Too many secondary burials in Minoan Crete?

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Abstract

This article addresses the assumption that the mortuary record of Prepalatial and Protopalatial Crete (3000-1800 BC) is dominated by secondary burials and its corollary that the Minoans practiced double funerals. First, ethnographic and historical data are employed to examine the diverse types of funerary, post-funerary and non-funerary manipulations that produce secondary bone deposits. Then, the Sissi cemetery, located in northern Crete and used from Early Minoan IIA (2650-2450 BC) until Middle Minoan IIB (1850-1800 BC), is analyzed following the epistemological process of archaeothanatology, which makes it possible to test a whole range of potential scenarios rather than only one predetermined hypothesis. We argue that, at Sissi, secondary bone deposits are mostly the product of pragmatic gestures linked to the management of the sepulchral space. Such gestures are conducted with due respect for the community's forbears while contributing to their memorialization, but they must not be confused with double funerals and their associated set of funerary, social and economic correlates.

Highlights

- This is the first application of archaeothanatology to the study of a Minoan cemetery.
- Secondary bone deposits may be the product of a broad range of funerary, post-funerary and non-funerary manipulations of the dead.
- Alternative hypotheses to secondary burials and double funerals must be considered.
- Mortuary practices related to secondary manipulations of the dead are reconstructed in the Sissi cemetery.
- At Sissi, secondary treatments of the dead are mostly related to the management of the sepulchral space.

Keywords
Archaeothanatology; Bronze Age Crete; Mortuary practices; Secondary burial; Post-funerary treatment; Bone manipulation; Ossuary; Collective tombs.

1. Introduction

On the Greek island of Crete, the beginnings of the second millennium BC witnessed the development of cities and towns, as well as the construction of monumental court-centered buildings traditionally known as 'Palaces'. In contrast, the archaeological record of the Prepalatial period (Early Minoan I-Middle Minoan IA, 3000-1950 BC[1]) is dominated by tombs and burials, while settlements are elusive. Our knowledge of society before the rise of the palatial system is therefore based essentially on mortuary deposits. Unfortunately, the interpretation of these deposits faces multiple obstacles owing, on the one hand, to the nature of Minoan burial practices and, on the other, to the state of their documentation.

Diversity characterized the Prepalatial mortuary landscape (Legarra Herrero 2014). The most popular types of tombs were caves and rock shelters, monumental circular tombs (or 'tholos tombs'), and single- or multi-roomed rectangular tombs (or 'house tombs'). Circular tombs were commonly (albeit not exclusively) built in south-central Crete, whereas rectangular tombs, caves and rock shelters were mostly used in the north and east regions of the island (**Fig. 1**). In spite of their typological diversity, most Prepalatial tombs were collective burial places – that is, they received the remains of numerous individuals who died over an extended period of time (Schmitt & Déderix 2018). Many of these collective tombs were used for centuries and sometimes for as long as a millennium. Some remained in use after the construction of the First Palaces, and a few new ones were founded during the Protopalatial period (Middle Minoan IB-Middle Minoan IIB, 1950-1800 BC).

The first collective tombs of Prepalatial and Protopalatial Crete were discovered at the turn of the 20th century. Taramelli excavated burial remains in the cave of Miamou in 1897 (Taramelli 1897), a few years before the Italian School of Archaeology at Athens unearthed circular tombs at Haghia Triada (Paribeni 1904; Stefani & Banti 1930-1931) and Siva (Paribeni 1915). Between 1904 and 1918, Xanthoudides excavated ten cemeteries of circular tombs in south-central Crete (Xanthoudides 1924) and a burial cave at Pyrgos, along the north shore of the island (Xanthoudides 1918). In eastern Crete, the American School of Classical

[1] Calendar dates are based on Momigliano 2007: table 0.2.

Studies discovered rectangular tombs at Gournia (Boyd 1905: 182-188), Vasiliki (Seager 1916: 20), Pseira (Seager 1910) and Mochlos (Seager 1909; 1912), while the British School at Athens excavated the rock shelter of Karvounolakkos (Bosanquet *et al.* 1903: 339-350) and rectangular tombs at Palaikastro (Bosanquet 1902: 290-297; Bosanquet *et al.* 1903: 350-354; Dawkins & Currelly 1904: 196-198, 202; Dawkins *et al.* 1905: 268-272, 293).

These early excavations, which were conducted hastily, encountered masses of commingled bones and artefacts. The publications that ensued were partial, focusing on architecture and grave goods, but devoting little attention to human bones. They mentioned thick burial strata, scattered bones, fragmentary remains of many corpses mixed with grave goods, heaps of skulls and long bones, and, only occasionally, one or two isolated articulated skeletons. Such accounts illustrate the confusion that reigned in the tombs at the time of their discovery. According to excavators, this confusion was the consequence of looting in ancient and modern times (Evans 1924: ix; Xanthoudides 1924: 7-8, 51, 73-74) and, above all, of the collective use of the tombs: as they were accessed repeatedly over the centuries, their contents were trampled on and accidentally disturbed (Seager 1912: 16), old burials were intentionally pushed aside or even cleared out to make room for new ones (Evans 1924: vi; Xanthoudides 1924: 7, 34), and selected elements such as skulls and long bones were piled along the walls (Bosanquet 1902: 292; Seager 1912: 18; Evans 1924: vi; Xanthoudides 1924: 8, 34, 92).

As additional tombs were excavated (e.g. Marinatos 1929; 1930-1931; Pendlebury *et al.* 1935-1936), the body of evidence grew larger regarding accidental disturbances and, most importantly, intentional manipulations of skeletal remains (e.g. Pini 1968: 16-18). The suggestion was also made that some tombs may have been used as ossuaries – that is, not for primary interments but as repositories for disarticulated bones (Bosanquet 1902: 293; Dawkins & Currelly 1904: 202; Dawkins *et al.* 1905: 272; Seager 1912: 14-15, 32, 42; Evans 1921: 72, 107, 149-150; Stefani & Banti 1931-1931: 150). The term ‘secondary burial’, however, was seldom used in the early age of Minoan archaeology – and when it was, it was apparently meant to underline the disarray of the remains rather than to refer to a specific sequence of funerary gestures (e.g. Seager 1912: 15, 32).

In parallel, at the beginning of the 20th century, the French sociologist Robert Hertz (1907) and his fellow countryman, the folklorist Arnold Van Gennep (1909), used ethnographic data to study the practice of double funerals in contemporary societies. Double funerals are burial ceremonies that take place in two stages. The first stage starts with the death of an individual and ends with the disposal of the corpse in a temporary repository. Several months or years

later, a second burial ceremony is held, during which the remains of the corpse are exhumed and transferred into their final resting place. Hertz and Van Gennep demonstrated that: (1) in some societies, death is a gradual process of transition rather than an instantaneous event, and (2) this sometimes-lengthy process may be reflected in the practice of double funerals. Their works have been influential in the anthropology and later the archaeology of death (see e.g. Danforth 1982; Metcalf & Huntington 1991; Hutchinson & Aragon 2002; Robb 2007; Winter-Livneh *et al.* 2012; Kan 2016), especially following their translation from French into English in 1960 (Hertz 1960; Van Gennep 1960).

In Minoan archaeology, the issue of the secondary treatment of the dead started to gain attention during the late 1980s (e.g. Branigan 1987; 1993; Soles 1988: 58; 1992). Branigan (1987; 1993), in particular, investigated interferences with and manipulations of human bones in the circular tombs of south-central Crete. He suggested that some intentional actions (e.g. fumigations and clearances) served a practical function, i.e. preparing the tombs for new depositions, while others (e.g. removal or grouping of selected bones) were undertaken for "purely ritual reasons, very possibly with social overtones" (Branigan 1987: 48). Branigan (1993: 119-122) drew explicitly on Hertz and Van Gennep to underline the ritual and social significance of such manipulations. From then on, commingled bone deposits in Minoan collective tombs became commonly interpreted as secondary burials (e.g. Murphy 1998; Panagiotopoulos 2002; Betancourt & Davaras 2003; Papadatos 2005; Vavouranakis 2007; Driessen 2010; Murphy 2011; Girella & Todaro 2016). A model was thus developed, according to which secondary burials were the norm in Minoan collective tombs.
This model has stimulated the use of mortuary data to address issues of social organization, status and identities (e.g. Murphy 1998; Vavouranakis 2007; Driessen 2010; Murphy 2011; Hatzaki 2018). Admittedly, however, the identification of secondary burials in Prepalatial and Protopalatial Crete is based on ethnographic accounts more than on reliable archaeological data. The issue is twofold, affecting both the availability and the interpretation of material evidence. On the one hand, Minoan archaeology was quite slow in involving field anthropologists in the excavation of tombs and cemeteries. When collected at all, skeletal remains were studied in laboratories by osteologists who addressed questions of demography, pathologies or diet (Charles 1965; Becker 1975(a); 1975(b); McGeorge 1988; 1992; Musgrave 2015), but until recently, little attention has been paid to the treatment of the dead. On the other hand, the conceptualization of Minoan mortuary deposits as either 'primary burials' or 'secondary burials' has hindered the investigation of alternative scenarios (Haggis

2017: 430; Triantaphyllou 2017). In fact, the very term 'burial' is equivocal as it has both a generic meaning (i.e. the act of burying something in the ground, and by extension, the product of this act) and a funerary meaning (i.e. the act of placing a human corpse in a grave during a funeral, and by extension, the product of this act) – for an archaeothanatological discussion on the term 'burial', see e.g. Boulestin & Duday 2006. The inadequacy and reductivism of terminology have become evident in studies of recently excavated assemblages, which have challenged the stereotypical classification of the treatment of the dead in Prepalatial and Protopalatial Crete (Triantaphyllou 2016; 2017; 2018). A complex picture now starts to emerge, revealing that the bones were engaged with on multiple instances and for various reasons, not all of which necessarily carried a ritual or social significance (Legarra Herrero 2018: 149).

