Research Article

Sonia Machause López*, Robin Skeates

Caves, Senses, and Ritual Flows in the Iberian Iron Age: The Territory of Edeta

https://doi.org/10.1515/opar-2022-0222
received April 1, 2021; accepted January 14, 2022

Abstract: This article seeks to contribute to recent scholarship on ritual performances in caves, sensory archaeology and ritual journeys, and to stimulate fresh questions and debate about society, ritual, and mobility in the Iberian Iron Age. It uses an updated methodology for recording and interpreting – more contextually, holistically, and systematically – the multisensory affordances of caves and their landscapes on embodied human movements, experiences, and perceptions. It applies this approach to two caves situated in the territory thought by archaeologists to have been controlled by the Iberian Iron Age *oppidum* of Edeta/Tossal de Sant Miquel in the Valencia province: both interpreted as the destination for "pilgrimages" and related ritual performances, especially during the fifth to third centuries BC. In particular, the study presents a thick and multifaceted interpretative scenario of ritual flows to, through, and from these underground places, divided analytically into successive experiential stages. It concludes by questioning the current model of Iberian Iron Age ritual as an elite-dominated process and instead emphasises variability in multisensory ritual decision-making, practices and experiences over space, time, and culture.

Keywords: ritual caves, Iberian Iron Age, mobility, phenomenology, senses

1 Introduction

This article is informed by, and seeks to contribute to, recent scholarship on ritual performances in caves, sensory archaeology, and mobilities. Due to their otherworldly natural affordances (secretive underground locations, evocative forms, darkness, humidity, echoes, etc.), selected cave spaces have not only lent themselves to the performance of culturally diverse rituals throughout much of global human history but are increasingly being understood as vibrant co-participants in those events and as repositories for memories of them (e.g. Büster, Warmenbol, & Mlekuz, 2019; Dowd & Hensey, 2016; Machause, Rueda, Grau, & Roure, 2021; Moyes, 2012; Whitehouse, 1992). One way to deepen our appreciation of these processes is to consider – more systematically – the multisensorial impacts of caves and their landscapes on embodied human movements, experiences, and perceptions (e.g. Fazenada et al., 2017; Skeates, 2007), as part of a developing archaeology of the senses (e.g. Hamilakis, 2013; Skeates & Day, 2020; Skeates, 2010). A pertinent concept here is that of "sensorial assemblage", defined by Hamilakis (2013, p. 126, 2017) as, "the contingent co-presence of heterogeneous elements such as bodies, things, substances, affects, memories, information, and ideas". These ideas extend to the significance of underground places as components of landscapes, and connect to recent thinking about mobilities and ritual journeys. Instead of presuming places, such as caves, to be fixed and distinct from their visitors, we can envisage a complex relationality, whereby places are

* **Corresponding author: Sonia Machause López,** Departament de Prehistòria, Arqueologia i Història Antiga, University of Valencia, Av. Blasco Ibáñez, 28, Valencia 46010, Spain, e-mail: sonia.machause@uv.es
Robin Skeates: Department of Archaeology, Durham University, Durham, UK, e-mail: robin.skeates@durham.ac.uk
ORCID: Sonia Machause López 0000-0003-0668-0695; Robin Skeates 0000-0002-2059-4921

animated by streams of diverse mobile people, performances and portable resources flowing in and out of them (e.g. Bennett, 2010; Casey, 1993; Ingold & Vergunst, 2008; Peterson, 2019). Compelling examples are provided by pilgrimages, understood here as kinetic, interactive, and transformative rituals, performed by a group of people to a particular place of veneration associated with a powerful spiritual entity (e.g. Coleman & Eade, 2004; López-Bertran, 2011; Stoddard, 1997; Turner & Turner, 1978). Scholarship on pilgrimage, then, is relevant to and informs our study. We are, however, critically aware of the emphasis on religion that comes with it and consequently prefer the term "ritual journey" in this article to complement our emphasis on flows.

During this ritual passage, shared, but also personal, identities, expectations, and perceptions would be experienced (Nordin, 2009; van Dyke, 2018). We can, however, seek to decentre and unbound their destinations by paying greater attention to the journeys and routes taken by people (e.g. Cummings & Johnston, 2007; Gibson, 2007; Machause López & Diez Castillo, in prep.), which also lie at the heart of what pilgrimage is. These ritual journeys might have provided opportunities to establish new practices, to transform the social order and even promote personal interests. Most researchers agree that pilgrimage involves a journey to a sacred destination (e.g. Coleman & Elsner, 1995; Cummings & Johnston, 2007; Friese & Kristensen, 2017; Morinis, 1992). This generally implies movement over space and time, performance, the affirmation of social identity, and the enabling of economic changes. The definition of "pilgrimage" is, however, neither universal nor transcultural (Coleman, 2002), particularly given variables such as destination, distance, scale, and motivation (Stoddard, 1997). Thus, each example must be understood in context (Coleman & Elsner, 1995). Dynamic personal and social experiences and understandings of the landscape, and of sacred geography in particular, are key here (Bender, 2001; Lash, 2018; López-Bertran, 2011; Scriven, 2014; Tilley, 1994). So too is consideration of body movements, interactions and sensoriality, and of consequent changes to participants' bodies and minds (Maiese, 2011; Mlekuz, 2011). Thus, in this article, we emphasise the meaningful and transformative nature of bodily engagements across the landscape, including ritual gestures inside caves. Furthermore, instead of assuming one single, generalised human body, we try to consider the physical and social diversities of Iberian Iron Age bodies (differentiated especially by age, gender, and class, but also by health, etc.). From these perspectives, the ritual deposits in caves considered in this study must, then, be regarded as part of more holistic sets of embodied movements, interactions, decisions, and emotive experiences felt by group members.

In what follows, we draw on this thinking: first, to present an updated methodology for recording some of the multisensory dimensions of caves and their adjacent landscapes, and second, to present the interpretative results of the application of this method to two caves in the Valencia province. These caves have previously been interpreted as the destinations for pilgrimages and related ritual performances, mainly between the fifth and third centuries BC, due to their marginal location in the landscape relative to contemporary settlements, their striking physical characteristics, and their material remains resulting from ritual deposition practices (see Alfayé, 2010; Gil-Mascarell, 1975; Machause López, 2019; Moneo, 2003; Rueda, 2011). We seek to deepen this archaeological thinking.

2 Methods

Methodologically, our research builds on two significant trends in cave archaeology, which can be broadly described as "contextual" and "sensory". It is now widely accepted that caves need to be analysed and interpreted "in context", with reference to their rich web of culturally specific associations and contrasts, using comparative and multi-scalar approaches. Cave contexts include their place in the landscape; the "architectural" spaces of cave structures; their sediments; the history of their use; their meaningful constitution within "wider cosmologies, ritual actions, economic strategies, social practices, power relations, identities, and memories"; and their history of study (Bergsvik & Skeates, 2012, p. 2). As a consequence, in our contextual research, we do not simply focus on the interior of one cave or on two unrelated caves with similar formal characteristics, as has been done previously in other areas (e.g. Betts, 2003; Whitehouse, 2001).

Nevertheless, we compare in detail two different caves that were frequented during the same period (Iberian Iron Age, sixth to first centuries BC, with a focus on the fifth to third centuries) and situated within the same clearly defined territory (the *oppidum* of Edeta: Figure 1). Therefore, we analyse a ritual process that extended spatially and socially from dwelling places to the caves and their interiors. Extending the scale of this comparative approach to incorporate other caves in the region lies beyond the scope of this present study but is intended for future research.

Less widely accepted, but potentially rich interpretatively, is the possibility of studying the multisensory dimensions of caves, the materiality of deposited artefacts, and related embodied experiences and perceptions of them. A growing body of archaeological literature is developing in this area (e.g. Barnatt & Edmonds, 2002; Betts, 2003; Hamilton, Seager Thomas, & Whitehouse, 2016; Skeates, 2007, 2010, 2016; Whitehouse, 1992, 2001), with sensory considerations extending from caves understood as part of sensescapes, to the multisensory experiences of ritual cave spaces and performances, to the related production, consumption, and experience of cultural materials with sensuous properties. This study can now be realigned with reference to the emergent field of sensory archaeology, with its emphasis on identifying "the remarkable variety of ways in which we make sense of the world around us, especially as members of societies and cultures with particular sensory orders and dynamics" (c.f. Hamilakis, 2013; Skeates & Day, 2020, p. 14; Tarlow, 2000, p. 719). In practice, this can be done by explicitly incorporating thinking about sensoriality into existing research methods (Tringham & Danis, 2020), including those of cave archaeology. We do not deny the formative significance of phenomenological archaeology here (e.g. Tilley, 1994), with its emphasis on situated embodied acts, and have indeed used phenomenological walking (through caves and their wider landscapes) as a key method to produce some of the data and insights presented in this study. We do, however, aim (like Hamilton et al., 2016) for a greater emphasis on rigorously collected and systematically presented data. We try to overcome some of the limitations of early archaeological landscape phenomenology; Christopher Tilley's approach, in particular, has been rightly criticised for excessive subjectivity, the privileging of vision over

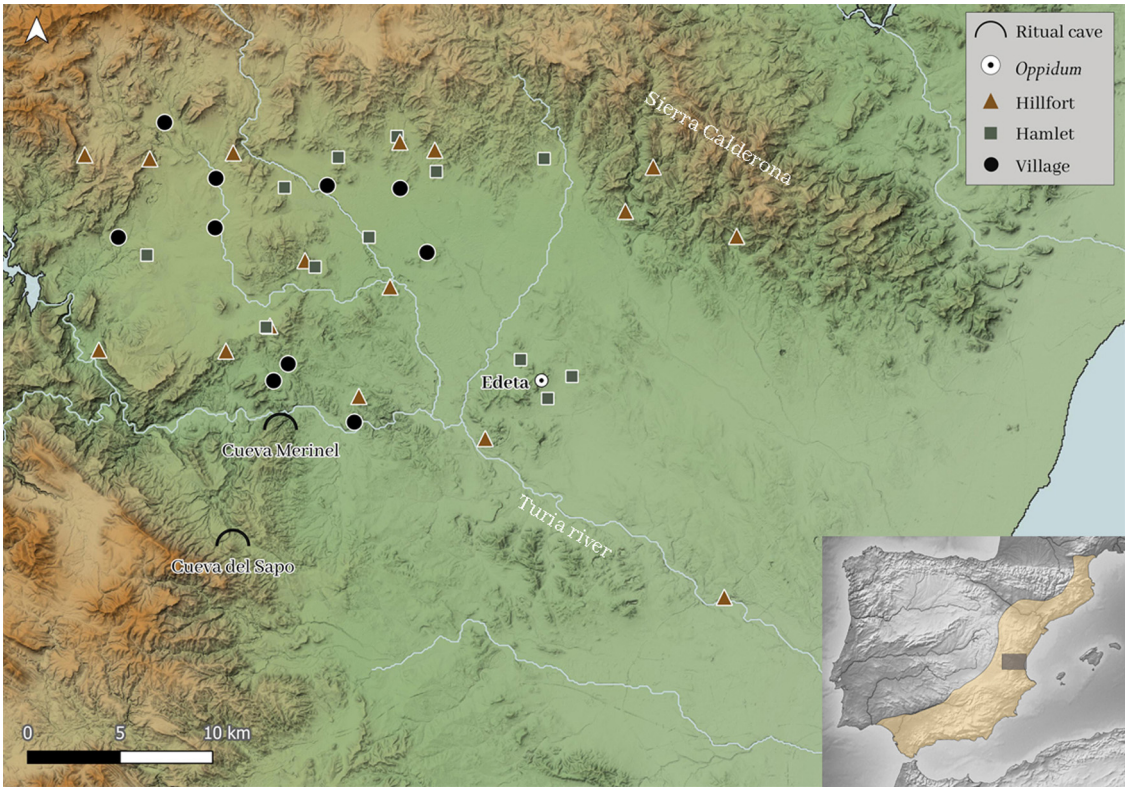

Figure 1: The territory of Edeta between the fifth and third centuries BC (based on data from Bonet et al., 2008), with the location of the territory inside the Iberian Culture (in brown).

multi-sensoriality, and the assumption of a generic, universal human body (e.g. Brück, 1998; see Johnson, 2012 for an overview of other critiques). Table 1, therefore, presents our particular set of sensorially adapted archaeological methods and datasets, including a reflexive assessment of their strengths and weaknesses. This is part of a wider ongoing project in which we will record sensory data by using digital technologies, including apps to geo-locate the points in the landscape where photographs have been taken. We will also include digital methods, pioneered by Trimmis (2018), to systematically record the environments of the various spaces of the two sample caves, including their light levels, temperature, relative humidity, and soundscapes, and correlate this data with the ritual deposits. We will also enrich our data by experimenting methodologically with new combinations of routeways, temporalities, personnel, and research questions. In this study, however, we embrace the potential of sensory archaeology to "enrich the interpretative possibilities" (Brück, 2005, p. 64), humanise history (Tarlow, 2000, p. 720), and pose new questions.

