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BIOARCHAEOLOGY OF HESPERIA PEOPLE: AN ANTHROPOLOGICAL AND ISOTOPIC STUDY OF BIO-CULTURAL IDENTITIES AND HUMAN MOBILITY AT PITHEKOUSSAI'S NECROPOLIS (ISCHIA ISLAND, EIGHTH CENTURY BCE-ROMAN PERIOD)

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Abstract

La necropoli di Pithekoussai (VIII sec. a.C.- I sec. d.C., isola di Ischia, NA) è un osservatorio privilegiato per la ricostruzione degli assetti demografici, dei pattern di mobilità geografica degli individui, delle pratiche funerarie e dalla loro evoluzione in senso diacronico nel periodo e nell'area tirrenica in generale. Le attestazioni nella necropoli di manufatti indigeni e allogeni e il trattamento differenziato del corpo (inumazione a fossa, *enchytrismos*, cremazione) concorrono alla definizione della natura "multietnica" della comunità pithekoussana, composta da individui di provenienze locale, peninsulare, greca e orientale.

In una prospettiva di ricerca interdisciplinare, la presente ricerca si pone l'obiettivo di quantificare, su base biologica, la variabilità demografica e i trend di mobilità individuale nelle diverse fasi di frequentazione a Pithekoussai. I lotti sepolcrali relativi ai secoli VIII-VI sec. a.C., arco cronologico corrispondente alle fasi di primo e più intenso utilizzo dello spazio funerario e qui presi in esame, rappresentano l'insieme edito in Pithekoussai I (di cui sono state rese disponibili al riesame antropologico 96 cremazioni e 12 inumazioni su 590 sepolture) e delle ancora inedite sepolture indagate durante gli scavi Buchner 1965-1982 (c.d. Pithekoussai II, di cui sono rese disponibili all'analisi antropologica 34 cremazioni, 62 inumazioni). L'analisi del rapporto tra i sessi evidenzia una leggera preponderanza del numero degli individui maschi sulle femmine (indice di mascolinità: 109). Per la serie delle inumazioni, la distribuzione campionaria dell'età alla morte nell'insieme di VIII-VI sec. documenta l'inclusione nella necropoli delle principali classi di età (perinatali, infanti, subadulti, adulti). Ciò malgrado, si osserva una generale sottostima della classe di età inferiore a un anno (rappresentanti appena il 5,7%) e differenze diacroniche per gli infanti di età compresa tra 1 e 5 anni (18,1% nelle fasi in cronologia relativa del tardo geometrico e 3,4% nelle fasi successive). Per la serie delle cremazioni, sottolineiamo come questo è un rito destinato agli individui di età maggiore ai 15-20 anni. Si discostano dalla norma due sepolture: la t. 916 (in cronologia relativa pertinente al tardo geometrico, scavi Buchner 1965-1982), contenente i resti di un infante di 1-5 anni e di una femmina adulta; la t. 140 (in cronologia relativa pertinente al medio proto-corinzio, scavi Buchner 1952-1961) riferibile a un individuo in accrescimento.

In almeno 62 sepolture è stata accertata, su basi morfologiche, la presenza di resti faunistici associati; tra i taxa identificati prevalgono gli ovicaprini e il maiale, mentre sono molto più sporadici bue, equidi, cane e avifauna. Considerando soltanto i reperti attribuiti a livello tassonomico, solamente in tre casi sono presenti nella stessa sepoltura resti di taxa differenti.
Tranne rare eccezioni, i resti di fauna presentano tracce di combustione simile a quanto documentato sui resti umani; tale evidenza risulta compatibile con una deposizione contestuale all'incinerazione e interpretabile, in prevalenza, come offerte per il defunto.

La mobilità geografica degli individui è stata studiata mediante l'analisi del rapporto isotopico $^{87}Sr/^{86}Sr$ su porzioni di smalto dentale, in 45 individui inumati, e sulla *pars petrosa* dell'osso temporale, in 45 individui cremati, al fine di identificare casi in cui il rapporto $^{87}Sr/^{86}Sr$ non rientri nell'intervallo del segnale locale; quest'ultimo è stato determinato per via sperimentale da diversi campioni moderni e dall'analisi della struttura della variabilità del campione.

In conclusione, nonostante i limiti dettati dalla scarsa rappresentazione del campione biologico, i risultati ottenuti consentono di determinare diacronicamente alcune variazioni demografiche; le indagini isotopiche hanno permesso, infine, di quantificare la presenza di individui allogeni all'interno della comunità pithekoussana, rafforzando e completando quanto intuito precedentemente dallo studio del record osteodentario e archeologico.

Infine, l'applicazione di tecniche di indagine istomorfometriche ha consentito di reinterpretare il record osteologico della cosiddetta Tomba della Coppa di Nestore, gettando nuova luce su uno dei contesti archeologici più affascinanti e controversi del Mediterraneo Occidentale.

A mio fratello Paki,

per essere di continua ispirazione.

Più di quanto egli creda

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Questa tesi, frutto di tre complessi anni, è prima di tutto un lavoro di crescita personale. Se è vero che il dottorato cambia l'approccio al mondo (della ricerca), in un'opera continua di demolizione e costruzione, è certo che la persona che scrive ora non è la stessa che batteva su una tastiera tre anni fa. I ringraziamenti che seguono, volutamente in lingua italiana e contrariamente al corpo della tesi, saranno poco sintetici e formali.

I miei supervisori, Maurizio Cattani e Luca Bondioli, sono stati – in maniera diversa e assolutamente complementare– i miei punti di riferimento. M. Cattani ha rappresentato la assoluta positività e vivacità di animo critico – qualità sicuramente fondamentali per qualsiasi dottorando–; non posso che ringraziarlo per avere creduto nelle potenzialità di questa ricerca e nelle mie. L. Bondioli è la persona senza cui, invece, nessun progetto su Pithekoussai avrebbe avuto ragion d'essere. Severo e esigente – qualità anch'esse fondamentali per qualsiasi dottorando, eppure a volte maledette – è per me prima che un insegnante di ossa-isotopi-statistica (quest'ultima assai infruttuosamente praticata), un maestro di vita. Mi ha conosciuto, come spesso racconta, che ero una matricola un po' troppo saccente, trasformandomi in un'aspirante studiosa che sa di non sapere. E questo potrebbe essere un buon punto di inizio.

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La mia esperienza romana si conclude con le figure di Bruno d'Agostino e Teresa Cinquantaquattro, studiosi che rappresentano il motore immobile di questa ricerca, fondata sull'interdisciplinarietà e sul dialogo tra diversi saperi. Sentir parlare il vostro di sapere è stato ed è un privilegio non da poco. Grazie.

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CHAPTER ONE

MULTIDISCIPLINARY APPROACHES ON MOBILITY AND IDENTITY ACROSS THE FRONTIERS OF THE ANCIENT MEDITERRANEAN SEA: AN ARCHAEOLOGICAL AND BIOARCHAEOLOGICAL OVERVIEW

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The core of Chapter One provides a multifaceted reconstruction of Early Iron Age Campania, contextualising the Greek foundation of Pithekoussai (eighth century BCE, Ischia island, Gulf of Naples) within the broader cosmopolitan milieu of this region.

Historiographical sources suggest that Pithekoussai is the oldest Euboean settlement in the western Mediterranean Sea. According to Strabo (*Geographia*, V, 9), Pithekoussai was founded by people whom came from Chalkida and Eretria, the two main cities in the Eubea region, at the beginning of the Magna Graecia experience (eighth-seventh centuries BCE) (Livy, *Ab Ube Condita*, VIII, 22; Buchner 1954, 1966; Buchner and Ridgway, 1993).

Interest in the nature of Pithekoussai has been a prominent theme in the Mediterranean and Classical archaeology with much research focusing on the ancient Greek colonisation and migration towards the Tyrrhenian coasts (e.g. Buchner 1954; Bérard 1963; Buchner 1966; Buchner and Boardman 1966; Buchner 1969; Ridgway 1981; Buchner 1982, 1983a, 1983b; Ridgway 1984; Buchner and Ridgway 1993; Boardman 1994; Gialanella 1994; d'Agostino 1994; Gras 1994; Malkin 1994; Asheri 1996; van Dommelen 1997; Bats and d'Agostino 1998; d'Agostino and Soteriou 1998; Osborne 1998; Bailo Modesti and Gastaldi 1999; Cerchiai 1999; d'Agostino 1999a, 1999b; De Caro 1999; Jannelli 1999; Purcell 1999; Schnapp 1999; Coldstream 2000; d'Agostino 2000; De Polignac 2000; Mele 2003; d'Agostino 2006; Hall 2002; Tsetskhladze 2006; Blandin 2007; Nizzo 2007; Brun et al. 2008; Greco 2008; Ridgway 2009; Dietler 2010; d'Agostino 2011; Greco 2011; Knappett 2011; Malkin 2011; Kelley 2012; Burmeister 2013; Blake 2013; Cerchiai et al. 2013; Cinquantaquattro 2016; Donnellan 2016).

At the end of the eighteenth century, Pithekoussai's necropolis was first identified by the local scholar Francesco De Siano (Buchner 1954, 1966; Buchner and Ridgway 1993). However, modern archaeological research did not start until 1952 (Buchner 1954, 1966; Buchner and Ridgway 1993). Several excavation campaigns, carried out by Giorgio Buchner and David Ridgway (1993) (Chapter One, paragraph 1.3) unveiled more than one thousand burials (Buchner's excavations 1952-1982); cremation and inhumation rituals are attested side by side. Not only is the heterogeneous funerary record from Pithekoussai essential for the reconstruction of the ancient history of the Mediterranean region in that period, but also it is also vital for the definition of the early stages of the western Greek colonisation (Buchner 1982; Buchner and Ridgway 1993; Coldstream

1993; d'Agostino 1994; Cinquantaquattro 2016). According to several scholars, Pithekoussai's material culture suggests that the site was a melting pot of cultural identities, composed by Euboean, East Greek, Phoenician and indigenous people (Buchner 1966; Buchner and Ridgway 1993; Ridgway 2000). The astonishing wealth of grave goods at Pithekoussai is vividly evoked by the Late Geometric *kotyle* of Rhodian manufacture, discovered in burial 168, a cremation known as the Tomb of Nestor's Cup (Buchner 1966; Buchner and Ridgway 1993) (Chapter Four). Nestor's grave is dated Late Geometric II (LG II, ca 730 BCE; *for Pithekoussai's dates and abbreviations Table 1.3*, Chapter One, paragraph 1.3). The drinking cup bears an incised metrical inscription (SEG XIV:604) composed of three lines of Euboean text; this finding is among the oldest known instances of written Greek and represents the first piece of poetry from Homeric times preserved in contemporary writing (Figure 1.1) (Buchner and Russo 1955; Webster 1960; Jeffery 1961; Buchner 1966; Watkins 1976; Powell 1991; Cassio 1994; Pavese 1996).

FIGURE 1.1 *Nestor's Cup*. Museo Archeologico Nazionale di Villa Arbusto, Lacco Ameno (*Ischia island*)

In recent decades, academic research has adopted multi-lines approaches to help improve our understanding of the character of these cultural interactions and their effects on the native and Greek-Oriental cultures (e.g. Hall 2002; Greco 2006; Hodos 2006; Knappett 2011; Kelley 2012; Hodos 2014; van Dommelen 2014; Donnellan 2016; Donnellan and Nizzo 2016; Hall 2016; Malkin 2016). The puzzling nature of Pithekoussai's society, as well as the historical and archaeological inferences about the mixed origins of its inhabitants remain contentious.

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Human mobility, cultural and ethnic identities are three key concepts of Pithekoussai's archaeology. In recent years, despite the discipline's tradition, an increasing number of studies have shown alternative approaches to migration and identity issues. These are used as multidisciplinary tools for addressing archaeological questions on biological and cultural interactions in past societies (Anthony 1990; Burmeister 2000; Cabana and Clark 2011; Burmeister 2013; van Dommelen 2014). New and more sophisticated strategies, borrowed from social and life sciences, allow us to evaluate ancient Mediterranean mobility scales and connectivity models, compensating for the weaknesses of archaeological theories and perspectives.

Chapter One is split into three sections:

1. section 1 briefly reviews some theoretic issues, focusing specifically on migration, ethnic and cultural identities, and cross-cultural interactions. All of these concepts, borrowed from sociological, historical and anthropological disciplines, have been systematically applied to European and Mediterranean Archaeology from different periods and in different ways. They are also employed in this research to help improve our

understanding of Pithekoussai's cultural foreign encounters and their impact on the indigenous culture, as well as their interactions with it.

2. Given the aims of this dissertation, section 2 discusses the effective research perspectives and tools from human biology, genetics and isotope analyses; their applications to the biological record allow us to obtain new data-sets on human mobility, as well as on archaeological and/or historical inferences about melting pot societies. This section is a summary of the state-of-art of this subject. Huge bodies of literature are currently available. Main case studies, from Mediterranean Prehistory to the Classical period, are part of this review and are presented in Chapter One, paragraph 1.1 Analytic methods and procedures adopted in this research are described and discussed in Chapter Two, paragraph 2.2.

3. section 3 provides an archaeological overview of the theoretical perspectives that have be applied in previous research of Pithekoussai's funerary evidence in order to examine the unanswered archaeological questions that investigated this pilot study.

1.1 *Poseidon's sons.*
Archaeological and cultural approaches to migration, ethnicity and cross-cultural interaction in the Mediterranean

Research into the mobility of people, artefacts, cultures and technologies has always been at the theoretical heart of the anthropological disciplines. The main aim of the most the mobility related research is to provide a more in-depth and nuanced comprehension of human history. The history of Mediterranean civilization is arguably a history of human mobility, identity and cross-cultural interactions. These three concepts are well-known within European and

Mediterranean archaeology and many questions regarding human mobility, identity and cross-cultural interactions remain contentious today.

A long research tradition in mobility studies has produced a huge body of literature, the aims of which was investigate human mobility strategies and their identifications in the past; throughout the decades, cultural, ethnical and historical studies have opened several and lively debates within European archaeology and Mediterranean studies (e.g. Anthony 1990; van Dommelen 1997, 1998; Abulafia 2003; Harris 2005; Riva and Vella 2006; Härke 2007; Dietler 2010). Different approaches to archaeological records have provided a narrative of migrations and cultural contacts aiming to explain the role played by them in the reconstructions of past societies (van Dommelen and Knapp 2010; Horden and Purcell 2000; van Dommelen and Rowlands 2012).

In the last century, the assumptions of a strong connection between movements of people and definitions of ethnic and cultural identities seemed to be widespread (Lowie 1937; Trigger 1989). More accurately, mobility issues have been applied to archaeological systems as a theoretical tool used to explain cultural and social change, as well as spatial distribution of archaeological findings, especially in prehistoric societies (Trigger 1989). Above all, the role of migration and identity in theoretical debates closely followed intellectual trends, which modified the central topic of different inferences throughout the years (Hakenbeck 2008; van Dommelen 2011; Burmeister 2017).

Migration theory and the defining culture were strictly connected to G. Kossinna's diffusionism. Kossinna, a German linguist and archaeologist, was author of the first conceptualisation of the so-called Indo-Germans group origins, as well as of the theoretical comprehension of prehistoric migration applied within European prehistoric contexts. In 1911 essay *Die Herkunft der Germanen*, Kossinna stated that "sharply defined archaeological culture-provinces coincide at all time with quite definite peoples or tribes" (cited in l, p. 28). More accurately, Kossinna used specific traits of material culture distribution to identify a myriad of different archaeological cultures, perceived as being the material remnants of closed ethnic communities. This understanding theory of human culture was based on the inferences of earlier German diffusionists (e.g. Ratzel 1899) and contributed to the development of migration theory through the concept of *Kulturkreise* or culture-area (Graebner 1911; Kossinna 1911; Curta 2002).

Later, in the 1930's *The Bronze Age*, V. G. Childe (1930) maintained that "when the whole complex of types, fashions and habits spreads into an area where the same forms of tools and weapons, artistic conventions and burial rites had not previously been generally current, we must admit that we are dealing with a migration" (*ibid.* p. 42). Despite being politically opposed to Kossinna's ideas, as a Marxist, Childe absorbed Kossinna's concept of archaeological culture and introduced it to Anglophone archaeology as a powerful tool to detect the characters of prehistoric societies (Trigger 1980). As reported by A. Brown (2014), in accordance with Childe: "Each culture had specific traits that differentiated it from another and, by consequence, had a specific ethnic identity, resulting in a complex vision of European prehistory formed of myriad culture. (…) Change was stimulated by external factors such as migration and diffusion, while those local, ethnic traits defining each culture, such as burial practice, would remain less receptive to change" (Figure 1.2) (*ibid.* p.1823).

On the contrary, in evolutionist theoretical models, social and cultural changes are mainly seen as the results of innate social and cultural processes rather than external factors such as migration and diffusion (Burmeister 2017). In the 1960's, with the rise of *New Archaeology* and its theory and methods, the exploitation of the concept of migration called for a deeper explanation of the cultural and social changes in the past. Central to this reflection was L. R. Binford's notion of migration as a mechanism behind cultural processes (Binford 1962, p. 218). Well-known in the archaeological literature for having introduced the hypothetic-deductive methods to this discipline, Binford was a main theoretician of the *New Archaeology* movement in the 1960's. In the introduction to his 1962's essay *Archaeology as Anthropology*, Binford (1962) argued how one of the major factors that contributed to the archaeological lack of migration studies was the tendency to read artefacts as "equal and comparable traits which a single model of culture change and modification" (*ibid.* p. 217). Furthermore, he claimed that "(…) change in the total cultural system must be viewed in an adaptive context both social and environmental, not whimsically viewed as the result of *influences*, *stimuli*, or even *migrations* between and among geographically defined units" (*ibid.* p. 217). More accurately, in shaping of L. White's (1959) dictum of culture as an "extra-somatic means of adaptation for the human organisms" (*ibid.* p. 8), migration is viewed as an exclusively historical explication that "(…) adds nothing to the explanation of the processes of culture change and evolution" (Binford 1962, p. 218).

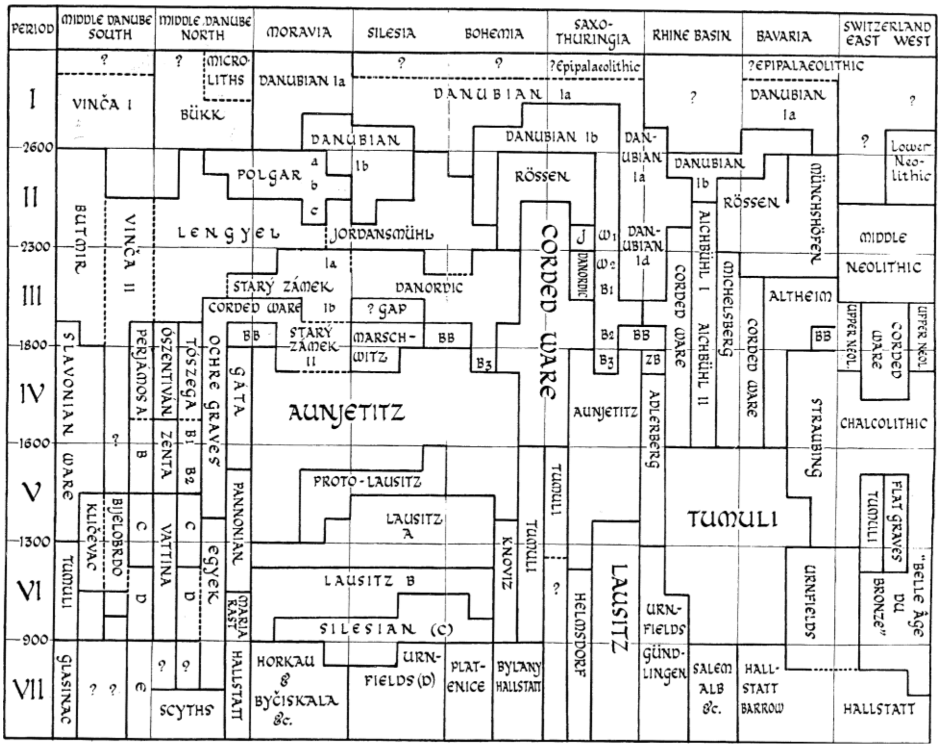

FIGURE 1.2 Childe's first chart correlating the archaeological cultures of central Europe (*Childe 1929*)

This *Retreat from migrationism* (Adams et al. 1978) will be described in an oft-quoted paper by D. W. Anthony as the baby migrationist being thrown out with the bathwater (Anthony 1990, p. 895). Nevertheless, several studies focusing mainly on the spread of agriculture across Neolithic Europe have also aimed to explain processes of migration and diffusion since the 1970s (Cavalli Sforza 1973; Ammerman and Cavalli Sforza 1979; Zvelebil 1986; Trigger 1989). The demographic model of *demic diffusion* in a *wave of advance*, developed by A. Ammerman and L. Cavalli Sforza (1984) in *The Neolithic Transition and the Genetics of Populations in Europe* has inspired the model about the spread of Indo-European languages by C. Renfrew. According to these scholars, the wave-like spread of agriculture is compatible with the real dates of the diffusion of agriculture as established by archaeology, as well as with the patterns of genetic variation of the European population, as established by geneticists. In the essay *Archaeology and Language. The puzzle of Indo-European Origins*, Renfrew (1987) identifies three primary models which determine the use of a given language in a given region: (1) *initial colonization*; (2) *replacement*; (3) *continuous development*. The application of the *wave of advance model* on (1) processes identifies a possible mechanism of language replacement, based on demography and subsistence; it implies that the introduction in a given population of a new technology, such as farming, allows a notable increase in that population density (*ibid.* pp. 121-9).

Mathematical models have been used to describe how archaeological material cultures change in time and space. The noteworthy impact of these studies can be appreciated as a move away from earlier ethnic interpretations of migration matters, shaped on the actual processes and effects of the human mobility within and beyond cultural matrices and geographic boundaries (Rouse 1986; Hakenbeck 2008).

Archaeological discourses on human mobility played out more sophisticated theories and models in the 1990's and 2000's. Previously mentioned scholars such as D. W. Anthony (1990, 1997) and S. Burmeister (1998, 2000, 2013, 2017) have emphasised the importance of theoretical investigations of: (1) individual agency and subjective, such as gender, age, and the social identity of migrants; (2) reconstruction of the social contexts of migrations; and (3) the multiple meaning of the material cultures. The latter is well described in the essay *The Archaeology of Migration: what can and should it accomplish?* (Burmeister 2017). This research raises the question of when it is possible to discuss migration inferences in ancient material record. Plausibly, besides migration, there are a number of different mechanisms which can result in cultural change. For example, trade and other forms of knowledge and culture (*ibid.*). In accordance with Burmeister (2000), without a more extensive theorising of migration, as an element of human behaviour, these intricate archaeological issues remain unanswered.

Migration in Archaeology: The Baby and the Bathwater (Anthony 1990) represents a landmark in archaeological debates about migration. As a general principle, Anthony's approach to migration systems depended upon an understanding of the general structure of human mobility as a shaped human behaviour (*ibid.*). He borrowed concepts from contemporary demographic and geographic disciplines to shed some light on prehistoric migrations' structures and improved our knowledge about how and why they may have occurred. On the basis of the E. Lee's work (1966), *A Theory of Migration. Demography*, Anthony applied the theoretical study of the so-called *push-pull* formulation (Figure 1.3), to explain the causes of migration. This model takes into account a number of negative, or *push* factors, in combination with a number of positive, or *pull* factors. More accurately, on the one hand we recognize as *push* factors miscellaneous factors that encourage people to move way; on the other hand, *pull* factors attract the migrants to a receiving country. Combinations of *push* and *pull* factors would then determine the size and the direction of flows (Portes and Böröcz 1989). Within this framework, the reconstruction of ancient scenarios must not be reduced to a mere cost-benefit analysis. *Push-pull* models represented a starting point for more sophisticated observations about the nature of the assumed *push* and *pull* factors: economical, demographical, social-cultural values also affect the decision to migrate, complicating every simple analysis. Nevertheless, as reported by Anthony (1990) "(…) the push-pull model can be retained as a guide to the general parameters that affected prehistoric migrations, as long as push and pull factors are not seen as purely mechanical determinants" (*ibid.* p. 899). This important starting point has paved the way for new perspectives and approaches to human population movement, very different from the culture-historical tradition. And the often-quoted sentence "Cultures do not migrate; people do" (Anthony 1997; p. 24) indicates where the academic gaze is currently turned.

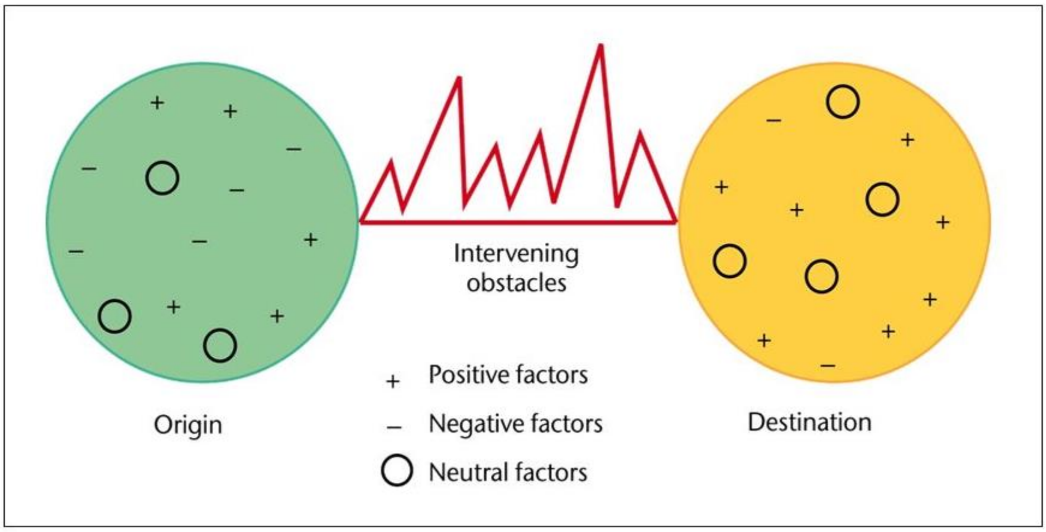

FIGURE 1.3 *Push-pull* theory based on (*Lee 1966*)

1.1.1 Issues and contexts of the defining cross-cultural contacts in the first millennium Western Mediterranean

In the reconstruction of the ancient Mediterranean landscape, the concept of migration is a ship rocked by the waves of ethnic and cultural identities. Movements of people as well as the meaning of material culture in ethnic and cultural terms are key reference points in Mediterranean archaeology (e.g. Barth 1969; Hodder 1982; Bentley 1987; Eriksen 1991; Jones 1997; Malkin 2001; McInerney 2001; Hall 2002; Brather 2004; Lucy 2005; Shepherd 2005; Brather 2008; McInerney 2014).

Ethnicity and identity are recognised as fluid phenomena (Hodos 2010) As conceptual categories, ethnicity and identity are strictly connected with methodological debates on migration within European archaeology, as well as

Mediterranean literature (e.g. Cunliffe 1988; Dietler 1999; Antonaccio 2001, 2003). Identification of ethnic and/or cultural group features as a model for detecting migration phenomena has become one of the main goals of the theoretical approaches in nineteenth century archaeology. In fact, a simplistic correspondence between material culture and ethnic and/or cultural identity was a broadly accepted assumption.

Archaeological interest and questions related to ethnicity definitions received fresh impetus with Ian Hodder and his rejection of the explanation of the cultural behaviour within universal models, as propagated by *New Archaeology* (Burmeister 2016, p. 46). I. Hodder (1982), author of *Symbols in Action*, showed how social behaviour was actively shaped by material culture and how this behaviour was adopted to specific group constellations in "interethnic contact" (*ibid.*). Hodder's work and archaeological theories in the late 1990's created a new paradigm shifting away from a monolithic and static conception of material culture as reflections of ethnic identity. M. Weber's pioneering definition of ethnic group as "(…) human groups that entertain a subjective belief in their common descendent because of similarities of physical type or of customs or of both, or because of memories of colonization and migration" became commonly accepted (Weber 1922, p. 219).

Ancient ethnicity and cultural identity are undoubtedly an essential field within the Classical disciplines. For obvious reasons, in Mediterranean studies the significance of ethnicity has been strictly linked to the colonialist view of Mediterranean history in Greek and Roman expansion and conquest terms (Ward and Joukowsky 1992; Knapp and Cherry 1994; Harris 2005; Knapp and van Dommelen 2008). Ethnic, linguistic, religious and political differences have been attested throughout the Mediterranean basin, particularly for historic periods. As noted by D. Abulafia (2011), these phenomena were "(…) constantly subject to external influences from across the sea and, therefore in a constant state of flux, while movements from the interior toward the sea introduces the culture, languages, and political traditions of areas close and remote in the hinterland of

Europe, western Asia, and North Africa." (*ibid.* p. 222). Nevertheless, the concepts of ethnicity and cultural identity assume more and diversified nuances. An extensive and detailed analysis of ancient migrations and connectivity strategies are crucial for better understanding the formation of early historic Mediterranean identities, as well as the formation of prehistoric ones. Ignoring this fact means ignoring is the elephant in the room.

B. Knapp and P. van Dommelen (2010) in *Material Connections in the Ancient Mediterranean* reported that "(…) colonial occupations, migrations and all manner of social exchanges in the past now demand more meaningful and effective theorised representations. Such work is essential if we wish to develop fresh cultural and historical understandings of how factors such as materiality, mobility, hybridisation, co-presence and conflict impacted on the formation of identity and subjectivity, whether past or present." (*ibid.* p. 2).

Accordingly, fresh perspectives to material culture are adopted in order to explore contact situations among different social and cultural identities. As Burmeister (2017, p. 60) recently pointed out, material culture is seen as means of social communications, as a strategy for shaping relationship. A careful examination of the complexity of material culture can improve our perception of changes that occurred in the social and cultural landscape, reconstructing the "social biography" and cultural meeting of people and objects (Kopytoff 1986; Morris 1992; Knapp and Cherry 1994; Knapp 2007; Knapp and van Dommelen 2008). Furthermore, funerary evidence, as part of material culture and remnant of ritual practices, can provide "(…) the ideal way to explore the complexities of social interaction, to examine the ways in which different group renegotiated their identities in the light of multiple and diverse cultural contacts" (Janes 2010, p. 131).

The archaeology of Cyprus provides a good example of the re-assessment of funerary data taking into account these new approaches (Janes 2010). According to traditional interpretations, Cyprus' complex cultural, socio-political landscape can be explained in light of the external cultural and social fluxes of Aegean and

Phoenician people in the Cypriot world, that occurred between the eleventh to ninth centuries BCE (Gjerstad 1926, 1948; Aström 1972; Coldstream 1985; Iacovou 2003¸ Given 2004; Iacovou 2004, 2005a, 2005b; Dickinson 2006). Cyprus was deeply involved in the collapse of the Mycenaean palatial system and Levantine centers, such as Ras ibn Hani and Ugarit, at the end of the thirteenth century BCE (Iacovou 1998, 1999b, 2001, 2006a; Karageorghis 1987, 1992; Rupp 1987). Consequently, several Late Bronze Age Cypriote sites were abandoned and/or destroyed. However, Cyprus' material culture continued to show very diversified cultural features from the Late Bronze Age and throughout the Iron Age (Karageorghis 1987; Rupp 1987; Karageorghis 1992; Iacovou 1998; 1999; 2001; 2006; Janes 2010). Attestations of Aegean flux was widely recognised in the funerary architecture and material culture. The diffusion of Greek names in the Cypro-syllabic script is also attested on the island throughout much of the Iron Age (Sherratt 2003; Janes 2010). All of this evidence was interpreted as archaeological proof of the Aegean ethnic domination in Cyprus' Iron Age material culture (Hall 1997).

