter, with straight sides, rounded morphology, and convex bases—some of which end with a concave detail. In terms of decoration, the ceramics exhibit the characteristic Ciempozuelos style, alternating between impressions and incisions, forming a variety of friezes arranged in different patterns. These decorative elements cover the entire exterior surface, including the base, and extend along the rim both externally and internally, with certain variations unique to each of the three formal groups of these vessels (Heras Martínez *et al.* 2014b: 192-194) (Figure 6).

Metallic elements: Metallic materials documented at the site are scarce but include two highly significant items: a Palmela-style point and an awl or bodkin, as well as remnants believed to be parts of various rings. All these artefacts are made of copper with a high arsenic content, likely originating from southern regions.

The Palmela point, found in the UT 4081 tumulus, is one of the most representative types of the Bell Beaker culture in central Spain, conforming to the typical dimensions of such objects (Garrido Pena 1999: 174-79). The awl, discovered in the hand of individual 4467 (UT 4463), displays a longitudinal bi-pointed shape with a square section, a form relatively common in funerary contexts in the Madrid region (Heras Martínez *et al.* 2014: 194-95). Lastly, remnants linked to possible rings, found in the UT 5005 rock shelter, were significantly altered due to chemical dissolution. Despite this, the copper material and square-sectioned fragments suggest the presence of at least three rings or perhaps a single spiral ring, inferred from the size of the fragments.

Miscellaneous objects: In this section, it is noteworthy that almost all the elements in this assemblage are associated with a single tomb, the UT 4463 excavated shelter. Foremost among these are two ivory artefacts: one is a rectangular prism with rounded angles and a central circular longitudinal perforation, possibly functioning as a button or bead; the other is a button with a double V-shaped perforation, created by two converging cones that do not pierce the upper face, featuring a prismatic morphology with a polished surface.

Additionally, two *Sus scrofa* (wild boar) tusks, likely part of a necklace, were found in this context, alongside two lower hemimandibles, potentially from the same animal. Other significant finds include several lithic elements, such as flakes, blades, and tool fragments made from flint, discovered in different structures within the tomb. Additionally, remnants of ochre were found in the UT 4361 and 5005 excavated shelters, possibly linked to the treatment of the bodies (Heras Martínez *et al.* 2014b: 197).

Conclusions

Both funerary areas, particularly the Bell Beaker necropolis, have been central to recent studies exploring habitation patterns and interpersonal relationships in the central Iberian Peninsula, especially within the Community of Madrid. A common feature of the Bell Beaker period is the presence of small necropolises with concentrated structures in a confined space, showcasing a range of diverse tomb architectures. In our case, these include tumuli, hypogea, and excavated shelters, both individual and multiple, often accompanied by grave goods. Over time, this pattern shifts towards a significant change in funerary practices, transitioning to individual burials in simple pits.

The data from various studies on the Bell Beaker phenomenon align with recent academic discourse. Some notable outcomes are the results of the chronological and genomic analyses, which position La Magdalena in the final phase of the Bell Beaker period, known as the Ciempozuelos phase. This contrasts with physical and cultural attributes, as individuals from different ethnic backgrounds coexisted within the same timeframe and space. Skeletal remains provide clear evidence of diverse origins: some individuals, like individual 4313 (UT 4081), show direct ancestry from the steppe; others, like individual 5010 (UT 5005), display signs of hybridization; while others, such as individual 4467 (UT 4463), are directly linked to local origins.

Bibliography

- Bernal-García, R., F. Gómez-Moreno, F. J. Serrano, C. Heras Martínez and J. Yravedra Saiz de los Terreros 2021. The role of birds in Roman imperial funerary rituals at La Magdalena (Alcalá de Henares, Spain): osteoarchaeological and symbolic analysis. *Archaeological and Anthropological Sciences* 13 (4): 1-14.
- Blasco, C., C. Liesau and P. Ríos 2019. El registro funerario campaniforme de la Región de Madrid reflejo de una sociedad plural y compleja, in G. Delibes and E. Guerra (eds), *¡Un brindis por el príncipe! El vaso Campaniforme en el interior de la Península Ibérica (2500-2000 a. C.) I*: 246-277. Alcalá de Henares: Comunidad de Madrid.
- Bueno, P., R. Barroso and R. De Balbín 2023. Hipogeos colectivos en el Megalitismo del Interior Ibérico. La necrópolis de Valle de las Higueras (Huecas, Toledo) como caso de estudio. *Menga, Revista de Prehistoria de Andalucía* 5: 2199-2238.
- Cabrera-Jiménez, C., V. Galera Olmo and C. Heras Martínez 2014. El Campaniforme en la submeseta sur: Estudios antropológicos de los restos esqueléticos de la Magdalena I (Alcalá de Henares), in *Actas de las IX Jornadas de Patrimonio Arqueológico en la Comunidad de Madrid*: 127-135. Alcalá de Henares: Dirección General de Patrimonio Cultural, Museo Arqueológico Regional y Colegio Profesional de Arqueología de Madrid.

- Cantalapiedra Jiménez, V., N. Castañeda Clemente, F. J. Fernández de la Peña and A. Ísmodes Ezcurra 2019. Avon, un nuevo yacimiento de la Edad del Bronce en el valle del río Henares (Madrid). Resultados de la primera campaña de excavación arqueológica (2013), in *Actas Reunión de Arqueología Madrileña (RAM) 2018*: 58-67. Madrid: Colegio de Doctores y Licenciados en Filosofía y Letras y en Ciencias de Madrid.
- Flores Fernández, R. and R. Garrido Pena 2014. Campaniforme y conflicto social: Evidencias del yacimiento de Humanejos (Parla, Madrid), in *Actas de las IX Jornadas de Patrimonio Arqueológico en la Comunidad de Madrid*: 159-167. Alcalá de Henares: Dirección General de Patrimonio Cultural, Museo Arqueológico Regional y Colegio Profesional de Arqueología de Madrid.
- Garrido Pena, R. 1999. *El Campaniforme en la Meseta: análisis de su contexto social, económico y ritual*. Unpublished Ph.D. dissertation, Universidad Complutense de Madrid.
- Garrido Pena, R. 2014. Entre el consenso y la incertidumbre: perspectivas actuales en el estudio del fenómeno campaniforme, in *Actas de las IX Jornadas de Patrimonio Arqueológico en la Comunidad de Madrid*: 87-104. Alcalá de Henares: Dirección General de Patrimonio Cultural, Museo Arqueológico Regional y Colegio Profesional de Arqueología de Madrid.
- Gómez-Moreno, F. 2017. *Factores tafonómicos de degradación y conservación de los restos óseos humanos de La Magdalena (Alcalá de Henares, Madrid)*. Unpublished Ph.D. dissertation, Universidad de Alcalá.
- Heras Martínez, C. and A. Bastida Ramírez 2019. Construyendo *Complutum*: el complejo industrial periurbano de 'La Magdalena', in J. Cabrero and P. González, (eds) *Pvrvpvea Aetas. Estudios sobre el Mundo Antiguo dedicados a la Profesora Pilar Fernández Uriel*: 619-44. Madrid-Salamanca: Signifer Libros.
- Heras Martínez, C. and A. Bastida Ramírez 2022. Evidencias de vida y muerte en el valle medio del Henares: el yacimiento de La Magdalena, in *Actualidad de la Investigación Arqueológica en España IV (2021-2022)*: 319-338. Madrid: Museo Arqueológico Nacional.
- Heras Martínez, C., A. Bastida Ramírez, E. Sánchez Medina, R. Corrales Pevida and V. Galera Olmo 2014a. 'Recuperando la muerte': Las necrópolis de La Magdalena (Alcalá de Henares), entre el Calcolítico y la Hispania visigoda, in J.L. Valle, (ed.) *Patrimonio Complutense Recuperado*: 22-75. Alcalá de Henares: Institución de Estudios Complutenses.
- Heras Martínez, C., M. Cubas Morera and A. Bastida Ramírez 2014b. Signos y símbolos en el registro funerario: Ajuares de la necrópolis calcolítica con campaniforme de 'La Magdalena I' (Alcalá de Henares), in *Actas de las IX Jornadas de Patrimonio Arqueológico en la Comunidad de Madrid*: 187-198. Alcalá de Henares: Dirección General de Patrimonio Cultural, Museo Arqueológico Regional y Colegio Profesional de Arqueología de Madrid.
- Heras Martínez, C., V. Galera Olmo and A. Bastida Ramírez 2011. La fase Campaniforme del yacimiento de La Magdalena (Alcalá de Henares, Madrid), in C. Blasco, C. Liesau, and P. Ríos, (eds) *Yacimientos calcolíticos con campaniforme de la región de Madrid: nuevos estudios*: 17-21. Patrimonio Arqueológico de Madrid 6. Madrid: Universidad Autónoma de Madrid.
- Heras Martínez, C., V. Galera Olmo and A. Bastida Ramírez 2014c. Enterramiento y ritual funerario en una necrópolis calcolítica con campaniforme en la submeseta sur: El yacimiento de 'La Magdalena I' (Alcalá de Henares), in *Actas de las IX Jornadas de Patrimonio Arqueológico en la Comunidad de Madrid*: 213-227. Alcalá de Henares: Dirección General de Patrimonio Cultural, Museo Arqueológico Regional y Colegio Profesional de Arqueología de Madrid.
- Liesau, C. and C. Blasco 2019. La manipulación de los ancestros: acerca de los complejos ritos funerarios campaniformes en el centro peninsular, in G. Delibes and E. Guerra (eds) *¡Un*

- brindis por el príncipe! El vaso Campaniforme en el interior de la Península Ibérica (2500-2000 a. C.)*
II: 182-204. Alcalá de Henares: Comunidad de Madrid.
- Liesau, C., C. Blasco, P. Ríos, J. Vega, R. Menduiña, J.F. Blanco, J. Baena, T. Herrera, A. Petri, and J. L. Gómez 2008. Un espacio compartido por vivos y muertos: El poblado calcolítico de fosos de Camino de las Yeseras (San Fernando de Henares, Madrid). *Complutum* 18(1): 97-120.
- Martín Ripoll, P., R. P. Menduiña García and J. Vega Miguel 2006. La necrópolis hispanovisigoda del yacimiento de Equinox, Alcalá de Henares. Madrid, in J. Morín (ed.) *La investigación arqueológica de la época visigoda en la Comunidad de Madrid, II. La ciudad y el campo*: 628-661, Zona Arqueológica 8-II. Alcalá de Henares: Museo Arqueológico Regional.
- Ministry of Environment and Spatial Planning 2007. *Atlas. El Medio Ambiente Físico en la Comunidad de Madrid*. Madrid: Comunidad de Madrid.
- Olalde, I., S. Brace, M. Allentoft *et al.* 2018. The Beaker phenomenon and the genomic transformation of northwest Europe. *Nature* 555, 190-208. <https://doi.org/10.1038/nature25738>
- Rodríguez-Pascua, M. A., C. Heras Martínez, A. Bastida Ramírez, P. G. Silva, M.^a A. Perucha Atienza, J. L. Giner-Robles, P.E. Roquero, P. Carrasco, R. Pérez-López, J. Lario, T. Bardaji, J. Elez and G.B. Gutiérrez 2016a. Resultó afectado el territorio complutense por la acción de un terremoto en el siglo IV AD?, in *Reunión de Arqueología Madrileña (RAM) 2014*: 191-201. Madrid: Colegio de Doctores y Licenciados en Filosofía y Letras y en Ciencias de Madrid.
- Rodríguez-Pascua, M. A., P. G. Silva, J. L. Giner-Robles, R. Pérez-López, M.^a A. Perucha Atienza and F. Martín-González 2016b. Arqueosismología: una nueva herramienta para la sismología y la protección del patrimonio. *Revista Otarq* 1: 151-169.

What's the relationship between hypogea and dolmens in the south of France? The example of the Fontvieille site in Provence

Xavier Margarit

Aix-Marseille Univ, Minist Culture, CNRS, LAMPEA, Aix-en-Provence, France, CNP

Abstract

While dolmens are the main expression of Neolithic funerary megalithism in southern France, a few hypogean tombs are also known in this region in Provence and Languedoc. The technical distinction between these two types of monumental architecture, exclusively or essentially erected for dolmens and exclusively excavated for hypogea, has consequently been expressed in cultural, geographical or chronological terms. These questions were posed very early on in relation to the Provençal necropolis of Fontvieille, due to the originality of the so-called mixed monuments, which are only partly underground and yet located alongside genuine dolmens. Based on these observations, it seemed necessary to re-examine the relationship between dolmens, hypogea and the monuments of Fontvieille in order to better understand the archaeological significance of the architectural features implemented by Neolithic populations. As a result, reviewing the data that form the basis for distinguishing between these types of monuments and the interpretations that have been made of them has led us to reinforce the idea that the elements that link these burials are more important than those that differentiate them. This analysis brings us to relativise the importance traditionally accorded by archaeologists to the distinction between dolmens and hypogean monuments at Fontvieille.

Key words: Neolithic, hypogeum, dolmen, Provence

Dolmens and hypogea, distinctive monuments of southern France

From the end of the 4th millennium BCE onwards, southern France was one of the regions in the western Mediterranean with the largest number of megalithic burial monuments. These mainly consist of dolmens, but there are also a few artificially excavated underground tombs, as well as four mixed monuments that are both built and excavated, identified only at the site known as Fontvieille or Arles-Fontvieille (Figure 1).

Dolmens have been classified into several types, all of which are covered with large slabs. The main types are the Languedoc, Bas-Rhodan and Causse dolmens in the south-west of Languedoc (Châteauneuf *et al.* 2016; Chevalier 1986; Jallot *et al.* 2011), and the dolmens of western Provence, known as elongated chamber dolmens, as well as those with square chambers, in the south-east of Provence (Sauzade 2021).

The Languedoc dolmens are raised with stone slabs and feature a passageway and a chamber approximately two metres long, sometimes preceded by an antechamber. The Bas-Rhodanian dolmens, which are comparable in size or even larger, feature a mixed architecture of slabs and dry-stone walls. They also have a passageway, and their possible antechamber may show a clear separation from the chamber by vertical slabs. The Causse dolmens are more modest in

size, short and narrow, with a single quadrangular chamber made of slabs approximately two metres long, without an entrance.

Similar to the dolmens in the Bas-Rhodan region, those in western Provence have an elongated chamber with a passageway that is always centred on the axis of the chamber, which is either trapezoidal or rectangular and over three metres long. Their dry-stone side walls sometimes incorporate large standing slabs. Finally, the square-chambered dolmens in eastern Provence are smaller in size, with a single quadrangular chamber made of slabs.

The few hypogea, entirely excavated, are mainly located in the Rhône Valley in two groups, Languedoc and western Provence, the latter mainly in Vaucluse (Colomer 1979; Sauzade 2021). These tombs consist of a quadrangular or oval chamber with rounded corners and roughly straight walls. Their entrance systems are not well known due to erosion and the collapse of the vaults of most of these tombs.

Finally, the monuments at Fontvieille, also known as hypogea, are a type in their own right due to their architecture, which borrows technically from both dolmens and hypogea. Like dolmens, their top opening is covered with a series of large megalithic slabs placed side by side. However, like hypogea, their passageway, antechamber and chamber were not built above ground but were excavated in the open air in the rocky subsoil of Miocene molasse, known as



Figure 1. Aerial view of the La Source hypogeum in Fontvieille. Image: Ministry of Culture, DRAC SRA, Hussy 1993.

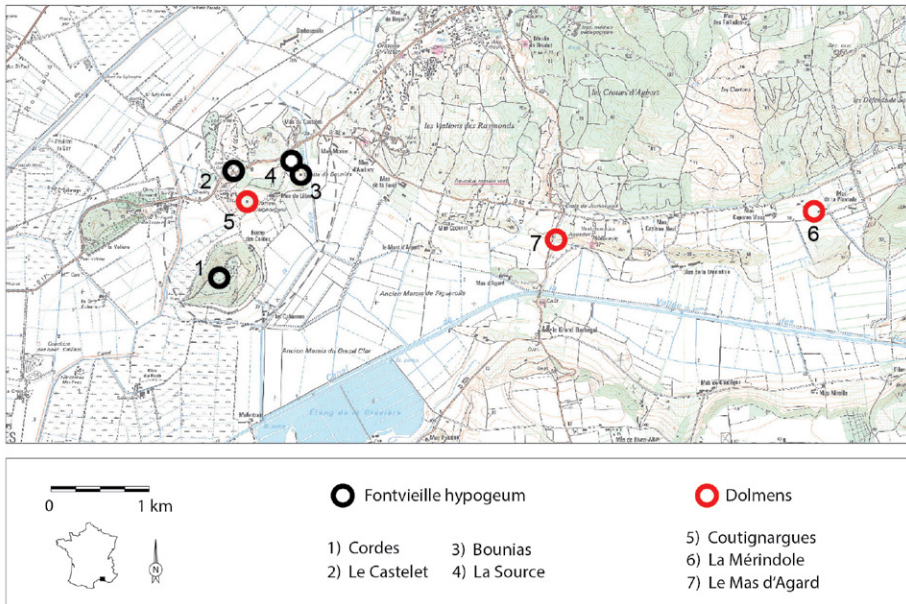


Figure 2. Map showing the location of the megalithic monuments in Fontvieille. Image: X. Margarit 2024, IGN background.

Fontvieille stone. This compact substrate is the result of sandy and limestone coastal marine sedimentation (Bruneton 1999). This architectural feature, which has no equivalent in the Neolithic period in southern France, has not facilitated the definition of these burials, which have long been described as caves, covered passageways or hypogea, the latter term having become established since the end of the 20th century.

The distinction between some of these types of dolmens in southern France can sometimes be debatable due to similarities, for example between those in Languedoc and Bas-Rhodan, or between those in Bas-Rhodan and the elongated chamber dolmens of Provence. However, a consensus has always existed among researchers regarding the overall classification between dolmens, hypogea and Fontvieille monuments. Research in recent decades has therefore focused more on the cultural and chronological relationships between these large megalithic complexes from the late 4th to the early 3rd millennium BCE. This is the case of dolmens and hypogea, which are difficult to periodise due to their assemblages of artefacts and therefore often comparable chronologies. However, hypogea generally contain a much larger number of individuals than other collective burials, the artefacts are often more abundant and the bodies of the deceased less disturbed (Sauzade 2021; Schmitt and Bizot 2021). The relationship between Languedoc and Vaucluse hypogea and the monuments at Fontvieille has been relatively little explored by researchers (Gutherz 1998). Regarding the dolmens and monuments at Fontvieille, they have been recognised for their architectural similarities, particularly their trapezoidal shapes (Guilaine 2015; Jallot *et al.* 2011; Sauzade 2008).

The unique features of the Fontvieille necropolis and monuments

The megalithic site of Fontvieille, located near the town of Arles in Provence, is situated in the lower Rhône plain, between the Camargue wetlands and the Alpilles limestone massif, some 30 kilometres from the Mediterranean Sea. It consists of seven monuments, four hypogea and three dolmens, all facing west, which present the more or less diffuse remains of eroded tumuli (Figure 2). Five of these burials, all excavated in the 19th century, are located a few 100 metres apart: the Cordes hypogea, also known as the Grotte des Fées (Fairy Cave), which is the most monumental, the hypogea of La Source, Bounias and Castelet, and the Coutignargues dolmen. The dolmens of Mérindole and Mas d'Agard are located between two and five kilometres further east (Sauzade 1990). From 2013 to 2016, a research programme updated our knowledge of these monuments and their contexts through the analysis of old data and through recording, surveys and excavations (Margarit *et al.* 2016).

The three dolmens are of the same type, with elongated chambers typical of western Provence. The best known is Coutignargues. It has a trapezoidal plan and profile. Despite its poorly preserved corridor, it is still 14m long, with the chamber measuring 10.30m. It was built with dry-stone and carefully shaped blocks for the walls and a monolithic slab for the chevet (Figure 3). Its covering of large megalithic slabs, which has now disappeared, was still



Figure 3. The Coutignargues dolmen. Image: Ministry of Culture, DRAC SRA, Rouquette 1975.

evident at the beginning of the 20th century and must have consisted of eight to ten stone slabs (Sauzade 1976).

The four hypogean monuments were built according to the same principles, with a staircase corridor, a small antechamber and an elongated chamber, the latter with a trapezoidal plan and elevation (Figure 4). Their creation, combining the cutting of the limestone subsoil and the covering of megalithic slabs, is a unique feature that has been described as an architectural synthesis (Guilaine 2015). The La Source hypogeum is 16.40m long, up to 2.60m high in the chamber, and has a corridor that is significantly shorter and more abrupt than the other three hypogea. The Bounias hypogeum, which is 19m long and up to 2.90m high, has the distinctive feature of side walls in the corridor that are not completely excavated, but whose upper part is made of dry-stone blocks. The Castelet hypogeum, 18m long and up to 2.50m high, has a slightly more elongated layout than the previous ones. Finally, the monument at Cordes is one of the most remarkable hypogea in Europe and the Mediterranean due to its exceptional dimensions (Arnal *et al.* 1953; Daniel 1960; Guilaine 2015, 2021). Located on the top of a hill at an altitude of 64m, it was excavated from the limestone substrate to a depth of 4m to 5m and a length of 42.70m. It consists of a 10.60m access corridor, a vestibule with two oval, symmetrical side rooms, a semi-circular vaulted corridor and a large chamber 24.40m long, 3.80m wide and approximately 3.50m high (Figure 4).

Culturally, the dolmens and hypogea of Fontvieille have revealed ceramic and lithic artefacts, ornaments and osseous industry that are fairly typical of funerary contexts in Provence. They can be attributed to the Late Neolithic period, in the 3rd millennium BCE, mainly to the Fontbousse culture and the Bell Beaker culture (Margarit *et al.* 2016). A few items, including a copper dagger, a bead and a perforated gold plate, pose questions about the status of the monuments or certain deceased individuals (Porqueddu *et al.* 2022).

Initially, these burials were attributed to the Bronze Age (Benoit 1930; Cazalis de Fondouce 1878). Their subsequent attribution to the Middle Neolithic period (Arnal *et al.* 1953; Daniel 1960), then to the Chalcolithic or Late Neolithic period (Audibert 1958; Courtin 1974; Sauzade 1976) was debated in the 20th century. Although their dating to a late stage of the Late Neolithic, in the middle of the 3rd millennium, was still being considered a few years ago (Sargiano *et al.* 2010; Sauzade 1996), it is now generally accepted that they date to an earlier stage, in the last centuries of the 4th millennium or the very beginning of the 3rd millennium (Guilaine 2015; Sauzade 2008). Thus, the archaeological Fontbousse and Bell Beaker artefacts found in these burials do not reflect the period of their foundation, but rather those of their later use.

The Fontvieille site therefore sets two main questions for researchers. The first concerns the significance of these monuments, which are both hypogea and dolmens, of which only four examples are known to exist at a single site in southern France. The second concerns the coexistence at this same site of these mixed hypogea and dolmens in western Provence, which are different yet related in terms of their architecture and associated artefacts.

Research has thus focused on the origin of these hypogea and the question of their chronological position in relation to that of Provençal dolmens. The proposal put forward since the mid-20th century, which sees the Fontvieille hypogea as the culmination of a Mediterranean

diffusionist dynamic originating in Sardinia or the Balearic Islands, was based fundamentally on the location of these monuments near the sea (Arnal *et al.* 1953; Audibert 1958). From this perspective, they were considered to be the architectural archetype that gave rise to the dolmens of Provence (Daniel 1960; Joussaume 1985; Sauzade 1990, 2008). Furthermore, the Fontvieille hypogea were also considered to be the origin of other Languedoc or Provençal hypogea in the Rhône valley (Courtin 1974).

However, the chronological and morphological data on which the comparisons between the monuments at Fontvieille and Mediterranean hypogea were based were not considered to be truly relevant. Similarly, it has been rightly pointed out that the similarities between the materials found in the Languedoc and Rhône hypogea on the one hand and those found in Fontvieille on the other were not sufficient to establish a connection between these two morphologically very different sites. As a result, without ruling out possible Mediterranean hypogean influences, the emergence of the Fontvieille burials is now considered a more complex phenomenon that was largely indigenous (Guilaine 2015).

A dolmen-hypogeum contrast less marked than it appears

From the late 19th to the mid-20th century, all the Fontvieille monuments, including the Coutignargues dolmen, were indiscriminately referred to as caves, crypts, *allées-couvertes* or hypogea (Arnal *et al.* 1953; Audibert 1958; Benoit 1930; Bouchinot 1905; Cazalis de Fondouce 1878; Nicolas 1890). This variability in terminology reflects the difficulty that the early researchers had in distinguishing between the different types of burials at this site. During the 20th century, the four hypogean monuments at Cordes, Bounias, La Source and Le Castelet were recognised for their originality but were indiscriminately referred to as *allées-couvertes* or hypogea before the latter term became more widely used. This hesitation to name these monuments results from their hybrid nature and their rarity. In other words, the architectural diversity of these four tombs, which combine construction and excavation, has not facilitated recognition of their belonging to the world of megalithism or that of hypogeism. Moreover, while the main researchers at Fontvieille have all addressed the distinction between dolmens and hypogea, most have also emphasised the links between these two types of burials. This is why, for example, research into the origins of the Fontvieille hypogea was also conducted in conjunction with research into the origins of dolmens. While the geographical, cultural and chronological nature of these links between dolmens and hypogea has already been highlighted, their technical dimension deserves further investigation.

Morphological similarities

The imposing size of the Fontvieille hypogea has greatly contributed to the uniqueness and renown of these monuments, especially that of Cordes, which is exceptionally long at over 40m. However, size alone cannot be considered the sole criterion for classifying these hypogea. The Cordes hypogeum is unique in that its size clearly surpasses not only that of dolmens in southern France, but also that of the three other hypogea at Bounias, La Source and Le Castelet. Furthermore, these three tombs measure between 16m and 19m in length (11m to 12m for the chamber), which is certainly remarkable, but comparable to the dolmen at Coutignargues, or those in Languedoc at Pas du Galardet in Pouget (Hérault), Saint-Eugène in Laure-Minervois and Fades in Pépieux (Aude) (Bec-Drelon 2016). The large size of the

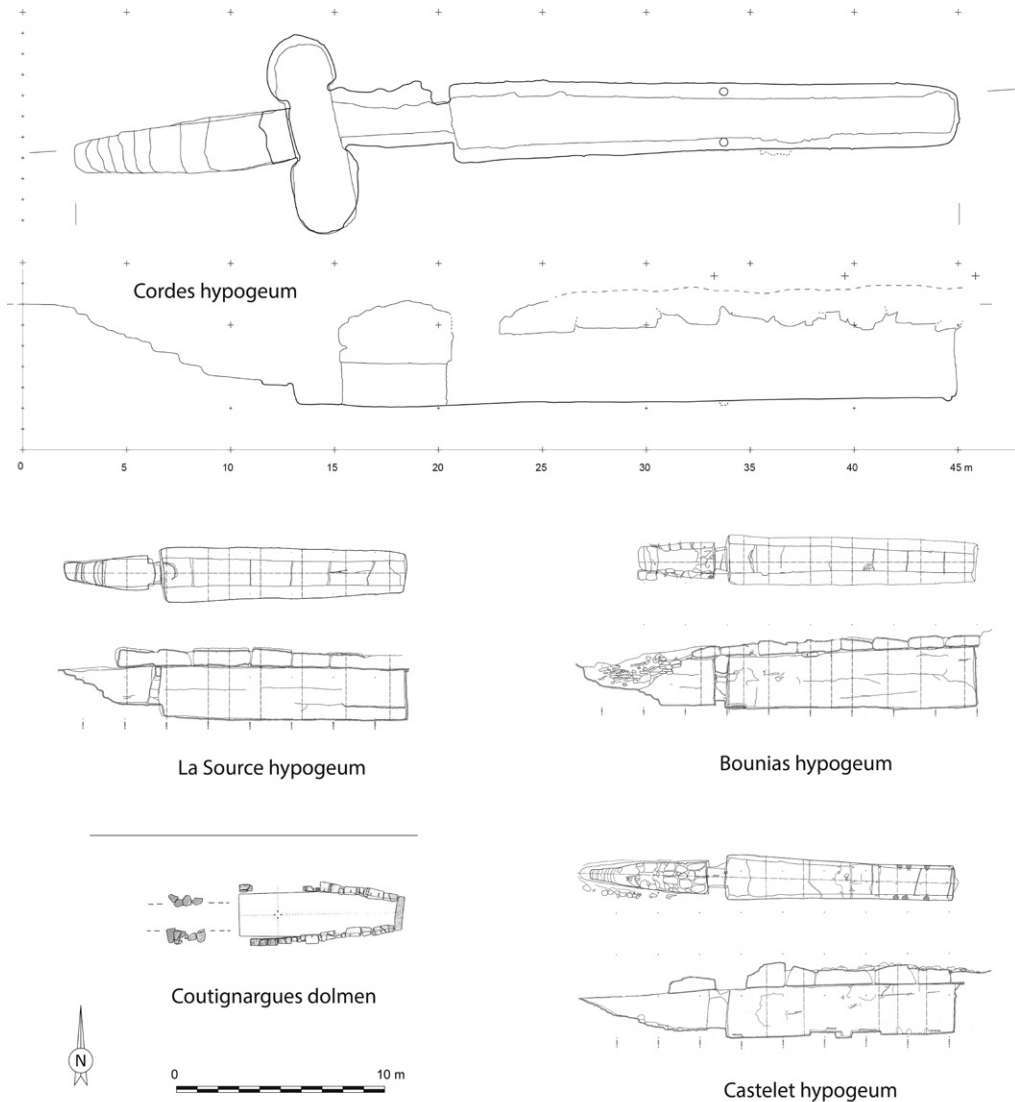


Figure 4. Plans and sections of the megalithic monuments in Fontvieille (Provence, France) *Hypogea*: Ministry of Culture DRAC-SRA; *Coutignargues dolmen*: based on Sauzade 1976.

Fontvieille hypogea is therefore a remarkable feature, but it is not specific to this type of burial site. Moreover, the elongated chambers of the dolmens in Provence also echo the very elongated morphology of the Fontvieille hypogea.

In addition, the trapezoidal shape of the chamber, which is narrower at the back than at the entrance, has always been noted as a common feature of Provençal dolmens and the

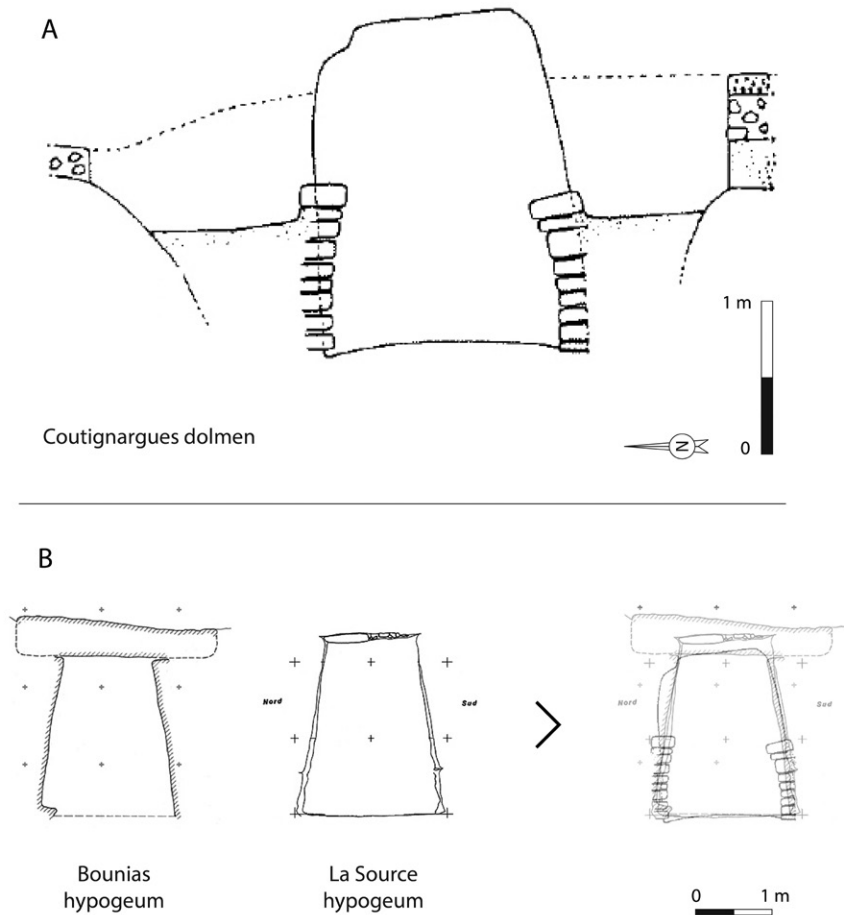


Figure 5. A: Frontal elevation view of the headstone and dry-stone side walls of the Coutignargues dolmen in Fontvieille (*Sauzade 1976*), showing the deep pit dug to create the chamber. B: Attempt to superimpose the trapezoidal elevation profiles of the chamber of the Bounias hypogeum, La Source and the Coutignargues dolmen (*X. Margarit*).

