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Rethinking Collective Burial in Mediterranean Caves: Middle Bronze Age Grotta Regina Margherita, Central Italy

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ABSTRACT

Drawing on the results of new multi-method research in Grotta Regina Margherita—the largest known Middle Bronze Age mortuary cave in west-central Italy (ca. 1650–1450 B.C.)—this article helps to replace the generic idea of “collective burial” with a more precise understanding of how the bodies of the deceased were transformed into potent social, symbolic, and sensuous resources housed in caves. It contextualizes this process within a nuanced understanding of settlement and subsistence practices, in which relatively short-lived and small-scale agricultural communities extended inland to the edge of the Apennine Mountains, ritually demarcating mortuary assemblages in caves in the process.

KEYWORDS

ritual; mortuary practices; prehistory; settlement; agriculture; radiocarbon dating; stable isotopes

Introduction

The term “collective burial” has traditionally been used uncritically by archaeologists. In studies of Mediterranean later prehistory, for example, it became a key component of archaeological shorthand signifying a widely-shared form of mortuary rite, extending from Iberia to Italy, involving the successive burial together of several corpses in megalithic tombs and caves (e.g. Barfield 1983). Furthermore, by generically encompassing both the archaeological description of successive mortuary depositions as well as the interpretation of actions, situations, and feelings shared by group members, the term has been the source of some confusion (Boulestin and Duday 2006, 150; Schmitt and Déderix 2018). Increasingly, however, it is now qualified by osteoarchaeologists (and forensic anthropologists) by terms such as “disarticulated,” “modified,” “fragmented,” “commingled” (i.e. mixed), and “disturbed.” These describe more precisely the physical outcomes of the complex cultural and natural taphonomic processes through which human bodies and skeletal elements are transformed following death and through which archaeological mortuary deposits are formed (e.g. Osterholtz, Bausian, and Martin 2014; Osterholtz 2016; Tomé et al. 2017; Schmitt, Déderix, and Crevecoeur 2018).

Over the last decade, our understanding of later prehistoric mortuary practices in caves in the Mediterranean region has benefitted from this shift in archaeological thought. This is particularly evident in Iberia and Italy, where publications of major research projects using multiple methods have led not only to methodological advances but also to more sophisticated, culturally-specific, and diverse interpretations of the place of death and burial in past societies. Outstanding examples are provided by research at Cova des Pas in Menorca (Cabanes and Albert 2011; Armentano Oller et al. 2012, 117), Bom Santo Cave in the Portuguese Estremadura (Gonçalves

et al. 2014; Carvalho et al. 2016), the Seulo caves in Sardinia (Skeates, Gradoli, and Beckett 2013), and Grotta Scaloria in southeast Italy (Robb et al. 2015; Elster et al. 2016). Together, these projects are helping us move beyond generic understandings of “collective burial” in caves to use more precise terminologies, identify variability and complexity in mortuary practices and taphonomic processes involving the bodies of the deceased, avoid simple, culturally-biased interpretations of death and burial, avoid taking “caves” and “rockshelters” for granted as “burial” places, consider the wider context of the mortuary sites, landscape, and society, and blur the boundaries between the “natural” and the “cultural” at caves. Although the results of each of these projects can be challenged in detail—especially regarding the under-developed contextualization of the caves and their occupants (both living and dead) within socio-economic strategies pursued across adjacent landscapes, and also their rather muted consideration of the multisensory perceptions and experiences of ritual participants in and around these special landforms—each of them has offered inspiration for our own project, to which we now turn.

Grotta Regina Margherita

This study aims, then, to add to cave archaeology’s contribution to our increasingly sophisticated understanding of later prehistoric cultural landscapes in the western and central Mediterranean by presenting and interpreting the results of a recently completed field project centered on Grotta Regina Margherita and its environs in the modern municipality of Collepardo (Frosinone province) (Figure 1). It is the largest known mortuary cave for Middle Bronze Age (MBA) central Italy (ca. 1650–1400 B.C.) in terms of both cave size and number of deposited individuals, although—as we shall see later—that archaeological fact misses the

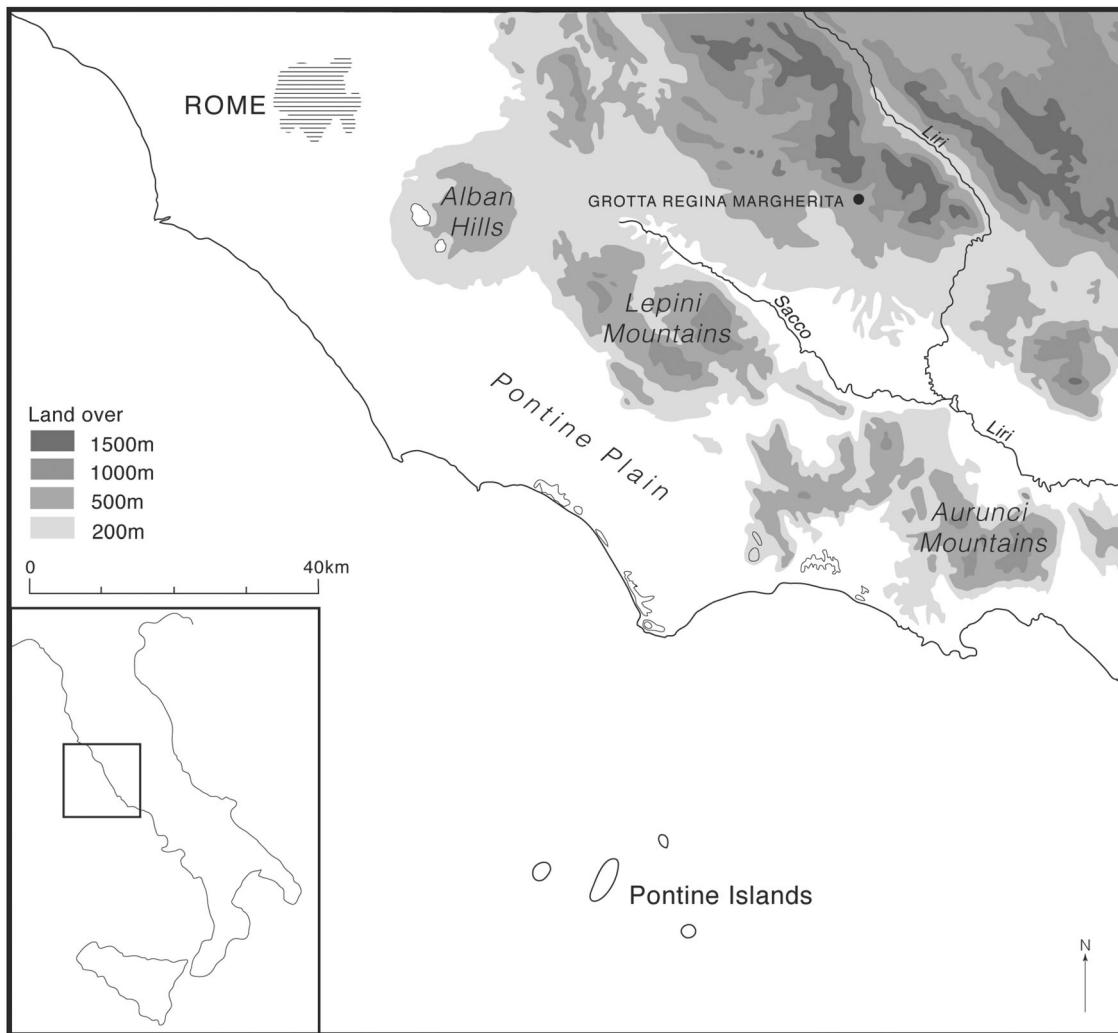


Figure 1. Grotta Regina Margherita's location in relation to southern Lazio's main landscape zones. Drawing: Yvonne Beadnell.

point of the cave's mortuary use. More specifically, we have sought answers to the following multi-scalar research questions, designed to be of relevance to all caves in (and beyond) this period and region: What was the place of caves in the

natural and cultural landscape? How and why were these places ritualized, particularly through mortuary rites and material symbols, and to what extent did such practices vary over space and time? How might visits to, and rituals



Figure 2. Visitors to Grotta Regina Margherita in the mid-19th century. Original: Santucci 1846. Photo: Jeff Veitch.

performed in, these caves have been experienced by the living? As in other recent cave archaeology projects, we used a variety of complementary research methods to investigate these issues. These included: synthesis of historic archival data; cave survey, mapping, and GIS-based modelling of caves in the landscape; ground penetrating radar (GPR), cave excavation, and scientific sampling; human bioarchaeology, with an emphasis on taphonomic reconstruction and stable isotope analysis, but also including ancient DNA (aDNA) analysis; AMS radiocarbon dating and Bayesian modelling; artifact and ecofact studies; and, socio-economic interpretation informed by archaeological and anthropological theory. Soil micromorphology, paleoenvironmental reconstruction, and analysis of organic residues were not undertaken. It is worth adding that, although the archaeological materials were studied separately by specialists, the commingling of the anthropogenic remains in the cave lent itself to the commingled, integrated textual format of this paper, to which are appended detailed reports on our scientific methods and data (Supplemental Material 1–4).