Similarly, Phoenician influences were recognised in sacral architecture, such as the temple of Starte and Melqart in Kition and in burial customs and practices: for example, *intra moenia pithos* burials of new-borns and children in Salamis (Bikai 1983; Coldstream 1985; Bikai 1987; 1989; 1992; Iacovou 1999a, 1999b; Karageorghis 1992; Yon 1999). As claimed by S. Janes (2010), this one-dimensional approach does not take into account neither the complexity of the socio-political and cultural development of Cyprus, nor the insularity, connectivity and identity questions (*ibid.* p. 128).

Within this framework, Janes' re-consideration (2010) focused on detecting some peculiar issues by analysing the complex and diversified burial practices attested on the island. The aforementioned Salamis, on the east coast of Cyprus, played a key role within the dynamic overseas relations among the island, the Near Eastern and Egypt (Calvet 1980). The mixed nature of the site was well-reflected in the artefacts and burial practises characterised by references to the

Aegean, Near East, Phoenicia and Egypt culture. For example, horse sacrifices of eastern tradition occurred in all the burials in the Royal Tombs area (Casterns 2005). Moreover, the use of Phoenician *pithoi* for infancy *enchytrismoi* and the different accesses to formal burial based on age discrimination can be considered as an adoption and adaptation phenomenon of foreign cultural elements in Salamis cultural horizon. However, the attestation of these phenomena does not implicate the presence of foreign people who ethnically or culturally dominated the local ones. The assumption about the passive role of the local communities has been bypassed by a dynamic and critical reading of the material culture. Salamis was a prosperous city, as argued by Jane (2010, p.139), where the burial practices reflect the different strategies of social organization and interaction: the erection of the first Royal Tombs during the Cypro- Geometric III (CG III, 850-700 BCE) clearly showed the emergence of a ruling lineage to the local population (Janes 2010). This process was undoubtedly facilitated by successful competition for both island resources, such as copper and timber, and control of increasingly lucrative trade links with the Eastern Mediterranean (Rupp 1988; Janes 2010). The Royal Tombs announced the control of internal affairs more than of external connection; and the sacrifice of horses "emphasised the power of ruling lineage to their eastern neighbours whilst also enabling these elites to consolidate their power within the ongoing intensive internal competition for control of the area" (Janes 2010, p. 141).

The reassessment of Cyprus' evidence shows the academic tendency to explain the multifaceted and nuanced ancient encounters in terms of two opposite categories: self and other; foreign and native; Greek and barbarian; conquest and conquered (Trigger 1989; Emberling 1997; Jones 1997; van Dommelen 1998; Riva and Vella 2006; Tsetskhladze 2006, 2008; Wallace-Hadrill 2008; Derks and Roymans 2009; Mac Sweeney 2011). This tendency was at the root of the intellectual reading of the growing migration phenomenon that characterised the Mediterranean basin during the first millennium BCE.

Detailed multidisciplinary studies conducted in central and western Mediterranean have showed that long-range travels, exchange of artefacts and raw materials has been attested across the Mediterranean since the Early Prehistory (e.g. Bigazzi and Bonadonna 1973; Cherry 1981; Chapman and Müller 1990; Cherry 1990; Renfrew and Aspinall 1990; Broodbank and Strasser 1991; Cherry 1992; Tagliacozzo 1993; Evans 1994; Halstead 1996; Bass 1998; Bar-Yosef 1998; Bednarik 1999; Broodbank 1999; Gamble 1999; Gowlett 1999; Bar-Yosef 2000; Snodgrass 2000; Aura et al. 2001; Bar-Yosef and Belfer-Cohen 2001; Barton 2001; Bednarik 2003; Francalacci et al. 2003; Broodbank 2006). At the beginning of the Holocene and throughout the Neolithic expansions, the movement of people and materials, from coastal Levant to the Iberian Peninsula, seemed to be characterised as an essentially maritime phenomenon (Broodbank 2006, pp. 214-7). One of the major indirect proof of these circulation systems is the wide distribution of the obsidian (e.g. Tykot and Ammerman 1997; Carter and Kilikoglou 2007; Bellot-Gurlet et al. 2008; Tykot 2014a). Obsidian findings both as raw material and artefacts revealed travelling routes of hundreds of kilometres from the major source sites of Lipari, Pantelleria, Palmarola, Monte Arci, as well as Carpathian and Aegean regions, operating since the Early Neolithic period. Indeed, in a recent work by R.H. Tykot (2017), XFR spectrometer non-destructive analysis were performed on thousands of obsidian finds from Neolithic to the Bronze Age, with the aim of distinguishing the Mediterranean, Carpathian and Aegean sources (Figure 1.4). Moreover, additional trace elements have allowed to characterise Lipari, Melos and Pantelleria's sub-sources (*ibid.*).

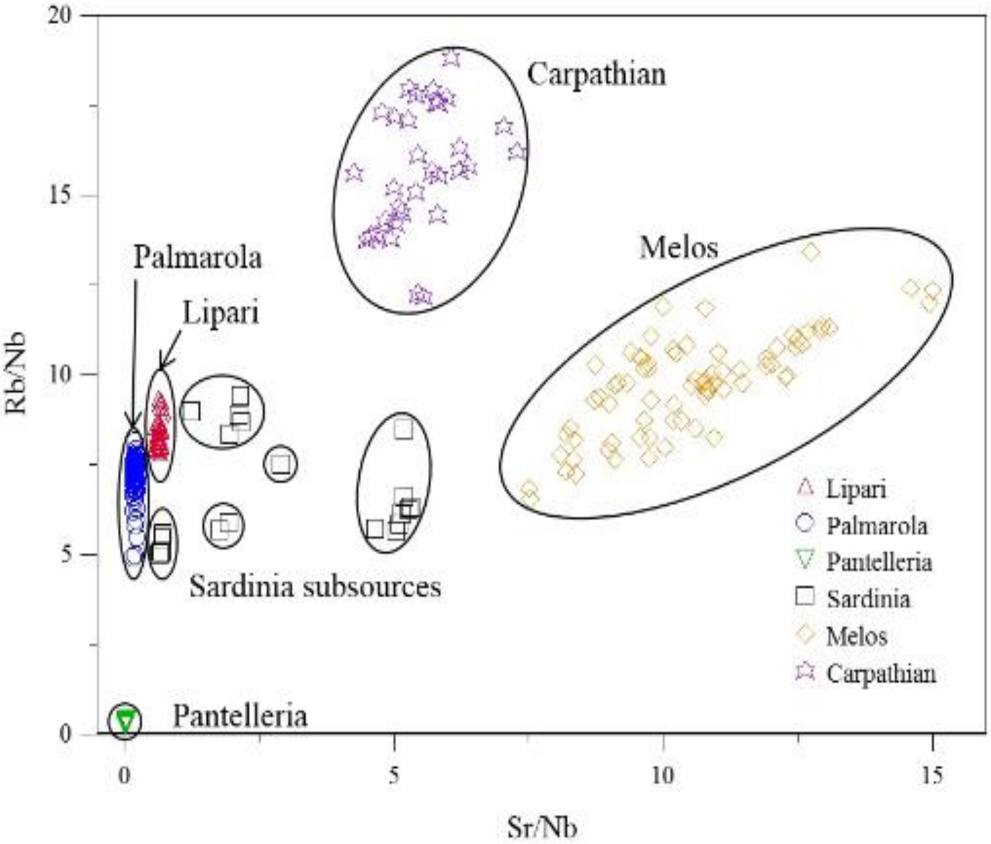

FIGURE 1.4 Graph of trace element data distinguishing Mediterranean and European obsidian sources (*Tykot 2017*)

Until the beginning of the first millennium BCE, exchange of raw materials and finished products, technologies and cultures were not straightforwardly connected with migration and colonisation phenomena. Yet, archaeological record has recognized protocolonial activities already in Bronze Age Minoan and Mycenaean civilizations within both eastern and western Mediterranean basins (Ridgway 1992; Albanese Procelli 1995; Vagnetti 1996; Leighton 1999). These encounters are described as a prelude to the massive experiment in cross-cultural interactions occurred during Greek colonisation (ca. 800-500 BCE). Before the first palaces appeared on the island of Crete, relationships among Minoan, Egypt and Near East people had significantly increased. Exchange of artefacts, such as scarab seals and stone vessels, and transfer of metal and faiance working technologies are well attested (Chadwick 1976: Bass 1998; Broodbank 2000; Tartaron 2014). To cite an example, the presence of Aegean/Cretan painters in the East seems to be confirmed by archaeological evidence from the Tel Kabri's palace in Israel (Cline et al. 2011). The site of Tel Kabri was identified as the capital of the Middle Bronze Age Canaanite Kingdom (c. 1700-1500 BCE). As reported by E. H. Cline and colleagues (2011), several fragments of wall and floor plaster were uncovered between the 2008 and 2009 site's excavations (*ibid.*). Aegean-style frescoes were attested; in particular, some fragments showed the colour scheme commonly used in the Aegean to depict animals, such as the Blue-monkeys' frescoes from Akrotiri's site, implying, ultimately, the presence of Cretan craftsmen in Tel Kabri (Figure 1.5) (Dakoronia 2006; Cline et al. 2011).

FIGURE 1.5 Griffin from a fresco at Mycenae, with fragments from Tel Kabri in upper right for comparison (*Cline et al. 2011*)

Moreover, the contextual analysis of the foreigners' figures carried out by D. Panagiotopoulos (2001) and described in *Keftiu in context: Theban tomb-paintings as* *a historical source* has pinpointed the diplomatic gift-giving in Aegean processions in the private Theban tomb-painting (ca. 1480-1380 BCE). The reading of hieroglyphic inscriptions also enabled Panagiotopoulos to identify Keftiu as the Egyptian name for Crete, or more generally the people from the Aegean, probably including the Peloponnese. Aegean male emissaries appear so as equal members of the international diplomatic community of the Near East (Panagiotopoulos 2001). Similarly, an Egyptian representation of Mycenaean soldiers was uncovered on a papyrus fragment from El-Amarna, a city of the eighteenth Dynasty and residence city of the King Akhenaten (ca. 1352-1335 BCE). Aegean warriors in Egyptian paintings would suggest that the later tradition of Greek mercenary activity around the Mediterranean has a Bronze Age antecedent (Hankey 1981).

Different degrees of raw materials and artefacts circulation seem to have developed also within western Mediterranean. As main assumption to explain these contacts, archaeological literature invoked the scarcity of Greek regions in raw materials and in particular metals (Lyons and Papadopoulos 2002; Hodos 2006). This condition prompted the Mycenaean system trades to exploit into western Mediterranean networks in which copper, tin and other metals circulated (e.g. Rizio 2005). Clearly, metals were of great importance to bronze age societies; the concentration of precious metal artefacts in the funerary records and the careful control over supplies of raw material in metals implied, for example, in the Linear B tablet uncovered at Pylos, demonstrate how essential they were to the Mycenaean palatial elite (Chadwick 1976). The assumption that Aegean people were getting metals from west-central Italy (Colline Metallifere and Monti della Tolfa) is indeed widely accepted. Metal sources in Sardinia, Alps and Iberia are also potential candidates to have supplied the Mycenaeans (e.g. Lo Schiavo et al. 1985; Pearce 2000). In this perspective, the requirements of sources might have encouraged early explorations of Sicily and southern Italy. Not by chance, several sites recorded sherds of Aegean pottery, notably Mycenaean-style, uncovered in Sicily, southern Italian peninsula, as well as in Sardinia and central

Spain (Ferrarese Ceruti 1979; 1982; Snodgrass 1991; Vagnetti 1982; Mederos Martìn 1999; Vianello 2005). Additionally, petrographic and chemical analyses have allowed to test the area of origin of some Aegean sherds from Italy, tracing them back to the Peloponnese, Crete, Rhodes, central Greece, and to Italy itself, with locally-produced imitations of the Mycenaean pots often making up the majority of the Aegean-style sherds (Blake 2008). The latter are mainly attested in the so-called Italo-Mycenaean wares along the Ionian coast of southern Italy, such as Termitito, in Basilicata; Broglio di Trebisacce, in Calabria; Scoglio del Tonno, in Apulia (Blake 2008).

However, the nature of those contacts is still puzzling and not at all easy to verify. On the one hand, according to some scholars (Peroni 1979; Bietti Sestieri 1988; Maddoli 1992; Vagnetti 1993; Castellana et al. 2000; Bettelli 2002) the existence of Aegean outposts into local communities can be assumed even if the Aegean evidence does not support the presence of fully-fledged Mycenaean colonies (Blake 2008). On the other hand, a recent paper by Emma Blake (2008) explored how the growing number of Aegean artefacts recorded mainly along the Adriatic and Tyrrhenian coastlines (Smith 1987; Marazzi and Tusa 2005; Merkouri 2005) has contributed to the tendency of emphasising the real impact of the Mycenaeans on social and cultural native systems (Blake 2008, p.1). This assumption appears to be underpinned mainly by the social development and transformation occurred at the end of the Italian Bronze Age (ca. 1300-1150 BCE), when Mycenaean records were most numerous (Peroni 1979; Blake 2008). Mycenaean influence has also been attested in different ways, such as wealth differentiation in tombs, in part based on Aegean materials themselves (Blake 2008, p. 2). For example, remarkable are the findings from Scoglio del Tonno, the necropolises of southeast Sicily and on the Aeolian islands (Vagnetti 1993).

At the end of the thirteenth century BCE and in the early twelfth century BCE, a sever contraction in Mycenaean imports is evident: Aegean finds are limited to the sites in Apulia, Broglio di Trebisacce and Nuraghe Antigori on Sardinia (Lilliu 1988; Ferrese Ceruti 1990; Relli 1994; Vanzetti 1995; Mederos Martìn 1999).

Both in the West and the East Mediterranean, the final collapse and disappearance of the Mycenaean palatial system shortly after 1200 BCE caused the disruption of long-distance trade routes. Nonetheless, there was no complete gap in cross-cultural communications; to cite some examples, as described by T. Tartaron (2014, p.1808) in the twelfth century BCE, Tiryns maintained contacts with Cyprus and Crete, and small objects from Syria, Egypt, Mesopotamia and Cyprus were deposited in the chamber tomb necropolis at Perati on the east Attic coast. Maritime activity was especially vigorous on both side of the Euboean Gulf, where depictions of galleys were painted onto pottery (Dakoronia 2006). Moreover, Euboean people animated the sea routes that involved the Aegean mainland and the coast of Thrace, developing two spheres of circulation and exchange: (1) the Euboean-Cycladic, and (2) the Cyprus-Levantine. Lefkandì and the Cypro-Phoenician area were the two main hubs for resource accumulation; Dodecanese and Crete, the two main centres of re-distribution. In particular, in Lefkandì on the Euboea's western coast, Cypriot, Egyptian, and Syro-Palestinian objects were placed in graves in the mid-eleventh century BCE (Popham et al. 1968; Crielaard and Driessen 1994; Antonaccio 2002). More importantly, during the Dark Age, Lefkandì produced a remarkable apsidal building (Figure 1.6), known as ἡρῷον, with mud-brick walls on a stone socle and an exterior peristyle of wooden posts. At the core of the building, two shaft graves have been uncovered: one contained remains of both male and female individuals; the other held four horses which appear to have been sacrificed and included in the grave. Two of the horses were found with iron bits still in their mouths. The bronze vessel holding the man's remains and some of the woman's jewerly were Bronze Age heirlooms from Cyprus and Near East.

Undoubtedly, Mycenaean, Aegean and Levantine material culture recovered at myriad of sites across the Near East and western Mediterranean has shown the geographical and cultural basins within which the palatial system and, later, more complex aristocratic societies participated in cross-cultural trade networks.

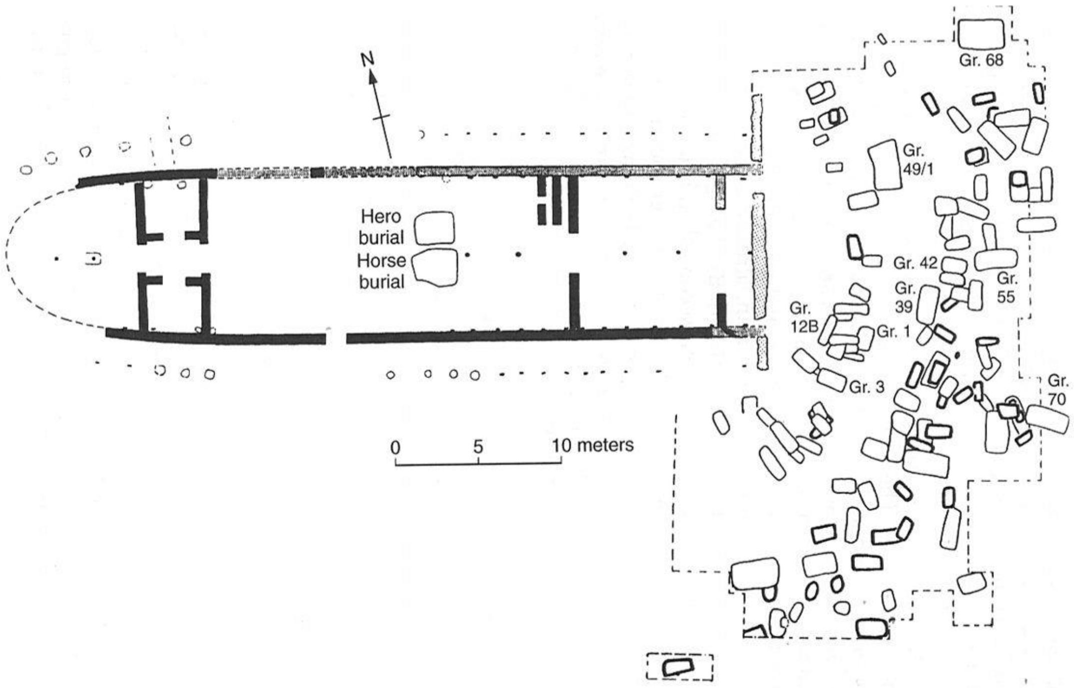

FIGURE 1.6 The Toumba apsidal building and cemetery at Lefkandì based on *(Popham and Lemos 1996; plate 4*)

However, the structure of this exchange system is still open to debate (e.g. Sherratt et al. 2001; Parkinson and Galaty 2007; Manning and Hulin 2005; Bennet 2007) and it is not the subject of this research.

Focusing our attention beyond the Aegean depression (ca. 1000-800 BCE) (Morris 2006; Morris and Powel 2010), in the Mediterranean Early Iron Age crucial changes occurred, markedly in cross-cultural dynamics (Hodos 2006; Hales and Hodos 2010; Knapp and van Dommelen 201). Greeks, Phoenicians and Eastern people were the main actors of new and more intense contacts with western Mediterranean (Hales and Hodos 2010). The so-called Eight-Century Renaissance entailed a mobility *en route* to the West; following the ancient maritime routes, the Aegean was integrated into Phoenician maritime networks (Boardman 1980; Ridgway 2002, 2004; Aubet and Núñez 2008). Euboean merchants and sailors, in particular, became prominent partners in east-west maritime trades.

Findings from Santa Imbernia in Sardinia, as well as Al Mina on the north Syrian coast (ca. 800 BCE) give evidence of the cooperation between Euboeans, Phoenicians and Levantines with native population (Boardman 1959, 2002; Hodos 2006). In particular, Santa Imbernia's excavation have yielded findings such as sherds of Red Slip pottery, Euboic skyphos, Aetos 666 kotyle, Levantine oil bottle, Samaria Ware small bowl, scabs, copper ingots and Phoenician amphora (Bafico and Manconi 1996; Bafico et al. 1997; Oggiano 2000; Rendeli 2005; Rendeli 2012).

Similarly, Al Mina is a case in point, place of interaction among Greeks, Phoenicians, Aramaeans and other North Syrians. The site was considered as key to understanding the role of the Phoenicians for the development of Greek alphabet. Al Mina recorded findings closely comparable with many contemporary sites in the Levant and Cyprus, so the city was considered part of the Cypro-Levantine cultural area of the Early Iron Age (Graham 1986, p. 54). It is generally accepted that the Greeks borrowed their alphabet from the Phoenicians and modified it in order to include vocalic sounds. The adoption of the Phoenician alphabet in Greek culture must have occurred at a place where Greeks and Phoenicians interacted. Al Mina is pinpointed as possible location (Herodotus 5.58.1-2; Woodard 1997).

By the mid-eight century BCE the Greeks established permanent settlements even at great distances from their homeland, from Spain to the Black Sea. For western regions, it was the birth of Magna Graecia (Strabo, *Geographia* VI.1.2; Polybius, *Histories* 2.39; Pliny the Elder, *Naturalis Historiae*, 3.95; d'Agostino and Ridgway, 1994; Horden and Purcell 2000; Cordano 2005; Hodos 2006; Hales and Hodos 2010) (Campania's archaeological context and its role as first Euboean overseas settlement will be discussed in Chapter One, paragraph 1. 3). Throughout the Iron Age and the historical periods, not only material culture, but also ancient Greek texts such as epic verses, inscriptions, odes, historiographical proses, tragedies and comedies provide our sources about the Greek cross-cultural dynamics in western Mediterranean. Among the oral traditions of heroic poetry, Homer's Odysseys played a decisive role. Even if the Homeric tradition preserved also a few reminiscences of early Mycenaean culture, from a period well before the destruction of Troy's VIIa levels (Nilsson 1934, pg. 158; Gray 1954, p. 28; Luce 1975, pp. 101-7; 119), Odysseys could be considered, *cum grano salis*, a good source of information about western ἀποικίαι, the Greek institutions away from the homeland. An often-quoted passage of the Odyssey (6.4-12), which relates the foundation of Σχερία, the city of the Phoenicians, is a well-known example. The colonisation process of Phoenician people, led by Nausithous, Poseidon's son and father of the King Alcinous, is clearly described below:

(…) ἔνθεν ἀναστήσας ἄγε Ναυσίθοος θεοειδής,
εἷσεν δὲ Σχερίῃ, ἑκὰς ἀνδρῶν ἀλφηστάων,
ἀμφὶ δὲ τεῖχος ἔλασσε πόλει καὶ ἐδείματο οἴκους
καὶ νηοὺς ποίησε θεῶν καὶ ἐδάσσατ' ἀρούρας.[1]

A number of episodes from the *Odyssey* involving Odysseus and his *nostoi* can be read as a metaphor of the encounters between Aegean and native populations, and consequently as a tool to conceptualise ethnicity and identity (Malkin 1998). Within such a framework, the modern concept of Hellenicity, based on shared traits and practices, is diametrically opposite to the indigenous cultural systems. More accurately, the Greek work of civilisation became the key to reading the Iron Age colonial contacts in the West. Yet, as mentioned above, new theoretical debates about cross-cultural interactions and their modalities seem to move away from this Helleno-centric perspective, within which the encounters between local

[1] From thence Nausithous, the godlike, had removed them, and led and settled them in Scheria far from men that live by toil. About the city he had drawn a wall, he had built houses and made temples for the gods, and divided the plough lands.

and non-local populations have been considered only from a binomial and simplistic point of view. More recently, postcolonial studies have pointed out how individuals in native populations acted in adopting or rejecting elements of other cultures, such as Aegean or Levantine ones (Lyons and Papadopoulos 2002).

Within the huge body of literature on early colonisation, *Local Responses to Colonisation in the Iron Age Mediterranean* has explored the Greek-native relationship involved in colonial situations, such as North Syrian coastal communities; Sicilian communities; and Libyan communities, rejecting the view of a unidirectional cultural foreign influence on local population (Hodos 2006). By exploring different material culture categories as funeral and religious practices, artistic styles, language and writing, consumption patterns, T. Hodos shows how indigenous people in Sicily absorbed Aegean culture, but in a selective manner and in accordance with their own cultural traditions and customs (Hodos 2006; p. 200).

Adoption and adaptation are two new concepts involved in the methods of interpreting the processes of connections within archaeological contexts. Similarly, in *Dead men tell no tales: ethnic diversity in Sicilian colonies and the evidence of the cemeteries* by G. Shepherd (2005) the main issue is the recognition of identity or ethnic markers in material culture features. Many archaeological questions have aimed for that. The intermarriage's issue between Greek males and native females is a good example (Van Compernolle 1983; Hodos 1999; Morris 1999; Shepherd 1999; Graham 2001; Lyons 2000; Langin-Hooper 2007; Herring 2008; Kelley 2012; Shepherd 2012; Saltini Semerari 2016). As pointed out by Shepard (2005), different forms of funerary ritual and specific types of grave goods, such as fibulae, have been implied to infer the presence of indigenous females in Greek settlements (*ibid.*) or, more generally, used to estimate the ethnic composition of a given population. The debate is still contentious and it will be discussed more accurately within the Pithekoussai's social composition issues (Chapter One, paragraph 1.3). From an archaeological perspective, the colonial milieu can be seen as a *terra nullius* or middle ground, enabling the production of *hybrid* cultures (Figure 1.7) (White 1991; Dobres 2000; Malkin 2001; Antonaccio 2003; Calame 2003). This dimension, in both intellectual and physical contexts, as described by Hodos, "(…) serves as a means of interpreting the physical, material and social interactions of cultures, interactions in which everyone has agency and mutual need." (Hodos 2006; p. 8).

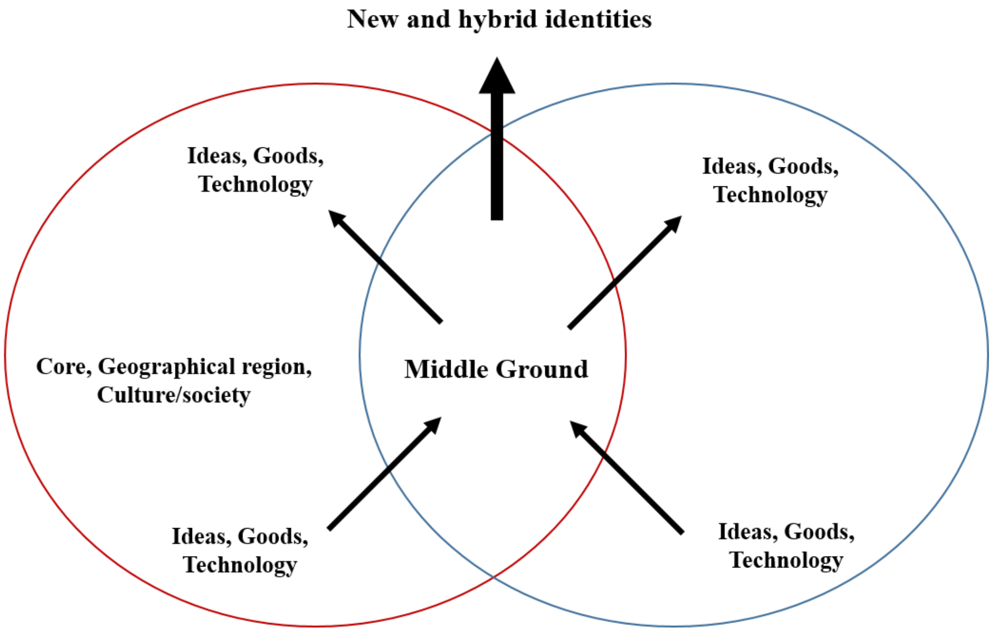

FIGURE 1.7 The Middle Ground: A physical and ideological melting pot where ideas and material may combine to produce distinct new hybrid identities (*Brown 2014*)

In conclusion, since the Early Iron Age cross-cultural contacts across the Mediterranean have implied exchange of raw materials and artefacts, circulation of idea, technologies and people, as well as the formation of hybrid and nuanced cultural identities. The interest of the archaeological research has been successfully addressed to re-think colonial encounter issues, exploring both mobility and connectivity's strategies. In fact, advances within theoretical and methodological debates are limited due to fragmented archaeological record. This weakness is opening the way to new forms of interdisciplinary contact, shortening the gap between humanities and science. In this scenario, biological approaches to human mobility - in addiction to an integrated research strategy – yield unique data-sets, providing answers to issues about the past not otherwise obtainable by archaeological research.

1.2 Who were Poseidon's sons?

Introduction to bioarchaeological and biochemical approaches to human mobility in the Mediterranean

Bioarchaeology is a bridge connecting the different subfields of physical anthropology by combining aspect of both biological and social sciences (Larsen 1997; Katzenberg and Saunders 2000; Wright and Yoder 2003; Buikstra and Beck 2006). At the heart of a bioarchaeological project is the scientific study of human remains using the archaeological record to enhance what can be known about the past. As such, bioarchaeology merges information from the human remains, i.e. age-at-death, sex, stature, pathology, physique and trauma, diet and mobility with other aspects of the environment and culture in which the person lived (population density, environmental factors, etc.).

Bioarchaeology employs interdisciplinary and cross-cultural research tools that can aid in the analysis of a wide range of questions about human behaviour otherwise unfathomable. Besides newer development of analytic techniques in age-at-death and sex determination, bioarcheology is showing more sophisticated tools with which to explore and re-think some questions about past populations. The biodistance analysis, genetics and geochemical approaches are widely used in bioarchaeology to determine the scale of human mobility in space and time (Tab. 1.1)

CATEGORY	TECHNIQUES	EVIDENCE FOR MOBILITY
Osteological	• Biodistance: cranial/post	1) Genetic relatedness, kinship and mate choice

	cranial and dental metric and nonmetric variation	2) Regional variation in cranial or dental modification/decoration
Biogeochemical	• Light isotopes: oxygen (^{18}O,^{16}O) and sulphur (delta 34 S); • Heavy isotopes; strontium ($^{87}Sr/^{86}Sr$) and Lead (Pb); • Trace elemental ratios: Sr/Ca and Ba/Ca	1) Differences in diet and water isotopic composition show geographic mobility
Genetic	• mtDNA • Nuclear DNA • aDNA • Polymorphisms in other biomolecules other than DNA Blood factors: ABO, Rh, HLA, etc.	1) Population history/phylogeny 2) Emergence of new alleles (e.g. lactase persistence)

TABLE 1.1 Bioarchaeological techniques used to reconstruct ancient mobility (Meiggs and Freiwald, 2014, p.3540)

Biological distance analysis considerers patterns of skeletal or dental phenotypic variation within the context of microevolutionary theory to investigate past population movements and residential mobility. More accurately, thought the concept of population *relatedness* – e.g. similarity or dissimilarity – biodistance studies take into account inter-intra group's metric and non-metric traits variation of human skeletal and teeth, attempting to incorporate skeletal morphology in the interpretation of genetic affinity and proving understanding into the role of development biology on the expression of morphological variants. As such, mobility is inferred thought deviation from regionally defined averages.

Biological distance is calculated on odonto-metric, craniometrics, non-metric cranial and dental morphological observations and summarised using multivariate statistical techniques (e.g. Buikstra and Ubelaker 1989; Buikstra et al. 1990; Relethford and Harpending 1994; Wolpoff and Caspari 1997; Sparks and Jantz 2002; Armelagos and van Gerven 2003; Ross et al. 2003; Roseman 2004; McKeown and Jantz 2005; Slice 2005; Manica et al. 2007; Pietrusewsky 2008; Hubbe et al. 2009; Smith 2009; Bietti et al. 2010; Ricaut et al 2010; Strauss and Hubbe 2010; Smith 2011; Raff 2019).

While understanding the nature of genetic relationships, usually at a predefined level of analysis (e.g., *inter*- or *intrasite* specific, global variation, regional continuity), has a long and varied history in physical anthropology, the unifying assumption has changed very little from the early days of anthropology: people sharing similar morphological features share a common ancestry when compared to groups with fewer shared features. Especially prominent during the latter part of the twelfth century and ongoing during the twenty-first are studies of the relationship between complex skeletal and dental structures and the genome, along with the development of increasingly robust analytical methods. Although current research emphasizes population genetic-based perspectives, there is some concern that typological (i.e., essentially racial) approaches persist (Armelagos and van Gerven 2003).