Recent studies on the treatment of the dead in Prepalatial and Protopalatial Crete form part of a broader trend in Aegean archaeology, which has witnessed, since the beginning of the 21st century, a growing interest in bioarchaeological approaches to mortuary practices (e.g. Triantaphyllou 2001: 47-65; Lagia *et al.* 2016; Moutafi & Voutsaki 2016; Jones 2018; Papakonstantinou *et al.* 2020; Moutafi 2021). In particular, such approaches have demonstrated that commingled deposits from Early Mycenaean and Mycenaean collective tombs (17ème-13ème centuries BC) are the product of multiple forms of manipulations (Moutafi & Voutsaki 2016; Jones 2018; Moutafi 2021).

These recent developments in Aegean and, more specifically, Minoan mortuary archaeology call for a reassessment of commingled bone deposits, which requires the adoption of an integrative methodology combining taphonomic observation, contextual analysis and theoretical framework, as recently advocated for the wider East Mediterranean (e.g. Fox & Marklein 2014; Moutafi & Voutsaki 2016). Accordingly, in this article, we propose to address the issue of the treatment of the dead in the collective tombs of Prepalatial and Protopalatial Crete by means of the archaeothanatological approach. Archaeothanatology aims at reconstructing the *chaîne opératoire* on the human dead body; it rests on an epistemological process that strictly distinguishes the steps of description, analysis and interpretation of the data, so as to avoid testing only one predetermined scenario. By adopting such an approach, we question the default interpretation of Minoan collective tombs as secondary burial places: in a way following in the footsteps of Whitley's "Too many ancestors" (2002), which condemned the omnipresence of ancestors in the archaeological discourse, we argue that the practice of secondary burial and, by extension, double funerals must be demonstrated rather

than assumed. Our article starts by addressing the identification of secondary burials in the archaeological record, before bringing ethnographic and historical data into the discussion. In doing so, we examine whether potential material signatures would enable archaeologists to distinguish secondary burials from other types of secondary bone deposits – either funerary, post-funerary or non-funerary. The cemetery of Sissi (Early Minoan IIA-Middle Minoan IIB, 2650/2450-1850/1800 BC), in northern Crete, is then employed to illustrate how alternative scenarios may produce similar archaeological signatures, which represents a serious challenge to interpreting post-depositional manipulations of human remains in collective tombs.

2. From secondary deposit to secondary burial

2.1 The issue of terminology

The practice of double funerals materializes in the form of secondary burials. However, the term 'secondary burial', while being common in the archaeological literature, is not used by ethnographers, who have little interest in classifying the material remains of burial practices. Archaeologists routinely employ ethnographic analogies to interpret material evidence and are therefore inclined to seek correspondences between ethnographic and archaeological terms. This is, for instance, the case of the ethnographic notions of 'temporary burial' and 'final burial', which were coined by Hertz (1960) to describe the sequence of events during double funerals but tend to be (erroneously) confused with the osteo-archaeological terms of 'primary burial' and 'secondary burial' (Boulestin & Duday 2006). Ethnographers observe dynamic human actions as they unfold, unlike archaeologists, who are left to interpret the static material remains of these dynamic human actions. Yet, Camps (1979: 436) actually refers to dynamic human actions rather than static material remains when he defines 'secondary burial' as "the deposition in a final burial place of defleshed bones retrieved from a temporary burial place or an exposure area" (our translation). To avoid confusing human actions with their material remains, Sprague (2005: 28) argues against the use of 'second burial' and 'second funeral', favoring instead a nomenclature based on the form of disposal and the number of processes involved in the treatment of the corpse. Sprague thus contrasts single and compound disposal, the latter involving at least "one or more processes that reduce the amount of material to be disposed". As to Knüsel and Robb (2016: 657), they define 'secondary deposition' as the "subsequent placement of human remains, following movement from their primary location". Like Camps', their definition focuses on the actions that produced the archaeological deposit rather than on the deposit itself.

The conflation of human actions and their material consequences causes confusion and shortcomings, which can (and must) be avoided by adopting an unequivocal terminology. The development of a proper terminological framework is one of the key points of focus of archaeothanatology, a discipline that emerged in France in the 1970s. Like bioarchaeology, archaeothanatology aims to reconstruct past mortuary practices through a contextual approach that takes into account the biological identity of the deceased as well as their cultural and archaeological context (Knüsel 2010). In addition, archaeothanatology builds specifically on taphonomy; it is based on a detailed understanding of osteology and the processes (natural and anthropic) of decay of the human corpse.

Archaeothanatology follows a strict epistemological process in three steps (Boulestin & Duday 2006; Duday & Guillon 2006; Duday 2009). The study begins on the archaeological site, where field anthropologists excavate, observe and document the deposits. Particular attention is paid to the joints and their state of articulation (even if partial). The skeleton, its components, and their relationship to architectural features, material goods and sediments are all carefully documented in recording sheets, pictures, drawings, etc., to later enable the identification of the processes that influenced the final arrangement of the bones. The position of the bones at the time of discovery may differ slightly or significantly from the position in which the fleshed corpse, body parts or disarticulated bones were initially deposited, owing to the taphonomic processes that the human remains and the burial environment undergo during and after decay. In its first step (i.e. observing and recording), archaeothanatology (Duday *et al.* 1990) thus adopts traditional principles and methods of field anthropology, as followed worldwide (Nilsson-Stutz 2003; Harris & Tayles 2012; Cancy & Casim 2017; Tamori 2017), before moving beyond them in the second and third steps. The second step of the archaeothanatological approach corresponds to the analysis of the observations made in the field, with the aim of reconstructing the original configuration of the deposit and the actions that led to its creation. Finally, the third step involves the interpretation of the deposit: the human remains, the objects associated with them, the burial structure and the characteristics of the site are all considered and cross-examined to infer their meaning.

In archaeothanatology, the clear distinction between the steps of (1) description, (2) analysis and (3) interpretation of archaeological evidence is reflected by terminology. In this way, the terms ‘burial’ and, by extension, ‘secondary burial’ belong only to the third, interpretative step. The use of ‘burial’ must indeed be restricted to contexts whose funerary nature can be demonstrated – that is, it applies only to locations that were consecrated by a funeral

ceremony and where the remains of one or several deceased were laid to rest (Boulestin & Duday 2006: 159). The more neutral term ‘deposit’, which designates human bone assemblages that may or may not be funerary, must thus be preferred at the steps of description and analysis. Interpreting a human bone deposit as a secondary burial involves demonstrating that (1) the deposit is indeed a burial and (2) this burial was made during the second stage of double funerals – which, in archaeology, involves proving that we are dealing with a secondary deposit.

2.2 What is a secondary deposit?

The term ‘secondary deposit’ and its antonym ‘primary deposit’ refer to the state of the human corpse at the time of deposition – they do not refer to a location or a specific human action taken on the corpse. A primary deposit corresponds to a corpse (or part of a corpse) deposited when the skeletal elements are still fully articulated, whereas a secondary deposit consists of human remains deposited or redeposited after partial or complete disarticulation (Boulestin & Duday 2006: 166). As a consequence, commingled bones (i.e. bones in disarray, without anatomical connections) tend to be interpreted by archaeologists as secondary deposits. However, it has been demonstrated that there is no absolute correlation between the disarray of the bones and secondary deposits (Bass 1971), which implies that bones in disarray are not in themselves conclusive of the secondary character of a deposit (Duday 2009). While secondary deposits indeed consist of partially or completely disarticulated bones, not all primary deposits produce fully articulated skeletons, as taphonomic processes can cause movement and displacement. For instance, a corpse laid on a wooden bier in a funerary chamber will fall to the ground once the wood and the human flesh have decomposed, thus resulting in disarticulated bones even though the corpse was deposited fully articulated.

The spatial arrangement of the bones and the categories of bones represented in the assemblage are more reliable clues to identifying a secondary deposit than is the mere disarray of the bones. In this way, the piling or gathering of disarticulated bones in a corner or against a wall of the funerary chamber suggests an intentional manipulation of the remains following the decomposition of soft tissues, thus supporting the identification of a secondary deposit. Furthermore, secondary deposits often consist mostly of large and noticeable bones, whereas small bones are commonly underrepresented, as they are easily missed or dropped when skeletal remains are retrieved from their place of decomposition and transferred into their final resting place. However, before concluding that the missing bones result from the

secondary nature of the deposit, archaeothanatologists must be able to dismiss other possible causes such as excavation methods (e.g. no sieving) or differential preservation of specific body parts (Knüsel & Robb 2016).

2.3 Which mortuary practices result in secondary deposits?

Secondary treatment of the dead may take multiple forms and, above all, may relate to a broad spectrum of funerary but also post-funerary and non-funerary practices. Following death, the deceased is deemed either worthy or unworthy of a funeral. In the first case, death begins a period of transition that defines the funerary cycle, which is usually considered to encompass the tripartite rites of passage (separation, liminality, incorporation) that enable the deceased to transition from life to death and society to overcome the irremediable loss of one of its members (Hertz 1960; Van Gennep 1960: 146-165; Metcalf & Huntington 1991; Fornaciari *et al.* 2010; Weiss-Krejci 2011: 71-72; Kan 2016). First, rites of separation set the deceased and the bereaved apart from the rest of society. The deceased thus enters a liminal state, being neither alive nor completely dead, whereas mourning taboos affect the daily life of the bereaved. After a culturally determined period of time, rites of incorporation eventually close the funerary cycle by (1) integrating the deceased into the world of the dead, (2) lifting mourning taboos and reintegrating the mourners into the flow of everyday social life, and (3) redistributing the deceased's property, roles and prerogatives among the living.

In societies where double funerals are not practiced, the funerary cycle outlasts the period devoted to the treatment of the corpse (Weiss-Krejci 2011: 71). In such cases, the deposition of the dead forms part of rites of separation, and a ceremony that does not involve the manipulation of bodily remains can be held weeks, months or years later to commemorate the deceased, end mourning taboos and signal the return to normality (e.g. Keswani 2004: 15; Revolon 2007; Venbrux 2007). In contrast, in societies that do practice double funerals, the treatment of the corpse tends to parallel the tripartite scheme: the first funeral ceremony belongs to rites of separation, whereas the second terminates the liminal period, often enabling or commemorating the incorporation of the deceased into the world of the dead (Hertz 1960). Double funerals thus produce one particular type of secondary deposit: deposits resulting from the manipulation of decomposed or partially decomposed bodies or body parts during the second act of the two-stage funerary process. The specificity of double funerals is that the secondary treatment of the dead is planned from the very beginning of the funerary process, before the first ceremony is conducted (Duday 2009). In societies where double funerals are practiced, the funeral is therefore considered unfinished as long as the bones have

not been exhumed and transferred into their final resting place; until then, the deceased, the mourners and society remain therefore in a dangerous liminal state.