Fontvieille hypogea (Figure 4). This is also true of the isosceles trapezoidal section of the chamber elevation shared by these two types of monuments. Furthermore, the trapezoidal elevation profile of the entrance to the Bounias hypogeum and that of the rear of the La Source hypogeum are perfectly superimposable on that of the chamber in the Coutignargues dolmen (Figure 5b). This example shows that, despite the divergent nature of their walls, the design of these hypogea and this dolmen is very similar, not only conceptually but also in terms of execution.

These monuments do, of course, also have their own distinctive features. This is the case of the Cordes hypogeum, which has an antechamber with two oval appendages perpendicular to the main axis of the tomb (Figure 4). The development of such side rooms is unknown in the dolmens of Provence, but they do not exist in the three other hypogea of Fontvieille either. It cannot therefore be considered an element that distinguishes the hypogea of this site from dolmens. Moreover, if we consider the morphology of these monuments alone, we can also find more similarities between the layout of the Coutignargues dolmen and that of the La Source hypogeum than between the layouts of the two hypogea of La Source and Cordes (Figure 4).

Technical convergence

Other features shared by the dolmens and hypogea of Fontvieille can be seen in their construction methods.

While the main feature of hypogea is that they were excavated, dolmens in western Provence were also generally built in hollows. The depth of these dolmen excavations can vary considerably, from a few dozen centimetres for some to over a metre for the one at Coutignargues (Figure 5a). Of course, these excavations are not complete, as they do not cover the entire height of the structure (Sauzade 2021). However, the excavations of the Fontvieille hypogea are not complete either, as they are topped with megalithic slabs. Thus, these dolmens and hypogea can be considered as more or less excavated or more or less erected. In other words, excavation and erection do not discriminate between these two types of monuments but rather link them together. It is only the degree of excavation or erection that distinguishes them.

On the other hand, the nature of the walls, rock in the hypogea or dry-stone blocks for dolmens, is by definition a distinguishing feature between these two types of monuments. However, in Fontvieille, this difference is less strict than it appears. Indeed, the Bounias hypogeum is renowned for its mixed corridor, partly excavated and partly built of rubble stones (Figure 6). These stones are carefully shaped, like those in the walls of the Coutignargues dolmen (Figure 3). A similar large block was also observed in front of the Castelet hypogeum. It is therefore possible that the levelled entrance to this monument may also have been completed with a dry-stone wall. In addition, two very carefully fitted blocks were inserted at the top of the carved wall of the Bounias tomb chamber (Figure 7).

These examples show that both construction methods, wall quarrying and dry-stone masonry, must have been used simultaneously in the construction of the Fontvieille tombs. They also demonstrate the hypogeum builders' considerable skill in shaping and assembling dry stone. The two techniques appear to be complementary in the architectural intentions of the Neolithic builders: to complete the carved top of the inner wall of the chamber, but also to continue the carved wall of the entrance corridor to the Bounias hypogeum, and perhaps also to that of Le Castelet. Thus, at Fontvieille, the distinction between walls excavated in the rock and walls built of rubble stone is not a strict criterion for distinguishing between hypogea and dolmens.

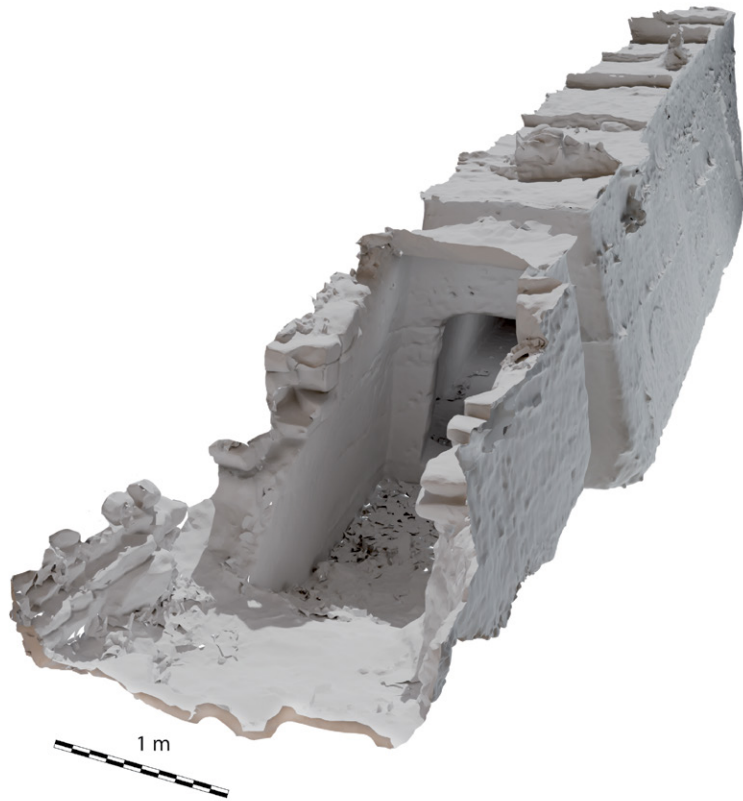


Figure 6. Extract from the 3D lasergrammetric model of the Bounias hypogeum in Fontvieille. In the foreground, the remaining rubble stones of the original dry stone corridor elevation can be seen. By revealing its volume, the overall 3D model of the hypogeum provides a better understanding of the morphological analogy between the Fontvieille hypogea and dolmens. *Image: X. Margarit and P. Barbuti 2025.*

Finally, other technical characteristics further link these hypogea and dolmens. This is the case of the quartzite pebble picks found in the dolmens of Coutignargues and La Mérindole. Such tools have also been reported in the hypogea of Castelet, Cordes and Bounias (Margarit *et al.* 2016). This shows that all these dolmens and hypogea were built using identical tools.

As for the regular pebble flooring reported in the burial chambers of Bounias, La Source and Le Castelet, it echoes the similar pebble flooring in the chamber of the Coutignargues dolmen (Sauzade 1990). This example shows that, beyond the structure of these monuments themselves, the layout of the interior space of the burial chamber also presents clear similarities among these tombs.



Figure 7. View of two stones inserted between the top of the chamber wall and the base of the capstone in the Bounias hypogeum *Image: X. Margarit 2016.*

Moreover, dolmens and hypogea have been recognised as two forms of enclosure serving the same purpose of physical and memorial preservation (Guilaine 2015). We can even assume that the Fontvieille burial sites did not look very different from one another in the Neolithic period. Indeed, from the outside, the mass of the tumuli probably did not allow their nature to be distinguished. Seen from the inside, whether megalithic or hypogean, the chamber remains nonetheless mineral, trapezoidal in shape, with sloping walls, a pebble-paved floor and a ceiling of interlocking slabs. In other words, beyond their differences in construction, the dolmens and hypogea at Fontvieille were most likely designed with the same intention, but also and above all for the same perception of their sepulchral and ritual spaces (Figure 6).

Conclusion

The four mixed funerary monuments at Fontvieille bear little resemblance to Mediterranean hypogeism and share certain similarities with megalithism, from which they also derive in part (Guilaine 2015; Sauzade 2021). More specifically, the Fontvieille hypogea and the elongated chamber dolmens of Provence have the same orientation, are grouped together on the same site, are associated with comparable archaeological artefacts and were constructed using similar tools. They also feature an access corridor, elongated trapezoidal chambers,

straight oblique walls with a trapezoidal cross-section, a roof made of large, monumental slabs and pebble-paved floors. Finally, while the contrast between construction and excavation has always been used to distinguish between these two types of tombs, it is clear that both dolmens and hypogea were partly elevated and partly excavated. Far from simply contrasting them, erection and excavation therefore also bring most of these monuments closer together.

In short, the dolmens and hypogea of Fontvieille differ only in terms of their degree of elongation, which is more pronounced in the hypogea, and the quality of their walls.

As we can see, the similarity between these two types of monuments, already highlighted by researchers, is certainly more significant than previously thought. Indeed, the data presented above show that they are not only related but are part of the same phenomenon.

This observation does not contradict the hypothesis that these hypogea may have been the origin of the Provençal dolmens with elongated chambers. However, it is also reasonable to think that they may have been designed on the model of the dolmens of Provence, as a specific expression of a variant of this megalithism. Indeed, we know that the megalithic monuments in Provence and the lower Languedoc must have been built according to common construction standards, but with distinct variations depending on the geographical area (Sauzade 2021). In other words, it is the diversity of its infrastructure that characterises megalithism in the south of France (Jallot *et al.* 2011). Therefore, the proposal to present the four hypogean tombs at Fontvieille as an epiphenomenon has the advantage of providing a framework for their appearance and rapid disappearance in a single location. Contrary to the hypothesis that these four monuments were the archetype of dolmens, we can also imagine that they were the result of a short-lived technical innovation based on the dolmen model.

In other words, the monuments at Fontvieille may have been conceptually just dolmens among others, whose excavation and elongation were simply more extensive. It is, in a way, more a difference in implementation than a difference in architectural design between these two types of tombs. Once covered with a mound, both would have offered roughly the same appearance, both from the outside and from the inside.

Consequently, it is legitimate to wonder whether archaeologists have not attached greater importance than the Neolithic builders themselves to the distinction between dolmens and hypogea, i.e. between raising or digging for the same purpose.

Thus, given the proximity between these tombs, the term 'hypogeum' alone does not adequately describe the nature of the monuments at Fontvieille. Indeed, this name tends to liken them to the true hypogea of the Rhône and Languedoc regions, with which they have little in common, and to distance them from the dolmens, which they closely resemble. However, it is not certain that another term could be entirely satisfactory to describe these hypogea-dolmens or dolmen-hypogea, as the variability of their names merely reflects their morphological and technical uniqueness.

Bibliography

- Arnal, J., J. Latour and R. Riquet 1953. Les monuments et stations néolithiques de la région d'Arles en Provence. *Études Roussillonnaises* 3(1): 27-69.
- Audibert, J. 1958. *Notes de Préhistoire provençale. Les hypogées préhistoriques de Fontvieille (Bouches-du-Rhône)*. Marseille: Provence historique 8(31).
- Bec-Drelon, N. 2016. Réflexions sur l'implantation et l'architecture des dolmens à couloir et à antichambre du Causse de l'Hortus (Hérault, France), in G. Robin, A. D'Anna, A. Schmitt and M. (eds) *Fonctions, utilisations et représentations de l'espace dans les sépultures monumentales du Néolithique européen*: 35-51. Aix-en-Provence: Préhistoires de la Méditerranée.
- Benoit, F. 1930. *La nécropole du Castelet. Mémoire de l'institut des fouilles de Provence et des Préalpes*, 1, 1926-1929. Paris: Berger-Levrault.
- Bouchinot, E. 1905. Note archéologique sur la crypte sépulcrale préhistorique de Coutignargue et sur l'Allée couverte de La Source près Arles. *Bulletin de la société des amis du vieil Arles* 3: 65-81.
- Bruneton H. 1999. *Évolution holocène d'un hydrosystème nord-méditerranéen et de son environnement géomorphologique. Les plaines d'Arles à l'interface entre le massif des Alpilles et le Rhône*. PhD dissertation Géographie Physique, Université de Provence.
- Cazalis de Fondouce, P. 1878. *Les temps préhistoriques dans le sud-est de la France, Allées couvertes de la Provence*. (Mémoires de l'académie de Montpellier 2). Montpellier: édition Coulet.
- Châteauneuf, F., P. Ambert, C. Requirand, A. Colomer and B. Beaumes 2016. Nouvelles recherches sur l'architecture, l'orientation et la situation des sépultures mégalithiques entre Hérault et Rhône, in G. Robin, A. D'Anna, A. Schmitt and M. (eds) *Fonctions, utilisations et représentations de l'espace dans les sépultures monumentales du Néolithique européen*: 283-295. Aix-en-Provence: Préhistoires de la Méditerranée.
- Chevalier, Y. 1986. L'architecture des dolmens du Sud de la France, in J.P. Demoule and J. Guilaine (eds) *Le Néolithique de la France: Hommage à Gérard Bailloud*: 359-377. Paris: Picard.
- Colomer, A. 1979. *Les grottes sépulcrales artificielles en Languedoc oriental*. Toulouse : Archives d'Écologie Préhistorique 4.
- Courtin, J. 1974. *Le Néolithique de la Provence*. (Mémoires de la société préhistorique française 11). Paris: Klincksieck.
- Daniel, G. E. 1960. *The prehistoric chamber tombs of France: a geographical, morphological a chronological survey*. London: Thames and Hudson.
- Guilaine, J. 2015. *Les hypogées protohistoriques de la Méditerranée, Arles et Fontvieille*. Paris: éditions Errance, Actes Sud.
- Guilaine, J. 2021. Mégalithes et grottes funéraires, cohabitation ? Complémentarité ? Exclusion ? Une histoire complexe, in M. Le Roy and J. Recchia-Quiniou (eds) *Grottes et dolmens, relations entre les sépultures collectives de la fin du Néolithique dans le Sud de la France*: 11-20. Aix-en-Provence: Préhistoires méditerranéennes 9, 2.
- Gutherz, X. 1998. Les dolmens en Languedoc-Roussillon, in P. Soulier (ed.) *La France des dolmens et des sépultures collectives (4500-2000 av. J.-C.)*: 131-133. Paris: Errance, Archéologie d'aujourd'hui.
- Jallot, L., L. Laporte and M. Sohn 2011. Mégalithismes en France, nouveaux acquis et nouvelles perspectives de recherche. *Gallia Préhistoire* 53: 289-338.
- Joussaume, R. 1985. *Des dolmens pour les morts, les mégalithismes à travers le monde*. Paris: Hachette.
- Margarit, X., M. Bailly, C. Bashore Acero, S. Bonnardin, J.-É. Brochier, A. Caraglio, J. Cauliez, A. D'Anna, C. Defrasne, G. Goude, X. Gutherz, C. Guttierrez, L. Jallot, T. Lachenal, O. Lemerrier,

- J. Mayca, S. Negroni, V. Ollivier, M. Orgeval, J.-L. Paillet, M.E. Porqueddu, N. Provenzano, S. Renault, L. Rousseau, M. Saletta, A. Schmitt, S. Van Willigen and L. Viel 2016. Les hypogées d'Arles-Fontvieille et leur environnement : nouvelles perceptions, nouvelles perspectives, in J. Cauliez, I. Sénépart, L. Jallot, P.-A. de Labriffe, C. Gilabert and X. Gutherz (eds) *De la tombe au territoire: actes des 11e Rencontres Méridionales de Préhistoire Récente*, Montpellier: 87-98. Toulouse: AEP.
- Nicolas, H. 1890. Tumulo-dolmen de Coutignargue à Castellet, près Arles. *Mémoire de l'Académie de Vaucluse* 9: 214-224.
- Porqueddu, M.-E., L. Viel and X. Margarit 2022. Quale status per i monumenti megalitici e i defunti che li occupano? La necropoli di Arles-Fontvieille (Francia), in N. Negroni Catacchio, C. Metta, V. Gallo and M. Aspesi (eds) *Ipogei. La vita, la morte, i culti nei mondi sotterranei, Atti del Quindicesimo Incontro di Studi Valentano (VT), Settembre 2020*: 679-692. Milano: Centro Studi di Preistoria e Archeologia.
- Sargiano, J.-P., A. D'Anna, C. Bressy, J. Cauliez, M. Pellissier, H. Plisson, S. Renault, A. Richier, O. Sivan and P. Chapon 2010. Les Arnajons (Le-Puy-Sainte-Réparate, Bouches-du-Rhone) : un nouveau dolmen dans le Sud-Est de la France. *Préhistoires méditerranéennes* 1: 1-37. <https://doi.org/10.4000/pm.439>
- Sauzade, G. 1976. Le dolmen de Coutignargues, commune de Fontvieille (Bouches-du-Rhône), in *Congrès Préhistorique de France, 20e session, Provence, Martigues 1974*: 567-580.
- Sauzade, G. 1990. Les dolmens de Provence occidentale et la place des tombes de Fontvieille dans l'architecture mégalithique méridionale, in J. Guilaine and X. Gutherz (eds) *Autour de Jean Arnal, Recherches sur les premières communautés paysannes*: 305-334. Languedoc Roussillon: CNRS, DRAC.
- Sauzade, G. 1996. La préhistoire d'Arles et ses environs, in *Musée de l'Arles antique, collections archéologiques d'Arles* : 24-28. Paris: Errance édition Actes Sud.
- Sauzade, G. 2008. Arles avant Arles: Préhistoire de la région, in J.-M-. Rouquette (ed.) *Arles, histoire, territoires et cultures*: 55-65. Paris: Imprimerie nationale.
- Sauzade, G. 2021. Les sépultures collectives provençales dans le temps long. Permanence et évolution des architectures et des pratiques funéraires, in M. Le Roy and J. Recchia-Quiniou (eds) *Grottes et dolmens, relations entre les sépultures collectives de la fin du Néolithique dans le Sud de la France*: 137-163. Aix-en-Provence: Préhistoires méditerranéennes 9, 2.
- Schmitt, A. and Bizot, B. 2021. Dolmens, grottes et hypogées en Provence, in M. Le Roy and J. Recchia-Quiniou J. (eds) *Grottes et dolmens, relations entre les sépultures collectives de la fin du Néolithique dans le Sud de la France*: 119-136. Aix-en-Provence: Préhistoires méditerranéennes 9, 2.

Final Neolithic ornaments and rock-cut tombs in south-eastern France

Laurine Viel

Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence, France
Grand site de l'aven d'Ornac

Abstract

Several groups of hypogea coexist with other types of collective burial in south-eastern France. One group, comprising around ten hypogea, is located between the south of the Drôme département and the north of the Vaucluse. These structures display slightly different architectures, and funerary practices vary from one hypogeum to another. However, the biological data and the ceramic and lithic finds are similar in the various sites. But what about the ornamental items, of which there are many at these sites? Are there also differences between sites? An in-depth study of Layer 5 in Les Crottes hypogeum at Roaix (Vaucluse) was undertaken to answer these questions. The typology of items is not very varied, but techno-functional and spatial analyses reveal probable differentiation between individuals through their ornaments. These results were compared with the inventories for Les Boileau hypogeum (Sarrian, Vaucluse) and Layer II in Le Capitaine hypogeum (Grillon, Vaucluse).

This comparison revealed a common background characteristic of the cultural atmosphere at the end of the Neolithic period in south-eastern France, but also a number of differences. Several possibilities could explain this diversity: chrono-cultural variations, status of individuals and populations, or freedom of choice for individuals.

Key words: Techno-functional analysis, morphometry, spatial analysis, Drôme-Vaucluse hypogea

Introduction

Neolithic societies in Europe and France underwent major economic and societal changes between the 5th and 3rd millennia BC. Different forms of collective burial are observed during this period (Ard and Mens 2018: 85). In Provence, between 3500 and 2000 BC, dolmens coexisted with sepulchral caves and rock-cut tombs, as well as other types of burial (Schmitt and Bizot 2021: 119-136). Two groups of rock-cut tombs have been identified (Figure 1):

- The Arles-Fontvieille necropolis in the Bouches-du-Rhône (Guilaine *et al.* 2015; Margarit this volume)
- A group of Drôme-Vaucluse rock-cut tombs, located in the south of the Drôme and the north of the Vaucluse, dug into the Burdigalian or Miocene molasse (Courtin 1961: 192; Mahieu *et al.* 2004: 375; Sauzade 1983).

We will focus on the second group. The rock-cut tombs in the Drôme-Vaucluse group differ in their architecture and burial practices. Some have more rectilinear walls; some are ovoid shaped. The sizes and number of individuals vary: 12m² at Les Boileau hypogeum (Sarrian,

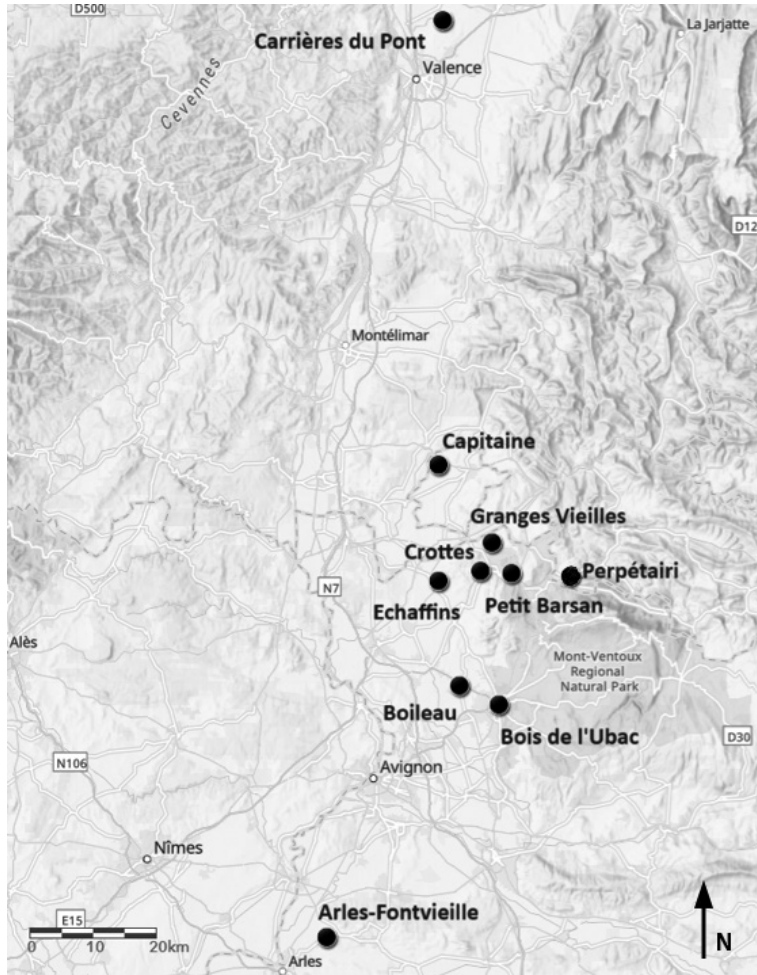


Figure 1. Distribution map of the Arles-Fontvieille necropolis and the hypogea of the Drôme-Vaucluse group. Design: M. É. Porqueddu.

Vaucluse) where 329 individuals were deposited (Devriendt *et al.* 2005: 123); 178 individuals per 100m² at Le Capitaine hypogeu (Grillon, Vaucluse), where the low density of bodies therefore led to less reworking (Chambon 2003: 222-229; Lambert *et al.* 2016: 321); and several funerary layers in Les Crottes hypogeu (Roaix, Vaucluse) with more than 200 individuals (Bizot, personal communication). Yet there are few differences in the biological data between the rock-cut tombs. Osteological activity markers, for example, are similar (Lambert *et al.* 2016: 324). There are few studies of the furniture from these sites. However, they do show certain homogeneity in the material (Sauzade 2021). Ceramics, for example, belong to the same styles (Cauliez 2011: 132 and 134). The lithic industry is typologically similar: retouched blades, rhombic or leaf-shaped armatures, and scrapers (Courtin 1961: 198; Sauzade 1983: 185-193, 209).

Ornaments, which are very common in rock-cut tombs, are a good indicator of cultural practices. It allows the individual to be differentiated (status, age, religion, marital status, sex, etc.). It is also a marker of cultural identity, as only ornaments that are accepted by the group are worn (Sciama 1998; Vanhaeren and D'Errico 2011: 60).

Ornamentation is a good tool for questioning the apparent contradiction between funerary practices that varied greatly from one site to another and a certain homogeneity in the biological data and grave goods, since it allows us to approach the scale of the individual and the group. We can ask if the ornamentation in the hypogea of the Drôme-Vaucluse group varies from one site to another, and if certain individuals stand out for their adornments. Part of this work was carried out as research towards my doctorate on Final Neolithic ornaments in Provence (Viel 2021). This thesis was supervised by M. Bailly and S. Bonnardin.

Methodology

We will compare the ornament elements from three rock-cut tombs in the Drôme-Vaucluse group: Layer 5 in Les Crottes hypogeum, Layer II in Le Capitaine hypogeum, and Les Boileau hypogeum. These are the most extensively studied burials in the group (Bizot and Schmitt 2019; Chambon 2003; Devriendt *et al.* 2005; Mahieu *et al.* 2004; Lambert *et al.* 2016; Sauzade 1983). The aim is to analyse variations between sites but also within sites.

Analysis and comparison of ornament items

Intrasite variability of ornament elements requires the record of the coordinates of the remains during excavation. Although the Capitaine and Boileau hypogea have such data, I only studied Les Crottes hypogeum (Layer 5) as part of my thesis (Viel 2021). Intrasite variability cannot be addressed without a morphometric, technical and functional approach. Indeed, these aspects enable us to detect differences that a typological approach would not allow. I have developed a methodology based on intrinsic characteristics; i.e. the raw data that can be gathered by studying a piece using physicochemical analysis and in-depth observation with a stereo microscope. I considered:

- Raw material properties (colour, structure and the material's ability to be transformed),
- The frequency of raw material sources and their theoretical proximity,
- Shape and size of objects,
- Technical and functional traces.

To define the types of ornamental elements whose shape is not derived from an anatomical element, two mutually perpendicular sections were used: the section parallel to the faces and the section perpendicular to the faces, which can be: circular, elliptical, quadrangular, triangular and three-lobed. Each type is determined by the shape of these two sections and are separated according to the maximum height or diameter-thickness ratio (thick, uniform, flat). A bead with a quadrangular perpendicular section, a circular parallel section and a flat ratio is a discoid bead; if it has a thick ratio, it is a cylindrical bead. A pearl with an ovoid perpendicular section, a circular parallel section and a thick ratio is a regular ellipsoidal pearl (Viel 2021: 103-107).

I was then able to establish a first level of interpretation: *chaînes opératoires* and use-wear reconstructed through all the characteristics as well as experiments and ethnoarchaeological studies. In this way, I was able to pose questions about:

- Standardisation of objects,
- Know-how employed,
- Investment in production,
- And degree of use-wear of the items (Viel 2021).

However, the comparison of ornament items between the different rock-cut tombs is based exclusively on a typological approach, employing the artefact publications. I have not yet studied these corpuses in greater detail. The comparison was made with the precise descriptions and photographs in various papers (Mahieu *et al.* 2004: 378; Sauzade 1983: 193).

Comparing composite ornaments

A great deal of information is provided by studying ornament elements one by one (e.g., beads). However, the vast majority were not worn alone. They were part of an assemblage known as ‘ornament’ (e.g., necklace). While some sets consist of a single element, such as a ring, they are very often composite. In this case, they are made of several linked elements.

To enable us to compare composite ornaments, a classification system has been established. It is based on ornament composition, i.e. the order and arrangement of the elements. The classification chosen is largely based on that established by H. Alarashi (2014: 625-629). This makes it possible to analyse the combination of several characteristics: shapes, materials, colours and templates (differences in sizes). There are several combinations in the sites (Table 1. Figure 2)

However, ornaments are often difficult to reconstruct, particularly in the case of collective burials. In fact, the numerous movements of the bones can disperse the elements that make up an ornament set. Layer 5 in Les Crottes hypogeum at Roaix is a good example of these difficulties.

Table 1. Description of the different types of combinations in the composite ornaments.

Type of composite ornament's combination	Shape	Size	Raw material	Colour
Simple ornament	1	1	1	1
Monotype single-colour ornaments	1	1	At least 2	1
Single-colour ornaments with two shapes and sizes	2	2	1	1
Two-colour monotype ornaments	1	1	At least 2	2
Two-colour ornaments with two shapes but one size	2	1	At least 2	2
Two-colour ornaments with two shapes and sizes	2	2	At least 2	2
Two-colour ornaments with three shapes but two sizes	3	2	At least 2	2

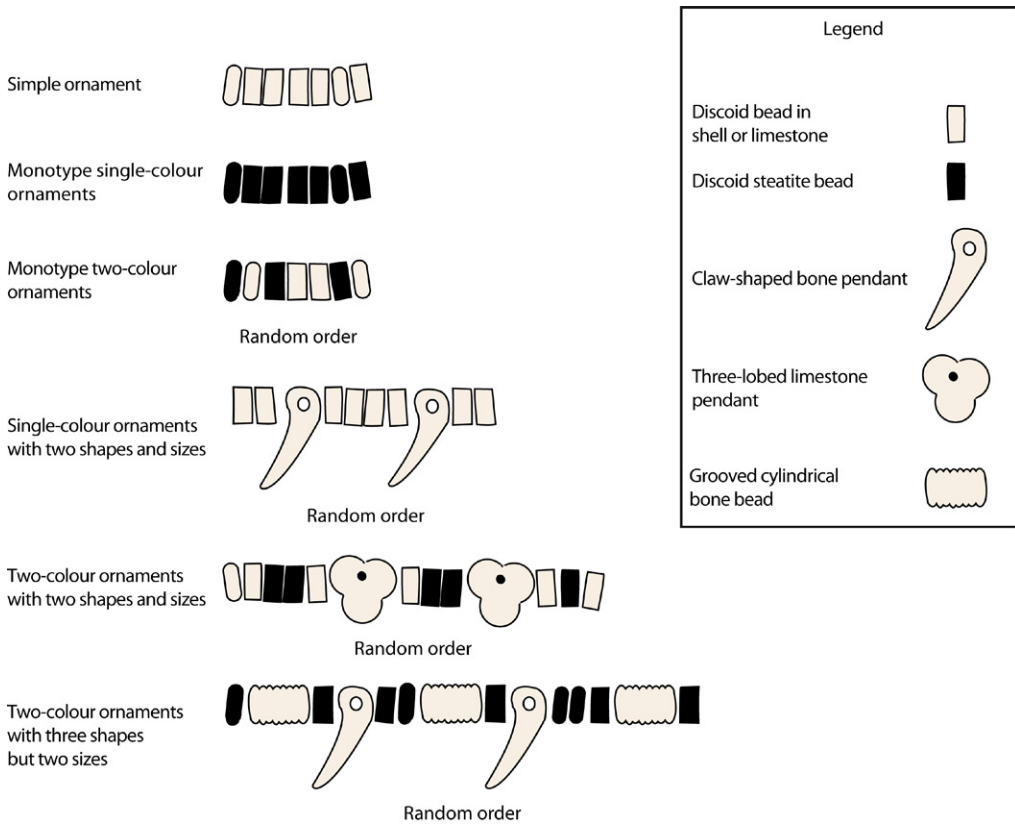


Figure 2. Diagram of different ornament compositions. The order is hypothetical for monotype two-colour sets and two-shape two-colour sets. *Design: L. Viel.*

Layer 5 in Les Crottes hypogeum at Roaix (Vaucluse)

Les Crottes hypogeum is in the Roaix commune, 2.5km north of the village. It is dug into the southern slope of a hill of Helvetian sandy molasse. This burial site would have been rectangular in shape, measuring around 9m long, 6m wide and 3.5m high.

History of research

In 1965, following extensive looting and erosion, J. Courtin was commissioned to carry out a rescue excavation (Chambon, 2003: 49-50; Gagnière 1968: 496). The excavation was based on the work done at the Mournouards hypogeum (Leroi-Gourhan *et al.* 1962): vertical photographs and connected bones and skeletal segment records. The main bones and archaeological remains are numbered and located in three dimensions.

During the excavations, five layers were identified, two of which were funerary (Layers 2 and 5). In recent years, the excavation data were re-examined by B. Bizot and A. Schmitt. With GIS

analysis, they subdivided the two funerary layers into several levels of deposits that were not discriminated during the excavation (Bizot and Schmitt 2019).

Although Layer 2 is the best known, because it was long considered to be a war layer (Chambon, 2003: 49-63; Sauzade, 1983), there were few ornament items in it. We will concentrate on Layer 5.

Layer 5

This layer (3340 and 2930 cal. BC) covers around 22m² (Sauzade *et al.* 2018: 14, 18). The bones are highly fragmented, and only a few anatomical connections remain. Spatial analyses have made it possible to divide Layer 5 into three successive levels (B. Bizot, personal communication):

- Level 5-a rests on the sandstone substratum. The bones were deposited on a pebble slab (Sauzade 1983: 203). The level is divided in two. In the lowest part (5-a-inf), the bones are very poorly preserved, but several segments of adult individuals have been identified. None of these associations could be linked to archaeological material. The second part (5-a-sup) contains more bone connections. Several objects, including ornaments, are attached to or very close to connected bones.
- Several bone connections belonging to adults were discovered in Level 5-b. Several sets of beads could be linked to these subjects.
- The final level (5c) contains numerous bones remains, some of which are connected. There is also a large amount of material, but it is not linked to bones.

Ornament elements from Layer 5 at Les Crottes

According to G. Sauzade (1983: 209-213), a total number of 2,534 ornamental items were recovered in Layer 5. 1,911 elements have been studied. At least nine different raw materials and 13 shapes can be differentiated (Figure 3).

Within these levels, concentrations of ornament elements were observed and represented on the plans (Figures 4, 5, 6 and 7). Some ornamental elements were isolated, others have been found side by side. The latter were then collected as a set. A set (several elements discovered in close proximity) could form a composite ornament or part of an ornament, sometimes associated with bones.

The precision of the spatial data for the items varies. In fact, 56.5% of the finds were discovered by sieving. We only know the altitude and the square in which they were found. These items were placed randomly in these squares and are slightly transparent on the plans. The others were discovered during the excavation. Their coordinates in three dimensions are known and they are placed in their exact position on the plans.

Level 5-a-inf

Ornament elements are rare in Level 5-a-inf (7% of the ornamental items in Layer 5, Table 2). This may be because there were few bones in connection, or that the rest of the ornaments were moved with the bones.