To cite an example, in S.K. Manolis' work (2001), the biological distance analysis was applied to cranial samples from prehistoric inhabitants of Crete island aimed to verify the archaeological question of the so-called Mycenaean invasion in Crete during the Late Bronze Age period (Evans 1968; Hood 1971; Zois 1973). According to archaeological sources, Mycenaeans invaded Crete after the Minoan eruption of Thera or Late Bronze Age eruption, dated to the mid-second millennium BCE (Sigurdsson et al. 1990). This dramatic event caused the devastation of the island of Thera, at-present Santorini, including the Minoan settlement at Akrotiri, as well as communities and agricultural areas on nearby islands and the coast of Crete with related earthquakes and tsunamis, determining the sunset of Minoan civilisation and the arise of the followed Mycenaean one (Sakellarakis 1980). Cranial specimens were uncovered from different sites around Crete, spanning within a wide range of time, from the Late Neolithic period until Late Minoan period (2700-1450 BCE). According to Manolis (2001), statistically important differences were observed, in the measurements of the vault, in maximum cranial length, maximum cranial breadth, minimum frontal breadth, and biasterionic breadth, which clearly characterise the shape of the skull vault. A change in the vault shape was observed in Late Minoan samples (*ibid.* p. 134). Changes in the splanchnocranium were also recognized from the Early Minoan period to the Late Minoan, due to a slight increase of the facial height. However, a strong change in facial characteristics were not observed; similarly, no differentiations of the cranial shapes and sizes were recorded. The only variables, which changed in the Late Minoan sample, were nasal height and nasal breadth, explained by Manolis as the arrival of a new population on the island during the Later Minoan (*ibid.* p. 135).

Similarly, but more recently, S. M. Hens and A.H. Ross' study (2017) aimed to explore the regional biological variation in Italy during Imperial Roman times (first-third centuries AD), analysing cranium samples from three different sites: Isola Sacra and Velia, which represent the middle-class tradesmen and merchants on the coastal port cities in central and southern Italy (Chapter One, paragraph 1.2.1); and Castel Malnome, a *suburbium* of Rome, composed by lower-class individuals. Figure 1.8 shows the 25 three-dimensional cranial coordinates landmarks (Roseman 2004; Roseman and Weaver 2004; Harvati and Weaver 2006; Smith 2009) taken into account by Hens and Ross and which were associated with multivariate statistics in Morphoj (*ibid*.). Three-dimensions morphometric methods were performed to test the null-hypothesis of no significant variation between the cranium specimens from the three sites. Geometric morphometrics methods allowed to quantify of shape variables controlling size and the localised regions of shape change or conservation. The results indicated that Castel Malnome was not significantly different from cranium specimens of the two coastal sites, while these latter were significantly different. According to Hens and Ross (2017), the high variability between Velia and Isola Sacra's samples was not unexpected due to the flux of Greek population in Velia locations and, more generally, in southern Italy.

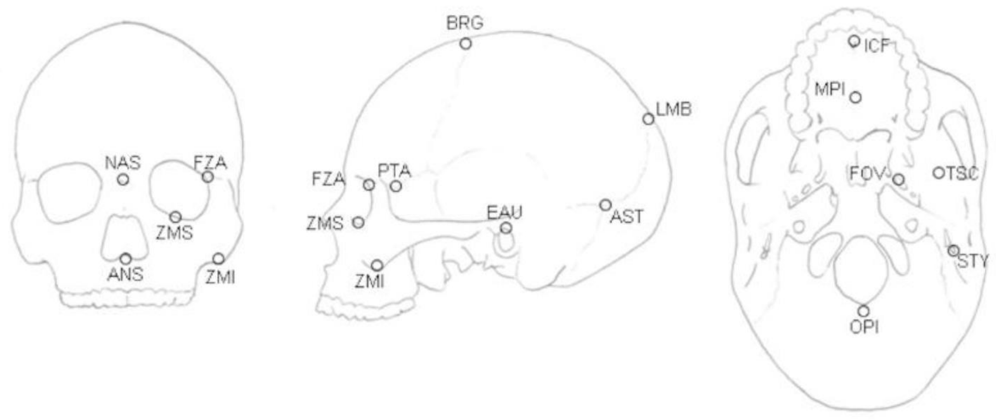

FIGURE 1.8 Twenty-five homologous cranial landmarks used in Hens and Ross's study (*Hens and Ross 2017*)

Looking once again at the Aegean prehistory, archaeological interest focused on the origin of the Bronze Age Minoan and Mycenaean cultures allows us to introduce another research tool used in bioarchaeological studies to detect ancestry and mobility of human population in the past: the ancient DNA. In the recent paper *Generic origins of Minoans and Mycenaeans*, a genome-wide aDNA was performed in order to provide a new source of information about Aegean Bronze

Age people (Lazaridis et al. 2017). Lazaridis' work has four aims: (1) to determine if the labels Minoan and Mycenaean correspond to genetically coherent population; (2) to investigate how the two groups were related to each other and to their neighbours across the Aegean, in Anatolia and to other population from Europe and Near East (1-17); (3) to explore how the inferences about their ancestral origins can inform debates about the origins of their cultures; (4) to investigate how the Minoans and Mycenaeans related to modern Greek who lived in the same area today (Lazaridis 2018). Genome-wide data was performed on 19 individuals. These include Minoans from Crete (2900-1700 BCE and 1370-1340 BCE), Mycenaeans from mainland Greece and from the western coast of the Peloponnese (1700-1200 BCE); Neolithic individuals from Alepotrypa Cave in Peloponnese (5400 BCE) and finally, Bronze Age individuals from southern-western of Anatolia (2800-1800 BCE). The data-set of the specimens was combined with 332 other ancient individuals from the literature and 2616 present-day humans genotyped. The principal component analysis (PCA) was performed (Figure 1.10). As shown in Figure 1.9, Neolithic specimens from Greece clustered with Neolithic farmers from Europe and Anatolia and can be distinct from Minoans and Mycenaeans. Similarly, Bronze Age specimens from south-western Anatolia were also distinct and located intermediate between Anatolian and Levantine populations, as well as individuals from the East (Armenia, Iran and the Caucasus). Admixture analysis allowed Lazaridis and colleagues (2017) to determine that Minoans and Mycenaeans possessed a genetic component shared with Bronze Age individuals from Anatolia, as well as Neolithic Central Anatolians and western Anatolians. Conversely, this component is absent in the Neolithic of north-western Anatolia, Greece and only appearing in the specimens from Late Neolithic and Bronze Age Europe, introduced by migration from the Eurasian steppe (Haak et al. 2015; Jones et al. 2015; Mathieson et al. 2015; Broushaki et al. 2016; Hofmanovà et al. 2016).

The eastern influence in the Bronze Age individuals from Greece and Anatolia is supported by the analysis of their chromosomes Y. As reported in Lazaridis

(2017), four out of five males among Minoans, Mycenaeans and south-western Anatolia belonged to haplogroup J, which was rare or not-attested in earlier population from these areas who were dominated by Y-chromosome haplogroup G2 (1,2,17). Conversely, haplogroup J was attested in Caucasus hunter-gatherers and Mesolithic individuals from Iran, and its spread westward may have accompanied the eastern genome-wide influence (*ibid.* p. 3).

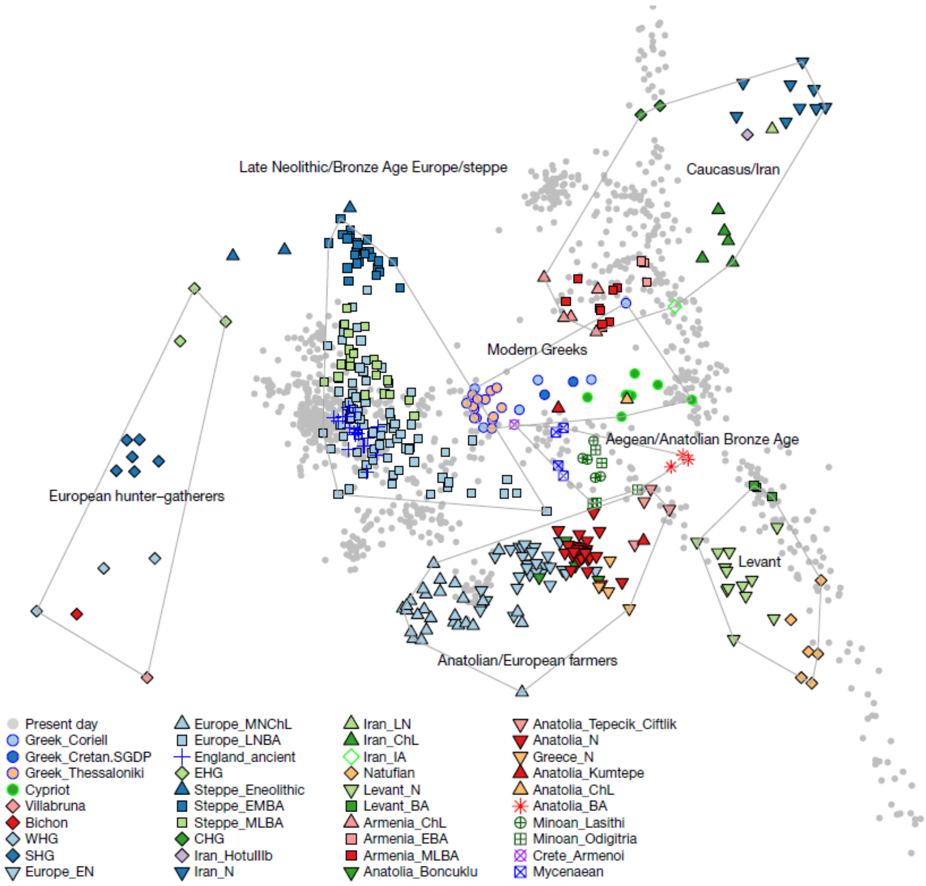

FIGURE 1.9 Three hundred and thirty-four ancient individuals projected onto the first 2 principal components computed on a sample of 1,029 present-day West Eurasians, including 30 Modern Greek samples from Greece and Cyprus (*Lazaridis et al. 2017*)

Minoans and Mycenaeans specimens, sampled from different sites in Crete island and mainland Greece were genetically homogeneous. Differences between them were modest against their broad overall similarity to each other and to the southern-western Anatolians, sharing both the local Anatolian Neolithic first farmer ancestry and the eastern Caucasus- related admixture. However, the Mycenaeans differed from Minoans in deriving additional ancestry from to the hunter-gatherers of eastern Europe and Siberia. Modern Greeks resemble the Mycenaeans, but with some additional dilution of the Early Neolithic ancestry. These results reinforce the idea of continuity and not isolation in the history of Aegean populations, before and after the arising of their earliest civilisation.

Beyond Minoans and Mycenaeans' genetic studies, new evidence of Phoenician genetic structures enabled researches to explore the integration with indigenous occurred in Phoenician settlements, identifying regionally informative mtDNA haplogroups to use as indicators of historical Phoenician ancestry, as well as the Phoenician genetic influences on modern populations, especially into Sardinian communities. The study was conducted by Matisoo-Smith and colleagues (2017) analysing complete mitochondrial genomes on ancient samples yielded in three Phoenician sites in Lebanon and Sardinian, as well as from an Early Middle Bronze Age site in Lebanon. From a chronological point of view, specimens dated back to pre-Phoenician (1800 BCE) and Phoenician (700-400 BCE) periods. A total of 16 ancient tooth samples were obtained from Lebanon sites, and 12 tooth from the Punic necropolis of Monte Sirai, in Sardinia (Bartoloni 2000; Gurguis 2005; Gurguis and Orquìn 2015). Furthermore, 87 samples were collected across different Lebanon communities, from individuals who provided information about their birth place and the geographical origins of three generation of Lebanon maternal ancestry. The comparative analysis was performed taking into account also mitogenome data from Pre-Phoenician samples analysed by Olivieri and colleagues (2015). The results of Matisoo-Smith's work allowed to identify one haplotype (H3) shared between pre-Phoenician and Phoenician teeth from Sardinia. The K1 and U5 haplogroups were found in pre-Phoenician Sardinians only, whereas the W5 and N1b1a5 and X2b clades contain only Phoenician Sardinians, and are distant from any pre-Phoenician Sardinian samples. In one specimen from Beirut were found two mutations not compatible with indigenous Lebanese lineage but rather with a foreign introduction to the Beirut's Phoenician population (Matisoo-Smith et al. 2017, p. 8). The most Phoenician specimens cluster together with pre-Phoenician samples. Four of the haplotypes identified in the Phoenician samples. Figure 1.10 shows the ML three for haplogroups N1b1, W5, X2, founded in Phoenician samples of Monte Sirai, and T2b3 identified as a foreign introduction to the one of the sites in Lebanon.

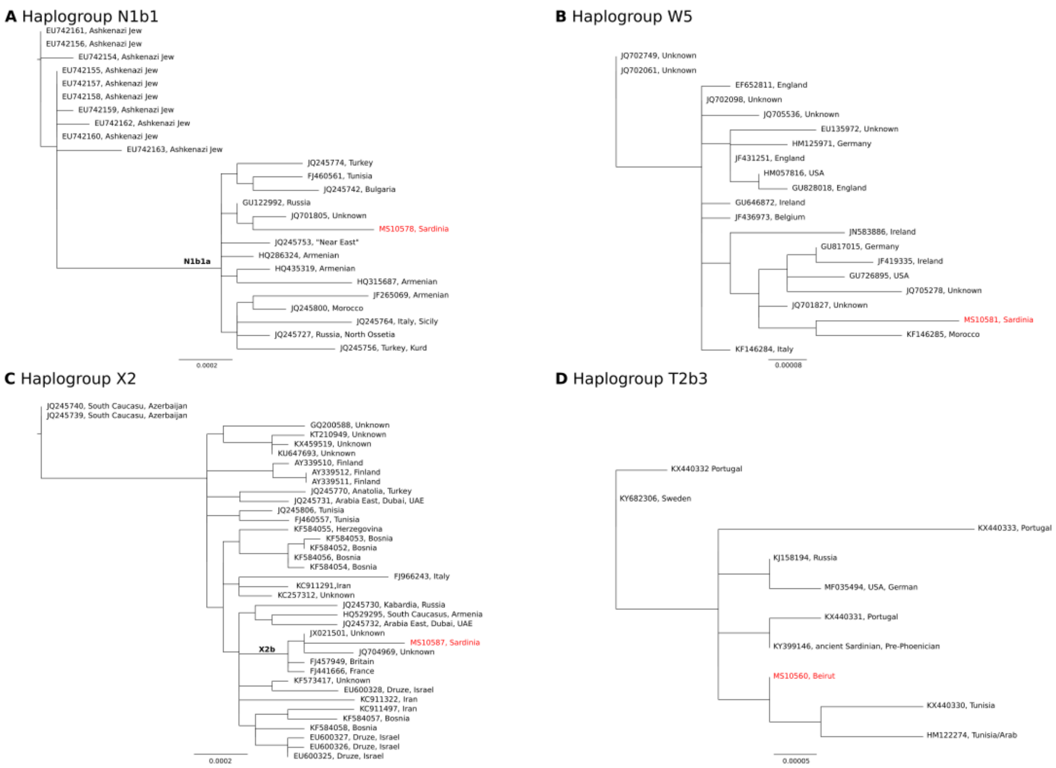

FIGURE 1.10 Maximum likelihood trees for what appear to be introduced ancient Phoenician haplotypes and publicly available sequences for the corresponding mitochondrial haplogroups (*Matisoo-Smith et al. 2017*)

The results showed a certain degree of continuity of some lineages between Phoenician and pre-Phoenician populations in Sardinia, supporting the archaeological evidence of integration between these two different cultures

(Delgado and Ferrer 2007). The comparison between the results of Matisoo-Smith's study and the published data of European mitochondrial haplogroup U5b2c1 from a young man buried in Carthage (Matisoo-Smith et al. 2016) allowed to identify non-indigenous mitochondrial haplotypes in Phoenician burials in and outside Lebanon. These include the T2b3 haplotype from Beirut and the N1b1a5 from Near East and the Northern European W5 found in Monte Sirai. According to Matisoo-Smith (2017), these haplogroups are examples of Phoenician genetic introductions to Sardinia and suggest the mobility of women across the wider Phoenician trade networks from non-Mediterranean populations, as well as from Europe to Phoenician sites in Lebanon. This study opened new scenarios on the inclusive and multi-ethnic Phoenician civilization (Matisoo-Smith et al. 2017).

1.2.1 Multi-isotopes approach to archaeological odonto-skeletal remains

This paragraph will first review some general information about isotopes as a tool to explore diet habits in ancient Mediterranean, opening a more in depth discussion on strontium isotopes studies to detect human movement in the past.

Isotope geochemistry is a field of geochemistry, involving the determination of the relative and absolute concentrations of the elements and their isotopes in the Earth and on its surface (Kumar Haldar 2018). Broadly, isotope geochemistry is divided in two branches: stable and radiogenic isotope geochemistry (Kohn, 2003). The existence of alternative forms of the same elements was first appreciated by radio-chemist Frederick Soddy at the beginning of the last century; nonetheless, the term 'isotope', identifying a natural element whose atoms has the same numbers of protons and electrons, but different number of neutrons, was coined in 1913's by Scottish doctor and author Margaret Todd. More accurately, various isotopes of an element have similar charges but different masses; and the superscript number to the left of the element designations indicates the number of protons plus neutrons in the isotope.

Since the middle of 1960's stable and radiogenic isotopes are applied in anthropology and archaeology (Table 1.2): the beginning of isotopes' uses in archaeology dates back to the application of lead isotopes study in ancient metals and slags by pioneers R. H. Brill and J. M. Wampler (1965).

ELEMENT	ISOTOPE MASS NUMBERS	PROPORTION IN NATURE	STABILITY
Carbon	12	98.93%	Stable
	13	1.07%	Stable
	14	one part per trillion	Half-life of 5730 ± 40 years
Nitrogen	14	99.64%	Stable
	15	0.36%	Stable
Oxygen	16	99.76%	Stable
	17	0.04%	Stable
	18	0.20%	Stable
Strontium	84	0.56%	Stable
	86	9.86%	Stable
	87	7.00%	Stable
	88	82.58%	Stable

TABLE 1.2 Naturally occurring isotopes of elements relevant to biomolecular archaeology (*Brown and Brown 2011, p. 80*)

Later, stable isotopic analysis of bone and dentine collagen as well as of bone apatite (e.g. Ambrose and Norr 1993; Schwarcz and Schoeninger 2012), and radiogenic isotopic analysis of bone and tooth mineralized tissues (e.g. Ericson 1985; Schwarcz 1991; Prince et al. 2001, 2002; Ambrose et al. 2003; Richards et al. 2003; Thompson et al. 2005; Bentley et al 2006; Jørkov et al. 2007; Crowe et al. 2010; Froehle et al. 2012; Killgrove and Tykot 2013; Reitsema 2013; Tanasi et al. 2018) have been widely performed to detect respectively ancient dietary habits and mobility assessment.

1.2.1.1 Isotope stables analysis for the reconstruction of diet habits in the ancient Mediterranean. A brief overview

Stable isotopic analyses of carbon (^{12}C, ^{13}C, ^{14}C) and nitrogen (^{14}N and ^{15}N), introduced in 1970s by J. C. Vogel and N. J. van der Merwe, are currently considered invaluable tools not only for modelling diets of humans in the past – eventually identifying diet variations associated with age-groups, multi-ethnic and/or social stratified population (White and Schwarcz 1989; Kellner and Schoeninger 2007; Holder et al. 2017) – but also for investigating breastfeeding and weaning age (e.g. Katzenberg et al. 1996; Herring et al. 1998; ¸Dupras et al. 2001; Richards et al., 2002; Schurr and Powell, 2005; Clayton et al. 2006; Prowse et al. 2008), and changing of weather and climate to reconstruct past habitat composition and processes (De Niro and Epstein 1978; Goodfriend 1990; Hayes at al. 1990; Drake et al. 2012; Riehl et al. 2014; Schubert and Beilman 2014).

The well-established technique for carbon and nitrogen analysis is made possible by consistent and predictable isotopic fractioning throughout food webs. M. J. De Niro and S. Epstein (1978) first proved that carbon isotopes in animal tissues reflect the isotopic composition of the diet. Briefly, $\delta\ ^{13}C$ values on biological tissues enable to determine the proportions of C_3 plants (e.g. wheat, barley, rice) and C_4 plants (e.g. millet, sorghum, maize), which used different photosynthetic pathway, as differential ^{13}C fractionation during photosynthesis generates distinct values for C_3 versus C_4 plants, which are then passed reliably up the food chain (Figure 1.11) (Bocherens and Drucker 2003). Carbon in bone can be derived from the consumption of protein, carbohydrates, or fats. Nitrogen stable isotope ratios can be used to estimate trophic position within a food web, as $\delta^{15}N$ values undergo a ~3–5‰ stepwise enrichment between trophic levels (Tykot 2014b).

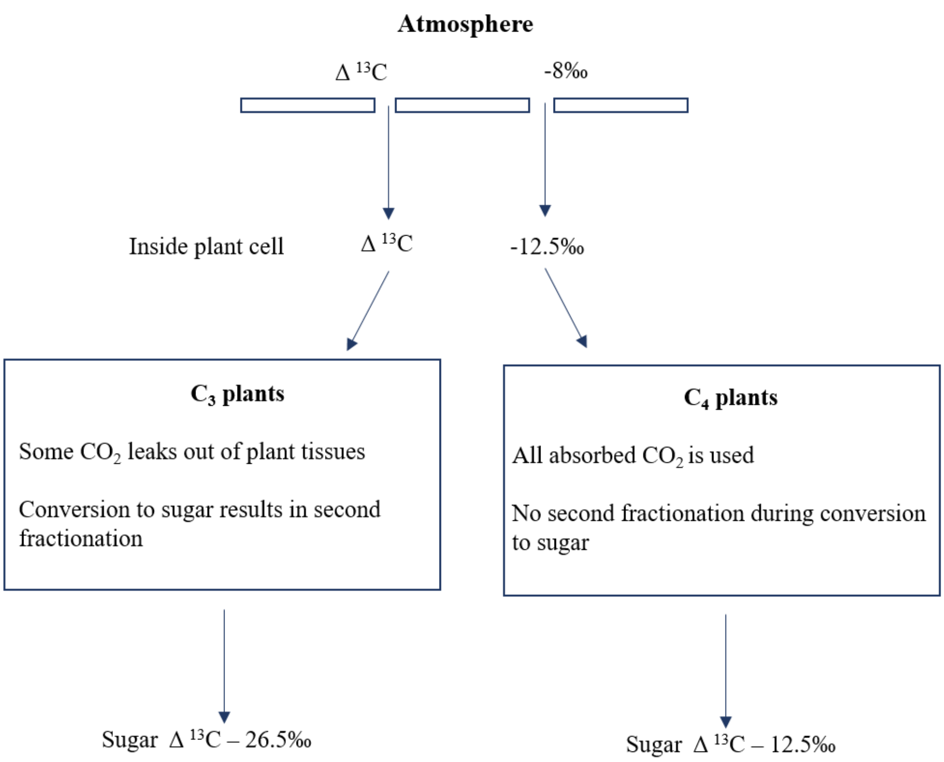

FIGURE 1.11 The differences between the carbon isotope fractionations occurring during photosynthesis in C_3 and C_4 plants (*Brown and Brown 2011*, *p. 82*)

Different levels of bioavailability and access to aquatic and terrestrial sources in the Mediterranean basin have undoubtedly played a key role in the birth and the development of technologies, economic strategies, fishing and farming activities, closely related diachronically to socio-economic structures and cultures of human communities. In recent years, extensive literature based on multi-line approaches from bioarchaeology and biochemistry was addressed to assess ancient Mediterranean dietary and food producing strategies, economy and health. In particular, several studies are available on Prehistoric periods, in order to mainly detect and explore: a. hunter-gather subsistence and role of marine resources' exploitation in coastal population diets during the Upper Palaeolithic and Mesolithic-Neolithic transition and after domesticated plants' and animals' introduction; b. type of food production and agriculture and herding development, first in Near East, then spreading out in the rest of Mediterranean; c. intra and inter population differences, related to biological and/or social distinctions (Le Bras-Goude 2011).

In spite of the outcomes available for Mesolithic sites on the Atlantic coast, including Portugal and Spain, in which isotope studies have shown that seafood was a main part of populations' diet (Lubell et al. 1994; Richards et al. 2000; Cubas et al. 2018), in different regions of the Mediterranean basin, a general trend is observed: a subsistence economy turned toward agriculture and herding, even close to the sea. Analyses carried out in some sites from Italian coastal lands such as Grotta delle Arene Candide, in Western Liguria (Francalacci 1989), Grotta del Romito, in Calabria (Craig et al. 2010), Grotta dell'Uzzo (Mannino et al. 2007), Grotta di San Teodoro and Grotta Addaura, in Sicily (Mannino et al. 2011) showed sea foods were rarely, if ever, consumed with shellfish constituting a minor resource; furthermore, subsistence reconstructions based on the faunal remain from Palaeolithic sites in Sicily (e.g. Cassoli and Tagliacozzo 1982; Mannino and Thomas 2009) show a diet dominated by protein of large terrestrial mammalian herbivores, such as red deer (*Cervus elaphus*).

Paleodietary studies conducted in Greece (Papathanasiou et al. 2000, 2003; Bourbou and Richards 2007; Triantaphyllou et al. 2008; Vika 2009; Petroutsa and Manolis 2010) are performed on mainly Neolithic and Bronze Age sites. As reported in a work published by Papathanasiou and collaborators (Papathanasiou et al. 2003), stable analysis of biological Neolithic evidence from Alepotrypa Cave, in Southern Greece, displayed a possible correlation between the poor health status recorded on human skeletons – affected by high frequency of *cribra orbitalia* and porotic hyperostosis and a rather poor diet based mainly on C_3 terrestrial resources with insignificant consumption of marine resources despite accessibility to the latter. Terrestrial diet, with the $\delta^{15}N$ values generally low, which indicate that very little of the dietary protein had an aquatic origin, from the three costal sites of Theopetra, Tharrounia and Kouveleiki, reaffirmed the hypothesis that Neolithic Greece, regardless of geographic location, was occupied by agricultural groups with a land-based economy and a diet consisting of only occasional or periodic exploitation of near-shore marine protein resources (*ibid.*). Furthermore, a terrestrial diet is also mentioned by E. Petroutsa and S. Manolis (2010), and S. Triantaphyllou (2015) in Greek Bronze Age populations without any significant amount of sea resources, but with animal protein intake varying between individuals. Dietary variation between *élite* and non-*élite* individuals occurred during the Late Bronze Age Mycenae (Richards and Hedges 2008), while freshwater fish become important in some sites.

Based on botanic evidence, the introduction of millet plants occurred in central and eastern Europe, from the Steppe, during the Neolithic period as documented firstly by H. Hjelmqvi (1969) (Nesbitt and Summers 1988; Zohary and Hopf 2001). Currently, information about spreading dynamics of millet plants into the Mediterranean region, as well as about the scale of eating and its economic importance is scarcely available (Tafuri et al. 2009). Despite the rare evidence of millet plants in the Alps regions and in northern Italy, as far as the Po Plain, in the Early Bronze Age contexts, there is no evidence of millet cultivation in Southern Italy for the pre-classical time (Spurr 1986). This evidence seems to be confirmed by M.A. Tafuri's work, which sheds new light on the issue of introduction and consumption of millet plants in the Western Mediterranean, by studying four inland Early and Middle Bronze Age Italian sites (Figure 1.12). Two sites are located in North-eastern Italy: Olmo di Nogara, in Friuli Plain; Sedigliano, in Adige Valley; on the contrary, two sites are located in Southern Italy: Toppo Daguzzo and Lavello, both of them in Basilicata. Stable carbon and nitrogen isotope analysis were carried out on human and animal bones from each of the four sites. Results show that, contrary to expectations, status differences did not extend to the diet, or if they did, social dietary discriminations are not isotopically measurable. Even more meaningful are the difference between isotopic signatures from the North and South sites: human and faunal remains from Olmo di Nogara and Sedignano are significantly enriched in ^{13}C. Arguably, this evidence can be attributed to the sensible eating of domestic millet plants, such as *Panicum miliaceum* and/or *Seteria italic*, which are C_4 pathway plants. By contrast, biological samples from Toppo Daguzzo and Lavello are low in ^{13}C in favour of a greater consumption of proteins from C_3 plants. This data supports the hypothesis that widespread cultivations of millet took place firstly in Northern Italy, following its introduction from across the Alps region in central Europe (Tafuri et al. 2009).

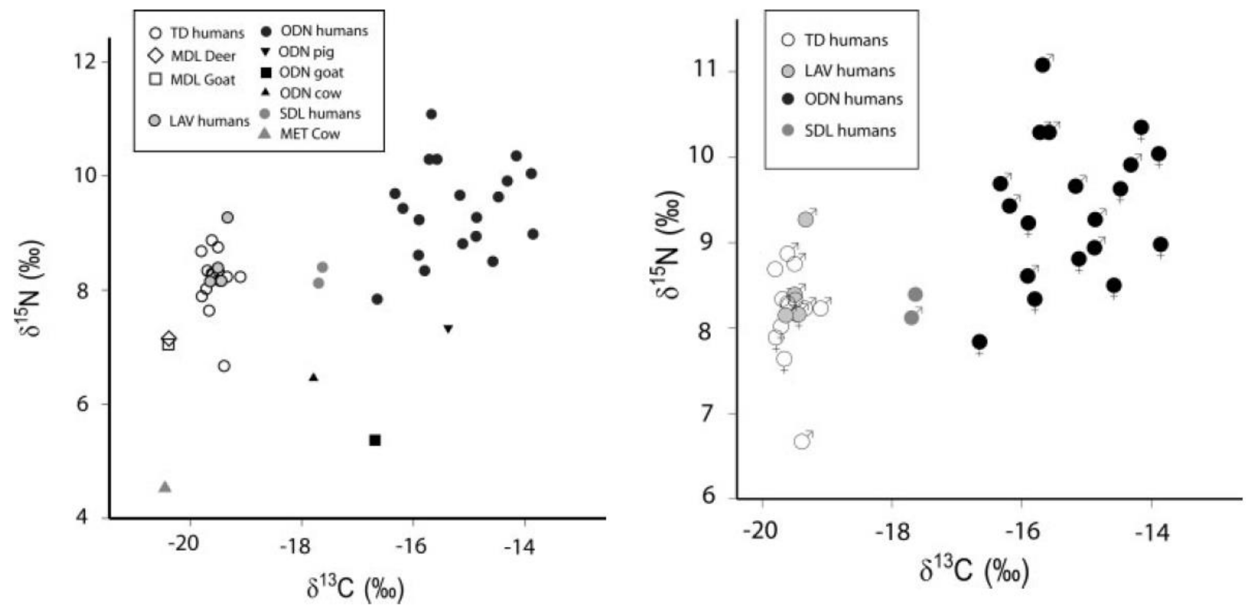

FIGURE 1.12 Stable carbon and nitrogen isotope ratios of human and animal bone collagen from Toppo Daguzzo, Olmo di Nogara, Lavello, Madonna di Loreto, Sedigliano, Mereto (*on the left*); Stable carbon and nitrogen isotope values of human bone collagen from Olmo di Nogara, Lavello, Toppo Daguzzo and Sedignano by sex (*on the right*) (*Tafuri et al. 2009*)

Multi-isotopic researches carried out on the Mediterranean Antique world clearly show a wider dietary variety, even if terrestrial food still represents the main consumption of proteins. Currently, few studies are available on the Near East regions: an example is paleo-dietary reconstruction of the roman Natfieh community, in the northern rural area in of the Jordan region. Stable isotopic analysis of human teeth and bones, led by K. Al Bashaireh and colleagues (2010), demonstrated that on the one hand, the average $\delta^{13}C$ values for all samples indicates a consumption of protein sources from C_3 plants and/or animals that consumed C_3 plants, while the range of $\delta^{15}N$ values depended upon terrestrial animal proteins, such as meat, milk, dairy products and eggs. On the other hand, minimum effect of marine food sources or C_4 proteins are recorded. Low consumption of sea food could be linked to the long distance of the Natfieh site from the closest aquatic food sources of Mediterranean shoreline and Lake Tiberias, respectively located 110 and 30 km away from Natfieh. According to Al Bashaireh's inferences, regular consumption of fish products may have been restricted to elite members of society; by contrast, small difference in dietary profiles among different age classes and sexes probably indicate a similar social condition.