Disturbing the dead: previous visitors to the cave

Grotta Regina Margherita is a large limestone karst cave, well known to scholars and tourists since the late 18th century A.D. for its vast cathedral-like space, its spectacular speleothems, and its protected colony of bats. One of the first scholars to write about this marvelous spectacle was the geologist Paolo Spadoni (1802), who also noted that some of the calcite formations had been blackened by smoke from straw and branches burnt by local herders who used the cave as a shelter. Thereafter, villagers guided a succession of notable people around the cave, lit up by flaming torches and fires, which then led the visitors to recall their experiences of the cave's evocative features, not only in text and drawings, but also sometimes by breaking and removing stalactites (e.g. Santucci 1846, 1847; Gori 1855; Gregorovius 1856) (Figure 2). Even Queen Margherita of Savoy visited in 1904, prompting the local administration to rename the cave in her honor.

The cave's geological and archaeological deposits also attracted increasing interest and interventions. The first excavations were undertaken by the geologist Giuseppe Ponzi, who described the Grotta di Collepardo as a bone cave (comparable to those publicized by Buckland), having discovered possible (but unconfirmed) Pleistocene faunal remains in a reddish limestone deposit sealed under a stalactite crust (Ponzi 1855, 474). But it was only in the 1950s that human remains were securely identified in the cave, as revealed by a photograph taken in front of the cave in 1956 of three young men displaying a collection of large-sized human bones (Comune di Collepardo 2001). In the 1970s, pieces of prehistoric coarseware were also found in the cave through surface collections made by the prehistorian Italo Biddittu (Biddittu and Segre 1976–1977). Illicit excavations then led to further collections of pottery fragments, a few animal bones, and the disturbed bones of at least five individuals being recovered in the central zone of the cave (Guidi 1980, 1981; Coppa 1981). In 1982, Grotta Regina Margherita was opened to the public as a show-cave, following the construction of concrete walkways flanked by safety railings. In 1989, Alessandro Guidi, of the local Archaeological Superintendence, accompanied by a physical anthropologist and a zooarchaeologist,

systematically surveyed the surface deposits of the cave, mapping numerous concentrations of bones and pottery fragments, which were assigned to the MBA, Roman, medieval, and modern eras (Guidi 1991–1992). They found the largest concentrations of cultural material of all periods in the central zone of the cave, but only Bronze Age material in the innermost part, close to the cave wall. Guidi consequently emphasized the ritual, and especially funerary, use of the cave in the MBA, but also suggested that the cave could have served as a shelter in those areas where pottery was found on the surface without human remains (interpretations of which we will return to below). A key point to note from this history of activities in Grotta Regina Margherita is that, up to the 1980s, relatively undisturbed MBA mortuary deposits could still be found on the surface of the cave, particularly in its Interior Hall, where protective calcite crusts had formed over many of them.

In 2008, Micaela Angle, who had succeeded Guidi as Inspector of Archaeology, initiated a new phase of archaeological research in the cave (Mancini 2007; Angle et al. 2010; Catracchia, Celletti, and Mancini 2012). This has involved not only further mapping and collection of surface finds, but also, for the first time, the systematic archaeological excavation during four field seasons, in 2008 and 2014–2016, of the cave's MBA cultural deposits (which have turned out to be even richer than the surface remains) and their post-excavation analysis.

Life and death in Middle Bronze Age southern Lazio: the cave in its regional context

The Italian region of southern Lazio lies to the southeast of Rome and can be divided into five main landscape zones: the offshore Pontine islands; the marshy, alluvial Pontine Plain, adjacent to the sand dunes and lagoons of the Tyrrhenian coast; the volcanic Alban Hills and their freshwater lakes; the limestone Lepini and Aurunci mountains, flanking the main Apennine chain; and the interior zone centered on the Sacco and Liri river valleys, on whose innermost margin Grotta Regina Margherita lies (Angle and Guidi 2007) (see Figure 1). Our understanding of ways of life and death in this region during the MBA is hampered by an enduring primary concern of Italian archaeologists with typo-chronology (e.g. Cocchi Genick et al. 1995), despite the pioneering work of Graeme Barker on settlement, economy, and society in prehistoric central Italy (e.g. Barker 1981). According to the most recent published gazetteer of later prehistoric sites in southern Lazio, 58 early MBA sites are known (Angle et al. 2010, fig. 1). The majority of these are (broadly defined) settlement sites, ranging from the lake-dwelling Vil-laggio delle Macine in the Alban Hills, where a mixed economy of agriculture supplemented by hunting, fishing, and gathering was practiced (e.g. Carrà, Cattani, and Rizzi 2007), to the hill-top settlement of Monte Castellone in the deep interior of the region (Pascucci and Mancini 2005). Various caves were also frequented, especially for diverse ritual purposes, the largest of which are Grotta Vittorio Vecchi (Rubini, Andreini, and Coppa 1990; Pascucci 1996), Grotta del Pertuso (Silvestri et al. 2019), and Grotta Regina Margherita. Such sites were more widely distributed throughout the region than in the preceding Early Bronze Age, including further inland. This trend was originally understood by Puglisi (1959) and Barker (1975) in terms of



the origins of specialist, long-distance, transhumant pastoralism in central Italy, with seasonal grazing lands on the coastal plain and in the Apennine Mountains connected via a network of transit camps (including caves) situated in the intervening valleys. This paleoeconomic model has since been challenged (e.g. Lewthwaite 1981; Albarella 1999, 326–327), although hints of it remain in the scholarship, notably in the interpretation of the early MBA site of Gorgo del Ciliegio, situated in the upper Tiber basin in Tuscany, as a small settlement used by a group whose economy was based mainly on mobile pastoralism (Moroni et al. 2020). The results of our research in and around Grotta Regina Margherita, presented below, offer a contrasting perspective that benefits from stable isotope data.

A place for the dead: the cave in its local landscape setting

In seeking to contextualize the MBA use of Grotta Regina Margherita on a more local scale, we undertook archaeological survey work along the Fiume valley (in which the cave is situated) and on the adjacent plateaux. This work was mainly restricted to relocating previously discovered prehistoric sites, due to the dense vegetation in the valley (which has become increasingly impenetrable since goat herding declined in the area) and due to the elaborate modern enclosure of the adjacent plateau, but was still informative. We then examined systematically the spatial patterning of these sites, with sites plotted in GIS on a simple terrain map, and by altitude and slope, each analyzed in terms of viewshed and least cost pathways, although these analyses essentially confirmed what we experienced when visiting the sites.

Grotta Regina Margherita opens about 30 m above the bottom of a gorge and below the hill on which the medieval (and possibly earlier) village of Collepardo now sits. It is relatively accessible both from below (along the valley bottom) and above (from the hilltop) (Figures 3, 4). Located at an altitude of 480 m, it is one of a number of natural limestone caves situated along the steep northern slopes of the Fiume valley (Figure 5; for details, including bibliographic references, see Supplemental Material 1). The Fiume flows down from the edge of the Monti Ernici to feed the River Cosa. Bronze Age remains have been found in at least three more of these Collepardo caves. A nearby cave, Peschio Ricciardo, has produced two Bronze Age pottery sherds. Irregular excavations by local enthusiasts in Grotta Rossa have produced fragments from a range of Early/MBA pottery vessels, some animal bones, and charcoal. Work following clandestine excavations in one of the caves at Madonna delle Cese also led to the recovery of large quantities of similar pottery fragments, plus some unspecified lithic artifacts. It remains a matter of debate whether these caves might be regarded as temporary herder/hunters' shelters and/or as special places where food offerings were ritually sacrificed (e.g. Rossenberg 2012, 182). Perhaps the fact that the relatively easily inhabitable Mesolithic hunters' cave in the same valley, known as Peschio Ranaro, was not reoccupied in the Bronze Age lends weight to the latter argument. Grotta Regina Margherita stands out by comparison as the most accessible, lowest-lying, largest, most humid (and hence most spectacular in terms of speleothems), and most archaeologically rich of all the Collepardo caves, and also as the only one so far to have produced human remains. This

might lead us to hypothesize that, although a variety of caves were occupied and even ritualized during the Bronze Age, both in this area and across central Italy (e.g. Guidi 1991–1992; Cocchi Genik 1999; Di Gennaro 1999), only a few of them, with particularly distinctive natural attributes, were selected as mortuary sites. Over time (a theme to which we will return below), the repeated culmination of funerary rituals in these natural caves transformed them into special, culturally-defined, memorable anchoring places in a wider Italian and Mediterranean land- and sea-scape characterized by an increasing mobility and dispersal of people, animals, and objects (e.g. Broodbank 2013; Cavazzuti et al. 2019).