Table 1: Principal methods used in this research: protocols, strengths, and weakness

Method	Protocols followed	Strengths	Weaknesses
Literature review	• Extensive re-reading and critical evaluation of scholarly literature on sensory studies, cave archaeology, and pilgrimage/ritual journeys to assess the applicability of existing scholarly concepts and practices to this case-study • Re-reading of excavation and post-excavation reports for the two sample caves to extract sensorial details • Compilation of database on all known Iberian Iron Age sites in the territory of Edeta • Review of iconographic data on the Iberian Iron Age, with particular reference to caves and bodies	• Building on the work of other scholars to legitimise and inform our research • "Grounding" of sensory interpretations with reference to details, and critical evaluation, of the recorded excavated material remains from the sample caves • Informed archaeological/iconographic contextualisation of cave locations and bodily aspects of material culture (c.f. Papadopoulos, Hamilakis, Kyparissi-Apostolika, & Díaz-Guardamino, 2019)	• Literature review is unlikely to have been fully comprehensive • Excavation and post-excavation reports lack full details relevant to sensory analysis • Despite being relatively well known, the regional archaeological and iconographic contextual data are inevitably partial
Phenomenological walking	• Repeated walking of alternative routes to, and visiting of, the two sample caves at different times/seasons by a small but diverse team of collaborators: four men and four women in their 30s–60s (five archaeologists, one astrophysicist, and one environmentalist). All with good walking ability, although the oldest needed more breaks along the way. Only one was previously familiar with the landscape • Divided afterwards into experiential/spatial "stages" (see Figure 4) • Division of the ritual process into "stages", justified with reference to general anthropological models (e.g. van Gennep, 1960)	• Incorporation of multiple perspectives (instead of that of the individual analyst) • Extending the scope of previous work on sensory cave archaeology by attempting, systematically, to identify and evaluate multiple social and sensorial variables (including decision-making) for each "stage" of the journey/ritual process, outside and inside the caves, based on multiple visits at different times and seasons	• Unlikely that the full range of sensorial variables and social perspectives have been covered or recorded comprehensively in and out of the field • Unlikely that the precise routes taken in the past were retraced • Questionable assumption that, despite vegetation changes, the landscape outside and inside the caves has not changed significantly over the last two millennia (palaeoenvironmental data, that can minimise this, is not available for the moment) • Risk of imposing inappropriate experiential/spatial "stages"/divisions onto the ritual process

(*Continued*)

Table 1: *Continued*

Method	Protocols followed	Strengths	Weaknesses
LCP and viewshed analyses	• Least cost path (LCP) analysis of walking routes from the *oppidum* and other dwelling places to the two sample caves, and of viewsheds from and around the caves through Geographic Information System (GIS), using QGIS and R (Machause López & Diez Castillo, in prep.) (see Figure 2)	• Rigorous alternative and complement to the phenomenological walking routes chosen by, and views described by, the field teams	• Edeta *oppidum* is unlikely to have been the only starting-point for multiple journeys to the two caves • Culturally determined experiences of time and space overlooked by least cost path analysis (promoting practicality and pragmatism over other factors) • Landscape is continuously changing, influenced by social variables (Bender, 1993, p. 2). • Over-emphasis on sight through viewshed analysis • Artificial, a bird's-eye view, way of seeing the landscape (Latour, 1986, Thomas, 1993)
Access analysis	• Plan-based systematisation of the spatial routes and decisions taken by people moving through the two sample caves (c.f. Hillier & Hanson, 1984) (see Figure 7)	• Systematic recording and comparing of cave spaces and related routing decisions required of visitors	• Unlikely assumption that the caves' plans have not changed over the last two millennia • Oversimplified 2D map-based approach, which underestimates the complex 3D and multisensory nature of moving through cave spaces • Tendency to propose a single, linear route
Visualisation	• Use of drone flights, 3D views, photographs and videos of the landscape and cave spaces and people in them as an additional source of information (with reference to the UTM coordinates, orientation and altitude of each picture location) • Inclusion of a body scale, photoshopped as an anonymous "grey" shape in some cases (see Figures 5, 6, 8 and 9)	• Photographs and videos can help to stimulate memories of multisensory experiences and explain them to audiences	• Photographs and videos are light-dependent technologies, which struggle to represent the twilight and dark zones of caves • The images selected are always subjective (Chadwick, 2004, p. 21) • Inclusion of real modern people in the photographs can be misleading and distracting; the anonymised "grey" body is evidently unreal; the use of a 1.9 m tall man as a scale is excessive compared to the relatively shorter stature of prehistoric people (Cox, Ruff, Maier, & Mathieson, 2019).
Collaborative sensory knowledge production	• Detailed interrogation of the first author (female, Spanish post-doc) by the second author (male, British professor, who has never visited the sites), and repeated brainstorming, to elicit further details of bodily experiences and sensory assemblages for each stage,	• Recalling and expanding of phenomenological details not recorded in the field (including the personal experiences of the first author and other team members)	• Sensorial and scholarly bias of the co-authors, influenced, for example, by ethnographic data from the region or Iberian iconography data

(*Continued*)

Table 1: *Continued*

Method	Protocols followed	Strengths	Weaknesses
	followed by "flipping" the emphasis with the first author writing first drafts of the text, which were then corrected and commented on in detail by the second author	• Clarification of taken-for-granted details (e.g. of cave spaces), helped by questions from the second author (who has not visited the caves) • Identification of gaps on the field records (measurements, photographs, etc.) • Reflexive and constructive co-production of sensory ideas, scenarios, and text, focusing on the archaeological realities (contexts and material remains), and avoiding their over-sensorialisation, as well as narrow, personalised, age-biased and gender-biased perspectives	• Multiple scenarios and options: unlikely to be all covered (even though we acknowledge and incorporate alternative scenarios) • Additional insights could be gained by the second author visiting the sites

3 Two Ritual Caves in Context

Ritual practices and deposits during the Iberian Iron Age varied considerably across sites and territories (Grau & Rueda, 2018). Diverse ritual practices were performed in natural caves during the fifth and third centuries BC: sacrifices, libations, offerings, and commensality practices, mainly linked to rites of passage (Rueda, 2013). These resulted in diverse offerings and accumulation of materials, such as ceramic vessels, metal ornaments, spindle whorls, faunal, and human remains (Machause López, 2019). Variability has also been observed among well-studied areas. Examples include the territory of Castulo, distinguished by the repeated votive deposition of bronze artefacts (Rueda, 2011); the territory of Kelin, with the repeated deposition of ceramic plates, calyx vases, and spindle whorls (Machause & Quixal, 2018); the territory of Edeta, with ceramics, faunal offerings, and funerary rituals (Machause López, 2019); and the central area of Contestania, with organic offerings deposited inside large pots (Grau & Amorós, 2013). Unfortunately, a traditional archaeological focus on artefacts has left other important aspects neglected (González-Alcalde, 2005). Recent landscape archaeology, for example, has begun to show how the landscape influenced the choice of some caves as ritual places. In particular, it has been suggested that the location of these caves, generally in areas with very low settlement density, might be connected to the marking of territorial boundaries (e.g. González Reyero, Sánchez-Palencia, Flores, & López Salinas, 2014; Grau & Amorós, 2013; Machause López, 2019; Rueda, 2011).

In this study, we compare and contrast two caves situated in the territory thought to have been controlled by the Iberian Iron Age *oppidum* of Tossal de Sant Miquel (known to the Romans as Edeta), and present our interpretations of the rituals performed in and around them, based on our methods (see Table 1) and theoretical perspective. This political landscape, covering around 900 km^2, has been defined with reference to geography and settlement patterns in the Valencia province (e.g. Bonet, 1995; Bonet, Mata, & Moreno, 2008) (Figures 1 and 2). (For a broader perspective on Iron Age political landscapes in southern and northeast Iberia, see: Bonet, Grau, & Vives-Ferrándiz, 2015; Grau, 2011, 2016, 2019; Ruiz & Molinos, 1998). It was delimited to the north by the Sierra Calderona mountain range, to the south by the Turia river and Montes Rodanas, to the east by the tributaries of the Turia river and its fluvial plain, and to the west by the upland of Los Serranos (Figure 1). These borders are thought to have been shared by neighbouring Iberian territories, such as Kelin (to the west), with five caves containing explicitly ritual

deposits evidenced on its margins (Machause & Quixal, 2018), and La Carència (south), Arse (northeast), and Cerro Viejo (northwest), where, for the moment, ritual practices have not yet clearly been identified in caves. Within these territories, known settlements have been divided, based on altitude, size and use, comprising the *oppidum* (over 10 ha), surrounded by hillforts, and lower altitude villages and hamlets (Bonet et al., 2008) (Figure 1). The kind of society envisaged by archaeologists for this area is one characterised by fluid heterarchies, where power was constantly negotiated (Bonet et al., 2015) – similar to the models proposed for other Mediterranean later prehistoric societies (Hamilakis, 2002). This fluidity is particularly evident in the larger *oppida*, such as Edeta, where elite factions and their supporters are thought to have resided together collaboratively, but competitively, in houses of different sizes that suggest differential control and accumulation of surpluses. In contrast, the occupants of the small settlements linked to the *oppida* seem relatively undifferentiated (Bonet et al., 2015). The elite factions are thought to have participated in complex and dynamic exchange networks, where status was constantly renegotiated through social interactions. These social dynamics were also played out in communal practices, linked to larger urban and rural landscapes. In this context, ritual performances within and on the margins of territories would have played an important role as arenas to reinforce and renegotiate political control and alliances (Wright, 2004).

Diverse types of Iberian Iron Age sacred place have been identified in the territory of Edeta: urban sanctuaries, both "private" and "public"; a few mortuary spaces; and rural shrines, comprising caves and rock-shelters (Bonet & Mata, 1997). In particular, selected caves located on the edge of the territories were ritualised between the fifth and the third centuries BC, particularly through the accumulation of offerings within them. This process has been interpreted in terms of social groups performing diverse rites of passage and consecrating their territorial boundaries (e.g. González Reyero et al., 2014; Grau & Amorós, 2013; Rueda, 2011) – an interpretation we accept but also seek to refine in this article, with particular reference to ritual journeys and sensoriality, which have only begun to be considered in recent studies (e.g. Machause López, 2019; Rueda & Bellón, 2016). The southern border of the Edeta territory was marked by two ritual caves, Cueva Merinel (Bugarra municipality) and Cueva del Sapo (Chiva municipality), which we have chosen for our comparative case study. These caves are situated around 6 km apart (in a straight line) and located around 15–18 km from the main *oppidum*.

- Merinel cave is located at an altitude of 300 m, 1 km upstream from the Turia river, on the Northeast side of a ravine, which cuts into a steep hillslope. The cave is predominantly horizontal in the entrance, with a certain inclination and a slope of –68 m inside (Fernández, Garay, Giménez, Ibañez, & Sendra, 1982, pp. 193–194) (Figure 3(1)). The archaeological story of this cave began in 1953, when the Valencian Speleology Group discovered a deposit at the back of the main chamber, including around 20 Iberian vessels, mixed with charcoal and animal bones. Unfortunately, those materials ended up in private collections. However, three seasons of work undertaken by the University of Valencia in the 1980s helped to map the cave system, relocate the anthropogenic deposit, and recover archaeological materials (ceramics, metals, lithics, faunal remains, charcoal, and coprolites) dating mainly to the Iberian Iron Age (especially the fifth to third centuries BC), but also to the Bronze Age and Chalcolithic (Figure 3(1(a–c))). Interpretation of the deposit as a ritual one is suggested not only by its "liminal" placement in the innermost dark zone of this marginal cave (see plan in Figure 6) but also by the restricted composition of the ceramic assemblage (549 fragments; Minimum Number of Individuals (MNI) 41 – a number that will increase if we consider inaccessible collections that have been already published) and faunal assemblage (1522 Number of Rests (NR); MNI 56). These assemblages are dominated by *calyx* form vessels (MNI: 43% of the Iberian ceramics, some of them burnt) and by cranial body parts of newborn pigs (18% of MNI) and of sheep and goat (82% of MNI) (Aparicio et al., 1983, pp. 375–385; Blay, 1992; Machause López, 2019; Martínez Perona, 1992). Ritual performances in this cave, therefore (ultimately), involved diverse practices that led to the deposition of ceramics, metals, and animals, such as libation, sacrifice, commensality, and burnt offerings. In addition, recent study of the deposit has identified four human bone fragments with similar calcite concretion to that seen on the faunal remains: a proximal part of the diaphysis of a tibia, a distal part of a humeral shaft, and two diaphysis fragments of a subadult femur[1] (Machause López, 2019). The

1 Preliminary analysis undertaken by Ángela Pérez at the Museu de Prehistòria de València (Prehistory Museum of Valencia, Spain).