Focusing on the Western Mediterranean region, in spite of few pilot isotopic studies for the Classical period, and published in recent times – e.g. Killgrove and Tykot 2012; Tanasi et al. 2017 – one of the key works about ancient dietary habits and different accesses to food resources at the Roman age was conducted by T. L. Prowse and collaborators on the skeletal and dental collection from the well-known Imperial Roman necropolis of Isola Sacra, south-west of Rome, on the Tyrrhenian Sea coast-line (Prowse 2003; Prowse et al. 2004; 2005; FitzGerald et al. 2005; Prowse et al. 2008; Crowe et al. 2010; Bondioli et al. 2016). Isola Sacra skeletons, buried between first and third centuries AD, were the middle-class inhabitants of *Portus Romae*, one of the most important maritime ports of trade during the Roman Empire (Baldassarre 1978). From an anthropological point of view, the biological composition of the sample, – i.e. males, females, infants and adults – and the high number of individuals offered the scholars a great opportunity to investigate more thoroughly variations among different members of this society (Prowse et al. 2005; 2008; Bondioli et al. 2016).

More than one hundred adults were analysed with the purpose of exploring the dietary profiles on collagen and bone apatite – collagen and bio-apatite do not contain the same signatures of human diet: collagen, as a protein, is enriched both in carbon and nitrogen and is able to provide informations on both δ ^{13}C and δ ^{15}N values; on the contrary, bio-apatite is primarily calcium hydroxyphosphate with absorbed carbonates, and so it contains carbon but not nitrogen. Also, collagen is formed mainly from amino acids contained in dietary protein, whereas the carbon in bio-apatite has contributions from ingested proteins, carbohydrates, and fats – (Prowse 2003; Prowse et al. 2004; 2005); additionally, a previous sampling of fifty infants (i.e. < one age at-the-death) and children, then extended to bone collagen samples from 37 other sub-adults (Prowse et al. 2008), has allowed to investigate breastfeeding, transitional feeding and weaning patterns. An assessment of childhood diet taking into account oral pathology in dentition of 78 individuals, aged between one and twelve years, was also performed (*ibid.*). According to historical and archaeological sources, the multi-lines study carried out on Isola Sacra has demonstrated that not all members of Roman society had equal access to different varieties of food items, especially those very expensive such as fish, meat, wine and oil (Garnsey 1999; Prowse et al. 2005). As it is well known, indeed, even if isotopic data cannot distinguish among dietary patterns of different quality, carbon and nitrogen are able to indicate if an individual has consumed a greater proportion of a certain isotopically characterized food, for example freshwater or sea resources (Prowse et al. 2005).

Regarding the infant-juvenile sub-sample, isotopic analysis of bone collagen in femur and rib revealed that infants are fully weaned up until two-three years of age; by four-five years of age δ ^{13}C and δ ^{15}N values are similar to adult values, since isotopic traces of breastfeeding in the bone are no longer present in individuals over five years' age. Moreover, the presence of dental disease and/or enamel alterations such as caries, calculus, or tooth wear suggests that infants and children were provided complementary foods and other items that negatively impacted their oral health since early age (Prowse et al. 2008).

On the one hand, the consumption of hard and abrasive food can indeed wear dental enamel and dentin very quickly, especially if we consider that deciduous enamel is thinner than permanent one. On the other hand, the frequency of carious lesions and calculus in individuals of two-three years and older seems to point towards the hypothesis that complementary food promoted those oral diseases, mostly on deciduous dentition: for example, a diet of soft food, enriched in carbohydrates, plays a key role in the formation of carious lesions (Powell 1985; Touger-Decker and van Loveren 2003). As expected from the comparison between isotopic values and dental data, individuals with declining $\delta^{15}N$ show evidence of tooth wear, even at relatively young ages (two-three age-at-death), unlike individuals who still appear to be consuming a significant proportion of breast milk, who are only affected by slight dental wear.

Furthermore, a study carried out by C. FitzGerald and colleagues (2005) has allowed to detect individual health condition by histomorphometric analysis of hypoplasic enamel defect on more than two-hundred deciduous teeth. Later, these preliminary results have been followed by more extensive and comprehensive work by L. Bondioli and collaborators (2016) on both Isola Sacra and Velia Imperial Roman cemeteries.

Dental enamel does not undergo remodelling processes and preserves, in contrast to bone tissues, its original structure during its life (S.W. Simpson, 1999). Consequently, histological characterization of the enamel is considered a good source of information about individual health conditions (FitzGerald et al. 2005). Strong stress events of either internal or external nature may indeed leave permanent marks in corresponding position of the secretory ameloblasts front, resulting in a disruption of secretory phase of amylogenesis and an abrupt change in the orientation of the enamel prisms (Nava et al. 2017). Macroscopically, this phenomenon can be observed on the tooth surface as transverse lines or pits (dental enamel hypoplasia); on the other hand, defects in enamel structure are also visible in histological thin section as a broad dark bend better known as Wilson bend or ARL (accentuated Retzius lines) (Wilson and Shroff 1970). Among physiological stress events and processes, the birth is recorded in the growing enamel of the individual surviving the labor and the perinatal phase, and leaves an accentuated black line known in literature as Neonatal Line (Sabel et al. 2008; Zanolli et al. 2011); the Neonatal Line allows to distinguish primary enamel and dentine formed *in utero* from those growing after birth; also it constitutes a point zero, used to calibrate a daily time ratio of dental enamel formation (Nava et al. 2017). The stress event chronology in the deciduous teeth from Isola Sacra was established by two regression formulas (Guatelli-Steinberg et al. 2012; Birch and Dean 2014); outcomes available for Isola Sacra juvenile sub-samples display two periods of high stress prevalence: a. first period, from around two months until five months of age; b. second period, verified from around six months until nine months of age. This study confirmed the expected results: the high number of physiological stresses documented shows a dramatic increase between one and five months of age, plausibly related to the decline of maternal buffer; however, especially in children at later ages, the stress frequency attested from birth to nine months of age seems to have had no effect on their very survival. The comparison between physiological perturbations and individual $\delta\ ^{13}C$ and $\delta\ ^{15}N$ values does not allow any associations. (Bondioli et al. 2016).

Among adult age-classes, the overall trend of isotopic data indicated the consumption of terrestrial C_3 food combined with marine sources (Figure 1.13). Nitrogen values from collagen did not display any significant differences between male adults and female adults; however, $\delta\ ^{15}N$ values are averagely higher among males than females in all age classes; female $\delta\ ^{15}N$ values tend to grow closer to male values with increasing age-at-death, which suggests that older females in this population had greater access to food enriched in $\delta\ ^{15}N$. Collagen from male samples, and older individuals in general, was very significantly enriched in ^{15}N but not in ^{13}C. Carbon values revealed also a consistent pattern, wherein females have lower $\delta\ ^{13}C$ values than males in all age categories. Furthermore, the combined δ ^{13}C and δ ^{15}N values suggest that females were consuming a greater proportion of terrestrial C_3 plants in their diet, and that marine foods made up a comparatively larger proportion of the male diet. Bone carbonate somewhat depleted in ^{13}C in some older individuals suggests increased consumption of olive oil and possibly wine (Prowse et al. 2005; 2008; Bondioli et al. 2016).

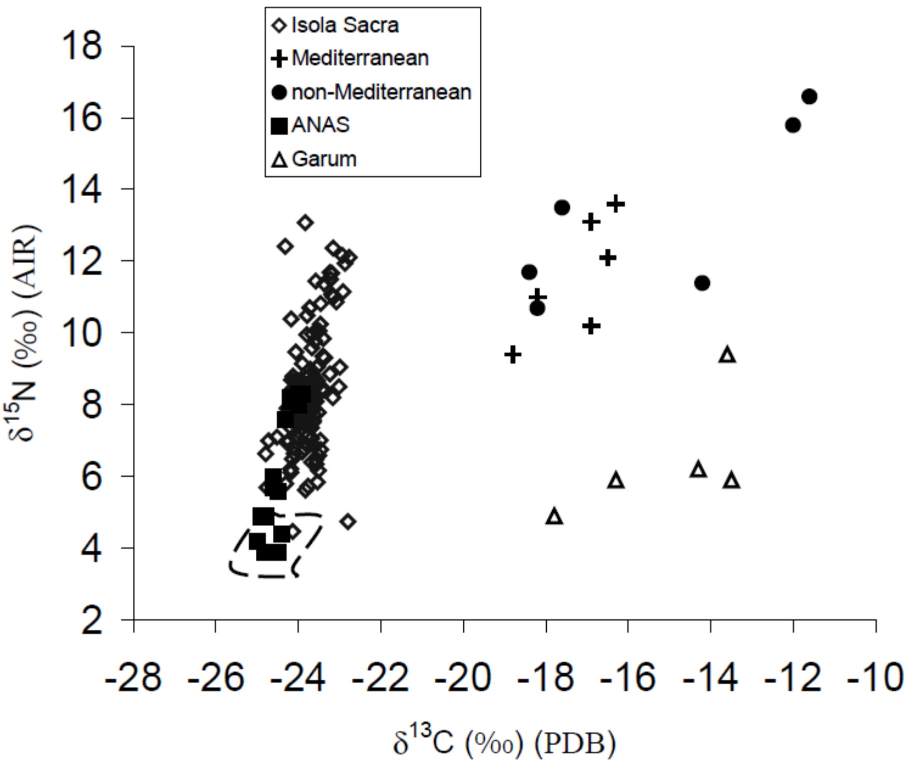

FIGURE 1.13 Inferred isotopic composition of diets of humans from Isola Sacra and possible protein sources (*Prowse et al. 2004*)

In view of the coastal nature of the site and the high exploitation of aquatic source in the community, further works have tested possible correlations between dietary habits and specific occupational pathological conditions observed on the skeletal remains (Crowe et al. 2010; Bondioli et al. 2016). δ ^{13}C and δ ^{15}N values from collagen are crossed with demographic, morphological and paleopathological data; the parameters taken into account are as stated as follows: sex, age-at-death, as well as EAE (external auditory exostosis), and enamel hypoplasia defects. The correlations between sex and age-at-death of individuals and their $\delta\ ^{13}C$ and $\delta\ ^{15}N$ values, as well as the frequency of enamel hypoplasia defects in juvenile sub-sample are previously discussed (FitzGerald et al. 2006; Bondioli et al. 2016). Among skeletal markers of occupation, the most consistent skeletal marker detected is obviously the external auditory exostoses, a benign bony growth within the external auditory canal. Even today, clinical epidemiological surveys reveal how in patients with repeated exposure to cold water for prolonged periods of time, such as water surfers and kayakers, the reactive exostosis can occur in the external auditory canal. In other words, a local reaction of the ear's soft tissues leads to the stimulation of osteogenic cell activity and finally to exostosis (Okumura et al. 2007; Barbon et al. 2017).

Research carried out by Bondioli and colleagues showed the EAE frequency attested in 21.1% of Isola Sacra adult males (Bondioli et al. 2016). The correlation between EAE frequency and carbon and nitrogen ratio values in Isola Sacra samples fails to be considerably different from zero; by contrast, the necropolis of Porta Marina in Velia is statically different: the EAE frequency is attested in in 35.3% of adult males, and it is higher among individuals with very high nitrogen isotopic values, plausibly the aquatic food consumers (Craig et al. 2010; Crowe et al. 2010; Bondioli et al. 2016). On the one hand, if in Velia's case the consumption of foods from the sea could be viewed in connection with fishing activities and EAE disease, on the other hand, for Isola Sacra, where the exploitation of aquatic resources seems to be more widespread through the population, and where the historical scenario of seaport and fluvial activities was much more complex than in Velia, a close correlation between EAE, fish consumption and fishing activities is less likely to be proved (Bondioli et al. 2016).

1.2.1.2 Outlining ancient mobility in Mediterranean archaeology

In recent years, the use of stable and radiogenic isotopes analysis was widely attested for detecting and exploring on small and larger scales the ancient human mobility at both individual and population levels (e.g. Kristiansen 1989; Kutschera and Müller 2003; Montgomery et al. 2003; Haak et al. 2008; Frei and Price 2012; Frei et al. 2015; Cavazzuti et al. 2019a) Among stable and radiogenic isotopes, oxygen (^{16}O, ^{17}O and ^{18}O) and strontium (^{87}Sr, ^{86}Sr), lead (^{204}Pb, ^{206}Pb, ^{207}Pb and ^{208}Pb), and sulphur (^{34}S) are notably useful for these purpose.

The application of chemical isotopes to mobility issues springs from the assumption that the identification of allochthonous individuals within ancient population specimens depends on different geographic places having different chemical signatures (Bentley et al. 2004; Hodell et al. 2004; Evans et al. 2006). Chemical characterization of soil and water at trophic level is determined by geochemical features, such as ages of local rock and earth formation, and varies geographically. Lead isotope ratios, for example, are determined in bedrock by the original amounts of uranium (U), thorium (Th) and lead (Pb) in the rock, as well as the elapsed time since the rock formation; moreover, unlike strontium and oxygen isotopes, lead concentrations in living organisms are not influenced by sea spray (Sharpe et al. 2016); by contrast,$^{18}O/^{16}O$ ratio values in rainfall and surface water strictly depend on latitude, altitude, amount of precipitation and distance from the sea, and hence display geographical patterning, not as detailed as geological $^{87}Sr/^{86}Sr$ variations, but still sufficient to be of some value in the study of past human mobility (Bowen et al. 2005; O'Brien and Woollen 2007; Price et al. 2015). Furthermore, many parts of the temperate and tropical regions of the world show similar $\delta^{18}O$ values, spanning from -2.0‰ to -8.0‰; due to the high range of values it is difficult to characterize distinctive differences in these regions (Longinelli and Selmo 2003; Bowen et al. 2005; Price et al. 2015; Giustini et al. 2016).

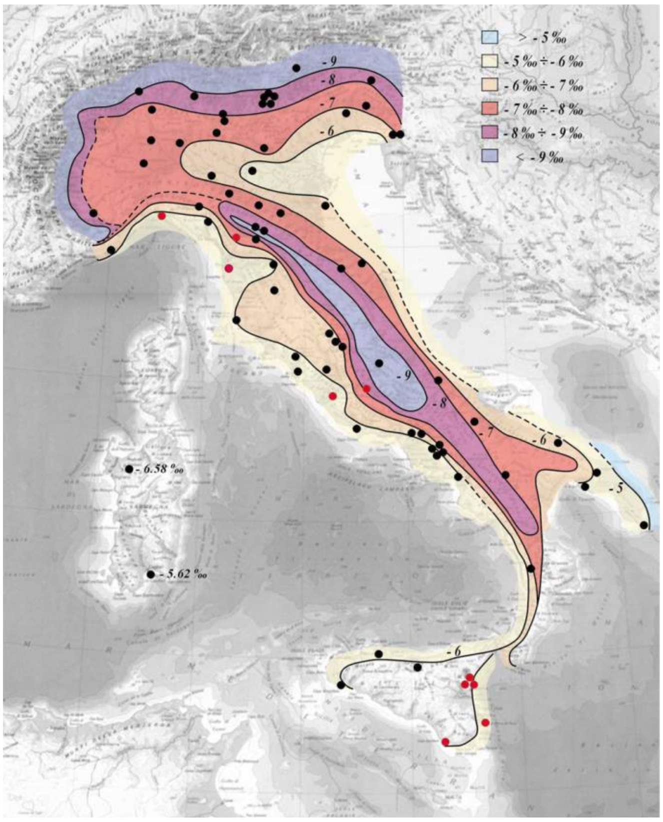

FIGURE 1.14 Variability of the mean oxygen isotopic composition of precipitation in Italy (*Longinelli and Selmo 2003, p. 80*)

With regards to Italy, the first isoscapes of oxygen isotope composition was elaborated by A. Longinelli and E. Selmo (2003) (Figure 1.14).

Using specimens of rainwater from different sites across the Peninsula and its islands, Longinelli and Selmo (2003) were able to define three Local Meteoric Water Lines for norther, central and southern Italy. As pointed out in a recent study by Mauder and colleagues (2018), $\delta^{18}O$ values on dentine apatite phosphates from archaeological faunal specimens, albeit indicative of altitude, are nor really relevant for provenance studies since the intra-individual variability from the same site can reach peaks of 4‰ and, therefore, be misleading for the determination of local baselines. For these reasons, the best research strategies are based on a multi-isotopic approach combining oxygen with strontium and eventually lead isotopes.

Among the tangled branches of human mobility research, strontium isotope is one of the most widespread and effective tools to distinguish local from non-local individuals in ancient osteological records. The first application of $^{87}Sr/^{86}Sr$ isotopes ratio dates back to the 1980's and was performed by J.E. Ericson, who attempted to trace human mobility through the extraction of $^{87}Sr/^{86}Sr$ value from mineralized tissues. In nature, strontium has four isotopes, i.e. ^{84}Sr, ^{86}Sr, ^{87}Sr and ^{88}Sr, of which only ^{87}Sr is radiogenic, formed by the β decay of rubidium ^{87}Rb. $^{87}Sr/^{86}Sr$ values in the Earth's crust largely depend on the age and type of rock. Geological units formed more than 100 million years ago and characterized by a high Rb/Sr ratio have a high proportion of heavy strontium {0.710, 0.740}, whereas newer rocks formed 1-10 million years ago contain a relatively low Rb/Sr proportion and consequently a lower $^{87}Sr/^{86}Sr$ {0.702, 0.704} (Szostek et al. 2015). Strontium passes from rocks to soil and groundwater through weathering processes, and from there to local plants and animals (Price et al. 2002). As a consequence, humans who take up strontium largely through food and water which they consume tend to have $^{87}Sr/^{86}Sr$ values very similar to those available through the local bedrock geology (Figure 1.15). Minerals from the same rock can differ greatly in their $^{87}Sr/^{86}Sr$ ratio. Therefore, the weathering of those different minerals, which contributes to the local *biologically available strontium* (BAS), together with atmospheric suppliers will result in a unique $^{87}Sr/^{86}Sr$ value (Bentley 2006). In contrast to other isotopes, strontium does not undergo fractionation due to the fact that it has a large atomic mass, and, consequently, the same ratio is kept through its cycle (Bentley et al., 2002; Bentley et al., 2004; Bentley, 2006). Thus, the Sr ratio in animals and humans reflect almost exactly the one we can find in rocks (Bentley et al., 2004), and that is why Sr has been used to spot human mobility so far (Smrčka 2005; Szostek, et al. 2005). In the mammalian skeletons, via its biological characteristics, $^{87}Sr/^{86}Sr$ ratio replaces calcium during the development of mineralized tissues of bone, dentine, enamel and keratin, due to their bivalent state (Hillson 2005; AlQahtani et al. 2010; Font et al. 2012; Beaumont and Montgomery 2015; Frei et al. 2015).

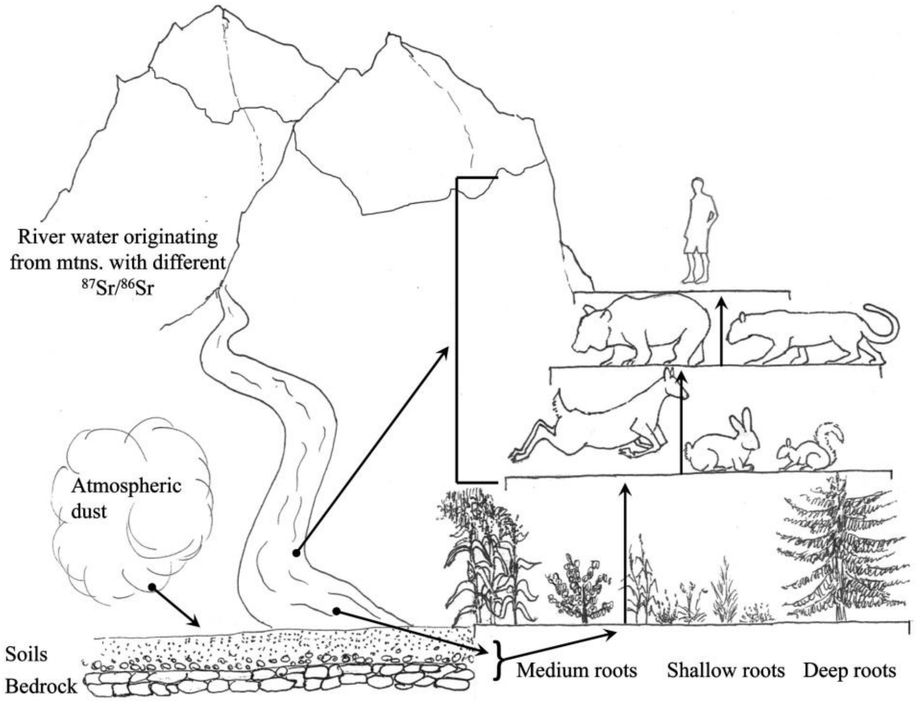

FIGURE 1.15 Sketch of the Sr system (*Grimstead et al. 2017*)

Despite the straightforwardness of the $^{87}Sr/^{86}Sr$ isotope principles, there are many hidden nuances that need to be acknowledged in order to use this technique at its best. In fact, the skeleton's development involves the mineralizing process of its different tissues at different times, and, in the case of the bone, it exhibits metabolic turnover that can change chemical composition over an individual's lifetime (Ericson 1985, Krueger 1991, Price et al. 1994; Bentley, 2006; Hedges et al. 2007; Crowder, 2013; Mahoney 2018) (Figure 1.16).

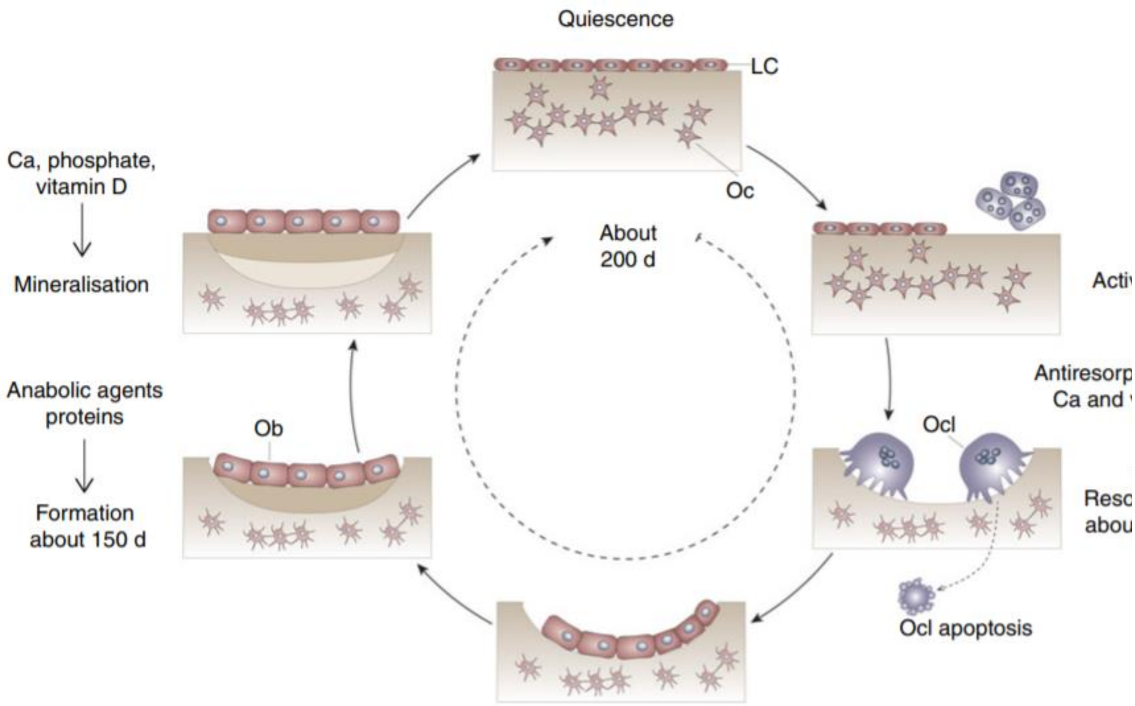

FIGURE 1.16 *Bone remodelling cycle*. Bone turnover follows a sequence of events that includes activation, recruitment of osteoclasts (Ocl) to begin resorption, degradation and removal of bone, reversal, and formation of new bone by osteoblasts (Ob). After this phases a quiescent or resting period occurs. Lc (lining cell); Oc (osteocyte) (*Bonjour et al. 2014; p. 5*)

Nevertheless, as mentioned above, the enamel of teeth does not change its chemical composition and reflects the dietary and chemical signature intake during the time of its formation in early infancy (Hillson 2005; AlQahtani et al. 2010; Müller et al. 2019). Hence, due to its biological features and high informative value, dental enamel is ideal for provenience detection. Nonetheless, as noted archaeological skeletal collections often involve cremations. Alterations and modifications patterns on biological remains in colour, shape and size, resulting from fire and high temperatures are mainly recorded (e.g. Schmidt 2008). These thermal changes in teeth may produce the crown explosion – with the exception of immature teeth, not fully formed and protected by maxillary and/or mandibular bone –. For this reason, enamel fragments from cremains are mostly unavailable. Nonetheless, recent studies which have taken into account cremated bones in the archaeological record have shown that $^{87}Sr/^{86}Sr$ can still be carried out on burned bones. As already shown in previous studies on ^{14}C dating of combusted human remains (Lanting and Brindley 1998), burning bones undergo a process of crystallisation and, therefore, are far more resistant to the phenomenon of diagenesis (Harbeck et al. 2011; Snoeck and Pellegrini 2015; Snoeck et al. 2015, 2016) compared to inhumed bones. Bones from diverse body parts have been interrogated to gain information on various life windows of the analysed individual. Researches carried out by Jørkov and colleagues (2009), later extended by L. Harving and collaborators (2014), on the petrous portion, or *pars petrosa* of temporal bone, provide a new useful tool for investigating early dietary patterns as well as mobility phenomena. The otic capsule of the inner ear is formed by endochondral ossification around the sixteen-eighteen weeks *in utero* and fully ossified around the time of birth (Jeffery and Spoor 2004). Moreover, studies have shown that the inner layers of the inner ear do not undergo any further remodelling process after two years of age (Richard et al. 2017; Kontopoulos et al. 2019) (Figure 1.17).

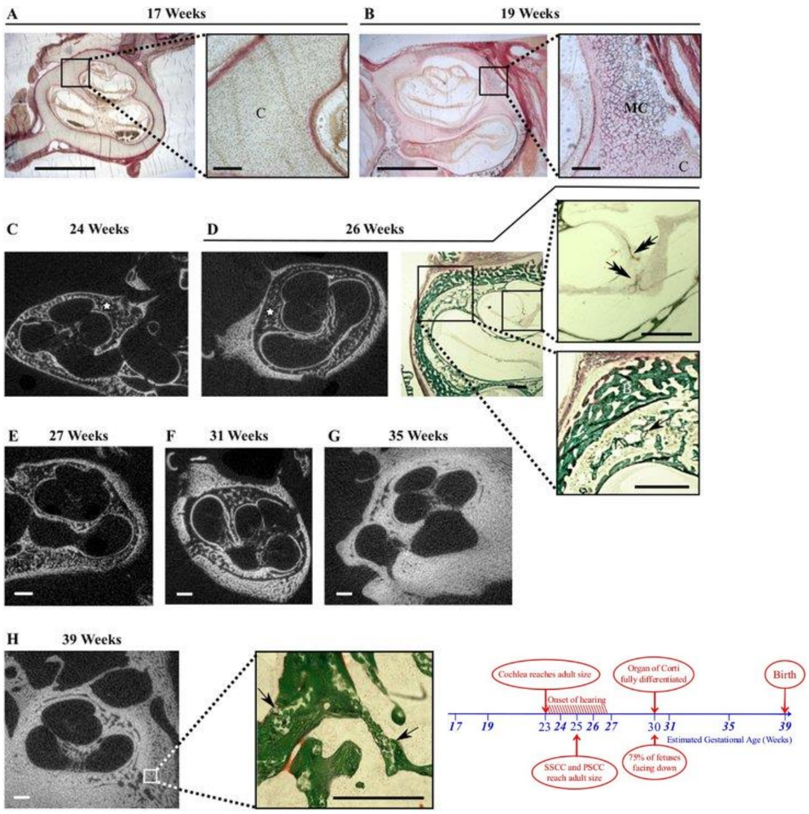

FIGURE 1.17 Ossification of the cochlear otic capsule (Richard et al. 2017)

Having looked and explored potential questions about the archaeological record, it is now necessary to turn to the *biologically available strontium* (BAS): the local isotopic background for the environment. At the beginning of its application, bedrock $^{87}Sr/^{86}Sr$ ratio was used for detecting the local Sr ratio and, eventually, compared to the Sr ratios obtained from human bones in order to distinguish local from non-locals (Price et al. 2002). However, various studies have demonstrated that the Sr ratio contained in bedrocks can differ from the $^{87}Sr/^{86}Sr$ ratio contained in plants, water, soil, animals and human bones recognisable as BAS (Sillen et al. 1998; Price et al. 2002). These studies have shown that there are various Sr sources which enter the system and contribute together with the $^{87}Sr/^{86}Sr$ ratio of bedrock to the ratio of the BAS (Stewart et al. 1998; Bentley 2006); therefore, the $^{87}Sr/^{86}Sr$ ratio contained in bedrocks has been shown not to be unsatisfactory to detect ancient people's mobility. Various studies have established that the main contributor to the BAS is bedrock (Bentley 2006), but atmospheric suppliers are important sources too. For example, sea spray has been shown to be influential (Whipkey et al. 2000; Price and Gestsdottir, 2006) and that is the reason why it is not possible to investigate only local bedrock values. Some scholars have claimed that plant and soil should be preferred to detect mobility in the past (Sillen et al. 1998), but other studies have established that the values of these latter are not always consistent (Blum et al. 2000 *contra* Hodell et al. 2004). By contrast, animal bones show an incredible homogeneity in strontium values despite a clear heterogeneity in the Sr ratio shown in rocks, plants and soils strontium ratio (Price et al. 2002). The work by T.D. Price and colleagues (2002) has stressed the importance of using archaeological and modern fauna to detect BAS. However, there are sources of biases that need to be considered when these samples are collected. Even though modern animals are easy to collect because they have less constraints for permits particularly if the samples are taken within Europe, modern pollution (Sillen et al. 1998; Probst et al. 2000) including modern fertilizers must be taken into account (Aberg et al. 1998). Another issue that emerged is connected with the fact that small animals generally feed on shallow root plants which incorporate different $^{87}Sr/^{86}Sr$ ratio compared to long root plants which are consumed by humans and bigger animals (Reynolds et al. 2012).

Potential issues have also arisen for the sampling of archaeological animals. First of all, animals as well as humans might have travelled long distances, so it cannot be excluded that $^{87}Sr/^{86}Sr$ ratio might mirror another geological area (Bentley et al. 2003).

Another element to take into account with regard to archaeological bones is the diagenesis of buried bones (Budd et al. 2000) which cannot be so easily eliminated (*contra* Sillen et al. 1998). It is for this reason that animal teeth are generally selected for a more reliable approach, even though these are not always available (small rodent teeth, for example, might be quite hard to find in the archaeological record) and can show some problems related to diagenesis. Finally, modern and archaeological animals must be ideally sampled around the area of interest (Guede *et al.*, 2017).

To conclude, the sampling of various elements for the biologically available $^{87}Sr/^{86}Sr$ requires particular attentiveness and various nuances must be taken into account. The complexity of the Sr cycle must be evaluated, starting with an initial evaluation of the bedrock Sr, considering the location of the site and potential atmospheric contributors. Archaeological and modern animals are a valid source for the local baseline, but using plants, water and soil as well as animal sources could ensure a much more reliable and complete evaluation of the local BAS (Bentley et al. 2004). Even though the procedure will result to be far more expensive in case all these samples are considered, it would guarantee reliable information.