Hints of an extended adjacent settlement zone to the north of the Fiume valley are offered by patchy surface finds of prehistoric artifacts on the more gently sloping plateau (see Figure 5, Supplemental Material 1). For example, on the hillslope some 45 m immediately above Grotta Regina Margherita, we identified a grey stratum containing Final Bronze Age pottery and animal bone radiocarbon dated to ca. 1150–1050 CAL B.C. This appears to be a colluvium deposit slumped down from the overlying hilltop of Collepardo, where a naturally defended hilltop settlement is likely to have existed, as in other parts of central Italy. Later prehistoric flint and obsidian artifacts have also been found on the outskirts of modern Collepardo. In addition, Bronze Age pottery was discovered on the upper hillslopes of Selva D'Ecio, about 3.6 km further along the Fiume valley. Unfortunately, systematic archaeological survey was not feasible in this zone, though cultivable land does exist here and surely did in the past. Combined with what we know about Bronze Age settlement elsewhere in southern Lazio (Belardelli et al. 2007), it is therefore possible to hypothesize the existence of a scatter of Bronze Age hilltop settlements in this zone that were small and agricultural in nature (c.f. Moroni et al. 2020). Furthermore, despite their being situated on the inner margin of Bronze Age settlement distribution in southern Lazio, the Fiume catchment zone had the potential to be occupied year-round by one or more agricultural communities, rather than exploited "only a little" (e.g. Angle and Guidi 2007, 152), and by seasonally transhumant pastoralists (e.g. Puglisi 1959; Barker 1975). The combined human and animal stable isotope data from Grotta Regina Margherita—for which all $\delta^{13}\text{C}$ (carbon) values are above -21.6‰—are indicative of (later lifetime average) diets derived from relatively open environments without dense forestation (Gron et al. 2018). The $\delta^{15}\text{N}$ (nitrogen) data (to which we will return below) also highlight a low meat contribution to the human diet, which lends weight to the suggestion of an agricultural population being buried in the cave, albeit one whose mixed economy included the exploitation of domestic animals. In fact, when compared to stable isotope values for human bone at other Early and Middle Bronze Age sites in Italy (see Supplemental Material 4, SM Figure 3), the Grotta Regina Margherita sample has the lowest $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values, which strengthens the impression of a group whose diet contained no marine protein and very little terrestrial animal protein.

We cannot assume that all members of a particular community were buried here, even though (as we will see below) the demographic profile of its mortuary population looks representative of a living population. Nevertheless, it is possible that, through its establishment, maintenance, and



Figure 3. Grotta Regina Margherita's landscape setting in the mid-19th century. Original: Santucci 1846. Photo: Jeff Veitch.

dominance over other potential burial caves along the Fiume valley, Grotta Regina Margherita expressed some kind of a communal ideal with which its users identified, particularly at a time in later prehistory when human occupation of the interior of southern Lazio was expanding out from the major river valleys, along tributary streams, and up onto adjacent hills (for the first time since the Mesolithic), and when the Colleparo hills might have seen a first scattering of year-round agricultural settlement.

In its local Bronze Age landscape context, one can also regard the Colleparo caves as being situated below and out of sight of the main line of communication, settlement, and subsistence, extending across the plateaux and hills. This vertical spatial distinction between Bronze Age settlements and caves has also been noted in other parts of the central Mediterranean region (e.g. Skeates, Gradoli, and Beckett 2013, 109) and might be interpreted in terms of a widespread cosmological conception of caves as forming part of an underworld, both spatially and metaphorically. From this perspective, one could argue that a certain spatial and social distance was maintained between the living and the dead. However, the mortuary rites repeatedly performed in Grotta Regina Margherita were also undeniably connected (materially, symbolically, and spatially) to people, objects, and places in the surrounding lived-in landscape—a relationship that would have been highlighted over and again during funerals when the bodies of the deceased and accompanying goods were carried by ritual participants down to the cave. Grotta Regina Margherita might, then, best be described as a ritually demarcated place of the dead within the world of the living.

The ritualization of Grotta Regina Margherita: spatial, chronological, and sensorial patterning inside the cave

On the inside, the transformation of Colleparo's largest natural cave into a culturally significant mortuary cave was

also quite sharply delimited, spatially, chronologically, and sensorially. From the outside, Grotta Regina Margherita looks like a clearly defined place in the landscape, marked by a visually striking, large, triangular entrance (11 m wide and 7 m high) framing a dark interior (see Figure 4). Once inside, however, visitors are immediately struck by the cool temperature and vast size of what appears to be a single underground chamber, while their eyes struggle to define the lines of its dark walls and ceiling. It is only when they move further in that their attention is captured by the cave's deep interior, crowded with stalactites and stalagmites. With growing familiarity, different spaces can be recognized, which have—since prehistory—reciprocally structured human behavior in the cave and been modified by human interventions (c.f. Prijatelj and Skeates 2019). Essentially, these can be divided into two contrasting zones, separated in the middle by a natural “wall” formed by large stalactite formations and fallen rocks: the Entrance Hall and the Interior Hall. In addition, on the eastern side, a short passage leads to a small and completely dark third chamber, which today houses a protected colony of bats. Because access to this chamber is legally restricted and its floor covered by an accumulation of guano, it has not been investigated archaeologically.

Since 2008 (Angle et al. 2010), our strategy has been to excavate and compare soundings in contrasting areas of the cave: two in the Entrance Hall and five in the Interior Hall (Figure 6). Given the size of the cave, this work could continue for many more years, but we believe we have now excavated a representative sample of deposits. Our initial working hypothesis saw a distinction between, on the one hand, ritual preparations and funerary feasts performed by all mourners in the accessible, spacious, relatively well-lit Entrance Hall—distinguished archaeologically by the presence of a few hearths and stone tools—and, on the other hand, an emphasis on primary and secondary mortuary rites being performed by smaller numbers of people in well-defined, small, and tight spaces, enclosed and veiled



Figure 4. Grotta Regina Margherita and the River Fiume gorge. Photo: Robin Skeates.

by potent speleothems, in the spatially distinct, dark, and humid Interior Hall—distinguished archaeologically by concentrations of human remains and body ornaments. According to this scenario, the two areas could have been connected, both physically and symbolically, by ritual passages of the bodies of the living and the dead and of associated goods. However, the pattern of 18 AMS radiocarbon dates on archaeological samples from excavated primary and secondary contexts throughout the cave presents a more complex picture (see Supplemental Material 2 for details, including of Bayesian modelling). This indicates chronological as well as practical differences between different parts of the cave, with a cow molar, found along the boundary between the two Halls and dated to ca. 1900–1750 CAL B.C., representing (so far) the earliest occupation of the cave, during the Early Bronze Age; this is followed by the deposition in the

Interior Hall of human remains directly dated to ca. 1650–1450 CAL B.C., during the MBA; and then, charcoal from two hearths in the Entrance Hall post-dating this mortuary phase, ca. 1500–1300 CAL B.C. Below, we compare, contrast, and interpret in more detail the relevant archaeological deposits in the two halls of Grotta Regina Margherita, including their chronology. For details of our osteological methods and data, including the criteria used to estimate MNIs from the human remains, plus associated references, see Supplemental Material 3.

The Entrance Hall

The Entrance Hall covers a large area (ca. 30 m deep and 40 m wide), which slopes downwards from the cave entrance (**Figure 7**) (Geologists debate if, and when, subterranean water might have filled the lowest part of this hall to form

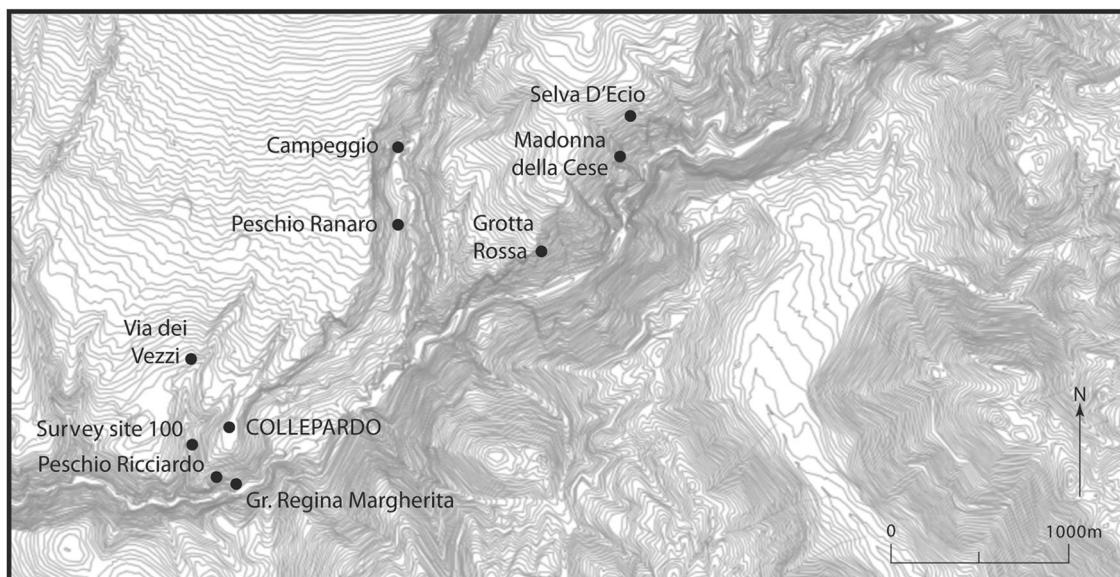


Figure 5. Map of later prehistoric sites located along the Fiume valley. Drawing: Yvonne Beadnell.