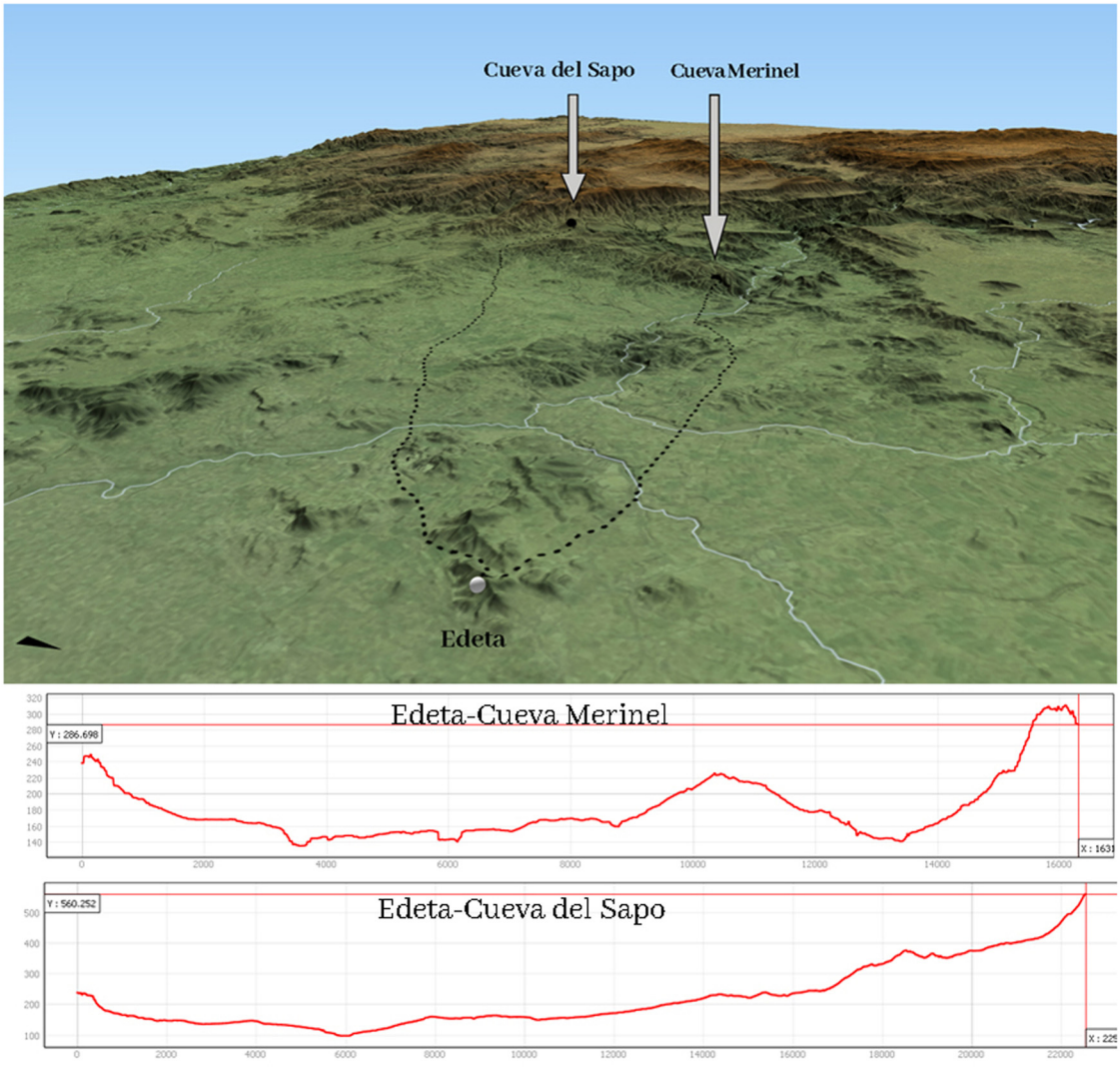

Figure 2: Least cost paths and profile lines from the *oppidum* to the caves, based on Alberti's (2019) cost formula.

radiocarbon results for the left femur diaphysis relate its deposition to the Iberian Iron Age frequentation of the cave (340–52 cal BC $2\sigma^2$) and may indicate a shift in its ritual use – one that now incorporated ancestral relics – after the third century BC.

- Sapo cave is situated at a higher altitude of 565 m, 7 km from the Turia river, on an upper slope of the Atalaya hill. Today, a vertical drop of 5.5 m gives access to a sloping gallery, which extends 18 m to the northeast and 8 m to the southwest (Figure 3(2)). Following the discovery of Iron Age ceramics and human remains by clandestine diggers, the University of Valencia undertook archaeological excavations here in 1983, at the southwest end of the gallery and near its middle (Pla Ballester, 1985; Portell, 1983). In 2018, 2019, and 2021, this study recommenced with further excavations at the end of the gallery and in a small niche (see plan in Figure 8). A ritual interpretation has also been plausibly proposed here, due to the marginal location of the deposits and cave, and the nature of the archaeological deposits, which contained an atypical inhumation accompanied by a varied group of ceramic vessels (current MNI 31: amphorae, clay jars, calyx forms, plates, mortars, cooking jars and lids, a funerary hermetic urn, and a spindle whorl), bronze artefacts, and the faunal remains (Figure 3(2(a–c))). The faunal sample, which

2 2123 ± 24 BP: SUERC-96578.

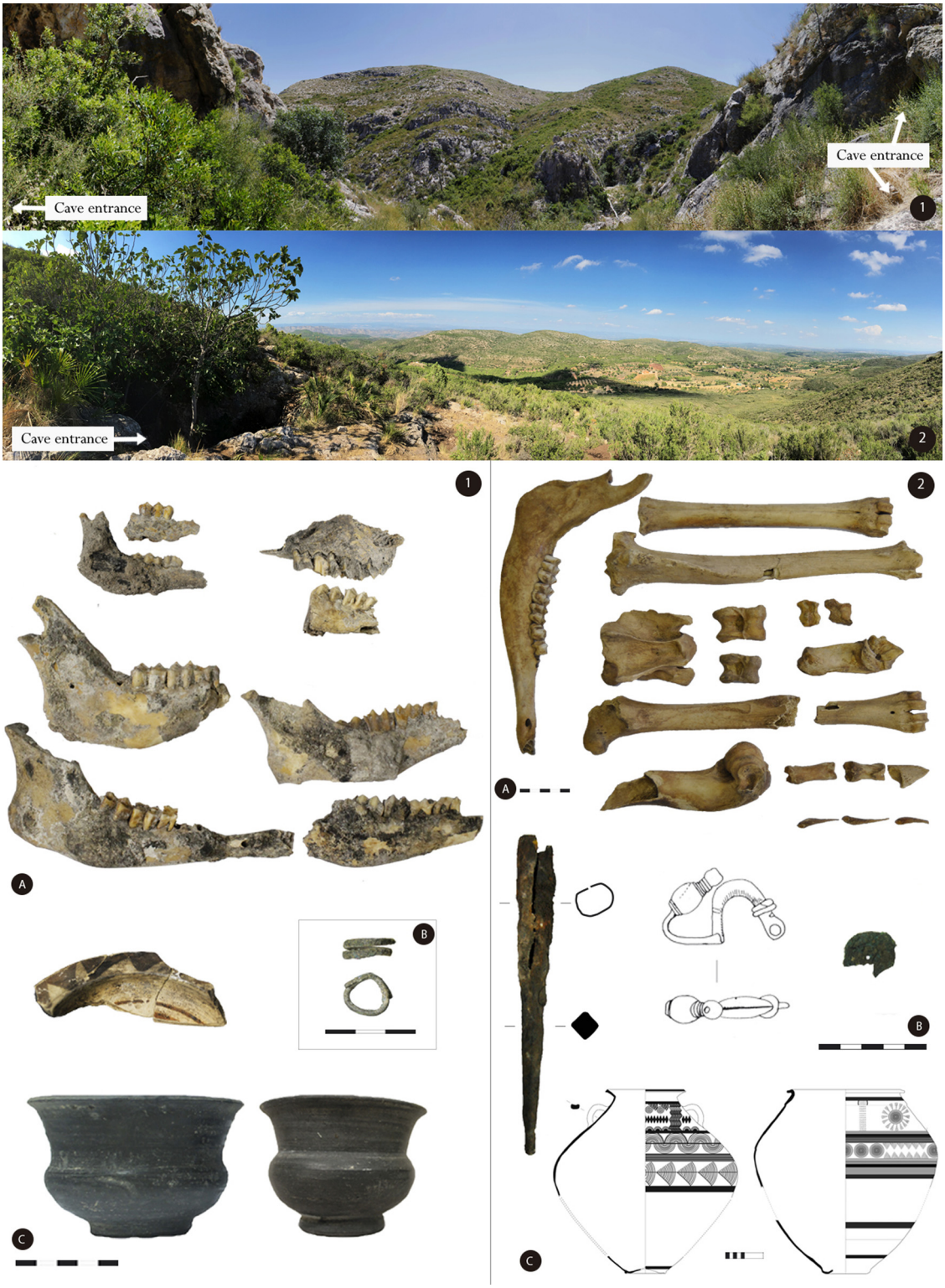

Figure 3: Panoramic views and representative materials from Cueva Merinel (1) and Cueva del Sapo (2): (a) Faunal remains, (b) metal objects, and (c) ceramics.

numerically constitutes almost 50% of the materials in the cave, presents a particular taxonomic spectrum, with a predominance of red deer (MNI 12) and ovicaprids (*Capra hircus*: MNI 3, *Capra* sp. MNI 2; *Ovis aries*: MNI 2; and indeterminate ovicaprids: MNI 7) (Machause & Sanchis, 2015, Table 1). The remains of two dogs are also present, which are not common in domestic contexts, with a high level of anthropogenic

modifications (cut marks). The faunal assemblage presents a relatively small degree of fragmentation, including some complete individuals in anatomical connection, although some modifications can be related to specific treatments of the carcasses (cut marks and burnt bones). We cannot be certain that all of these remains were all introduced during ritual performances, but – given these treatments – we consider it highly likely that the majority were. More specifically, initiation rites have been proposed for this cave with reference to the ceramic offerings and the red deer, whose combined symbolic significance is highlighted by the appearance of deer as symbols on contemporary pottery vessels representing a ritualised hunt (Machause & Sanchis, 2015; Machause, Pérez, Vidal, & Sanchis, 2014). At Iron Age sites in France, the unmodified remains of red deer found in ritual contexts have been interpreted as prestigious hunting trophies (Méniel, 2012) – a possibility that may also be apply to Sapo cave.

4 Cave Ritual Journeys

Combining the theoretical basis, methodology, ensuing dataset, and archaeological context set out above, we offer below an interpretative account of the sensorial and social dimensions of Iberian Iron Age ritual journeys incorporating the caves of Merinel and Sapo. In this, we consciously combine our researchers' first-hand experiences with archaeological interpretations of Iron Age peoples' sensory experiences and perceptions. Our scenario of ritual flows and cycles is divided analytically into successive stages (Figure 4), all of which involved embodied mobility, interactivity, decision-making, performance, experience, and perception. Our intention is not to reify these "stages": they emerged from our discussion of these particular caves. Nevertheless, they may have some wider archaeological applicability.

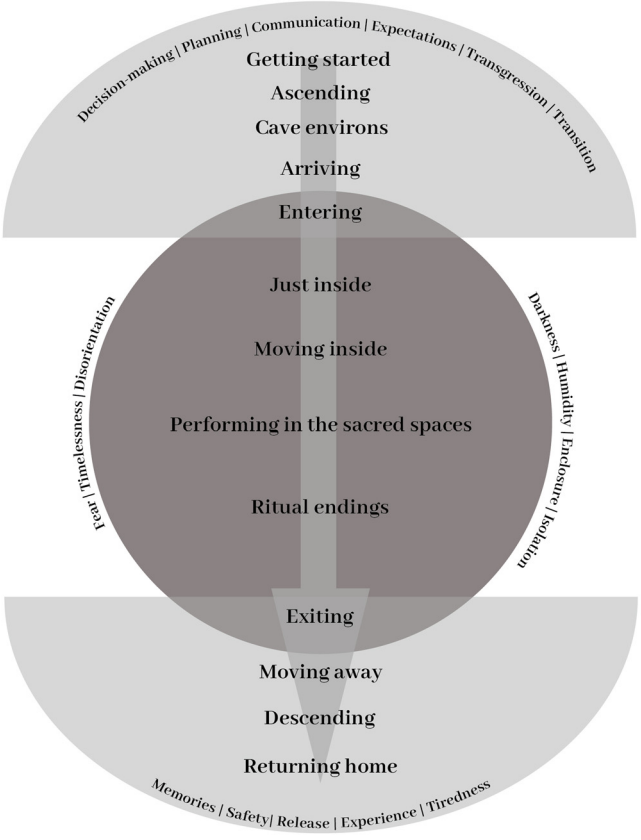

Figure 4: Ritual processes, experiential stages, and sensorial stimuli.

4.1 Getting Started

Getting started is the hardest part: both in mobilising a ritual journey and in trying to reconstruct how people achieved this in the past. It is, however, one of the most important parts of the ritual and interpretative processes as decisions taken at this stage condition what follows.

The settlement archaeology of the Edeta territory provides us with a variety of potential starting points: hillforts, villages, large and small hamlets, and, of course, the *oppidum* (see Figures 1 and 2). The archaeological assemblages in the caves cannot be linked exclusively to one place or group of people. Therefore, although for the purposes of our spatial analysis we use the *oppidum* as a starting point, our interpretative account remains open to participants drawn from a variety of communities. So, for example, while elite factions from Edeta may have led some occasional, larger scale ritual passages to the caves, it is possible that the caves' ritual assemblages were also formed during the course of repeated smaller scale group visits from the closest dwelling places. How, and when, did people from one or more of these places – some with evidence of ritual performances of their own – come together to form a temporary group setting out with at least one of their goals being to connect with supernatural forces at one of their sacred caves situated on the margins of their territory?

A core group of people needed to take responsibility, for planning, as well as persuading participants, whose personal motivations, understandings, and expectations would have varied. Previous experience and decision-making would have counted here, particularly considering that the caves can be hard to find (Machause López, 2019). Leadership is implied here, but not necessarily or exclusively that of elites; ritual journeys could have been organised by groups of diverse size and social standing, including families. Communication was essential. Culture and tradition conditioned and constrained, but each event required a new set of decisions, adaptations, and explanations to be made. Who to include (and who to leave behind, according to political status, kin-affiliation, age, gender, etc.), what provisions to take and give, when to depart, what route to take, which cave to target, what to ask for, and when to repeat the process.

As archaeologists, we can highlight, in particular, the material things that the participants would have selected and brought together at this stage, working back from what they ultimately deposited in the caves. Examples include human and animal bodies and disarticulated remains, large and small ceramic containers, metal weapons, and ornaments. These raise a number of questions, some of which have the potential to be answered by additional scientific analysis. What types of material things were included, and how do they compare to the material culture used in the settlements? Over what catchment areas were these materials procured? In what numbers and weights were they transported? Might beasts of burden and carts have been used? What did the ceramic vessels contain? When were the animals slaughtered? New details will emerge, but a risk remains that, in referring back to the palimpsest of ritual deposits in the caves, we produce an over-generalised account of the ritual process; we must bear in mind that, in practice, the pilgrimage differed each time it was performed.