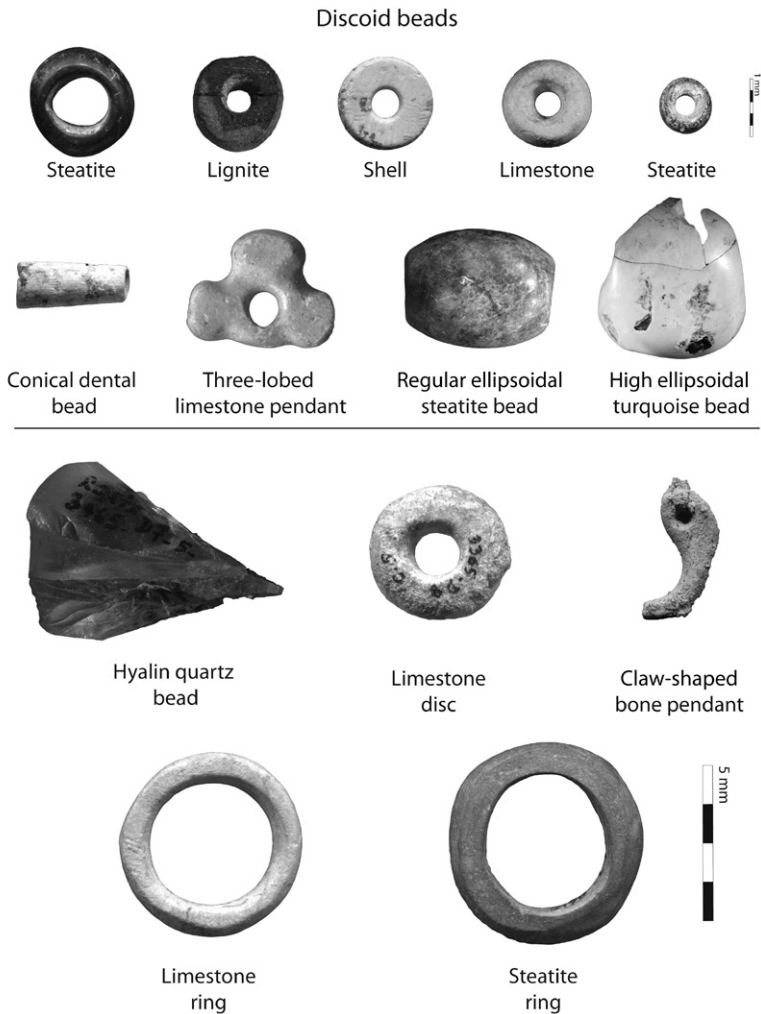


Figure 3. Photographs of different ornament elements from Layer 5 in Les Crottes hypogeum. *Image: L. Viel.*

The spatial distribution of the ornaments varies according to their type (Figure 4). The discoid beads are located to the west and south, in three main concentrations. The first (5-a-inf-1) is in Square C5. The second concentration (5-a-inf-2) is in Squares A6, B6 and B7 and the last (5-a-inf-3) is in D4 and D5.

Discoid steatite beads are absent from the southern part. Limestone beads are concentrated in the centre and south of the level. Shell beads are distributed over the entire surface of the level.

Table 2. Number and percentage of the ornamental elements in the different levels and concentrations

Level	Concentration name	Number of ornamental element	Percentage
5-a-inf		133	7
	5-a-inf-1	29	1.5
	5-a-inf-2	21	1.1
	5-a-inf-3	26	1.4
	5-a-inf-Other	57	3
5-a-sup		477	25
	5-a-sup-1	277	14.5
	5-a-sup-2	90	4.7
	5-a-sup-3	18	0.9
	5-a-sup-Other	92	4.8
5-b		624	32.7
	5-b-1	170	8.9
	5-b-2	108	5.7
	5-b-3	102	5.3
	5-b-4	36	1.9
	5-b-5	75	3.9
	5-b-Other	133	7
5-c		391	20.5
	5-c-1	137	7.2
	5-c-2	82	4.3
	5-c-3	33	1.7
	5-c-Other	139	7.3
Indeterminate level	Indeterminate concentration	286	15
Total		1911	100

Due to the low precision of location, it is not possible to estimate the number of ornaments within each concentration.

The other ornament elements (steatite ring, ellipsoidal and ovoid steatite beads, copper bead) are located outside the concentrations in the eastern part of the level (Figure 4).

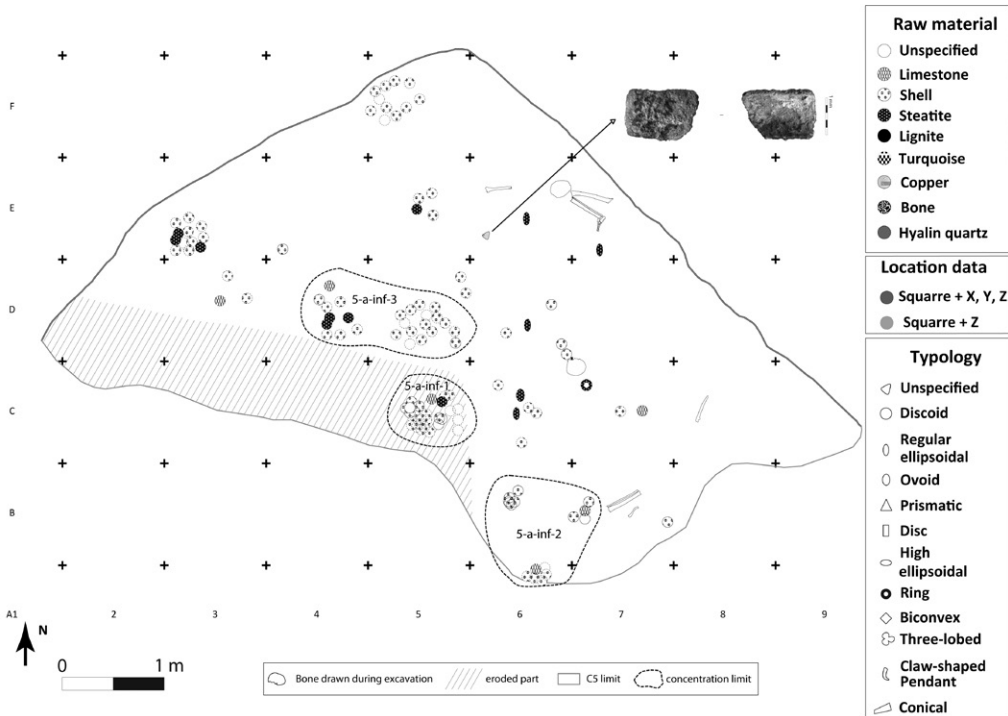


Figure 4. Distribution map of ornamental elements from Level 5-a-inf. Design: L. Viel, A. Caraglio and B. Bizot.

Level 5-a-sup

The ornamental elements in Level 5-a-sup represent 25% of the Layer 5 adornments (Table 2). They are mainly located in the centre.

Discoid beads are predominant (97.3% of the items in Level 5-a-sup). Steatite beads are mainly found in the west. Limestone and shell beads are distributed over the entire surface (Figure 5).

As in Level 5-a-inf, the limestone rings and disc and the prismatic quartz bead are located outside the concentrations, to the east. The three-lobed limestone or claw-shaped bone pendants are associated with the discoid beads.

Concentration 5-a-sup-1 is in Squares C5, D5 and D6 (277 ornamental items; i.e. 58.1% of the assemblage from the level: Table 2). It comprises several sets of objects that seem to be linked to two connected bone groups. The first consists of a pelvis, two femurs, a spine and forearms. An ornament was found on the distal part of the right femur. It consists of disc-shaped limestone beads, alternating with claw-shaped bone pendants (Figure 5). Towards the upper part of this individual, 128 discoid shell beads were discovered. This could be a necklace deposited with this individual or with the second subject. Concentration 5-a-sup-1 appears to be a site of primary deposits of at least two individuals with one or two ornaments.

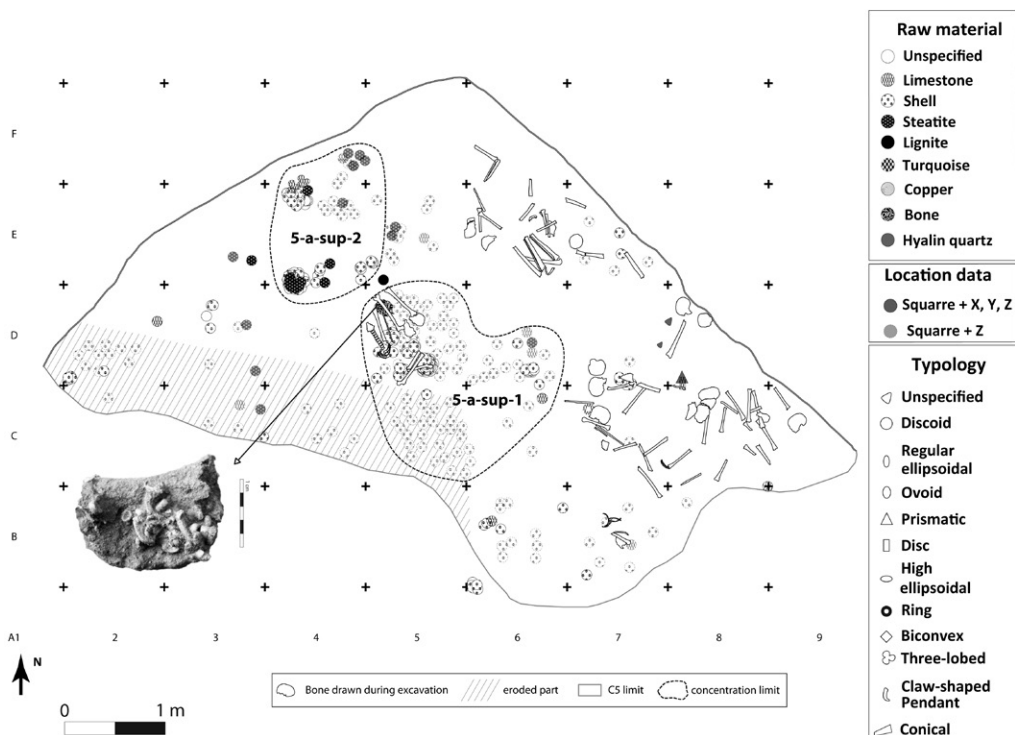


Figure 5. Distribution map and photographs of ornamental elements from Level 5-a-sup. *Design: L. Viel, A. Caraglio and B. Bizot.*

Concentration 5-a-sup-2 in E4 and E5 comprises 90 elements (18.9% of the items from the level: Table 2) separated into two sets. The first contains discoid shell and steatite beads, as well as two three-lobed limestone pendants. The second contains discoid shell, limestone and steatite beads. It is therefore not possible to say how these ornaments were worn, or how many individuals were involved.

Level 5-b

Level 5-b contained the most ornamental elements from Layer 5 (32.7% of the total elements: Table 2).

Discoid beads are predominant. They represent 98.9% of the ornamental elements in Layer 5-b. Steatite beads are concentrated in the west part and in Square D7. Limestone beads are mainly found in Squares C/D6 and D/F5 but are present all over the level, like the discoid shell beads (Figure 6).

The three-lobed limestone pendants are located outside the concentrations, while the ellipsoidal bead and the bone claw pendants were found within the concentrations.

The level contains five concentrations of ornamental elements. The largest, 5-b-1, located in Squares C2/3 and D2/3, contained 170 items. Unfortunately, only a third of these objects were discovered *in situ* and two thirds during sieving. Moreover, the *in-situ* sets are mainly isolated beads or small sets (fewer than five items). This concentration includes discoid limestone and steatite beads and the turquoise bead. No bones were found in anatomical connection in this area. The objects and bones would have moved more in this area. It is therefore impossible to know how many ornaments there were, how they functioned, or which individuals were associated with them.

Concentration 5-b-2 (Square E4) contained 108 ornament items (i.e. 20.8% of those from Level 5-b: Table 2). It comprises a substantial set of 51 discoid shell beads and one steatite bead. Around 15 beads, mainly in shell, were concentrated in the northern part of the square. They were at the same altimetric level and could be part of the same ornament. The bones present were isolated, so it is not possible to establish how the two or more ornaments in this concentration were worn.

Concentration 5-b-3 (Squares C6 and D5/6) contained 102 items (i.e. 16.3% of the items in Level 5-b: Table 2). It is made up of two groups. The first was in Square D5. It consists of a small group of discoid shell beads. Other more isolated beads look close in plan view, but were not at the same height, so probably do not belong to the same ornament. The second is based around two sets whose proximity would suggest that they form a single ornament made up of nine discoid limestone beads and four steatite beads, as well as a piece of quartz. Concentration 5-b-3 therefore consists of at least two ornaments, possibly three or four or more, but the number of individuals is not known.

Concentration 5-b-4 (Square F5) contains only one set of 36 limestone beads (i.e. 5.76% of those from the level: Table 2). It was located on the thorax of an individual whose skull, shoulder and left upper limb were connected. The layout suggests that the beads were strung one after the other (Figure 6). Concentration 5-b-4 could be a composite ornament, probably a necklace.

Concentration 5-b-5 (Square D7) comprises 26 discoid shell beads and 49 steatite beads (i.e. 12% of the level's elements: Table 2). It is mainly composed of a group of discoid beads in green steatite whose diameter is very homogeneous and larger than that of other beads of the same type and material (Viel 2021: 380-409). About 20cm from the rest of the concentration, the discoid shell beads might form another ornament. Concentration 5-b-5 consequently contains at least two different ornaments.

Level 5-b is therefore characterised by the presence of areas where the ornaments seem to have moved around a great deal, and of individualised ornaments sometimes associated with bones.

Level 5-c

Level 5-c contained 20.5% of the ornamental items from Layer 5 (Table 2) and was mainly located against the eastern wall. Discoid beads are predominant; accounting for 98.7% of the ornamental objects in Level 5-c. Steatite beads are found within the concentrations, but



Figure 6. Distribution map and photographs of ornamental elements from Level 5-b. *Desgin: L. Viel, A. Caraglio and B. Bizot. Photograph: J. Courtin.*

very few outside them, while limestone beads are found a little further away. Shell beads are scattered and cover the entire level. However, two-thirds of them are located within concentrations. The other ornamental objects are only found within concentrations, unlike in first levels (Figure 7).

The ornamental elements in Concentration 5-c-1 (Squares D1-D2-D3-E3) are quite scattered. It is very important in terms of size and number, containing 139 items; i.e. 35.3% of those from the level (Table 2). These are mainly discoid shell beads, followed by steatite and limestone beads. A long conical bead in *Antalis* sp. (tusk shell), a three-lobed limestone pendant and a piece of turquoise are also present. No connected bones have been identified in this concentration. This could therefore be a major depositional area. Would that be the case, the remains have been moved around greatly. However, two small ornaments can be identified. The first consists of nine discoid shell and steatite beads, the second of six discoid shell beads.

Concentration 5-c-2 (Squares F4-F5) contains only isolated discoid shell, steatite and limestone beads. This also could be a place where the remains have been disturbed considerably. The same applies to Concentration 5-c-3 (square E4), where only a small group of four discoid shell beads and two three-lobed pendants can be identified.

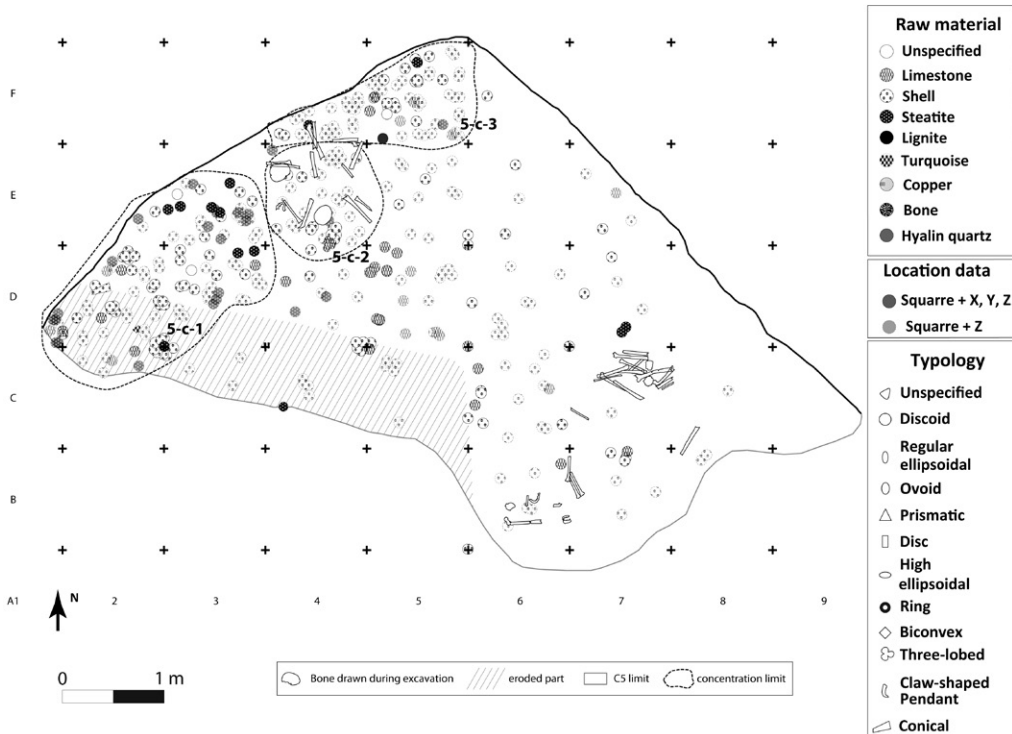


Figure 7. Distribution map of ornamental elements from Level 5-c. Design: L. Viel, A. Caraglio and B. Bizot.

Summary of ornamental elements in Layer 5

Form, material and composition

At least nine raw materials, 13 different shapes and 15 shape-raw material combinations can be observed in the ornamental objects studied. Discoid beads represent the vast majority, accounting for 98.2% of the ornament elements, particularly shell beads (67.5%, 1,289 items). Limestone and steatite beads are less abundant (12 and 9.8%). Other ornament elements from Layer 5 are present in very small quantities (Table 3).

The description of the spatial distribution of ornamental objects, particularly sets, has enabled us to identify composite ornaments. These are identifiable by the large number of elements in the set and/or their location. Some composite ornaments are formed by a single set. Some assemblages that are spatially close to each other could form a single composite ornament if grouped together. Except for two sets that combine different types of ornamental elements, the other 64 sets are composed of discoid beads. The number of objects in them varies from two to 116, of which only eight contain more than ten elements.

Different compositions were thus revealed. Among the large sets (more than ten objects), four can be considered as simple ornaments. These are made up of discoid beads in limestone (Concentration 5-b-4), shell (5-a-sup-1) or steatite (5-b-5).

Two other ornaments are of the two-colour monotype sets. The first has a composition that seems unbalanced since it contains only one black bead whereas the other 49 are white (Concentration 5-b-2). The second is more balanced in terms of number (ten beads in shell, eight in steatite and one in limestone: Concentration 5-a-sup-2).

Of the two ornaments made up of two different shapes with two different sizes, one is single-coloured (limestone beads and claw-shaped bone pendants: Concentration 5-a-sup-1), the other is two-coloured (Concentration 5-a-sup-2). The second, however, contains only one black object. The rest are discoid shell beads and two three-lobed limestone pendants.

While it is possible to say that the ornaments are single- or two-coloured, and made up of one or more types, it is not possible to know how the elements were arranged within a set. The set alternating claw-shaped bone pendants and discoid limestone beads is the exception because it was still in place around the bone (Figure 5).

The small assemblages can mainly be classified as simple ornaments, particularly those made up of five to nine objects. Others are two-coloured monotypes and one single-coloured but consisting of beads of different materials (shell and limestone). While this classification is more or less reliable for large sets, it should be taken as a guide for sets with fewer than ten objects. The beads found individually *in situ* and those discovered during sieving of the sediments were probably part of an ensemble. These assemblages could be larger.

It is therefore difficult to estimate the number of ornaments at the site. The average number of objects per set (taking all set sizes together) is eight, or around 313 discoid bead compositions. If we consider only the large sets (more than ten objects), the average is 44 items, or 56 sets. The number of ornaments can therefore vary from several hundred to around 50. Given that one of the sets identified is made up of more than a 100 beads, the total may be much smaller.

Spatial and temporal distribution

There are differences in the distribution of ornament elements between the levels. Firstly, the number of ornamental objects is different (4% for 5-a-inf, 26.4% for 5-a-sup, 34.6% for 5-b and 21.8% for 5-c). It is now difficult to know whether these differences are linked to conservation, tomb emptying, cultural differences or differences between individuals.

Secondly, the general distribution of ornamental items varies from one level to another. These objects are grouped together in the centre of Level 5-a, but in the western part in Level 5-c. Both central and western areas in Level 5-b display high ornamental object density. Very few elements were found in the eastern part of the burial.

This distribution is not always explained by the presence of bones. In fact, in Level 5-a, the areas of bone density do not overlap with those of ornamental elements. On the other hand, the gradual displacement of ornament elements from the centre to the west seems to

accompany the bones in the second and third phases of Layer 5, although the concentrations of ornamental objects do not perfectly overlap those of the human remains. Several possibilities (which may be combined) could explain this difference.

The first hypothesis is that the bones were moved without the ornaments. As the ornaments were small objects, they were left in place (intentionally or not). In fact, there seem to be concentrations where ornaments still in place can be identified without being attached to bones. However, this does not explain why the connected human remains have no ornaments. In addition, the ornamental elements in the concentrations in Level 5-c are widely scattered, demonstrating that these pieces may also have moved.

The second possibility is that the ornaments were moved together with some of the bones. As the bones in connection are primarily those of the lower or upper limbs, the ornaments might only have been loosely attached to these parts of the body. This hypothesis is validated by the presence of the necklace in Concentration 5-b-4 attached to the upper part of the skeleton. However, it cannot be said that ornaments on the lower limbs were absent at Roaix, as indicated by the presence of an ornament at the base of a femur. This does not allow us to make a definitive statement.

The third possibility is that some individuals were buried without preservable ornaments. Several examples show that at least some of these ornamental objects were placed on the dead. The distribution of ornamental elements and bones, as well as the presence of bones in connection without ornament, seem to indicate that not all the deceased were ornamented. The number of people buried in Layer 5 is thought to be around 105 (Bizot, personal communication). The number of ornaments could vary from around 50 to several hundred, so it is difficult to estimate the number of individuals who were adorned.

In addition to this, there are differences in distribution according to the type of ornament. Discoid beads and other ornamental items are separated in Level 5-a. Similarly, discoid shell beads seem to be more accessible to the populations in Les Crottes hypogeum than steatite discoid beads. In fact, the former are more numerous and spread over the entire surface of the burial and in all the levels. Steatite beads, on the other hand, are less widely distributed.

Discoid steatite beads can also be separated into two groups with slightly different *chaînes opératoires*, depending on their morphometric, technical and functional characteristics (Viel 2021: 381-409).

The ornaments therefore tend to distinguish some of the dead in Les Crottes hypogeum, although the distinctions are not very marked. The individuals could have possessed different statuses. Unfortunately, the lack of information on the biological identity of the interred does not allow us to go any further.

Ornaments from other rock-cut tombs in the Drôme-Vaucluse group

Ornamental objects from other hypogea in this group were not studied as part of my thesis (Viel 2021). The comparison of the ornaments from two other rock-cut tombs with those from Layer 5 will therefore be based on descriptions and photographs from various publications.

Table 3. Numbers and percentage of the different form-raw material combinations according to site

	Shape-raw material combinations	Layer 5 of the Crottes		Layer 2 of the Capitaine		Boileau	
		Number	Percentage	Approximate number	Approximate percentage	Approximate number	Approximate percentage
Bead	Conical bead in <i>Antalis sp</i>	1	0.05	250	0.83	about 15	3
	Copper bead	1	0.05				
	Discoid lignite bead	2	0.10			"a few"	
	Discoid limestone bead	215	11.25	610	2.03	"a few"	
	Discoid shell bead	1289	67.45	840	2.80	"a few"	
	Discoid steatite bead	182	9.52	≈27 000	90.00	350	70
	Discoid beads made from unspecified raw materials	188	9.84				
	Notched bone bead					"around an hundred"	20
	Ovoid steatite bead	1	0.05				
	Prismatic hyaline quartz bead	1	0.05				
Pendant	Regular ellipsoidal limestone bead			1	0.003		
	Regular ellipsoidal steatite bead	4	0.21	2	0.007		
	Turquoise or variscite bead	2	0.10	3	0.01	3	0.6
	Claw-shaped bone pendant	8	0.42	60	0.20	"a few"	
	Grooved bone pendant			42	0.14		
	Grooved cylindrical bone bead			16	0.05		
	Perforated canid's canine tooth			1	0.003		
	Perforated wild boar's tusk			1	0.003		
	Pointed bone pendant			7	0.02		
	Pointed limestone pendant			40	0.13	"a few"	
Other shapes	Three-lobed limestone pendant	10	0.52	355	1.18		
	Limestone disc	1	0.05				
	Limestone ring	3	0.16				
	Steatite ring	1	0.05				
	Unknown shape	2	0.10				
Total		1911	100	≈ 30 000		≈ 500	

Les Boileau hypogeum (Sarrian, Vaucluse)

Presentation of the site

Les Boileau hypogeum (2610-2470 cal. BC) was discovered in 1979 and excavated by E. Mahieu and H. Barge between 1983 and 1994. The sepulchral layer was excavated by stripping, using dentist's tools and a Hoover. All the sediment was sieved. The various bones were photogrammetrically recorded, and all the elements were plotted in three dimensions (Lemerrier *et al.* 2004: 246; Mahieu 1989: 7-10).

The hypogeum is ovoid shaped. Although small in area (12m²), it contained at least 329 individuals (Devriendt 2004: 182).

Ornamental elements

Les Boileau hypogeum at Sarrian contained around 500 ornament elements (Table 3). There is a single-coloured set with two shapes and sizes. This is probably a hairnet found on a skull, made up of rows of notched bone beads alternating with conical beads in *Antalis* sp. (Mahieu *et al.* 2004: 378). No other assemblages are mentioned in the literature.

Seven raw materials, six shapes and nine combinations of shapes and raw materials can be counted among the ornamental items from Les Boileau hypogeum. Thus, there is less variability than in Les Crottes hypogeum. The average number of ornamental items is one and a half per individual buried in this hypogeum. This is the lowest average known for hypogea in the Drôme-Vaucluse group. In addition, the presence of head ornaments, comprising at least 20 items, shows that the individuals were not all buried with ornaments.

Capitaine Hypogeum (Grillon, Vaucluse)

Presentation of the site

The site was discovered in 1975, then excavated between 1975 and 1977 under the direction of G. Sauzade. This is the largest hypogeum in the group (over 100 m²). However, only 178 individuals were buried there (Lambert *et al.* 2016: 321; Mahieu 1984). The stratigraphy comprises three layers: I, IIa and II. Only elements from Layer II (3090-2890 cal. BC) will be presented as it is the only funerary layer (Chambon 2003: 222; Sauzade 1983: 185; Sauzade *et al.* 2018: 14).

Ornament elements

In contrast to Les Boileau hypogeum, ornamental items are very abundant in Layer II in Le Capitaine hypogeum, with almost 30,000 ornamental items discovered (Sauzade 1983: 193).

Eight raw materials, 11 shapes and 15 shape-raw material associations can be observed among the ornamental items from Le Capitaine hypogeum (Table 3). Whereas the variability is slightly greater than at Les Boileau, it is like that in Layer 5 in Les Crottes hypogeum, despite the much greater number of items.

Ornaments combining one or more types of elements were discovered. Discoid steatite beads are included in all the compositions described. There may be others that do not contain this type of object. Discoid steatite beads are sometimes used in simple ornaments. They are, however, more often associated with other types:

- Conical beads in *Antalis* sp. (bicoloured with two shapes but one size),
- discoid beads in limestone or shell (monotype two-colour),
- pointed bone or limestone pendants, claw-shaped bone pendants or three-lobed limestone pendants (two-coloured with two shapes and sizes),
- grooved pendants and grooved cylindrical beads in bone (Sauzade 1983: 185). This last composition is a bicoloured set with three shapes but only two sizes, as the steatite discoid beads and the grooved cylindrical bone beads are similar in diameter (Sauzade 1983: 190-191).

According to the inventory, the average number of ornament elements per individual was around 163. However, the number of items making up the ornaments is not specified in the publications. Although their position has been recorded, the distribution of sets and isolated items is not specified either. A study like that carried out for Les Crottes hypogeum needs to be carried out to find out whether all the deceased from Le Capitaine hypogeum were buried with (preserved) ornaments or not.

Ornament elements from the Drôme-Vaucluse hypogea: between singularisation of individuals and cultural belonging?

This brief presentation of the ornamental items from three hypogea in the Drôme-Vaucluse group highlights certain diversity within the sites and a high degree of variability between sites.

Variability within sites?

A study of the ornament elements from Layer 5 in Les Crottes hypogeum at Roaix shows low typological variability. In fact, a minimum of 15 associations of different shapes and materials were recorded for at least 1,911 ornamental items. This diversity is much less pronounced than in other deposits from the same period. For example, 49 associations of form and material have been observed for just 147 ornamental items at the Ponteau domestic site in Martigues, Bouches-du-Rhône (Viel 2021: 618). The number of form-raw material combinations for ornamental items in Layer 5 in Les Crottes hypogeum is like that in Layer 2 in Le Capitaine hypogeum (15 for around 30,000 items). It is higher than that for Les Boileau hypogeum: nine form-raw material combinations for around 500 items.

Moreover, most of the form-raw material associations in Layer 5 in Les Crottes hypogeum represent no more than 0.5% in this corpus. Les Boileau and Capitaine hypogea show at least seven and 15 form-raw material combinations respectively, and nine for the Perpétairi hypogeum. Most of the combinations are also present in very small quantities at the sites. Discoid shell, limestone and steatite beads dominate the various assemblages. The variability of ornamental elements within the sites is not that marked, given the inventories.

The spatial distribution of the ornament elements in Layer 5 also varies according to typology. Discoid beads form concentrations whose position varies according to the layer. Discoid shell beads are present in all the levels in Layer 5 over their entire surface area. This is not the case for rings, for example, which are found to the east along with other ornamental elements discovered in very small quantities. These objects are found outside the concentrations of discoid beads.

There is another difference between the individuals buried with ornaments and those without preserved ornaments. This separation can be seen in Layer 5 in Les Crottes hypogeum. The number of ornaments is estimated at between fifty and several hundred (depending on the number of items combined in each ornament). Given that one of the sets identified is made up of more than a 100 beads, it is likely that a part of the deceased (approximately a 100) was unadorned. This is probably the case for Les Boileau hypogeum, even if the number of ornamental items and their distribution are not given in the publications. In fact, the number of ornaments elements per buried person is low (around 1.5). The presence of an ornament made up of about 20 items suggests that the number of assemblages is smaller than the number of individuals.

How can these differences be explained? As mentioned above for Les Crottes hypogeum, the differences do not necessarily seem to be linked to the movement of the bones, nor to taphonomic processes, since concentrations or even sets have been discovered. Not all the deceased were buried with preservable ornaments. Those whose ornamental objects have been discovered would not have been buried with the same ornaments. We know that Final Neolithic collective burials were often reserved for certain members of the community (Chambon 2003). However, it is also known that not all individuals in a collective tomb were buried with artefacts, so the deceased were treated differently in death within the same burial site (Sohn 2006: 238). Did the populations who buried their deceased in these hypogea wish to differentiate individuals through their ornaments?

Through their network, did some people (or those close to them) have access to rare objects while others did not? Could these differences be linked to the status of the individuals (age group, gender, religion, hierarchical status, economic status, etc.)? The position in the grave and the objects deposited with the dead vary mainly according to the hierarchical status, age and gender of the individual, although other causes may influence funerary practices (Boulestin 2016: 367-368; Thomas 2000). Unfortunately, the bones from Layer 5 in Les Crottes hypogeum are not sufficiently well preserved to determine whether age and gender were criteria for variation.

Another possibility is that individuals enjoyed some freedom in the choice of their ornaments, as in the upper levels of Çatal Höyük (Bains *et al.* 2013: 346). This option can be seen in the rare ornaments found in small quantities at the sites. It can be interpreted as an expression of the freedom for some individuals to choose their own ornaments (Marchand 2014: 401).

Between common background and cultural mosaic: variability of ornamental elements between sites

The ornamental elements in the hypogea in the Drôme-Vaucluse group vary little between the sites presented in this article, even if they differ in their spatial distribution within each site. What are the similarities and differences between the sites?

A common regional and extra-regional background

Six form-raw material combinations are common to the three hypogea in the corpus, and four are present in two of the three sites (Table 3). The presence of discoid beads made of limestone, steatite and shell, as well as variscite beads in hypogeum no. 1 at Perpétairi in Mollans-sur-Ouvèze, excavated by the Catelan brothers in 1914, is noteworthy. Given that there was no sieving during the excavation of this burial (Catelan and Catelan 1914; Courtin 1961), the number of objects shared with the other three hypogea is probably greater.