Although several archaeological contexts have lent themselves to the application of the $^{87}Sr/^{86}Sr$ ratio analysis, this kind of analyses have seldom been applied to western Mediterranean archaeological contexts. As discussed above, archaeological records and historical facts have allowed archaeologists and historians to assume and detect the movement of artefacts and people to and within the Mediterranean basin through material cultures assemblages. However, these assumptions have been rarely tested on human odonto-skeletal records. A recent work by M. Tafuri and colleagues (2016) has investigated the mobility phenomena in Middle Neolithic sites of Grotta Scaloria (5500-520 BCE), Passo di Corvo (5355.5350 to 5345-4784 BCE), Masseria Candelaro (phases II and III, from 5610 to 5040 BCE) and La Torretta/Poggio Imperiale (5476-5397 to 5247-5230 BCE) (Cassano and Manfredini 2005; Tunzi Sisto and Sanseverino 2007; Robb et al. 2015). Tafuri's work demonstrated that the first site had the greatest range of non-local individuals in the dataset. This result allowed scholars to hypothesize the presence of allochthonous individuals in Grotta Scaloria site related to funerary practices attested in the cave, which implied the gathering of people from different parts of Peninsula. The $^{87}Sr/^{86}Sr$ baseline is in this case based on human bones, which might be considered a source of bias due to post-burial contamination. The study of Italian contexts, therefore, reveals itself to be quite challenging and demanding since there are only few information on the bioavailable $^{87}Sr/^{86}Sr$.

Bronze Age societies from northern Italy were recently investigated by C. Cavazzuti and colleagues (2019a) (Figure 1.18).

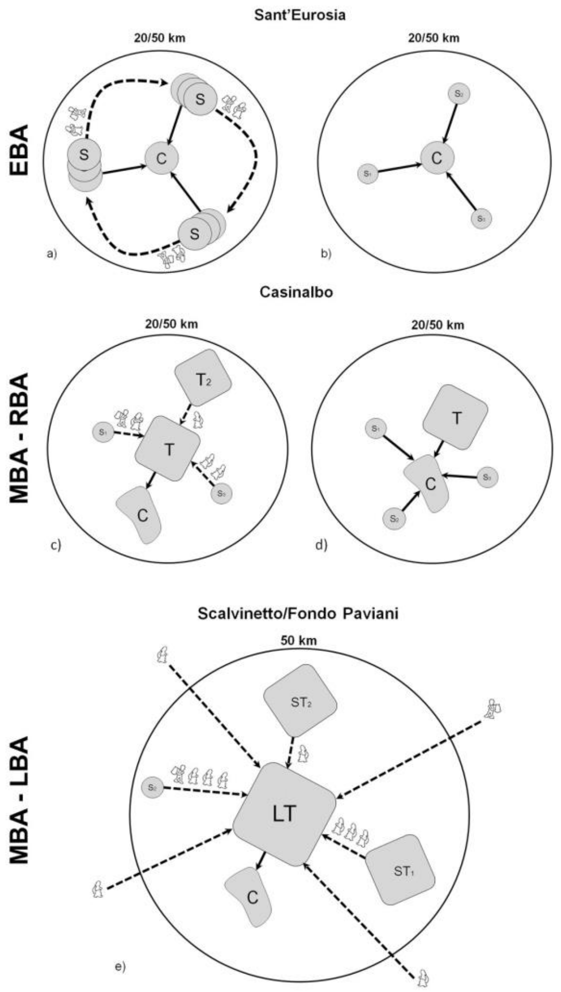

FIGURE 1.18 Different models of mobility for the three investigated sites in Cavazzuti et al. 2019a

Though a multi-isotopes analysis, combining both strontium and oxygen ratios, Cavazzuti explored the mobility strategies within the two sides of the Po plain (north and south), selecting four different sites: Scalvinetto and Fondo Paviani; Sant'Eurosia and Casinalbo. More than one-thousand individuals, both inhumed and cremated, were analysed. Furthermore, ten different geo-lithological zones have been identified to facilitate the mapping of strontium isoscapes and to assess the residential mobility of individuals. Thirty-five baseline values have been produced analysing faunal tooth enamel for each site, or conversely, modern snails found in targeted geo-lithological units. The northern and southern parts of the Po river plan showed different amplitude of bioavailable $^{87}Sr/^{86}Sr$ baseline. The multi-lines approach applied to inhumation specimens allowed to distinguish outsiders among those individuals coming from a place with a similar $^{87}Sr/^{86}Sr$ local baseline. Conversely, cremated specimens were subject only of $^{87}Sr/^{86}Sr$ ratio analysis, carried out on petrous portions of temporal bone and, when possible, on enamel from permanent molars. In order to obtain a double-check of the $^{87}Sr/^{86}Sr$ values, some individuals were sampled from both enamel and petrous bone. The results show that no difference in the $^{87}Sr/^{86}Sr$ ratio value in enamel and petrous bone from the same individuals is attested, encouraging this kind of application. Strontium and oxygen values among the sites show that the Early Bronze Age population of Sant'Eurosia might be regarded as rather mobile. No significant differences were observed in males and female's subsamples. Conversely, the cremations from Casinalbo show different pattern of mobility by sex: the high dispersion of female values suggested an occurrence of exogamic practices. With regard to the infant age-class, the $^{87}Sr/^{86}Sr$ individual ratios of some subadults from Casinalbo were compatible with the $^{87}Sr/^{86}Sr$ of hinterland local range. According to the authors, this occurrence is explained in terms of displacements during the early stages of life or it could be the results of Casinalbo being a central graveyard, which around which were placed some satellite centers (Cavazzuti et al. 2019a).

Finally, the Middle-Late Bronze Age of Scalvinetto's graveyard suggests that 47% of individuals are not indigenous. The higher $^{87}Sr/^{86}Sr$ values were shown in inhumation sub samples. According to R. Peroni (1996) archaeological attestations of local production of Apennine, Aegean-Mycenaean and Levantine-Cypriot Bichrome style ceramics might reflect the presence of foreign potters. Conversely, the hypothesis was taken into account the hypothesis that local potters moved to Greece to acquire the know-how from the local ceramic specialists and came back following an apprenticeship.

Focusing our attention on the Aegean region, a multi-analytic analysis was performed by Panagiotopoulou and colleagues (2018) for the Early Iron Age of Thessaly, in Greece. Strontium isotope analysis of tooth enamel was integrated with the contextual analysis of funerary rituals and osteological assessment of the skeletal assemblage. After the collapse of the Mycenaean palatial system, social and cultural transformations occurred in the Protogeometric communities located in southern Thessaly, in the northern border of the previous Mycenaean world (Morris 2007). In particular, the distribution of vessel and metal artefacts indicated that the region had contacts and interacted both inside and outside Thessaly. With regard to the changes in the funeral performances record of the post-Mycenaean period, many theories have been put forward to explain them, as the occurrence of a large-scale migration of a hostile group from northern regions of Greece and the Balkans (Desborough 1972). More recently, archaeological literature promoted the idea that a deterioration of living conditions led to a gradual transformation of the social organization of Early Iron Age communities (Morris 2007). In order to verify the commingled provenance of these people, tooth specimens were collected in three different site of Thessaly: the cemetery of Chloe, Voulokaliva and Pharsala. These sites show a local $^{87}Sr/^{86}Sr$ ranged respectively {0.7086, 0.7103}, {0.7078, 0.7092}, {0.7078,0.7090}. The human $^{87}Sr/^{86}Sr$ values from Chloe necropolis indicate that all of the samples are local. More interesting are the results from Voulokaliva site. According to Panagiotopoulou and colleagues (2018), all individuals from

Voulokaliva are local who obtained their food from a region whose $^{87}Sr/^{86}Sr$ values are not influenced by the sea. Conversely, the human $^{87}Sr/^{86}Sr$ values from Pharsala clearly indicated two distinct groups (one local, one non-local) (Figure 1.19, Panagiotopoulou et al. 2018). Isotopic results do not match with the archaeological evidence, according to which aspects of burial practices, such as tomb types and treatment are culturally comparable. Thus, non-local individuals have been detected, possibly originating from a region that is geologically and isotopically, but not necessary culturally, distinguishable.

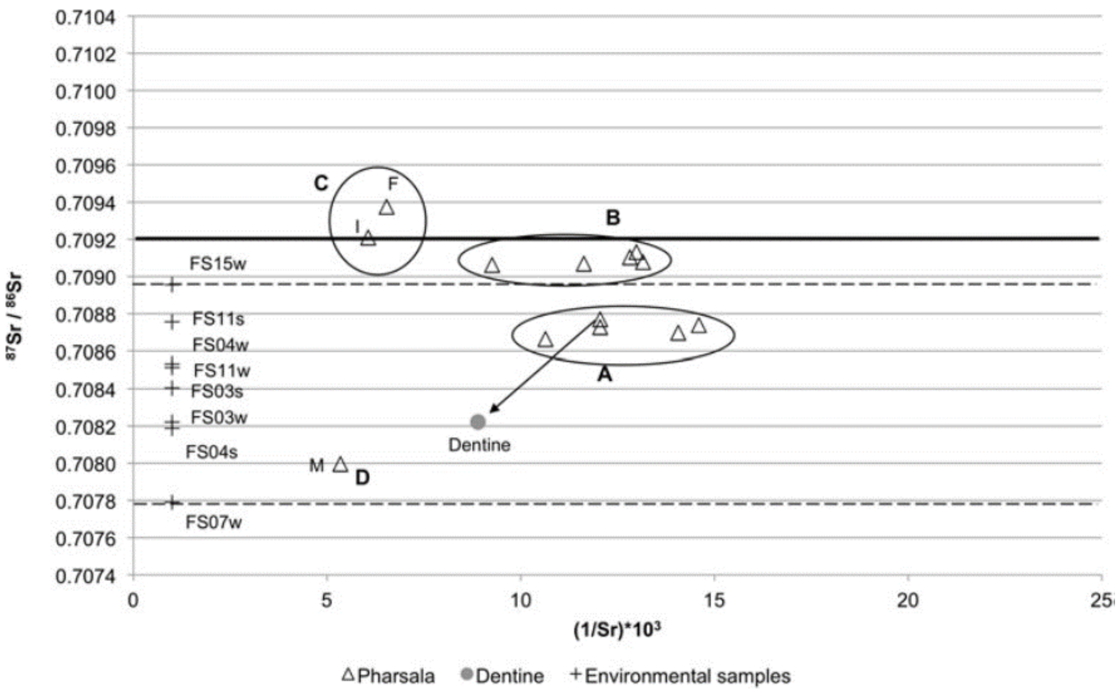

FIGURE 1.19 $^{87}Sr/^{86}Sr$ ratios of human enamel and environmental samples from Pharsala plotted against the $^{87}Sr/^{86}Sr$ concentration of the samples (*Panagiotopoulou et al. 2018, p. 604*)

To conclude, the research carried out by K. Killgrove (2010) and J. Montgomery (Killgrove and Montgomery 2016) aims to identify migration patterns in Imperial Rome through the analysis of oxygen, strontium, carbon and nitrogen isotopic ratio, looking at the cemeteries of Casal Bertone and Castellaccio Eurparco. Both works have showed that migrants were not as healthy as locals. $^{87}Sr/^{86}Sr$ baseline was identified, despite the geological and cultural complexity of the area of Rome. The study, indeed, took a critical approach for the construction of the strontium baseline due to the high variability of the geological patterns and issue connected to imported water. Briefly, the studies demonstrated that immigrants are particularly frequent among male individuals. Additionally, the analysis of carbon and nitrogen have underlined changes in the diet of outliers.

This literature review points out the importance of a multi-disciplinary approach which involves anthropology, geo-chemistry, genetics and archaeology in order to draw a more complex and in-depth comprehension of the bio-cultural dynamics occurred in the ancient Mediterranean world. The theoretical tools collected in these paragraphs allow us to better understand and explore the intricate archaeological questions concerning Pithekoussai's funerary records. The mobility of people and goods, the interaction among different ethnic and cultural identities are at the core of the archaeological debates on Pithekoussai. The aim of the next paragraph is to describe these phenomena.

1.3 *Among the natives, among the Greeks.* The Euboean foundation of Pithekoussai in the Iron Age Campania

The Early Iron Age in Campania (eight century BCE) is an excellent observatory for understanding the resumption of already existent contacts between the Aegean and the West. More precisely, this paragraph looks at the relationship between Greek people and natives in the eighth century BCE after the establishment of Aegean components in the Campanian area. As pointed out in recent debates, Campania region assumed a central position with regard to the interaction between different ethnic and cultural identities (Figure 1.20).

However, only recent studies have revealed the prominent role of the native agency in the creation of new hydride cultures. Interpretative theoretical tools such as middle ground, cross-breeding and silent resistance have been applied to the Campania Iron Age contexts in order to archaeologically explore the residential mobility phenomena, from the Aegean area, as well as Hirpinia and Oenotria indigenous ones, within sites deeply affected by different cultures fluxes (e.g. Cuozzo 2003; Cerchiai and Cuozzo 2016; Pellegrino et al. 2017).

FIGURE 1.20 Campania region (*Cerchiai 1999*)

For example, Malkin (2011) defined the middle-ground in the Iron Age Campania "(…) in terms of "construction collective identities" (*ibid.* pp. 23-24). This notion takes into account three different elements: (1) the definition of a geographical and cultural neutral space of interaction; (2) the importance of maritime connections as main vector within interaction and attraction processes; (3) the unstable and transitory nature of the concept of mediation, replaced by form of dominant political formations (Antonaccio 2013; Cerchiai 2014).

It is imperative to specify that indigenous communities, represented by a complex system of settlements within the Campania region, had already established significant maritime networks with southern Tyrrhenian areas before the Greek people established contacts with the Italian peninsula (Cerchiai 2014). Cuma, for example, was one of the prominent centres for the control of the coastal areas. Similarly, the settlement of Castiglione, located on the Ischia island at the Procida Canal had access to the mandatory route to and from Central Italy (Cerchiai 1995, 2014). Not by chance, Cuma as well as Castiglione di Ischia were characterized by the evidence of Villanovan ceramics, which could have arguably represented phenomena of trade and/or mobility (Cerchiai 2014). The site of Castiglione, recently re-examined by Pacciarelli (2011) and already mentioned by Buchner (1982), yielded biconicals vases and bowls which have close comparisons with the material culture found in Pontecagnano as well as in southern Etruria (Pacciarelli 2011; Cerchiai 2014). As reported by Pacciarelli (2011), these findings stress the noteworthy role acquired by Castiglione di Ischia within the above mentioned complex maritime networks. Biconical vases belonging to the Villanovan tradition are also attested in Cuma; a biconical urn found in the cremation SP700716 is also worth mentioning, since it bears resemblances to the to the types attested in Pontecagnano's material culture (Brun et al. 2009). Furthermore, the presence of comb decorated pottery – in both Cuma and Castiglione di Ischia- has allowed scholars to better frame the Early Iron Age evidence in Poggiomarino, in the Sarno Valley, associating with the dynamics of circulation and openings of a site connected to artisan production and exchange (d'Agostino 2011; Bartoli 2012). This is to say that the indigenous world of coastal Campania appears to have actively participated in a circuit of maritime relationships during the Early Iron Age. As shown so far, these phenomena of mobility are well represented in Cuma by the compresence of funerary rituals such as incineration with inhumation, this latter being attributable to Fossa-Kultur *facies* according to Cerchiai (2014).

Gricignano d'Aversa's necropolis (eighth-seventh century BCE-end of the Iron Age and the Early Orientalizing) represents one of the most significant archaeological discoveries in the framework of pre-classical Campania (Figure 1.21).

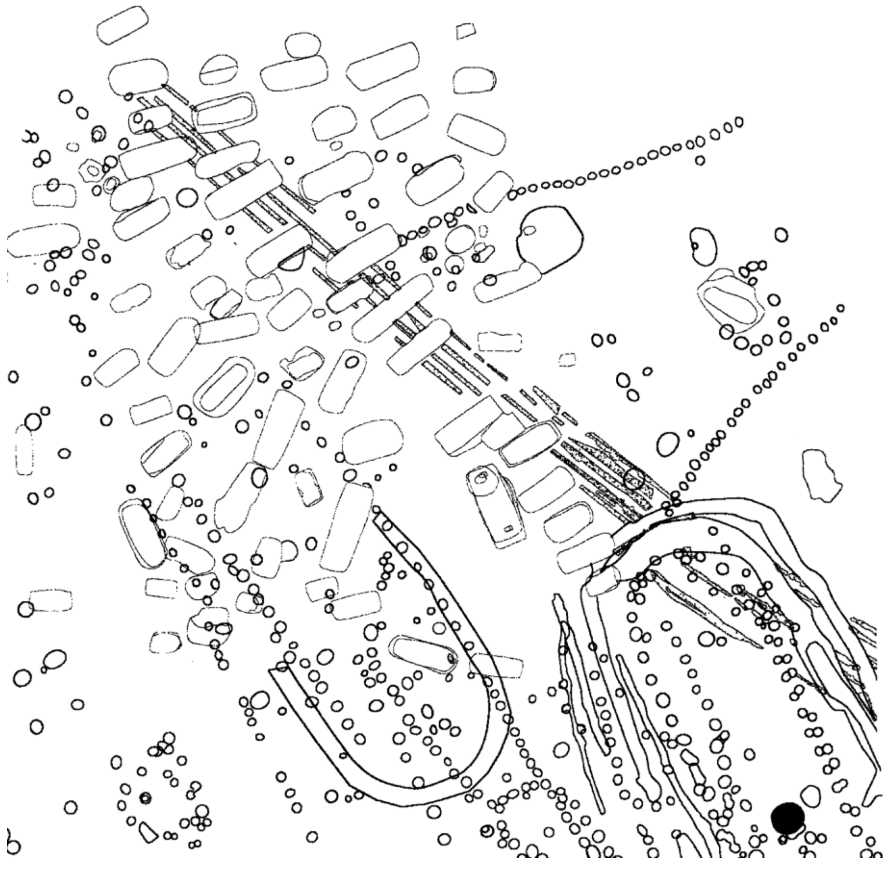

FIGURE 1.21 Gricignano d'Aversa's necropolis (*Laforgia 2007*)

Preliminary information highlighted the mixed cultural aspects of material culture represented by mixed funerary rituals (i.e. inhumations and cremations) as well as vases imported from Pithekoussai and Cuma. Greek vessels and imitation of these latter, with a selection of forms constantly included in the funerary system, are also attested (Laforgia 2007; d'Agostino 2011; De Caro 2011). The process of active appropriation of the material culture triggered by the dynamics of interaction is greatly described by the female inhumation 50 (Figure 1.22).

FIGURE 1.22 Inhumation 50, Gricignano d'Aversa's necropolis (*Laforgia 2007*)

In fact, the material culture assemblage of this tomb shows *impasto* vases, a cup and an *oinochoe* in Proto-Corinthian style and an *impasto* globular olla depicted with Geometric style motif, which is attested in other inhumations of this necropolis (Cerchiai 2014). This latter vase is typical of the indigenous vascular repertoire of the Fossa-Kultur but, in this specific tomb, it was re-functionalized within a set of vases used for manipulating and consuming wine, a form of ritual closely connected to the Greek practice of symposium. Designated to contain liquids, the olla was adapted to new consumption practices through contacts contact with the Greeks (Greco and Mermati 2006; Cerchiai 2014), attesting what is recognised as a hybridisation phenomenon.

As Cerchiai pointed out (2014), the comparison between Pithekoussai and Gricignano d'Aversa can also be extended to the presence in both sites of objects of ornament and tools in bronze extraneous to the local culture assemblage and referable to the area of Central Italy. The circulation of these goods is perhaps connected to the mobility of individuals or small groups attracted to the coast by new opportunities offered by the development of the middle-ground (Cerchiai 2014).

Around the middle of the eighth century BCE, at the edges of the Villanovan territory, two well-known settlements developed in the locality of Masseria Casella and Monte Vetrano. Both sites are of short duration and ended at the beginning of the seventh century BCE. They are characterized by an independent material culture different from the one attested in Pontecagnano. As described by Cinquantaquattro (2001, 2009), there are specific connections with the Pithekoussan material culture and Masseria Casella's graveyard. An example of these connections, is represented by inhumation 4900 which belongs to an infant and is dated to the third quarter of the eighth century BCE. This burial, like those attested in Ischia, is equipped with a grave goods set that include mainly imported vases with the isolated occurrence of a small amphora. This specific composition anticipates the selection of the basic-kit introduced in Pontecagnano's necropolis in the Orientalising period, according to the same chronological decalage known for Pithekoussai (Cinquantaquattro 2001).

Although the site of Monte Vetrano has only partially been published, the data from the various sepulchral nucleuses illustrate the social articulations and the multiple cultural matrices of the community. The most relevant datum is the presence of both female and male inhumations of exceptional level of wealth. An interesting example is the inhumation 74 dated to the third quarter of the eighth century BCE and equipped with a very rich set of bronze vases, among which a North Syrian cup and a Nuragic boat stand out; worth mentioning are also the inhumations 24 and 51 which can be attributed to warriors from the Calabrian area due to the grave goods' compositions and the presence of a type of long sword (Cerchiai et al. 2016). The exceptional scarab with a dance scene around a large amphora is another element indicative of the openings towards the mercantile component which mediates the circulation of products imported from the Aegean and from the East (Figure 1.23). Despite the fact that the scarab was found out of context, it can be dated to the third quarter of the eighth century BCE and comparable with a group of specimens related to the Lyre Player Group because it was found in relation to materials that can be framed in II B phase (Botto 2007; Cerchiai et al. 2016). As it will be described later for Pithekoussai's context, the crouched or supine-contracted position of the body suggested, from an archaeological point of view, an ethnic/cultural connotation of the individual (Cerchiai et al. 2009).

FIGURE 1.23 Monte Vetrano, scarab with a dance scene around a large amphora (Soprintendenza Archeologia Campania) (*Cerchiai and Cuozzo 2016)*

These burial customs characterized a vast geographical area, which includes Puglia and eastern Basilicata and in this specific case is referred to the Ofantine southern area, the most direct connection between the Agro Picentino and Adriatic regions. The itinerary involved the Hirpinian areas inhabited by the people of Oliveto Citra-Cairano from which, according to archaeologists, the woman buried in the inhumation 24 of the southern necropolis of the Fontanelle area must have reached Monte Vetrano. This inhumation yielded a bracelet *ad arco inflesso* which is the most exclusive ornament of the Hirpinian facies (Pellegrino et al. 2017). Another ethnic/cultural marker was recognized in the Medium-Adriatic zoomorphic pendants, yielded in female inhumation 68 from Boscariello locality (Cerchiai 2014). As in the case of inhumation 24, the pendants are associated in the ornamental set with types of fibulae that generally marks a gender opposition, according to a custom documented in Pontecagnano's burials and ascribable to the cultural area of Hirpinia. These material culture assemblages are attested also in other area of the indigenous Campania (d'Agostino and Gastaldi 2012; Cerchiai 2014; Pellegrino 2017). Thus, Monte Vetrano settlement might have represented the opening of an articulated indigenous world to the Tyrrhenian Sea. It is the aggregation and control exercised by these top figures that shapes the community of Monte Vetrano, in which the high funerary variability signals a plurality of ethnic/cultural components attracted by the opportunities offered by the relationship with Pontecagnano (Cerchiai 2014).

Among this composite and cross-breeding framework that characterized the Orientalizing Campania, Pontecagnano offers a privileged point of view of the processes of hybridization and re-elaboration of allogeneic cultures processes (Figure 1.24) (d'Agostino and Cerchiai 2003; Cerchiai 2010).

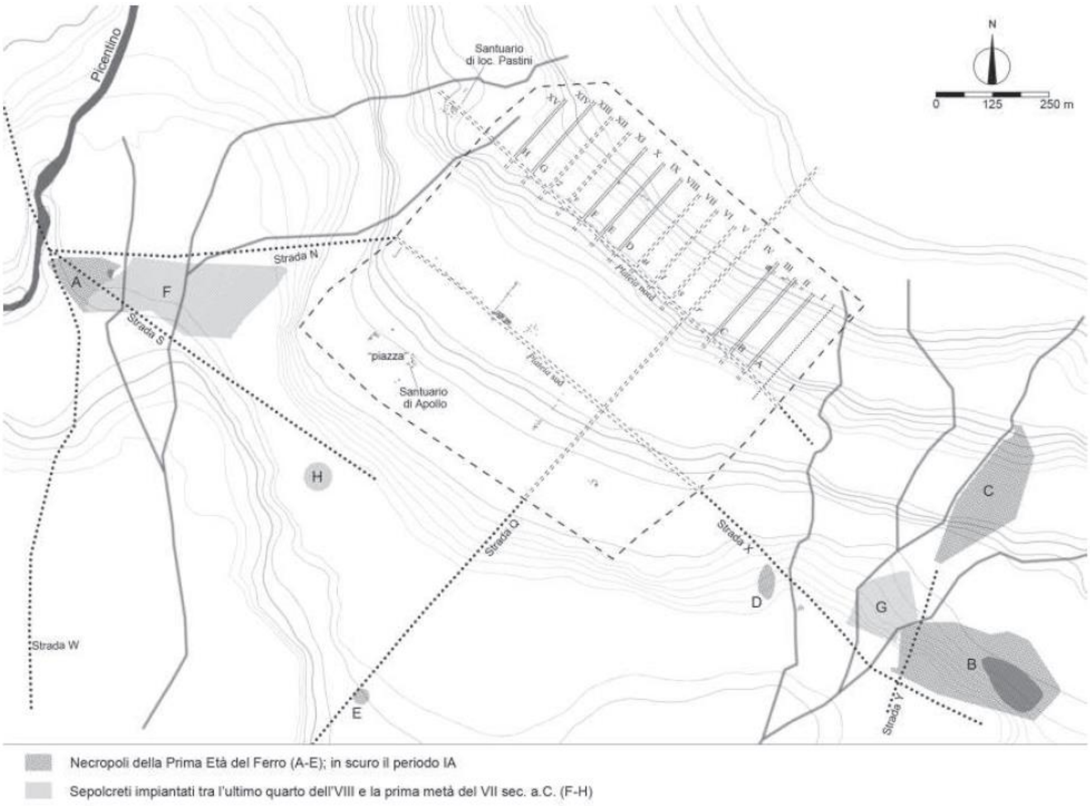

FIGURE 1.24 Pontecagnano's settlement and necropoles (Early Iron Age and Early-Middle Orientalising period) (*Pellegrino et al. 2017*)

Within this framework lies the affirmation of the *corredo-base*. This type of grave good is completely innovative compared to the Early Iron Age, represented by the constant association of *oinochoe*, *skyphos* and *kylix*, accompanied by the *impasto* amphora, generally of Pontecagnano type and cup or bowl or *piattello* connected to the consumption and/or the offer of solid food (d'Agostino 1968; Cuozzo 2003). This type of grave goods represented in tombs of both genders and for all age classes remain the same until the second half of the seventh century BCE. These objects can arguably represent hybrid material culture which, according to some scholars, is connected to the idea of *middle ground notion* (Malkin 2011).

The Pontecagnano community and, in particular its *elite* groups, seem to display their relationships with the broadest Tyrrenian aristocracy through the employment of set of vases strictly connected to the practice of wine consumption. An example of that, with regard to colonial material culture, is represented by the wine set of vases for pouring and drinking in proto-Corinthian and Italo-geometric style, most likely from Pithecusa or Cuma. This peculiar type of material culture is especially attested in the necropolis of De Chiara area of Pontecagnano, where 95 tombs were excavated. Even though these tombs cover a chronological range that goes from the end of the eight century to the beginning of the fourth century BCE, the necropolis was mostly used from the eight up until the seventh century BCE. Apart from the material culture of colonial origins, objects of different origins are attested in Pontecagnano i.e. the Oliveto Citra Cairano material culture. Females bronze *parure* from this site are highly represented, whereas the boccale, the *askos* and a bowl with moon handle are documented even if less common (Pellegrino et al. 2017).

The infant tomb 4900 from the Casella necropolis of Pontecagnano (Early Orientalizing) is particularly depictive of the above described situation (Cinquantaquattro 2001): various objects and costumes of diverse provenance are here recorded. The pit of this tomb, differently from the other infant tombs, is fully covered in tuff. This type of rock was already used to cover the wealthiest and most eminent tombs of the Pontecagnano necropolis in the Early Iron Age (Cinquantaquattro 2001). Additionally, the grave goods documented in this tomb (*impasto* vase, a small amphora and a group of drinking vessels i.e. *oinochoe*, cup, *kantaharos* e *lekane*) bare strong resemblances with the grave goods assemblages found in late geometric Pithekoussai tombs: i.e. tombs 168 (*oinochoe*, Thapsos cup, *kantharos*), 212 (oinochoe, Thapsos cup-lekane), 171 and 515 (*oinochoe* and *kantharos*) (Cinquantaquattro 2001). Therefore, Pontecagnano's *elite* did not only acquire decontextualized objects as trade of exchange from Pithekoussai, they also employed the entire composition of the grave goods, which are without any doubt representative of a more profound meaning and a specific rituality, adapting them in later context of Pontecagnano necropolis.

Since the early discovery of the necropolis, Pithekoussai was identified as a *melting pot* of different ethnic and cultural groups, among which Greeks, natives, and Phoenicians were the main ethnic identities attested; a middle ground where diverse groups interacted in a nonthreatening environment to negotiate the terms of coexistence and cultural exchange. Undoubtedly, the site is at the heart of the Iron Age's mobility and exchange phenomena, which involved a complex networking between Greeks and Levantines trades and Etruscan, Campanian, Latium and Adriatic areas.

Different types of material culture which archaeologically represent different ethnic or cultural groups are here attested; Pithekoussai might have been inhabited by Greeks and Phoenicians as well as by local people culturally associated to the pre-Hellenic Cumae inhabitants who already lived within the Island (Cerchiai 1999). Besides above mentioned groups, the material culture from the Gulf of Naples, Pontecagnano, Adriatic coast, and typical components of Agro Picentino, Valle del Sarno, Cuma, southern Latium and probably Etruria are also attested (Buchner 1982; Ridgway 1992; Buchner and Ridgway 1993; d'Agostino 1999; Nizzo 2007; Cinquantaquattro 2016; Pellegrino 2017 et al.).

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The necropolis of Pithekoussai is located in the San Montano Valley, adjoining the modern village of Lacco Ameno, in the northeast corner of the Ischia island; this latter being the largest of the Phlegrean islands, on the western edge of the Gulf of Naples (Campania, Italy) (Figure 1.25). The discovery of the first tombs occurred in 1952 thanks to a native archaeologist G. Buchner, who opened a new chapter of the Mediterranean archaeology on the so called Euboean colonisation (Buchner 1966; 1982; Buchner and Ridgway 1993; Nizzo 2007; Cinquantaquattro 2016). Unfortunately, according to archaeologists only 10% of Pithekoussai graveyard was explored (Buchner and Ridgway 1993; De Caro 1994). A series of excavations directed by Buchner and colleagues for four decades allowed us to decode the astonishing wealth which emerged from the Pithekoussan ground. Between 1952 and 1982, more than 1200 burials were uncovered, both inhumations and cremations.