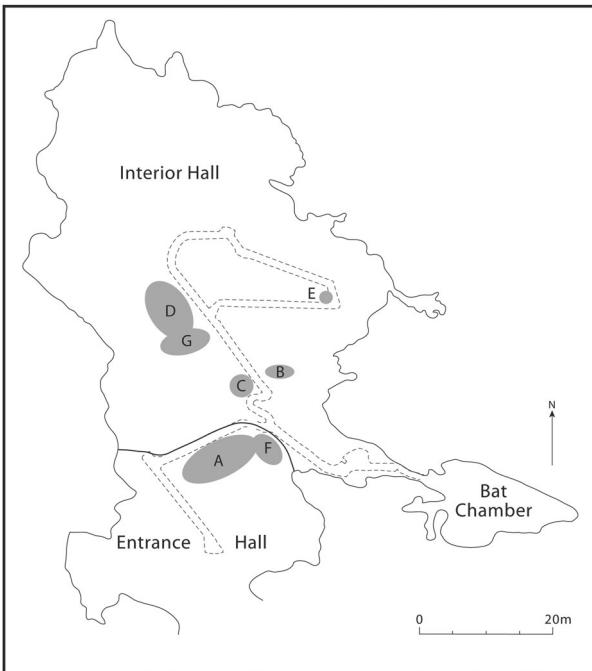


Figure 6. Plan of soundings in the Entrance and Interior Halls of Grotta Regina Margherita. Drawing: Yvonne Beadnell.

a lake—e.g. Mecchia et al. 2003, 341–343). The large size and southeastern orientation of the cave entrance render this hall a relatively well-lit twilight zone. It is also a geologically dynamic environment, containing a large quantity of limestone detritus derived from various rock-falls, but also some stalactites. As a consequence, the MBA anthropogenic remains from this space were generally found in disturbed archaeological contexts, which restrict their interpretation. Furthermore, although it is possible to identify a distinct set of archaeological materials in this zone, characterized by hearths and chipped stone artifacts (which were found exclusively in this area), as well as faunal remains (90% of identified bones representing sheep/goat; Silvestri et al. 2018, 139–141) and pottery fragments, their chronological basis needs to be taken into account.

Sounding A. Sounding A (8 m^2) was positioned in the lowest part of the Entrance Hall, some 10 m below the ground-level of the cave entrance. GPR data confirm the presence here of fills of soft material between harder blocks that range in size from a few centimeters to around 1.5 m long (de Neef 2017). Archaeological finds, some of which were concreted by calcite, included human and animal bones, an intact carinated cup (found in a rock-fall crevice) (Figures 8, 9a), fragments of pottery vessels, two ceramic spindle whorls, two faience beads, an obsidian bladelet, charcoal, and ashes. The human remains belonged to a minimum of 12 individuals and included an adult female (40–50 years), an adult male (30–40 years), two adolescents (12–16 years), and three infants and children (1–8 years). However, the majority of the anthropogenic deposits found here were disturbed by a series of post-depositional processes related to natural rock-falls and to the construction of the tourist walkway. It is possible, then, that all of the human remains found here were originally deposited in the Interior Hall. An exception is represented by the two hearths uncovered in the deepest excavated strata, the best preserved of which had a diameter of 0.4 m. Radiocarbon dated charcoal samples (LTL-5275A and LTL-5276A) assign these two hearths to

the centuries immediately following the mortuary use of the cave (ca. 1500–1300 CAL B.C.), while their stratigraphic position shows that they pre-date the major rock-fall that led to the re-deposition of mortuary deposits in the Entrance Hall. It is possible, then, that these hearths represent traces of later, unrelated, non-mortuary uses of the cave, over the course of a few centuries—by small-scale, seasonal herders, for example.

Sounding F. Sounding F (24 m^2) lay a few meters to the east, and revealed a similar series of anthropogenic deposits disturbed by substantial rock-falls, the installation of the tourist walkway, and the historic display of a modelled nativity scene (*presepe*) in this area. This disturbance is confirmed by refitting pottery fragments found across different grid squares and contexts in this sounding, by the relatively high proportion of human bones exhibiting scratches and abrasions from rocks, by the relatively high degree of recent bone fragmentation, and by the relatively high proportion (39%) of very small bone fragments. Archaeological finds included human and animal bones, fragments of MBA pottery, obsidian and flint flakes, and a fragmented bone decorated with an incised band filled by a lattice pattern (Figure 10g). The remains of at least 8 human individuals are represented here, with three adults and five sub-adults. However, the many inconsistencies in the representation of human bones for this area make it difficult to accurately pinpoint deposition practices. As in Sounding A, one possible explanation is that most of the cultural remains found in this area actually derive from deposits originally formed in the Interior Hall of the cave, which were later redeposited below as a consequence of a variety of transformation processes, including historic rock-falls. Another explanation is that this relatively accessible and visible area was particularly subject to bone robbing in recent times.

The Interior Hall

In contrast, the otherworldly Interior Hall (ca. 60 m deep, 55 m wide, and 20 m high) feels very different, with a relative humidity of up to 90%, a constant temperature of 12°C, and more complete darkness. It contains a dramatic series of large speleothem formations, designated by tour-guides today as the “petrified forest,” whose evocative anthropomorphic shapes inspired the name of the cave prior to the twentieth century, Grotta dei Bambocci, whose etymology refers to both children and puppets/dolls (see Figure 2). This is a complex, disorienting space which is difficult to make sense of as a whole due to its steeply sloping floor and assortment of thick and tall speleothems. It can, however, be navigated and comprehended via a number of discrete spaces of varying size and slope, which have lent themselves both to mortuary depositions and to archaeological excavation. Based on the demographic composition of the individuals identified in each sounding here, a working hypothesis (which could potentially be tested by aDNA study of the human remains in terms of their affiliation) is that, within the local context of this large mortuary cave created by one or more scattered communities living in its vicinity, each of the Interior Hall’s delimited spaces was reserved for use by different kin groups (Angle et al. 2010, 390). According to our radiocarbon dates, these different mortuary compartments appear to have been used during the same time period, lasting for probably no more than 200 years, between ca. 1650 and 1450 CAL B.C. Why it was



Figure 7. The Entrance Hall. Photo: Robin Skeates.

not used for longer surely relates to the history of settlement in the surrounding Collepardo area during the MBA, which might have been a relatively short-lived experiment with year-round agricultural settlement on the margins of the wider settled landscape of southern Lazio.

Sounding C. Sounding C (1 m^2) investigated a small, hidden, and hard-to-reach space delimited by large speleothems along the boundary between the Entrance and Interior Halls (Catracchia, Celletti, and Mancini 2012). Beneath some disturbed upper deposits, a shallow, but intact, cultural deposit was encountered. It contained numerous, highly fragmented human and animal bones, a few pottery sherds, a faience bead, and a ceramic spindle whorl. The human remains belonged to a minimum of 7 individuals and included an adult male (40–50 years), an adult female (20–40 years), two adolescents (12–16 years), and three infants and children (up to 7 years). A cow molar (SUERC-78154) has provided a relatively early radiocarbon date of ca. 1900–1750 CAL B.C. This pre-dates the radiocarbon dated human remains in the cave by at least a century but poses more questions than answers, having been found in disturbed deposits that

also contained modern glass. Does it, for example, hint at the seasonal use of the cave as a herder's shelter during the Early Bronze Age, prior to the possible year-round settlement of the Collepardo area during the MBA?

Sounding B. Sounding B (3 m^2) lay only a few meters to the east. Here, a deposit—concreted by calcite—was identified, containing just a few, uninformative human and animal bones and pottery fragments.