All these elements, present in two or three sites in the corpus, belong to common collections of different scales. Three-lobed limestone pendants, claw-shaped bone pendants and spiked pendants are typical of the Final Neolithic in south-eastern France. They are particularly present in sites attributed to the Ferrière or Fontbousse periods, the epicentre of which is in the Languedoc (Barge 1982: 194-195).

On a wider scale, we find discoid beads, particularly those made of steatite, as well as beads made of variscite or turquoise. They are frequently found in Late Neolithic sites located around the north-western quarter of the Mediterranean (Sohn 2006: 95-96, Thomas 2014: 239).

These common features on a broad geographical scale place the populations of the Drôme-Vaucluse hypogea group in the cultural environment of the Final Neolithic in southern France and the north-western quarter of the Mediterranean. The common characteristics of the ornamental elements echo the presence of certain morphological criteria in the ceramics, lithic and bone industries discovered during the Final Neolithic and throughout Provence (Cauliez 2011; Lemerrier *et al.* 2004). Architecture, funerary practices and symbolic and ideological elements also display similar characteristics across the whole Mediterranean Midi (Cauliez 2010: 243-245).

Three sites for three different groups?

Despite the presence of this common background, there are several differences between the ornamental elements at the three sites in the corpus.

Firstly, some objects are only found in one of the sites (Table 3). The number of form-raw material combinations varies according to the burial site: five out of 15 in Les Crottes hypogeum, two out of nine at Les Boileau and seven out of 15 at Le Capitaine.

Secondly, objects common to two or three sites are present in different proportions. The most striking example is the discoid steatite beads. In fact, they represent most of the objects in the

Table 4. Different types of ornament depending on the site

Type of set	Layer 5 of the Crottes	Layer 2 of the Capitaine	Boileau
Simple sets	3 -Discoid shell beads -Discoid limestone beads -Discoid steatite beads	At least 1 Discoid steatite beads	
Monotype single-colour sets			
Single-colour sets with two shapes and size ranges	1 Limestone beads and bone claw-shaped pendant		1 Notched bone beads and conical beads in <i>Antalis sp.</i>
Monotype two-colour sets	2 Discoid steatite and limestone or shell beads	2 Discoid steatite and limestone or shell beads	
Two-colour sets with two shapes but one size range		1 Discoid steatite beads and conical beads in <i>Antalis sp.</i>	
Two-colour sets with two shapes and two size ranges	1 discoid shell and steatite beads and three-lobed limestone pendants	3 -Discoid steatite beads and pointed bone or limestone pendants -Discoid steatite beads and claw-shaped bone pendants -Discoid steatite beads and three-lobed limestone pendants	
Two-colour sets with three shapes but two size ranges		1 Discoid steatite beads, grooved pendants and grooved cylindrical beads in bone	
Total	At least 7	At least 8	At least 1

Le Capitaine hypogeum (around 90%) and Les Boileau hypogeum (around 70%). In Les Crottes hypogeum, they account for only 9.5% of the ornaments.

Thirdly, the composition of the ornaments seems to differ from one site to another. The number of different ornamental items appears to be roughly equal between Les Crottes and Le Capitaine hypogea (Table 4). However, steatite discoid beads are the basis of the composition of the ornaments in Le Capitaine hypogeum, where the ornaments are mainly two-coloured. In Les Crottes hypogeum, on the other hand, they are more often single-coloured and made up mainly of discoid shell or limestone beads.

Finally, while it has been said that each site contained individuals buried with preserved ornaments and others without, it is also important to emphasise the significant difference in the number of ornament elements at each site. Compared with the 500 items at Boileau, Layer 5 in Les Crottes hypogeum contains four times as many elements, and there are 60 times as many at Le Capitaine.

How can these differences be explained? A first explanation could be linked to chronology. Les Boileau hypogeum is slightly more recent (2610-2470 cal. BC) than Les Crottes hypogeum (3340 and 2930 cal. BC) and Le Capitaine hypogeum (3090-2890 cal. BC).

Another possible hypothesis would be cultural differences between these populations, even though the ceramics from these three sites seem to belong to the same style (Cauliez 2011: 132, 134). The lithic industry is typologically similar (Courtin 1961: 193-198; Mahieu *et al.* 2004: 371; Sauzade 1983: 185-193, 209) but has not been studied, particularly technically. There could therefore be differences. Could the presence of three different assemblages in the sites in the corpus indicate a fairly strong local choice, perhaps reflecting greater territorial anchorage and a desire to reinforce signs of belonging? Could these distinctions be different from those expressed by ceramics throughout Provence (Cauliez 2011: 171; Lemerrier *et al.* 2004: 251)?

Finally, the populations could have had different statuses. This status (hierarchical, economic, religious, etc.) would have given them different access to large-scale exchange networks, such as the one for discoid steatite beads.

Conclusion

In Provence, in south-eastern France, groups from the late Final Neolithic buried their dead in hypogea concentrated in the south of the Drôme and the north of the Vaucluse. These burials exhibit different architecture and funerary practices. However, the grave goods appear to be similar from one site to another, particularly ceramics (Cauliez 2011: 132, 134). We wondered whether this was the case for the ornaments.

An in-depth study was carried out of the ornamental items from Layer 5 in Les Crottes hypogeum (Roaix). A typological comparison was then made with the description of ornamental objects from Les Boileau (Sarrián) and Capitaine (Grillon) hypogea.

The ornamental items show similarities from one site to the other. There is a common background represented by the presence of ornamental objects typical of the Final Neolithic in south-eastern France, or characteristic of the north-western quarter of the Mediterranean. However, there are differences between the three sites. The number of ornament elements varies greatly from one site to another. Certain form-raw material combinations are only present at one of the three sites. The ornaments are not made up of the same elements.

Analysis of Les Crottes hypogeum in Roaix clearly shows that a detailed, in-depth study can reveal differences even in the case of common background elements. The example of the steatite discoid beads is the most significant. The spatial analysis of the ornamental elements in Layer 5 illustrates the importance of this type of study. It allows us to highlight the differences between individuals who are adorned and those who have no preserved

ornaments, and between those buried with ornaments belonging to the common background and those with less frequently found ornaments. We hope that similar analyses will one day be carried out on the ornamental objects from Le Capitaine and Boileau hypogea, since the quality of the excavations allows this.

This significant variability in ornamental items within and between sites may be linked to several factors. Intra-site diversity could be due to differences in status between individuals. The variability between sites could be explained if these three sites were used by different chrono-cultural groups. Populations could have enjoyed different access to the networks used to obtain these items of finery. Or is all the variability within and between the sites due to individuals' freedom in choosing their ornaments? These lines of thought are, of course, compatible and there are many possible reasons for this variability.

Finally, it should be emphasised that rock-cut tombs were not the only type of burial used in the Final Neolithic in the region. There were also dolmens and sepulchral caves. It would be interesting to compare the ornaments found in these types of burial with those found in hypogea.

Acknowledgements

I would like to thank the organisers for inviting me to take part in the study day on '*Façonner la mort: rencontres franco-ibériques autour des hypogées préhistoriques / Construyendo la muerte: encuentros ibero-franceses sobre los hipogeos prehistóricos*'. I would particularly like to thank Bruno Bizot, who provided me with all the data from Les Crottes hypogeum and authorised me to publish my results from this site. Part of the present study was carried out as research towards a PhD at Aix-Marseille University, funded by the French Ministry of Higher Education and Research. This work was supervised by M. Bailly and S. Bonnardin, whom I would also like to thank.

Bibliography

- Alarashi, H. 2014. *La parure épipaléolithique et néolithique de la Syrie (12e au 7e millénaire avant J.-C.) : techniques et usages, échanges et identités*. Unpublished PhD dissertation, Université Lumière Lyon 2.
- Ard, V. and E. Mens 2018. Le mégalithisme : regards croisés entre mondes atlantique et méditerranéen, in J. Guilaine and D. Garcia (eds) *La protohistoire de la France*: 79-93. Paris: Hermann.
- Bains, R., M. Vasić, D. E. Bar-Yosef Mayer, N. Russell, K. I. Wright and C. Doherty 2013. A Technological Approach to the Study of Personal Ornamentation and Social Expression at Çatalhöyük, in I. Hodder (ed.) *Çatalhöyük Research Project volume 9: Substantive Technologies at Çatalhöyük reports from the 2000-2008 Seasons*: 331-363. London Los Angeles (Calif.): British Institute at Ankara Cotsen Institute of Archaeology at UCLA.
- Barge, H. 1982. *Les parures du Néolithique ancien au début de l'Age des métaux en Languedoc*. Paris: CNRS.
- Bizot, B. and A. Schmitt 2019. L'outil SIG au secours d'un contexte funéraire en déshérence : l'hypogée des Crottes (Roaix, Vaucluse). *Préhistoires méditerranéennes* 7: 1-8.

- Boulestin, B. 2016. Normes funéraires : Illusions et vérités in M. Lauwers and A. Zemour (eds) *Qu'est-ce qu'une sépulture? : Humanités et systèmes funéraires de la Préhistoire à nos jours : actes des rencontres 13-15 octobre 2015*: 369-379. Antibes: Association pour la Promotion et la Diffusion des Connaissances archéologiques.
- Cauliez, J. 2010. Pour réécrire la fin du Néolithique dans le sud-est de la France : bilan critique sur cent années d'études. *Gallia Préhistoire* 52: 241-313.
- Cauliez, J. 2011. Restitution des aires culturelles au Néolithique final dans le sud-est de la France. Dynamiques de formation et d'évolution des styles céramiques. *Gallia Préhistoire* 53: 85-202.
- Chambon, P. 2003. *Les Morts dans les sépultures collectives néolithiques en France : Du cadavre aux restes ultimes*. Paris: Editions du CNRS.
- Courtin, J. 1961. La sépulture chalcolithique du Perpétairi à Mollans (Drôme). *Gallia Préhistoire* 4: 192-205.
- Devriendt, W. 2004. *Etude anthropologique de l'hypogée des Boileau apport à la connaissance des populations du néolithique final en Provence*. Unpublished PhD dissertation, Aix-Marseille II.
- Devriendt, W., E. Mahieu, H. Barge, L. Lalys, Y. Ardagna and M. Signoli 2005. L'hypogée des Boileau (Vaucluse - France) : approche paléodémographique d'une population du Néolithique final, in Y. Ardagna, G. Boëtsch, O. Dutour, L. Lalys and M. Signoli (eds) *L'homme et ses images : mesures, représentations, constructions : actes du XXVème Colloque du GALF, Marseille 2001*: 345-354. Marseille: Centre national de la recherche scientifique (France). Unité mixte de recherche 6578.
- Gagnière, S. 1968. Provence-Côte d'Azur-Corse. *Gallia préhistoire* 11: 493-528.
- Guilaine, J., J.-C. Golvin, G. Sauzade and X. Margarit 2015. *Les hypogées protohistoriques de la Méditerranée : Arles et Fontvieille*. Arles: Éditions Errance.
- Lambert, A., A. Schmitt and M. Bailly 2016. Reconstituer les gestes et activités des populations du Néolithique final vaclusien : état des lieux des données archéologiques et apport de l'anthropologie biologique, in J. Cauliez, I. Sénépart, L. Jallot, P.-A. Labriffe (DE), C. Gilibert and X. Gutherz (eds) *De la tombe au territoire and Actualité de la recherche : actes des 11e Rencontres Méridionales de Préhistoire Récente, Montpellier (Hérault), 25-27 septembre 2014*: 319-327. Toulouse: Archive d'Écologie Préhistorique.
- Lemercier, O., E. Blaise, J. Cauliez, R. Furestier, C. Gilibert, N. Lazard, L. Pinet and N. Provenzano 2004. La fin des temps néolithiques, in J. Buisson-Catil, A. Guilcher, C. Hussy, M. Olive and M. Pagni (eds) *Vaucluse préhistorique : le territoire, les hommes, les cultures et les sites*: 203-252. Le Pontet: Barthélémy.
- Leroi-Gourhan A., G. Bailloud, M. Brezillon, C. Monmignaut 1962. L'hypogée II des Mournouards (Mesnil-sur-Oger, Marne). *Gallia Préhistoire* 5(1): 23-133.
- Mahieu, E. 1984. *Etude anthropologique d'un hypogée vaclusien chalcolithique*. Unpublished PhD dissertation, Université Reims-Champagne-Ardenne.
- Mahieu, E. 1989. *L'Hypogée des Boileau, Sarrians (Vaucluse)*. Marseille: E.P.A.
- Mahieu, E., W. Devriendt, H. Barge, L. Lalys, P. Adalian, Y. Ardagna and M. Signoli 2004. L'hypogée des Boileau (Vaucluse, France): étude fonctionnelle et anthropologique, in N. Cauwe, M. Vander Linde, O. Tunca and M. Lebeau (eds) *Section 10 - L'âge du Cuivre au Proche Orient et en Europe*: 375-384. Oxford: Archaeopress.
- Marchand, G. 2014. *Préhistoire atlantique : fonctionnement et évolution des sociétés, du Paléolithique au Néolithique*. Arles: Errance / Actes Sud.
- Sauzade, G. 1983. *Les Sépultures du Vaucluse, du Néolithique à l'Age du Bronze*. Paris: Laboratoire de Paléontologie humaine et de Préhistoire - Institut de Paléontologie humaine.

- Sauzade, G. 2021. Les sépultures collectives provençales dans le temps long. Permanence et évolution des architectures et des pratiques funéraires, in J. Recchia-Quiniou and M. Le Roy (eds) *Grottes et dolmens : Relation entre les sépultures collectives de la fin du Néolithique dans le Sud de la France*: 137-163. Aix-en-Provence: APPAM.
- Sauzade, G., B. Bizot and A. Schmitt 2018. La chronologie des ensembles funéraires du Néolithique final provençal. Proposition de sériation intégrant les contextes d'habitat. *Préhistoires méditerranéennes* 6: 1-46.
- Schmitt, A. and B. Bizot 2021. Dolmens, grottes et hypogées en Provence. Bilan et interrogations, in J. Recchia-Quiniou and M. Le Roy (eds) *Grottes et dolmens : Relation entre les sépultures collectives de la fin du Néolithique dans le Sud de la France*: 119-136. Aix-en-Provence: APPAM.
- Sciama, L. D. 1998. Gender in the making, trading and uses of beads. An introductory essay, in L.D. Sciama and J.B. Eicher (eds) *Beads and bead makers gender, material culture, and meaning*: 1-46. Oxford, New York: Berg.
- Sohn, M. 2006. *Du collectif à l'individuel (évolution des dépôts mobiliers dans les sépultures collectives d'Europe occidentale de la fin du IVe à la fin du IIIe millénaire av. J.-C.)* Unpublished PhD dissertation, Université Panthéon-Sorbonne.
- Thomas, J. T. 2014. *Emerging economies: late Neolithic and Copper Age beads and pendants of the Portuguese Estremadura*. Unpublished PhD dissertation, University of Iowa.
- Thomas, L.-V. 2000. *Les chairs de la mort corps, mort, Afrique*. Paris: Institut d'édition Sanofi Synthélabo.
- Vanhaeren, M. and F. D'Errico 2011. L'émergence du corps paré. *Civilisations* 59(2): 59-86.
- Viel, L. 2021. *Entre richesses et objets ordinaires, les parures de la fin du Néolithique en Provence : approches morphométrique et technique*. Unpublished PhD dissertation, Aix-Marseille Université.

Neolithic hypogea in the south-west of the Marne (France)

Rémi Martineau

CNRS, ARTEHIS. University of Burgundy

Abstract

This contribution provides a general overview of what is known about the hypogea of the Marne. So far, 166 hypogea (grouped in 44 necropolises) have been excavated, from Sézanne to Reims, in the valleys of the Suippe, Vesle, and Marne rivers, notably in the Saint-Gond Marshes region, where seven gallery graves have also been identified. The hypogeum phenomenon dates mainly from the *Néolithique récent* (3600-3000 cal BC) and, to a lesser extent, from the *Néolithique final* (3000-2200 cal BC). Radiocarbon dating and the study of artefacts found in these hypogea provide evidence of two successive chronological phases. This compendium presents the digging techniques and architecture of the hypogea, the sculptures and paintings that decorate them, and the funerary practices of these Neolithic communities. Artefacts from every-day life were buried with their deceased owners in the funeral chambers, and the tools used to dig the hypogea were also deposited there. Anthropobiological analyses of the buried population have brought to light evidence of mining activities, linking the collective burials with the flint-mining sites. The hypogea can now be classified into three groups, based on differences in architecture, sculptures, paintings, burial modes, and funerary practices.

Key words: Neolithic, Marne, hypogea, collective burials, funerary practices, flint mining.

In northern France, more than 350 collective burials (hypogea and gallery graves) from the *Néolithique récent* (3600-3000 cal BC) and the *Néolithique final* (3000-2200 cal BC) have so far been identified in the Paris Basin (Bailloud 1974; Chambon and Salanova 1996; Peek 1975). Many other aspects of the *Néolithique récent* have yet to be explored; until recently, research had focused almost entirely on the burials alone. At least 166 hypogea have been discovered in the Marne since the early 19th century. The first was discovered in 1806 at Chouilly (Marne, NE France), with around 130 being identified between 1872 and 1939. Very few of these hypogea were therefore excavated with modern archaeological and anthropological methods, thus limiting the information available about funerary practices. A multidisciplinary research programme (the Neolithic of the Saint-Gond Marshes region, resp. R. Martineau) (Martineau *et al.* 2023) was set up in 2010 to investigate the technical, economic, territorial, and societal organisation of that period (Martineau and Delhay 2019; Martineau and Dumontet 2024). One of the aims of this project is to study the hypogea within the social context of the *Néolithique récent* and the *Néolithique final*.

These hypogea represent an exceptional heritage that is very rare for the Neolithic period outside the Mediterranean Basin. The good preservation of these monuments and of the artefacts within them has encouraged further research. Although these sites were excavated much earlier, their data have yet to be exploited. Recent investigations of the links between these burials and the flint-mining areas of south-western Marne have led to increasing interest in these studies (Martineau *et al.* 2014, 2019). This contribution provides a general overview of what is known about the hypogea of the Marne, particularly the themes that have been studied over the past twenty years (Martineau 2022). The chronology and dating

of these hypogea, their architecture, sculptures and paintings, the funerary practices, and the relationship between the hypogea and the flint-mining sites (Martineau *et al.* 2019, 2024) provide evidence of several different groups and chronological phases.

Geographical and archaeological context

Previous archaeological documentation of these ancient excavations was sporadic, resulting in many sites being forgotten. The lengthy work of collecting documentation from the past two centuries, combined with verifications by walk-over surveys, has enabled us to draw up a precise inventory of almost all the previously identified sites, thus producing the first comprehensive spatial distribution map for the Marne hypogea (Figure 1). The 175 hypogea previously documented in the Marne have not all been confirmed by recent studies. Currently, 166 hypogea, grouped in 44 necropolises, have been excavated, from Sézanne to Reims, in the valleys of the Suipe, Vesle, and Marne rivers, particularly in the Saint-Gond Marshes region (Petit Morin Valley, Marne, France). This region lies beneath the Île-de-France cuesta, in the south-west of the Marne *département*, where mines and hypogea have been excavated in the upper Campanian chalk slopes. The very high density of hypogea identified in the Saint-Gond Marshes region probably results from intensive research by the pioneers Joseph de Baye and Emile Schmit, followed by Augustin Roland and Pierre Hu. This region corresponds to a major flint-mining complex, comprising 49 Neolithic sites that have been excavated or surveyed, including 23 necropolises comprising 135 hypogea, seven gallery graves, seven confirmed flint mines, four settlements, including one with a palisade enclosure, and eight earthfast polissoirs (Martineau *et al.* 2014, 2015, 2019) (Figure 2). All of the hypogea and gallery graves date from the *Néolithique récent*, as do four of the flint mines and two of the settlements, including the one with a palisade enclosure. At least 300 more Neolithic sites have potentially been identified, covering around 400 hectares on the chalk and limestone hillsides. Further research is necessary to characterise these sites, but 160 appear to be settlements or flint workshops, while 66 provide evidence of flint mining, grouped in 18 sectors. Many of these sites date from the *Néolithique récent*, the period corresponding to the hypogeum phenomenon.

On the Côte des Blancs, another 20 hypogea are grouped in five necropolises, including one located only a few kilometres from a flint mine. Fifteen individual hypogea have been identified along the Île-de-France cuesta and in the Marne valley, together with a necropolis of three hypogea in Châlons-en-Champagne. The Saint-Gond Marshes region also includes seven gallery graves, but the state of preservation and excavation conditions for two of them make it impossible to define their architecture. The gallery grave at Bannay ‘Le Reclus/La Grande Culbute’ was built above ground and covered by a tumulus. The covering slabs there are supported by orthostats on the ground. The semi-buried covering slabs of the four other gallery graves (Aulnay-aux-Planches ‘La Plaque’ and probably Congy ‘Les Hayettes’, Aulnay-aux-Planches ‘Au-Dessus du Chemin des Bretons’, and Villevenard ‘Le Chenail’) are all placed directly on the substrate, with the burial chamber partly dug into the ground. These megalithic gallery graves are located in the same region as the hypogea, sometimes within a few hundred metres of each other. The artefacts from these two types of burials are comparable and can all be attributed to the *Néolithique récent*. Given the scarcity of stone in the region, we suppose that the hypogea were designed to replace megalithic monuments. Did these two types of architecture function in a complementary way for funerary purposes? The geographical

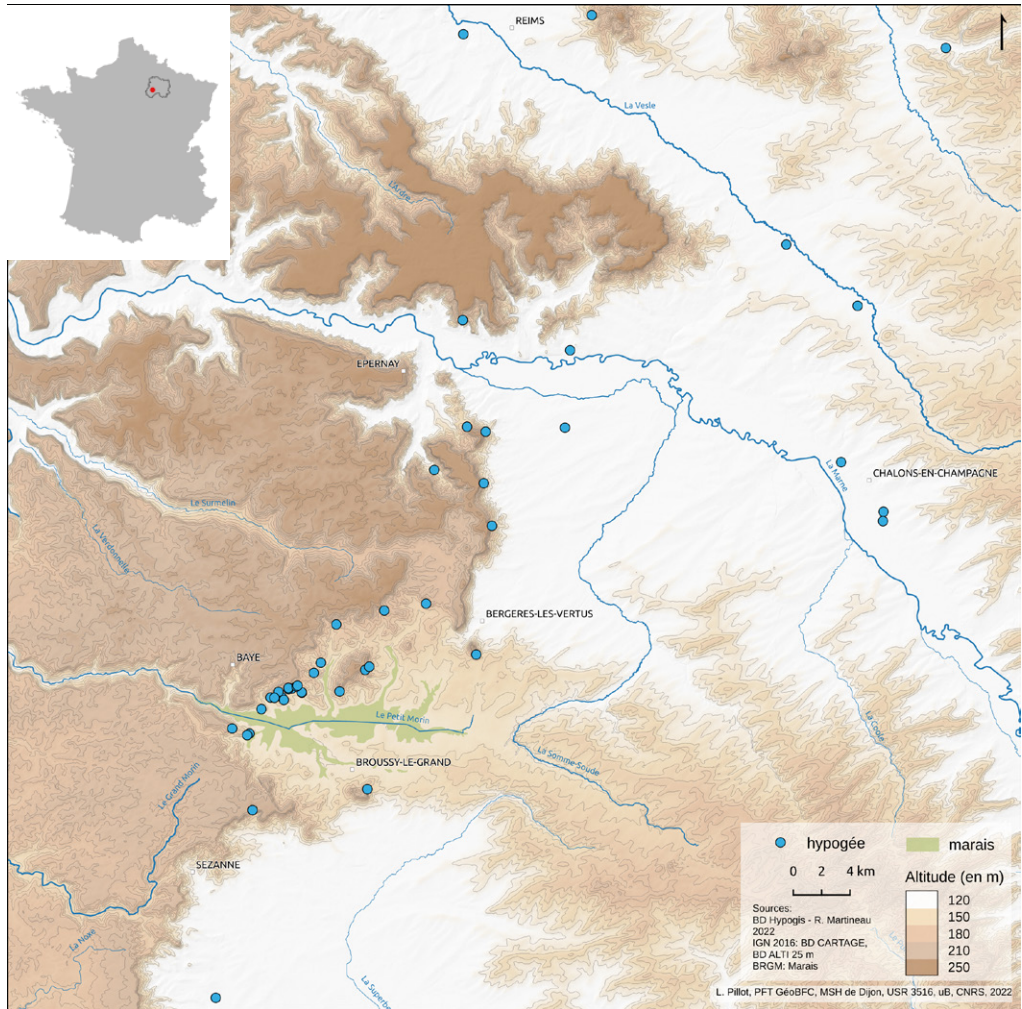


Figure 1. Distribution map of hypogea of the Marne. CAO: L. Pillot and M. Imbeaux.

proximity of hypogea and megalithic burials is an important factor in attempting to answer this question.

Chronological context

Two settlements at Broussy-le-Grand 'L'Ourlet' (Charnot 2019) and Val-des-Marais (Morains-le-Petit) 'Le Pré à Vaches' (Martineau *et al.* 2014, 2023; Langry-François *et al.* 2024) have been dated by *Néolithique moyen II* and *Néolithique récent* pottery finds. Few Neolithic settlements have so far been identified in the Champagne-Ardenne region. Indeed, settlements dating from the *Néolithique récent* are very rare in Northern France. All the hypogea and gallery graves in this region date from the same period, during which time collective burials were

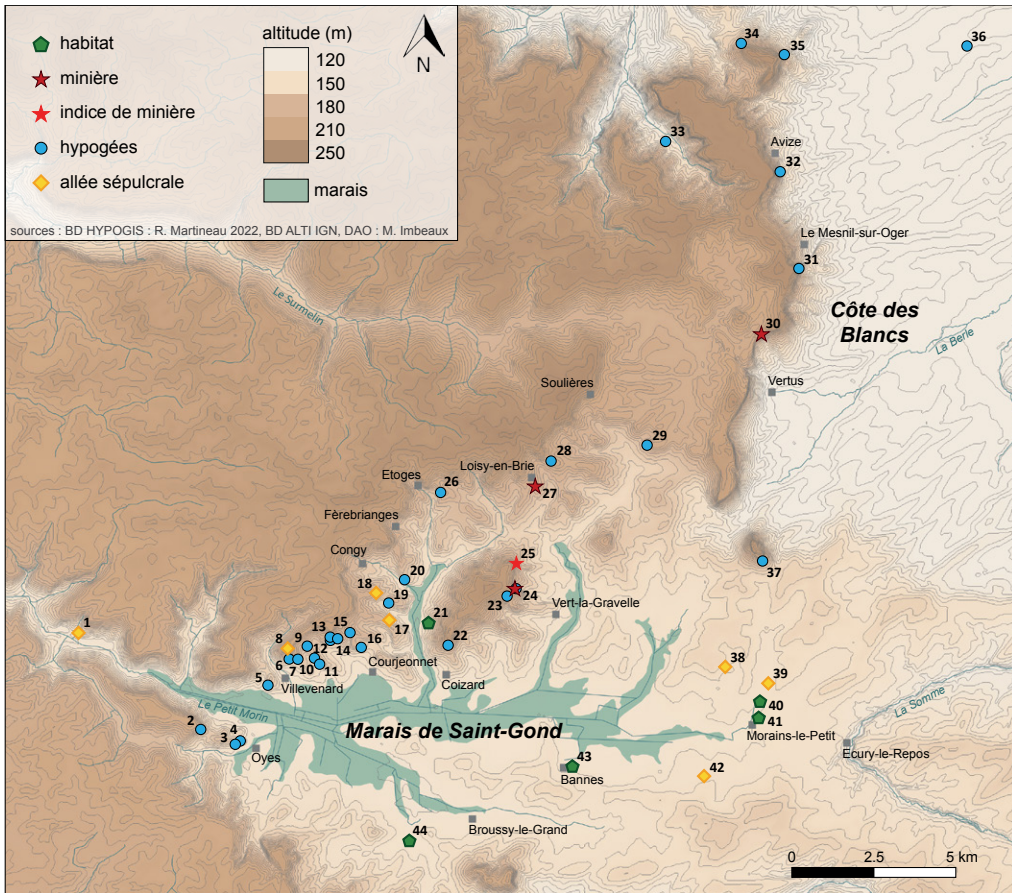


Figure 2. Distribution map of the sites of the *Néolithique récent*. CAO: M. Imbeaux. : 1. Bannay « Le Reclus », 2. Oyes « La Crayère/Le Gros Chêne », 3. Oyes « Au-Dessus du Moulin/La Butte du Moulin », 4. Oyes « Le Village », 5. Villevénard « La Craière », 6. Villevénard « Les Vignes Jaunes », 7. Villevénard « Les Ronces », 8. Villevénard « Le Chenail », 9. Villevénard « Tout y Brûle », 10. Villevénard « La Pente du Moulin », 11. Villevénard « Le Moulin Brûlé », 12. Villevénard « Les Houyottes/Le Trou Blériot/Le Trou de Renard », 13. Villevénard « Le Tas de Noyers », 14. Courjeonnet « Les Vignes Jaunes », 15. Villevénard « La Pierre Michelot », 16. Courjeonnet « Les Vignes Jaunes/Les Jaudelles », 17. Congy « Les Châtaigniers », 18. Congy « Les Hayettes », 19. Congy « Les Cornabeaux », 20. Congy « La Garenne », 21. Coizard « Lessard », 22. Coizard « Le Razet », 23. Vert-Toulon (Vert-la-Gravelle) « Les Marnières », 24. Vert-Toulon (Vert-la-Gravelle) « La Crayère », 25. Vert-Toulon (Vert-la-Gravelle) « Le Bois de la Gravelle », 26. Étoges « Le Four à Chaux », 27. Loisy-en-Brie « 56 Grande Rue », 28. Loisy-en-Brie « Les Gouttes d'Or », 29. Étrechy « Beau Regard », 30. Vertus « Grandval », 31. Le Mesnil-sur-Oger « Les Mournouards » II (3), 32. Avize « Les Dimaines », 33. Grauves « Les Poussements », 34. Chouilly « Les Ronds Buissons », 35. Chouilly « La Grifaine », 36. Plivot « Les Grandes Naux/La Grande Noue », 37. Val-des-Marais (Coligny) « Le Mont-Aimé » II, 38. Val-des-Marais (Aulnay-aux-Planches) « La Plaque », 39. Val-des-Marais (Morains-le-Petit) « Les Vordes », 40. Val-des-Marais (Morains-le-Petit) « Le Pré à Vaches », 41. Val-des-Marais (Morains-le-Petit) « Le Pré à Vaches », 42. Val-des-Marais (Aulnay-aux-Planches) « Au-Dessus du Chemin des Bretons », 43. Bannes « Le Village », 44. Broussy-le-Grand « L'Ourlet ».

being established throughout the Paris Basin (Bailloud 1974). The hypogeum phenomenon has been radiocarbon-dated to between 3650 and 2900 cal BC (Blin 2015; Chambon *et al.* 2017; Edinborough *et al.* 2021), thus covering the entire *Néolithique récent* and the beginning of the *Néolithique final*. Recently, two necropolises have been excavated, at Chouilly ‘La Grifaine’ (Garmond and Bouquin 2016) and at Saint-Memmie ‘Avenue Jacques Simon’ (Richard and Martineau 2020; Richard *et al.* 2020). These sites lie north of the Saint-Gond Marshes region, at a distance of 20 to 30kms, thus confirming the chronological framework presented here.

The scarcity of ceramics in tombs and the few coeval settlements make it impossible for the moment to define the archaeological culture groups corresponding to the many collective burials in the Paris Basin and elsewhere in northern France (Chambon and Salanova 1996; Cottiaux *et al.* 2014; Salanova *et al.* 2011). All 350 collective burials in northern France and southern Belgium had previously been defined as forming the Seine-Oise-Marne (SOM) culture. In 2011, the SOM culture was redefined and divided into several smaller groups, with three chronological phases (Salanova *et al.* 2011). The SOM culture can be used to evoke collective burials but cannot describe specific cultural groups that have not yet been defined. This period is therefore better termed *Néolithique récent* rather than SOM culture. The hypogea must have been established and used during phases 1 and 2 of this proposed periodisation. Most of the artefacts discovered in the hypogea can be attributed to the *Néolithique récent* period. The proportion of artefacts characteristic of the last phase of the *Néolithique récent* or the beginning of the *Néolithique final* is very low and concerns very few hypogea. Among them, are some of the hypogea at Villevenard ‘Les Ronces’ or at Oyes ‘La Butte du Moulin’, where we note the presence of spindle whorls, leaf arrowheads, barbed and tanged arrowheads, and daggers (Augereau *et al.* 2004; Renard *et al.* 2014). Grog (*chamotte*) is included in the ceramic paste used for almost a third of the pottery (29%) found in the hypogea of the Saint-Gond Marshes region. This temper is characteristic of phase 3 of the *Néolithique récent* and the early *Néolithique final* phase, whereas flint temper characterises phases 1 and 2 of the *Néolithique récent* (Cottiaux *et al.* 2014).