FIGURE 1.25 Ischia island

The first excavations campaigns took place between the 1952 and 1961, followed by three-years of interruption until 1965. With the first campaigns, two adjoining areas (A and B batches) of approximately a thousand square meters were excavated yielding 730 graves (Buchner 1954, 1966, 1969; 1973, 1982, 1983a, 1983b; Buchner and Ridgway 1993). Figure 1.26 shows a re-elaboration in Q-Gis and Rstudio of three different levels in stratigraphic sequences of PTH I area. Those three levels included three different maps as reported in Buchner and Ridgway (1993) in order to describe Pithekoussai's complex stratigraphy: (1) AI and BI maps include the most recent tombs, from the fifth century BCE to the roman period; (2) AII and B II maps refer to the cremations cairns levels from the eighth to the early seventh century BCE; (3) AIII and B III maps include the underlying inhumations that also dated from eighth century to the beginning of the seventh century BCE. Due to the high frequency of cairns reported in the area B superimposed on another one, the authors necessitated to also draw a B II *bis* map (*ibid.*)

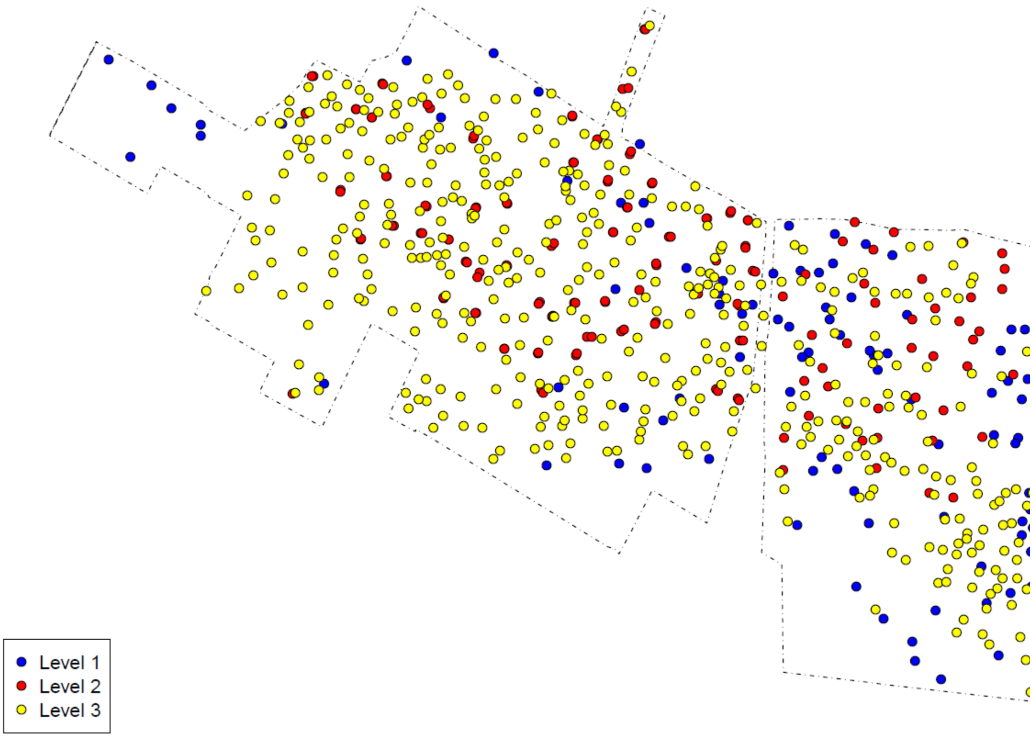

FIGURE 1.26 Distribution of PTH I's graves (inhumations and cremations) by the three different levels in Buchner and Ridgway (1993)

Excavations at Pithekoussai's graveyard continued from 1965 until 1982 thanks to the collaboration between the University Museum, the then Soprintendenza delle Antichità di Napoli and the British School in Rome. In 1993, the funerary contexts (from the burial 1 to 723) yielded between 1952 and

1961 were published in the monograph *Pithekoussai I* (PTH I) thirty years after the conclusion of the archaeological excavations by Buchner and his colleague David Ridgway (1993). In 2012, the Soprintendenza Archeologia, Belle Arti e Paesaggio per l'area metropolitana di Napoli promoted a research group composed by Bruno d'Agostino, Costanza Gialanella, Piero Guzzo, Nicoletta Manzi, Carmine Pellegrino e Teresa Elena Cinquantaquattro with the purpose of analysing the still unpublished material from the burials, investigated between 1965 and 1982, and recognised as *Pithekoussai II* (PTH II). This included a batch of approximately three-hundreds funerary contexts (from burial 730 to 1033), datable between the middle of eighth century BCE until the Roman period, and investigated between 1965 and 1967 in an area located to the south-east of the sector already was already published in the volume Pithekoussai I (Buchner and Ridgway 1993). Within this wide chronological range, the major incidence of the graves can be dated between the end of the eighth century BCE and the beginning of the seventh century BCE (Cinquantaquattro 2016).

Dates and abbreviations used in Buchner and Ridgway (1993) for Pithekoussai's necropolis are here reported (Table 1.3).

PERIOD	ABBREVIATION	DATES
Late Geometric I	LG I	ca. 750-725
Late Geometric II	LG II	ca. 725-700
Middle Proto-Corinthian	MPC	ca. 675-650
Late Proto-Corinthian	LPC	ca. 650-625
Corin	C	ca. 600
Hellenistic-Roman	H.R	ca. 500- roman period

TABLE 1.3 Dates and abbreviation for Pithekoussai's graveyard (*Buchner and Ridgway 1993*)

A huge body of literature has focused on the archaeological attempts to characterize the relations between different ethnic and cultural groups attested in Pithekoussai's society; this was mainly done through the analysis of multiple aspects of the material culture assemblages and burial rites unveiled in Pithekoussai. The first observations conducted by Buchner and Ridgway (1993) allow us to identify three different rituals attested side by side on the complex stratigraphic sequences of depositions (Figure 1.27): (1) secondary cremations in *tumuli* of rough stones, with a diameter between 1.50 and 4.50 meters; (2) single and multiple primary inhumations in pit graves for adults and sub-adults; (3) *enchytrismos* in amphorae and rarely attested in *pithoi*, *chytra* and olla, or more rarely in crater (*enchytrismos* 1000, Northern sector of PTH II's area) for new-borns and infants with or without packing of stones (*ibid.*; Cinquantaquattro 2016). Those different rituals were followed by different treatments of the bodies.

With regard to cremation, according to Buchner and Ridgway (1993) (Buchner 1966; 1982), the burning of corpses was performed outside the burial place, in an *ustrinum* placed nearby; the *ustrina* have not been identified yet. Burnt human remains mixed with fragments of vessels and personal items were carried to the burial place in a pit characterized by the presence of a carbonated roundish lens, and then covered. The ashes were covered by a cairn with a diameter from 1.5 to 4.5 meters. In some cases, the presence of a circular wall with a diameter of 4.5. meters, a κρηπίς of a *tumulus* formed by an accumulation of earth was attested. In addition, an unburnt *oinochoe* was often placed on the heap of bones and sherds (*ibid.*). According to Buchner (1966), this occurrence reinforced the close correspondence of Pithekoussan cremation rituality with the ritual described by Homer, particularly in the funeral games in honour of Patroclus' episode (Iliad XXIII, 255 f.). The *oinochoe* was part of *plethora*-set destined to the symposium's occasions. In mortuary rituals, *oinochoes* were used to pour wine on the dying pyre remains in order to extinguish the last embers (Buchner 1966). Similarly, as noted by V. Nizzo (2007) the *lekythos a bocca quadrata* attested in some cremations may explain the same ritual function (*ibid*).

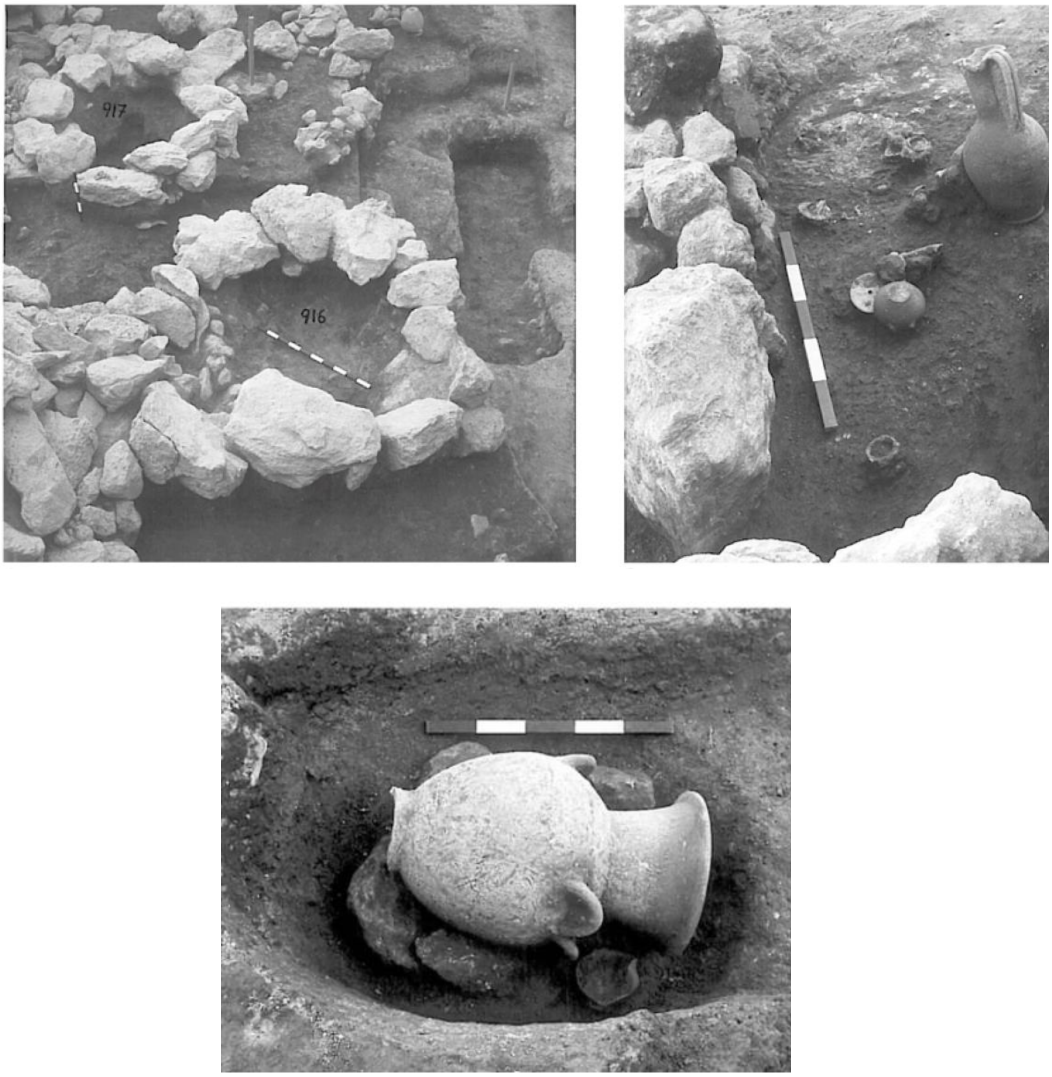

FIGURE 1.27 Inhumations from Pithekoussai's graveyard: a. secondary cremations in *tumuli* (cremations 916; 917, PTH II) (*Cinquantaquattro 2016*); b. single primary inhumations in pit grave (inhumation 951, PTH II) (*ibid.*); c. *enchytrismos* in crater (enchytrismos 1000, PTH II) (*ibid.*)

By contrast, the inhumation ritual was much more diversified (Buchner 1966; Buchner 1982; Ridgway 1992; Buchner and Ridgway 1993). This was in fact regulated by a complex system of self-representation, recognized by Buchner (1966) in three different forms: (1) pit-graves in a trench containing a wooden casket over which large rough stones were laid. Unfortunately, after the breakup of the wooden casket, the stones fallen inside the pit compromised the state of conservation of both the grave goods and the human remains, which crushed under the weight of the collapsing element; (2) pit graves with stone support, decidedly less frequent than the first and differentiated by the deposition of rough stones of various size around and above the body of the deposed, almost filling entirely the lower part of the pit. The presence of intact vases, placed in the interstices left vacant by the stones, supports the hypothesis of a voluntary deposition of vessel and items; (3) shallow pit graves with no grave goods. Pit graves orientations were variable, even if they were generally placed in the SE-NW direction, with the skull of the deposed facing east; in few cases, the skull is facing west in a pit grave placed in the N-S direction (*ibid.*).

Of pre-eminent interest in Buchner and Ridgway works was also investigating the inter-connections in stratigraphy between the most ancient burials dated to 750-700 BCE, i.e. to the so-called Euboean period. This research focused mainly on (1) the identification of *family plots*, though the systematic reconstruction of funerary rituals habits in the parcelling of the graveyard; (2) the de-codification of possible diversified *modus operandi* for biological, ethnic, cultural and social different characterisation of Pithekoussai social structure (Buchner 1982; Buchner and Ridgway 1993). As pointed out by Nizzo (2007), these social and ethnic/cultural classes can be recognised in the so called phenomenon of *agglutination*, one of the most peculiar feature of Pithekoussai's record (Buchner and Ridgway 1993).

The *agglutination* is a specific stratigraphic relationship existing among some groups of cremation cairns and, more rarely, between inhumations. It consisted in the unification of a tumulus with a pre-existing one through two different processes: on the one hand, the implantations of a new *tumulus* following the destruction of a part of the pre-existing *tumulus* or, on the other hand, its completely overlapping (Figure 1.28).

FIGURE 1.28 The *agglutination* phenomenon of the *tumuli* 945 and 944, PTH II (*Cinquantaquattro 2016*)

The reading of the horizontal stratigraphy of the necropolis translates into the perception of an *intentionality* of Pithekoussan groups to articulate the funerary areas in a composite manner. To cite an example, the *enchytrismoi* 365; 366; 368 are recognised below the *tumulus* 148 (Nizzo 2007). Similarly, the tumulus *771*, in the southern area of the PTH II characterized by the absence of cremation cairns, defined by Buchner at the time of the excavation as the largest found until then, was placed on a surface previously occupied by pit-graves of infants (790 and 796) and *enchytrismoi* (791, 792; 793; 794; 795). These sequences were interpreted by archaeologists as a possible attempt to restore family ties dissolved with death; conversely, the absence of stratigraphic relationship is also attested, perhaps in order to maintain distinct familiar, ethnic, cultural or social segments (Buchner and Ridgway 1993; Nizzo 2007)). Although it is difficult to define in terms of *intentionality* and *unintentionality* the stratigraphic landscape of Pithekoussai graveyard, it is certain that the analysis of horizontal and vertical stratigraphy has made possible to reconstruct cases in which interventions subsequent to the depositions showed the intention of a given family group to keep some burials separate from others: the erection of small dividing wall used for restoring the division between the burials unintentionally altered in graves 355 and 354 are good examples (Nizzo 2007). The critical reading of these distinct and different funerary levels brought Buchner and Ridgway (1993) to identify the possible phenomenon of reassignment of some plot occurred in the LG I period, such as the cairns 944; 945; 946; (Cinquantaquattro 2016); the same type of evidence is also attested between LG II and MPC, a phase of the necropolis archaeologically characterised by the extinction of numerous family groups and the reassignment of the funerary lot, after a period of abandonment. The archaeological evidence has clearly showed a series of levelling of the pre-existing burials carried out to make space for new cairns and inhumations, e.g. burial 142 (Nizzo 2007).

The first interpretation of the funerary performances revealed a diversification in the treatment of the body based on both age-at-death of individuals and social hierarchy; it seemed that the inhumation ritual was a prerogative of new-borns, infants and subadults; whereas, cremation was reserved to the domain of *élite* adults (Ridgway 1992). According to B. d'Agostino (1999; 2011), these two different rituals (inhumation vs. cremation) are strictly connected with the social status of the buried individual; indeed, whilst cremations were reserved to Pithekoussai's *élites*, inhumations were for the most part reserved to individuals, characterized by a condition of social *marginality*. This marginal condition could have been related to the character of (1) *transition*, where it was connected to the age-at-death of the individual – the deceased was too young to enter *pleno iure* into the social structure; (2) *definitive* and *irrevocable* when it was connected to the condition of social sub-alternation of the deceased, who retained nevertheless the access to the formal burial (*ibid.*). The excavators noted that a number of inhumations were set apart from the other tombs in clusters, suggesting some marginality on the part of the occupants. This has led some scholars to suggest that these inhumations belonged to indigenous italic individuals (Ridgway 1992; d'Agostino 1999; Cuozzo 2007).

Nonetheless, as described above in this Chapter, the close relationship between material culture and social/ethnic and cultural identities are inherently more complex. However, in Pithekoussai literature, most interpretations of the site still rest on an implied binary opposition between Greek as founders and initiative-takers and natives as marginal, in which the native inhabitants of the Italian peninsula acted in a subordinate position to Greeks and as passive recipients in relation to the Greeks (Kelly 2012; Donnellan 2016). Nonetheless, according to most scholars, Pithekoussai's evidence supported this model through some archaeological ethnic and cultural markers (Ridgway 1992; d'Agostino 1994; Papadopoulos 1998; d'Agostino 1999; Ridgway 2000; d'Agostino and Cerchiai 2004; Ridgway 2004a; 2004b; Cuozzo 2007).

The question of intermarriage between Greeks males and indigenous females is significant example. According to Coldstream (1993), the hypothesis of matrimonial exchanges between foreigners and native females is based on the funerary recognisability of the female component of allogenic origin. More precisely, this inference was sufficient to explain the presence of indigenous material at Pithekoussai (Coldstream 1993; Shepherd 1999). This position considered excessively more simplistic, was rejected in Olivia Kelley (2012) and Giulia Saltini Semerari's (2016) works.

Similarly, the position of inhumed individuals was detected as a probable ethnic or cultural marker. For the subsamples PTH I, the preservation of skeletons has made possible to analyse the position of 190 inhumations out of 342; in 78% of the cases, the inhumed is in a supine position with the upper limbs stretched along the sides; in 13% of cases the upper limbs are located on the pelvis or thorax of the deposed; in 2% the lower limbs are crossed, while the upper limbs are carried to the thorax (Nizzo 2007).

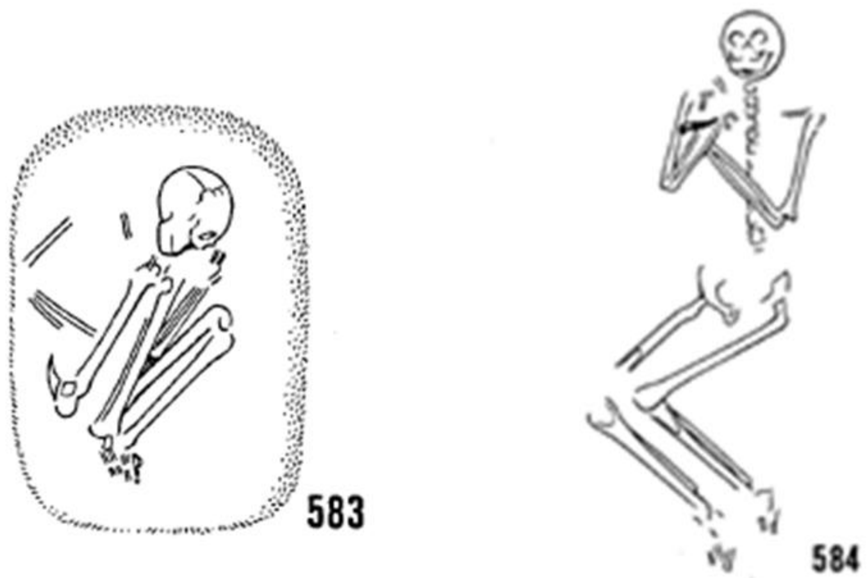

FIGURE 1.29 The crouching position of the inhumated 583 and 584, PTH I (*Buchner and Ridgway 1993*)

Conversely, 13% of the samples, distributed throughout the entire life span of the necropolis, is represented by huddled individuals. Taking into account the edited materials from PTH I, three burials, more precisely the 317,318,319 located in a liminal area of the necropolis, are characterized by the presence of grave goods referring to the indigenous Daunia culture; this is particularly evident in the female burial 283; a personal item of the woman was a *tutulus*, an earring with bronze thread and a double spiral fibula, interpreted as pertinent to a female from the Irpinia hinterland. As reported above, the crouching position of the body is sporadically attested in that area and is part of the funeral customs of the Oliveto Citra-Cairano *facies*, attested in a wide territory between the Lucan hinterland and the Daunia (Figure 1.29) (Cerchiai et al. 2013).

Within PTH II's subsamples, cremation 944 had aroused scholars' attention because of the composition of the grave good set. This is composed by local LG panel type Thapsos *oinochoe*, an eastern type *aryballos* and a small amphora with spiral decoration. According to Buchner and Ridgway (1993), the *impasto* amphora, similarly to the specimen found in grave 159, is an imported product from the Etruscan-Latium area and could be considered as an example of the relationship among aristocratic *élites* which involved the Tyrrhenian communities and the settlements of Capua, Pontecagnano and Pithekoussai, outlining a network that did not exclude models of transversal mobility.

The Carpenter's tomb, pertaining to an adult male (Becker 1995;1999) was interpreted by some scholars as another example of integration of allochthonous components within Pithekoussai's community. The grave displays some peculiar characteristics such as a *tumulus* of square-shaped stones recognised as the *semata* of the burial. As for the grave goods, two *impasto* vases, a carenated bowl and a jug seem to indicate the foreign origin of the inhumed. The kit is complemented by a repertoire of woodworking tools, which indicated the presence of an ethic model that values the ostentation of the objects that positively qualify the social condition of the deceased (Buchner and Ridgway 1993). This occurrence completely foreign to the Greek tradition is strongly present in the indigenous customs. The *tumulus* of the royal Circle, uncovered by Paola Zaccani Montuoro at Francavilla Marittima site is an example of this local tradition. (Zaccani Montuoro 1970; 1977; 1980). Other explicative examples of this tradition are a group of tombs from the necropolis of Pontecagnano (Middle-Late eighth century BCE) which contain iron tools (d'Agostino and Gastaldi 1989; De Natale 1992; Cinquantaquattro 2001). Inhumation 4890 contained a variety of iron tools alongside a variety of impasto vessels and an iron spearhead (Cinquantaquattro

2001). Tomb 4461, one of the so-called princely tombs, contained an array of iron objects, including two chisels, an axe, two spearheads and a knife blade, together with a rich assortment of bronze vessels, that suggested a sacrificial function (Cerchiai 1995).

As already highlighted for the Località Casella necropolis (Cinquantaquattro 2001), the multi-functionality of the unearthed tools does not allow us to give a direct association of each tool to a specific work activity, but the association of one or more of these tools together ascribe these tools to a specific sphere of activity(*ibid.*).

With regard to the Orientalising period, similar tools have been interpreted as related to an ideological context of offering and/or earth sphere (d'Agostino 1977). That is the reason why archaeologists have associated the Carpentiere Tomb as well as the tomb 4890 to the working sphere. Tomb 4890, which belongs to an adult male, had for example nine impasto vases, a bronze dragon fibula, and a working tool set in iron. The association weapons-working tools highlights the warrior as well as the working dimension of the deceased recalling the Fossa Kultur tradition which was widespread in southern Italy between the end of the night century and the beginning of eighth century BCE. However, according to archaeologists, both the tomb 678 from Pithekoussai and tomb 4890 from Pontecagnano slightly differ from this tradition. As a matter of fact, whereas the individual from 4890 might have belonged to an elevated social group, as it is recognised for the Etruscan-Italic tradition, where working tools are generally associated to wealthy tombs, (d'Agostino 1987), the tombs with working tools found in Pithekoussai belong to a more modest social group or, as in the care of infants, (i.e. 515 and 557) to people that are not entirely integrated in the society (Cerchiai 1999; d'Agostino 1999; Cinquantaquattro 2001). The material culture assemblage associated with the inhumation 951 from the PTH II subsample allowed us to verify how in this cultural horizon, the self-representation of aristocratic *élites* also took into account also infants. Personal items and tools from Italic cultural landscape were found in this burial. An *oinochoe* (*con ansa bifida e corpo ovoide allungato*) with a horse figurate and a LG I hemispheric *black kotyle* were found beside an ardesian disc with central hall and an iron knife Other objects found in the tomb were a bronze dragon fibula, bronze bracelets, a seal in the shape of a lion found on the chest of the dead. South of the skull were found two lances ritually broken together with a series of hooks, pendants and tweezer. The hooks might have belonged to a belt and can be confronted with tomb 624 (Buchner and Ridgway 1993).

The tweezer, already found in inhumation 530 of Pithekoussai, finds comparisons in central Italy as well as in Campania and, more precisely in Capua and Pontecagnano (Cerchiai 2014). There are two elements that make this tomb particularly interesting. On the one hand the presence of two bronze lances ritually de-functionalised similar in dimension but broken at two different points (Cinquantaquattro 2016). As previously suggested by Cinquantaquattro and Guzzo, this might be interpreted as the hoarding of two objects which are not used anymore. On the other hand, at the same time, the presence of these weapons is exceptional within the Pithekoussan context since there are no other weapons attested as a conscious removal of any type of elements strictly connected to the warfare. By contrast, weapons are largely used as representatives of *élites* in Etruria, Etruscan Campania and italic areas during the Orientalising period.

Cum grano salis, the presence of elements indicative of cultural and ethnic realities different from those of Greek culture, accompanied by the exaltation of the grave architecture through the erection of a tumulus, as prerogative of cremations, may indicate the high heterogeneity of the funeral ritual in Pithekoussai. Thus, the access to formal burial access of the allogeneic groups shows how phenomena of integration characterized the burial tissues in a widespread manner from the earliest stages of the life of the necropolis.

What has been said so far is grafted in a broader and more complex debate about the reconsideration of the relationship among natives and Greeks theorised by d'Agostino (2011). d'Agostino has rejected the Buchner's assumption about the presence of impasto pottery as an ethnic marker. The production of impasto vessels is ascertained in burials dating to the second half of eighth century BCE; these findings are documented prevalently in the females' and infants' burials. However, their presence does not seem to be prerogative of a precise biological and social segment of the community, as well as it does not seem to distinguish *a priori* burials of socially subordinate individuals. This assumption is well based on the following observations: (1) not all inhumations of adults are characterized by poor grave goods; (2) numerous *impasto* vessels are also present in some important cremation tumuli. Therefore, to attempt an interpretation of these dynamics and their influence in the modes of representation of the different ethnic-social Pithekoussan structures, it was necessary to evaluate the incidence of these classes of materials within the family plots and in the topographically marginal areas of the necropolis. Luca Cerchiai's (1999) analysis has made possible to identify some other archaeological indicators of probable origins, such as wood and leather working tools as personal items, attested in the liminal areas of the necropolis and interpreted by Buchner as individuals of subordinate condition of probable Daunian origin.

In an interpretation proposed by d'Agostino (2011), impasto vessels are not only an ethnic markers of the donor but also a social integrator for the receiving nucleus. This interpretation allows us to better understand the political mechanisms pursued by the Pithekoussan *elite* group and its relations with the outside. The pottery imported from Latium, Etruria and Campania showed a double and highly active circulation of goods.

With this regard to this, two tombs from the PTH I sector are particularly worth mentioning (Cinquantaquattro 2016). On the one hand, the enchytrismos 575, LG I, where a Greek amphora is used for an infant most likely of eastern origins (Ridgway 1984). On the other hand, a local amphora with the engraved name of *Dazimos*, a probable Messapian name with Greek origins (Colonna), was found in tomb 285 (Buchner and Ridgway 1993). What is more, Phoenician amphorae are used in *enchytrismoi* (908;933;934) in the North East fascia of cremation 771, sector PTH II (Cinquantaquattro 2016). It is necessary to highlight that tombs represented by local material culture are less than 10%. A clear selection of both PHT I and PTH II areas was attested ever since the first phases of the necropolis. With regard to the area PTH II, the presence of non-locals in the northern part of the necropolis is represented by two funerary clusters 944; 945; 946 and 826 e 863 *tumuli* respectively which reveal strict connections with the Etruscan-Latium areas. These burials are referred archaeologically to foreign women inserted in the high *élite* of Pithekoussai.

The archaeological record of Pithekoussai reveals without any doubts the inclusive character of the necropolis. However, the material culture does not only represent the relationship between Greek and allochthonous people but also between different social components which appear to be transversal if compared to the ethnical and cultural dimension. The Campania region and Pithekoussai were a *melting pot* of different cultures and identities; a *middle ground* where local *élites*, Greeks, Phoenicians and Etruscans interacted in a nonthreatening environment to negotiate the terms of coexistence and cultural exchange.

The scenario outlined in this pages gives an indication of the complexity of the study of human history, in particular of the aspects linked to the mobility of individuals. Chapter One also pointed out the importance of integrating biological and cultural points of view into historical-archaeological realities. The analysis of the biological record, not secondary to the archaeological analysis, becomes therefore vital in the understanding of the ancient bio-cultural structures, the dynamics of population and hybridisation. In the case of Pithekoussai, historical-archaeological inferences describe a multi-ethnic society, an open system that welcomes culture and people by incorporating them into a pre-existing social system, not without forms of change and transformation. But what exactly can the biology of the people from Pithekoussai tell us? What information can we obtain from the geochemical analysis of their remains? Was Pithekoussai a true *apoikia*? To science the arduous sentence.

CHAPTER TWO

MATERIALS AND METHODS.
FROM THE VESSEL TO THE BONE: THE INTEGRATE ANALYSIS OF HUMAN REMAINS FROM PITHEKOUSSAI'S CEMETERY

2.1 Pithekoussai's Skeletal and dental collections

The skeletal and dental remains discussed here were recovered from two different funerary areas of the Pithekoussai graveyard, *Pithekoussai I* (PTH I) and *Pithekoussai II* (PTH II). As discussed in Chapter One, PTH I and PTH II chronologies spans from 750 to 675 BCE, or the Late Geometric periods I and II (LG I-II), to the Hellenistic-Roman periods (H-R) (Buchner and Ridgway 1993; Cinquantaquattro 2016. For an accurate description of the funerary context and its material culture, Chapter One, paragraph 1.3).

An initial assessment of PTH I remains was performed in the 1960's and 1990's by Robert Munz (1970) and Marshall J. Becker (Becker and Donadio 1992; Becker 1995, 1999). More accurately, portions of mandibular and maxillary bones, and dental remains yielded from the first excavation campaigns between 1952 and 1961 were analysed by Munz in 1967. Munz's subsample consisted of 123 inhumations. As described by the German dentist, in some cases the teeth were completely covered by hard incrustations of soil and silicate crystals (Munz 1970). This occurrence is also attested in our samples. Determination of sex was not performed, due to the poor state of preservation of materials and the absence of morphological traits of sexual dimorphism. Conversely, the age-at-death of individuals, mostly infants and sub-adults, was performed as reported by Munz "(..) according to the teeth growth rates found in an anatomy textbook." (*ibid.*)

A more extensive work was carried out by Becker, who focused his analysis not only on the basic information, including individual age-at-death and sex, but also on attempting to ascertain the ethnic-cultural identities of the deceased basing on the crossing between material culture assemblages and biological evidence (Becker 1995, 1999). Between 1991 and 1992, Becker analysed skeletal remains from 17 inhumations and 112 cremations dated around 750 and 675 BCE; 2 later inhumations were also included. Bone fragments were glued using a water soluble polyvinyl acetate solution. Determination of sex in inhumed subsample was obtained though the observations of dimorphic traits of postcranium (e.g. long bone shaft diameters; Becker and Salvadei 1992); conversely, age-at-death was determined though the evaluation of teeth developments.

In 2015, as a result of the close collaboration between the Servizio di Bioarcheologia of Museo delle Civiltà and the Soprintendenza Archeologia, Belle

Arti e Paesaggio per l'area metropolitana di Napoli, the entire skeletal collection (PTH I and PTH II) was moved from the Museo Archeologico Nazionale di Villa Arbusto in Lacco Ameno (Ischia island) to the Servizio di Bioarcheologia of Museo delle Civiltà. The relocation of skeletal remains allowed us to perform a morphological and morphometric re-assessment of PTH I burials, previously analysed by Munz and Becker, as well as to extend the anthropological analysis to PTH I and PTH II unpublished subsamples; moreover, as a pilot study, we were able to determine diachronic information on residential mobility patterns within Pithekoussai society, through $^{87}Sr/^{86}Sr$ ratio analysis.