Another type of secondary deposit results from delayed funerals. This practice may occur in societies where secondary manipulations of the dead are infrequent or even exceptional, being made necessary by the circumstances, timing or place of death (Metcalf 1981: 572-573; Schroeder 2001: 85; Kerner 2018: 112-116). Secondary treatment of the dead among the southern Betsileo of Madagascar fall into this category: although the southern Betsileo do not normally bury their dead twice (Evers 2001: 102-124), exceptions occur that allow deceased initially deposited in single graves to be gathered back to their kin in a collective tomb (Parker Pearson & Regnier 2018: 53). This is the case of victims of contagious diseases, who are refused primary burial in the family tomb for fear that they might contaminate their forebears, as well as of individuals who die afar. If the corpse cannot be repatriated immediately due to time or economic constraints, it is temporarily buried in the village where the death took place. A year or two later, the bones are exhumed, repatriated, honored in a funeral accompanied by days of feasting, and reburied in the collective tomb. Similar practices are documented in Medieval and post-Medieval Europe, where it was quite frequent for aristocrats to die at a distance from their chosen burial place (Weiss-Krejci 2001; 2005; 2008). In the case of double funerals and delayed burials, the secondary treatment of the dead forms part of the funeral and, hence, the funerary cycle. The completion of the funerary cycle marks the social death of the deceased (Weiss-Krejci 2011: 71), but it does not mean the end of interactions between the living and the dead. The dead often continue to be commemorated, they may be called upon, and their skeletal remains may also continue to play an active role. Post-funerary manipulations (that is, manipulations after the completion of the funerary cycle) and secondary deposits of human bones may relate to a broad range of ritual and non-ritual behaviors (Duday *et al.* 1990; Weiss-Krejci 2011: 77-80; Kerner 2018). Skeletal remains may, for instance, be manipulated in the context of relic cults and ancestor veneration. It must be stressed here, however, that the veneration of ancestors does not always require material support in the form of the bones of the dead. Furthermore, access to ancestorhood is restricted to specific individuals selected on the basis of criteria that vary culturally (Whitley 2002; Couderc & Sillander 2012; Teinz 2012) – "even though every ancestor is dead, not every dead person is an ancestor" (Teinz 2012: 235) – and these selected individuals achieve ancestorhood through rituals that may or may not relate to funerary practices (Whitley 2002: 122; Hill & Hageman 2016(b): 55-57). Processes of ancestralization and the veneration of

ancestors must, therefore, be clearly distinguished from funerary practices in general and from the practice of double funerals in particular.

Another form of post-funerary manipulation of the dead corresponds to burial relocations, which may occur for multiple reasons. Examining mortuary treatment among the Babenberg and Habsburg dynasties, Weiss-Krejci (2001: 775-778) noted that the dead were frequently rearranged within collective burial places or transferred from one burial place to another, sometimes long after their funeral. Relocations occurred primarily for political reasons, for instance to forge a link with a former dynasty or because the original burial place was considered improper in the light of the growing status of the dynasty. Post-funerary relocations are also documented in the ethnographic record: in some societies, selected deceased are sometimes transferred from an old collective tomb into a new one, for instance to give genealogical depth and breadth to the new tomb (Parker Pearson & Regnier 2018: 53) or to avoid leaving it empty, out of fear that it would become 'hungry' for corpses and cause untimely deaths within the community (Jeunesse & Denaire 2018: 100). Burial relocation differs from secondary funerals in that (1) it takes place after the completion of the funerary cycle and (2) the subsequent relocation of the remains was not planned at the time of the initial deposition.

The previous two paragraphs addressed post-funerary manipulations of human remains for ritual, religious, political, social and superstitious motives. In addition, the dead may also be manipulated after the end of the funerary cycle for reasons pertaining primarily to the management of the sepulchral space, resulting in deposits characterized in archaeothanatology as 'reductions' and 'ossuaries'. The term 'reduction' applies to individuals whose remains are repositioned or swept aside within the tomb, in order to make room for a fresh cadaver. Repeated episodes of reductions and piling of defleshed bones to accommodate new primary deposits are, for instance, well documented in Neolithic collective tombs (Duday 2009). In its archaeothanatological meaning, the term 'ossuary' also relates to the management of space: it designates pits, charnel houses or other types of structures that contain secondary deposits of bones retrieved from one or several burial places. For instance, in Medieval and Modern Europe, ossuaries commonly received dry bones exhumed from overcrowded cemeteries, long after the funerals. Ossuaries stem from the need to make room for new corpses but without discarding the remains of old deceased. The deposition of bones in an ossuary (that is, a consecrated space) testifies to respect for the dead even after their decomposition, which is in

drastic contrast to post-funerary disturbances such as grave-robbery and profanation (Aspöck *et al.* 2020).

Like funerary and post-funerary processes, non-funerary processes (i.e. processes taking place outside the funerary cycle) may also potentially involve secondary manipulations of the dead and may therefore result in the formation of secondary deposits of human bones (Schmitt in press(a)). Such a possible scenario could, for instance, concern a murder victim whose body was buried immediately after the crime by the perpetrator who might later exhume and discard it to prevent its discovery.

In conclusion, secondary deposits excavated by archaeologists may potentially be the product of a broad variety of gestures and practices – some more frequently attested in the history of humankind than others. The discovery of secondary deposits resulting from the manipulation of decomposed bodies or body parts can therefore not be interpreted *de facto* as evidence for the practice of double funerals.

2.4 Why does the distinction matter?

Double funerals represent a distinctive type of funerary practice in which the treatment of the corpse, the fate of the deceased and mourning processes are interrelated in an idiosyncratic manner. This practice must therefore be distinguished from other types of funerary, post-funerary and non-funerary forms of treatment of the dead. Furthermore, the implications of reconstructing double funerals in past societies go well beyond the funerary realm per se and touch upon socio-economic issues. Studies conducted since the 1980s have placed the emphasis on the central role that burial customs in general and double funerals in particular play in the constitution, reproduction and transformation of social order (e.g. Bloch 1982; Bloch & Parry 1982; Parker Pearson 1982; 1993; Cannon 1989; Metcalf & Huntington 1991: 133-161; Hutchinson & Aragon 2002; Keswani 2004; Kan 2016).

In societies where double funerals are practiced, the long time period that elapses between death and final burial makes it possible to shift the focus from the dead back to the living. As the body decomposes and turns into dry bones, the dead becomes a resource susceptible to manipulation for the benefit of the living (Kan 2016: 282-283). This period between death and final burial also allows for the accumulation of wealth to conduct lavish funerals that tend to reflect the socio-economic ambitions of the bereaved more than the actual status of the

deceased (Hutchinson & Aragon 2002: 30, 46). In this way, double funerals are associated with increased mortuary elaboration, thus accentuating the active role of burial practices in strategies of social negotiation (Keswani 2004: 13-16; Kan 2016: 14). At the same time, they contribute to affirming and renewing social ties at a local as well as supra-local level, as they usually gather close and larger kin, more distant relatives, and even outsiders who occasionally join from far away. Compared to rites of primary burial, secondary burial practices appear therefore to increase the potential for manoeuver in term of social negotiation and integration. That being said, it should be noted that such an effect is not exclusive to secondary burial ceremonies: it can also be produced by large-scale feasts held to end the mourning period or to commemorate the deceased without manipulating their remains (Metcalf & Huntington 1991: 118-120, 129-130; Winter-Livneh *et al.* 2012: 427).

Pursuing this line of inquiry, researchers have also attempted to link the practice of multi-stage funerals with specific forms of socio-economic systems. According to Hutchinson and Aragon (2002: 30), lengthy funerary cycles involving the exhumation and reburial of the dead characterize societies in which "kinship is the principal means of social organization", whereas others have suggested that they are attested in societies where "power is represented as traditional authority" (Bloch 1982: 223; see also Keswani 2004: 14-16; Kan 2016: 282-283). Traditional authority is grounded in the belief that socio-political order is ideal, eternal and unchanging. This belief is, however, challenged periodically by death. Secondary burial ceremonies contribute to reaffirming the continuity of society in the face of death, by overcoming the individuality of the deceased and celebrating their rebirth into the collectivity of the group's forebears. In this way, these ceremonies emphasize the cohesion and endurance of the kinship group, not only in life but also after death, from one generation to the next. Intergenerational continuity is fundamental in societies where the living owe their status, rights, prerogatives and property to their lineal descent from the dead (Woodburn 1982: 206-207). This is notably (but not exclusively) the case among cultivators who work the land, clear and improve it, and pass it on to their descendants.

None of the above is exclusive to double funerals – some societies complete death rites of passage without manipulating the bones; social negotiation takes place in a variety of funerary and non-funerary contexts; and not all societies organized around kinship ties bury their dead twice. Nevertheless, the term 'double funerals' carries a set of correlates in terms of funerary behaviors, mourning processes, strategies of social negotiation and competition, and socio-economic organization. Therefore, even though we agree with Moutafi (2021: 34-35, 44, 271-

272) that ritual and practical aspects of mortuary practices are not mutually exclusive, we argue that it is crucial, for archaeologists, to demonstrate that we are indeed dealing with the remains of secondary burials, as opposed to other types of secondary deposits.

3. Ethnographic insights into secondary manipulations of the dead

3.1 The treatment of the dead in double funerals

Ethnographic accounts and missionary narratives abound with examples of societies performing double burial rites in the present or the recent past, which can help archaeologists to better understand the practice of double funerals. The aim, here, is evidently not to apply ethnographic observations to the archaeological record. It is, more realistically, to try to clarify the characteristics and the archaeological signature of these two-stage funeral ceremonies that archaeologists tend to reconstruct based on the commingled bone assemblages of Prepalatial and Protopalatial Crete. A cross-cultural overview of the literature reveals that double funerals may take multiple forms, not only between but sometimes also within cultural groups: diversity characterizes the treatment of the corpse, the temporality and the spatiality of the burial rites, as well as the identity of the deceased granted double funerals.