This finding means that some of the hypogea must have been in use until the beginning of the 3rd millennium, during the transition between the *Néolithique récent* and the *Néolithique final* (phase 3 of the *Néolithique récent*. Salanova *et al.* 2011), or at the beginning of the *Néolithique final* (around 3000-2900 cal BC). These *Néolithique final* artefacts are always found in burials that yielded a majority of *Néolithique récent* remains, confirming that all the hypogea were installed during the earlier period. In one case, Loisy-en-Brie ‘Les Gouttes d’Or’, several bodies were placed in the antechamber, thus corresponding to a secondary phase, after the burial chamber was full (Chertier *et al.* 1994). Throughout Western Europe, the burial sites established during the 4th millennium for collective burial were still occasionally used during the *Néolithique final*, often to bury only a few individuals, following practices and rites that were very different from what they had been in the more distant past. We can thus observe the rise of several cultures (i.e. Globular Amphorae, Individual Burial, Corded Ceramic, and Bell Beaker), which gradually led to the disappearance of collective burials (Sohn 2006). Most of the collective burial sites in the Netherlands, Germany, and Northern France have yielded burials from the 3rd millennium and, in particular, very late reuse of these collective monuments during the Bell Beaker culture, the *Groupe des Urnes à Décor Plastique* (GUDP), and the Early Bronze Age.

There is no typological evidence to suggest that the hypogea in the Marne were reused after 2800 cal BC at the latest, and probably not even after 2900 cal BC. In this region, no Bell Beaker, GUDP, or Early Bronze Age elements have been found in the hypogea or megalithic gallery graves. None of the hypogea in south-western Marne was the subject of such late reuse. This may be due to the fact that the hypogea were completely sealed off when they were abandoned, which prevented other populations from reusing them at a later date. This is not, however, the case for the gallery graves in the Paris Basin, which were in use during both periods. Surprisingly, no artefacts dated after 2900 cal BC. were discovered in the gallery graves of the Saint-Gond Marshes region. Hypogea and gallery graves in south-western Marne were established and used during the *Néolithique récent*. In a few cases, collective burials were still in use at the beginning of the *Néolithique final*. This major result demonstrates that both hypogea and gallery graves form a chronologically coherent whole.

Necropolises, architecture, and digging techniques

Hypogea are generally grouped in necropolises: isolated cases probably indicate that previous archaeological excavation had been too limited. Necropolises have been identified at Chouilly 'La Grifaine' (11 hypogea), at Le Mesnil-sur-Oger 'Les Mournouards' (tree hypogea), at Val-des-Marais (Coligny) 'Le Mont Aimé' (two hypogea) on the Côte des Blancs, and at Coizard 'Le Razet' (38 hypogea), Villevenard 'Les Ronces' (24 hypogea), Courjeonnet 'Les Houyottes' (11 hypogea), Courjeonnet 'Les Vignes Basses' (11 hypogea), and Vert-Toulon (Vert-la-Gravelle) 'La Crayère' (four hypogea) in the Saint-Gond Marshes region. The Coizard 'Le Razet' site includes 38 hypogea, two of which feature bas-relief sculptures, while another two feature paintings. Excavated in 1872 by Joseph de Baye (Baye 1880), the site was classified as a Historic Monument on 14 May 1926. The architecture is in a good state of preservation. The site is briefly mentioned at least 65 times in the literature, but has been the subject of few in-depth publications (Bailloud 1974; Charpy 2014; Villes 1996, 1998a, 1998b). The spatial organisation of the Coizard 'Le Razet' and Chouilly 'La Grifaine' necropolises is in parallel rows, staggered along the slope (Martineau *et al.* 2016). There is no overlap between the monuments, suggesting awareness of their spatial organisation, resulting in coherent management of the burial space over time.

In this region, hypogeum architecture is quite variable: there may be one or two funerary chambers, sometimes with an antechamber or a vestibule. The thickness of the chalk above the monuments seems to range between one and three metres. The corridors measure between two and nine metres in length. The chambers are of various shapes, most often square (Figure 3), trapezoidal, or rectangular. Some hypogea have an antechamber, which is usually rectangular or sub-rectangular. The openings giving access to the chambers or antechambers can be round, oval, square, or rectangular, but are always very low and narrow. The interiors of the chambers are structured by various features: dividing walls, pilasters, floor markings, benches, shelves, niches, and 'hooks', reflecting a precise spatial organisation in relation to funerary practices. Shelves or niches were also sometimes dug in some of the antechambers. On the chalk walls and ceilings, thousands of marks made by polished axes and deer antlers document the digging process. Once the central part had been excavated, the walls were roughly shaped with deer antlers and then straightened with polished axes. We are currently examining these digging tools in order to reconstruct the techniques, gestures, and *chaînes opératoires* used.



Figure 3. The square funerary chamber of hypogeum 4 at Vert-Toulon (Vert-la-Gravelle) ‘La Crayère’ (Marne). Photo: R. Martineau.

Sculptures and paintings

Fifteen of the hypogea (< 10%), grouped into six necropolises, feature truly exceptional sculpted or painted representations (i.e. three geometric designs in sunken relief; 11 sculptures in bas-relief; 23 sculpted, engraved, or painted representations of signs, objects, or figures). The bas-relief sculptures in the Marne hypogea often depict human figures (some of which are clearly female), a tine deer-antler pick, and stone axes hafted in deer-antler sleeves, all with transverse handles (Figure 4). The themes of axes and human figures are repeated in several sites in the western part of the Saint-Gond Marshes and are sometimes even found on the same wall. Both sculptures and paintings are mainly found in the western part of the Saint-Gond Marshes region, sometimes together in the same necropolises. In at least four of the hypogea, one or more painted signs can be found on the walls. One of them depicts a ‘shovel’, while the others are composed of intersecting parallel and perpendicular lines, commonly known as ‘grids’. Such paintings are particularly noticeable in the antechamber of ‘Les Ronces’ 21 at Villevenard. The two painted chalk blocks in this hypogeum have been dated to the end of the *Néolithique récent* and the beginning of the *Néolithique final* by physico-chemical study of the pigments (Armitage *et al.* 2020). These abstract signs are also present in the Coizard necropolis at ‘Le Razet’. In the northern part of the Côte des Blancs, there is a ‘wheel shaft’ sculpture at Chouilly ‘La Grifaine’ 7.



Figure 4. Inside the funerary chamber of Coizard « Le Razet » 23 (Marne), view of the entrance with on either side the bas-relief sculptures of axes and deer antler axe sheaths with transverse handles.

Photo: R. Martineau.

Artefacts from everyday life

Thousands of highly characteristic archaeological artefacts found in the tombs also serve to identify the *Néolithique récent* and the beginning of the *Néolithique final* periods (3600-2900 cal BC) (Chambon and Salanova 1996; Cottiaux and Salanova 2014; Martineau *et al.* 2016). The corpus of artefacts is composed of flat-bottomed, truncated cone-shaped pottery, and many types of ornaments (e.g. discoid chalk beads, keel-shaped deer-antler pendants, double-drilled sconces in *Unio* mother-of-pearl), together with bone punches, deer-antler tools (axe sleeves and tine picks with transverse handles) and weapons (blunt arrowheads). The flint lithic industry is dominated by trapezoidal transverse arrowheads, blades, flakes, scrapers, polished axes, and strike-a-lights (rarely with marcasite fragments). The transverse arrowheads were produced from blades knapped by indirect percussion, or from flakes. The artefacts characteristic of the *Néolithique final* (daggers, leaf arrowheads, and perforated axehead pendants) are far less numerous. The objects deposited in the tombs do not correspond to the entire typological corpus of artefacts found in the settlements. Grindstones and millstones are never present in any of the collective burials in the Paris Basin, including those in the south-west of the Marne. The trapezoidal transverse arrowheads, the leaf- or lozenge-shaped arrowheads, and the flint strike-a-lights are over-represented in burials in comparison with settlements (Renard 2018: 272).

The ornaments, pottery, flint artefacts, bone tools, and deer-antler tools and weapons found in the hypogea clearly show traces of previous use in daily life (Cottiaux *et al.* 2014). Many objects were fractured or broken; some had even been repaired. Pottery shows traces of carbon, related to the cooking of food, while many ornaments show wear, often indicating that they had been worn for a long time (Langry-François 2003: 70; Polloni 2008: 79; Sohn 2002: 514). These deposits of used and worn objects are not specific to south-western Marne or to hypogea; this situation is general in collective burials in the 4th and 3rd millennia in most of Western Europe (Sohn 2006: 185-189). The deceased were buried with their clothing, their ornaments, and the tools they used from day to day, probably in the same position as in daily life, particularly the quivers and blades. Both men and women wore ornaments and possessed quivers, as well as rough flint blades and strike-a-lights, often worn in pairs on their belts. Many children also wore ornaments, but do not appear to have been equipped with tools.

It is therefore the equipment used by the deceased that is the vector for the dissemination of materials within the area concerned. This is a major result, since it means that the social and territorial organisation of communities can be examined through the image obtained from the study of the distribution of raw flint materials in burials. We might ask whether the funerary practices in these collective burials truly reflect the economic and social organisation of the living, or whether they modify the reality of the Neolithic way of life? It is clear that two categories of objects were generally deposited in graves. The first corresponds to personal objects carried or worn during life and deposited with the deceased. The second corresponds to a few specific objects deposited in the grave as 'collective' deposits, potentially corresponding to funerary codes and practices. This is probably the case for the polished axes, and perhaps also for the pottery vessels (Sohn 2002). The axes and antler picks used to dig the monuments appear to have been integrated into the burial architecture as foundation deposits. Sometimes these tools were even sculpted as integral parts of the hypogeum walls, possibly representing all the deceased who were to be buried there. In any case, these deposits seem to have played a symbolic role in the digging of a new grave.

Collective burials

The spatial organisation of the tombs provides some insight into how they operated. The interior spaces were highly structured. Along the same axis as the entrance and the *trou d'Homme*, there was a central circulation axis in the burial chambers, at least when they were first in use. Space must have been left free inside the chamber, immediately after the entrance, throughout the use of the hypogeum, in order to provide access for new burials. At the beginning of the burial period, the deceased were buried along the side walls, parallel to the axis of circulation. At first, the bodies were placed side by side and sometimes head to foot. As the number of burials increased, the individuals were placed on top of one another, and even moved when necessary.

The presence of removable wooden doors that could easily be opened for new burials is suggested by rebates (recessed door frames) to provide space for the door, lateral perforations for wooden poles to block the door, and indentations to allow the door to pivot. When the decision was made to abandon the use of the hypogeum, the entrance and the corridor were systematically filled in with megalithic stones sealed with chalk, to prevent any further access (Baye 1880, fig.16).

The few well-studied contexts show that collective burials ceased to be used at different stages. In hypogea with only a few burials, it is possible to observe the early stages of use (Blin 2012). These cases highlight the initial conception of the spatial organisation of the burial space, which gradually changed and became more complex as a result of the successive accumulation of bodies. The absence of any correlation between the size of the burials and the number of people buried suggests a series of different phases during the use of the hypogeum. The number of individuals in a burial does not allow us to deduce the length of its period of use, since we do not know the number of bodies buried at any given moment, nor the time that elapsed between burials.

Hypogea were in use for periods that appear shorter than those of most megalithic collective burials in the Paris Basin. At Le Mesnil-sur-Oger ‘Les Mournouards’ (II) 3, Bayesian analysis of 27 radiocarbon dates (between 3380 and 3100 cal BC) indicates that the site was operational for a period of 100 to 265 years (Chambon *et al.* 2017). This is much less than the estimated period of use at La Chaussée-Tirancourt ‘La Sence du Bois’ (Somme), for example, where successive *Néolithique récent* and *Néolithique final* occupations may have lasted for about a millennium (Leclerc and Masset 2006). This shorter period of consistent use has major implications for the study of hypogea and collective burial systems. In south-western Marne, instead of depositing and removing bodies several times, new hypogea may have been established. As suggested by Gérard Bailloud (1974), several hypogea may therefore be the equivalent of a gallery grave. However, this does not rule out potential emptying of the grave, as identified in the case of Le Mesnil-sur-Oger ‘Les Mournouards’ (II) 3, for example (Blin 2012). As we have shown, artefacts can also be helpful in delimiting the period of use of collective burials. The period of use of the necropolises, the need for new graves, and the burial rhythm must all be more fully investigated.

All burials during the *Néolithique récent* were collective. Cremation was rare; burial was the most common practice. Bodies were generally placed in the burial chambers, either supine (lying down), flexed (with bound limbs), or seated (also with bound limbs). These English translations of French terms were proposed by Knüsel (2014). In some cases, only the arms were bent; in other cases, the upper and lower limbs were bent, notably at Loisy-en-Brie ‘Les Gouttes d’Or’ (Chertier *et al.* 1994) (Figure 5). The biological anthropology of collective burials in south-western Marne has been the object of earlier studies, many of which were incomplete. Only the osteological remains from Loisy-en-Brie ‘Les Gouttes d’Or’ have been studied in detail, but few results have so far been published. The number of bodies buried in a hypogeum varied greatly, ranging from a minimum of two to a maximum of 170 (Martineau 2019). Men, women, and even children could be buried together, but very young children were rarely buried in hypogea. Children under the age of five are very poorly represented in the burial population, and those under one year old were even less frequently buried in hypogea (Le Roy 2017). Two cases of tuberculosis have been found in two different hypogea, one in the Saint-Gond Marshes region and the other in the northern part of the same region. They attest to the presence of serious infectious diseases that had perhaps been treated by trepanning, at least in one of the two cases mentioned. The cranial trepanations, bone plates, and washers that resulted from these operations bear witness to practices that may well have been surgical in nature. They were probably performed in an attempt to treat certain illnesses, or to heal fractures. In most cases, we do not know the reasons for these trepanning operations.



Figure 5. The burial chamber of Loisy-en-Brie ‘Les Gouttes d’Or’ after removal of the vault. 170 individuals were buried in this hypogeum. Photo: B. Chertier (Chertier *et al.* 1994).

Grouping the hypogea

It is possible to distinguish three groups based on architectural differences (Figure 6). Group 1, in the Saint-Gond Marshes region consists of small hypogea with a single square (or slightly trapezoidal) chamber, sometimes with an antechamber. A typical representative is Villevenard ‘Les Ronces’. Group 2, north of the Saint-Gond Marshes and extending into the Marne valley, consists of hypogea with a single rectangular chamber, often with an antechamber. This group is composed of two separate zones. A typical representative is Loisy-en-Brie ‘Les Gouttes d’Or’ (Chertier *et al.* 1994). Group 3, along the Côte des Blancs, consists of two-chambered hypogea, almost always with an antechamber (Martineau *et al.* 2016). Typical representatives are the hypogea 5, 6, and 7 at Chouilly ‘La Grifaine’.

Arnaud Blin (2012) has shown that there were three modes of burial in hypogea: supine (lying down), flexed (arms and/or knees bound against the body), or seated (spine vertical, limbs flexed and bound). The majority of the burials in Group 1 are in a supine elongated position. Burials in a flexed or seated position constitute a funerary practice so different from burials in a supine position that we can only attribute a marked and voluntary cultural character to this practice. On the basis of strictly anthropological arguments, Blin (2012) proposes that a culturally distinct group should be formed. Three of the four hypogea (with a majority of flexed (and sometimes seated) burials belong to Group 2 (Bouy ‘Les Varilles’, Ay-Champagne ‘Warmery Haut’, and Loisy-en-Brie ‘Les Gouttes d’Or’), while the fourth, Chouilly ‘La Grifaine’ is

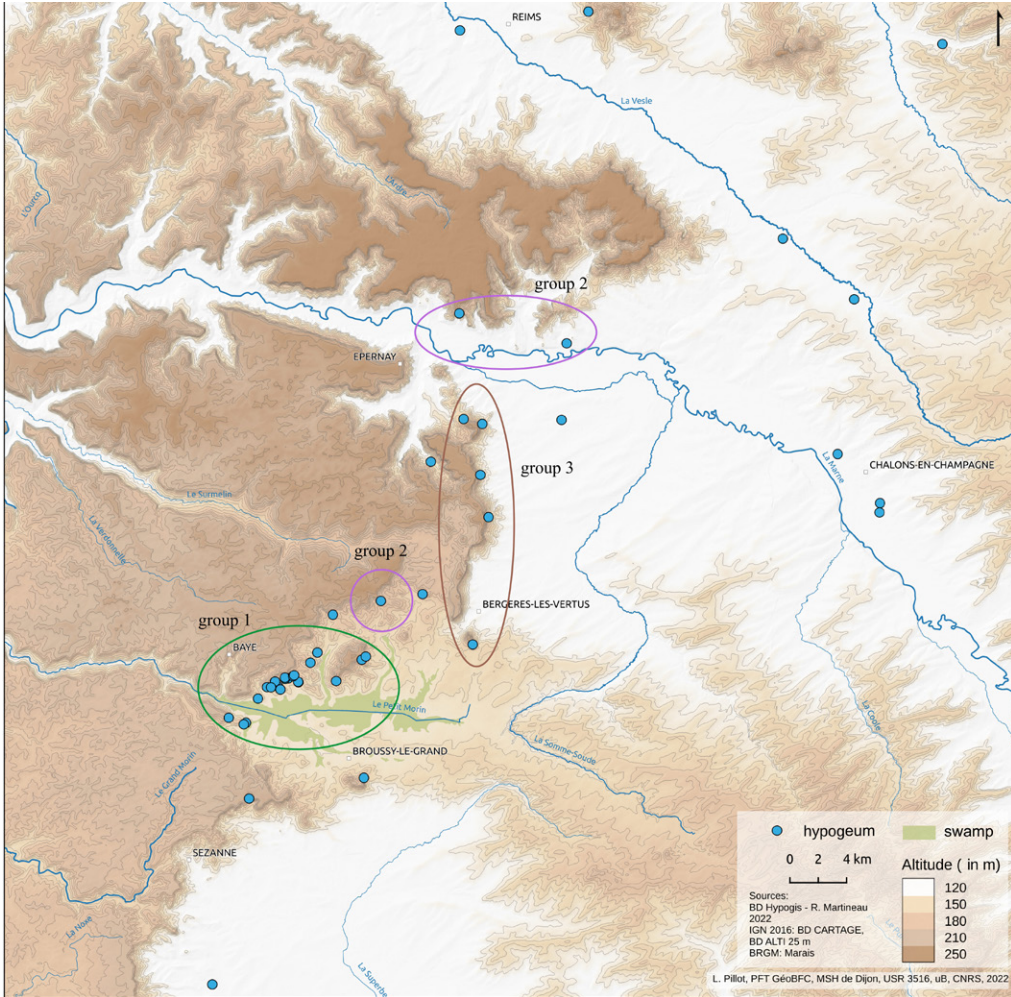


Figure 6. Tree geographical groups of hypogea based on architectural differences.

DAO: L. Pillot and R. Martineau.

found in the north of Group 3. Funerary practices are to some extent correlated with the layout of the hypogea. Nevertheless, there are hypogea with supine burials at Avize ‘Les Dimaines’, Le Mesnil-sur-Oger ‘Les Mournouards’ and Chouilly ‘La Grifaine’ along the Côte des Blancs (Group 3). Furthermore, some of the hypogea in the Saint-Gond Marshes region (Group 1), such as Courjeonnet ‘Les Vignes Jaunes’ or Villeneuve-Saint-Vistre et Villevotte ‘Montaubar’ also comprise a few burials in a flexed position. There is no strict correlation between burial mode and the three groups identified above. At Chouilly ‘La Grifaine’, in hypogeum 6, all the bodies (six in the first chamber and ten in the second) have flexed arms and legs (Martineau *et al.* 2016). Once again, no strict correlation can be established between the flexed position and the single-chambered hypogea with a rectangular plan. Funerary practices such as flexed and

bound bodies appear to be linked neither to geography nor architecture; they may possibly be chronological or anthropological in nature.

The hypogea in which the majority of burials were in a flexed or seated position consisted of elongated rectangular chambers, most often with antechambers. These burials have yielded artefacts attributable both to the *Néolithique récent* and *Néolithique final* periods. Little of the archaeological material from Group 1, in the Saint-Gond Marshes, is attributable to the *Néolithique final*. Much more of the material from Group 2, which extends into the Marne Valley, can be attributed to the *Néolithique final*. In Group 3, along the Côte des Blancs, the main chronological argument is provided by the flexed burial position, together with the small proportion of artefacts from the *Néolithique final* (Martineau *et al.* 2016). The hypogeum phenomenon thus comprises three groups and at least two chronological phases. The second phase has been identified throughout the study area, although less markedly in Group 1, the Saint-Gond Marshes. A detailed study of all the artefacts found in the hypogea will be necessary to describe and characterise such chrono-cultural differences, to take account of this new chronological model.

Detailed studies are currently underway for each previously excavated site, focusing on the following elements: documentary studies of each site and excavation context; topographical surveys, plans, and cross-sections of each type of architecture; detailed descriptions of sculptures and paintings; analysis of the archaeological context to reconstruct archaeological assemblages (flint, bone, deer-antler tools, and ornaments); petrographic and geochemical studies of flint artefacts.

Hypogea and flint mining

Several converging arguments suggest a link between the population buried in the hypogea and the flint quarried locally in the mines (Martineau *et al.* 2024). Four mines were partly exploited in the *Néolithique récent* (i.e. during the hypogeum period). Although the other flint mines on these chalk hillsides have not yet been dated, their systematic spatial proximity with the collective burials reinforces the hypothesis that there must have been a link between them. Palaeopathological studies carried out on human bones from five hypogea and one gallery grave along the Côte des Blancs and in the north of the Saint-Gond Marshes have identified the most common pathologies (osteoarthritis and spinal compression or crushing). Numerous fractures (phalanges, femur, pelvis, radius, ulna, scapula, clavicle, and cranium), particularly of the forearms and hands (Comode 1994; Donat 2020; Fusté 1952; Leroi-Gourhan *et al.* 1963), have also been identified, together with several degenerative pathologies characteristic of mining work (Bouquin and Garmond 2021). At Loisy-en-Brie ‘Les Gouttes d’Or’, for a minimum number of individuals (MNI) of 170, eleven of the eighteen fractures identified (i.e. 61%) concerned the radius and ulna (Comode 1994). Two other forearm fractures were also identified, one in the de Baye collection, and the other at Le Mesnil-sur-Oger ‘Les Mournouards’ II (3). These pathologies could well be directly linked to mining activity: they are consistent with accidents during flint extraction, and with physical activities such as carrying heavy loads that severely test the body. Flint miners worked lying down for much of the time, with deer-antler picks at arm’s length. Detaching blocks of flint by ‘caving’ or *foudroyage* (i.e. by removing the easily fractured chalk substrate from below the flint nodules) may well have resulted in forearm fractures. Macroscopic analysis has shown that secondary flint was used

in 88% of the *Néolithique récent* series from the Paris Basin (Augereau *et al.* 2007: 174; Donat *et al.* 2014: 392; Renard *et al.* 2014). It is very likely that some of this production came from the Saint-Gond Marshes region. The sedimentary petrography analyses carried out by Marie Imbeaux show that the vast majority of the flints from the hypogea belong to the Saint-Gond facies, which has nine subfacies (Imbeaux *et al.* 2018; Imbeaux 2024; Martineau *et al.* 2024). All the recipient sites contain flints from several of these subfacies (Imbeaux 2016; Imbeaux *et al.* 2018).

Synthesis

This first data synthesis documenting the Marne hypogea provides new perspectives to reconstruct the economic, societal, and territorial organisation of the societies of the *Néolithique récent*. In the south-west of the Marne, many valid arguments have been identified highlighting links between the local flint-mining context and the population buried in these collective burial sites (hypogea and gallery graves). One of the most important results is the surprisingly high percentage of fractures of both forearms and hands observed in this population. Combining the characteristics of the hypogea and the anthropological data with archaeological evidence from settlements and flint mines should open fresh perspectives for the comprehension of Neolithic societies. By compiling many sources of information about the hypogea, two successive chronological phases are distinguished in each of the three groups proposed in this study. The Saint-Gond Marshes region (Group 1) is the best known, as its architecture, decorations, funerary practices, and artefacts are already well defined. The hypogea are single-chambered, with or without an antechamber or a vestibule. The chamber plans are often small and square, sometimes trapezoidal. Most of the deceased were buried in a supine position. To the north of the region, between Loisy-en-Brie and the right (north) bank of the Marne, the architecture of the hypogea in Group 2 often includes an antechamber, with elongated rectangular burial chambers, and bodies in a flexed or seated position. Among the artefacts in these burials, a small proportion spans the last phase of the *Néolithique récent* and the beginning of the *Néolithique final*. In Group 3, along the Côte des Blancs, between Val-des-Marais and Chouilly, the hypogea have two burial chambers and an antechamber. Some of the ornamentation consists of artefacts that are quite different from those in the other two groups.

In the Saint-Gond Marshes region (Group 1), the foundation deposits are sometimes symbolically represented by sculptures of axes and deer-antler axe sleeves with transverse handles, and even a transverse-handled tine pick. Human figures accompany these representations of tools characteristic of the period, together with black-painted geometric representations such as the ‘shovel’, or parallel vertical lines often crossed by a transverse median line. The burial chambers were always clearly separated from the outside world, not only because they were underground, but also because the corridor was offset from the axis of the chamber. The narrowness of both the door and the *trou d’Homme* (and the vestibule or antechamber) reinforced this separation between the terrestrial and subterranean worlds. The architecture of all the hypogea studied was originally designed to separate the world of the dead from that of the living.

Acknowledgements

Jean-Jacques Charpy, Jean-Paul Thevenot, Marie Imbeaux, Lucile Pillot, Catherine Perlès.

Rewriting: Carmela Chateau-Smith. Publication in English was made possible by a grant from the Fonds Vidal, MSH Dijon USR3516 CNRS-Université de Bourgogne.

Bibliography

- Armitage, R.A., P. Bueno-Ramírez, R. De Balbín-Behrmann, R. Martineau, F. Carrera-Ramírez, T. Tara Fairchild and J. Southon 2020. Charcoal-painted images from the French Neolithic Vilvenard hypogea: an experimental protocol for radiocarbon dating of conserved and in situ carbon with consolidant contamination. *Archaeological and Anthropological Sciences* 12 (123): 2-16.
- Augereau, A., P. Brunet, L. Costa, R. Cottiaux, T. Hamon, E. Ihuel, F. Langry-François, P. Magne, A. Maingaud, N. Mallet, R. Martineau, B. Mille, L.-A. Millet-Richard, A. Polloni, C. Renard, G. Richard, L. Salanova, A. Samzun, I. Sidera and M. Sohn 2007. Le Néolithique récent dans le Centre-Nord de la France (3400/3300-2800/2700 av. J.- C.): l'avenir du Seine-Oise-Marne en question, in J. Evin (ed.) *Un siècle de construction du discours scientifique en Préhistoire : ... Aux conceptions d'aujourd'hui. Vol. 3 Actes 26e congrès de la Société préhistorique française, Avignon-Bonnieux, Centenaire, 21-25 sept. 2004*: 165-184. Paris: Société préhistorique française.
- Augereau, A., C. Renard, J. Couderc, A. Goutelard, E. Ihuel, F. Langry-François, P. Magne and L.A. Millet-Richard 2004. Les industries lithiques de la fin du Néolithique en Centre-Nord de la France. État documentaire et pistes d'études, in M. Van Der Linden and L. Salanova (eds) *Le troisième millénaire dans le nord de la France et en Belgique* (Anthropologica et Præhistorica 115 / Mémoire de la Société préhistorique française XXXV): 83-89.
- Bailloud, G. 1974. *Le Néolithique dans le Bassin parisien* (Ile supplément à Gallia Préhistoire). Paris: CNRS.
- Baye, J. de 1880. *L'archéologie préhistorique*. Paris: Ernest Leroux.
- Blin, A. 2012. Une nouvelle analyse de l'hypogée néolithique des Mournouards II au Mesnil-sur-Oger (Marne). *Revue Archéologique de l'Est* 61: 35-54.
- Blin, A. 2015. Mortuary practices as evidence of social organization in the Neolithic hypogea of the Paris basin. *European Journal of Archaeology* 18(4): 580-598.
- Bouquin, D. and N. Garmond 2021. Pathologies et traumatismes professionnels au Néolithique : des mineurs de silex à Chouilly « La Grifaine » (Marne)?. *Les nouvelles de l'archéologie* 165: 50-55.
- Chambon, Ph., A. Blin, C. Bronk Ramsey, B. Kromer, A. Bayliss, N. Beavan, F. Healy and A. Whittle 2017. Collecting the dead: temporality and disposal in the Neolithic hypogée of Les Mournouards II (Marne, France). *Germania* 95: 93-143.
- Chambon, P. and L. Salanova 1996. Chronologie des sépultures du IIIe millénaire dans le bassin de la Seine. *Bulletin de la Société préhistorique française* 93(1): 103-118.
- Charnot, M. 2019. La céramique néolithique de Broussy-le-Grand « L'Ourlet » (Marne). Approche typologique et technologique. *Revue Archéologique de l'Est* 68: 5-38.
- Charpy, J.-J. 2014. Nouvelle lecture des sculptures trouvées dans les hypogées des Marais-de-Saint-Gond (Marne), in R. Cottiaux and L. Salanova (eds) *La fin du IVe millénaire dans le Bassin parisien. Le Néolithique récent entre Seine, Oise et Marne (3500-2900 avant notre ère)*. (supplément

- 34 de la Revue Archéologique de l'Est et supplément 1 de la Revue Archéologique d'Île-de-France): 411-422. Dijon: Société Archéologique de l'Est.
- Chertier, B., C. Bouttier-Nicolardot and J.P. Nicolardot 1994. L'hypogée néolithique de Loisy-en-Brie (Marne), lieu-dit Les Gouttes-d'Or. *Préhistoire et Protohistoire en Champagne-Ardenne* 18: 23-53.
- Comode, P. 1994. L'hypogée néolithique de Loisy-en-Brie (Marne), lieu-dit Les Gouttes d'Or. Paléopathologie. Le squelette post-crânien. *Préhistoire et Protohistoire en Champagne-Ardenne* 18: 61-62.
- Cottiaux, R. and L. Salanova (eds) 2014. *La fin du IV^e millénaire dans le Bassin parisien. Le Néolithique récent entre Seine, Oise et Marne (3500-2900 avant notre ère)*. (supplément 34 de la Revue Archéologique de l'Est et supplément 1 de la Revue Archéologique d'Île-de-France). Dijon: Société Archéologique de l'Est.
- Cottiaux, R., L. Salanova, P. Brunet, T. Hamon, F. Langry-François, A. Maingaud, R. Martineau, B. Mille, A. Polloni, C. Renard and M. Sohn 2014. Le Néolithique récent dans le Bassin parisien (3600-2900 avant notre ère) : périodisation et faciès régionaux, in R. Cottiaux and L. Salanova (eds) *La fin du IV^e millénaire dans le Bassin parisien. Le Néolithique récent entre Seine, Oise et Marne (3500-2900 avant notre ère)*. (supplément 34 de la Revue Archéologique de l'Est et supplément 1 de la Revue Archéologique d'Île-de-France): 455-529. Dijon: Société Archéologique de l'Est.
- Donat, R. 2020. *Société, environnement et état sanitaire au Néolithique récent : les groupes humains des hypogées I et II du Mont-Aimé (Val-des-Marais, Marne)*. PhD dissertation, Université Paul Sabatier - Toulouse III.
- Donat, R., M. Sohn, F. Langry-François, A. Polloni, A. Maingaud, G. Maziere and E. Crubézy 2014. Le mobilier de l'hypogée 2 du Mont-Aimé au Val-des-Marais (Marne) dans son cadre régional : nouvelles données, in R. Cottiaux and L. Salanova (eds) *La fin du IV^e millénaire dans le Bassin parisien. Le Néolithique récent entre Seine, Oise et Marne (3500-2900 avant notre ère)*. (supplément 34 de la Revue Archéologique de l'Est et supplément 1 de la Revue Archéologique d'Île-de-France): 389-410. Dijon: Société Archéologique de l'Est.
- Edinborough, K., R. Martineau, A. Dufraisse, S. Shennan, M. Imbeaux, A. Dumontet, P. Schauer and G. Cook 2021. A Neolithic population model based on new radiocarbon dates from mining, funerary and population scaled activity in the Saint-Gond Marshes region of North East France. *Quaternary International* 586: 121-132.
- Fusté, M. 1952. Ossements humains du dolmen des Bretons (Marne). *Bulletins et Mémoires de la Société d'anthropologie de Paris* Xe série, t. III (3-4): 118-155.
- Garmond, N. and D. Bouquin 2016. Fouille de deux hypogées sur la nécropole de Chouilly « La Grifaine » (Marne): premiers résultats. *InterNéo* 11: 121-132.
- Imbeaux, M. 2024. *Étude de l'organisation des territoires au Néolithique moyen II et récent dans le quart sud-est du Bassin de Paris. Caractérisation des provenances et diffusion des silex par la pétrographie et la géochimie*. PhD dissertation, Université de Bourgogne Franche-Comté.
- Imbeaux, M., J. Affolter and R. Martineau 2018. Diffusion régionale du silex crétacé des minières de Saint-Gond (Marne, France) au Néolithique récent et final. *Bulletin de la Société préhistorique française* 115(4): 733-767.
- Knüsel, J. 2014. Crouching in fear: Terms of engagement for funerary remains. *Journal of Social Archaeology* 14: 26-58.
- Langry-François, F. 2003. *Le mobilier lithique des sépultures collectives en hypogée du département de la Marne. Approche typologique et technologique des industries en silex taillé du III^e millénaire avant J-C*. Mémoire de DEA, Université de Bourgogne.