Having, then, (re)assembled these things and themselves, the participants would eventually have set off on their journey, perhaps gaining members, materials, and momentum as they crossed the domestic landscape, taking a break to rest and eat, but also stopping to perform minor ritual acts at significant points along the way (Nordin, 2009, p. 197) (see possible paths followed in Figure 2). The actual paths followed remain unknown as no evidence of trail markers has yet been identified. Depending on the starting point, the duration of this stage could have been longer or shorter. If we consider it to have been the main *oppidum*, located 15–18 km from the caves, a whole day would have been required for a round trip (i.e. between 5 and 8 h one way) (Machause López & Diez Castillo, in prep.). However, we cannot dismiss the possibility of people spending the night inside or next to the caves before returning to Edeta, especially considering the time spent inside the caves.

4.2 Ascending

With about an hour's walk to go before reaching Merinel cave and 20 min to Sapo cave, the ritual journey would have changed character. This transition was marked, first, by crossing the river Turia, which is likely

to have taken on a symbolic significance. This was followed by the inevitable ascent of the respective hills of Loma de la Pinada and Atalaya Hill (Figure 5(2)).

As the group climbed, the landscape would have felt different and opened up around them (on a clear day), with extensive views back towards the River Turia valley, Edeta *oppidum*'s mountain and the sea, and ahead to further hillslopes. The materials they carried would have weighed heavier. For example, large jars

Figure 5: Ascending (2), cave environs (3), and arriving (4) at Cueva Merinel (left) and Cueva del Sapo (right) (human scale: 1.90 m), with specific location in the landscape (3D view) and orientation of the picture.

each with a capacity of 50–100 L were borne up to the caves, which (depending on their contents) would mean a 40–100 kg load, according to experimental archaeology calculations (Vives-Ferrándiz, Bonet, Izquierdo, & Mata, 2007, Table 2). The pilgrims would certainly have adjusted their bodily postures.

Each journey and each cave afforded somewhat different experiences (both our own visits and our least cost path calculations confirm this). In particular, the way up to Merinel is more demanding (steeper), but shorter, than that to Sapo.

Ultimately, the guides of the group would have decided how to tackle the ascents, including whether to make deviations past landmarks such as the awe-inspiring doline of Sima Colomera, close to Merinel (see Figure 5: bottom left and 3D video in the Online Supplementary Material[3]).

4.3 Cave Environs

The close environs of each cave (within a radius of 30 min walking distance) needed to be carefully negotiated – physically, visually, and verbally. As both caves can be, to varying degrees, difficult to locate and access, the group would have needed guiding forward by people who had visited them before. At the same time, the group would have continued to orientate themselves with reference back to the known landscape they had come from (Figure 5(3)).

Merinel cave is set at the back of a depression in its hillside. This place and the cave's three entrances are visible from below and from the opposite hill, but not from above. This provided an opportunity to re-order, more formally, the participants immediately prior to arriving (Turner, 1967). It is difficult to reach due the presence of three, interconnecting, steeply sloping ravines, which confuse and physically challenge visitors, whatever route they take. At least one of these barriers needs to be crossed, using the adjacent hills as reference points (see Figue 5: bottom left and 3D video in the Online Supplementary Material). The symbolic potential of this crossing is evident.

In contrast, Sapo cave is a hole in the ground. It is, therefore, invisible beyond a distance of 15 m, and consequently difficult to locate and relocate. It is safest and less demanding to approach it from below, via its northeast hillslope, where, on a clear day, the view back to Edeta's landscape and the sea steadily improves (see Figures 3(2) and 5: bottom right and 3D video in the Online Supplementary Material).

4.4 Arriving

Arriving immediately outside the cave entrances would have represented another significant stage in each journey. Groups would have rested, re-grouped, and reviewed the landscape here to varying degrees according to the arduousness of the ascent just undertaken, the group size, and the precise configuration of flat and sloping ground in front of each cave. Immediately outside Merinel cave's entrances, the space is narrow and sloping: you feel confined, it is difficult to sit here, you are enticed by the immediately visible left-hand entrance, which is well lit with a flat floor (Figure 5(4-left)). In contrast, at Sapo, small groups of people can sit on the relatively flat rocky rim of the cave hole and admire the view back towards the sea (Figure 5(3 and 4-right)).

A few people may also have gathered firewood at this stage, to take inside, if they had not already carried it up in bundles. The sight of the cave entrances would have elicited a variety of emotions depending on each person: relief at having arrived, exhaustion for some participants (related to their age or physical condition), but also expectation tinged with both excitement and anxiety about what was to happen inside

3 Online Supplementary Material: Animated 3D video of both landscapes (Cueva Merinel and Cueva del Sapo) https://doi.org/10.1515/opar-2022-0222.

these architecturally striking stone structures. The emotional rush is particularly strong outside Sapo cave where it becomes evident that you will next need to climb down a deep hole with vertical walls (Figure 8(5)).

Before proceeding, decisions and announcements were required as the configuration of the group. Who would enter first, who next, who last, and who not. One can assume that established social categories and relations counted.

4.5 Entering

The next step taken by the participants was to transgress one of the cave entrances. The significance of this stage within the whole ritual process cannot be understated. Thresholds and doorways are of cross-cultural symbolic significance, involving bodily practice of transition, transformation, and liminality, particularly, when crossed during the course of rites of passage (Bourdieu, 1977; Eriksen, 2013; van Gennep, 1960). These general concepts are applicable to the Edetan caves. Nevertheless, according to their precise form, number and position, and to who was negotiating them, the impact and import of the cave entrances would have varied culturally.

The spatial and social configuration of the group immediately outside the cave entrances would now have been set in motion. Merinel and Sapo caves' entrances needed to be negotiated one-by-one (Figures 6(5.1–5.3) and 8(5)). An order to people entering was, therefore, required. Some members of the group may even have chosen, or been obliged, to stay outside, according to their social status.

Experientially, the cave entrances would have been evaluated in terms of their ease (or difficulty) of access, including the extent to which their adjacent interior spaces were lit and visible. Merinel has three entrances, two of which lead directly and one indirectly to the circular space that precedes the interior ritual deposit (as can be seen in Figure 6(5.1–5.3) and the access analysis presented in Figure 7(1)). The small triangular entrance on the left-hand side (when facing the cave) is now the most accessible because of its flat floor, which lies on the same level as the space outside, and because you can discern the main interior space of the cave from it (once your eyes have adapted to the relative darkness). The middle, square entrance is more difficult to negotiate – depending on your agility and risk appetite – because it requires climbing down, assisted by speleothems that offer handholds and footholds, and in some cases by other people. The relatively large, oval, right-hand entrance seems easier from outside (if one ignores the dense vegetation that currently blocks it), but is actually the most difficult for accessing the ritual deposit as a 10 m deep, steep, and slippery, slope needs to be negotiated using a rope or a ladder. Depending on the emotional and sensorial requirements of each performance (Hamilakis, 2013; Hamilton et al., 2016), any of these entrances could have been chosen. Indeed, we should not discount their simultaneous use by different sub-groups, ordered, for example, by age or gender.

At Sapo, it is not yet certain how people in the past might have entered the cave because, in addition to today's vertical-sided, 5.5 m deep, hole, which needs to be climbed down nowadays with the help of a rope, a ladder, or just the fig tree (Figure 8(5)), our 3D map of the cave system indicates that a more accessible entrance might have connected the surface to the cave's corridor (see 3D profile in Figure 8), one end of which seems to be blocked by a substantial rock fall (Figure 8(7.1–7.2)). If entry was via the vertical hole, then a quick decision would have been required as to how to proceed, because of the restricted space, the steeply sloping and uneven floor at the bottom of the hole, and the need to proceed one at a time. Either one can stay standing and walk down the sloping corridor to the right (northeast) through a natural rock doorway (Figure 8(7.4)), or one can crouch and move to the left (southwest) through a small triangular entrance (Figure 8(6 and 7.3)). Both portals present uninviting darkness ahead (see Figure 7(2)). Human entries into dark spaces often elicit apprehension over the unseen and unknown, although there are some who find such encounters, and their particular "visual temporality", attractive, challenging, and exciting (Weismantel, 2013). Ultimately, whoever was at the front of the group would have led the way.

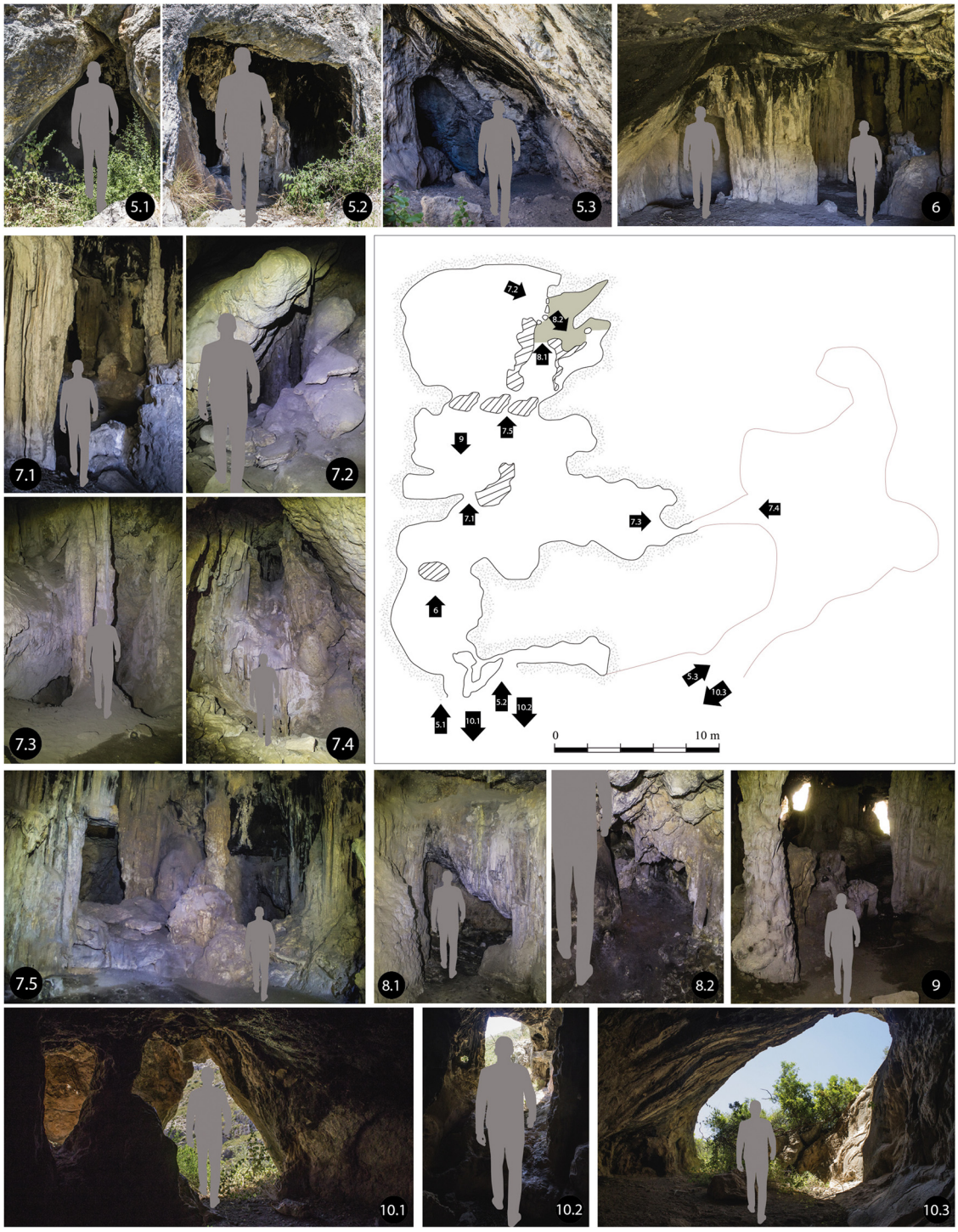

Figure 6: Experiential stages in Cueva Merinel (human scale: 1.90 m): entering (5.1–5.3), just inside (6), moving inside (7.1–7.5), performing in the sacred spaces (8.1–8.2), ritual endings (9), and exiting (10.1–10.3), with location plan (ritual deposit area highlighted in colour, based on Martínez Perona, 1992, Figure 1).

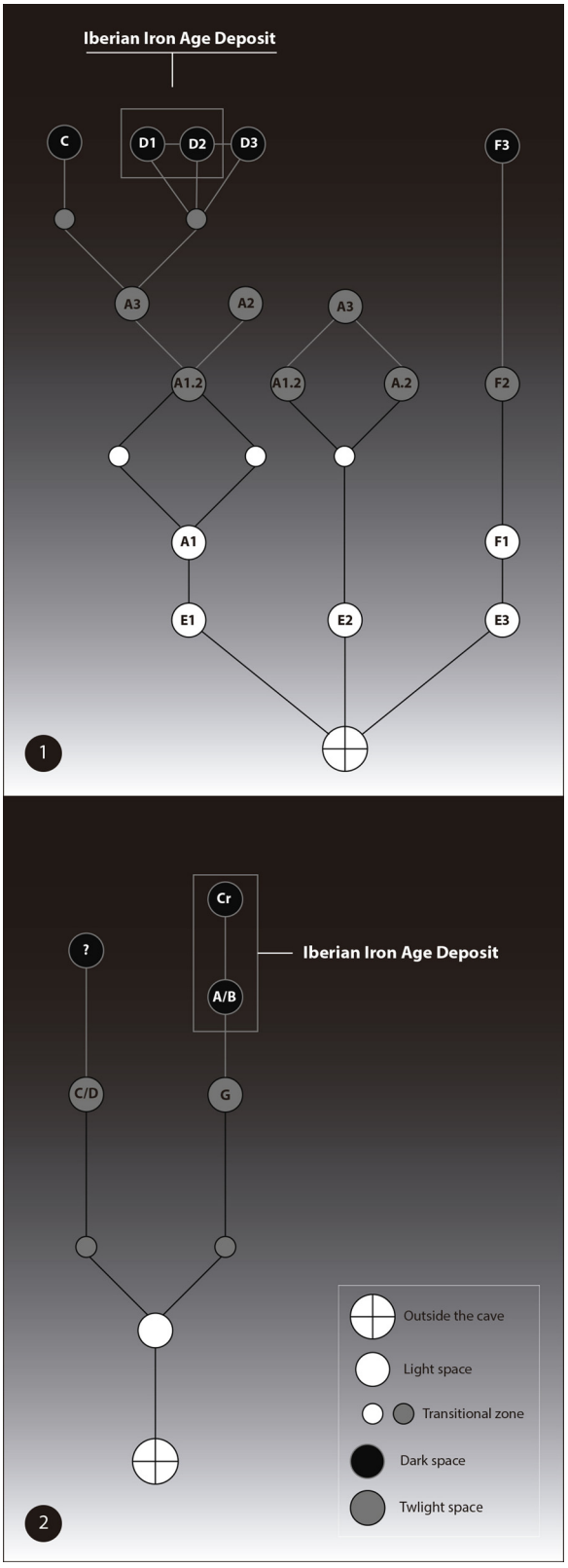

Figure 7: Access analysis for Cueva Merinel (1) and Cueva del Sapo (2).