Bodily treatment: During the initial funeral ceremony, the Tlingit cremate their dead (Kan 2016: 32-42), whereas the Wendat (Tooker 1964: 130-132; Trigger 1969: 105-106) and the Uut Danum (Couderc 2018: 69) bury the body in an earth pit or leave it to decay on a raised platform. Natural decomposition takes place in temporary graves too among the Betsimisaraka and the Bara of Madagascar (Parker Pearson & Regnier 2018: 44-45), in a coffin or a large jar among the Berawan of Borneo (Metcalf & Huntington 1991: 85), on scaffolds or in trees among the Sioux (Yarrow 1880: 159), and inside inhabited longhouses for Olo Ngaju chiefs (Borneo, Indonesia; Hertz 1960: 29-30). In other societies, the corpse is exposed to animals, desiccated by means of heat and smoke, excarnated, or embalmed (Sprague 2005: 63-64; Waterson 2009: 380; Kerner 2018: 56). Secondary cremation – that is, cremation of decomposed bodies after a period of temporary storage or burial – is attested among the Ma'anyan of Borneo (Metcalf & Huntington 1991: 98; Couderc 2018: 70) and for Thai kings during the 19th and early 20th centuries (Wales 1931: 137-154). These different forms of mortuary treatment enable, hasten or halt the decomposition of the corpse, so that it reaches a stable state (e.g. dry bones, burnt bones, mummy) before being transferred into its final resting place. Soft tissues still preserved at the time of exhumation may be scraped off the bones, which are also often washed before reburial.

The amount of skeletal remains manipulated during second funerals is variable. Among the Wendat (Trigger 1969: 109) and the Tlingit (Kan 2016: 42), the bones were seemingly all retrieved and reburied. Likewise, in the Greek village of Potamia (Thessaly), Danforth (1982: 18-20) observed that all of the bones were carefully exhumed from the cemetery, placed in a metal box and brought into the village crypt. In contrast, the collective tombs of the Uut Danum receive the skull accompanied by a variable amount of bones, depending on the preservation of the skeleton, the size of the vessel chosen to contain the bones, and local traditions (Couderc 2018: 69-70). In other societies, specific skeletal elements are selected for secondary treatment. This is the case in the Western Solomon Islands, where only the skull is exhumed, washed and bleached in the sun (Wall & Kuschel 1975: 59-61; Weiss-Krejci 2018: 108).

Temporality: In some societies, such as the Padju Epat of Borneo and the Pamona of Sulawesi (Hutchinson & Aragon 2002: 31-34), collective secondary burial ceremonies are conducted on a periodical basis, thus honoring multiple deceased at the same time. Likewise, among the Wendat, the second funeral (known as the Feast of the Dead) was triggered by the decision to relocate the settlement, which occurred every 10 to 30 years (Birch & Williamson 2015). Since the ceremony was organized at once for all the deceased buried in the village cemetery, some bodies were still fleshed on the day of their exhumation, while others had spent years or even decades into the ground. In most societies, however, the second funeral takes place after an interval deemed sufficient for the body to decay, which varies culturally – e.g. 42 days for priests and nobles in 19th century Bali (Metcalf & Huntington 1991: 142), 12 months among Palestinian Jews during the first century AD (McCane 1990: 36) and three years in some parts of Greece (e.g. Kenna 1976; 1991; 2015)[2]. Once this interval has passed, it is often possible

[2] Studies conducted in different parts of Greece have demonstrated the existence of local and regional patterns and traditions. For instance, on the Cycladic island of Anafi and in other Greek regions, the bones are exhumed a minimum of three years after burial (Kenna 1976; 1991; 2015), but in Northern Thessaly, Danforth (1982: 15) reported that the secondary burial ceremony had to be conducted "before [the corpse] had completed five full years in the ground". In other Greek regions, the exhumation and reburial of the bones is not practiced (Tzortzopoulou-Gregory 2010; Kenna 2015: 243). Furthermore, changes in death-related practices have occurred during the last decades, in the context of wider demographic, economic and technological transformations (e.g. Kenna 1991; 2015; Tzortzopoulou-Gregory 2008; 2010). Regarding modern Greek secondary burial practices, it must also be stressed that the word '*osteophylakeion*', which is translated as 'ossuary', is to be understood

for the second funeral ceremony to be significantly delayed further, due to multiple constraints. One such constraint is economic: second funerals tend to be lavish celebrations requiring considerable amount of resources that take months or years to accumulate. Several families sometimes join forces to meet the cost and honor multiple deceased in the same ceremony (Hertz 1960: 53; Couderc 2018: 62). Furthermore, due to the economic burden they represent, double funerals are often organized primarily for aristocrats or heads of families only. Lower-ranking deceased may thus spend years in their temporary grave, waiting to benefit from the ceremony organized for higher-ranking relatives worthy of their own second funerals.

Spatiality: Davidson (1949: 78) described that, among the Warramunga of northern Australia, a tibia was curated from the skeleton, while the rest of the bones were reburied in an anthill and the skull was smashed with a stone axe. Such a secondary treatment of the dead, thus disposed of in nature, would leave little material evidence for archaeologists to discover. In fact, most secondary burials known to archaeologists come from tombs. As demonstrated by ethnographic evidence, the tomb in which the deceased's remains are deposited during the second funeral ceremony may be either the same as the temporary repository in which the corpse decomposed, or a different tomb reserved for secondary burial only. The final resting place of the dead may be individual or, more frequently, collective. A frequent pattern, attested for instance among the Wendat (Tooker 1964: 130-140; Trigger 1969: 103-109; Sioui 1999: 144-152) and the Uut Danum (Couderc 2018), involves (1) the decomposition of the corpse inside an individual grave and (2) the transfer of the then-dry bones into a collective tomb, access to which is often regulated by kinship (Schmitt & Déderix 2018: 205-207). In this way, the physical remains of the deceased are gathered to their forebears' (Hertz 1960: 82-83). Among the Bara of Madagascar, the deceased are often brought into the patrilineal tomb during the first funeral, but they are initially kept apart in individual coffins. It is only after the flesh has decayed that the bones are transferred into large collective caskets, deposition in which is dictated by sex, age and descent (Metcalf & Huntington 1991: 120-121).

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according to its generic meaning (i.e. repository for human bones) rather than its archaeothanatological definition (i.e. secondary deposit of bones moved after the completion of the funerary cycle, for reasons related to the management of the sepulchral space; see below).

Reburial in a collective tomb does not necessarily result in the loss of the deceased's physical individuality. Among the Uut Danum (Couderc 2018) and the Tlingit (Kan 2016: 42), the bones of each individual are stored in a personal container. Likewise, among the Toraja (Sulawesi, Indonesia), the dead are individually wrapped in shrouds, and high-ranking deceased are also memorialized through personal wooden effigies that are displayed on balconies on the façade of collective hypogea (Waterson 2009: 378; Jeunesse & Denaire 2018: 99). Among the Wendat (Tooker 1964: 137; Sioui 1999: 152), however, personal containers were not used and the bones were intentionally mingled, thus dissolving the individual into the community of the dead.

Selection criteria: Significant cross-cultural differences also exist as to which deceased are entitled to double funerals. In some societies, double burial rites are practiced for all or most adults. Among the Wendat (Birch & Williamson 2015), the Tlingit (Kan 2016) and the Uut Danum (Couderc 2018), a significant proportion of the dead ultimately benefit from double funerals, and indeed, such a scenario is probably what archaeologists have in mind when they reconstruct secondary burial practices in Minoan Crete. But in other societies, double funerals are reserved for specific segments of the population, depending on selection criteria such as status, kin or sodality association (Schroeder 2001: 85). Children are often denied secondary burial on the grounds that they are not fully-fledged members of society (Hertz 1960: 85-86). Adults who died a bad death are also commonly excluded from the normal funerary sequence as, sometimes, are elders, whose diminished faculties deprive of full membership in society. According to Wendat beliefs, the second funeral released the soul, which was thus finally able to start the journey to the land of the dead, sometimes decades after death. However, this journey was a dangerous one that young children and elders lacked strength to complete. Instead of being exhumed and reburied in the collective pit, they were therefore left in the village graveyard, forming a distinct community awaiting reincarnation (Sioui 1999: 145). Individuals who died violent deaths were not exhumed or reburied either, for they were believed not to communicate with other souls in the afterlife (Tooker 1964: 132). The example of the Wendat thus reveals a tight connection between second funerals, access to the land of the dead and, hence, the fate of the soul.

3.2 The treatment of the dead in delayed funerals and post-funerary practices

As demonstrated above, double funerals vary cross-culturally in terms of treatment of the corpse (both during the first and second funeral ceremonies), selection criteria, as well as

spatial and temporal framework. Double funerals can thus produce an almost infinite range of archaeological signatures. To help to reconstruct the practice of double funerals based on the archaeological record, it is therefore useful to compare them with other practices involving secondary manipulations of the dead. Unfortunately, delayed funerals and post-funerary manipulations of the dead have raised quite limited ethnographic interest, with the exception of ancestor veneration.

In delayed funerals, the corpse is manipulated twice, as it is in double funerals. However, in the case of delayed funerals, the treatment of the dead in two stages represents a breach to the usual funerary protocol: it corresponds to an unusual measure prompted by unusual circumstances – e.g. the tomb is still under construction, or the death happened far away from the tomb and the corpse must be repatriated to be buried. Following death, the cadaver may be either temporarily stored until naturally decomposed, or actively processed (e.g. cremated, embalmed, eviscerated or excarnated) to facilitate its transportation to the designated tomb (Weiss-Krejci 2001: 770-775; 2004; 2005; 2008). Detailed studies on the topic are lacking, but available evidence suggests that all or, at least, most of the bones are usually retrieved and deposited in the tomb (e.g. Kerner 2018: 112-116). Delayed funerals are commonly carried out for only one specific deceased individual at a time. They would thus manifest archaeologically as sporadic individual secondary deposits in a mortuary record otherwise dominated by primary burials.