Sounding E. Sounding E (1 m^2) is a small sunken space situated just over 10 m further inside the dark Interior Hall among a group of speleothems. It is the innermost area excavated in the cave. The deposits in this area are loose, having been heavily disturbed by the installation of the tourist walkway. Numerous concreted human bones, a few pottery fragments, and some charcoal and ashes were found here. A minimum number of 7 individuals is represented by the human bones, with three adults and four sub-adults (one infant of less than one year, one child of around 6 years, one child of around 9 years, and one adolescent). There is at least one female adult and one male adult. Exceptionally, a humerus and an ulna were found in anatomical connection here. This, together with the relatively high average frequency of representation of skeletal elements, including fragile and small bones, in this area (50%), indicates the successive primary deposition of whole bodies here. A human left talus (SUERC-78150) has a radiocarbon date of ca. 1500–1450 CAL B.C., which is contemporary with some of the dated left tali from Sounding D. This confirms that the remains of different individuals were deposited in different parts of the Interior Hall in the same (maximum 200 year) period of mortuary activity.

Sounding D. Sounding D (9 m^2) lies to the west in a relatively well-defined sunken space delimited by large speleothems (including the stalagmite "throne" said to have been sat on by Queen Margherita). Here, a rich and relatively extensive mortuary deposit has been identified, comprising a dense and compact "carpet" of human bones and associated artifacts (Figure 11), embedded in a fine cave loam and patches of calcite crust. Eighty-eight per cent of the human



Figure 8. Cup, Sounding A. Photo: Jeff Veitch.

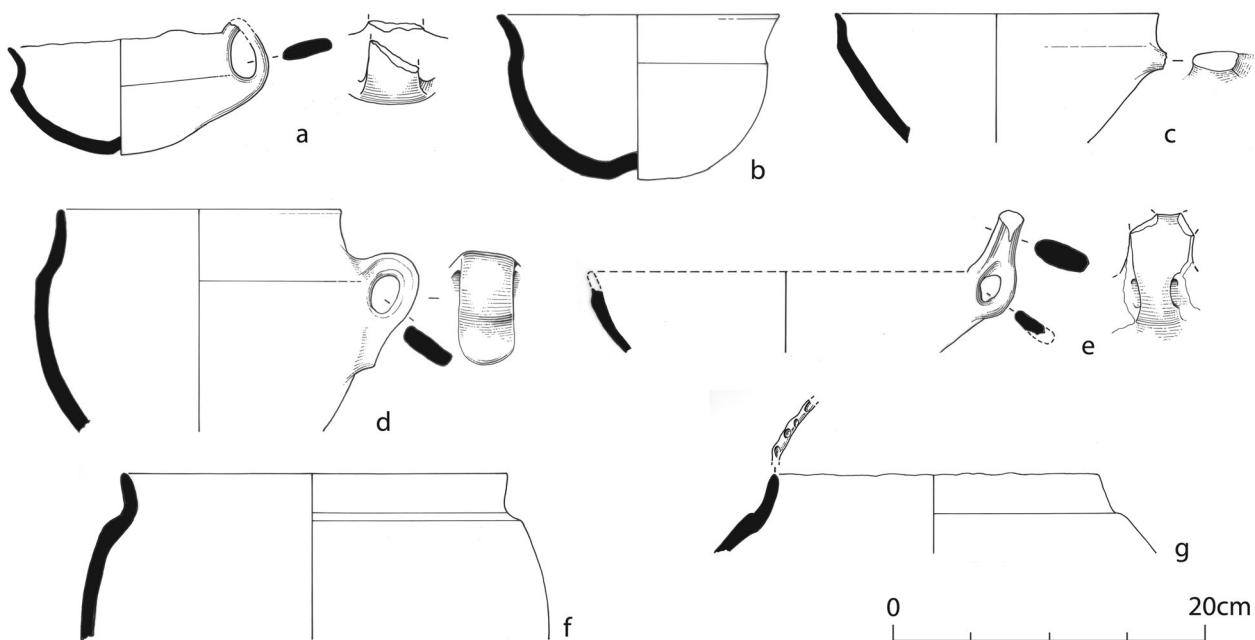


Figure 9. MBA ceramic vessels from Grotta Regina Margherita. Drawings: Daniela Mancini and Yvonne Beadnell.

bones from this area exhibited calcite accretions, and 5.6% were completely encased in calcite. Finds include human and animal bones, pottery fragments, a clay spindle whorl, two fragments of a small bronze ornament made of a cylindrical spiral of wire to which is attached a fragment of a faience bead, a disc-shaped bead or button of mother-of-pearl (Figure 10f), a quadrangular piece of sandstone, with wear traces from use in sharpening or smoothing (Figure 10k), and some pieces of charcoal. The human remains recovered so far (from the upper two thirds of the deposit) belong to at least 19 individuals, with 10 adults (including at least three young adults and one older adult of 40–60 years) and 9 sub-adults (one fetus/perinatal individual, one infant of 18 months, one infant of approximately 2 years, one child of approximately 3–6 years, one child of approximately 8 years, one older child of 10 years, and three adolescents). aDNA analysis confirms there are at least two females and one male adult. Despite the generally disarticulated (and also somewhat fragmented) state of the human remains, a few of the bones (including some phalanges) were found in articulation, and all bones from the skeleton (including many small and fragile bones) were represented, suggesting the original deposition of whole bodies in this area (as in Sounding E). However, the under-representation of long bones (particularly the lower limbs—tibiae and femora) hints at the successive removal of large bones from this area, which visitors might then have redeposited elsewhere in or beyond the cave. The presence of mineralized breaks and calcite accretions covering breakage points also indicates that most of the bones were fragmented prior to the formation of the calcite, quite possibly in the Bronze Age during the course of primary and secondary mortuary rites, which added to and disturbed earlier mortuary deposits in this area. We cannot claim, however, that such fragmentation was intentional.

We obtained 10 radiocarbon determinations on human bones from this sounding to gain some idea of the period of time over which these mortuary deposits were formed, selecting only left tali to ensure we were dating different

individuals. The basic timespan provided by these determinations, at the 68% probability level, is ca. 1600–1450 CAL B.C. Using Bayesian chronological modelling, at the same probability, the period of activity can be narrowed down to 1–60 years, falling within 1545–1480 CAL B.C. Given that all 10 radiocarbon determinations are statistically consistent, it is even possible that the deposit represents a single event, although this scenario seems unlikely given what we know about the stratified accumulation of mortuary deposits in the adjacent Sounding G (see below) and the fact that we did not excavate down to the very bottom of the deposit in Sounding D. An analogy might be drawn with the well-dated monumental mud-vaulted tholos tombs at Copper Age Valencina de la Concepción in southwestern Spain, whose use was generally relatively short-lived—either for a single event, or for a few decades or a few generations at most (García Sanjuán et al. 2018, 282).

Sounding G. Sounding G (3.6 m^2) is a narrow space flanked by two rows of large stalagmites, located immediately above and to the southeast of Sounding D (Figure 12). The relative inaccessibility of this space and the formation of a thin calcite layer have helped to protect its stratified archaeological deposits, which are characterized by a particularly dense concentration of well-preserved human bones and a large number of associated ornaments. Three sequential radiocarbon determinations (SUERC-78152, SUERC-78153, and SUERC-78151) on samples of human bones from the deepest, middle, and upper deposits confirm the lack of disturbance to the deposits in this constrained area and span ca. 1650–1500 CAL B.C., which overlaps with the timespan of the adjacent mortuary area in Sounding D. The 17,966 bone fragments recovered from this area belong to a minimum of 30 individuals. Eighteen adults range from at least three young adult individuals to one individual of 25–35 years and one over 45 years. The twelve sub-adults range from four infants (one neonate, one 6–9 months, one around 1 year, and one 2–4 years) to four children (two 9–10 years and two 5–8 years), and four adolescents. There may have been at least one female and one