- Langry-François, F., R. Martineau and G. Lépine 2024. Un habitat et une enceinte du Néolithique récent à Val-des-Marais « Le Pré à Vaches » (Marne). *Bulletin de la société préhistorique française* 121(2): 337-340.
- Le Roy, M. 2017. How Were Infants Considered at Death during the Neolithic Period in France?, in E. Murphy and M. Le Roy (eds) *Children, Death and Burial. Archaeological discourses*: 19-34. Oxford: Oxbow.
- Leclerc J. and M. Masset 2006. L'évolution de la pratique funéraire dans la sépulture collective néolithique de La Chaussée-Tirancourt (Somme). *Bulletin de la Société préhistorique française* 103(1): 87-116.
- Leroi-Gourhan, A., G. Bailloud and M. Brézillon 1963. L'hypogée II des Mournouards (Mesnil-sur-Oger, Marne). *Gallia Préhistoire* V(1): 23-133.
- Martineau, R. 2019. *Le complexe minier des Marais de Saint-Gond et de la Côte des Blancs (Marne, France). Étude de l'organisation de la société au Néolithique récent à partir des sépultures collectives, des minières de silex et des habitats*. Habilitation à diriger les recherches, Université de Bourgogne Franche-Comté.
- Martineau, R. 2022. Le Néolithique de la région des Marais de Saint-Gond (Marne), in J.J. Charpy (ed.) *Les Marais de Saint-Gond. Une longue histoire*: 53-58. Saint-Gond: Archéologie Patrimoine.
- Martineau, R. (resp.), J. Brenot, J.-J. Charpy, J. Desmeulles, A. Dumontet, C. Durlet, G. Fronteau, M. Imbeaux, B. Lambot, F. Langry-François, A. Lausueur-Michon, G. Lépine, F. Lévêque, A. Monnier, E. Pleuger and A. Polloni 2023. *Les complexes miniers néolithiques de la région des Marais de Saint-Gond (Marne). Évaluation des indices d'habitats par sondages*. Projet collectif de recherche.
- Martineau, R., J.-J. Charpy, A. Dumontet, J. Affolter and B. Lambot 2014. Les minières de silex néolithiques des marais de Saint-Gond (Marne). *Revue Archéologique de l'Est* 63: 25-45.
- Martineau, R., J.-J. Charpy, A. Dumontet, J. Affolter, G. Pierre and A. Devos 2015. Hypogées, minières et «ateliers de taille» des marais de Saint-Gond et du sud-est du plateau de Brie (Marne), in C. Laurelut and J. Vanmoerkerke (eds) *Occupations et exploitations néolithiques : et si l'on parlait des plateaux?*. (Bulletin de la Société Archéologique Champenoise 107,4): 281-297. Reims: Société archéologique champenoise.
- Martineau, R., J.-J. Charpy, F. Langry-François, A. Polloni in collaboration with P. Huard, F. Spiès and S. Thiol 2016. Les nécropoles d'hypogées de La Grifaine et Les Ronds Buissons à Chouilly (Marne). *Gallia Préhistoire* 56: 127-193.
- Martineau R. and C. Delhay 2019. *Vivre et mourir en Champagne il y a 5000 ans*. CNRS Images. <https://videothèque.cnrs.fr/doc=6715>
- Martineau R. and A. Dumontet 2024. *Le Néolithique de la région des Marais de Saint-Gond*. Dijon. <https://saintgond.hypotheses.org/>
- Martineau, R., M. Imbeaux, J. Affolter, J.-J. Charpy, F. Bostyn and A. Dumontet 2019. The Neolithic Flint Mines of Les Marais de Saint-Gond and La Côte des Blancs (Marne, France), in H. Collet and A. Hauzeur (eds) *Mining and Quarrying. Geological Characterisation, Knapping Processes and Distribution Networks during Pre- and Protohistoric Times*. (Anthropologica et Præhistorica 128): 101-118.
- Martineau, R., M. Imbeaux, F. Langry-François and J. Affolter 2024. La place des hypogées au sein des complexes miniers du Néolithique récent du sud-ouest de la Marne (France), in I. Kerouanton, Ch. Maitay, I. Praud and L. Soler (eds) *La place des morts chez les vivants. Architecture, mémoire et rituels de la fin du Mésolithique à l'âge du Bronze*: 595-610. Mémoire LIX. Association des publications chauvinoises.

- Peek, J. 1975. *Inventaire des mégalithes de la France. Région Parisienne*. 1er supplément à Gallia Préhistoire. Paris: CNRS.
- Polloni, A. 2008. La parure dans les sépultures collectives de la fin du I^{er} au début du II^e millénaire en bassin parisien. PhD dissertation, 2 vol. Paris I Panthéon Sorbonne.
- Renard, C. 2018. Caractérisation de l'industrie lithique de la fin du Néolithique, dans le bassin de la Seine (de la deuxième moitié du I^{er} millénaire à la fin du III^e millénaire av. J.-C.). *Bulletin de la Société préhistorique française* 115(2): 253-288.
- Renard, C., A. Polloni, M. Sohn, E. Ihuel, F. Langry-François, P. Magne, A. Maingaud, R. Martineau and L. Salanova 2014. La collection Joseph de Baye au Musée d'Archéologie Nationale, in R. Cottiaux and L. Salanova (eds) *La fin du I^{er} millénaire dans le Bassin parisien. Le Néolithique récent entre Seine, Oise et Marne (3500-2900 avant notre ère)*. (supplément 34 de la Revue Archéologique de l'Est et supplément 1 de la Revue Archéologique d'Île-de-France): 313-371. Dijon: Société Archéologique de l'Est.
- Richard, I. and R. Martineau 2020. L'hypogée de Saint-Memmie "avenue Jacques Simon" (Marne) et son contexte régional. Journée archéologique champenoise. *Bulletin de la Société archéologique champenoise* 113(1): 57-59.
- Richard, I., S. Desbrosse-Degobertière, C. Buquet-Marcon, L. Pecqueur and C. Thevenet 2020. Nouvelles perspectives sur les hypogées marnais : la fouille de Saint-Memmie (Marne). *InterNéo* 13: 25-34.
- Salanova, L., P. Brunet, R. Cottiaux, T. Hamon, F. Langry-François, R. Martineau, A. Polloni, C. Renard and M. Sohn 2011. Du Néolithique récent à l'âge du Bronze dans le Centre Nord de la France: les étapes de l'évolution chrono-culturelle, in F. Bostyn, E. Martial and I. Praud (eds), *Le Néolithique du Nord de la France dans son contexte européen. Habitat et économie aux 4^e et 3^e millénaires avant notre ère*: 77-101. France: Revue Archéologique de Picardie numéro spécial 28.
- Sohn, M. 2002. Place et rôle du mobilier dans les sépultures collectives du Bassin parisien à la fin du Néolithique. *Bulletin de la Société préhistorique française* 99(3): 501-520.
- Sohn, M. 2006. *Du collectif à l'individuel : évolution des dépôts mobiliers dans les sépultures collectives d'Europe occidentale de la fin du I^{er} à la fin du III^e millénaire avant J.-C.* PhD dissertation, 2 vol. Université de Paris I Panthéon Sorbonne.
- Villes, A. 1996. Sépultures collectives du Néolithique en Champagne, recherche d'une identité régionale. *Bulletin de la Société préhistorique française* 93: 312-317.
- Villes, A. 1998a. Les figurations néolithiques de la Marne, dans le contexte du Bassin parisien. *Bulletin de la Société archéologique champenoise* 91(2): 7-45.
- Villes, A. 1998b. Les sépultures collectives néolithiques en Champagne. Bilan régional, in P. Souliers (ed.) *La France des dolmens et des sépultures collectives (4500-2000 avant J.-C.)*: 78-88. Paris: Errance.

Prehistoric rock-cut tombs in the western Mediterranean: a global approach to local phenomena

Marie-Elise Porqueddu

Service régional de l'archéologie, Direction régional des affaires culturelles des Hauts-de-France

Abstract

Rock-cut tombs represent one of the most widespread and diversified forms of late prehistoric architecture devoted to the dead in the western Mediterranean. While initially perceived as a general phenomenon linked to the spread of megalithic structures, funerary hypogea proved to comprise a variety of forms that appeared locally in different areas between the 5th and 2nd millennia BC. As the emergence of hypogea has multiple origins (Jordão and Mendes 2006), these artificial cavities are most often approached on a site or regional scale. Few authors have produced overviews on the subject.

Therefore, our aim is to go beyond regional typological and chrono-cultural approaches to offer a broader reflection on the carving, construction, and use of rock-cut tombs on a Mediterranean scale. By focusing on the technical features, we propose to work on patterns associated with the emergence of the use of this type of funerary architecture. The development of technical and geomorphological analyses of the carving processes is crucial to understanding the cultural and natural factors that determined the creation of these rupestrian spaces. As we focus on the skills involved in working the rock, we will also be looking at other prehistoric underground structures such as mines and quarries.

Key words: Hypogea; rock-cut tombs; technology; typology; Mediterranean; Neolithic

Introduction

The end of the Neolithic and the beginning of the Bronze Age proved to be a flourishing period for funerary architectures, with numerous types of monuments and burial sites. Among the architectures, we naturally think of the megalithic phenomenon, which expanded remarkably during the Neolithic period, but another type of architecture was particularly widespread in the Mediterranean. These were artificial funerary cavities, also known as hypogea. These underground structures designed to accommodate the dead are found throughout the countries of the western Mediterranean, and in some places are the dominant form of funerary architecture. Their morphology varies from simple tombs accessible via a vertical shaft to complex spaces composed of several chambers or even multiple underground levels.

The study of these artificial cavities has given rise to a variety of research traditions, many of them local. Sardinia is undoubtedly the best example, with its thousands of *domus de janas* ('houses of the fairies'), for which many researchers have specialised and developed new theoretical and methodological frameworks (Lilley 2023; Robin 2015). The presence of these structures also in Sicily and on the Italian mainland has led to numerous comparisons and discussions on their emergence and development in these regions. In addition, the



Figure 1: Distribution map of the sites mentioned in the article. 1. Cerro de las Aguilillas (Ardales/Campillos, Málaga, Spain); 2. Cuesta de la Reina (Ciempozuelos, Madrid, Spain); 3. Camino de las Yeseras (San Fernando de Henares, Madrid, Spain); 4. Arles-Fontvieille (Fontvieille, Bouches-du-Rhône, France); 5. S'Elighe Entosu (Usini, Sardinia, Italy); 6. Cucurru S'Arriu (Cabras, Sardinia, Italy); 7. Cala Colombo and Cala Scizzo (Torre a Mare, Bari, Italy); 8. Calaforno (Giarratana, Sicily, Italy); 9. Hal Saflieni (Paola, Malta). Design: M.E Porqueddu. Source map: <https://www.arcgis.com/>.

geographical proximity of the Maltese archipelago, with several hypogea, including the emblematic Hal Saflieni (Figure 1), and closer ties in material culture over the entire region has enabled the latter to be included in Italian discussions on this subject (Cazzella 2000; Lilliu 2000; Walter 2000). Artificial caves in the central Mediterranean are a key area of study for researchers, with a particular focus on dating studies (Parkinson *et al.* 2021; Whitehouse 1972).

However, few researchers have taken an interest in the study of hypogea on a much more supraregional scale within the western Mediterranean, encompassing different regions such as Italy, the Iberian Peninsula and southern France. Several meetings have enabled researchers to present case studies in international contexts (the conference *L'Ipogeismo nel Mediterraneo: origini, sviluppo, quadri culturali* held in Sardinia in 1994 and published in 2000 is certainly the best example). There have also been some analyses on a Mediterranean scale, comparing the various hypogea in this vast region and seeking to establish common threads, but these are still very rare (in this case, the work of Jean Guilaine is undoubtedly the most accomplished on the subject, see Guilaine 1994 and Guilaine *et al.* 2015; while Giovanni Lilliu was a driving force behind the development of many new perspectives on the subject, see Lilliu 2000).

The analysis of prehistoric rock-cut tombs in a geographical area as vast as the western Mediterranean is complex. Besides the number of sites to be analysed, it is above all a question of addressing architectures within a broad chronological arc and belonging to dozens of different archaeological cultures. How, then, can we approach these architectures without looking exclusively at their typological aspects, and renewing the narrative around them? The aim of this chapter is to offer such a broader reflection, starting by setting out the characteristics common to these architectures and thus trying to identify a common thread between them. By analysing the vocabulary and definitions used by researchers in this geographical area, we can first establish a general idea of what hypogea are. We will then propose a specific study approach concerning the very nature of these architectures, i.e. their artificial carving into the rock.

How to characterise hypogea? Questions of vocabulary

Etymology and definitions

Addressing such a vast phenomenon on such a large geographical scale means first reaching a common understanding of the terms used and the definition of the object of study at stake. To achieve this task, we need to go back to the vocabulary we use and its etymology. The term hypogeum is present in all the Latin languages of the western Mediterranean. Whether as an adjective or a noun, the roots of the term hypogeum come from the Latin '*hypog(a)eus*' meaning 'underground' and from the Greek, where the word is broken down into the components 'under' and 'earth' (see *Centre National de Ressources Textuelles et Lexicales*).

In addition, definitions can be examined in dictionaries, and more specifically in the languages of the researchers involved in the present volume, i.e. Spanish, Portuguese, and French. Used as an adjective, the term refers to what is below ground level. In dictionaries, the word hypogeum is also directly associated with archaeology, referring to an underground construction used for burials (see for French *Centre National de Ressources Textuelles et Lexicales*, for Spanish *Diccionario de la lengua Española* from Real Academia Española, for Portuguese see *Dicionário da Língua Portuguesa* from Academia das Ciências de Lisboa).

Finally, different definitions are given by the researchers themselves within the western Mediterranean. A few examples are worth mentioning. Clop and Majó (2017) describe hypogea as large, underground burial spaces, either built or carved. Jordão and Mendes (2006), for their part, consider the most important component to be a chamber carved into the rock, pointing out that this is the common feature of all these structures. They continue by stating that the fundamental elements are the chamber and a distinctive access space, to which other architectural elements can be added. The collective aspect of the burial also appears to be important.

Another very relevant point of view is that of speleologists and geologists, which is unfortunately rarely discussed by archaeologists or only in the context of specific collaborations (or once again in connection with strong research traditions, as in Italy). Various speleological societies in Europe, as well as the International Congress of Speleology (ICS), have specific committees dealing with artificial cavities and are developing typologies. The way in which the word hypogeum is defined here is in line with the more general meanings we have seen

in dictionaries and leads us to think more broadly about its use as an adjective, so that we can define as hypogeum both prehistoric tombs and domestic cavities excavated during historic periods (Bixio *et al.* 2012; Del Prete and Parise 2012; Polimeni *et al.* 2019).

Thus, it becomes clear that the etymology of the word and the definitions provided in the dictionaries give a general definition of these architectures and emphasise their underground component. The method of construction is not mentioned. It is only the practical use made of them by the researchers that enables them not only to evoke the carved nature of these spaces but also to introduce other discriminating elements which, as we shall see later, incorporate the differences between the various types of rock-cut tombs.

Other expressions are also used to refer to rock-cut tombs, some of which are very regional. Sardinia has a particular expression, born from oral and mythological tradition and now part of scientific literature: *domus de janas*. The term literally means ‘houses of the fairies’ and may be linked to the presence of marks reminiscent of the claws of these imaginary beings as well as architectural elements reminiscent of a house (false doors, windows, fireplaces, etc.) (Turchi 2011). It is noteworthy that the term refers only to rock-cut tombs dating back to the 4th millennium BC and that are therefore linked to specific archaeological cultures. Rock-cut tombs found in Sardinia but not belonging to this chronological period, either earlier or later, may have other names. This terminological distinction is similar to that developed in continental Italy, where a hypogeum is a complex architectural space, similar to that of the Sardinian *domus de janas*. There, artificial cavities can also be referred to as *tomba a forno* or *tomba a grotticella*. These expressions are used for tombs that are generally a single cell with a chamber and access shaft (Negroni Catacchio and Aspesi 2016; Silvestrini *et al.* 2006). The terminology used varies according to the region being studied, and there is a distinction between hypogea and artificial funerary cavities. The latter term may also be substituted in English in the academic literature by ‘rock-cut tombs’. This expression is particularly advantageous in that it does not only refer to the subterranean nature of the architecture, but also and primarily to the construction technique and materials used. The vocabulary used and the associated typology for artificial funerary cavities in the Mediterranean is the product of different regional research traditions, from which it can be difficult to develop dialogues between them.

‘Proto-hypogea’: intermediate form or real hypogea?

Beyond the distinction made by certain research traditions between hypogea and artificial funerary cavities, it is necessary to look at the emergence of these architectures and the first architectural forms associated with them. This question is very clearly formulated by Jean Guilaine (1994: 220): when can an excavated structure be considered a hypogeum? The discriminating criteria generally quoted by researchers are as follows: the collective nature of the burial, the presence of a complex, articulated architectural plan, and carving into rock.

Some authors use the term proto-hypogea to describe artificial cavities that do not meet the requirements inherent to hypogea. This term is particularly used for structures found in Catalonia (Spain) from the 5th millennium BC. These architectures, currently known as ‘*sepulcros de fosa*’, generally consisted of a single chamber with a corridor or access shaft (Guilaine *et al.* 2015; Petit Mendizábal and Pedro Pascual 2005; Roig Buxo *et al.* 2010). They

therefore do not display the architectural complexity attributed to hypogea. Similarly, they do not have the characteristics of collective tombs, with several burials and use of the structure over time, as the tomb is sealed after the first funerary deposit. As the authors Petit Mendizábal and Pedro Pascual (2005) point out, although such monuments do not correspond to the generally accepted description of prehistoric and protohistoric hypogea, these structures are not simple pits.

This type of architecture in Catalonia is reminiscent of the artificial cavities from the 5th millennium BC in Sardinia. As already mentioned, studies on Sardinian hypogea clearly distinguish hypogea associated with the 4th millennium *domus de janas*. However, these were not the first underground funerary structures to appear on the island. Rock-cut tombs first appeared in Sardinia during the 5th millennium and are associated with the Middle Neolithic and the Bonu Ighinu culture. The cemetery at Cucurru S'Arriu (Figure 1) features rock-cut tombs with a vertical shaft leading to a single funerary chamber containing one or two inhumations (Loria and Trump 1978; Santoni 1994; 2000). In this case, the authors do not refer to these as proto-hypogea but make a clear distinction between rock-cut tombs and hypogea.

Another factor that sometimes appears to discriminate between tomb forms and encourages authors to use the term proto-hypogea is the type of soil and rock that is carved out to create these architectures. In fact, there may be a distinction between architectures dug into clay soils or soft rocks, such as limestone, and those excavated in harder rocks such as granite. For Petit Mendizábal and Pedro Pascual (2005), this difference in the nature of the excavated underground material may explain why research focusing on hypogea has been sidelined in certain areas. Structures excavated in clay are generally of smaller dimensions, and thus can be considered exempt from the use of the term hypogeum. These tombs are also less well preserved, making them difficult to identify. The discovery of new hypogea cemeteries in central Spain, such as Camino de las Yeseras (Figure 1), some of them dug into layers of clay, has led to a revival of studies on the subject, and above all to the re-analysis of old findings. As is often the case in archaeology, the context in which research is carried out and discoveries made exerts a major influence on the subjects studied. The expansion of archaeology as part of urbanisation and development projects in Spain and Portugal has made it apparent not only that hypogea were not confined to the south of the Iberian Peninsula, Catalonia and the Balearic Islands, but also that the documentation of formerly well-known cemeteries such as Cuesta de la Reina in Ciempozuelos (Figure 1) has been revised (Bueno Ramírez *et al.* 2005; 2017; Ríos Mendoza 2011).

The prefix *proto*, as emphasised by various authors (Guilaine 1994; Guilaine *et al.* 2015; Petit Mendizábal and Pedro Pascual 2005), therefore implies an evolutionary process leading from simple rock-cut tombs to complete hypogea receiving a large number of deceased and possessing architectural complexity. It links the two architectural forms through a hierarchical relationship, the term *proto* clearly meaning the first model, that which comes first. In fact, its use offers two possibilities for the appearance of hypogea in the western Mediterranean: an evolutionary process from these early forms to the hypogeum as defined by many researchers, or in the absence of these intermediate structures, the direct appearance of hypogea as the result not of local evolution but of importation and/or assimilation and cultural influence. Of course, this evolutionary rhetoric is not sufficient.

Beyond typo-chronology, rock carving as a common feature

Variability of architectural designs

From this brief analysis of definitions and vocabulary, two architectural concepts of rock-cut tombs already seem to stand out. On the one hand, these are generally small artificial cavities with a single chamber and access space, and on the other, much more elaborate structures with several distinct spaces. However, as we have already mentioned, rock-cut tombs from the Neolithic and Bronze Age display a wide variety of architectural forms.

The typologies developed in the various regions with hypogea identify several differentiating features. The configuration of the access to the tomb and its location in relation to the rock surface are distinguishing factors within the typologies. The presence of an external access corridor to the tomb or a vertical shaft, or even no specific access at all, can be decisive in certain categories. The typology developed by Encarnación Rivero Galán (1986) for the south of the Iberian Peninsula is one of these regional typologies that is frequently recalled. It distinguishes four main types and a fairly large number of sub-types. The major difference between Type I and Type II is the presence of an access corridor cut into the bedrock. The presence of one or more burial chambers and their morphology are also determining factors in drawing up regional typologies. Such typological approaches have long been developed in Sardinia (Demartis 1986; 2001; Derudas 2000). Nevertheless, the specific context of Sardinia and the large number of hypogea have prompted researchers to look for other elements that would allow them to classify these tombs and, above all, to provide socio-cultural interpretations. The work on the variability of angles formed within walls by Liliana Spanedda is along these lines (Spanedda and Cámara Serrano 2011). Different typologies have also been introduced for the hypogea of the Balearic Islands (Gornés Hachero 1996; Plantalamor 1991; Veny 1982). Rafael Micó (2006), who partly adopts the typology of his predecessors, differentiates between types of hypogea based on antagonism between simplicity and complexity of architecture ('simple hypogea' and 'hypogea with a complex layout'), as well as the presence of a third type comprising hypogea with megalithic features ('hypogea with megalithic access').

The various typologies, and sometimes chronologies, that exist across regions also highlight scholars' inability to fit certain architectures (that appear to be singular) into pre-defined types and categories. This includes monuments that are not strictly hypogea, as they incorporate stone-built features or pre-existing natural features. The Cala Colombo and Cala Scizzo sites (Bari, Italy) (Figure 1) are natural caves that have been modified by various human interventions. This hybrid aspect between the natural and the anthropic does not fit into any specific category, leading to a diversification of the vocabulary used, oscillating in these cases between hypogeum and semi-artificial cavity (Geniola and Sanseverino 2014). The issue of the multiplication of terms for structures with excavated and built elements is even more significant and representative of our typological problems (Porqueddu 2018). These special architectures can be integrated into typologies, as we have seen for the Balearic Islands (Micó 2006). This is also the case for Sardinia, where significant work has been done on hypogea with megalithic entrances (Cicilloni 2015; 2019). Nevertheless, these remain specific cases where this type of monument is represented significantly in the regions mentioned. It is, for example, difficult to classify the Arles-Fontvieille necropolis in the south of France (Figure 1; Figure 2). The four monuments at this site consist of an imposing trench carved out of the



Figure 2: Entrance to the Castelet hypogeum in the Arles-Fontvieille necropolis (France). *Photograph: M. Orgeval.*

rock to form a subterranean chamber, covered with megalithic slabs and a cairn, which are the constructed elements. These are known as ‘mixed’ monuments because they feature two types of construction technique (quarrying and building in stone). At Arles-Fontvieille, these monuments are clearly out of the norm, measuring between 20 and 40 metres in length and up to four metres in depth (Margarit *et al.* 2016; Porqueddu *et al.* 2022). Likewise, the fully carved hypogea of Hal Saflieni (Malta) and Calaforno (Sicily) (Figure 1) are distinctive for their imposing dimensions and unique architectures (Guilaine *et al.* 2015). Hal Saflieni is notable for the development of an underground network on three distinct levels and the presence of multiple funerary and non-funerary chambers (Bonanno 1996; Guilaine *et al.* 2015; Pace 2006). The Calaforno hypogeum is a complex of 36 chambers opening one after the other over a hundred metres (Di Stefano and Militello 2015). These three sites clearly demonstrate the use of different excavation and construction techniques, as well as completely unusual architectural developments that are impossible to classify.

Rock as a matrix, technique as a guiding theme

Faced with all these architectural forms and typologies, it can be easy to become overwhelmed. The proliferation of terms used, and the distinctions made between the different types of rock-cut tombs leaves no room for a more global vision of these underground architectures, which were nonetheless widespread at the end of Prehistory in the western Mediterranean. This determination to categorise these underground architectures needs to be questioned. If we explore the various existing typologies, and the factors that enable each category to be defined, we can see that not only are they difficult to navigate, but that these typological distinctions

more often reflect purely formal issues, whereas it is essential to consider functionality and, above all, the relationship with rock carving and geomorphological features. The typological approach to prehistoric hypogea therefore needs to be reviewed. As Henry, Angelbeck and Rizvi (2017) point out in their critical approach to typology in archaeology, it is not a rejection of all forms of categorisation and their use as an analytical tool, but a question of addressing considerations around their potentially restrictive uses.

It is ultimately by going back to the definitions of the terms used and their etymology that we can distinguish what these structures have in common. Hypogea all have two aspects in common, their construction technique (i.e. excavation) and their topographic location (underground). These aspects could, moreover, be seen as antagonistic to megalithic architectures, which are built above ground. Nevertheless, the material involved, stone, remains the same and therefore by extension the very nature of the techniques employed. For these architectures, we should focus mainly on stone working, its techniques and the mastery of them.

Looking at the ontology of prehistoric and protohistoric rock-cut tombs in the western Mediterranean, we can refer to Doug Bailey's work, *Breaking the Surface. An Art/Archaeology of Prehistoric architecture* (2018). The opening up to other disciplines and other subjects within this book clearly shows the difficulty of establishing definitions for so-called negative architectures, dug into the ground, whether they be domestic, funerary or even cult-related. We can then address the philosophical essence of these structures and ponder the question of holes, their existence and their creation within a surface (Bailey 2018). The definitions given may provide a basis for wider reflection on our rock-cut tombs in the western Mediterranean. These holes within soil and rock are intimately linked to the surface they break, in this case rock, of different geological compositions, as well as to the technical action that enables them to be formed, in this case carving and extracting material from an object. This philosophical exploration also suggests that the actions involved in filling in these 'negative' spaces do not tie in with their ontology directly but are second- or even third-degree actions (Bailey 2018). We should focus not so much on the content as on the container. This point of view is particularly relevant in our case, where the descriptive limits of the different types of rock-cut tombs and hypogea often relate to the number of deceased inside them. The intention here is not to totally dismiss the funerary function of these underground spaces, but to invite us to consider the architecture itself and the various actions that led to its creation. It is not a matter of considering prehistoric rock-cut tombs purely as receptacles for the dead and drawing distinctions between them based on their architectural typology and their contents, but rather an invitation to perceive them as embodying techniques and know-how in relation to the material, in relation to the rock.

These structures are therefore primarily defined by their carving, the first stage in their biography, but also a stage that is often given very little consideration by researchers working on this subject.

The potential of a technical approach for a global approach to hypogea

The technical approach as a method

A technological analysis of the hypogea could enable us to overcome the problems we have encountered and propose a focus simply on the common feature of these architectures, their underground carving. As the subject of a doctoral dissertation and various post-doctoral research projects, the technological analysis of these underground monuments can be carried out by following three key methodological lines of enquiry (Melis and Porqueddu 2015; Porqueddu, 2018; 2023; Porqueddu *et al.* 2021): the study of the tools used in the carving process (Figure 3), the analysis of the tool marks visible on the hypogea walls (Figure 4), and experimental studies (Figure 5). Of course, these three methodological points cannot be addressed for every case study, as in most cases the tools associated with the excavation of structures have not been found, and in other examples tool marks have not been preserved. Nevertheless, this was possible in some cases, such as at the Arles-Fontvieille necropolis and the S'Elighe Entosu necropolis (Sardinia) (Figure 1) (Porqueddu *et al.* 2021). In situations where it is not possible to implement all these methodological elements, the application of one of the points can still provide significant data.



Figure 3: Two mallets from the Castelet hypogeum in the Arles-Fontvieille necropolis (France). The notches and grooves used to fit the tools are highlighted. *Photography and design: M.E. Porqueddu.*



Figure 4: Tool marks on the walls of a hypogeum in the Sas Concas necropolis (Sardinia, Italy). Marks of different shapes and sizes can be seen between the wall and the ground. *Photograph: M.E. Porqueddu.*

The tools used in the excavation of hypogea are sometimes preserved as they are deposited directly in the tombs and form an integral part of the funerary goods (Cappai and Melis 2008; Porqueddu 2019). This is the case in several hypogea in southern France and Sardinia, and in Spain at the Cerro de las Aguilillas necropolis (Figure 1), where more than 200 picks have been found inside and outside the tombs (Ramos Muñoz *et al.* 1999). The technological study of these tools not only allows us to work on the techniques and technical gestures employed during the excavation of the structures, but also to study the economy of the worksite, with aspects such as the time allowed for the procurement of raw materials and the manufacture of these tools.

Numerous hypogea have been emptied and reused in different periods. It can sometimes be difficult to date them precisely. However, a comprehensive study of their walls can provide new insights into their history. The study of the walls reveals a detailed stratigraphy of tool



Figure 5: Testing an experimental limestone tool by direct percussion against a rock surface during the experimental protocol implemented for the study of the S'Elighe Entosu necropolis (Sardinia, Italy).

Photograph. M.E. Porqueddu.

marks and thus the different phases and stages in the excavation of these structures (Lamesa 2020). Similarly, the study of the subsequent incisions, graffiti and engraved signs that can be found on the walls enables us to establish chronologies for their use in the most recent periods and to understand the changes that have been made to the hypogea (Defrasne 2014). We need to consider the walls as an object entity and to apply technological analysis to it. Walls are therefore not only a technical support but also a narrative medium.

The aim is to reconstruct as many steps as possible in the process of carving out and building these underground structures. The concept of *chaîne opératoire* is applied here to architecture (Porqueddu *et al.* 2023). In addition to the methodological components of our technological analysis, it is essential to provide geological and geomorphological studies. These data will enable a better understanding of the characteristics and behaviour of the different rocks, to determine the choices and technical possibilities of the human communities that created the hypogea. The carving of hypogea in the Mediterranean is clearly associated with the presence of loose rocky facies that are easy to carve negative spaces in. However, there are counterexamples, such as the hypogea carved out of granite in Sardinia, demonstrating the technical skill and perhaps also the adaptation shown by prehistoric human populations (Soula 2014). Geomorphological data also offers the possibility of understanding certain stages of excavation and certain morphological and architectural choices. Conversely, the

lack of geological and geomorphological data and knowledge leads to fundamental errors of interpretation.

The technological approach applied to the architecture of rock-cut tombs in the Mediterranean allows us to consider hypogea and sites on a local scale, while offering new possibilities for comparison on a much larger, regional or even international scale. It provides the opportunity to study the behaviour and technical choices of human groups on the same technical bases of the *chaîne opératoire*, enabling a more global approach to these underground structures, while addressing the chronological and cultural characteristics, which can sometimes be restrictive, at a later stage.

Ditches, mines, hypogea, pits: a world of digging and carving

There can be no technological analysis of these underground architectures without considering the know-how and skills involved in this practice. These skills are closely linked to these human groups' knowledge of rocks. Indeed, these pre- and protohistoric communities were familiar with digging in soil and rock. Most of these communities created holes of various shapes and sizes for a variety of reasons: for their homes and domestic spaces; to provide a resting place for the dead; or to extract various materials (Bailey 2018). The management of soil and subsoil was an integral part of their daily lives. It called for the development of specific know-how in relation to the materials involved and the actions carried out. In carving out the rock, hypogea can be closely associated with other underground structures. The most obvious are mines, where rock would be extracted in significant quantities. The techniques and processes involved in opening mine shafts and galleries are well known in Europe, not only because of the number of documented examples, but also for the presence at the sites of mining tools and marks left on the walls. Although these are different structures with distinct purposes, it is essential to consider the data from prehistoric and protohistoric mining sites to understand the skills involved in carving out rock-cut tombs. Data from mining sites can also provide information on the *chaîne opératoire* used to carve out hypogea, as long as the same geological and geomorphological bases are considered (Porqueddu 2023).

As Nuria Castañeda points out in her contribution to this volume, flint mines were worked in Spain and Italy from the 6th millennium BC. To obtain the flint, human communities developed their own technical systems for extracting the material, adapted to the geomorphology of the terrain concerned. By the time the first rock-cut tombs emerged in the western Mediterranean, the skills involved in rock carving had been fully mastered. The appearance of hypogea could be part of these technical systems, as mining techniques were transferred to the funerary sphere to meet new sociological and cultural needs. Human communities were largely able to exploit the forms and techniques they knew to create these new underground architectures (Porqueddu 2023). Hypogea are considered here as part of specific 'technical environments', in the terms developed by André Leroi-Gourhan (1945).