Post-funerary relocations, as documented by historical and ethnographic data (e.g. Weiss-Krejci 2001: 775-778; 2005; Jeunesse & Denaire 2018: 100; Parker Pearson & Regnier 2018: 53), are also unusual events organized in particular circumstances and for selected individuals. The initial burial place, the place of relocation and the time that elapses between burial and relocation all vary greatly, depending on the intention behind the relocation: the corpse may be relocated nearby or far away, in an individual or a collective tomb, soon after the initial burial or centuries later. Ethnographic evidence about the transfer of forebears from an old to a new collective tomb (e.g. to avoid leaving the new tomb empty, or to give it genealogical depth and breadth; Jeunesse & Denaire 2018: 100; Parker Pearson & Regnier 2018: 53) is of potential relevance for the study of collective tombs in Prepalatial and Protopalatial Crete. Unfortunately, this practice has received limited attention, thus leaving us with little information regarding the osteological profile of this particular type of post-funerary secondary deposit. It is, for instance, unclear whether the corpses must be entirely

decomposed at the time of transfer from an old to a new tomb, and whether all the bones or only selected body parts are redeposited into the new tomb.

Ancestor veneration has attracted a lot of ethnographic attention, but comprehensive studies on its archaeological and, especially, osteo-archaeological implications remain fewer in number (e.g. Hill & Hageman 2016(a)). For the deceased destined to become ancestors, the process of ancestralization involves rites of passage that may start either with the initial treatment of the corpse or after the completion of the funerary cycle, and that may or may not rely on the manipulation of the deceased's bodily remains. In cases where the veneration of the ancestors focuses on bodily remains, the entire body may be preserved (e.g. through mummification) or, more commonly, selected bones (especially skulls) may be retrieved from the grave and curated (Hill & Hageman 2016(b): 55-57). These bones may be decorated, polished, or worked into objects. They may be displayed or concealed, but generally they are deposited away from the funerary space, for instance in pits, in shrines or in houses. In fact, the discovery of human bones in structured deposits away from tombs and cemeteries is a strong archaeological argument for the practice of ancestor veneration (Driessen 2019). Such deposits may contain bones of one or multiple individuals, male and female. In contrast, tombs and cemeteries have little evidence to offer that would enable archaeologists to reconstruct confidently the practice of ancestor veneration. This is especially true of collective tombs filled with commingled bone deposits, where patterns of bone retrieval would be extremely difficult to recognize.

Reductions and ossuaries as defined in archaeothanatology – i.e. secondary deposits resulting from post-funerary gestures related to the management of the sepulchral space – are poorly documented in ethnography. Most of the evidence originates from Medieval and Modern Europe (Weiss-Krejci 2005; Richier 2016; Kerner 2018: 60-63, 67-70). The individuals subjected to such post-funerary manipulations are selected for a pragmatic reason (i.e. room must be made to accommodate new cadavers) after the end of the funerary cycle – that is, after they have received a complete funerary treatment suited to their social and cultural identity. Both sexes and all age categories may be subjected to the manipulation, which may be undertaken for partially or completely skeletonized corpses, for entire skeletons or for selected body parts (generally the skull and large bones, e.g. long and innominate bones), for one or multiple individuals who are redeposited in one or multiple events. The bones may be redeposited within the tomb (in the case of reduction) or transferred into an ossuary, which may be a simple pit dug in the ground, a natural cave or a built structure. The deceased

usually lose their individual identity at the time of redeposition, but their human nature remains acknowledged and respected.

3.3 Distinguishing among secondary deposits

As demonstrated by ethnographic and historical data, various funerary and post-funerary practices may produce secondary deposits and none of them are associated with an unequivocal archaeological, osteological or demographic signature. The interpretation of such deposits represents therefore a methodological challenge (Kerner 2015). This is all the more true when dealing with secondary deposits that include the remains of multiple individuals and are associated with few or no artefacts that would enable a distinction between funerary and post-funerary forms of treatment. Archaeothanatology is of particular relevance in such as a context, as its epistemological process in three steps clearly differentiates the description, the analysis and the interpretation of the deposits – thus enabling an investigation of the whole realm of possibilities instead of testing only one default scenario. While acknowledging that mortuary practices cannot be fully understood by focusing exclusively on human remains, we nevertheless argue that osteo-archaeological evidence should remain the starting point of the investigation. It is indeed in relation to the treatment of the corpse, which is the primary focus of the mortuary practices, that architectural and other archaeological evidence gain significance.

In the remainder of this paper, we apply archaeothanatology to the study of the Minoan cemetery of Sissi, with the aim of sparking discussion regarding the identification of secondary burials in the mortuary record of Prepalatial and Protopalatial Crete.

4. The treatment of the dead at Sissi

The archaeological site of Sissi is located along the north coast of Crete, ca. 4 km to the east of the Palace of Malia. It occupies the slopes and summit of the hill known locally as ‘Kephali tou Agiou Antoniou’ or ‘Bouphos’. Excavations were conducted in 2007-2011 and 2015-2019 under the direction of Prof. J. Driessen and the auspices of the Belgian School at Athens (e.g. Driessen 2018). They brought to light settlement remains dating between Early Minoan IIA (from ca. 2650 BC) and Late Minoan IIIB (until ca. 1200 BC), a Neopalatial court-centered building (17th-16th century BC), a large Postpalatial building complex (late 14th-13th century BC), as well as burial contexts. In particular, a cemetery of rectangular tombs dated to the Prepalatial and Protopalatial periods (Early Minoan IIA-Middle Minoan IIB, 2650/2450-1850/1800 BC) extends on two natural terraces on the northeast slope of the hill, overlooking

the sea (**Fig. 2**). For practical reasons, excavations in the cemetery were split into two zones: zone 1 corresponds to the lower terrace and the eastern part of the upper terrace, whereas zone 9 occupies the western part of the upper terrace. A minimum number of thirty-five rectangular compartments have been identified to date in the cemetery. In zone 1, these compartments are built one next to another, following the orientation of the slope. In contrast, the broader terrace of zone 9 accommodates two or perhaps three larger tombs made up of several compartments.

The cemetery at Sissi was the first of Bronze Age Crete to be investigated using the approach of archaeothanatology (Crevecoeur & Schmitt 2009; Crevecoeur *et al.* 2015). During excavation, emphasis was placed on the detailed understanding and recording of stratigraphic units inside and outside the tombs. The position of all human remains was systematically described following the standard procedure of field anthropology (Duday 2009). Complex deposits of human remains were excavated in successive cleaning phases, each phase involving several steps: the bones in the upper part of the deposit were scraped to remove as much soil as possible without being moved; they were then photographed and documented in an inventory sheet, and were eventually removed to allow the next cleaning phase to proceed. Standard information was recorded for each bone: anatomical identification, state of preservation, orientation, which face was showing, and altitude above sea-level. High-resolution orthophotographs were taken and georeferenced in a Geographical Information System, to locate precisely each bone in space and in relation to the rest of the deposit. Back in the lab, the bones and associated artefacts exposed in each cleaning phase were drawn digitally based on the georeferenced orthophotographs and, in this way, the complexity of the deposit was reconstructed in its entirety. In parallel, the bones were analyzed to determine the biological identity of the individuals and the composition of the deposit – i.e. sex, age-at-death, minimum number of individuals, anatomical metric and non-metric variations, dental and bone health (Crevecoeur *et al.* 2015).

Human bone deposits from four compartments (1.9 and 1.10 in zone 1, and 9.1 and 9.8 in zone 9) are examined here to discuss the treatment of the dead during the Prepalatial and Protopalatial periods. These compartments testify to mortuary gestures observed also in other compartments (Schoep et al. 2011; 2012; Schmitt & Sperandio 2016; Schmitt & Déderix in press) and are therefore representative of the whole cemetery. However, additional research is necessary to be able to determine whether slight changes or evolutions can be identified in the treatment of the dead throughout the period of use of the Sissi cemetery.

4.1 Compartments 1.9 and 1.10 in zone 1

More than 20 compartments were identified and (partially) excavated in zone 1 from 2007 to 2011, yielding deposits dated between Early Minoan IIA (2650-2450 BC) and Middle Minoan IIB (1850-1800 BC) – for preliminary reports, see Crevecoeur & Schmitt 2009; Schoep 2009; Schoep *et al.* 2011; 2012; 2017. The two small, adjoining Compartments 1.9-1.10 (**Fig. 3**) are along the north edge of the lower terrace of zone 1, aligned east-west – 1.9 to the east and 1.10 to the west. Their common north wall indicates that the two compartments were constructed together, and pottery evidence suggests a date of use during the Early Minoan III-Middle Minoan IA period (2200-1950 BC) (Schoep *et al.* 2011: 61). It is not impossible that 1.9 and 1.10 formed part of a larger tomb, the northern part of which would have been washed away by sea erosion.

Compartment 1.10 is rectangular in shape and ca. 1.7 by 1.2 m in size (Schoep *et al.* 2011: 61-64). The irregular bedrock inside the compartment was levelled by means of a packing of small stones and earth, on top of which a pebble floor was laid out. 1.10 yielded poorly preserved bones, some articulated but others disarticulated, belonging to a minimum of 20 individuals (MNI determined based on frequency and exclusion): 12 adults and adolescents, and eight non-adults (including three perinates). The remains of adults and adolescents were found partially articulated in the eastern part of the compartment. The corpses had been deposited following the same orientation, with their head towards the southeast, but in variable positions: some individuals had their lower limbs flexed beneath the thorax in a prone position, some were in a contracted position on their left side, and others were on their right side. The preservation of labile joints and anatomical articulations points to the identification of primary deposits that were partially disturbed as new deceased were brought into the compartment. The bones of non-adults were mostly scattered throughout 1.10, although some preserved a few anatomical connections. In addition, a cluster of skulls was discovered in the northwest corner of the compartment.