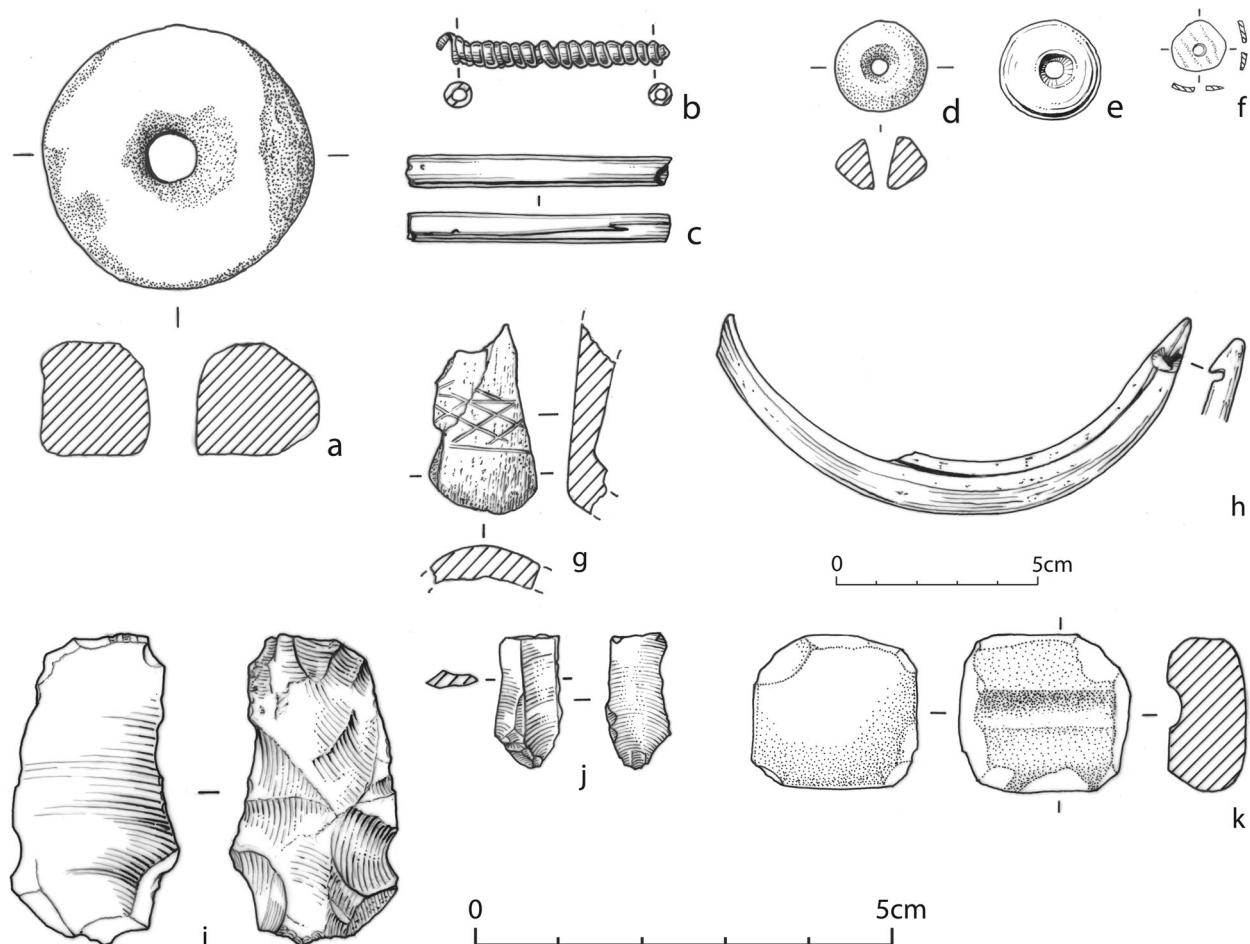


Figure 10. MBA artifacts from Grotta Regina Margherita: A) ceramic spindle whorl, B) bronze spiral, C) bronze tube, D) faience bead, E) amber bead, F) perforated mother-of-pearl, G) incised bone, H) perforated boar's tusk, I) chert blade, J) obsidian bladelet, and K) grooved sandstone. Drawings: Daniela Mancini and Yvonne Beadnell.

male among the adult remains (although these estimates are based on metric indices of the long bones). The representation of body parts, which includes small and fragile bones (the latter including a relatively high representation of sub-adult bones), clearly indicates that complete bodies

were deposited in this area. However, successive primary depositions seem to have led to the heavy disturbance and fragmentation of bones (68% of the latter being older, mineralized breaks), although the degree of weathering is lower than in the more exposed Sounding D. A group of long

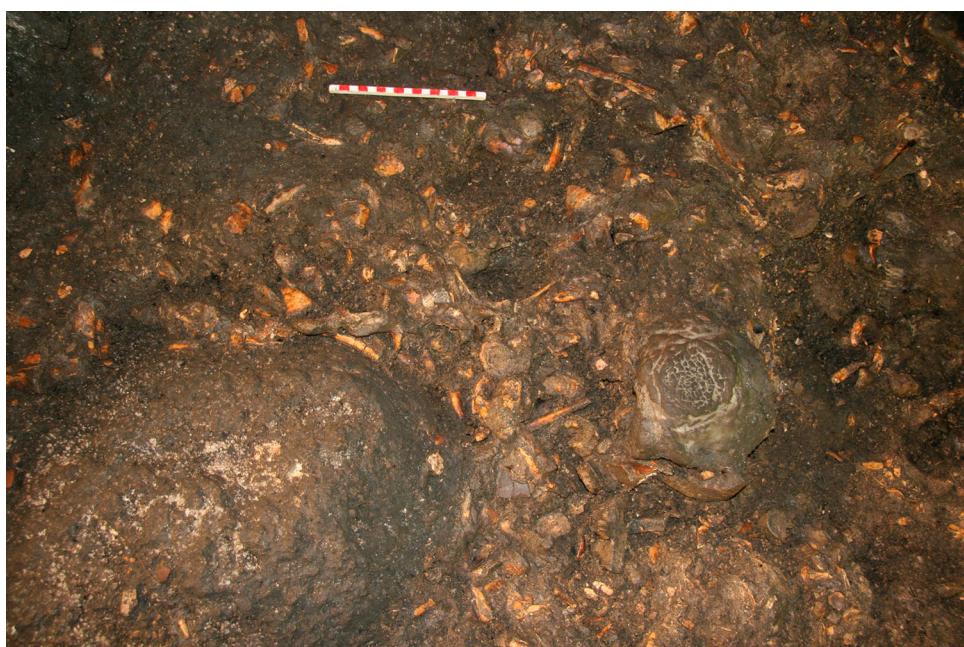


Figure 11. Layer of calcite, human bones, and artifacts, Sounding D. Photo: Robin Skeates.



Figure 12. Work in Sounding G. Photo: Jeff Veitch.

bone fragments found packed into a crevice below the large stalagmite on the eastern edge of the area (Grid Squares G4 and G6) might even indicate the clearing or caching of large bones (some potentially obtained from the adjacent mortuary deposits, such as Area D, where such bones are underrepresented), although it is also possible that these large bones slipped here naturally due to the sloping of the deposits in this area. Forty-five bones exhibited green staining, probably derived from decayed copper alloy ornaments. Associated artifacts from this area include pottery fragments, a seashell, and a range of body ornaments (25 bronze spirals and tubular pieces, 22 faience beads, 18 amber beads, and a perforated boar's tusk) (see Figure 10). A few bones of sheep/goat and pig, three charred broad beans (*Vicia faba*), two charred grains of emmer wheat (*Triticum dicoccum*), and a few pieces of charcoal were also found here. These agricultural products, quite possibly farmed locally, might be regarded as sacrificial food offerings. They can be compared to larger ritual deposits of animal and plant remains in other MBA caves in central Italy and beyond, intended to satisfy the needs of the dead and chthonic forces (e.g. Tongiorgi 1947; Miari 1995; Silvestri et al. 2018).

Ways of life and death: human remains

Thanks to careful excavation followed by water-sieving of the soil via a 2 mm mesh, a high level of recovery of human bones was achieved across our seven soundings in Grotta Regina Margherita: a total of 34,690 bone fragments from the 2014–2016 field seasons. Each of these was subject to specialist bioarchaeological analysis and recording, although only 30% could be identified to element due to their generally highly fragmented state (for details of methods, data, and related references, see Supplemental Material 3). In the process, we have gained knowledge of both the formation of the “collective burial” and of the ways of life and death of the persons whose remains we encountered.

We have been able to answer many of the questions posed in relation to the taphonomy of commingled deposits of human remains (Knüsel and Robb 2016, 668). The full representation of body parts by the human bones suggests that whole bodies were originally carried into and deposited in the Interior Hall, a conclusion also reached by Coppa (1981, 54) regarding the bones collected in 1980. The complete absence of animal gnawing or teeth marks on the bones suggests they were not accessible to scavenging animals, presumably having been well wrapped during decomposition; they were not “buried” to any significant depth under soil and stones. The bodies of multiple deceased individuals were deposited in the cave, almost certainly in successive acts of deposition. Secondary deposition practices, involving the reordering and fragmentation (even if unintentional) of the bones, also seem to have taken place. Sixty per cent of the bone fragments have mineralized breaks (as opposed to fresh breaks), suggestive of fragmentation during prehistory, at a stage after death when the bodies were decomposed and skeletonized (c.f. Robb et al. 2015). Cremination was not practiced. Only four bones were colored black, possibly due to scorching/burning from historic period fires. Over time, the human remains became increasingly disarticulated, mixed, highly fragmented, small-sized, and fragile. Seventy-eight per cent are less than a quarter of their original size, and 71% measure 1–3 cm in length, while only 6% are mostly complete. This was due to a variety of natural and cultural transformation processes. The high humidity of the Interior Hall, combined with calcite formation, has rendered the bones waterlogged, weak, and susceptible to weathering and breakage. Ninety-six per cent of the bones exhibited at least some exfoliation of the cortex, and 61% had calcite accretions. Other natural factors, including rock-falls, insect boring, bat guano, and mold/fungus growth, have also affected the bones. In addition, the historic lighting of fires in the cave, the feet of numerous visitors over the last two centuries, the installation of the touristic walkways and electric lights, previous archaeological interventions, and bone

collecting, have all had a detrimental impact on the state of preservation of the human remains, albeit to varying degrees in different parts of the cave.