By placing architecture and its technical study at the very core of rock-cut tomb studies, it is possible to consider new data on prehistoric human societies. This also opens the way to the establishment of new typologies, no longer based solely on formal aspects but on technical data. Each space must be considered first and foremost as a technical and functional space with specific roles at each stage in the process of excavation, use and abandonment of the tombs. As

we have shown, it involves incorporating techniques relating to the creation of the structure itself, as well as those associated with the treatment of the dead (Tchérémissinoff 2022). Like a mining site, considering hypogea as primarily technical spaces also provides a glimpse into the gestures made by the populations of the past, the organisation of excavation sites and the sociability associated with them. Hypogea are significant locations for human societies, not only because they are linked to the funerary sphere and therefore to deeply-rooted social and cultural practices, but also because they represent community spaces of creation. The imposing dimensions of the Arles-Fontvieille and Hal Saflieni examples also demonstrate the technical, time and human investment involved in creating these structures. Investments that we could take into greater consideration in our ways of viewing and studying hypogea. These are approaches that have already been followed by researchers analysing materials or megalithic architectures, and which should be followed for hypogea (Tchérémissinoff 2022).

Conclusion

At first sight, this chapter may appear to be merely a critique of the classification systems we use daily in archaeology. The different typologies adopted to describe and classify prehistoric and protohistoric hypogea in the western Mediterranean are essential to our work as archaeologists, and their existence has enabled us to advance our knowledge of past societies that used these architectures, as well as to put forward new ideas. Nevertheless, certain classifications, the fruit of research traditions that are deeply rooted in the local area, do not allow us to look at rock-cut tombs in a new way, or even from a broader perspective, as has sometimes been achieved with megalithic structures.

The point here is not to discard all ideas of classification or differentiation between the hypogea in this vast area that is the western Mediterranean and to ignore the differences and cultural characteristics. Rather, we wish to go beyond the usual representations of the subject and propose that these architectures be observed on more neutral grounds. Technology, which is also essential to our work in Prehistory, provides the means to accomplish this and develop new knowledge of these architectures and, by extension, of the human groups behind them. Technology is giving us the opportunity to rethink our traditional typologies and to implement more inclusive criteria that can be used on a wider chronological and spatial scale. The combination of technical and functional parameters could allow us to develop typologies that are no longer based solely on formal characteristics.

It is also an invitation to move away from the traditional practices of disseminating our research, and to propose new ways of sharing our knowledge. Events on prehistoric hypogea are most often organised by Italian organisations, where international cases are presented, but Italian sites are still in the majority. Recent examples include the *‘Ipogei La vita, la morte, i culti nei mondi sotterranei Ricerche e scavi’* conference in 2020 and the *‘Ipogeismo e megalitismo in Europa e nel Mediterraneo tra il V ed il III millennio a. C. La Sardegna, crocevia di popoli e di culture’*, held in Sardinia in October 2024. These events usually consist of collections of specific cases or regional reviews, leaving little time for more general reflections on hypogea. The presentation of sites and case studies is, of course, essential, but limits methodological and, above all, theoretical exchanges. The project *Construyendo la muerte: encuentros ibero-franceses sobre los hipogeos prehistóricos / Façonner la mort: rencontres franco-ibériques autour des hypogées préhistoriques*, organised in 2023 and from which this book originates, was no exception.

Nonetheless, it provided an opportunity to exchange ideas outside the Italian discussions on the subject and to reflect on the know-how associated with hypogea. If we want to include prehistoric hypogea in a discussion on the technology involved in their creation, we also need to look at the research carried out on quarries and rock-cut sites from other chronological periods. That is the aim of the international conferences organised by the informal research network IRAAR - *International ReseArch group on Quarries and Rock-cut sites* (Porqueddu *et al.* 2022).

This chapter is intended to be an incentive to leave the familiar ground of studies on hypogea and to propose new opportunities for investigating these subterranean architectures. Rock-cut tombs do not form a homogeneous entity, but thanks to their technical approach it is possible to go beyond the fragmentation of studies on the subject and propose common lines of work.

Funding: This article is the result of research carried out during two postdoctoral stays in Spain funded by the Fyssen Foundation (2020-2022) and as a member of the École des hautes études hispaniques et ibériques, Casa de Velázquez (2022-2024). This article was written during the period at Casa de Velázquez.

Bibliography

- Bailey, D. 2018. *Breaking the Surface: An Art/Archaeology of Prehistoric Architecture*. Oxford: Oxford University Press.
- Bixio, R., A. De Pascale and M. Mainetti 2012. Census of rocky sites in the Mediterranean Area, in C. Crescenzi and R. Caprara (eds) *Crhima Cultural Rupestrian Heritage in the Circum-Mediterranean Area Common Identity - New Perspective, The Rupestrian Settlements in the Circum-Mediterranean Area*: 89-93. Firenze: Università degli di studi di Firenze.
- Bonanno, A. 1996. *Malte. Un paradis archéologique*. La Valette: M.J. Publications.
- Bueno Ramírez, P., R. Barroso Bermejo and R. Balbin Behrmann 2005. Ritual campaniforme, ritual colectivo: la necrópolis de cuevas artificiales del Valle de las Higueras, Huecas, Toledo. *Trabajos de Prehistoria* 62(2): 67-90.
- Bueno Ramírez, P., R. Barroso Bermejo and R. Balbin Behrmann 2017. Redefining Ciempozuelos. Bell-beaker culture in Toledo?, in V.S. Goncalves (ed) *Sinos e Taças. Junto ao Oceano e mais longe. Aspectos da presença campaniforme na Península Ibérica*: 324-341. Lisboa: UNIARQ - Centro de Arqueologia da Universidade de Lisboa.
- Cappai, R. and M.G. Melis 2008. Signe et fonction des objets lithiques préhistoriques en Sardaigne. *Préhistoires Méditerranéennes* 14, <pm.revues.org/360>
- Cazzella, A. 2000. Due tradizioni alle origini dell'ipogeismo in Italia e a Malta ?, in G. Lilliu and M.G. Melis (eds) *L'ipogeismo nel Mediterraneo: origini, sviluppo, quadri culturali : atti del Congresso internazionale, Sassari-Oristano, Italia, 23-28 maggio 1994*: 511-518. Sassari: Università degli studi di Sassari.
- Cicilloni, R. 2015. Capitolo VIII. Le domus de janas con corridoio d'ingresso di tipo "megalitico" o "dolmenico", in G. Tanda (ed.) *Le domus de janas decorate con motivi scolpiti, Nuove tecniche di documentazione e di analisi per una ricostruzione delle società dalla fine del V al III millennio a.C.*: 193-218. Cagliari: Condaghes.
- Cicilloni, R. 2019. Megalithic monuments in Sardinia (Italy), in J. Müller, M. Hinz and M. Wunderlich (eds) *Megaliths - Societies - Landscapes. Early monumentality and social differentiation*

- in Neolithic Europe, Proceedings of the international conference «Megaliths - Societies - Landscapes. Early Monumentality and Social Differentiation in Neolithic Europe» (16th-20th June 2015) in Kiel, Bonn: 345-358. Habelt, R: Frühe Monumentalität und soziale Differenzierung.*
- Clop, X. and T. Majó 2017. Prácticas funerarias y cronometría entre 3.500-1.500 Cal ANE en el noreste de la Península Ibérica, in J.A. Barceló Álvarez, I. Bogdanovich and B. Morell Rovira (eds) *Iber-Crono: Actas del Congreso de Cronometrías para la Historia de la Península Ibérica, Barcelona, 17-19 octubre 2016: 99-115. Barcelona: CEUR-WS.*
- Defrasne, C., 2014. Les relevés de gravures de l'hypogée du Castelet, in X. Margarit (ed.) *Les monuments mégalithiques d'Arles-Fontvieille, état des connaissances, contextes et nouvelles données, Rapport de Projet Collectif de Recherche 2014: 131-142. Aix-en-Provence: DRAC PACA - Service régional de l'archéologie / Laboratoire Méditerranéen de Préhistoire Europe Afrique.*
- Del Prete, S. and M. Parise 2012. The influence of geological and geomorphological factors in the realization of artificial caves, in C. Crescenzi and R. Caprara (eds) *The rupestrian settlements in the circum-Mediterranean area, CRHIMA-CINP, October 2010 - September 2012: 19-30. Firenze: Università degli di studi di Firenze.*
- Demartis, G.M. 1986. *La necropoli di Anghelu Ruju*. Sassari: Carlo Delfino Editore, Sardegna Archeologica Guide e Itinerari.
- Demartis, G.M. 2001. *Le Domus de Janas della Nurra*. Sassari: Soprintendenza Archeologica per le Province di Sassari e Nuoro/Imago Media Editrice.
- Derudas, P.M. 2000. *Archeologia del territorio di Ossi*. Sassari: Soprintendenza Archeologica per le Province di Sassari e Nuoro/Imago Media Editrice.
- Di Stefano, G. and P. Militello 2015. Calaforno (Giarratana, Prov. Di Ragusa). *Notiziario di Preistoria e Protistoria* vol. II (2): 63-65.
- Geniola, A. and R. Sanseverino 2014. Strutture, materiali e stilemi nel Neolitico medio avanzato nella Puglia centro-settentrionale, in A. Gravina (ed.) *Atti del 34° Convegno Nazionale sulla Preistoria-Protostoria-Storia della Daunia, San Severo 16-17 novembre 2013: 87-98. San Severo: Archeoclub San Severo.*
- Gornés Hachero, S. 1996. Arqueología de la muerte y cambio social. Análisis e interpretación de la necrópolis de Cales Coves, Menorca. *Complutum* 7: 91-103.
- Guilaine, J. 1994. *La Mer Partagée. La Méditerranée avant l'écriture 7000- 2000 avant Jésus-Christ*. Paris: Hachette.
- Guilaine, J., J.C. Golvin, G. Sauzade and X. Margarit 2015. *Les hypogées protohistoriques de la Méditerranée. Arles et Fontvieille*. Arles: Éditions Errance.
- Henry, E.R., B. Angelbeck and U.Z. Rizvi 2017. Against Typology a Critical Approach to Archaeological Order. *The SAArchaeological record, The Magazine of the Society for American Archaeology, special section: anarchy and archaeology* 17(1): 28-30.
- Jordão, P. and P. Mendes 2006. As grutas artificiais da Estremadura portuguesa: uma leitura critica das arquitecturas. *Arqueologia & Historia* 58/59: 43-78.
- Lamesa, A. 2020. Methods for Rock-hewn worksite analysis: case study of Göreme's n°4b (Cappadocia) "Thwarted" worksite. *Anatolia Antiqua* 28: 23-45. doi: 10.4000/anatoliaantiqua.1308
- Leroi-Gourhan, A. 1945. *Milieu et technique : évolution et techniques*. Paris: Albin Michel.
- Lilley, K. 2023. *Carving out communities: funerary monuments as expressions of identity in Pre-Nuragic Sardinia*. Unpublished PhD dissertation, University of Edinburgh.

- Lilliu, G. 2000. Aspetti e problemi dell'ipogeismo mediterraneo, in G. Lilliu and M.G. Melis (eds) *L'ipogeismo nel Mediterraneo: origini, sviluppo, quadri culturali : atti del Congresso internazionale, Sassari-Oristano, Italia, 23-28 maggio 1994*: 3-28. Sassari: Università degli studi di Sassari.
- Lilliu, G. and M.G. Melis (eds) 2000. *L'ipogeismo nel Mediterraneo: origini, sviluppo, quadri culturali: atti del Congresso internazionale, Sassari-Oristano, Italia, 23-28 maggio 1994*. Sassari: Università degli studi di Sassari, 2 vol.
- Loria, R. and D.H. Trump 1978. Le scoperte a “Sa Ucca de su Tintirriolu” e il Neolitico sardo, in *Monumenti Antichi - Serie monografica e miscellanea II XLIX(2)*: 115-253. Roma: Accademia Nazionale dei Lincei.
- Margarit, X., M. Bailly, C. Bashore Acero, S. Bonnardin, J.E. Brochier, A. Caraglio, J. Cauliez, A. D'Anna, C. Defrasne, G. Goude, X. Gutherz, C. Gutiérrez Sáez, L. Jallot, T. Lachenal, O. Lemerrier, J. Mayca, S. Negroni, V. Ollivier, M. Orgeval, J.-L. Paillet, M.E. Porqueddu, N. Provenzano, S. Renault, L. Rousseau, M. Saletta, A. Schmitt, S. Van Willigen and L. Viel 2016. Les hypogées d'Arles-Fontvieille et leur environnement : nouvelles perceptions, nouvelles perspectives, in J. Cauliez, I. Senepart, L. Jallot, P.A. (de) Labriffe, C. Gilabert and X. Gutherz (eds) *Actes des 11e Rencontres Méridionales de Préhistoire Récente, 'De la tombe au territoire' & Actualité de la recherche, Montpellier, 25-27 septembre 2014* : 87-98. Toulouse: Archives d'Ecologie Préhistorique.
- Melis, M.G. and M.E. Porqueddu 2015. New documentation on digging techniques of the prehistoric funerary hypogea of the western Mediterranean. *Origini XXXVII*: 127-148.
- Micó R. 2006. Radiocarbon Dating and Balearic Prehistory: Reviewing the Periodization of the Prehistoric Sequence. *Radiocarbon* 48(3): 421-434.
- Negroni Catacchio, N. and M. Aspesi, 2016. Rinaldone e Gaudio: rituali a confronto, in N. Negroni Catacchio (ed.) *Ornarsi per comunicare con gli uomini e con gli Dei. Gli oggetti di ornamento come status symbol, amuleti, richiesta di protezione. Ricerche e scavi. Atti del Dodicesimo Incontro di Studi Valentano (VT) - Pitigliano (GR) - Manciano (GR), 12-14 Settembre 2014*: 611-636. Milano: Centro di studi di Preistoria e Archeologia.
- Pace, A. 2006. The Emergence of Maltese Ritual Funerary Monuments between 4000 and 2500 BC, in G. Mifsud-Chircop (ed.) *The Ritual Year 1, 20-24 March 2005*: 135-165. Malta: Publishers Entreprises Group.
- Parkinson, E.W., T.R. McLaughlin, C. Esposito, S. Stoddart and C. Malone 2021. Radiocarbon Dated Trends and Central Mediterranean Prehistory. *Journal of World Prehistory* 34(3): 317-379. doi: 10.1007/s10963-021-09158-4
- Petit Mendizàbal, M.A. and M. Pedro Pascual 2005. Hipogeos durante el III milenio AC en el nordeste de la Península Ibérica. *Mayurqa: revista del Departament de Ciències Històriques i Teoria de les Arts* 30(1): 203-223.
- Plantalamor, L. 1991. *L'arquitectura Prehistòrica i Pro-tohistòrica de Menorca i el Seu Marc Cultural*. Maó: Treballs del Museu de Menorca 12.
- Polimeni, B., R. Bixio, C. Galeazzi, C. Germani, M. Parise, S. Saj and M. Sammarco 2019. Creating a Map of the Underground Heritage in the Mediterranean Area: A Visual Representation for a Comprehensive Research, in G. Amoruso and R. Salerno (eds) *Cultural Landscape in Practice: Conservation vs. Emergencies* (Lecture Notes in Civil Engineering; Vol. 26). Springer Nature.
- Porqueddu, M.E. 2018. *Bâtir sous terre : Architectures et techniques des sépultures collectives hypogées de Méditerranée occidentale à la fin de la Préhistoire*. Unpublished PhD dissertation, Aix-Marseille Université/Università degli Studi di Sassari.

- Porqueddu, M.E. 2019. De l'outil à la représentation du collectif ? Le dépôt du macro-outillage de creusement dans les cavités artificielles funéraires au Néolithique. *Techniques & Culture*, Varia, <https://doi.org/10.4000/tc.10786>
- Porqueddu, M.E. 2023. Savoir-faire and Technical Environment: Rethinking the Emergence of Rock-cut Tombs in the Neolithic Mediterranean, in A. Lamesa, K. Whitaker, C. Sciuto and M.E. Porqueddu (eds) *From Quarries to Rock-cut Sites. Echoes of Stone Crafting*: 21-44. Leiden: Sidestone Press.
- Porqueddu, M.E., M. Bailly, X. Margarit, P. Fallavollita and M.G. Melis 2021. From Surfaces to Tools: Traceology and Experimental Analysis of Digging Techniques of Mediterranean Rock-Cut Tombs, in C. Sciuto, A. Lamesa, K. Whitaker and A. Yamac (eds) *Carved in Stone, The archaeology of rock-cut sites and stone quarries* (Bar International Series 3054): 9-21. Oxford: Archaeopress.
- Porqueddu, M.E., L. Viel and X. Margarit 2022. Quale status per i monumenti megalitici e i defunti che li occupano? La necropoli di Arles-Fontvieille (Francia), in N. Negroni Catacchio, C. Metta, V. Gallo, and M. Aspesi (eds) *Ipogei. la vita, la morte, i culti nei mondi sotterranei, Atti del quindicesimo incontro di studi valentano (VT), 11-13 settembre 2020*: 679-692. Milano: Centro Studi di Preistoria e Archeologia.
- Porqueddu, M.E., A. Lamesa and C. Sciuto 2022. IRAAR: A project for promoting the study of rock-cut sites and quarries, in *18th International Congress of Speleology - Savoie Mont Blanc 2022, Vol. II -Karstologia Mémoires n°22 - SYMPOSIUM 13 - Artificial cavities*: 389-392.
- Porqueddu, M.E., C. Sciuto and A. Lamesa 2023. Reconsidering the Chaîne Opératoire: At the Crossroad Between People and Materials. *Open Archaeology*, <https://doi.org/10.1515/opar-2022-0296>
- Ramos Muñoz J., M. Del Mar Espejo Herrerías, A. Recio Ruiz, P. Cantalejo Duarte, E. Martín Córdoba, M. Pérez Rodríguez, V. Castañeda Fernández, J.J. Durán Valsero and I. Cáceres Sánchez 1999. Excavación arqueológica de urgencia en la necrópolis colectiva de cuevas artificiales del Cerro de las Aguillillas (Ardales/Campillos, Málaga), in *Informe preliminar, Anuario Arqueológico de Andalucía 1994, III. Actividades de urgencia, Dirección General de Bienes Culturales, Servicio de Investigación y Difusión del Patrimonio Histórico*. Sevilla: Junta de Andalucía, Consejería de Cultura, Dirección General de Bienes Culturales, 355-361.
- Ríos Mendoza, P. 2011. *Territorio y sociedad en la región de Madrid durante el III milenio a. C.: el referente del yacimiento del Camino de las Yeseras*. Madrid: Universidad Autónoma de Madrid.
- Rivero Galán, E. 1986. Ensayo tipológico en los enterramientos colectivos denominadas Cuevas artificiales de la mitad meridional de la Península Ibérica. *Habis* 17: 371-402.
- Robin, G. 2015. Iconographie funéraire et espace architectural dans les hypogées néolithiques de Sardaigne, in G. Robin, A. D'Anna, A. Schmitt and M. Bailly (eds) *Fonctions, utilisations et représentations de l'espace dans les sépultures monumentales du Néolithique européen*. Aix-en-Provence: Presses universitaires de Provence.
- Roig Buxo, J., J. Manell Roig Coll, J.F. Gibaja, P. Chambon, V. Villar, J. Ruiz, X. Terradas and M. Eulalia Subira 2010. La necropolis de Can Gambús-1 (Sabadell, Barcelona). Nuevos conocimientos sobre las prácticas funerarias durante el Neolítico medio en el Noreste de la Península Ibérica. *Trabajos de Prehistoria* 67(1): 59-84. doi: 10.3989/tp.2010.10031
- Santoni, V. 1994. Le Néolithique moyen-supérieur de Cuccuru S'Arriu (Cabras-Oristano, Sardaigne), in J. Vaquer and J. Guilaine (eds) *Le Néolithique du Nord- Ouest méditerranéen, XXIVe Congrès Préhistorique de France, Carcassonne, 26-30 septembre 1994* : 77-87. Paris: Société préhistorique française.

- Santoni, V. 2000. Alle origini dell'ipogeismo in Sardegna: Cabras Cuccuru S'Arriu, la necropoli del neolitico medio, in G. Lilliu and M.G. Melis (eds) *L'ipogeismo nel Mediterraneo: origini, sviluppo, quadri culturali: atti del Congresso internazionale, Sassari-Oristano, Italia, 23-28 maggio 1994*: 369-397. Sassari: Università degli studi di Sassari.
- Silvestrini, M., A. Cazzella, I. Baroni and G. Recchia 2006. Le necropoli eneolitiche delle Marche e la facies di Rinaldone, in C. Negroni Catacchio (ed.) *Pastori e guerrieri nell'Etruria del IV e III millennio a.C. La civiltà di Rinaldone a 100 anni dalle prime scoperte. Atti del settimo incontro di Studi Viterbo - 21 Novembre 2003 Valentano (Vt) - Pitigliano (Gr), 17-18 Settembre 2004*: 196-202. Milano: Centro di studi di Preistoria e Archeologia.
- Spanedda, L. and J.A. Cámara Serrano 2011. Tipologia, disegno ed importanza sociale delle domus de janus della Sardegna nord-occidentale durante la preistoria recente, in *XLIII Riunione Scientifica - L'età del rame in Italia, Bologna, 26-29 novembre 2008*: 775-780. Firenze: Istituto Italiano di Preistoria e Protostoria.
- Soula, F. 2014. Le phénomène hypogéique et mégalithique du territoire de Mamoiada (Province de Nuoro, Sardaigne). Analyse spatiale, environnementale et contextuelle du monde funéraire, in G. Robin, A. D'Anna, A. Schmitt and M. Bailly (eds) *Fonctions, utilisations et représentations de l'espace dans les sépultures monumentales du Néolithique européen*. Aix-en-Provence: Presses universitaires de Provence.
- Tchéremissinoff, Y. 2022. *Évolution des pratiques funéraires néolithiques de la plaine languedocienne*. Unpublished PhD dissertation, Aix-Marseille Université.
- Turchi, D. 2011. *Leggende e racconti popolari della Sardegna*. Roma: Newton Compton Editori.
- Veny, C. 1982. *La necrópolis protohistórica de Cales Coves, Menorca* (Bibliotheca Præhistorica Hispana 20). Madrid: Consejo Superior de Investigaciones Científicas Press.
- Walter, P. 2000. La genèse des hypogées en Méditerranée centrale et le commerce de l'obsidienne, in G. Lilliu and M.G. Melis (eds) *L'ipogeismo nel Mediterraneo: origini, sviluppo, quadri culturali: atti del Congresso internazionale, Sassari-Oristano, Italia, 23-28 maggio 1994*: 607-620. Sassari: Università degli studi di Sassari.
- Whitehouse, R., 1972. The rock-cut tombs of the central Mediterranean. *Antiquity* XLVI: 275-281. doi: 10.1017/S0003598X00053874

Websites:

- Centre National de Ressources Textuelles et Lexicales, viewed 15 July 2024, <<https://www.cnrtl.fr/etymologie/hypog%C3%A9e>>.
- Diccionario de la lengua Española, from Real Academia Española, viewed 15 July 2024, <<https://dle.rae.es/hipogeo?m=form>>.
- Dicionário da Língua Portuguesa Academia das Ciências de Lisboa, viewed 15 July 2024, <<https://dicionario.acad-ciencias.pt/pesquisa/?word=hipogeu>>.

Flint Mining Know-How in the South European Neolithic

Nuria Castañeda

Dpt. Prehistoria y Arqueología. Ftad. Filosofía y Letras. Universidad Autónoma de Madrid. Avda. Tomás y Valiente 1, 28049 Madrid (Spain)

Abstract

Despite some scarce earlier quarrying activities, there is a critical moment in the 6th millennium Mediterranean Early Neolithic when mineral resources began to be exploited by means of deep shafts, galleries and trenches which produced significant transformations in local landscapes. Those exploitations used to include some elements of symbolic nature that conferred mining activities with a special character beyond economic functional terms.

The Neolithic flint mine phenomenon is heterogeneous, depending on the type of the rocks that have been affected by silicification. Nevertheless, it can be divided into two chronological moments: the earlier one, 6th millennium mining, located in southwestern Europe, at Defensola A (Italy) and Casa Montero, and the subsequent 5th millennium mining, in the Early Neolithic at Pozarrate (Spain); and Middle Neolithic mining in central Europe and the British Islands.

The aim of this work is to compare the best known early flint mines in Europe in order to analyse the technical know-how developed and put into practice to dig the complex deep mining structures and consider the importance of knowledge transfer in extractive activities. The acquisition of technical knowledge in mining and its transmission would include the technique for digging the structures, and the implementation of safety, waste management and productivity measures.

Key words: Technology, Mining, Quarrying, Knowledge Transmission, Mediterranean, Early Neolithic

Introduction

Before the communal landscape transformation that resulted from ditched enclosures, megaliths and hypogea, mining was one of the first collective activities in human history considered part of the new ideas and cultural manifestations of the Neolithic in Western Europe (Consuegra and Díaz-del-Río 2018). The first farming way of life that spread from the East led to an increase in the extraction of stone, particularly the more ubiquitous silica rocks, by means of deep galleries, shafts and trenches.

Mines are special places where people that dig them go into the earth to extract the mineral by means of considerable physical effort. These aspects conferred a symbolic meaning to mining, beyond the economic functional purpose of obtaining the resources. Examples of symbolic manifestations were found in Grimes Graves (UK) (Topping 2021); Casa Montero and Gavà-Can Tintorer (Spain) (e.g., Consuegra *et al.* 2018), among others. In addition, the wide circulation of objects made from raw materials with aesthetic qualities obtained by quarrying or mining, such as marble from Andalusia (Spain) (Martínez-Sevilla *et al.* 2020), or obsidian from Sardinia

(e.g., Costa 2006) underscores the importance that this new material culture possessed in the earlier Neolithic Europe.

The exploitation of mines involved a considerable amount of technical knowledge acquired by experience and transmitted from generation to generation. Mining and quarrying are necessarily linked to the place where the outcrop is located. This means that there would be a previous survey, knowledge of the exact location, and a journey (Milne 2012), so it implies planning.

Whether there was free or limited access to the resource, the need of a workforce for mining entails collective participation, in the framework of local groups, which implies that social organisation of the extractive activities is necessary. Both traditional and prehistoric mining and quarrying usually display clear organization and a hierarchized system of tasks that offer several advantages (Whittaker *et al.* 2009; Castañeda 2018; Pétrequin and Pétrequin 2020). Firstly, it prevents conflicts among people if everyone knows what to do. Secondly, we must consider the danger involved in digging in depth; organization improves safety as people who carry out a specific task know how to continue the work and which labour has already been done. Finally, the hierarchy of tasks allow younger and less experienced individuals to progressively become involved in the collective craftwork of mining, from peripheral tasks with a lower level of responsibility to more complex missions, by learning processes (Castañeda 2021).

The assemblage of mining knowledge involves several aspects: from the identification of the outcrop to the best excavation method to obtain optimal results, how to extract the rock without damaging it, waste management and safety.

The objective of this paper is to analyse the know-how developed in Neolithic mining and quarrying by means of comparing some case studies, to consider the importance of transmission of knowledge and to assess the hypothesis that all this knowledge about digging the earth could have been the seed of the subsequent collective landscape modifications by the excavation of ditches or hypogea.

Neolithic mining in Europe

Mining started in Western Europe during the 6th millennium BCE. Although there is scarce evidence of flint proto-quarrying in the Palaeolithic and Mesolithic, what we can strictly refer to as ‘mining’ is a Neolithic phenomenon (Consuegra and Díaz-del-Río 2018). Among all the mineral resources that a Neolithic community could exploit, flint was the most ubiquitous and abundant. Procuring flint is as ancient as human lithic technology. One might expect that people would search for underground flint if raw material on the surface is scarce. Nevertheless, abundant flint outcrops usually indicate that it is worth the effort to excavate and extract it. Expertise in collecting and knapping flint indicates that silica nodules usually suffer alterations as they are exposed to natural agents such as temperature oscillations, lichen, desilicification and erosion. Underground flint nodules are better preserved and allow appropriate blanks to be chosen for their size and shape.

If an outcrop was exhausted, hunter-gatherer groups would have started to remove a small amount of soil with wooden sticks to continue exploiting the vein. The Palaeolithic places

where we currently know that flint was extracted were the result of reiterative small visits to the outcrop. The transformation of the extractive labour that took place in the Early Neolithic exceeds the scale of sporadic visits of small groups and becomes a collective social event.

The assemblage of radiocarbon dates currently available confirms that the spread of the Neolithic is contemporaneous with mining in southwestern Europe (Consuegra and Díaz-del-Río 2018) (Figure 1). Defensola A in the Gargano mining complex (Italy) is the oldest flint mine in Europe known to date (Galiberti and Tarantini 2023). The second oldest is Casa Montero (Consuegra *et al.* 2018), followed by Pozarrate (Tarrío *et al.* 2022), both in Spain. Further research will probably confirm that Montvell quarry (Spain) will also be one of the earliest (Terradas and Ortega 2017). These four mines are the testimony of the relationship of the first farming groups in Iberia with Mediterranean Neolithic communities and the rapid spread of the new way of life in the Iberian Peninsula. The experience of stone quarrying at Levant sites probably indicates that early flint mining-quarrying examples in eastern Mediterranean Europe are simply not known yet. Nevertheless, the Gargano flint blades circulated from West to East as they are found in Croatia (e. g., Mazzucco *et al.* 2018). Were the first Neolithic groups in Iberia searching for flint?

As we have seen, despite some scarce radiocarbon dates that confirm the exploitation of outcrops by hunter-gatherers in Mesolithic times, the earliest mining activity began in Southern Europe in the 6th millennium cal BCE and spread to Central Europe in the 5th millennium, and to the British Islands and Atlantic Europe in the 4th millennium (Consuegra and Díaz-del-Río 2018) (Figure 1).

The first flint mines shared some features. One of them is the production of blades. Although the reduction process did not take place in Defensola A, Pozarrate or Montvell, unlike Casa Montero, both the flint products from these mines and some abandoned cores demonstrate that blades were the first main product from the flint mines. The other point in common is the intensity of the exploitation despite inaccessibility or difficulties and the variability in mining systems.

Neolithic flint mining in Central Europe is related to Middle Neolithic cultures and mainly devoted to the fabrication to knapped and polished axes, whereas there was no flint axe production in the early Neolithic southern mining. In France, early Neolithic polished axes were produced in jadeite from the Alps. The extraordinary aesthetic qualities of this stone caused the wide circulation of these objects and probably a relatively high demand (Pétrequin and Pétrequin 2025).

A profound analysis of flint mining has shown that it is a heterogeneous and complex phenomenon with different manifestations depending on the geological formation, the digging methods, the management of the extracted mineral and the organisation for the exploitation.

To illustrate this variability and the technical knowledge that we can infer from these sites, this study will compare the phenomenology of the Neolithic flint mines in southwestern Europe, the earliest ones currently known: Defensola A (Italy), Casa Montero and Pozarrate (Spain).

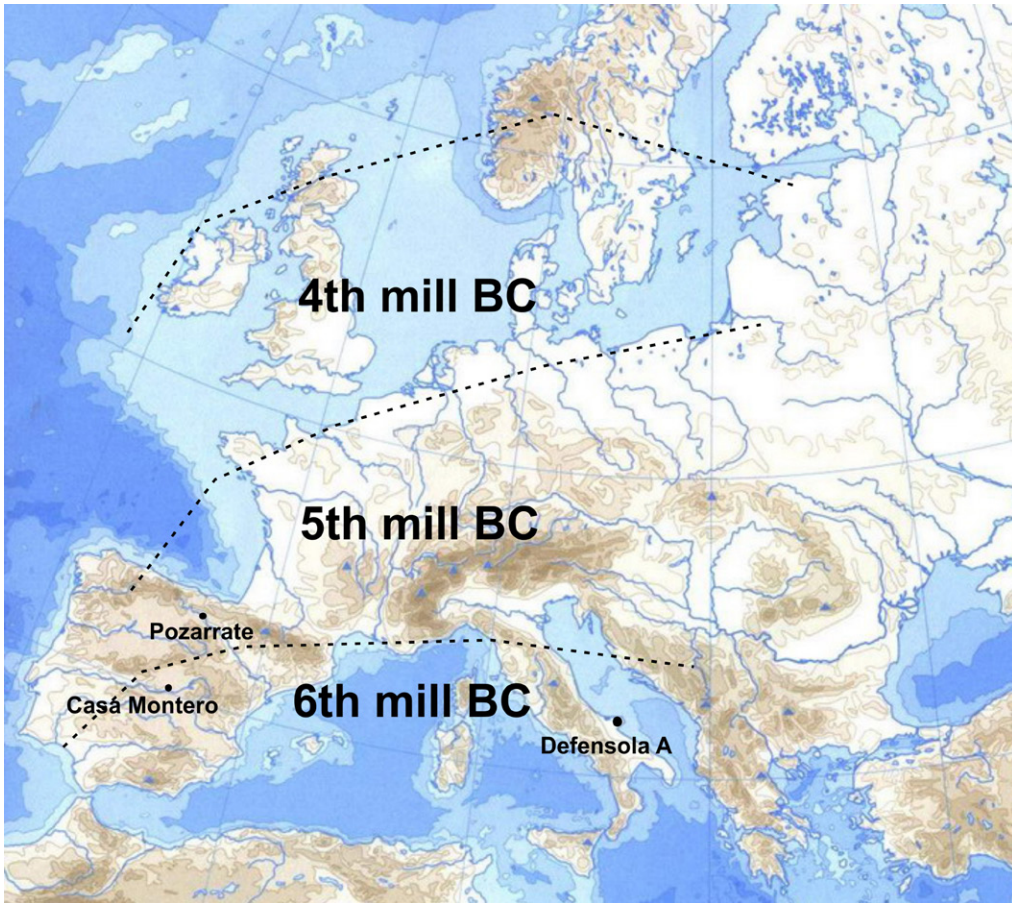


Figure 1: Spread of Neolithic flint mining and location of the sites mentioned in the text. *Drawing: N. Castañeda.*

Mining through horizontal galleries and chambers: Defensola A (Italy)

Most of the prehistoric flint mining activity in Italy is concentrated in the Gargano flint mining complex (Vieste, Apulia) (Basili *et al.* 1995). It is formed by at least 25 mines divided into two ‘districts’. It was exploited during a long period of time, from the 6th to 2nd millennia (Di Lernia *et al.* 1995; Tarantini and Galiberti 2012), but the Neolithic exploitation is concentrated in an estimated area of 4km², including the Defensola A, Defensola C, S. Marco and Arciprete mines (Tarantini and Galiberti 2012).