The osteological profile of the remains (Crevecoeur *et al*. 2015: 293) is characterized by a complete absence of carpals and anterior tarsals, as well as by a near-complete absence of metacarpals, metatarsals, vertebrae and phalanges. Such a severe under-representation of small bones and larger cancellous-filled bones seems to be the consequence of poor preservation conditions rather than of the incomplete relocation of skeletal remains of bodies that would have decomposed elsewhere. Indeed, the eroded surface of otherwise well-preserved bones and the disintegrated extremities of long bones suggest that the assemblage suffered from intense weathering in the depositional matrix, throughout the millennia. Due to

the immediate proximity of the sea, the two compartments and their content suffered from erosion, and the fractures observed on the bones indicate that they were crushed under the weight of the sediments.

Compartment 1.9 (Crevecoeur & Schmitt 2009: 77-86; Crevecoeur *et al.* 2015: 292-294) is an elongated built space (ca. 1.8 by 0.7 m in size) filled with poorly preserved and disarticulated bones. A minimum number of 13 individuals have been identified in the assemblage: ten adults and adolescents, and three non-adults (including one perinate). The bones were placed directly on the bedrock, arranged so as to take advantage of micro-topographic conditions. Most of the skulls were aligned along the north wall, where the bedrock slopes down and forms a natural cavity. The west and east parts of 1.9 were occupied by long bones oriented east-west and north-south, respectively, as dictated by the shape of the bedrock. Larger and irregular elements, such as coxal bones, were clustered towards the west. No articulation or anatomical congruity was observed, save for a loose connection between a skull and the first two vertebrae, as well as a strict connection between a femur and a coxal bone, suggesting that the ligaments had not yet completely decomposed when the body parts were relocated. Each of the 13 individual identified in Compartment 1.9 is represented by more than one bone. Foot and hand bones are severely under-represented, which has two possible explanations: either these small bones disintegrated due to the action of environmental agents, as has been suggested for 1.10, or feet and hands were not commonly deposited in Compartment 1.9. What is certain, however, is that the assemblage of 1.9 results from the secondary deposition(s) of bones and body parts (rather than complete skeletons) of several individuals who decomposed in another location. The absence of interstitial sediment between the bones suggests that the assemblage is the result of either a single redeposition event or several redeposition events within a relatively short period of time. In other words, Compartment 1.9 contains one or several secondary deposit(s) of human bones.

Based on the evidence, the following scenario can be suggested (**Fig. 4**). Fresh cadavers were laid out on the floor in Compartment 1.10 and left to decompose. Their remains were subsequently disturbed, either partially or completely. Some bodies were pushed aside, probably when a new corpse was brought in the tomb, and skulls were gathered in the northwest corner. Similar manipulations have been observed in Compartments 1.11 and 1.17 in zone 1 (Crevecoeur & Schmitt 2009; Schoep *et al.* 2011; Crevecoeur *et al.* 2015). Some bones were probably also removed from Compartment 1.10, either after or instead of

sweeping the skeleton aside. The removed body parts were perhaps transferred into Compartment 1.9, or to (an)other location(s). Compartment 1.9 yielded a multiple secondary deposit that can be interpreted as the result of either successive episodes of relocation of bones, or an extensive clearance of 1.10 or (an)other compartment(s) before a new sequence of use. The age-at-death profile is similar in Compartments 1.9 and 1.10. The bone representation index is also comparable in the two compartments, but the poor state of preservation of the assemblage prevents the identification of potential matching pairs (for instance, the right humerus of an individual in 1.10 and their left humerus in 1.9), which would have demonstrated beyond doubt that bones were transferred from 1.10 into 1.9.
The careful excavation, recording and analysis of the two assemblages reveal that 1.10 contained primary burials manipulated and disturbed after decomposition, whereas 1.9 was used for the secondary deposition of skeletonized remains (**Table 1**). The question remains as to whether Compartment 1.9 served as a tomb for secondary burials or as an ossuary. The fact that the bones were deposited directly on the bedrock – in contrasts to primary burials which, at Sissi, were usually made on prepared surfaces or pebbles floors – leads us to suggest that Compartment 1.9 was probably used as an ossuary (. Such an association between a collective tomb (1.10) and an ossuary (1.9) is without parallel in the excavated sectors of the Sissi cemetery.

4.2 Tomb A in zone 9

Excavations in zone 9 started in 2010. Two multi-roomed tombs (A and B) were discovered, in addition to a segment of a wall and fragments of human bones that seem to belong to a third tomb (C) (**Fig. 5**). Tomb A rests on the rock shelf that forms the northwest edge of the terrace of zone 9. It consists of seven built compartments, which were fully excavated during the 2010-2011 and 2016-2019 campaigns – for preliminary reports, see Schoep *et al.* 2012; Schmitt & Sperandio 2018; Schmitt & Déderix in press. Analysis is ongoing, but enough data has already been obtained to discuss the treatment of the dead. Compartments 9.3 and 9.9 yielded no human bones. In Compartment 9.5, superimposed earth and pebble floors were identified, with vases (e.g. cups, lamp) placed on top of them, sometimes upside down. Two long bones were also found on one of these floors. Compartments 9.1, 9.2, 9.4 and 9.8 yielded human bone deposits. The material goods associated with the skeletal remains were few. Compartments 9.1 and 9.8 are of particular relevance to addressing mortuary practices, for they testify to diverse manipulations of the dead. Pottery evidence dates the deposits in 9.1 and 9.8 to Middle Minoan I (2050-1900 BC) and Middle Minoan II (1900-1800 BC).

Preliminary reports on the excavation of Compartment 9.1 have been published elsewhere (Schoep *et al.* 2011: 65-67; 2012: 42; Crevecoeur *et al.* 2015: 294-295). The focus here is on primary and secondary forms of mortuary treatment, and more specifically, on the distinction between secondary deposits and disturbed primary burials. Compartment 9.1, ca. 3.5 by 1.7 m in size, yielded skeletal remains belonging to a minimum number of 15 individuals. A layer of small stones and pebbles (labelled FE165) was laid out inside the compartment to level the uneven bedrock. On top of this layer, the oldest burial stratum (no. 1) yielded a minimum number of seven individuals, including a skeleton in partial connection (ribs, thoracic vertebrae, left humerus and incomplete coxal bone), dislocated adult and adolescent bones (foot and hand bones, mandible, fragments of long bones), and three concentrations of perinates' bones. The evidence thus demonstrates that at least some of these deceased were deposited as fresh cadavers. This burial stratum was then sealed off by a thin earth floor, and six individuals were successively brought in burial stratum 2 (**Fig. 6**). The order of deposition can be determined only for Individuals 1, 4 and 5. Individual 1 was deposited in the north corner of the compartment. The body was installed in a half-pithos cut lengthwise and placed in a shallow pit meant to hold it steady. Before soft tissues had completely decomposed, the lower limbs were pushed to the side to make room for Individual 4, who was installed in a shallow pit dug immediately south of the pithos. The pit was not backfilled after the deposition of the body, which thus stuck out. However, the hypercontracted position in which the skeleton was found suggests that Individual 4 was tucked in a perishable container (e.g. basket, cloth) or tied by ropes. Individual 5 was installed on the floor, either at the same time or after Individual 4 – otherwise, Individual 5 would have been disturbed when the pit was dug in preparation for the deposition of Individual 4.

Individual 3 was laid out on the floor in the east corner of Compartment 9.1. Further west, Individual 6 was placed in a shallow pit reinforced to the west by a wooden plank and covered by a perishable element (perhaps a second wooden plank) on top of which several vases were deposited. This reconstruction of the burial of Individual 6 is based on (1) the longitudinal linear delimitations observed at a short distance beyond the pit and (2) the discovery of pottery collapsed on a thin layer of sediments that had accumulated on the skeleton. The state of articulation of the skeleton corroborates the idea that Individual 6 was protected within a perishable structure. The skeletal remains of Individual 7 were discovered in the south corner of Compartment 9.1, within in a narrow pit filled with dark clayey soil. The bones had been arranged: long bones were clustered in the south part of the pit, with the coxal bones in the west and the skull on top, in the center. The remaining bones of the skeleton were missing,

and none of the scattered bones found in stratum 1 match the gracile stature of this adult individual. It is evident that Individual 7 did not decompose where we discovered their remains – in other words, Individual 7 is a secondary deposit.

Following the deposition of Individuals 1, 3, 4, 5, 6 and 7, sediments accumulated, either naturally or intentionally. Later, another shallow pit was dug along the northeast wall, a pebble surface was laid out, and the body of Individual 2 was brought in, forming burial stratum 3 in Compartment 9.1. This skeleton was also interfered with, when a final earth floor was installed in Compartment 9.1 (stratum 4).

According to our observations and analysis (**Fig. 7**, **Table 1**), Individuals 1, 3, 4 and 6 were brought in as fresh cadavers and deposited on the floor, in containers (either perishable or in clay) or in shallow pits. Individuals 3, 4 and 6 were left untouched, but others were manipulated during or after decomposition. Individual 1 was pushed aside intentionally, to make room for Individual 4. As to Individual 5, the preservation of labile connections demonstrates that it represents a primary deposit, even though the skeleton was disturbed and partly removed when a shallow pit was dug in the layer of sediments that had accumulated in the tomb, in preparation for the deposition of Individual 2 in stratum 3. The skeleton of Individual 2 was also interfered with, probably accidentally, when a final earth floor was installed in Compartment 9.1. Indeed, some of their bones were removed and redeposited in an unidentified location, whereas the rest of the skeleton was left in place. Conversely, the place of decomposition of Individual 7 is unknown; only selected bones were retrieved and redeposited within a pit dug in the south corner of 9.1, whereas primary burials were made in the central and north parts of the compartment. Individual 7 is therefore a unique example of a secondary deposit in Compartment 9.1. But does it correspond to a funerary or a post-funerary deposit?

The pattern of deposition in Compartment 9.1 differs from that observed in 9.8. Compartment 9.8 is a trapezoidal room, ca. 2.5-2.6 by 1.4-2.0 m in size (**Fig. 8**), in the corner of Compartments 9.4 and 9.5. It has a pebble floor (FE143), on top of which were found 35 disarticulated bones (fragmentary ulna and femur, ribs, hand and foot bones, vertebrae, mandible) belonging to a minimum number of 3 individuals (two adults and a non-adult). These bones, found in a good state of preservation, are interpreted as the residues of clearing operations during which old deposits were removed from 9.8 and redeposited elsewhere (Schmitt & Déderix in press). The presence of small bones point to primary deposits, but there

is no information as to the exact treatment of the corpse at the time of deposition in the compartment, or the fate of the bones after their removal.