Calculating the Minimum Number of Individuals (MNI) in commingled assemblages is “notoriously difficult ... especially in cases of highly fragmented bones” (Schmitt and Déderix 2018, 209). Two estimates of MNI are presented here for the bones recovered during the 2014–2016 seasons. The first, a conservative estimate, was based on the analysis of overlapping regions of bones from the cave as a whole, independent of location. The second estimate is a gross estimate, in that each sounding is regarded as a separate entity, with the MNI calculated independently from different bone regions for each area and then totaled. There are problems with both estimates. In the first, we assume that elements of one individual could potentially be dispersed in any number of locations around the cave, and thus the MNI must be considered by overlapping elements across the site. In the second, we assume that depositions of bodies were made singularly and separately in each area, over many generations, and that any elements from one individual have not been found in another excavated area of the cave. For both, we must acknowledge that successive deposition and fragmentation exponentially suppress the number of identifiable individuals in comparison to the number of individuals originally deposited (Robb 2016b). It is also important to remember that, because we did not excavate all of the surviving mortuary deposits in the cave, we are dealing with a small sample of the whole burial population. In the first (conservative) estimate, there are approximately 42 individuals accounted for. In the second estimate, the total MNI suggests 64 individuals. Looking at the human remains from the 2008 excavation season (Angle et al. 2010), a total MNI of 31 individuals is accounted for. Combining all four excavation seasons, the gross MNI rises to around 95 individuals. This figure can be further increased to around 100 individuals if one adds the 5–7 individuals calculated from the assemblage of human bones collected in 1980 (Coppa 1981).

Age estimates are slightly more reliable. Adult elements were aged based on full epiphyseal union and growth, tooth wear patterns, the sternal ends of ribs, and pubic symphyses. There were no other reliable factors used; auricular surface changes to the ilium, for instance, were not observed, as most items were too fragmented or covered in calcite to be of use. In fact, the MNI for adult remains was more often based upon tarsal counts. Estimates of sub-adult age were based on fusion of the epiphyses, long bone growth patterns, and tooth eruption and formation patterns. The sub-adult categories used are Fetus (< birth), Infant (0–3 years), Child (3–12 years), and Adolescent (12–20 years). Essentially, our study indicates that the deceased belonged to all ages. Taking our gross MNI of 95 individuals, we have 44 adults and 51 sub-adults (a ratio of 46:54%). The adults range from three aged over 40 years to one in the 30–40 year range to eleven young adults (20–35 years). The sub-adults comprise 17 adolescents, 15 children, 12 infants, and two fetal/perinatal individuals.

Sex estimation proved difficult due to the fragmented nature of the bones and the absence of more reliable indicators such as crania or os coxae. However, several long bones (humeri, radii, ulnae, and femora) allowed us to use metric indices to gain a very general idea of sex distribution. Of 23 adult long bones useable for sex estimation from the

2014–2016 excavation material, 11 were identified as female, 6 (or possibly 7) as male, and 5 as ambiguous. No emphasis, however, should be placed on this imbalanced ratio, particularly since equal numbers of males and females have been estimated for the 2008 material (Angle et al. 2010).

Assessment of pathologies included analyses of bone abnormalities, signs of infection, disease, and arthropathies. Sixteen bones exhibited signs of degenerative joint diseases leading to osteoarthritis. This gives a very low incidence rate across the whole bone assemblage. The majority of these examples are from the foot and hand; the former possibly reflecting the rough terrain that the population traversed, the latter a sign of ageing among the older adults. Examples of dental disease were identified in loose and complete dentitions. Eighteen teeth (just 2% of all teeth) exhibited caries—the majority molars—which could have been caused by a wide range of disease factors. Thirty-six teeth (4.4%) had dental enamel hypoplasias—the majority incisors, canines, and premolars—indicative of childhood metabolic stress. Dental calculus, taking the form of small to moderate plaque ridges, was present on 94 teeth (11%). Only six bones showed evidence of healed fractures: four pedal phalanges, a rib, and a scapula.

Carbon and nitrogen stable isotope analysis sheds light on the diet of the deceased found at Grotta Regina Margherita (see Supplemental Material 4). A sample of 10 different individuals, represented by 10 left talus bones recovered from the same stratigraphic layer (Spit II of Context 32 in Area D), all radiocarbon dated to a narrow timespan (see above), was analyzed. The low $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values for the adult and sub-adult individuals suggest a diet high in plants such as grains, fruit, and vegetables, with minimal amounts of terrestrial animal protein, no millet, and little to no marine protein. These results are in line with previous stable isotope studies of Copper and Bronze Age populations in central and southern Italy, which have also reported very little animal and marine protein (e.g. Tafuri, Craig, and Canci 2009; Lai et al. 2018). One infant has $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values approximately one trophic level above the other individuals. Rather than these elevated values indicating a diet different from the adults, they are consistent with the trophic shift associated with an infant ingesting breastmilk and/or during the weaning process (e.g. Cortese 2016–2017).

Meaningful objects: artifacts

The living evidently provided for the deceased in the afterlife, leaving a range of material offerings with them in Grotta Regina Margherita. These objects appear to have been placed in close association with the bodies of the deceased and to have then been subject to similar post-depositional processes. Being comparable to artifacts from contemporary settlements in southern Lazio, they also referenced the world of the living and its familiar materials, embodied practices, and social distinctions.

A small quantity of historic period pottery was found in the surface deposits of the cave (Guidi 1991–1992). By contrast, numerous prehistoric pottery sherds have been found, including over 1000 recovered during our excavations between 2008 and 2015 (see Figure 9). With the exception of the largely intact carinated cup recovered from a rock-fall crevice in Sounding A (see Figures 8, 9a), this material is highly fragmented and in a poor state of preservation,

with relatively few diagnostic sherds. The prehistoric fabrics are dominated by coarse and semi-fine wares, with smoothed red and brown surfaces; a small quantity of fineware is present, characterized by polished surfaces. A variety of vessel forms can be identified: closed forms (jars, vessels with necks, and large containers) and open forms (bowls and carinated cups). All of this prehistoric material is assignable stylistically to the west-central Italian Grotta Nuova and Protoappennine facies of the (initial) MBA (Cocchi Genick 2001; Angle et al. 2010, 387). This tight stylistic attribution and relative dating ties in with the narrow timespan for the prehistoric use of the cave provided by our radiocarbon determinations (see above). More interpretatively, the pottery ties in closely with the standard cultural repertoire of MBA vessels found at contemporary settlement sites in southern Lazio, and, despite probably serving a similar practical role as containers of food and drink, could also have acted as theatrical props in the mortuary rites. In particular, the predominance of carinated bowls and cups could have reinforced the symbolic significance of serving food and drink to the deceased.

Four perforated ceramic spindle whorls (disk-shaped and bi-conical) have been recovered from Grotta Regina Margherita (Figure 10a). Whether or not they were worn as ornaments by the deceased is unclear. Nevertheless, as grave goods, these could have contributed to the definition of the identities of the deceased. More specifically, an association between spindle whorls and adult females is emerging from studies of mortuary contexts elsewhere in Bronze Age and early Iron Age Italy (e.g. Gleba 2015; Rolfo et al. 2016). These objects may, then, have represented not only personal possessions but also social markers of gender, age, status, and skill in spinning and weaving.