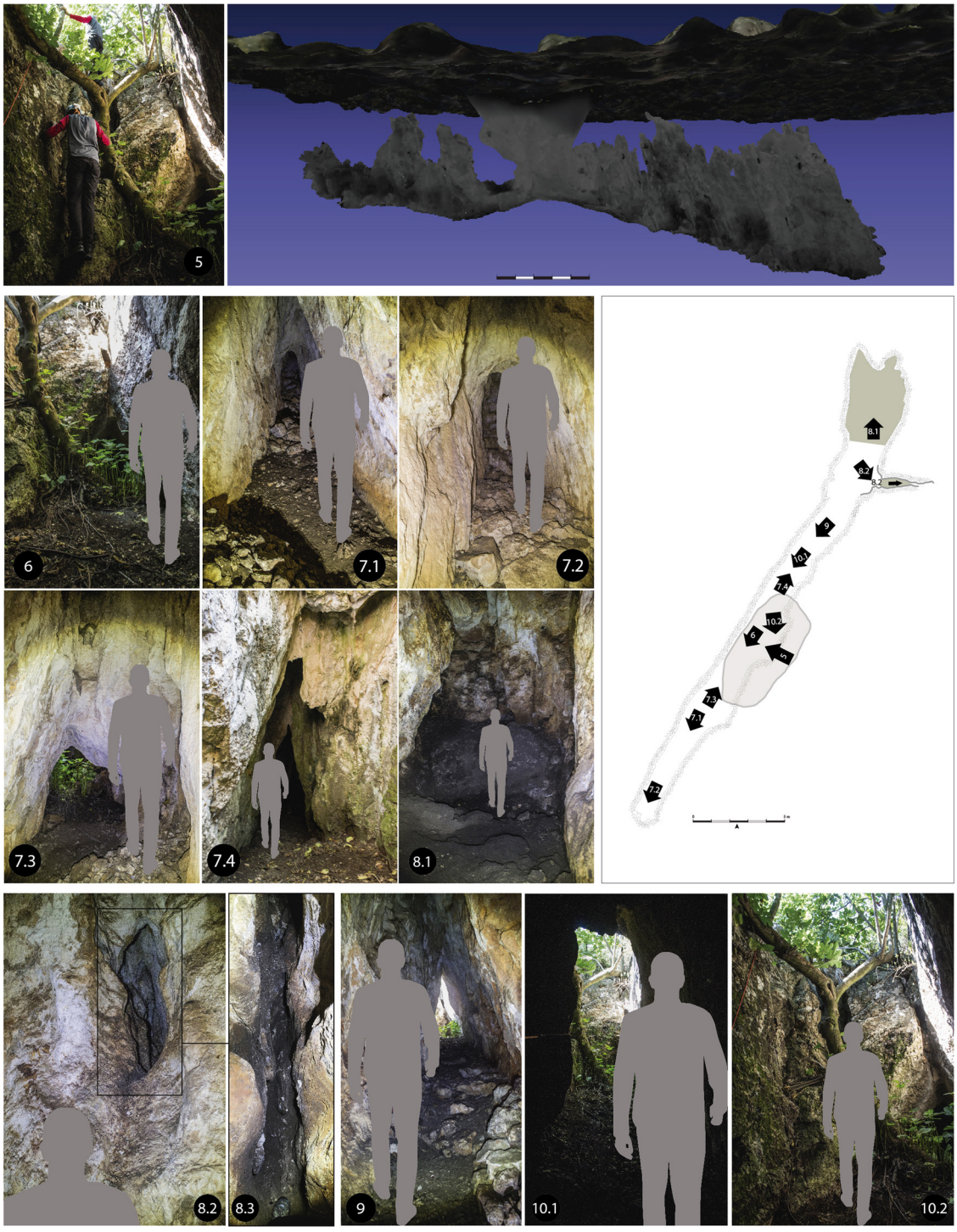

Figure 8: Experiential stages in Cueva del Sapo (human scale: 1.90 m): entering (5), just inside (6), moving inside (7.1–7.4), performing in the sacred spaces (8.1–8.3), ritual endings (9), and exiting (10.1–10.2), with 3D model profile (Global Mediterránea & Geomática) and location plan (ritual deposit area highlighted in colour).

4.6 Just Inside

Having crossed the cave's threshold, members of the group would have entered into a transitional zone and state. A key shared perceptual feature in caves is a first impression that you are both "inside" and "below":

in an underground space closed in by rock, whose environment contrasts with that just left behind. Perception of this transition can be marked or subtle, immediate or gradual, accurate or misjudged, fleeting or memorable, depending on the cave morphology and especially on the light level, in what always turns out (when measured objectively) to be a twilight zone.

At Merinel, the left-hand entrance transitions seamlessly into a circular entrance chamber, 5 by 6 m in extent with a 4 m high ceiling (Figure 6(6)). Up to 10 people can stand up or sit down in this space and breathe easily due to fresh air circulating from the entrances. Not surprisingly, this chamber has been used as a shelter on several occasions (for shepherds, fugitives, and archaeologists) (F. Blay, personal communication, 2015).

At Sapo, having entered first via the vertical hole and then progressed down through the portal to the right, the transition is much more rapid (Figure 8(7.4)). It takes place in the first 2–3 m of the now underground corridor, which remains lit, but obscured by one's own and other people's bodies behind when heading to the bottom of the cave, and with darkness immediately ahead.

These transitions had the potential to be marked by preliminary ritual acts. These, however, need not have left any material traces.

The mood of groups also tends to change at this point, becoming more serious, alert, and focussed on what lies around and ahead. Leadership and decision-making come again to the fore in response to the question of how to proceed, although the cave morphologies also play an influential part (see Figure 7). From the entrance chamber in Merinel, you cannot see the middle cave entrance, but with light beaming through it, a group of speleothems are highlighted ahead, drawing visitors on and to the right, rather than left through an easily overlooked but intriguing, modified, rectangular doorway (see right human grey shape in Figure 6(6)). In Sapo, the only option is to continue on down the corridor (Figure 8(7.4)).

4.7 Moving on Through the Cave

Each group's progress deeper into the caves would have been characterised by some similar and novel experiences and perceptions. As before, an experienced guide is likely to have continued to lead the way, with the rest of the company following as a unified group (albeit with different levels of agility). Some participants, however, might have progressed on their own, depending on their physical and emotional confidence. Safety for oneself and one another would again have been a key concern, augmented now by a growing sense of unease as the known became replaced by the strange, twilight by more complete darkness, tempo by timelessness. While the outside world began to be forgotten, abnormal vibrant things would have been encountered: dripping speleothems, bats, and cave insects. Immaterial small-scale ritual acts could again have been performed along the way.

Each cave system affords a different bodily and emotional experience, depending on each person, how challenging they find the underground spaces to stand in and move through, levels and qualities of light, sound and humidity, the amount and stability of rocks and sediments underfoot, the extent to which bats are flapping around, and so on.

In Merinel, the light filtering in from the entrances dimly illuminates a circular space surrounded by tall stalactite columns, within which as many as 15 people can gather (Figure 6(7.1)). Some of the group may have remained here, looking forward into the gloom, and back at the cave entrances, which appear from this point like shining eyes (Figure 6(9)). Other people may have moved through the cave and stopped in an adjacent space, accessible from the oval entrance (Figure 6(5.3)), but separated from the circular space by a 10 m slope (Figure 6(7.4)). In the circular space, the light is strongest around the summer solstice, when an adjacent rock fall is also illuminated (Esteban, 2021). Having climbed over this (with help for those carrying objects in their hands), the cave presents a choice of direction: left, into a large downward sloping space with an accumulation of rocks, or right, to reach a cluster of small dark spaces, also delimited by speleothems (Figure 6(7.5 and 7.2)).

Sapo's 18 m long corridor, which is straight and narrow (1.3–1.8 m wide) is more straightforward to navigate, but still presents challenges. The darkness instils anxiety, over personal safety and what lives down there. Descending the uneven and slippery slope in single file, visitors sometimes touch one or both side walls (Figure 8(7.4 and 9)). Doing this hands-free, while carrying things, can be particularly dangerous. You focus on reaching the end of the corridor, and you know when you have done so because the space opens up slightly (3.2 m wide) (both to the left and above; Figure 8(8.1)), the walls are now coated with some wet stalagmites, and you can feel the humidity and cold, especially in the summer (when the contrast with outside is strongest). Looking back, a little light illuminates the entrance to the corridor (Figure 8(9 and 10.1)). At around 3 pm in late summer, nowadays, it also reaches weakly to the bottom here, enabling you to discern without a torch the outline of the face of a person standing by the right (northeast) wall.

Hidden from sight, in some of the deepest, darkest, most humid, and cramped spaces of each cave, encased in otherworldly speleothems, a few representative members of each group would have now reached their sacred destinations.

4.8 Performing in Sacred Spaces

In our two caves, and in many others, the precise spaces to be sacralised through ritual acts of deposition share some key architectural and experiential features. Archaeological studies of ritualised underground spaces around the world agree that they are often amongst the deepest and darkest cave zones and, frequently being naturally bounded, they are restricted in size and secluded (e.g. Büster et al., 2019; Dowd, 2015; Moyes, 2012). Translated into experimental terms, visitors to these spaces can feel some discomfort (due to constrained bodily movement) and can feel isolated and disoriented (even if some light from the entrance can be seen), but they generally also feel calmer and more intimate, with the few other people there, and especially with the cave, whose damp surfaces they now inevitably touch with their bodies (Betts, 2003, p. 115; Tringham, 2013, p. 178) (see sensorial stimuli in Figure 4). This vibrant sensorial encounter also extends to the residues of previous rituals performed in those spaces, which often led to the accumulation of offerings. Depending on the available artificial light, these historic things could have been inspected, rearranged, and sampled, triggering echoes of former performances, times, and people. Repeating the ritual process in their own ways, our groups would have incorporated their own selection of symbolically significant offerings within these assemblages – including human remains, body ornaments, ceramic vessels, and their contents, selected joints and types of meat – all of which now referenced the lived-in world outside at the same time as appealing to the inhabitants of the underworld. Perhaps, members of the group took turns to deposit these things, moving from adjacent waiting areas in and out of the reified sensorium of the inner sanctum, where only shadows and muffled voices could be discerned. Codified body language and gestures would have contributed to communication during rituals. Some indication of these is provided by iconographic representations of the body in other Iberian Iron Age ritual contexts, including acts of giving, touching, looking, and listening. In particular, ritual corporeality is visible on some bronze votive offerings and terracotta figurines, with enlarged hands, eyes and ears, and bare feet, which underline the significance of the senses and of physical contact and communication with ritual spaces and supernatural forces (Grau, Amorós, & López-Bertran, 2017; López-Bertran & Víves-Ferrándiz, 2018; Rueda, 2011). More specifically, such gestures have been interpreted in terms of ritual actions such as presentation, salutation, prayer, propitiation of fertility, and different offerings (Nicolini, 1969; Prados, 1992).

Merinel's ritual deposits extend across two small interconnected spaces, constricted by dripping speleothems, with dark and damp interiors. Just how developed and active these speleothems were 2000 years ago need to be established. Approaching from the left, a maximum of four or five people can squeeze into the first of the cavities (D1: measuring 2 m wide, 8 m deep, and 2 m high), with just one person standing and the others crouched, while only one or two people can see and fit into the connecting narrower space (D2: 0.7 m wide, 0.5 m deep, and 1 m high), on hands and knees (Figure 6(8.1 and 8.2)). A third, adjacent small

space is even less accessible (needing to be approached from the right, squeezing between two speleothems), and lacks cultural deposits (see plan, with ritual deposit area highlighted in colour, in Figure 6). From within the two enclosed depositional spaces, you can hear people elsewhere in the cave but only see shadows, and so you can feel isolated and slightly disoriented. Ritual acts performed in these spaces would not have been entirely secret, particularly when artificially illuminated, but the sights and sounds reaching potential audiences situated at different observational points elsewhere in the cave would have been obscured to varying degrees, especially by the speleothem screens. These sensorial distinctions could have reinforced social ones within the group, but also had the liminal potential to challenge and modify them.

The deposits found here in Merinel had accumulated across many generations, spanning the Chalcolithic, Bronze Age, and Iberian Iron Age (at least, from 2250 BC until the last phase of the Iberian Iron Age: 300 BC) (Aparicio et al., 1983; Aparicio, 1991; Machause López, 2019). Encounters with old-fashioned objects, including fragments of distinctive bell beakers, flint flakes, a wooden bead and perforated Cardium shells, could have deepened the vibrancy of these spaces, as well as the legitimacy and social significance of the rituals (Bradley, 2002, pp. 122–123; Mills & Walker, 2008, p. 8).