Following clearing operations, the remains of this first burial stratum in Compartment 9.8 were sealed under a thick earth floor (FE153) in which four pits (FE113, FE114, FE121 and FE128) were dug to receive 4 articulated skeletons and two deposits of commingled bones belonging to a minimum number of 8 individuals – i.e. a minimum of 12 individuals in total (Schmitt & Sperandio 2018: 71-76) (**Figs 8-9**). Pit FE113, along the west wall of Compartment 9.8, contained an individual placed on their left side, with the head to the south and the lower limbs tightly flexed to the north (FE112). The hyper-contracted position of the body suggests that it was tied or wrapped in a perishable container, such as a piece of cloth or a basket. The skeleton was not disturbed by subsequent human action. Pits FE114 and FE121, along the north wall and in the north-east corner of Compartment 9.8, each contained a half-pithos (FE111 and FE115, respectively) laid on its side and hosting a single primary deposit. As was also observed in Compartment 9.1, the evidence suggests that these two half-pithoi were not covered and therefore the bodies protruded. When the cemetery was abandoned, Tomb B and the south rooms of Tomb A were dismantled, the terrace of zone 9 was levelled, and a thick layer of earth, stones, pebbles and pottery sherds was laid out. These levelling operations caused the partial disturbance of the skeletons in pithoi FE111 and FE115 (Schmitt & Sperandio 2018: 73-76; Schmitt & Déderix in press). As a result, the skeleton in FE111 lacks its cranium, first cervical vertebrae and most of its lower limbs, and some of its bones were found commingled in the upper part of the pithos' fill. The skeleton in FE115 was in a more complete state of preservation, but some of the bones had also been displaced after decomposition.

Pit FE128 had a clearly different configuration (**Fig. 9**): it was dug through older layers down to the bedrock, thus being deeper than the three aforementioned pits, and it contained two large pithos fragments placed upright and held in place by field stones. These two fragments formed a container (FE127) for the primary burial of an individual deposited on its back, with the lower limbs drawn up to the torso. The head initially leaned against the inner face of FE127, but it slid down as the body decomposed in an empty space. FE127 was narrower than Pit FE128, and the gap left in the pit was filled with disarticulated human bones. This secondary deposit (labelled 'Bone Deposit 2') comprised ca. 150 bones belonging to a minimum of three individuals, all incompletely represented in the assemblage. Another secondary deposit ('Bone Deposit 1') was discovered in a shallow depression in the southeast

corner of Compartment 9.8. It comprised ca. 300 commingled bones, for a minimum number of five individuals (based on skull count).

There is no evidence on the relative chronology of the pits dug in the earth floor (FE153) of Compartment 9.8; it can therefore not be determined whether they were dug simultaneously or successively. The coexistence of a primary deposit in Pithos FE127 and a secondary deposit (Bone Deposit 2) in Pit FE128 is intriguing. At any rate, it is certain that Bone Deposit 2 does not contain human remains accidentally discovered when Pit FE128 was dug to install Pithos FE127 – if it were the case, Bone Deposit 2 as well as floor FE153 or the underlying layers would have yielded fragmentary bones broken by the digging of the pit. A more likely hypothesis is that Bone Deposit 2 may contain skeletonized remains of individuals initially placed as fresh cadavers in FE127 (**Fig. 10**, **Table 1**). Bone Deposit 2 consists of selected bones rather than complete skeletons; since the missing bones have not been found elsewhere in Compartment 9.8, it would be reasonable to assume that they were cleared out and redeposited in an unknown location. Regarding Bone Deposit 1, two hypotheses are plausible. On the one hand, it could comprise remains of individuals buried in Compartment 9.8 during its first phase of use and cleared out prior to the installation of the floor (FE153). But on the other hand, Bone Deposit 1 could also contain skeletal remains of successive primary deposits made in the pithoi (FE111 and FE115) and displaced after decomposition.

A related issue is that of the interpretation of Bone Deposits 1 and 2 (**Fig. 10**). Are they secondary burials or, on the contrary, secondary deposits resulting from reduction processes? According to the first scenario, the three pithoi (FE111, FE115 and FE127) would have served as temporary repositories in which the corpses decomposed, waiting for the second funeral and the secondary burial of skeletal remains in Bone Deposits 1 and 2. The skeletons found in the three pithoi would thus be evidence of incomplete funerary sequences and the discovery of articulated bodies would merely be the consequence of the abandonment of the tomb (Schmitt in press(b)). According to the second scenario, however, FE111, FE115 and FE127 would have been used for primary burials that were cleared out when the need arose to make room for new deceased. Several arguments support the second scenario: (1) articulated skeletons in Compartment 9.8 are too numerous to be easily dismissed as remains of incomplete funerary sequences; (2) the hypothesis that the funerary process would have been interrupted by the sudden abandonment of the cemetery cannot be sustained, since Tomb B and the southern compartments of Tomb A were actively dismantled and levelled rather than passively deserted; (3) the packing of skeletal elements in the corner of 9.8 and against the

wall of Pithos FE127 matches the archaeological signature of reductions; (4) the occurrence, in the same compartment, of spatially defined primary deposits next to commingled secondary deposits fits the pattern of primary burials and reductions rather than that of temporary deposits and secondary burials. We suggest therefore to interpret the primary deposits in Pit FE113 and the pithoi (FE111, FE115 and FE127) as primary burials, and Bone Deposits 1 and 2 as reductions.

5. Discussion

To reconstruct mortuary practices in archaeology, osteological data must be analyzed in conjunction with taphonomic processes and stratigraphic evidence. In Minoan Crete, osteo-archaeologists started to take a leading role in mortuary studies less than two decades ago – first studying human bones in laboratories, based on archaeologists' field notes (e.g. at Archanes, Haghios Charalambos, Moni Odigitria and Livari), and then participating directly in the excavation of burial sites (e.g. at Sissi, Petras and Koumasa). Recent studies have contributed rich data on the treatment of the dead in Bronze Age Crete (e.g. Triantaphyllou 2005; 2010; 2012; 2016; 2017; 2018; Betancourt *et al.* 2008(a); Crevecoeur & Schmitt 2009; Schoep *et al.* 2011; 2012; Schmitt *et al.* 2013; Crevecoeur *et al.* 2015; Triantaphyllou *et al.* 2017; Schmitt & Sperandio 2018; Papakonstantinou *et al.* 2020; Schmitt & Déderix in press). This new data reveals that, during the Prepalatial and Protopalatial periods, skeletal remains were subjected to multiple forms of manipulation. Furthermore, it is now evident that the treatment of the dead varied between cemeteries but also within the same cemetery and sometimes even within the same tomb. The consequences are significant: such variations between and within cemeteries imply that we must first study each site individually and independently, before attempting regional comparisons and island-wide syntheses.

If the Sissi cemetery had been excavated and studied within the framework of the model according to which secondary burials were the norm in Minoan collective tombs, the deposits would have been interpreted in relation to the two stages of double funerals – see e.g. Driessen 2010; Girella & Todaro 2016. Compartment 1.10 would have been described as the temporary repository in which fresh corpses were left to decompose after the first funeral, and Compartment 1.9 as the tomb in which skeletal remains were transferred during the second funeral. Similarly, in Compartment 9.8, Pithos FE111, Pit FE113 and Pithos FE115 would have been interpreted as temporary repositories, and Bone Deposits 1 and 2 as secondary burials. As to the primary deposits in Compartments 9.1 and 9.8, they would have been

viewed as deceased whose funerary treatment was interrupted and left incomplete. On the contrary, following the three-step epistemological process of archaeothanatology has made it possible to consider alternative scenarios and, often, to confidently reject the identification of secondary burials.

At the core of the debate lies the identification of primary deposits. Indeed, in societies where double funerals are commonly practiced, the mortuary record is dominated by secondary bone deposits, while primary deposits are rather scarce. Following this line of thought, Minoan archaeologists have noted that explicit mentions of articulated skeletons are few in 20th century excavation reports (e.g. Maggidis 1994: 66-67), thus suggesting that primary deposits are "an aberration, only preserved because of coincidence" (Driessen 2010: 109). However, extreme caution is required since early excavations devoted little attention to skeletal remains and, especially in the absence of field anthropologists, primary deposits disturbed by subsequent burial activities, taphonomic processes or looters could have been misidentified as secondary deposits. The possibility must thus be considered that early excavation reports may grossly underestimate the frequency of primary burials in Prepalatial and Protopalatial tombs. The evidence of Sissi is particularly relevant in this respect, given the sheer number of primary deposits (intact, intentionally disturbed or accidentally disturbed) that archaeothanatologists have identified. Primary deposits are too numerous in Compartments 1.10, 9.1 and 9.8, among others, to be simply interpreted as the remains of unfinished double funerals. They represent, therefore, a strong argument against the idea that secondary burial was the norm at Sissi.

The evidence from Sissi can, of course, not be extrapolated and used to claim that primary burials must have been the norm throughout Crete during the Prepalatial and Protopalatial periods. In fact, recent excavations by field anthropologists have demonstrated that disarticulated bones dominate the assemblages of Koumasa (circular tomb) and Petras (rectangular tombs) (e.g. Panagiotopoulos 2015: 236; Triantaphyllou 2016; 2017). The discrepancies observed between Sissi, Koumasa and Petras serve as a reminder that hasty generalizations should be avoided.