In this research 364 burials were analysed. These included 18 inhumations, 1 *enchytrismos* and 112 cremations from PTH I, as well as 166 inhumations, 9 *enchytrismoi* and 69 cremations from PTH II (Appendix A). Pithekoussai's inhumed and cremated remains are poorly preserved. Consequentially, the anatomical regions of each individual are often not well represented. As reported in Buchner and Ridgway (1993), grave goods and osteological remains were affected by intense post-depositional alteration because they were buried in warm volcanic sediments (*ibid.* p. 30). Ischia island is characterized by an active hydrothermal system (Chiodini et al. 2004; Di Napoli et al. 2011). As such, the geological history of the island is characterized by secondary volcanic phenomena such as seismic events, landslides and tsunamis (Cubellis and Lungo 2018; de Vita et al. 2006; Della Seta et al. 2012). Among these, the presence of fumarolic activities and hot spring water is attested even today. Undoubtedly, high soil temperature ~63°C recorded by archaeologists due to the elevated geothermal gradient accelerated the oxidation of grave goods as well as the biological record. Bone degradation is mainly observed on inhumed remains, represented in most cases by only few fragments of dental crowns. Conversely, due to the fact that calcined bone is more resistant to diagenetic alterations and chemical exchanges within the burial environment (Snoeck et al. 2014a, 2014b), the cremation sub-sample seemed to survive to Ischia soil better.

Before their relocation at the Servizio di Bioarcheologia, human and faunal remains from both PTH I and PTH II subsamples were stored at the Museo Archeologico Nazionale di Villa Arbusto in hundreds of paper boxes, labelled with the burial identification number.

In some cases, teeth and skeletal fragments from the same burials were divided randomly in more than one box. No anatomical division (e.g. skull, arm and leg, pelvis, hand and foot) occurred. Both inhumed and cremated remains were uncleaned from soil and other adhering sediments; small shards of vessel and metals artefacts were found among the cremains. Conversely, the PTH I subsamples analysed by Munz (1970) and Becker (1995; 1999) were placed in plastic boxes cleaned and anatomically divided in the cranium and postcranium districts.

2.2 Morphological and morphometrical analysis of skeletons and teeth

Over the past thirty years, the study of human skeletal and dental remains from archaeological sites has developed from a descriptive field to one that provides answers to archaeological questions. The emphasis focuses mainly on biocultural adaptation and paleodemographic reconstructions (sex, age, health, diet, residential mobility, etc…). Yet, some critics were moved against biocultural approach in the evaluation of health status and adaptation using archaeological specimens. To cite an example, some critical issues were pointed out in an often-quoted paper by James W. Wood and colleagues (1992). According to Wood (1992), the *osteological paradox* potentially contributed to limit the reconstruction of the demographic asset and adaptive success of human populations in the past, through the three main tools of *demographic nonstationary*; *selective mortality*; *hidden heterogeneity in risk* or *frailty* (Wood et al. 1992). Fortunately, after the publication of these critical concepts, bioarchaeology is increasingly widespread and today new methodologies that allow us to explore quantity and quality of information are developing from demography, biodistance, paleodiet and mobility, growth disruption and paleopathology (Wright and Yoder 2003).

The advanced investigatory technique that were employed in this research to analyse inhumed and cremated remains from the graveyard of Pithekoussai are discussed below.

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In this study, skeletal preparation (cleaning procedure) was performing using method outlined in White and Folkens (2011). Cleaning procedure and morphological analysis were conducted at the Servizio di Bioarcheologia of Museo delle Civiltà. Due to the high level of fragmentation and the poor state of preservation of both inhumation and cremation burials, the remains of these type were cleaned without water using soft-bristle brushes (Fig. 2.1).

FIGURE 2.1 Cleaning process of the maxilla portion and teeth from inhumation 949 (S) (*PTH II*)

After the pre-treatment of materials, morphological and morphometric analyses of the specimens was performed. Each recognized individual has been entered into a database in a Microsoft Excel spreadsheet, alongside all available information.

2.1.1 Minimum Number of Individuals (MNI)

Establishing M.N.I. for each funerary unit was the primary task of this research. As reported in Chapter One (paragraph 1.3) Pithekoussai's stratigraphy is characterized by the agglutination and overlapping phenomena, which involved two or more graves, as well as by the proof of multiple primary inhumations. Furthermore, after their burning in shared *ustrina*, cremation remains were collected and buried in bare earth (Chapter One, paragraph 1.3). From a taphonomic point of view, two events occurred for cremations: (1) mixed gathering of the remains: if skeletal residues from the preceding combustions had been gathered together with a second one, the corresponding cremation would contain parts from other individuals. However, this situation should not be defined a double/multiple burial *sensu stricto*; (2) biodisturbations and stratigraphic contaminations of funerary units are made worse by the presence of funerary (durable?) urn.

Prior to the M.N.I. estimation, the specimens from both inhumation and cremation graves were separated into human and faunal remains for each funerary unit. The identification of faunal remains was performed in collaboration with Francesca Alhaique and Ivana Fiore at the Servizio di Bioarcheologia of Museo delle Civiltà (Chapter Three, paragraph 3.1.4). The M.N.I. index was obtained by counting all non-joining or non-matching elements or portions for each burial (Adams and Konisberg 2004; White and Folkens 2011; Varas and Leiva 2012; Boz and Hager 2014). Regarding the cremation series, we assumed as criteria of exclusion of double or multiple burials, the quantitative relation, i.e. portions of weight of the according bone remains, and/or the representation, i.e. delivery of all major parts from both or more individuals (Wahl 2001; Schmidt and Symes 2015).

2.1.2 Paleodemographic Reconstruction

Age-at-death distributions, sorted by sex determination, are of primary importance for demographic reconstruction of ancient population. (Sutton 1988; Roksandic and Armstrong 2011). As such, the reliability of demographic reconstruction built on skeletal material depends on the accuracy of individual age and sex estimations (Acsàdi and Nemeskéri 1970; Bocquet-Appel and Masset 1982; Van Gerven and Armelagos 1983; Boddington 1987; Wood et al. 1992; Chamberlain 2000; Wright and Yoder 2003; Bocquet-Appel 2008). Similarly, the accuracy and precision of estimations depends on the available skeletal elements, as well as on the sample composition (White and Folkens 2011).

Due to the high degree of fragmentation and the poor state of the osteological remains that were the object of our study, age-at- death and sex multi-analytic techniques were performed (when possible) on different skeletal and dental indicators. Results of the morphological and morphometrical assessment have been categorized in different classes based on those outlined by Buikstra and Ubelaker's classification (1994) as shown in Table 2.1. Because of the uncertainties involved in the determination of sex from Pithekoussan skeletal remains, a vocabulary of terms (Table 2.2), expressing both the determination of sex and our confidence in the determination, is made available below. Moreover, sexing of juvenile's sub-sample was not performed in our study because juveniles have not yet undergone the osteological change related of pubescence that result in sexually dimorphic features.

AGE CLASS	AGE-AT-DEATH
FETUS	before birth
INFANT	0-3 years
CHILD	3-12 years
ADOLESCENT	12-20 years
YOUNG ADULT	20-35 years
MIDDLE ADULT	35-40 years

OLD ADULT	>50 years
ADULT	>20 years

TABLE 2.1 Age classes used in Pithekoussai morphological analysis record (*after Buikstra and Ubelaker 1994*)

TERM	ABBREVIATION	MEANING
FEMALE MALE	F M	High accuracy and precision of sex diagnosis.
FEMALE (?) MALE (?)	F? M?	Medium accuracy and precision of sex diagnosis.
FEMALE (??) MALE (??)	F?? M??	Low accuracy and precision of sex diagnosis.
FEMALE (???) MALE (???)	F??? M???	Very low accuracy and precision of sex diagnosis.
INDETERMINATE	ND.	Absence of diagnostic traits. This condition is peculiar of: a. adults very poor represented; b. sub-adults with secondary traits in the skeletons not yet distinct.

TABLE 2.2 Terms, abbreviations and meanings in sex determination diagnoses used in Pithekoussai's analysis

Paleodemographic dynamics of the main chronological phases of Pithekoussai's graveyard (i.e. LG I, LG II, H-R) (Buchner and Ridgway 1993; Cinquantaquattro 2016; Chapter One, paragraph 1.3, Table 1.3) have been reconstructed using different methods (e.g. Weiss 1973; Bocquet-Appel and Masset 1982; Masset and Parzysz 1985; Buikstra et al. 1986; Bocquet-Appel 2002; Hoppa and Vaupel 2002;

Wittwer-Backofen and Buba 2002). Therefore, for this research it was possible to evaluate the following ratios:

1. *Juvenility index* = ${}_{15}D_{5}/D_{20+}$, the ratio between the number of individual aged between 5-15 years and the number of deaths at >20 years (Bocquet-Appel and Masset 1977; Masset and Parzysz 1985);
2. *Old-age-dependency ratio* = ${}_{0\text{-}15}D+{}_{50}D/\ {}_{15\text{-}50}D$, the ratio between the number of individuals aged >50 and the number of individuals aged between 15 and 50 years (Weiss 1973; Mensforth 1990);
3. *Total Fertility Rate* = ${}_{30}D/{}_{5}D$, the ratio of the number of individuals aged >30 and the number of deaths aged >5 (Buikstra et al. 1986);
4. *Sex ratio* = (M/F) the ratio of the number of males to females within adults.

Age-at-death estimation is based on morphological indicators of the skeleton linked to the development, growth, and maturation of osteological and odontological structures. Regarding the inhumation sub-sample, age-at-death was estimated by examining of nine features of specific areas of the skeleton: (1) dental formation and eruption of deciduous and permanent dentitions (Trodden 1982; Smith 1991; Hillson 1996; Ubelaker 1999; 2008; AlQahtani et al. 2010); (2) long bone length – mainly humerus, radius, femur and tibia- (used as complementary techniques when teeth are absent)(Scheuer and Black 2000; Ubelaker 2008), as well as (3) epiphyseal closure of skeletal elements (Krogman and Işcan 1986¸ Cardoso 2008). Long bone length has been measured using an osteometric-table and digital sliding caliper; (4) tooth-wear patterns in maxilla and mandibular permanent dentition, especially the molars, in the adult sub-samples (Brothwell 1981; Smith 1984; Lovejoy 1985a; Mays 2002); (5) degenerative changes of the symphyseal surface of the pubic of the os coxae, synostosed with advancing age (Todd 1920; Brooks 1955; Mckern and Stewart 1957; Gilbert and McKern 1973; Suchey et al. 1986; Katz and Suchey 1986; Brooks and Suckey 1990; Klepinger et al. 1992); (6) degenerative changes of auricular surface of the ilium (Lovejoy et al. 1985b; Buckberry and Chamberlain 2002; Mulhern and Jones 2005); (7) degenerative changes of sternal rib epiphysis (Işcan et al. 1984, 1985, 1987; Loth et al. 1994; Yoder et al. 2001); (8) degenerative changes of vertebrae and joint surface (osteoarthritis, Schmörl's nodes and other conditions with proliferation or eburnation) and (9) oral disease (*ante mortem* tooth loss –AMTL); (Oxenham et al. 2002; Hillson 2008; Pinhasi and Mays 2008).

Individual were assessed for sex by examining (1) dimorphic traits of neurocranium and splanchnocranium (e.g. nuchal crest, mastoid process, supraorbital margin, glabella, mental eminence, ramal flexion morphology) (Krogman 1962; Acsàdi and Nemeskéri 1970; Ferembach et al. 1980; Buikstra and Ubelaker 1994; Loth and Henneberg 1996; Hill 2000; Balci et al. 2005); (2) dimorphic features of greater sciatic notch and preauricular sulcus of the pelvis (Acsàdi and Nemeskéri 1970; Buikstra and Ubelaker 1994; Ubelaker and Volk 2000).

Regarding cremation sub-sample, peculiar heated-inducted features of cremated bones, as well as the high underrepresentation of Pithekoussan skeletons have been taken into consideration within the methodological spectrum. A range of analytical techniques are part of a broader methodology developed in forensic and archaeological research on burned bones (Baby 1954; Binford 1963; Gejvall 1969; Bradtmiller and Buikstra 1984; Shipman et al. 1984; McCutcheon 1992; Piga et al. 2008, 2009, 2010, 2013). However, very few studies have focused on methodologies aimed at sexing and aging human cremains (McKinley and Bond 2001; Williams 2015; Cavazzuti et al. 2019b).

The effects of fire include destruction, fragmentation, warping and shrinkage of the bone (Figure 2.2). All of these strongly affect applicability and reliability of standards and methods for age-at-death and sex assessments (Shipman et al. 1984; Holck 1986; Buikstra and Swegle 1989; Symes et al. 2008; Gonçalves et al. 2013). Heat also causes color changes on the bones: as temperature increases, the bone carbonizes, changing from pale yellow, reddish-brown, very dark gray brown, black, medium blue, gray and light gray, whitish and calcined white (Shipman et al. 1984; Symes et al. 2008).

FIGURE 2.2 The effect of fire on the cremated individual 944 A

Pithekoussai's cremations assessment has been focused on: (1) macroscopic observation of the bones modification (warping, shrinkaging, color and size changes) and fragmentation pattern, in order to reconstruct any differential effects of the cremation process on various skeletal parts for each individual, as well as intra-individuals (Holck 1986); (2) weight for each skeletal district (i.e. cranium and mandible; teeth; vertebrae; sternum and ribs; shoulder girdle; arm; hand and foot; pelvis; leg) as an expected indicator of selective collection of bones from the funeral pyre, as well as an indicator of taphonomic contamination between two or more individuals on the same stratigraphic unit (Adams and Konigsberg 2008; Ubelaker and Rife 2008; Duday 2009; Adams and Byrd 2014); (3) macroscopic identification of human and non-human remains for each funerary burial (Whyte 2001); (4) age-at-death and sex assessment as follows.

Similarly to what reported for inhumation series, when it was possible, primary indicators in the estimation of age-at-death in subadult and adult cremations were (1) epiphyseal closure of skeletal elements (McKern and Stewart 1957; Webb and Suchey 1985; Krogman and Işcan 1986; Cardoso 2008); (2) degenerative changes of the symphyseal surface of the pubic of the os coxae (Todd 1920; Brooks 1955; Mckern and Stewart 1957; Gilbert and McKern 1973; Meindl et al. 1985; Suchey et al. 1986; Katz and Suchey 1986; Brooks and Suckey 1990; Klepinger et al. 1992); (3) degenerative changes of auricular surface of the ilium (Lovejoy et al. 1985b; Buckberry and Chamberlain 2002; Mulhern and Jones 2005); (4) degenerative changes of sternal rib epiphysis (Işcan et al. 1984; 1985;1987; Loth et al. 1994; Yoder et al. 2001); (5) degenerative changes of vertebrae and joint surfaces (osteoarthritis, Schmörl's nodes and other conditions with proliferation or eburnation). The determination of sex has been performed basing on (1) sexually dimorphic features of neurocranium and splanchnocranium (e.g. nuchal crest, mastoid process, supraorbital margin, glabella, mental eminence, ramal flexion morphology) (Acsàdi and Nemeskéri 1970; Schwidetzky et al. 1980; Buikstra and Ubelaker 1994; Hill 2000; Balci et al. 2005); (2) new osteometric methods for sexing as complementary techniques and in absence of cranium and pelvis dimorphic traits (Cavazzuti et al. 2019b).

2.3 Strontium analysis: analytic procedures for sampling and laboratory processing

The $^{87}Sr/^{86}Sr$ ratio analysis is widely employed in for archaeological provenance studies of humans and other animals (e.g. Ericson 1985; Price et al. 1994; Sealy et al. 1998; Chapter One, 1.2). The key issue of this method is the equilibrium between the $^{87}Sr/^{86}Sr$ ratios in teeth and bones and the local $^{87}Sr/^{86}Sr$ bioavailable signature. Since $^{87}Sr/^{86}Sr$ ratio passes from lithosphere to the biosphere into and through the local food chain with no significant fractionation of $^{87}Sr/^{86}Sr$, soil and water isotopic signatures are transferred to teeth and bones biominerals. (Ericson 1985; Price et al. 2002; Blum et al. 2000; Chapter One, paragraph 1.2).

More accurately, nonlocal samples are defined as those whose isotopic composition falls outside a range of estimated or measured absolute isotopic variation, which can be derived from various proxies such as local population variation, measurements of bioavailable $^{87}Sr/^{86}Sr$ in local vegetation or fauna, and predictive models of spatial $^{87}Sr/^{86}Sr$ variation (Bentley 2006).

An initial assessment of migration rates within Pithekoussai's skeletal and dental record has been performed through the $^{87}Sr/^{86}Sr$ ratio analysis in 2016 (Gigante et al. 2016, 2017,2018). This research allows us to extend the preliminary study of Pithekoussai's diachronical mobility to both PTH I and PTH II subsamples. Human samples selection was conducted at the Servizio di Bioarcheologia of Museo delle Civiltà. The pre-treatment of samples and Sr-isotopic analysis was performed at the Geochemistry Laboratory of the Institut für Geowissenschaften (IfG) at the Goethe Universität in Frankfurt am Main. The sampling criteria and procedures adopted in this study to evaluate local $^{87}Sr/^{86}Sr$ bioavailability and $^{87}Sr/^{86}Sr$ ratio in human remains are described below.

2.3.1 $^{87}Sr/^{86}Sr$ Bioavailability of Ischia island

In strontium isotope analysis, local $^{87}Sr/^{86}Sr$ bioavailability is determined though multi-analytic methods. According to Price and colleagues (2002), the variation in biogenic $^{87}Sr/^{86}Sr$ ratios is controlled by combined variations of inputs from the lithosphere, hydrosphere, and atmosphere (*ibid.*). The relative proportional contributions of these different inputs can vary based on a wide range of local environmental conditions, such as the presence and deposition of sea spray or marine-derived precipitation (Kennedy et al. 1998), the impact of ^{87}Sr-enriched of Saharan dust on the modern biosphere, weathering of bedrock and soil conditions (Bern et al. 2005; Pett-Ridge et al. 2009).

In order to define the local $^{87}Sr/^{86}Sr$ bioavailability in our study we have considered four different sources: (1) volcanic Sr-signature of whole-rock (D'Antonio et al. 2013); (2) ancient and modern animals, (3) modern plants, and (4) burial soil (Vuorinen et al. 1996). Moreover, the marine isotopic ratio 0.70917

(Mc Arthur et al. 2001) and Sahara dust compositions 0.715-0.725 (average 0.7194) (Grousset et al. 1998) or 0.7160-0.7192 (Krom et al. 1999) were used as comparative baseline Sr-isotopic compositions.

Ischia is an active volcanic island located at the North-western corner of the Gulf of Naples (South Italy; Figure 2.3). This island is part of the Phlegrean Volcanic District (PVD) along with Procida island and Flegrean volcanic fields (Orsi et al. 1966; D'Antonio et al. 2013). The geological history of the island is characterized by a complex interplay of tectonism, volcanism, erosion and sedimentation phenomena (Buchner 1986; Vezzoli 1988; Orsini et al. 1991; de Vita et al. 2006; Brown et al. 2008; Sbrana et al. 2009; de Vita et al. 2010). Volcanic eruptions are attested prior to 150 ka BP and continued, with long quiescence periods, until the last eruption in 1302 AD. Mt. Epomeo is the result of the early volcanic activity, the Green Tuff eruption (55 ka BP), followed by block resurgence of the caldera floor after ca. 33 ka BP (D'Antonio et al. 2013).

With regards to the island's isotopic signature, its geochemical assessment shows large variability in Sr, Nd, Pb, O and B isotopic values (Civetta et al. 1991; Turi et al. 1991; Orsi et al. 1992; Piochi et al. 1999; Slejko et al. 2004; D'Antonio et al. 2007; Avanzinelli et al. 2009). As for the radiogenic Sr, as reported in D'antonio et al. (2013), its heterogeneities in $^{87}Sr/^{86}Sr$ ratios of magmas erupted over the past 55 ka BP highlight a complex behaviour of the feeding system, characterized by the alternation of closed-system conditions, and replenishment by new, isotopically distinct magmas, with evidence for crustal contamination as well as mixing processes (*ibid.* p. 4). New $^{87}Sr/^{86}Sr$ ratios analysis of whole rock tephra samples from Molara, Vataliero and Cava Nocelle, on the South-eastern sector of the island, clearly shows $^{87}Sr/^{86}Sr$ values between 0.70631 and 0.70648, slightly different from those reported in literature from the three volcanic centers, 0.70620 and 0.70635 (Civetta et al. 1991; D'Antonio et al. 2007, 2013). However, a reasonable explanation for the variable range measured in whole-rock samples could be the different proportions of phenocrysts and glass in tephra samples (D'Antonio et al. 2013).

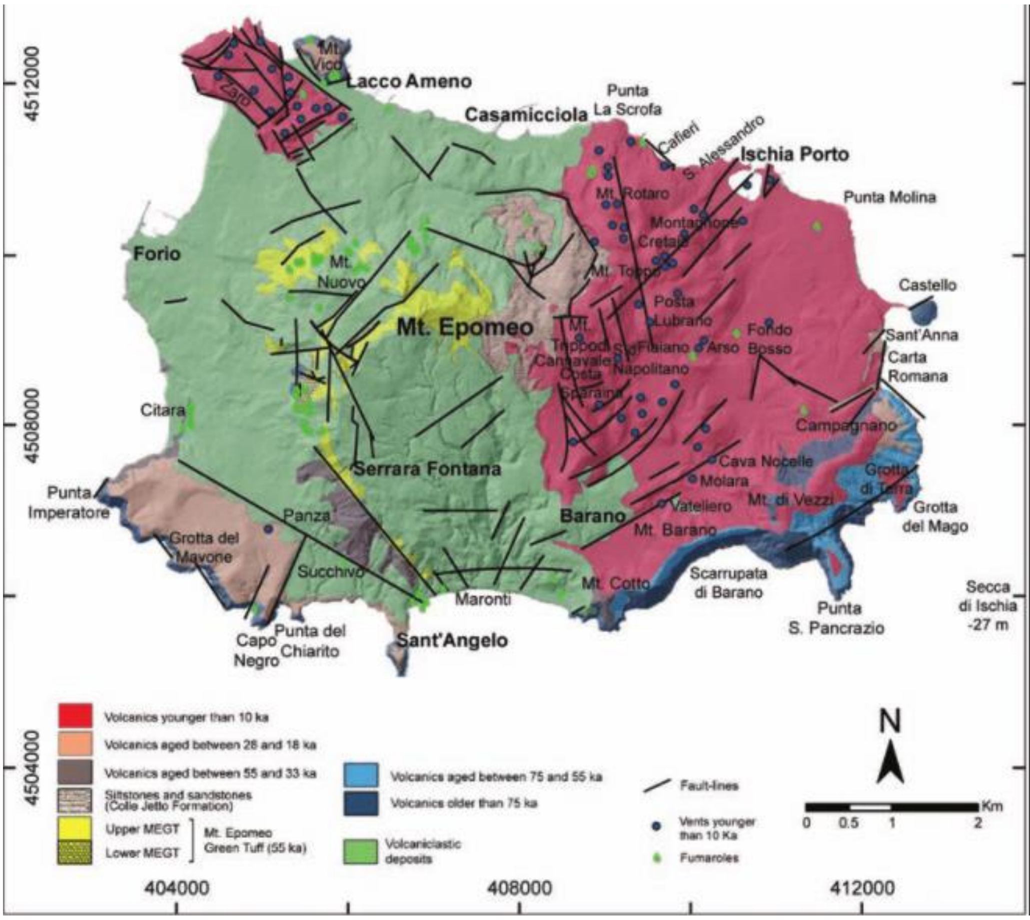


FIGURE 2.3 Geological sketch map of Ischia (*D'Antonio et al. 2013*)

Dental enamel of ancient animals was collected from osteological remains of the inhumation grave 1120. The identification of the species (as sheep) was carried out together with archaeozoologists at the Servizio di Bioarcheologia of Museo delle Civiltà. Dental enamel of wild modern rabbit from Mt. Epomeo was collected with the help a local hunter. Both ancient and modern teeth were pre-treated. Prior to sampling, adhering contaminants and all traces of dentine were removed from specimens with dental burrs. In accordance with the methods proposed by Müller and colleagues (2003), the mass of each specimen was between 20 and 40 mg.

Modern vegetation (shallow roots plants) was gathered across seven different areas of Ischia island, at different distances from the coastline, in order to verify the sea-spray effect on the Sr values (Figure 2.4). GPS coordinates were recorded for each sampling area, which have been selected along wild zones in order to minimise the risk of contamination by anthropogenic strontium from agricultural sources. One square meter was traced in the field. Sampling was performed gathering a few grams of grass from each angle of the square. Fresh grass was placed in paper bags and left to dry. The mass of each area-sample, after drying, was 2 gr. All samples were placed into labelled plastic vials and transferred to the Clean Laboratory of the Institut für Geowissenschaften in order to be treated.

FIGURE 2.4 Sampling of modern vegetation on Ischia island. On the right, sampling grass procedures

2.3.2 Human record: tooth and bone sample

Human samples used in this research were from: a. 45 permanent teeth (enamel mainly from first or second maxillary/mandibular molars) in inhumed adults; b.

49 petrous portion of temporal bone (*pars petrosa*) in cremated adults and inhumed adults and sub-adults (Ericson 1985; Bentley 2006; Jørkov et al. 2008; Harvig et al. 2014). Among these, four inhumed individuals were subject to a double check which involved a sampling of both tooth enamel and petrous bone. Sampling consistency is reported in Appendix B.

a. Tooth enamel

Human tooth is high informative value related changes in an individual's behaviour and environment during the period of enamel formation (Humphrey et al. 2008). As such, enamel chemistry provides an ideal source of information concerning paleobiological questions as the individual mobility. The high amount of hydroxyapatite crystals, a chemical constituent tolerant to substitution by a range of trace elements, allows to incorporate these elements into the enamel forming at the time of exposure. Furthermore, once formed, tooth enamel does not alter its chemical signature (Hillson 1996; Schweissing and Grupe 2003; Montgomery 2010; Price et al. 2011; 2013; Chapter One, paragraph 1.2). In order to explore childhood origins, enamel samples selected for this research were mainly from first and second permanent molars, both maxillary and mandibular. However, due to the poor state of preservation of Pithekoussai's dental remains, 1 individual (PTH 755; LG period II) was sampled from third molars (Appendix B). Since upper and lower dentitions show similar development rates, strontium isotopic values do not differ from upper to lower teeth (Harris 1996; Slovak and Paytan 2011). The approximate timing of dental crown and root formation of human permanent dentition allows us to estimate the initial development of first molar *in utero* (~28/32 gestational weeks) and are completed from ~3 years of age; second molars initially begin to form at 2-3 years until 7-8 years (Smith 1991; Hillson 1996; AlQahtani et al. 2010). Conversely, third molars are the most variable in terms of their formation and eruption (Hillson 1996; White and Folkens 2011). Even though third molars encapsulate a later Sr-signature, they are the least likely of all teeth to be affected by maternal $^{87}Sr/^{86}Sr$ ratios from after the period of weaning and thenceforth (Humphrey et al. 2008).

Enamel samples were collected from the occlusal margin of protoconid, or mesiobuccal cusp on lower molars, and protocone, or mesiolingual cusp on upper molars, to the cement-enamel junction (CEJ) (Figure 2.5). Sampling criteria have taken into consideration diagenetic and taphonomic alterations of the crown surface: teeth affected by chromatic variations, abrasions or poor state of enamel preservation were not sampled (Schoeninger et al. 1999). Wear patterns of occlusal surfaces were also taken into account.

Prior to cutting, digital imaging has been performed in order to provide a digital archive of all sampled materials. The cutting of specimens has taken place at the Geochemistry Laboratory of Institut für Geowissenschaften of the Goethe Universität. A flexible diamond edged rotary mounted on a drilling machine (DREMEL® model 300) was used to cut a longitudinal crown section of the cusps. Adhering contaminants (soil and sediments) and all trace of dentine attached to the enamel were removed using a dental burr. After sampling, equipment cleaning was performed to prevent contamination. Enamel samples were checked under binocular microscope in order to verify dentine remains (Figure 2.6). Enamel mass before leaching ranged between 20 and 40 mg. Once weighted, the samples were placed into labelled plastic vials and transferred to the Clean Laboratory.

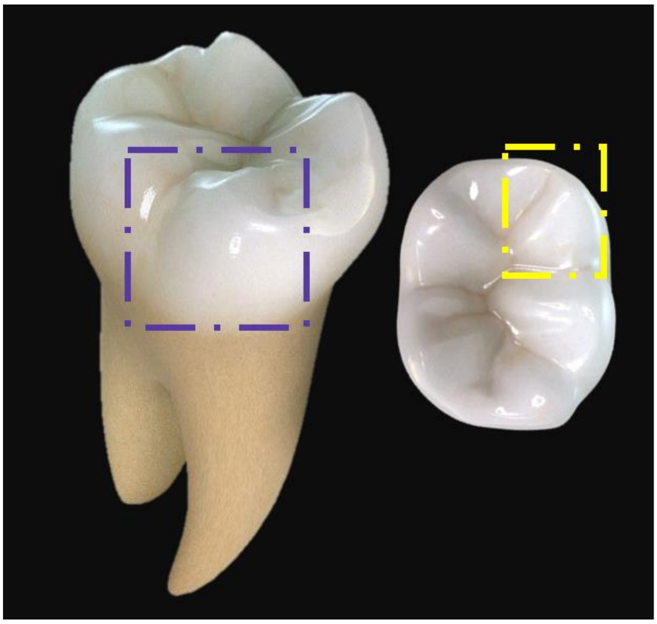


FIGURE 2.5 Enamel sampling area, from the occlusal margin of protoconid, or mesiobuccal cusp on lower molars, and protocone, or mesiolingual cusp on upper molars, to the cement-enamel junction (*CEJ*)

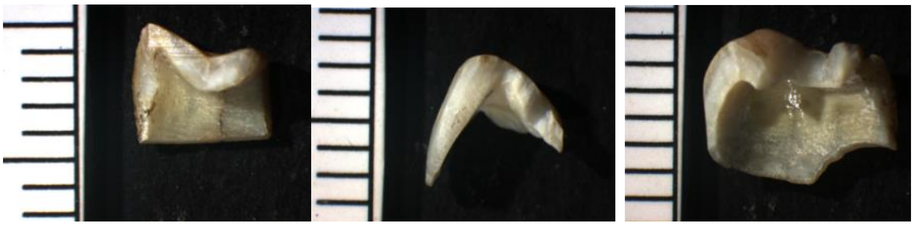


FIGURE 2.6 Enamel portions after cutting procedures. The samples checked under binocular microscope in order to verify dentine remains

b. Petrous bone

As discussed above, Pithekoussai's graveyard is characterized by the co-presence of inhumations and cremations (Buchner and Ridgway 1993; Chapter One, paragraph 1.3). Regarding the latter, heat-inducted changes do not affect the original biological isotopic composition of cremated bones, even when they have been exposed to very high temperatures (Harbeck et al. 2011). Conversely, macroscopic alterations of dental tissues are attested. The effect of heat on dental enamel causes its rupture into microscopic fragments difficult to identify. Crowns usually survive intact if the teeth are still within their crypts, i.e., not yet erupted and protected by bone walls (Shipman et al. 1984; Buikstra and Swegle 1989; Bass 1995; Chapenoire et al. 1998; Muller et al. 1998; Cattaneo et al. 1999; Delattre 2000; Sakoda et al. 2000; Bowers 2004; Collins 2004; Hillson 2005; Schmidt and Symes 2015). Recent publications have demonstrated the effectiveness of using petrous portion of the temporal bone as a proxy or supplement for tooth enamel in isotopic mobility studies for a variety of reasons. As described in Chapter One (paragraph 1.2), *pars petrosa* is the densest bone of the skeleton and frequently preserved in ancient cremations; its formation begins *in utero* at approximately 16th-18th gestational weeks and ossifies at the time of birth. And, more importantly, the otic capsule of the inner ear does not undergo any further remodelling after the age of 2 years (Harvig et al. 2014; Snoeck et al. 2014a, 2014b, 2015, 2016, 2018; Cavazzuti et al. 2019a; Chapter One, paragraph 1.2)

For this research, samplings were performed using methods and criteria outlined by Jørkov and colleagues (2008). As reported previously, prior to cutting, a digital imaging of specimens has been performed in order to obtain a digital archive of all sampled materials. Likewise, the cutting of petrous bones has taken place at the Geochemistry Laboratory of the Institut für Geowissenschaften of the Goethe Universität. The petrous bone was drilled at a 90° angle into the otic capsule (0-5-0.8 cm down), between the internal acoustic meatus and the subarcuate fossa using a low speed (2 mm diameter) drill. The extraction of bone tissue from the otic capsule of the petrous bone was performed using a 1 mm mechanical saw mounted on a drilling machine (DREMEL® model 300) (Figure 2.7). Bone powder was dropped in cleaned and labelled plastic vials. Specimens size before leaching ranged between 20 and 40 mg.