The Iberian Iron Age ceramic vessels are relatively easy to categorise, by appearance and touch, and are likely to have retained their quotidian distinctions in the cave, albeit with new layers of symbolic significance. A collection of at least 20 more-or-less intact pottery vessels was recovered from Merinel, plus fragments representing many others. The most frequent form (in the currently published corpus) comprises around 42 small *calyx* vessels, none taller than 6.4 cm, with thin walls and plain surfaces, sometimes slip-coated and burnished (Figure 3(1c)). These could have been held – according to contemporary sculptural representations (Izquierdo, 2003) – by one donor, generally women, in two hands, with the thumbs behind and eight fingers gripped around the front, or in one hand by two people. Although also used in quotidian contexts, they multiplied as offerings in the cave, perhaps used as lamps or containing organic offerings, such as libations (Martínez Perona, 1992). Cooking jars and matching lids, made of a coarser reduced fabric, are likely to have held prepared food and drink. A few serving vessels – plates and bowls – made of a distinctive pale, oxidised, thin-walled fabric, decorated with painted geometric patterns (Figure 3(1c)) could also have presented offerings to chthonic forces.

Accompanying gifts of food are represented by the bones of pigs and ovicaprids (Figure 3(1a)). In both cases, there was a selective, symbolic emphasis on young animals (pigs of less than 6 months, ovicaprids less than 2 years) and on head parts (cranium and mandible fragments: pigs – 87% of all bones and ovicaprids – 81%) (Blay, 1992).

Three disarticulated human long bones (a tibia, a humerus, and a femur) were also found here. Some of these could have been ritually deposited along with other materials, whereas the femur that has been directly radiocarbon dated was deposited after the third century BC, at a time when the nature and significance of ritual practices might have placed a greater emphasis on ancestral relics. Whatever their precise date, these human bones could have been amongst the most potent objects to be deposited, with considerable symbolic and emotional connotations (e.g. Hill & Hageman, 2016; Nilsson Stutz, 2020).

A few valued ornaments also referenced missing bodies and more visible display in the lived-in world, at the same time as appealing aesthetically to the underworld's inhabitants. A small twisted ornament of shining bronze (perhaps a child's ring) (Figure 3(1b)), a fragment of a bronze *fibula* and a (now lost) small, disc-shaped bead of colourful vitreous paste recall examples from other settlements and caves in the region (Martínez Perona, 1992, p. 269).

At Sapo, ritual deposits have been excavated in three slightly different spaces: two towards the end of the (northeast) corridor (situated to the right of the vertical cave entrance), and one just inside the left (southwest) portal (see plan in Figure 8).

According to the currently available data, the area richest in archaeological objects, and also reused across the most periods, lies at the end of the northeast corridor, where the space opens up slightly, allowing up to four or five people to stand in a circle, in a humid, cold, and weakly illuminated other-worldly environment (Figure 8(8.1)). Radiocarbon determinations combined with ceramic typo-chronology are revealing that this space was repeatedly visited over a long period of time, between the Chalcolithic and Middle Ages, but also that the main

period of deposition was the Iberian Iron Age, between the fifth and second centuries BC (Machause et al., 2014). This reuse, and recent illicit excavations, have led to mixing of the upper 2 m of deposits.

A total of 75 disarticulated fragments of human bone were found here, including elements from an adult man and an adult woman (MNI). Interestingly, the remains of the woman, radiocarbon dated to c. 390–200 cal BC (2σ),[4] were not burnt. As in Merinel, this mortuary treatment contrasts with the common Iberian Iron Age rite of adult cremation and urnfield burial, and aligns closer to the treatment of anomalous members of society, represented by newborn infants buried under the house floors and skulls exhibited (perhaps as war trophies) in northeast Spain and southeast France (e.g. Oliver, 2004; Roure & Pernet, 2011). This unusual mortuary behaviour in a cave context adds to our appreciation of the diversity of mortuary rites performed in the Iberian Iron Age and to the distinctive symbolic significance of this particular cave space. This is, especially, interesting in the Edeta area as known mortuary contexts are very scarce here compared, for example, to the cemeteries in the southeastern part of the Iberian Peninsula.

Over 20 times as many pieces of animal bones (4,392) were recovered (from the 1983 excavation alone) and more pieces have been recovered in recent excavations. The most common species are red deer, followed by ovicaprids, and then a few dogs (Figure 3(2a)). Although this faunal assemblage may be multi-period, it is worth noting that, in contrast to Iron Age assemblages from settlement sites, wild species are more frequent and whole bodies more clearly represented at Sapo (by fuller representation of skeletal parts, and fewer signs of human modification through cutting, fire and fragmentation) (Machause & Sanchis, 2015). A practical and symbolic emphasis on hunting and herding make sense in this upland context, but, as sacrificial offerings, we should also think about the physical effort of carrying these carcasses, or part of them, down to the bottom of the cave and of the environmental impact of their subsequent decomposition.

About a third less (around 1,035) Iron Age ceramic fragments were found in this space (during the 1983 excavation) and more sherds of the same type have been found in recent excavations. They include seven large and heavy jars (Figure 3(2c)) and one amphora, which required at least two people to carry them (perhaps using a support structure), whereas food preparation vessels are represented by a mortar and five cooking jars, and serving vessels by nine plates and bowls and a *calyx*. These vessels are similar in form to those made and used at contemporary settlement and ritual sites, but are less varied and carry more decoration, which may reflect a degree of selection made at the start of the ritual journey. Ongoing residue analysis will help to determine if these vessels contained offerings of food and drink.

As at Merinel, a few bronze ornaments (described as a fibula and one small applique) added to the symbolic value of the ritual deposit, together with some fragments of iron (representing a ferrule, a spear, and a possible chisel; Figure 3(2b)).

A more spatially and materially circumscribed space was marked by a crack in the wall situated 13 m back up the corridor. First-time visitors to the cave do not notice the opening of this crack because of their focus on reaching the end of the corridor and because its base lies above the eye-line, 2.5 m above the present-day floor (Figure 8 (8.2 and 8.3)). It is, then, a relatively hidden space. Most people, however, need help to climb up into it and to avoid immediately falling back out, before standing in it one foot in front of the other, with one's torso slightly twisted. It is certainly a very intimate space, where the body moulds to the unyielding affordances of the cave rock, in a bodily position that soon becomes uncomfortable, aurally disorienting (the voices of people back in the adjacent corridor cannot be heard clearly), and enigmatic (air flowing in from the interior of the crack hints at the possibility of it ultimately connecting to the outside). A decorated sherd of Iberian Iron Age pottery was recovered here, as well as some charcoal, which might have come from a flaming torch in whose light the crack and corridor would have become visible.

Sapo cave's third deposit is somewhat contrasting and also more difficult to interpret. It lies in the opposite direction to the northeast corridor and is accessed by crouching down to pass through a low and narrow triangular portal (maximum 1.3 m high, 1.5 m wide, and 2.5 m deep; Figure 8(7.3)). This opens up into a slightly wider space (2.15 wide and 4.6 m high) that turns out to be the start (or end) of a dark corridor, which slopes upwards for around 8 m (unlikely to be a second cave entrance) but which is today blocked by

4 2130 ± 30 BP: Beta – 327999.

a rock fall (Figure 8(7.1 and 7.2)). The space is dimly illuminated by light entering via the portal and an adjacent small hole. The shallow deposits found here in 1983 had been disturbed by illegal excavations. They contained only a tenth of the number (110) of pottery sherds found at the end of the first corridor, including fragments of a plate and an amphora that actually re-fit with pieces found in that space, which raises the possibility that they might have been abandoned here by clandestine diggers in recent times.

4.9 Ritual Endings

To achieve the required impact on chthonic and human participants, the end of each ritual performance in the caves is likely to have been marked. One way to do this might have been for a person, maybe an experienced ritual leader, to re-order the materials in the sacred spaces, leaving the majority as sacrifices, but potentially also setting aside some for re-use during the next performance and others as ritually charged mementoes to be taken away. The under-representation of post-cranial body parts in the Merinel faunal assemblage offers a hint of the latter, as does the discovery of a fragment of stalactite at the Iberian Iron Age settlement of La Bastida de les Alcusses (Moixent, València) (Fletcher, Pla, & Alcácer, 1965, p. 211). Another approach, for which there is good archaeological evidence, especially in Merinel (e.g. charcoal and partly burnt bones), was to set fire to the offerings, in a spectacular finale of crackling flames, blazing light, heat, and choking smoke. This practice could have echoed contemporary mortuary rites of cremation. It also left little alternative but to leave the cave as quickly as possible (Figures 6(9) and 8(9)).

4.10 Exiting

The caves are likely to have been exited in an orderly fashion, both for safety reasons and to maintain the ritual process. The participants, having been separated by the confined innermost spaces, and due to the unfamiliarity of some of them with the layout of the caves, would have needed to regroup, prior to making their way back towards and out of the small cave entrances, one by one (Figures 6(10.1–10.3) and 8(10.1 and 10.2)). Some features of the caves would have been noticed for the first time, such as the shape of the doorways seen from the inside, through which light from outside now guides you back and draws you through (Figures 6(9) and 8(9 and 10.1)). Despite differences in cave environments, which can shade or highlight contrasts between being inside and outside, the sensation of leaving the cave is always perceptible, for example, through light, colours, vista, air quality, temperature, posture, and emotional release.

4.11 Moving Away

These marked contrasts are followed, outside and moving away from the cave entrances, by a progressive experience and emotional state of transition to being out in the open, alive to a familiar yet appreciable environment. In practice, larger groups re-connect and relax, either just outside the cave or in a more convenient area, depending on the precise configuration of the terrain. At Sapo, the process is relatively brief, with familiarity, the warmth of the sun and the panoramic view of the land and sea rediscovered immediately at the top of the vertical entrance hole. At Merinel, in contrast, the sloping ground and sensation of being boxed in encourage visitors to keep moving: climbing first down the ravine and then, having crossed the stream, up the opposite steep slope, to eventually reach (after some 20 min) the rim of high ground that affords an immense view out across the landscape and a chance to catch one's breath (Figure 9(11)). Before moving away, an exchange of impressions might take place (among performers, but also between performers and the people who stayed outside the cave). However, some information might have been kept secret.

Figure 9: Moving away (11) and descending (12) from Cueva Merinel (left) and Cueva del Sapo (right) (human scale: 1.90 m), with specific locations in the landscape (3D view) and orientation of the picture.

Moving on, participants would then have continued towards their homes, now visible again in the distance during any remaining daylight hours. (These observations assume Edeta and its environs to be "home"; different scenarios can be envisaged if, for example, the caves were visited from the neighbouring territory of La Carència to the South.) People often look back, at this point, to check that everyone is safely accounted for and to take a last look at the cave where the ritual has just been performed.

4.12 The Descent

The descent presents people with the simple new objective of getting home (Figure 9(12)). The way back tends to be easier, faster, and less consciously examined, with the route clearer to navigate and physical burdens lighter to carry (the bulk of them having been offloaded in the cave). This stage of the ritual process might have become reflectively inward and quiet, filled with thoughts from the experiences performed and experienced inside the cave, perhaps accompanied by a feeling of emotional release. All this, and the fact

that you are pointed in the opposite direction, can open you up to appreciating new aspects of the landscape (although other feelings, such as heat, fatigue, and hunger, can get in the way).

4.13 Returning Home

The final stage of the ritual journey culminated in homecoming but still involved a number of significant processes (Coleman & Elsner, 1995, p. 6). The group would have retraced their steps, back across the river Turia and the domestic landscape of Edeta, rediscovering familiar places and people along the way, but perhaps stopping before finally re-entering their daily lives and spaces (see Figures 1 and 2). In the same way that we consider converging paths from potentially multiple starting points, we can imagine here participants gradually dispersing to their respective dwelling places and families, in the case of larger, composite, groups. Here, they may have shared some immediate memories of their experiences and any souvenirs brought back, which captured the essence of the ritual experiences lived (Mazumbar & Mazumbar, 2004, p. 394), with initial excitement giving way to tiredness. Our travellers would then have resumed their daily lives, but in a changed state (varying from subtle to an overtly new social status) as a consequence of their rite of passage, equipped with new knowledge, experience, memories, and expectations. After due consideration, some of them would repeat the process, eventually leading the way (see Figure 4).

5 Concluding Thoughts

We hope that the foregoing scenarios might stimulate fresh questions and debate: about society and ritual in the Iberian Iron Age, and – more broadly – about approaches to cave archaeology, sensory archaeology, and ritual journeys. In the future, we will expand our study to incorporate an ever greater diversity of caves. Here, we highlight two relevant questions and some related concerns and responses.

First, what impact might all this have on current understandings of the Iberian Iron Age? Memorable ritual journeys across the landscape, incorporating performances in liminal sacred caves, might be broadly regarded as a regionally distinctive sensorial feature of Iberian Iron Age cultures and religion (both in general and from region-to-region), which contributed to social processes on various levels, as suggested in other areas (e.g. Alfayé, 2010, p. 183; Grau, 2012, 2016). Therefore, ritual caves should not be understood only as places of ritual deposition. Caves formed part of complex, dynamic, and extended ritual processes and sacred landscapes that incorporated dwelling places, embodied ritual passages and performances across the landscape, and involved only partial endings.

But was pilgrimage an elite-dominated process – led always by *oppidum*-based elite factions, and supported by selected followers, wishing to ritually legitimise and reinforce their power, and demarcate and protect their territories? Or was it a more local, small-scale form of ritual celebration? Was pilgrimage as structured and repetitious a process as we have proposed here (Figure 4)? Was linearity (or circularity) an intentional, even inevitable, dimension of pilgrimage, particularly given the affordances of the land-form and cave-form (ranging from natural lighting patterns within caves to the nature of archaeological cave sedimentation), or has it been imposed by us through our analytical approach? Despite highlighting contrasts between our two chosen caves, have we still underplayed diversity? Could movement through and liminal ritual performances in remote underground places have provided opportunities for establishing new practices, for subverting (even transforming) the social order, or for promoting more personal, family-scale interests and aspirations? To express our thoughts more candidly, we believe that the inclusion of daily objects (ceramic vessels in particular) suggests that the rituals were not exclusively concerned with or performed by an elite but were more socially diverse, making them relatively open to different people, practices, and interpretations. A similar argument has been made for the urban sanctuary of Edeta, which

has been understood as a space of collective aggregation (Bonet, 1995). The caves, then, could have hosted some performances that were strategically sponsored by social sub-groups, ranging from elite factions to commoner families, and others that belonged to a wider community, yet still mainly reinforced established social identities and power relations.