At Sissi, the dead were initially brought into the tombs as fresh cadavers. They were installed directly on the floor, in burial containers, or in shallow pits dug in the floor. These pits were only a few centimeters deep, which indicates that they were not meant to conceal the corpse but rather to delimit its own individual space in the collective tomb and to help to maintain it

in place. Such pits have so far been identified only at Sissi, unlike burials on the floor and in clay containers (pithoi and larnakes), which are a common occurrence in Crete. The use of clay containers for burial purposes grew in importance at Sissi, as elsewhere in Crete, during the Middle Minoan I period (2050-1900 BC; Vavouranakis 2014; Legarra Herrero 2016). At Sissi, pithoi and larnakes were used exclusively for primary burials. The possibility nevertheless exists that, after being brought into the tombs, the containers may have been reused for successive burials: Bone Deposits 1 and 2 in Compartment 9.8 may indeed include remains of individuals cleared out of clay containers to make room for new, fresh corpses. In other cemeteries, pithoi and larnakes contained primary or secondary deposits of bones that belonged to one or several deceased and had been deposited in one or several episodes (e.g. Marinatos 1930-1931; Haggis 1996; Panagiotopoulos 2002; Papadatos 2005; Schmitt *et al.* 2013). Since pithoi and larnakes were used for various types of deposits (primary or secondary, individual or multiple, simultaneous or successive), their adoption cannot be taken as evidence of an island-wide change in mortuary practices during the Late Prepalatial period. Burial containers in collective tombs seem rather to have helped the management of the sepulchral space, facilitating manipulations and clearances of burial remains (Hamilakis 2018: 318; Vavouranakis 2014: 214-215; Legarra Herrero 2016: 182).

Following their deposition in the rectangular tombs of Sissi, some corpses were left untouched, some were accidentally disturbed by subsequent burial activities or levelling operations, and others were intentionally manipulated (**Fig. 4, 7, 10**). Intentional secondary manipulations documented at the site include displacement of bones within the compartment, removal of bones from the compartments, and transfer of bones into another compartment. Some deceased were perhaps manipulated in more than one instance. However, our knowledge of the treatment of the corpse is contingent upon the archaeological record, which leaves us with many unknowns. For instance, where did the cadaver of Individual 7 decompose, before some of their bones were collected and redeposited in a shallow pit in the south corner of Compartment 9.1? In Compartment 9.1, in another compartment of Tomb A, or in another tomb? Likewise, where were the missing bones of Individuals 2 and 5 redeposited? Several scenarios are plausible, none of which can be favored based on current evidence. Indeed, it is only the discovery, at different find spots, of fragments of the same objects or bones of the same deceased that would make it possible to reconstruct confidently the itinerary followed by the corpse during and after the funerary cycle.

Whether the bones were displaced within the burial compartments or taken out, we argue that intentional secondary manipulations of the dead at Sissi are more convincingly interpreted in relation to the management of the sepulchral space than in the context of double funerals. The collective tombs of Sissi were used repeatedly, which made it necessary periodically to make room for new corpses that were deposited on existing or newly built floors. Preparation for the installation of a new floor involved the partial or nearly complete removal of old burial remains, as demonstrated by residual bones (some of which preserve anatomical connection or congruity) in the lower burial strata of Compartments 9.1 and 9.2. Old skeletal remains could be redeposited in different locations. They could be pushed aside or piled within the burial compartment, thus producing reductions such as Bone Deposits 1 and 2. They could be gathered in ossuaries such as Compartment 1.9. And they could perhaps also be discarded, as seems to be the case of the disarticulated bones found mixed with pottery, animal bones, charcoal and fragments of mudbrick in Area 1.30 (Schoep et al. 2011: 59-61).

Other cemeteries in Prepalatial and Protopalatial Crete have yielded evidence suggesting that skeletal remains were relocated or discarded after the end of the funerary cycle (e.g. Branigan 1970: 108-109; 1987: 48-49; 1993: 121; Maggidis 1994; Soles 1992: 245-247; Panagiotopoulos 2002: 173-174; Papadatos 2005: 52-53, 58-59; Triantaphyllou 2018). For instance, at Archanes, bones and artefacts scattered in bedrock crevices (the 'Area of the Rocks') may represent the remains of old burials cleared out of built tombs prior to the deposition of new corpses (Sakellarakis & Sakellaraki 1997: 232, 236; Papadatos 2005: 52-53). At Petras, a rock shelter containing a secondary deposit was discovered ca. 50 m to the south of the cemetery of rectangular tombs (Triantaphyllou 2012). This secondary deposit contained human bones mixed with archaeological material dated from Early Minoan IB (1950-1900 BC) to Middle Minoan IB/IIA (1850-1850 BC), which the excavator interpreted as "coming from the cleaning of a particular House Tomb on one specific occasion, as indicated by the inverted stratigraphy and the joins of the skeletal material" (Tsipopoulou 2012: 125). The fact that some of the bones were cleared out of the tomb centuries after burial means that the transfer was not planned from the very beginning of the funerary process. The temporal framework of the rock shelter of Petras agrees therefore with its interpretation as an ossuary, as is also the case of the Haghios Charalambos cave (Betancourt *et al.* 2008(a); 2008(b); Betancourt 2014). The ossuary of Haghios Charalambos differs from the rock shelter of Petras and Compartment 1.9 of Sissi in that it is isolated in the landscape rather than associated with built tombs. It yielded a huge secondary deposit comprising human bones of

over 1000 deceased, more than 1500 vases and multiple artefacts ranging from Final Neolithic (4th millennium BC) to Middle Minoan IIB (1850-1800 BC). The bones and associated artefacts were cleared out of one or several unknown tomb(s) and redeposited into the cave in Middle Minoan IIB. Osteo-archaeological data leave no doubt that, except for a few body parts that were still partially articulated, most corpses had already decomposed by the time of their transfer into the ossuaries of Sissi, Petras and Haghios Charalambos. However, the transfer caused the destruction of all evidence pertaining to the previous treatment of the dead; it is therefore impossible to determine whether the bones redeposited in the ossuaries represent remains of primary burials, secondary burials, or post-funerary deposits.

At Sissi, there is one secondary deposit that does not match the usual archaeological signature of reductions and ossuaries: Individual 7 in Compartment 9.1. Following the decomposition of the corpse in an unknown location, selected bones of Individual 7 were collected, brought in the south corner of 9.1, arranged in a shallow pit, and covered with fragments of pottery vases. The arrangement of the deposit and the preservation of the deceased's individuality may be compatible with a true secondary burial (Crevecoeur *et al.* 2015: 295). However, ethnographic evidence suggest that, in societies where double funerals are reserved for highly selected individuals, secondary burial generally takes place in tombs specifically intended for that purpose. Since Individual 7 was discovered in a compartment otherwise occupied by primary burials, alternative scenarios should be considered as well. Individual 7 could, for instance, represent an example of delayed burial (e.g. an individual who had to be buried in the tomb only after decomposition, perhaps because the death happened far away) or post-funerary relocation (e.g. an old forebear who was transferred into Compartment 9.1 to give it genealogical depth). The interpretation of Individual 7 as a secondary burial cannot be entirely dismissed on current evidence, but alternatives are at least as plausible.

Overall, there is no evidence that double funerals were practiced commonly (if at all) at Sissi during the Prepalatial and Protopalatial periods. Secondary manipulations of the dead occurred regularly, but mostly for pragmatic reasons dictated by the management of space. That is not to say, however, that such manipulations were not ceremonial events of ritual and social significance, neither that they should be understood as a form of disrespect towards the dead – see also Moutafi (2021: 271-272). Quite the contrary. The phenomenon is illustrated dramatically by the huge secondary deposit from the Haghios Charalambos cave: retrieving, transporting and redepositing such a volume of old burial remains represented a major

undertaking, which was accompanied by a communal feast held outside the cave (Betancourt *et al.* 2008(b)). Human bones function as mnemonic devices (Hamilakis 2013: 129-160); their structured transfer into ossuaries probably contributed to memorializing forebears (who were not necessarily ancestors) and to strengthening the cohesion and collective identity of the associated community or communities. But no matter the significance of post-funerary manipulations of the dead, they are not to be confused with double funerals. Whether or not they are ritualized, post-funerary mortuary practices carry different social meanings than double funerals.

6. Conclusion

Ethnographic and historical data demonstrate that disarticulated bone deposits may be the product of a broad range of secondary manipulations of the dead. Such manipulations may take place during, after or even outside the funerary cycle. As a result, the practice of double funerals should not be the interpretation of first resort for every deposit of disarticulated bones in the archaeological record. In a pioneering study, Branigan (1987) raised awareness that mortuary practices in Minoan circular tombs involved various types of interferences with human bones, some of which had a pragmatic purpose while others were of a ritual nature. Here, we argue that the attention raised by ritual (funerary) practices should not conceal the possibility that human remains were manipulated for pragmatic (post-funerary) reasons as well: the ritual character of secondary bone deposits must be demonstrated rather than assumed.

Excavating and analyzing the Sissi cemetery following the approach of archaeothanatology has made it possible to move beyond the default identification of secondary burials in the Minoan mortuary record. The abundant primary deposits found in the rectangular tombs of Sissi are more convincingly interpreted as primary burials than as remains of incomplete double funerals. Some of these primary burials were left intact, some were accidentally disturbed when new cadavers were deposited, and others were intentionally manipulated. We argue that, at Sissi, intentional manipulations of partially or completely decomposed corpses were mostly carried out after the end of the funerary cycle, for the purpose of managing space and making room for new deceased. When the need arose, old burial remains were relocated within the same compartment (reduction), transferred into an ossuary, or perhaps discarded. In the whole Sissi cemetery, there is only one deposit (Individual 7 in Compartment 9.1) for which the identification of a secondary burial cannot be completely dismissed – and this even though alternatives are probably more plausible.

The evidence thus supports the reconstruction, at Sissi, of primary burial practices and post-funerary manipulations of skeletal remains. Recent studies paint the picture of a great diversity of funerary and post-funerary practices in Prepalatial and Protopalatial Crete, preventing generalizations based on individual sites. Nevertheless, old excavation reports require extreme caution, for the mere mention of commingled bones does not make it possible to distinguish between secondary burials, reductions and ossuaries, among others. The human corpse is the main object of the funerary (and post-funerary) treatment of the dead; the debate must thus revolve around skeletal remains. Yet, for a long time, Minoan mortuary studies focused on architecture, grave goods and landscape, while the general disregard for human bone deposits during excavations offered little opportunity for more than broad statements regarding the treatment of the dead. Nevertheless, the recent involvement of field anthropologists in the excavation of Prepalatial and Protopalatial cemeteries has already started to make its mark, and the steadily growing dataset is enabling us to break free from the stereotypical understanding of Minoan burial practices.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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