Defensola A is currently the oldest flint mine known in Europe, dated from 6010–5727 to 5385–5216 cal. BCE (Di Lernia *et al.* 1995; Tarantini and Galiberti 2012) coetaneous with the first neolithization in the region.



Figure 2: Defensola A: Plan of the mine (drawing after Galiberti and Tarantini 2023).

Being the first one, Defensola A shows the most complex technical conditions (Guilbeau 2011). The geological context in which the flint was formed is limestone affected by seismic activity, which would be a nightmare for any miner. Defensola A is an entangled labyrinth of approximately 2750m² explored and 9000m² estimated (Galiberti and Tarantini 2023; Tarantini *et al.* 2011; Tarantini and Galiberti 2012) of long and low galleries up to 110m in length, and only 60cm in height (Galiberti and Tarantini 2023; Tarantini *et al.* 2011; Tarantini and Galiberti 2011, 2012) (Figure 2). The time needed to traverse the longest gallery from the entrance to the flint outcrop is 30 minutes, which means that full knowledge of the mine and an orientation system were needed. In addition, there is a lower level of galleries that remains unexplored (Galiberti and Tarantini 2023).

As the exploitation of the flint levels advanced and the distance to the face from the entrance increased, lighting and safety measures were needed. Galleries were dug close to one another. As safety was not assured by the nature of the limestone formation, Defensola A miners left some pillars without being excavated to prevent collapses. This allowed them to dig big chambers up to 50m² in size (Tarantini *et al.* 2011; Tarantini and Galiberti 2012). In addition, they put into practice a complex management of the waste produced in the exploitation of the mine.

The galleries that were not in use were filled with the limestone waste (Galiberti and Tarantini 2023; Tarantini *et al.* 2011). Occasionally, this waste was held up by walls of limestone blocks that were sometimes covered with mortar. At a later time, tunnels were dug through the debris that was previously sorted to improve the transit between the working face to the exit (Tarantini 2005; Tarantini and Galiberti 2011).

The refill of the galleries and the re-excavation of new tunnels indicate the recurrence in the use of the mine to be frequent as it allowed the orientation of the people in transit, planning and initiation to know how to reach the working face (Galiberti and Tarantini 2023). The considerable effort in the reconditioning of waste reinforces the idea that hard work was not an obstacle. These measures reveal the awareness of danger implicit in the extraction of flint in this place, revealed by fractures in the roof and the compression of the debris (Galiberti and Tarantini 2023).

There were two ways to extract flint nodules at Defensola A. The first and most frequent one was digging the upper part to extract nodules with wooden wedges (extraction by step). The second was to dig below the seam allowing nodules to fall by gravity (extraction by collapse) (Tarantini *et al.* 2011).

The mining tools from Defensola A highlight the quality of the specialized knowledge of mining that was put into practice. A large panoply of tools was made from flint (Galiberti 2005). On the one hand, the incisive tools are picks (with one or two pointed ends) and wedges. Some of these would be used as intermediate elements. Sometimes they were modified for hafting and sometimes they were bush hammered to prevent breakage. The continuous use of incisive tools required repairs and maintenance, and some picks surely become small maces. Flint wedges were used to undermine nodules and extract them as an intermediate element. On the other hand, hammers were sorted in different sizes (large and small maces) to break the limestone blocks, to dig, and to make and to repair picks and other retouched tools on flakes.

A flint workshop was discovered inside the mine. The production waste reveals the first part of lithic reduction, simple reduction cores with parallel blade-like extractions and not very elaborate retouched tools (scrapers and denticulated tools) for mining tasks (Galiberti and Tarantini 2023). In consequence, what we currently know about the need that promoted mining at Defensola A comes from the information at sites where Gargano flint has been identified. From macroscopic description, Gargano flint is not ubiquitous in Italy far from the Promontory (Guilbeau 2011). In the earlier Neolithic of Italy, Gargano flint is certainly or probably present only within 100-150km from the mine (Guilbeau 2011) but its presence and circulation on the eastern Adriatic coast is well documented (e.g., Della Casa *et al.* 2019; Forenbaher and Perhoč 2017; Mazzucco *et al.* 2018). The most characteristic blanks made on this flint are pressure blades, sometimes by using a lever, which is remarkable (Guilbeau 2011: 93-6).

All these data allowed researchers to interpret mining at Defensola A as the work of specialists due to the acquired knowledge and know-how, and time spent (see Clark 1995). They carried out this activity in irregular and cyclic periods according to the same seasonal mechanisms

of collective cooperation that made possible some farming activities (Galiberti and Tarantini 2023).

The exceptional preservation of the pottery vessels at Defensola A and the lamps near the working face suggest sudden abandonment due to tectonic movements (Galiberti and Tarantini 2023; Tarantini *et al.* 2011), although the exploitation of flint went on in other mines in the proximity. The interpretation of the Gargano exploitation systems related to chronology and layers suggests that seismic movements would force miners to change the horizontal chamber and pillars system to the vertical shaft extraction method (Galiberti and Tarantini 2023).

Quarrying through huge trenches: Pozarrate (Spain)

The Pozarrate quarry (Treviño, Burgos), located in northern Spain, exhibits completely different conditions compared to Defensola, although both mines share limestone as host rock for silicification. The flint formation of the Araico-Cucho mountain range was exploited from Palaeolithic times and this raw material circulated all across the Cantabrian coast (Corchón *et al.* 2009; Tarriño *et al.* 2011). The Neolithic quarry is dated between 5050-4370 cal. BCE (1sigma) coincident with the Neolithization of this part of Iberian Peninsula (Tarriño *et al.* 2022).

Despite the extension of 2000ha of the flint formation, the Neolithic quarry is located on the top of the Pozarrate Hill (814m asl), where access is more difficult (Tarriño *et al.* 2014). Taking advantage of the anticlinal formation, Neolithic miners exploited the flint outcrop by means of deep trenches approximately 4km long on the southern slope of the hill, where the flint layer outcrops because of erosion, and on the northern slope following the 21° slope of the layer towards the North (Tarriño *et al.* 2014, 2022). The archaeological excavations have revealed a quarry face 3m high and at least 10m wide, with an estimated minimum length of 160m. The inclination of the flint levels implied the extraction of a huge amount of limestone rock to access the nodule bed, with a consequent considerable modification of the landscape. It is an open-air quarry where safety and waste management issues were radically different to those observed at Defensola A.

Neolithic quarry workers combined two methods to break the limestone: mechanical and chemical damage (Tarriño *et al.* 2022).

The mechanical work was executed by means of percussion tools. Several types of mining tools have been documented. Firstly, 15 complete dolerite maces and hammers with an average weight of 9kg, among 550 fragments, have been found until now (López-Tascón *et al.* 2024). These tools usually show simple modifications for hafting. Although the source of the raw material is not currently defined, the closest primary outcrop is 7km distant. These maces were used to break the limestone, the smallest ones could be used as hammers with an intermediate element. Secondly, there are 15 antler tools, but only a few can be considered mining tools that would be used as a lever to extract the flint nodules or break the stone in weak parts. Finally, some pieces from the flint waste were reused occasionally as wedges or hammers.

Some features in the stratigraphy testify the use of chemical damage by fire that changed the calcareous rock into lime. As a result, the rock became softer, and the rest of the fire attack remains visible (*pyrobreccia*) (Tarriño *et al.* 2022). This method was used also in Defensola A (Tarantini 2005) and other mines.

As the work advanced from the upper part where the flint layer was visible on the surface to the deeper part, the trench was apparently backfilled with block levels at 45° inclination.

All these features highlight the specialised technical knowledge involved in mining adapted to the specific conditions of the outcrop.

Digging through thousands of vertical shafts: Casa Montero (Spain)

Casa Montero (Madrid, Spain) (Consuegra *et al.* 2018; Díaz-del-Río *et al.* 2023) is the second most ancient mine in Europe, and one of the oldest Neolithic sites in inner Iberia. Twelve radiocarbon dates indicate only a time range of a century in the use of the mine: 5337–5218 cal. BCE (calibrated with CALIB 6.0.1 to 1 sigma).

Neither the geological conditions nor extraction methods are like the previous examples. Casa Montero silica formation (Bustillo *et al.* 2009) is in a Cenozoic sedimentary basin. The silicification process was produced in clay, transforming it into opals, opaline flint and recrystallized flint. There are at least four silicification episodes affected by deformation and collapses of the underlying gypsum strata. This means that on occasions flint can be seen on the surface and, in other cases, it is several metres deep.

Casa Montero miners used the quarrying method to extract the flint levels that were on the surface. There are six small quarry areas between 3.5m² and 56m² in size in the part of the mine that was excavated. Nevertheless, the most frequent system that characterised the mine was the excavation of vertical shafts, up to 10m deep (mean 4.74m) and an average diameter of 1.10m. Unlike what may be thought, it was the safest and most productive system to dig in clay. This method was put into practice in an intensive way during the 120 years of use of this part of the mine. As a result, 3,794 mining shafts have been documented in 4.2ha (0.09 shafts/m²) (Figure 3).

The structures are very close to each other, so any variation in depth of the flint episodes can be detected. The existence of test pits in the limits of the mine, the proximity and the alienation of the mining structures allowed the different veins of mineral to be followed in a complex geological formation that is deformed from its original shape.

The narrowness of the shafts allowed up and down transit by resting on the walls with hands, feet, and the back. It was also a safety measure that impeded the collapse of the walls of the structure, revealing the acquired experience and knowledge and the consciousness of the danger in this mine. Frequently, there are parts wider or narrower as adaptations to ease transit and the occasional over exploitation of a flint vein. After the flint was extracted, it was reduced in the surrounding area and all the waste from flintknapping and mining was used to refill the shafts, avoiding accidental falls and maximising the exploitation area. These features show the systematic organisation of the mine.

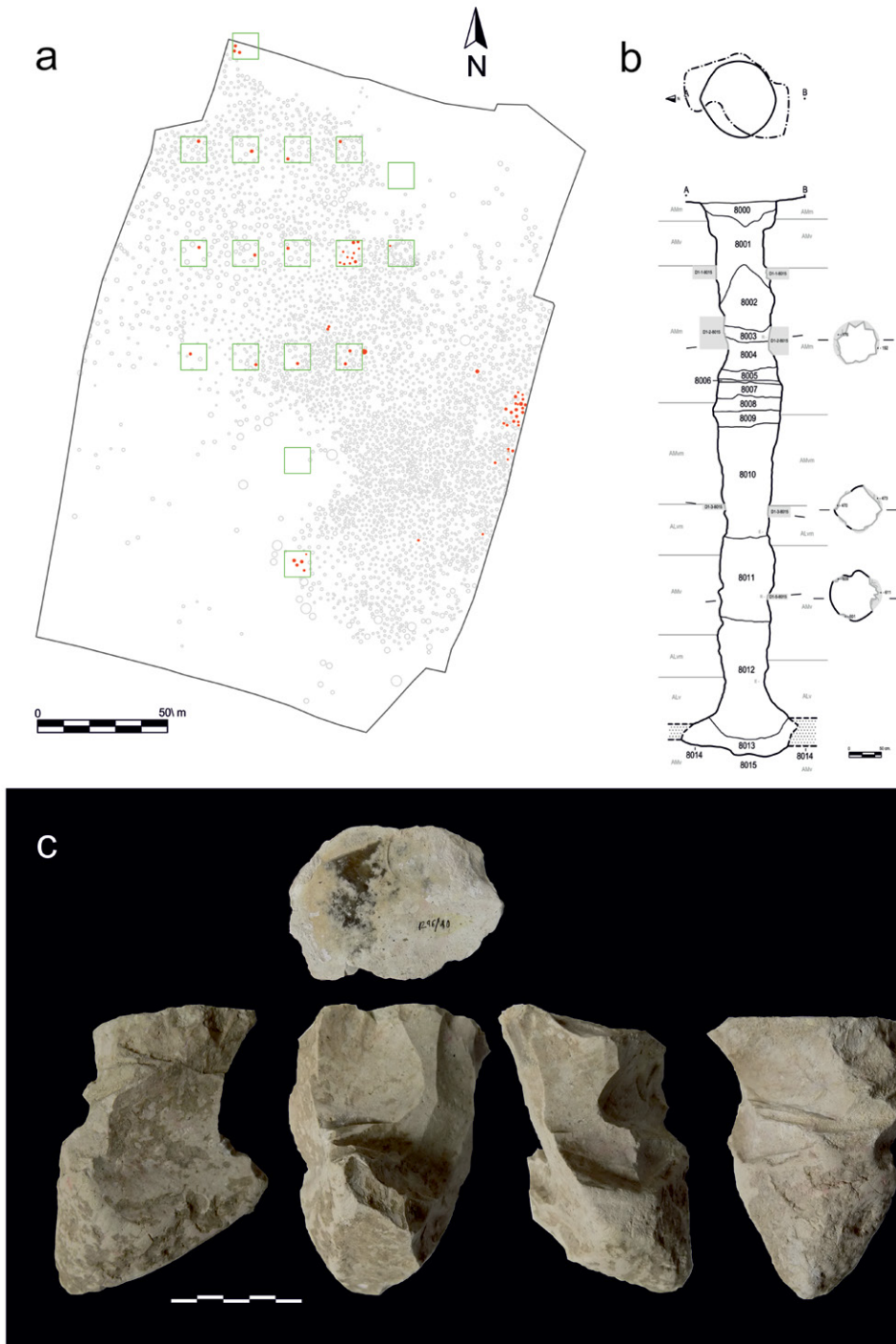


Figure 3: Casa Montero: a) Plan of the mine (Casa Montero Project); b) cross section of one of the shafts (Casa Montero Project); c) opaline core showing poor level of knapping skill. *Photograph: N. Castañeda.*

Mining tools at Casa Montero do not present any deliberate modifications for hafting, but they show some level of specialisation in terms of specific morphologies for different tasks. There is a large assemblage of 534 whole mining tools, among 4,638 fragments: 513 are made from quartzite (94.42%) and other non-silica rocks and 21 were made by taking advantage of the abundant flintknapping waste (Capote 2013; Consuegra *et al.* 2018).

The percussion tools are divided into mining tools, tools for knapping, and tools used for undetermined tasks (Capote 2013). Considering that Casa Montero was both an extraction and transformation centre (Castañeda *et al.* 2015), most of the tools were used for knapping (73.4%). Only 124 elements were devoted to mining tasks, and they show considerable diversity. On the one hand, the percussion tools: maces, hammerstones and big hammers; and on the other hand, incisive tools like chisels, picks and wedges. Maces (8) (1,100-2,500g) with plain percussion areas and probably hafted, and hammers (5) (360-970g) with convex percussion areas, are linked to the use of intermediate soft elements, such as wood pointers or chisels (Capote 2013) especially effective to dig the shaft as recent experiments have demonstrated (Porqueddu *et al.* 2024). Big hammers (11) (1,450-2,400g) were used in very heavy percussion to fracture the big blocks (Capote 2013).

Spatial constraints in those narrow shafts impede the use of certain tools with long handles (Porqueddu *et al.* 2024). In consequence, small intermediate elements like wedges or chisels were more often used, as attested by the abundant marks left in the walls. These tools were made on quartzite pebbles (28), flintknapping waste (10) (Capote 2011, 2013) and probably wood (Porqueddu *et al.* 2024). These elements were selected for their size and shape without any transformation. Wedges on quartzite (17) and flint (21) were probably used to undermine and extract the nodules.

Casa Montero was also a place where massive processing of flint took place in order to obtain small blades (5cm average length) for deferred use as sickles (Castañeda *et al.* 2015; Castañeda 2018). Considering the estimated population density in the inner Tagus basin in the Early Neolithic, the number of shafts, the short-term chronology of the mine currently known, and the fact that several shafts were refilled at the same time, Casa Montero would have been exploited in several mining events in which the whole community participated (Consuegra *et al.* 2018; Díaz-del-Río *et al.* 2023).

Knowledge transmission in mines

As we have seen, Neolithic mining requires an array of diverse technical knowledge that was transmitted *in situ*. In addition, mines offer social benefits to the youngest individuals of the group. Since they are far from the habitat settlements, going to the mine implies the experience of a journey (Milne 2012) and new opportunities to explore the community's territory. Collective mining events allowed them to meet other people and by participating in an organised collective task, children and young people can be involved progressively in increasingly complex activities and learn to be responsible. The participation of children and youths in collective events and tasks such as mining and quarrying ensures the transmission of knowledge and the social reproduction of the prehistoric groups.

What we have learnt through the analysis of the lithic assemblage from Casa Montero is that the young members of the group were acquiring and practising knapping skills (Castañeda 2018). Knapping-learning was of key importance in these societies, but it also consumes a huge amount of raw material. As the main purpose of flint mining was not to extract flint to practice, a complex management system was carried out so that new knappers' training was not detrimental to the flint source exploitation (Castañeda 2021). The access to the best quality raw material was controlled as trainees could use better blanks to learn to the extent they improved their knapping skills. Young people contribute to the group with a workforce while their learning allows social reproduction. Mining offers a way to participate and become full members of the group, with abundant raw material to practise. *In-situ* flint reduction by experts allows the observation and guided learning for the trainees while producing waste that is used as raw material for the new knappers by recycling.

Discussion and conclusions

Although digging for flint was known before, real mining and quarrying as collective tasks that transformed the landscape started and expanded together with the Neolithization process in the central-western Mediterranean in the 6th millennium cal. BCE. The first European mining, of which examples have been presented here, shows from its beginnings a high level of specific technical knowledge. This knowledge would be acquired by practice and transmission from one generation to another. This would imply some level of independent specialisation of the group (in terms of Clark 1995) that would probably carry out the mining work in irregular cyclic periods.

The comparison of the first three mines in Southern Europe: Defensola A, Casa Montero and Pozarrate, has revealed that the extraction of flint was very well-planned collective labour that involved a huge amount of effort. Much of the knowledge involved in mining corresponds to safety, waste management and, contrary to what it might seem at first sight, efficiency. The expertise in the geological position of the silica veins determined the exploitation system, by long and deep galleries and chambers at Defensola A, big trenches and crescent dumps at Pozarrate, and vertical narrow shafts at Casa Montero.

Safety was a critical issue, and Early Neolithic miners took advantage of the waste produced in this work. By minimising the space that was opened at a time, miners at Defensola and Casa Montero prevented collapses. The obliteration of the structures was a key systematic action, sometimes in a very complex manner. At Pozarrate big blocks of waste were sorted in layers and walls were built at Defensola. Every aspect was planned and organised, so people needed to know how and where to continue the work in the next mining season.

Each part of the process needed a specific tool, and much time and effort were needed to prepare them and transport them to the outcrop. It seems to be clear that we cannot interpret the investment of the workforce in economic terms, because hard work or access conditions did not dissuade Neolithic miners from extracting flint. In those contexts, the evidence of symbolic meaning of mining is not rare (Topping 2021).

It is obvious that knowledge of digging stone is very ancient as some rock cut constructions are known in the Levant. Neolithic flint mining activities in the central-western part of the

Mediterranean region contributed to the spread of this knowledge. Considering that Neolithic mines and quarries share several aspects, such as geological adaptations, safety, logistics, tools and symbolism, we can propose that extractive activities would constitute an assemblage of specialised knowledge about digging the earth that was transmitted from one generation to another, as part of the cultural background of the farming communities in the western Mediterranean region.

It is difficult to assess the relationship between digging the earth in search of flint and other rocks and digging the earth to deposit bodies. Nevertheless, we can suggest that the experience and knowledge obtained and developed in flint mining could have contributed to the excavation of hypogea: both symbolically charged tasks.

Funding

This work is part of the projects ‘Childhood in Prehistory’ 2022-T1/HUM-23889 of the Research Talent Attraction CM Program, ‘Flint mining in Inner Iberia’ SI1-PJI-2019-00108, both funded by Comunidad de Madrid and Universidad Autónoma de Madrid, and ‘Copperchildren: Childhood in Copper Age Iberia: a comparative technological approach’ PID2023-149101NB-I00, funded by Spanish Research Agency (AEI), Spanish Ministry of Science, Innovation and Universities (MICINNU) and European Regional Development Fund (ERDF).

Bibliography

- Basili, R., G. Di Lernia, G. Fiorentino and A. Galiberti 1995. Review of Prehistoric Flint mines in the ‘Gargano’ Promontory (Apulia, Southern Italy). *Archaeologia Polona* 33: 412-434
- Bustillo, M. A., N. Castañeda, M. Capote, S. Consuegra, C. Criado, P. Díaz-del-Río, T. Orozco, J.L. Pérez-Jiménez and X. Terradas 2009. Is the macroscopic classification of flint useful? A petroarchaeological analysis and characterization of flint raw materials from the Iberian Neolithic mine of Casa Montero. *Archaeometry* 51(2): 175-196.
- Capote, M. 2011. Working in the flint mine: Percussion tools and labour organisation at Casa Montero (Spain), in M. Capote, S. Consuegra, P. Díaz-del-Río and X. Terradas (eds). *Proceedings of the 2nd International Conference of the UISPP Commission on Flint Mining in Pre-and Protohistoric Times* (BAR International Series 2260): 231-242. Oxford: Archaeopress.
- Capote, M. 2013. *Trabajo y comunidad en el Neolítico antiguo: los útiles de percusión de la mina de sílex de Casa Montero* (Madrid). Unpublished Ph.D. dissertation, Universidad Complutense de Madrid.
- Castañeda, N. 2018. Apprenticeship in early Neolithic societies. The transmission of technological knowledge at the flint mine of Casa Montero (Madrid, Spain), c. 5300-5200 cal BC. *Current Anthropology* 59(6): 716-740.
- Castañeda, N. 2021. An Operative Sequences Network: The Technical Organization at Casa Montero Early Neolithic Flint Mine (Madrid, Spain). *Open Archaeology* 7(1): 986-999.
- Castañeda, N., C. Criado, A. Nieto and C. Casas 2015. La producción laminar de Casa Montero (Madrid) in V. S. Gonçalves, M. Diniz and A. C. Sousa (eds), 5.º *Congresso do Neolítico Peninsular. Actas. Lisboa 6-8 abril 2011*: 480-484 Lisboa: UNIARQ.
- Clark, J. E. 1995. Craft specialization as an archaeological category. *Research in Economic Anthropology* 16: 267-296.

- Consuegra, S. and P. Díaz-del-Río 2018. Early prehistoric flint mining in Europe: a critical review of the radiocarbon evidence, in D.H. Werra, M. Woźny (eds), *Between history and archaeology. Papers in honour of Jacek Lech*: 1-8. London: Archaeopress.
- Consuegra, S., N. Castañeda, M. Capote, C. Criado, C. Casas, A. Nieto, E. Capdevila and P. Díaz-del-Río 2018. Casa Montero (Madrid): the earliest Neolithic flint mine in Iberia (5300-5200 BC). *Trabajos de Prehistoria*, 75(1): 52-66.
- Corchón, M.S., A. Tarriño and X. Martínez 2009. Mobilité, territoires et relations culturelles au début du Magdalénien moyen cantabrique : nouvelles perspectives, in F. Djindjian, J. Kozłowski and N. Bicho (eds), *Le concept de territoires dans le Paléolithique supérieur européen* (BAR International Series 1938): 217-230. Oxford: Archaeopress.
- Costa, L. J. 2006. Récents acquis sur la circulation préhistorique de l'obsidienne en Corse. *Bulletin de la Société Préhistorique Française* 103(1): 71-85.
- Della Casa, P., S. Hye and U. Töchterle 2019. The island of Sušac (HR) Central Adriatic crossroads since the Neolithic, in S. Hye and U. Töchterle (eds), *Upiku: Tauke. Festschrift für Gerhard Tomedi zum 65. Geburtstag*: 103-120. Bonn: Verlag Dr Rudolf Habelt.
- Díaz-del-Río, P., C. Consuegra, N. Castañeda, E. Capdevila, M. Capote, C. Criado, C. Casas and A. Nieto 2023. The Flint mine of Casa Montero (Madrid, Spain). Making society in Early Neolithic Europe, in F. Bostyn, J. Lech, A. Saville and D. Werra (eds), *Prehistoric Flint Mines in Europe*: 167-186. Oxford: Archaeopress.
- Di Lernia, S., G. Fiorentino, A. Galiberti and R. Basili 1995. The Early Neolithic mine of Defensola A (I 18): flint exploitation in the Gargano area. *Archaeologia Polona* 33: 119-132.
- Forenbaher, S. and Z. Perhoč 2017. Lithic Assemblages from Nakovana (Croatia): Raw Material Procurement and Reduction Technology from the Early Neolithic until the End of Prehistory. *Journal of Mediterranean Archaeology* 30(2): 189-211.
- Galiberti, A. (ed.) 2005. *Defensola: una miniera di selce di 7000 anni fa*. Siena: Protagon Editori Toscani.
- Galiberti, A. M. and Tarantini 2023. The Early Neolithic mine of Defensola and the Gargano Promontory (Italy), in F. Bostyn, J. Lech, A. Saville and D. Werra (eds), *Prehistoric Flint Mines in Europe*: 19-58. Oxford: Archaeopress.
- Guilbeau, D. 2011. Le début du Néolithique en Italie méridionale: ce que nous disent les productions en silex du Gargano. *Origini: Preistoria e protostoria delle civiltà antiche* 33: 83-106.
- López-Tascón, C., H. H. Hernández, N. Castañeda, D. Herrero-Alonso, I. Elorrieta-Baigorri, F. Moreno-Prieto, A. Tarriño 2024. Bases arqueológicas para el estudio de los grandes instrumentos de percusión procedentes de Pozarrate, en el Complejo Minero del Sílex de Treviño (Sierra de Araico-Cucho, Burgos-Álava): prospectiva metodológica para su análisis tecno-funcional. *Arkeogazte* 13: 71-96.
- Martínez-Sevilla, F., S. F. Piper, F. Jiménez, J. A. Lozano and J. Carrasco 2020. Shaping marble, shaping minds: Apprenticeship in an Early Neolithic bracelet quarry. *Lithic technology* 45(1): 1-18.
- Mazzucco, N., D. Guilbeau, S. Kačar, E. Podrug, S. Forenbaher, D. Radić and A.M.T. Moore 2018. The time is ripe for a change. The evolution of harvesting technologies in central Dalmatia during the Neolithic period (6th millennium cal. BC). *Journal of Anthropological Archaeology* 51: 88-103.
- Milne, S. B. 2012. Lithic raw material availability and Palaeo-Eskimo novice flintknapping, in W. Wendrich (ed.), *Archaeology and apprenticeship: body knowledge, identity, and communities of practice*: 119-144. Tucson: University of Arizona Press.

- Pétrequin, P. and A.M. Pétrequin 2025. *Du jade pour les dieux. Un système religieux de l'Europe néolithique, Ve et IVe millénaires av. J.-C.* Besançon: Presses universitaires de Franche-Comté.
- Pétrequin, P. and A.M. Pétrequin 2020. *Ecology of a Tool: The ground stone axes of Irian Jaya (Indonesia)*. Oxford: Oxbow Books.
- Porqueddu, M.E., N. Castañeda and J. Baena 2024. Experimental approach to flint shaft mining: understanding the extraction process and the technical gesture at Casa Montero (Madrid, Spain). *EXARC Journal* 2024/2. <https://exarc.net/ark:/88735/10743>
- Tarantini, M. 2005. I muretti a secco. Tecniche costruttive e tipologie morfologico funzionali, in A. Galiberti (ed.), *Defensola. Una miniera di selce di 7000 anni fa...*: 93-102. Siena: Protagon Editori Toscani.
- Tarantini, M. and A. Galiberti 2011. *Le miniere di selce del Gargano VI-III millennio a.C. Alle origini della storia mineraria europea*. Firenze: All'Insegna del Giglio.
- Tarantini, M. and A. Galiberti 2012. Le miniere di selce preistoriche del Gargano alla luce delle ultime ricerche, in A. Gravina (ed.), *Atti 32° Convegno Nazionale sulla Preistoria, Protostoria, Storia della Daunia*: 59-74. <https://www.archeologiadigitale.it/attidaunia/>
- Tarantini, M., A. Galiberti and F. Mazzarocchi 2011. Prehistoric Flint Mines of the Gargano: An Overview, in M. Capote, S. Consuegra, P. Díaz-del-Río and X. Terradas 2011. *Proceedings of the 2nd International Conference of the UISPP Commission on Flint Mining in Pre-and Protohistoric Times (Madrid, 14-17 October 2009)* (BAR International Series 2260): 253-263. Oxford: Archaeopress.
- Tarriño, A., I. Elorrieta, M. García-Rojas, I. Orue and A. Sánchez 2014. Neolithic flint mines of Treviño (Basque-Cantabrian Basin, Western Pyrenees, Spain). *Journal of Lithic Studies* 1(2): 129-147.
- Tarriño, A., P.J. Lobo, M. García-Rojas, I. Elorrieta, I. Orue, A. Benito-Calvo and T. Karampaglidis 2011. Introducción al estudio de las minas neolíticas de sílex de la sierra de Araico (Condado de Treviño). Campaña de excavación del 2011. *Estudios de Arqueología Alavesa* 27: 7-48.
- Tarriño, A., C. López-Tascón, H. H. Hernández, I. Elorrieta, D. Herrero-Alonso, M. Aguirre, D. Larreina, N. Castañeda and J. A. Mujika 2022. The Neolithic Flint Quarry of Pozarrate (Treviño, Northern Spain). *Open Archaeology* 8(1): 273-286.
- Terradas, X. and D. Ortega 2017. Flint quarrying in north-eastern Iberia: quarry sites and the initial transformation of raw material. *Antiquity* 91: 359, e5.
- Topping, P. 2021. *Neolithic stone extraction in Britain and Europe: an ethnoarchaeological perspective*. Oxford: Oxbow Books.
- Whittaker, J., K. Kamp and E. Yilmaz 2009. Çakmak Revisited: Turkish Flintknappers Today. *Lithic Technology* 34(2): 93-110.

Building Death analyses the role of hypogea within the diversity of funerary constructions employed in the Western Mediterranean since the Neolithic. Their underground nature, entirely or partially carved out rock, and their architecture, sometimes hybrid, elevates them to the status of complex tombs exhibiting a wide variety of forms and functions.

The book derives from an international conference held on 23 November 2023 at the University of Alcalá (UAH), in Alcalá de Henares (Madrid, Spain), which brought together French, Portuguese, and Spanish specialists on the subject. It offers a novel overview of the rich assemblage of hypogea in Southwestern Europe. Papers address specific studies of necropolises, regional syntheses, and broader perspectives applied to the entire Mediterranean. The range of topics covers spatial distribution, chronology, construction typologies, funerary practices and grave goods, and even the contribution that can be made by analyses of other underground features such as flint mines.

Marie-Élise Porqueddu is a Doctor in Prehistory whose research focuses on the know-how and techniques involved in processing rocks. With a particular interest in rock-cut tombs, she is developing a technical approach to the chaîne opératoire involved in carving out and building these structures. She was a member of the Casa de Velázquez (École des hautes études hispaniques et ibériques) between 2022 and 2024.

Nuria Castañeda is a Doctor in Prehistory, Archaeology, and Heritage. Her research focuses on prehistoric childhood. She specialises in identifying knowledge transmission between generations by studying technical errors and skill levels in lithic production. She is currently a researcher under the Research Talent Attraction programme in the Department of Prehistory and Archaeology at the Universidad Autónoma de Madrid.

Rosa Barroso Bermejo is a Lecturer in Prehistory in the History and Philosophy Department at the University of Alcalá, Spain. Her archaeological research focuses on the study of the funerary prehistory of inland Iberia during the fourth and second millennia BC with a special interest on the transition from the Chalcolithic to the Bronze Age.

Primitiva Bueno Ramírez is Professor of Prehistory in the History and Philosophy Department at the University of Alcalá, Spain. She is an archaeologist specialising in Late Prehistory, with a long-standing research focus on Megalithism and Megalithic Art. The initial documentation of hypogean structures in the interior of the Iberian Peninsula, Valle de las Higueras, was achieved through her work.



Universidad
de Alcalá



Universidad Autónoma
de Madrid