From this perspective, then, we can readily acknowledge that the two caves we have compared show differences as well as similarities, in terms of their diverse affordances and materialities (as detailed in Section 3). This ties in with the wider diversity of sacred places identified in the region (Grau & Amorós, 2013; Machause López, 2019; Moneo, 2003; Prados, 1994; Rueda, 2011), and with the lack of a unified Iberian Iron Age culture or religion (Grau & Rueda, 2018). Indeed, we prefer to think more about variability over space and time, over every repeated ritual performance and reconstructed memory of it (Connerton, 1989).

The second question is, what are the more general consequences of thinking in this way, for archaeology and for mobility and pilgrimage studies? Here, we refer back to the strengths and weakness of our sensory methodology, summarised in Table 1. Essentially, we believe that this kind of approach has helped us challenge established archaeological categories (with cave "sites" better understood as landscape) to adapt existing archaeological methods of visual observation and documentation, to consider and gather additional sensory data, to offer revised and richer (more contextualised, holistic, and embodied) interpretations of ritual journeys and experiences, and to highlight their inherent diversity across space, time, and society. At the same time, we look forward to incorporating the results of ongoing archaeological excavation and laboratory work into our inclusive and multifaceted interpretative scenario.

Acknowledgements: We gratefully acknowledge the postdoctoral fellowship provided to Sonia Machause by the APOSTD-Generalitat Valenciana-European Social Fund that enabled her research visit to Durham University (2019–2020). We also acknowledge the support provided by our respective institutions: Department of Prehistory, Archaeology and Ancient History, University of Valencia and Department of Archaeology, Durham University. We would like to express our gratitude to the field team that shared their diverse experiences of visiting the caves and of excavating in Cueva del Sapo: Consuelo Mata, Vanessa Albelda, Iván Amorós, Alessia Larini, Marta Blasco, Agustín Diez, Paco Blay, César Esteban, and Pau Calatayud. In addition, we are sincerely grateful to our colleagues who commented on earlier drafts of this article: Agustín Diez, Ignasi Grau, Beatriz Marín-Aguilera, Consuelo Mata, Cristina Real, John Robb, Simon Stoddart, Ruth Van Dyke, and two anonymous peer reviewers.

Funding information: Authors state no funding involved.

Author contributions: All authors have accepted responsibility for the entire content of this manuscript and approved its submission.

Conflict of interest: Authors state no conflict of interest.

Data availability statement: All data generated or analysed during this study are included in this published article and its supplementary information files.

References

Alberti, G. (2019). Movecost: An R package for calculating accumulated slope-dependent anisotropic cost-surfaces and least-cost paths. *SoftwareX*, *10*(July–December), 1–5. doi: 10.1016/j.softx.2019.100331.

Alfayé, S. (2010). Hacia el lugar de los dioses: Aproximación a la peregrinación religiosa en la Hispania indoeuropea. In F. Marco, F. Pina, & J. Remesal (Eds.), *Viajeros, peregrinos y aventureros en el mundo antiguo* (pp. 177–218). Barcelona: Universitat de Barcelona.

Aparicio, J. (1991). Campaniforme cordado de la Cueva Merinel (Bugarra, Valencia). *Lauro*, *5*, 131–140.

Aparicio, J., San Valero, J., Martínez, J., Morote, G., Martínez, J., López, P., … Esteve, C. (1983). Actividades arqueológicas desde 1979 a 1982. *Varia*, *II*, 375–378.

Barnatt, J., & Edmonds, M. (2002). Places apart: Caves and monuments in Neolithic and earlier Bronze Age Britain. *Cambridge Archaeological Journal*, *12*(1), 113–129. doi: 10.1017/S0959774302000069.

Bender, B. (1993). *Landscape: Politics and perspectives*. Providence: Berg.

Bender, B. (2001). Landscapes on-the-move. *Journal of Social Archaeology*, *1*(1), 75–89. doi: 10.1177/146960530100100106.

Bennett, J. (2010). *Vibrant matter: A Political ecology of things*. Durham (NC): Duke University.

Bergsvik, K. A., & Skeates R. (2012). *Caves in context: The cultural significance of caves and rockshelters in Europe*. Oxford: Oxbow Books.

Betts, E. (2003). The sacred landscape of Picenum (900–100 BC). Towards a phenomenology of cult places. In J. B. Wilkins & E. Herring (Eds.), *Inhabiting symbols: Symbol and image in the Ancient Mediterranean* (Accordia Reserarch Institute, Vol. 5) (pp. 101–120). London: University of London.

Blay, F. (1992). Cueva Merinel (Bugarra). Análisis de la fauna. In J. Juan Cabanilles (Ed.), *Estudios de Arqueología ibérica y romana. Homenaje a Enrique Pla Ballester* (Serie de Trabajos Varios del SIP 89, pp. 283–287). Valencia: Diputación Provincial de Valencia.

Bonet, H. (1995). *El Tossal de Sant Miquel de Llíria: La antigua Edeta y su territorio*. Valencia: Diputación de Valencia.

Bonet, H., Mata, C., & Moreno, A. (2008). Iron age landscape and rural habitat in the Edetan Territory, Iberia (4th–3rd centuries BC). *Journal of Mediterranean Archaeology*, *21*(2), 165–189. doi: 10.1558/jmea.v21i2.165.

Bonet, H., & Mata, C. (1997). Lugares de culto edetanos. Propuesta de definición. *Quaderns de Prehistòria i Arqueología de Castelló*, *18*, 115–146.

Bonet, H., Grau, I., & Vives-Ferrándiz, J. (2015). Estructura social y poder en las comunidades ibéricas de la franja central mediterránea. In C. Belarte, D. Garcia, & L. Sanmartí (Eds.), *Les estructures socials protohistòriques a la Gàl·lia i a Ibèria* (Arqueo Mediterrània 14, pp. 251–272). Barcelona: Universitat de Barcelona.

Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge: Cambridge University Press.

Bradley, R. (2002). *The past in Prehistoric societies*. Cambridge: Cambridge University Press.

Brück, J. (1998). In the footsteps of the ancestors. *Archaeological Review from Cambridge*, *15*, 23–36.

Brück, J. (2005). Experiencing the past? The development of a phenomenological archaeology in British prehistory. *Archaeological Dialogues*, *12*(1), 45–72. doi: 10.1017/S1380203805001583.

Büster, L., Warmenbol E., & Mlekuz D. (Eds.). (2019). *Between worlds. Understanding ritual cave use in later prehistory*. Cham: Springer.

Casey, E. (1993). *Getting back into place: Toward a renewed understanding of the place-world*. Bloomington, IN: Indiana University Press.

Chadwick, A. (2004). Geographies of sentience' – an introduction to space, place and time. In A. Chadwick (Ed.), *Stories from the landscape. Archaeologies of inhabitation* (pp. 1–31). Oxford: BAR International Series 1238.

Coleman, S., & Elsner, J. (1995). *Pilgrimage. Past and present in the World religions*. Cambridge, MA: Harvard University Press.

Coleman, S. (2002). Do you believe in pilgrimage? Communitas, contestation and beyond. *Anthropological Theory*, *2*, 355–368. doi: 10.1177/1463499602002003805.

Coleman, S., & Eade, J. (Eds.). (2004). *Reframing pilgrimage. Cultures in motion*. London: Psychology Press.

Connerton, P. (1989). *How societies remember*. Cambridge: Cambridge University Press.

Cox, S. L., Ruff, C. B., Maier, R. M., & Mathieson, I. (2019). Genetic contributions to variation in human stature in prehistoric Europe, *PNAS*, *116*(43), 21484–21492. www.pnas.org/cgi/doi/10.1073/pnas.1910606116

Cummings, V., & Johnston, R. (Eds.). (2007). *Prehistoric journeys*. Oxford: Oxbow Books.

Dowd, M. (2015). *The archaeology of caves in Ireland*. Oxford: Oxbow Books.

Dowd, M., & Hensey, R. (Eds.). (2016). *The archaeology of darkness*. Oxford: Oxbow Book.

Eriksen, M. H. (2013). Doors to the dead. The power of doorways and thresholds in Viking Age Scandinavia. *Archaeological Dialogues*, *20*(2), 187–214. doi: 10.1017/S1380203813000238.

Esteban, C. (2021). Caves, astronomy and ritual on the Iberian Peninsula. In S. Machause, C. Rueda, I. Grau, & R. Roure (Eds.), *Rock & ritual. Caves, rocky places and religious practices in the Ancient Mediterranean*. Montpellier: Mondes Anciens, Presses Universitaires de la Méditerranée.

Fazenada, B., Scarre, C., Till, R., Jiménez Pasalodos, R., Rojo Guerra, M., Tejedor, C., … Foulds, F. (2017). Cave acoustics in prehistory: Exploring the association of Palaeolithic visual motifs and acoustic response. *The Journal of the Acoustical Society of America*, *142*(3), 1332–1349. doi: 10.1121/1.4998721.

Fernández, J., Garay, P., Giménez, S., Ibañez, P., & Sendra, A. (1982). *Catálogo espeleológico del País Valenciano* (tomo II). Valencia: Federació Valenciana d'Espeleologia.

Fletcher, D., Pla, E., & Alcácer, J. (1965). *La Bastida de les Alcuses I* (*Mogente-Valencia*) (Serie de Trabajos Varios del SIP 24). Valencia: Diputación Provincial de Valencia.

Friese, W., & Kristensen, T. M. (Eds.). (2017). *Excavating pilgrimage archaeological approaches to sacred travel and movement in the ancient world*. London and New York: Routledge, Taylor & Francis Group.

Gil-Mascarell, M. (1975). Sobre las cuevas ibéricas del País Valenciano. Materiales y problemas. *SAGVNTVM-PLAV*, 11, 281–332. doi: 10.7203/SAGVNTVM.

González-Alcalde, J. (2005). Una aproximación a las cuevas-santuario ibéricas en el País Valenciano. *Madrider Mitteilungen*, 46, 87–103.

González Reyero, S., Sánchez-Palencia, F. J., Flores, C., & López Salinas, I. (2014). Procesos de apropiación y memoria en el sureste peninsular durante la segunda edad del hierro: Molinicos y La Umbría de Salchite en la construcción de un territorio político. *Zephyrus*, *LXXIII*, 149–170. doi: 10.14201/zephyrus201473149170.

Gibson, E. (2007). The archaeology of movement in a Mediterranean landscape. *Journal of Mediterranean Archaeology*, *20,* 61–87. doi: 10.1558//jmea.2007.v20i1.61.

Grau, I. (2011). Landscape Dynamics, political processes, and social strategies in the Eastern Iberian Iron Age. In T. Moore & X. L. Armada (Eds.), *Atlantic Europe in the first millennium BC: Crossing the divide* (pp. 153–170). Oxford: Oxford University Press.

Grau, I. (2012). Landscape and ethnic identities in the Early States of Eastern Iberia. In G. Cifani & S. Stoddart (Eds.), *Landscape, ethnicity and identity in the Archaic Mediterranean Area* (pp. 228–244). Oxford: Oxbow Books.

Grau, I. (2016). Forging communities: Coalitions, identity symbols and ritual practices in Iron Age Eastern Iberia. *World Archaeology*, *48*(1), 110–124. doi: 10.1080/00438243.2015.1086671.

Grau, I. (2019). Social dynamics in Eastern Iberia Iron Age: Between inclusive and exclusionary strategies. In B. X. Currás & I. Sastre (Eds.), *Alternative iron ages: Social theory from archaeology analysis* (pp. 337–358). London & New York: Routledge.

Grau, I., & Rueda, C. (2018). La religión en las sociedades iberas: Una visión panorámica. *Revista de Historiografía*, *28*, 47–72. doi: 10.20318/revhisto.2018.4207.

Grau, I., & Amorós, I. (2013). La delimitación simbólica de los espacios territoriales: El culto en el confín y las cuevas-santuario. In C. Rísquez & C. Rueda (Eds.), *Santuarios iberos: Territorio, ritualidad y memoria* (Actas del Congreso Internacional "El Santuario de la Cueva de La Lobera de Castellar. 1912–2012", Jaén, 4–6 octubre 2012, pp. 183–212). Jaén: Asociación Para el Desarrollo Rural de la Comarca de El Condado.

Grau, I., Amorós, I., & López-Bertran, M. (2017). La colección de terracotas. In I. Grau, I. Amorós, & J. M. Segura (Eds.), *El Santuario ibérico y romano de la Serreta* (*Alcoi, Cocentaina, Penàguila*). *Prácticas rituales y paisaje en el àrea central de la Contestania* (pp. 61–118). Alcoi: Ajuntament d'Alcoi.

Hamilakis, Y. (2013). *Archaeology of the senses. Human experience, memory, and affect*. New York (NY): Cambridge University Press.

Hamilakis, Y. (2017). Sensorial assemblages: Affect, memory and temporality in assemblage thinking. *Cambridge Archaeological Journal*, *27*(1), 169–182. doi: 10.1017/S0959774316000676.

Hamilakis, Y. (2002). "Too many chiefs?" Factional competition in neopalatial Crete. In J. I. Schoep & R. Laffineur (Eds.), *Monuments of minos: Rethinking the minoan palaces* (Aegaeum 23, pp. 179–199). Liege: Université de Liège.