We also found significant numbers of small-sized ornaments, made of a variety of materials, in the mortuary deposits in Grotta Regina Margherita, especially in the well-preserved deposits of Sounding G. These are likely to have been worn by the deceased, either as personal possessions or as gifts to the dead, and would have carried some personal and social significance, including long-distance aesthetic and exchange values. Twenty-nine fragments of bronze artifacts were found, comprising narrow spiral and tubular pieces, the largest measuring 3.4 cm in length (Figure 10b–c). Green staining was also identified on 46 human bones (all but one in Sounding G), likely derived from decayed bronze objects. Anklets, bracelets, and necklaces/upper body adornments are indicated by the fact that 22% of them occur on foot/ankle/leg bones, 20% on hand/arm bones, and 17% on bones of the thorax. The remaining stained bones are small, unidentifiable fragments. Twenty-two beads of glassy faience were found, of segmented cylindrical and bi-conical forms, measuring up to 1.4 cm in diameter (Figure 10d). These are similar to examples of light blue glassy faience from a contemporary MBA rock-cut tomb at Prato di Frabulino in northern Lazio (Santopadre and Verità 2000), in whose 2 × 2 m chamber (similar in size, but more regular in form, compared to one of Grotta Regina Margherita's mortuary compartments) 84 specimens were recovered, and from the settlement of Villaggio delle Macine in southern Lazio (Bellintani et al. 2007). They can no longer be assumed to have been imports from Egypt (c.f. Sheridan and Shortland 2004). Eighteen small amber beads were recovered (Figure 10e). Comparable examples, identified as

Baltic succinite, have also been found at Villaggio delle Macine and were likely obtained from communities in northern Italy (Bellintani et al. 2007). A seashell (a topshell: Trochidae), transported at least 55 km inland from the coast, and a perforated disc of mother-of-pearl (1.3 cm in diameter), may have been used as ornaments (see Figure 10f). Two bone ornaments were also recovered: a perforated flake of boar's tusk (9.3 cm in diameter) and a bone incised with a lattice-filled band (Figure 10g–h).

Stone artifacts have so far only been found in the cave's Entrance Hall and might not, then, have been used in the MBA mortuary-related activities, but by earlier or later visitors (see above). Three flakes of granular chert were recovered (Figure 10i), as well as a bladelet and flake of obsidian (Figure 10j), the former scientifically sourced to Sardinia (where the obsidian industry continued into the Bronze Age) (Macchia et al. 2012). Finally, a 4.5 cm long quadrangular piece of sandstone with a worn groove has been interpreted as an abrasive tool (see Figure 10k).

Discussion

This wide-ranging, multi-method, and multi-scalar case study helps to replace the traditional, generic concepts of "collective burial" and of specialist transhumant pastoralism and to open up some more nuanced interpretative avenues regarding mortuary practices in and around later prehistoric Mediterranean caves. Below, we focus on the themes of collectivism, repetition, and sensorial assemblage.

Ethnographic and ethnohistoric accounts of collective burial from around the world in caves and other mortuary contexts caution against the assumption that such practices necessarily signify a collective form of social organization and identity (e.g. Hutchinson and Aragon 2002; Weiss-Krejci 2012, 2018; Schmitt and Déderix 2018). As Papadimitriou and Catapoti (2016, 21) put it, "collective identities are not predetermined, fixed or uncontested forms of belonging"—they were negotiated and transformed during the course of corporeal performances and may not have equated to perceptions of collective identity generated in the context of the everyday. In other words, we might better regard collective burial as an ideological strategy. Shanks and Tilley's (1982) early application of this way of thinking to mortuary practices in Neolithic chambered tombs, which they interpreted not only in terms of the reproduction of power relations but also the intentional misrepresentation and mystification of contradictions in the social order, has since been dismissed as "too subtle by half" (Thomas and Whittle 1986, 134). Nevertheless, an ethnographic example, recently applied to Neolithic Britain and Ireland, does underline the continued potential of the general concept of collective burial as an ideological strategy. In central and southern Madagascar, where rice cultivators practice collective burial (in contrast to cattle pastoralists, who maintain traditions of single burial), it is suggested that collective burial is used as an ideological strategy helping to keep valued agricultural resources, such as rice fields, within descent groups (Parker Pearson and Regnier 2018). Other scholars have returned in more detail to the archaeological record to explore the ideological purposes served by the intentional fragmentation, circulation, and deposition of human bone. Brück (2019), for example, has interpreted the disarticulation of human bodies and bone and their mixing with fragments of other materials



in Bronze Age Britain and Ireland in terms of the active construction of relational and inherently unstable forms of ancestral relics and social identities, including community identity. Might, then, an ideological strategy of collectivism—that prioritized a group over its members—have guided the mortuary behavior identified at sites like Grotta Regina Margherita? Here, following the example of social archaeologists like Tomkins (2012) and Robb (2016a), it is tempting to propose a general yet contextually-specific interpretative model to account for the mixing and breaking (even if unintentional) of human bones and related artifacts. This could have been for many possible purposes: to symbolize the integrity of communities of the living and their ancestors, including a desire to live together in peace and harmony; to reinforce the durability of this prominent cave and its community, particularly at a time when the marginal landscape within which they were situated was only tentatively beginning to be settled; and, to emphasize the interdependency of dynamic and potentially competing kin groups within that community, particularly with regard to restricted agricultural resources.

Repetition was another fundamental dimension of the ritual use and significance of Grotta Regina Margherita. With over half the population represented here dying under the age of 20, and few living longer than 40 years, the death of loved ones was a regular feature of life in the MBA of southern Lazio. In coping with both the need to dispose of decomposing bodies and the emotional and social loss of a person, successive mortuary rites were performed by the living. Physically, these rites distanced and incrementally decommissioned dead bodies, while both spiritually and socially, they helped send recently deceased members of society on a journey to an afterlife where they could reside among a community of feared yet potentially benevolent ancestors. The intimate spaces scattered amongst the petrified stalactites and stalagmites of the dark Interior Hall of Grotta Regina Margherita were evidently deemed precisely the right places for this ritual passage to end and begin again. It is not yet possible to say whether or not each compartment was used by a distinct kin-group. Nevertheless, each successive mortuary rite closely referenced previous practices, and, within a few generations, rich mortuary deposits had accumulated here. These offered potent symbolic resources that could be accessed, time and again, by the living, both physically and spiritually, to assist in their ongoing social projects.

Sensory archaeology is beginning to offer an additional perspective, with its emphasis on multi-sensory experiences, including of prehistoric caves and their mortuary assemblages in the Mediterranean region (e.g. Skeates 2007, 2010). Hamilakis' (2013, 126) term "sensorial assemblage" is particularly helpful here. He defines this as "the contingent co-presence of heterogeneous elements such as bodies, things, substances, affects, memories, information, and ideas." Different temporalities are also seen to commingle in a sensorial assemblage, while sensorial flows and exchanges are regarded as both part of this assemblage and the glue that holds it together. The example provided by Hamilakis is of commingled burials in the tholos tombs of Early Bronze Age Crete, where the sensorial and emotional contact of the living with bones and objects from different times arguably allowed a distinctive mnemonic-historical perspective on life and death to emerge among Early Bronze

Age Cretan people. Grotta Regina Margherita's use as a mortuary site was more short-lived, but the significance of visitors' full-bodied experiences of its natural architecture and (for a select few) its mortuary assemblages should not be underestimated. During the course of Bronze Age rites of passage, a series of sensorial contrasts and tensions would have been experienced, made sense of, and learnt through people's bodies: between the landscape outside and the liminal cave interior; between the accessible, well-lit Entrance Hall and the elevated, dramatic, dark, disorienting, and humid Interior Hall; and, between the various discrete mortuary compartments enclosed by speleothems. Within these spaces, members of society intimately engaged in culturally-defined, primary and secondary mortuary rites that led to the carrying, accumulation, decomposition, fragmentation, and weathering of potent, multi-sensory assemblages of commingled ancestral relics. In this repeated and reciprocal process, the monumental cave helped them to reproduce strategically the ideology and ideal of a co-operative agricultural community, deeply rooted in place and time.

Conclusions

This is an exciting time to be working in cave archaeology, and especially on later prehistoric mortuary caves in the Mediterranean region. There are some inspiring studies to build on, and plenty of new research questions to explore, using a wide variety of techniques in combination with social theory. There is also scope for new interpretations, especially of caves understood (outside) in terms of their wider contexts and (inside) through bodily practices and experiences. In this study, our hope is to have presented some of these possibilities. In particular, we have reiterated the need for terminological caution when considering "collective burial," and—through careful taphonomic and chronological analysis—have revealed some of the pattern and process in transforming the bodies of the deceased into potent social, symbolic, and sensuous resources. More broadly, we have helped to refine the absolute chronology for the early part of the MBA in west-central Italy, around 1650–1450 B.C. We have also helped to replace the old long-distance trans-human pastoralism model of later prehistoric societies in central Italy with a more nuanced understanding of settlement and subsistence practices, in which—sandwiched chronologically between ephemeral herding activities during the Early and later phases of the Bronze Age—relatively short-lived and small-scale communities with mixed agricultural economies extended inland up to the edge of the Apennine mountains. The ritual demarcation of mortuary assemblages in distinctive caves, like Grotta Regina Margherita, was central to this process.

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