Hamilton, S., Seager Thomas, M., & Whitehouse, R. (2016). Sensory worlds of Grotta Scaloria. In E. S. Elster, E. Isetti, J. Robb, & A. Traverso (Eds.), *Archaeology of Grotta Scaloria: Ritual in Neolithic Southeast Italy* (pp. 91–108). Los Angeles (CA): The Cotsen Institute of Archaeology Press, UCLA.

Hill, E., & Hageman, J. B. (Eds.). (2016). *The archaeology of ancestors. Death, memory, and veneration*. Gainesville, FL: University Press of Florida.

Hillier, B., & Hanson, J. (1984). *The social logic of space*. New York, NY: Cambridge University Press.

Ingold, T., & Vergunst, J. L. (2008). *Ways of walking: Ethnography and practice on foot.* Hampshire: Ashgate.

Izquierdo, I. (2003). La ofrenda sagrada del vaso en la cultura ibérica. *Zephyrus*, *LVI*, 117–35. doi: 10.14201.

Lash, R. (2018). Enchantments of stone: Confronting other-than-human agency in Irish pilgrimage practices. *Journal of Social Archaeology*, *18*(3), 284–305.

Latour, B. (1986). Visualization and cognition: Thinking with eyes and hands. In H. Kuklick (Ed.), *Knowledge and society studies in the sociology of culture past and present* (Vol. 6, pp. 1–40). Greenwich, CT: JAI Press.

López-Bertran, M. (2011). Practical movements: Kinetic rituals in the ancient Western Mediterranean. *Journal of Mediterranean Archaeology*, *24*(1), 85–109. doi: 10.1558/jmea.v24i1.85.

López-Bertran, M., & Víves-Ferrándiz, J. (2018). Tiny bodies for intimate worlds. Human figurines in Iberian Iron Age Sactuaries. In S. R. Martin & S. M. Largin-Hooper (Eds.), *The tiny and the fragmented: Miniature, broken, or otherwise incomplete objects in the ancient world* (pp. 145–169). New York: Oxford University Press.

Johnson, M. H. (2012). Phenomenological approaches in landscape archaeology. *Annual Review of Anthropology*, *41*(1), 269–284. doi: 10.1146/annurev-anthro-092611-145840.

Machause López, S. (2019). *Las cuevas como espacios rituales en época ibérica. Los casos de Kelin, Edeta y Arse*. Jaén: Colección Arqueologías, Serie Ibera, UJA Editorial.

Machause López, S., & Diez Castillo, A. (in prep.). *Moving through the landscape in the Iberian Iron Age: GIS, caves and ritual performance*.

Machause, S., Pérez, A., Vidal, P., & Sanchis, A. (2014). Prácticas rituales ibéricas en la Cueva del Sapo (Chiva, Valencia): Más allá del caliciforme. *Zephyrus*, *LXXIV*, 157–179. doi: 10.14201/zephyrus201474157179.

Machause, S., & Sanchis, A. (2015). La ofrenda de animales como práctica ritual en época ibérica: La Cueva del Sapo (Chiva, Valencia). In A. Sanchis & J. Ll. Pascual (Eds.), *Preses petites i grups humans en el passat* (II Jornades d'Arqueozoologia del Museu de Prehistòria de València, pp. 261–286). València: Diputació de València, Museu de Prehistòria.

Machause, S., & Quixal, D. (2018). Cuevas rituales ibéricas en el territorio de Kelin (ss. V-III a.C.). *Complutum*, *29*(1), 115–134. doi: 10.5209/CMPL.62398.

Machause, S., Rueda, C., Grau, I., & Roure, R. (Eds.). (2021). *Rock & Ritual: Caves, rocky places and religious practices in the ancient Mediterranean*. Montpellier: Mondes Anciens, Presses universitaires de la Méditerranée.

Maiese, M. (2011). *Embodiment, emotion, and cognition*. UK: Palgrave Macmillan.

Martínez Perona, J. V. (1992). El santuario ibérico de la Cueva Merinel (Bugarra). En torno a la función del vaso caliciforme. In J. Juan Cabanilles (Ed.), *Estudios de arqueología ibérica y romana. Homenaje a enrique pla Ballester* (Serie de Trabajos Varios del SIP 89, pp. 261–282). Valencia: Diputación Provincial de Valencia.

Mazumbar, S., & Mazumbar, S. (2004). Religion and place attachment: A study of sacred places. *Journal of Environmental Psychology*, *24*, 385–397. doi: 10.1016/j.jenvp.2004.08.005.

Méniel, P. (2012). Archéozoologie et sanctuaires: Quelques développements récents. In O. De Cazanove & P. Méniel (Eds.), *Étudier les lieux de culte de Gaule romaine* (Actes de la Table Ronde de Dijon, 18–19 Septembre 2009, pp. 10–20). Montagnac: Éditions Monique Mergoil.

Mills, B., & Walker, W. H. (2008). Memory, materiality, and depositional practice. In B. J. Mills & W. H. Walker (Eds.), *Memory work: Archaeologies of material practices* (pp. 3–23). Santa Fe: School for Advanced Research Press.

Mlekuz, D. (2011). What can bodies do? Bodies and caves in the Karst Neolithic. *Documenta Praehistorica*, *XXXVIII*, 97–107. doi: 10.4312/dp.38.8.

Moneo, T. (2003). *Religio ibérica: Santuarios, ritos y divinidades* (*siglos VII-I a.C.*). Madrid: Real Academia de la Historia.

Moyes, H. (Ed.). (2012). *Sacred darkness: A global perspective on the ritual use of caves*. Boudler, CO: University Press of Colorado.

Morinis, A. (Ed.). (1992). *Sacred journeys: The anthropology of pilgrimage*. London: Greenwood Press.

Nicolini, G. (1969). *Les bronzes figurés des sanctuaires ibèriques*. Paris: Presses Universitaires.

Nilsson Stutz, L. (2020). Sensing death and experiencing mortuary ritual. In R. Skeates & J. Day (Eds.), *The routledge handbook of sensory archaeology* (pp. 149–163). London: Routledge.

Nordin, A. (2009). Ritual agency, substance transfer and the making of supernatural immediacy in pilgrim journeys. *Journal of Cognition and Culture*, *9*, 195–223. doi: 10.1163/156770909X12489459066228.

Oliver, A. (2004). Sacrificios y 'mala muerte' en el registro arqueológico de los yacimientos ibéricos. *Espacio, Tiempo y Forma, Serie I. Prehistoria y Arqueología*, *16/17*, 391–417. doi: 10.5944/etfi.16-17.2003.4763.

Papadopoulos, C., Hamilakis, Y., Kyparissi-Apostolika, N., & Díaz-Guardamino, M. (2019). Digital sensoriality: The Neolithic figurines from Koutroulou Magoula, Greece. *Cambridge Archaeological Journal*, *29*(4), 625–652. doi: 10.1017/S0959774319000271.

Peterson, R. (2019). Do caves have agency? In L. Büster, E. Warmenbol, & D. Mlekuz (Eds.), *Between worlds. Understanding ritual cave use in later Prehistory* (pp. 29–44). Cham: Springer Nature Switzerland. doi: 10.1007/978-3-319-99022-4.

Pla Ballester, E. (1985). Excavación de urgencia en la Cueva del Sapo, del término de Chiva. In E. Pla Ballester (Ed.), *La labor del Servicio de Investigación Prehistórica y su Museo en 1983* (pp. 56–60). Valencia: Diputación de Valencia.

Prados, L. (1992). *Exvotos ibéricos de bronce del Museo Arqueológico Nacional*. Madrid: Ministerio de Cultura.

Prados, L. (1994). Los santuarios ibéricos. Apuntes para el desarrollo de una arqueología de culto. *Trabajos de Prehistoria*, *51*(1), 129–140. doi: 10.3989/tp.1994.v51.i1.470.

Portell, E. (1983). *Informe preliminar sobre el sondeo de urgencia realizado en la "Cova del Sapo", Chiva* (*Valencia*) (Unpublished report (Servei Investigació Prehistòrica-Museu de Prehistòria de València)).

Roure, R., & Pernet, L. (Eds.). (2011). *Des rites et des Hommes. Les pratiques symboliques des Celtes, des Ibères et des Grecs en Provence, en Languedoc et en Catalogne*. Paris: Éditions Errance.

Rueda, C. (2011). *Territorio, culto e iconografía en los santuarios iberos del Alto Guadalquivir* (*ss. IV a.n.e.-I d.n.e.*). Jaén: CAAI Textos, Universidad de Jaén.

Rueda, C. (2013). Ritos de paso de edad y ritos nupciales en la religiosidad ibera: Algunos casos de studio. In C. Rísquez & C. Rueda (Eds.), *Santuarios iberos: Territorio, ritualidad y memoria* (Actas del Congreso Internacional "El Santuario de la Cueva de La Lobera de Castellar. 1912–2012", Jaén, 4–6 Octubre 2012, pp. 341–384). Jaén: Asociación para el desarrollo rural de la Comarca de El Condado.

Rueda, C., & Bellón, J. P. (2016). Culto y rito en cuevas: Modelos territoriales de vivencia y experimentación de lo sagrado, más allá de la materialidad (ss. V-II a.n.e.). In S. Alfayé (Ed.), *Verenda numina: Temor y experiencia religiosa en el mundo antiguo* (pp. 43–80). Madrid: Monográfico de la Revista Arys (no. 14).

Ruiz, A., & Molinos, M. (1998). *The archaeology of the Iberians* (translated from the Spanish by Mary Turton). New York: Cambridge University Press.

Scriven, R. (2014). Geographies of pilgrimage: Meaningful movements and embodied mobilities. *Geography Compass*, *8*(4), 249–261. doi: 10.1111/gec3.12124.

Skeates, R. (2007). Religious experience in the prehistoric Maltese Underworld. In D. A. Barrowclough & C. Malone (Eds.), *Cult in context: Reconsidering ritual in archaeology* (pp. 90–96). Oxford and Oakville, CT: Oxbow Books.

Skeates, R. (2010). *An archaeology of the senses: Prehistoric Malta*. Oxford: Oxford University Press.

Skeates, R. (2016). Experiencing darkness and light in caves: Later prehistoric examples from Seulo in central Sardinia. In M. Dowd & R. Hensey (Eds.), *The archaeology of Darkness* (pp. 39–49). Oxford: Oxbow Books.

Skeates, R., & Day, J. (2020). Sensory archaeology: Key concepts and debates. In R. Skeates & J. Day (Eds.), *The routledge handbook of sensory archaeology* (pp. 1–17). London and New York: Routledge.

Stoddard, R. H. (1997). Defining and classifying pilgrimages. In R. H. Stoddard & A. Morinis (Eds.), *Sacred places, sacred spaces: The geography of pilgrimages* (pp. 41–60). Baton Rouge: Louisiana State University.

Tarlow, S. (2000). Emotion in archaeology. *Current Anthropology*, *41*(5), 713–746. doi: 10.1086/317404.

Thomas, J. (1993). The politics of vision and the archaeologies of landscape. In B. Bender (Ed.), *Landscape: Politics and perspectives* (pp. 19–48). Providence: Berg.

Tilley, C. (1994). *A phenomenology of landscape: Places, paths and monuments*. New York: Berg.

Trimmis, K. P. (2018). Paperless mapping and cave archaeology: A review on the application of DitoX survey method in archaeological cave sites. *Journal of Archaeological Science: Reports*, *18*, 399–407. doi: 10.1016/j.jasrep.2018.01.022.

Tringham, R. (2013). A sense of touch – the full-body experience – in the past and present of Çatalhöyük, Turkey. In J. Day (Ed.), *Making senses of the past: Toward a sensory archaeology* (pp. 177–195). Carbondale, IL: Center for Archaeological Investigation, SIU Press.

Tringham, R., & Danis, A. (2020). Doing sensory archaeology. The challenges. In R. Skeates & J. Day (Eds.), *The routledge handbook of sensory archaeology* (pp. 48–75). London and New York: Routledge.

Turner, V. (1967). Betwixt and between: The liminal period in rites de passage. In V. Turner (Ed.), *The forest of symbols: Aspects of ndembu ritual* (pp. 93–111). Ithaca: Cornell UP.

Turner, V., & Turner, E. (1978). *Image and pilgrimage in christian culture*. New York: Columbia University Press.

van Gennep, A. (1960 [1909]). *The rites of passage*. Chicago, IL: University of Chicago Press.

van Dyke, R. (2018). From enchantment to *agencement*: Archaeological engagements with pilgrimage. *Journal of Social Archaeology*, *18*(3), 348–359. doi: 10.1177/1469605318773846.

Vives-Ferrándiz, J., Bonet, H., Izquierdo, I., & Mata, C. (2007). De pesos y capacidades: Una experiencia en La Bastida de les Alcusses (Moixent, Valencia). In M. L. Ramos, J. E. González, & J. Baena (Eds.), *Arqueología experimental en la Península Ibérica: Investigación, didáctica y patrimonio* (Congreso Español de arqueología experimental. Santander, 2005, pp. 283–290). Santander: Asociación Española de Arqueología Experimental.

Whitehouse, R. D. (1992). *Underground religion. Cult and culture in Prehistoric Italy*. London: Accordia Research Centre, University of London.

Whitehouse, R. D. (2001). A tales of two caves. The archaeology of religious experience in Mediterranean Europe. In P. F. Biehl & F. Bertemes (Eds.), *The archaeology of cult and religion* (pp. 161–167). Budapest: Archaeolingua.

Weismantel, M. (2013). Inhuman eyes: Looking at Chavín de Huantar. In C. Watts (Ed.), *Relational archaeologies: Humans, animals, things* (pp. 1–20). London & New York: Routledge.

Wright, J. (2004). The emergence of leadership and the rise of civilisation in the Aegean. In J. Barrett & P. Halstead (Eds.), *The emergence of civilisation revisited* (pp. 64–89). Oxford: Oxbow.