Once weighted, samples were transferred to the Clean Laboratory of the Institut für Geowissenschaften.

FIGURE 2.7 Sampling procedures of the *pars petrosa* in cremated and inhumed individuals

2.3.3 Laboratory processing

Human and environmental samples were prepared for $^{87}Sr/^{86}Sr$ isotope analysis in four main steps: (1) cleaning; (2) leaching; (3) dissolution (wet-ashing); (4) Rb/Sr micro-separation; (5) Mass-spectrometer measurement. Due to the diverse characteristics of our specimens (human and faunal tooth enamel; human portion of petrous bone; modern vegetation; soil), these latter were chemically pre-treated with different procedures, whereas all samples followed the same procedures for Rb/Sr micro-separation (4) and mass-spectrometer measurement

(5). Analytical protocols adopted for this research followed Müller et al. 2003 with certain modifications, and are described below.

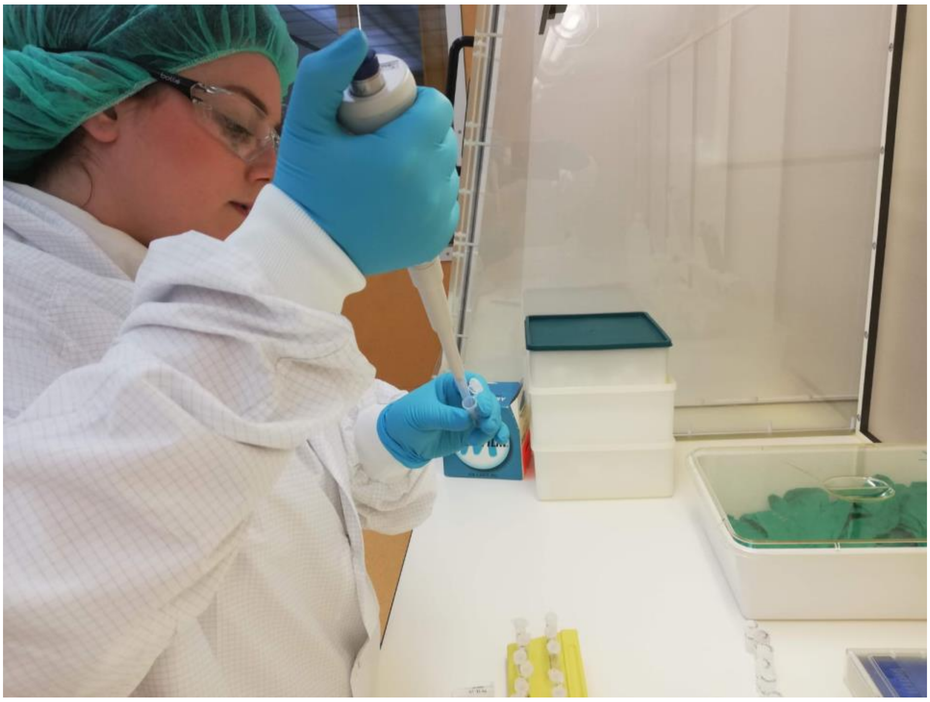


FIGURE 2.8 Leaching procedures of the enamel samples in the Clean Laboratory of the Institut für Geowissenschaften in Frankfurt

a. Human and faunal tooth enamel

Tooth enamel samples were weighted (20-40 mg) and transferred into centrifuge vials. Enamel samples were pre-treated (cleaning). 1 ml of acetone was added to the vials for 3-5 minutes in an ultrasonic agitation bath, followed by 1 ml of methanol for 3-5 minutes in an ultrasonic agitation bath. Samples were rinsed with 1 ml of milliQ water for three times, taking care of discharging the different liquid for each step. After cleaning, tooth enamel samples were pre-treated (leaching), in order to remove and minimize diagenetic contamination from enamel (Figure 2.8). Samples were left in 0.25 M acetic acid (CH_3COOH) in an ultrasonic agitation bath for 10 minutes and let stand for ~ 6 hours. Samples were transferred from centrifuge vials to Teflon™ beakers, previously cleaned with

14M HNO_3 and rinsed with milliQ water, in order to be dissolved. 1ml of 14M HNO_3 was added to specimens, the Teflon™ beakers closed and placed on heating plate overnight at 150°C. Once the samples were fully dissolved, the Teflon™ beakers were left open on the heating plate at 150°C let them evaporated.

b. Petrous bone powder

Petrous bone powder samples were weighted (20-40 mg) and transferred into cleaned centrifuge vials. Bone powder samples were not cleaned. Samples were left in 0.25 M acetic acid (CH_3COOH) in an ultrasonic agitation bath for 10 minutes and let stand for ~ 3 hours. Samples were centrifuged. After removing the acetic acid with disposable pipette and putting it aside, specimens were rinsed with milliQ water. After centrifuged, liquid (milliQ water) was removed with disposable pipettes for each sample. 2 ml of 14M HNO_3 was added into the vials. Samples were transferred from centrifuge vials to Teflon™ beakers, previously cleaned with 14M HNO_3 and rinsed with milliQ water, in order to be dissolved. Teflon™ beakers were closed and placed on heating plate overnight at 150°C, then opened and placed on the heating plate at 150°C in order to be evaporated. This step was repeated two more times or until the full dissolution of samples.

c. Vegetation

Dried grass samples were cut in small pieces, weighted (~1.5 gr) and transferred into cleaned Teflon™ beakers. The dissolution of samples was performed adding 10-15 ml of 14M HNO_3. Teflon™ beakers were placed on the heating plate at 150°C overnight, then opened and left on heating place at 150°C until full evaporation. As for powder bone samples, these step were repeated 2 more times or until fully dissolution of samples.

d. Burial soil

Burial soil samples were weighted (~2 gr) and transferred into cleaned Teflon™ beakers, then leached adding 8 ml of 0.25 M acetic acid (CH_3COOH) and let stand for ~36 hours. Leaching liquid were pipetted out, paying attention not to sample any soil, and centrifuged. Centrifuged liquid was transferred into 15ml Teflon™ beakers and dried down on heating plate at 150°C overnight, in order to dissolve any organic material left. Teflon™ beakers were opened and placed on heating plate at 150°C to be fully evaporated.

After samples preparation (1-3), Rb/Sr micro-separation (4) was performed using 50mal column + EICHROM SrSpec Resin. 300 µl of 3N HNO3 was added into Teflon™ beakers in order to dissolved the samples. Teflon™ beakers were placed on the heating plate at 100°C for ~30–60 minutes. Samples were pipetted into assigned Teflon™ columns filled with EICHROM SrSpec Resin using Pasteur pipettes. Labelled Rb Teflon™ beakers were placed under labelled columns. 300 µl and 650 µl 3M HNO_3 was added into Teflon™ columns for cleaning procedures. The discharged liquid was collected in Rb beakers, 1200µl of milliQ water was washed-down into columns and liquid collected. Sr Teflon™ beakers were closed and placed on heating plate at 100°C for 2 hours to fully evaporate the samples. This step was repeated one more time.

The $^{87}Sr/^{86}Sr$ determination was made using a spike artificially enriched in ^{84}Sr. Sr ratios were measured by Neptune™xt Series High Resolution Multicollector ICP-MS with 10^{13} Ω Amplifier technology (5) at the Geochemistry Laboratory of the Institut für Geowissenschaften (IfG) at the Goethe Universität in Frankfurt am Main. Reproducibility of the standard NBS987 during analysis of samples is (2σ, n =15).

2.4 Data handling R Studio and Q-Gis

All the data were collected into a set of Excel (Microsoft) file, structured to accommodate at best the archaeological, bioarchaeological and isotopic information about the graves and the individuals. The Excel program was used to create most of the tables and graphs of the bioarchaeological results. The spatial positions of the graves were derived from the available maps for PTH I (Buchner and Ridgway 1993) and for PTH II (Cinquantaquattro 2016).

The Cartesian coordinates of the centre of the graves were obtained using the free and Open Source Geographic Information System Q-Gis (Quantum GIS 3.8). The free software environment for statistical computing and graphics R (version 3.6.1) was used for isotopic data analysis and graphs (packages ggplot2, readxls). The package spatstat (version 1.61-0) was used to generate the maps of the grave distribution as well as the density plots.

Chapter Three

Results.
Funerary patterns, biological assessment and isotopic data of the odontoskeletal record from Pithekoussai

Chapter Three discusses the results of the multi-analytic assessment of Pithekoussai's skeletal and dental collection. As previously mentioned (Chapter One, paragraph 1.3) the archaeological investigations of both PTH I and PTH II areas yielded more than 1200 burials. The total amount of cremation and inhumation graves recorded in all of Pithekoussai's necropolis (PTH I and PTH II subsamples) is reported in Figure 3.1.

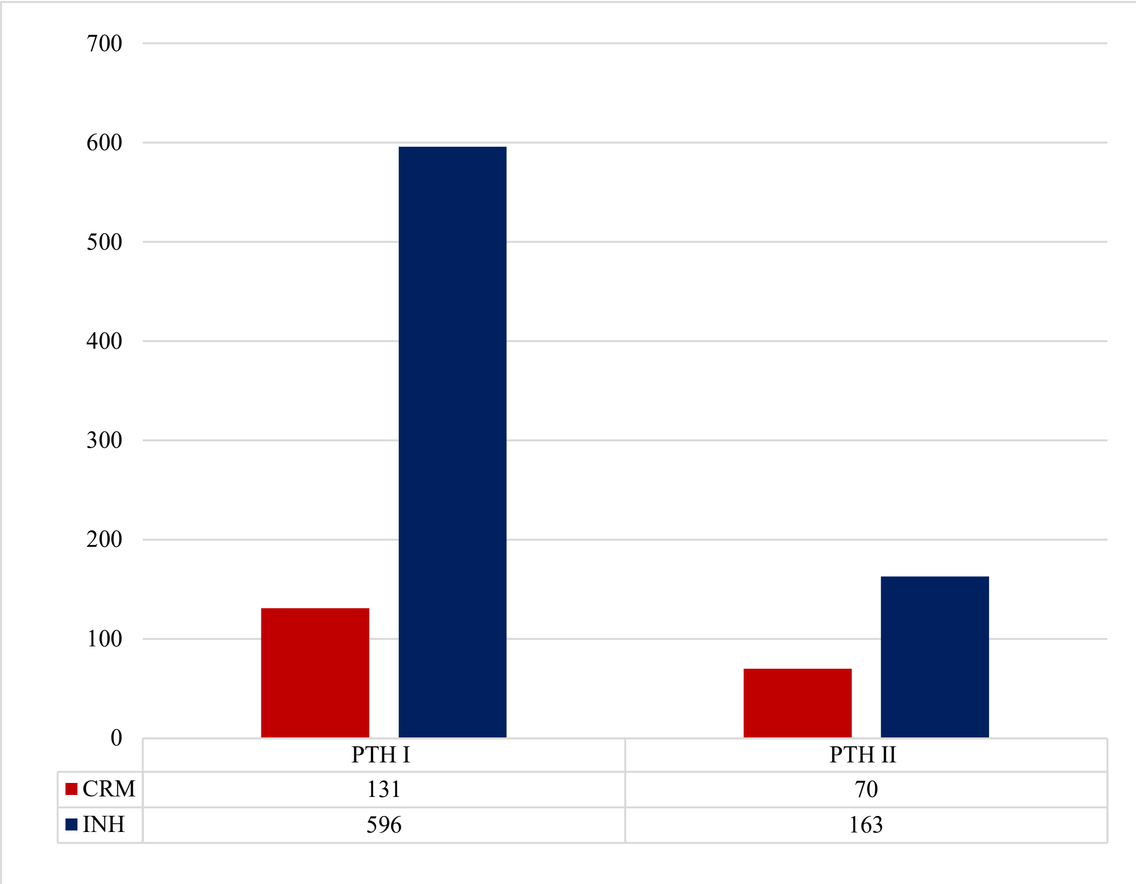


FIGURE 3.1 Distribution of cremations and inhumations in PTH I and PTH II series

A systematic study of the material culture assemblages, topography and stratigraphy for PTH I was published by Buchner and Ridgway (1993) (Chapter One, paragraph 1.3). Conversely, PTH II's funerary record is not fully published (Cinquantaquattro 2016). The data in Figure 3.1. are therefore incomplete for PTH II as they only report the number of graves presenting skeletal material and so far analysed. Applying the same criterion, i.e. taking into consideration the graves which only yielded skeletal materials, and have been available for this study, the distribution of the two subsets and for each ritual changes is shown in Figure 3.2.

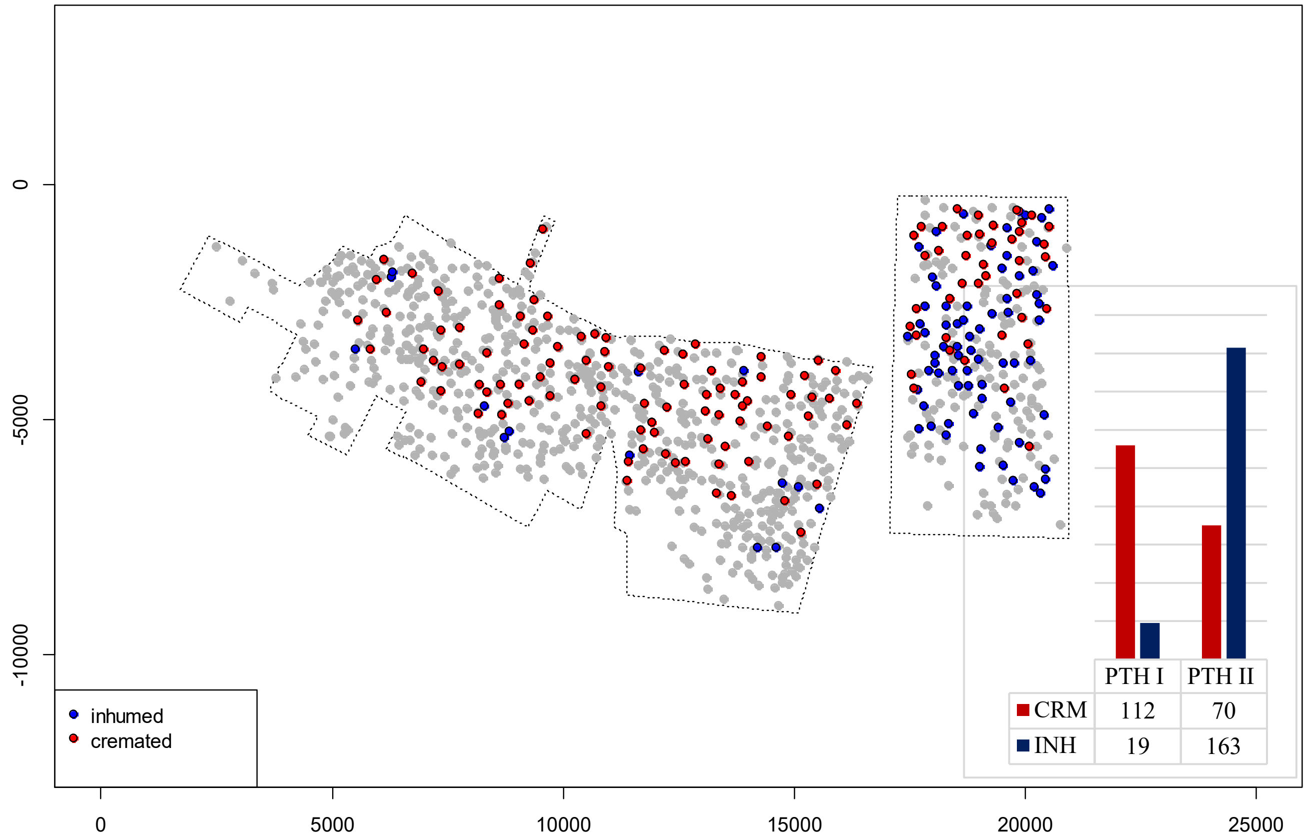


FIGURE 3.2 Anthropological record available for this study from inhumations and cremations of PTH I and PTH II series

Neither of the distributions shown in Figures 3.1 and 3.2 represents the real consistency so far excavated in Pithekoussai's graveyard. The distribution of the PTH II subsample described in figure 3.1 is limited by the absence of a complete published record. Furthermore, in Figure 3.2 an underestimation of the inhumations in the PTH I sub-sample is due to the poor state of preservation of the remains as well as to the fact that many of them were not available for this study. In sum, this analysis will take forcedly into account the anthropological record as described in Figure 3.2.

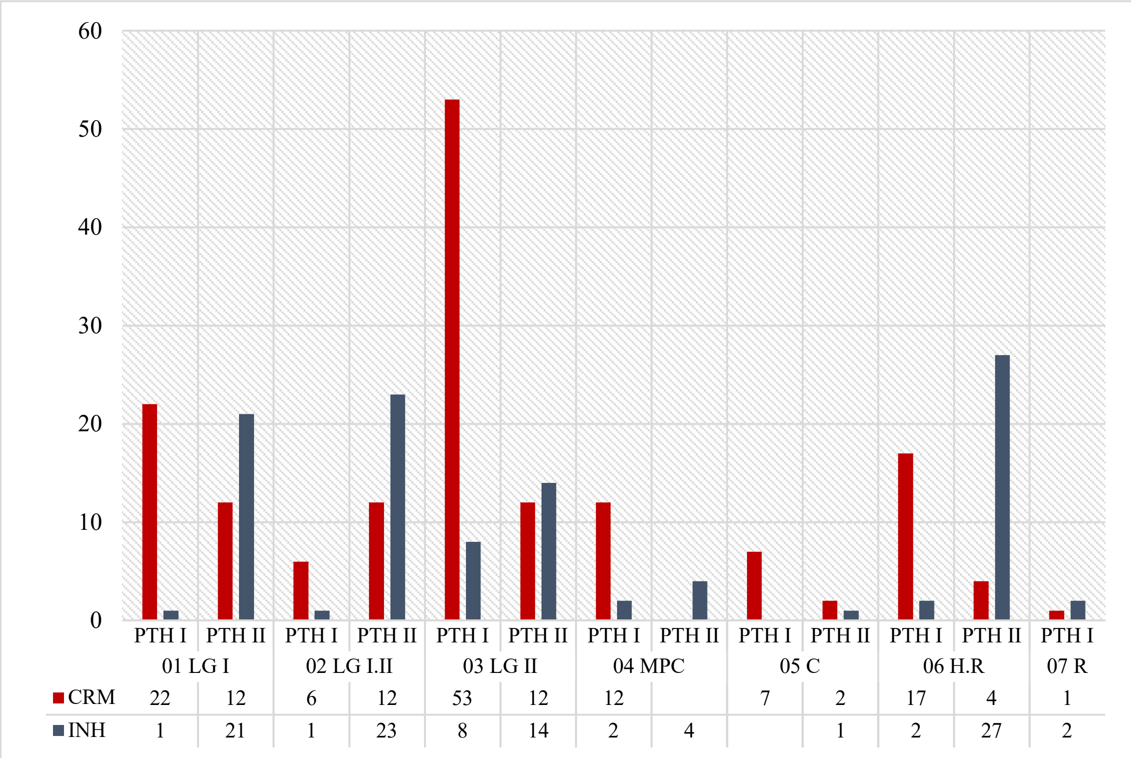


FIGURE 3.3 Distribution of anthropological record by chronology and ritual from PTH I and PTH II series

Thus, all remarks on the composition of the anthropological samples are purely descriptive and do not concern Pithekoussai's actual consistencies. This especially applies to PTH I. Figure 3.3 shows the number of inhumations and cremations pertinent to this anthropological study by the two sub-samples PTH I and PTH II and by the main chronologies. It should also be noted that

differently from the PTH I series, the PTH II subsample shows a larger number of cremations in phase LG II; conversely this trend changes in H.R, where a high presence of cremations is attested in the PTH I series. (Figure 3.3) However, given the underrepresentation of real archaeological consistency due to the presence/absence of the osteological remains, these observations are only descriptive of the sample compositions and do not allow any strictly archaeological consideration. Furthermore, from an anthropological point of view, as discussed above (Chapter Two, paragraph 2.2), the particular conditions of the taphonomic environment, more than the ritual treatment of the bodies (inhumed vs. cremated), certainly played a decisive role in the preservation of human remains. The fact that, contrary to what is reported by Pithekoussai's archaeology, the number of inhumed individuals is lower than the number of cremated ones could be explained by a better conservation of the latter in the warm volcanic soil. This data seems to confirm that cremated remains are more resistant to diagenesis (Pokines and Symes 2014).

Given the aim of this Chapter, the results described below will be split in two section. The first section analyses the general demographic parameters of the sample in terms of age-at-death distribution, *Sex ratio*, *Dependency ratio* and *Juvenile ratio*, investigating possible correlations between these evidence with the funerary rituals and changes across different chronological phases. The second section provides the individual results of strontium isotope analysis. These evidence were interpreted within the biological framework drawn in the previous sections. The main aim of this analysis is to delineate and quantify residential mobility in the Pithekoussai's society, as well as to point out possible correlations with individual life histories and general demographic trends of Pithekoussai's society.

3.1 Biological profile and osteobiographies of Pithekoussai's graveyard

3.1.1 Individual Skeletal Representation in inhumations

As reported above, the skeletal material from Pithekoussai's graveyard is deeply affected by the poor preservation of bones and teeth, due to the ritual treatment of the bodies and post-depositional diagenetic factors (Figure 3.4).

FIGURE 3.4 Inhumed individual from grave 755; crown fragments

With regard to inhumations, skeletal completeness was assessed according to four main categories: *1* scarce representation (<25% of the skeleton); *2* low representation (25% -50%); *3* good representation (50% -75%); and *4* high representation (>75%). None of the individuals exceeds 50% of skeletal representation.

Figure 3.5 shows the chronological distribution of the representation categories (scarce *1*. and low. *2*). As reported, the general underrepresentation of the skeletons is constant through time. In graves dated between LG I and LG II, inhumed remains are for the most part poorly preserved. Only in 8,16% of cases the skeleton preservation is higher than 25%. A better conservation of the remains is attested later in the Hellenistic-Roman period of the necropolis.

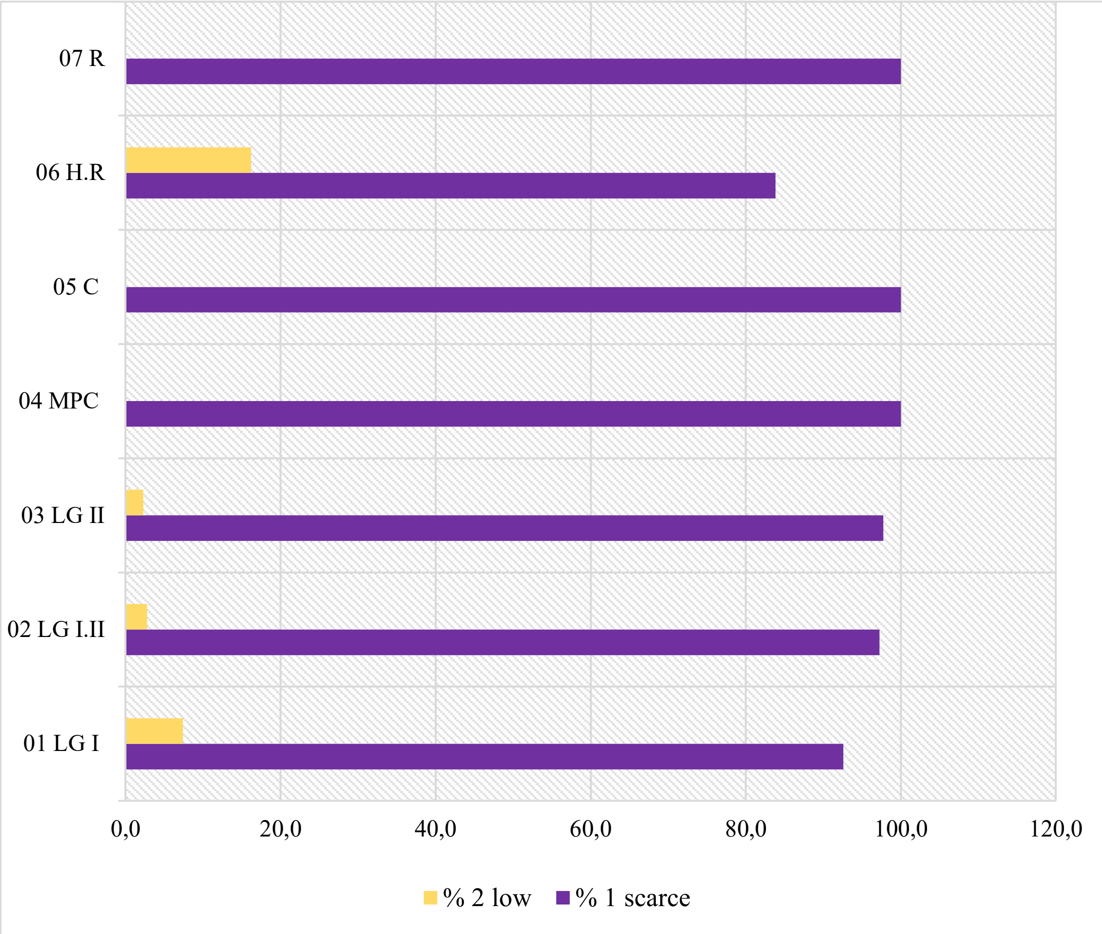


FIGURE 3.5 Chronological distribution of the representation categories of skeletons in inhumation series

Out of the better preserved inhumation burials, inhumation 950 was selected for a case study. Inhumation 950 was located within a complex stratigraphic sequence between cairns 938 and 937 which dated to LG II (PTH II subsample) (Cinquantaquattro 2016). Skeletal and dental assessment determined that inhumed individual PTH 950 was a male aged >40 years at death. PTH 950 was in a supine position with his upper limbs stretched along his sides. More interestingly, his feet were constricted by leg irons (Figure 3.6). An iron instrument and a scarab were also found with PTH 950 and it is likely that they were personal items that belonged to the individual. The iron instrument was probably a blade. It was covered in ivory disks interspersed with non-preserved materials, perhaps amber or wood. Inhumation 950's grave goods set is unusual and unique within Pithekoussai's graveyards. From an archaeological point of view, PTH 950 has been identified as an individual who died in deprivation of liberty. More accurately, the individual was believed to be a leading figure who was granted formal burial in an area of the necropolis characterized by the presence of cairns and, at the same time, who was buried with a weapon of indigenous provenance.

FIGURE 3.6 Inhumation 950, PTH II's area. Individual PTH 950 shows his feet constricted by leg irons (*Cinquantaquattro 2016*)

According to Cinquantaquattro (2016), the iron blade could represent a sacrificial instrument since the warrior's figure is not otherwise attested in Pithekoussai cemetery's funerary record. Anthropological analysis tried to detect traces of perimortal traumas. No traumatic conditions from intentional violence are observed. A slight form of enthesitis is diagnosed in the area of the Achilles tendon on the left calcaneus (Buikstra 2019). Skeletal elements are affected by a massive chromatic alteration of a brownish-reddish colour, extended regularly and circumscribed manner on the anatomical area that came into contact with the iron manacles. This condition is shown in Figure 3.7.

FIGURE 3.7 Chromatic alteration of the cortical area on PTH 950's skeletal elements

3.1.2 Individual Skeletal Representation in cremations

With regard to cremation, the weight of bones fragments was assessed in order to provide a quantitative information about the level of completeness for each individual. Figure 3.8 shows Pithekoussai's weights distribution assessed by PTH I and PTH II series, while Figure 3.9 shows the whole consistency (PTH

I and PTH II subsamples) by the main chronological phases of the necropolis. The two series show no substantial differences. For the periods between LG I and MPC, the average values distribution is rather steady. A better level of representativeness and preservation of the remains is attested during the Hellenistic-roman period. This might be due to the presence of cinerary urns, that limited the material dispersion in the ground, as well as to the possible absence of a selective gathering of remains. Moreover, in the chronological phases following the Corinthian period, no agglutination phenomena resulting in the absence of massive post-depositional manumissions were attested in Pithekoussai's cemetery.

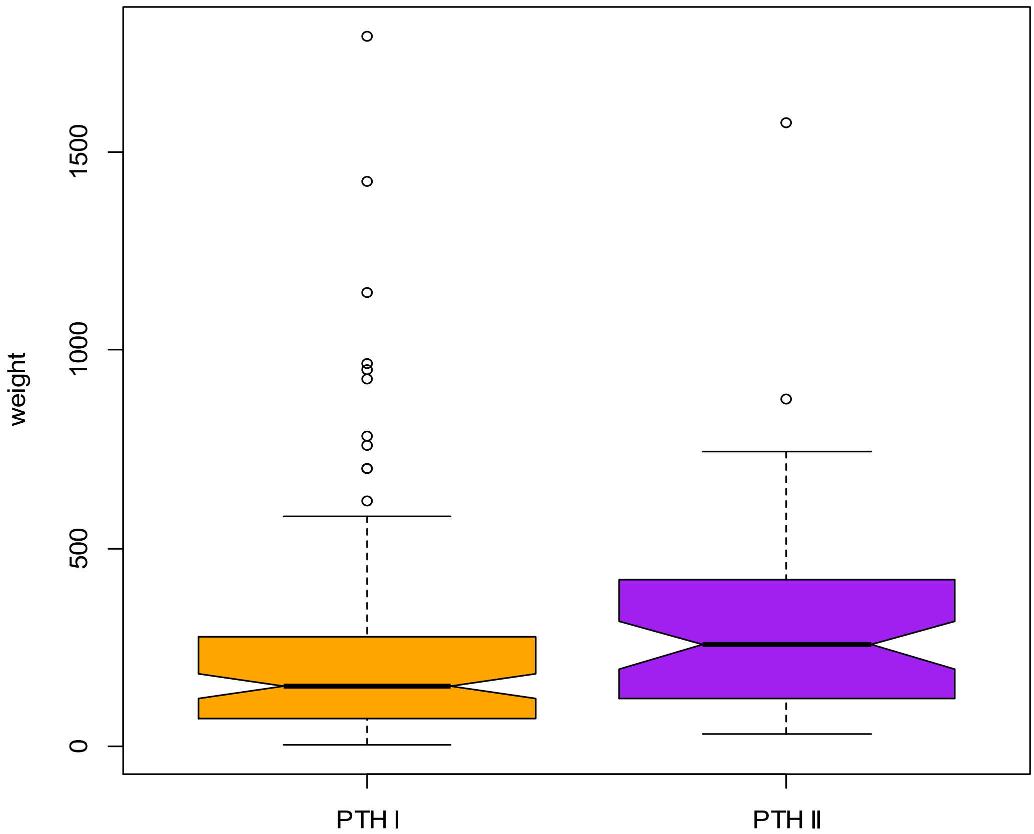


FIGURE 3.8 Distribution of the weights in the cremation sub-samples by PTH I and PTH II series

For the female subsample, the average weight is 243.02 grams. All the individuals are highly underrepresented with one exception. Grave 40 is the only cremation available for this study dating to the Roman period. The remains refer to a female aged >40 years at death. The high completeness of the skeleton is confirmed by the weight of the remains as 1424.97 grams.

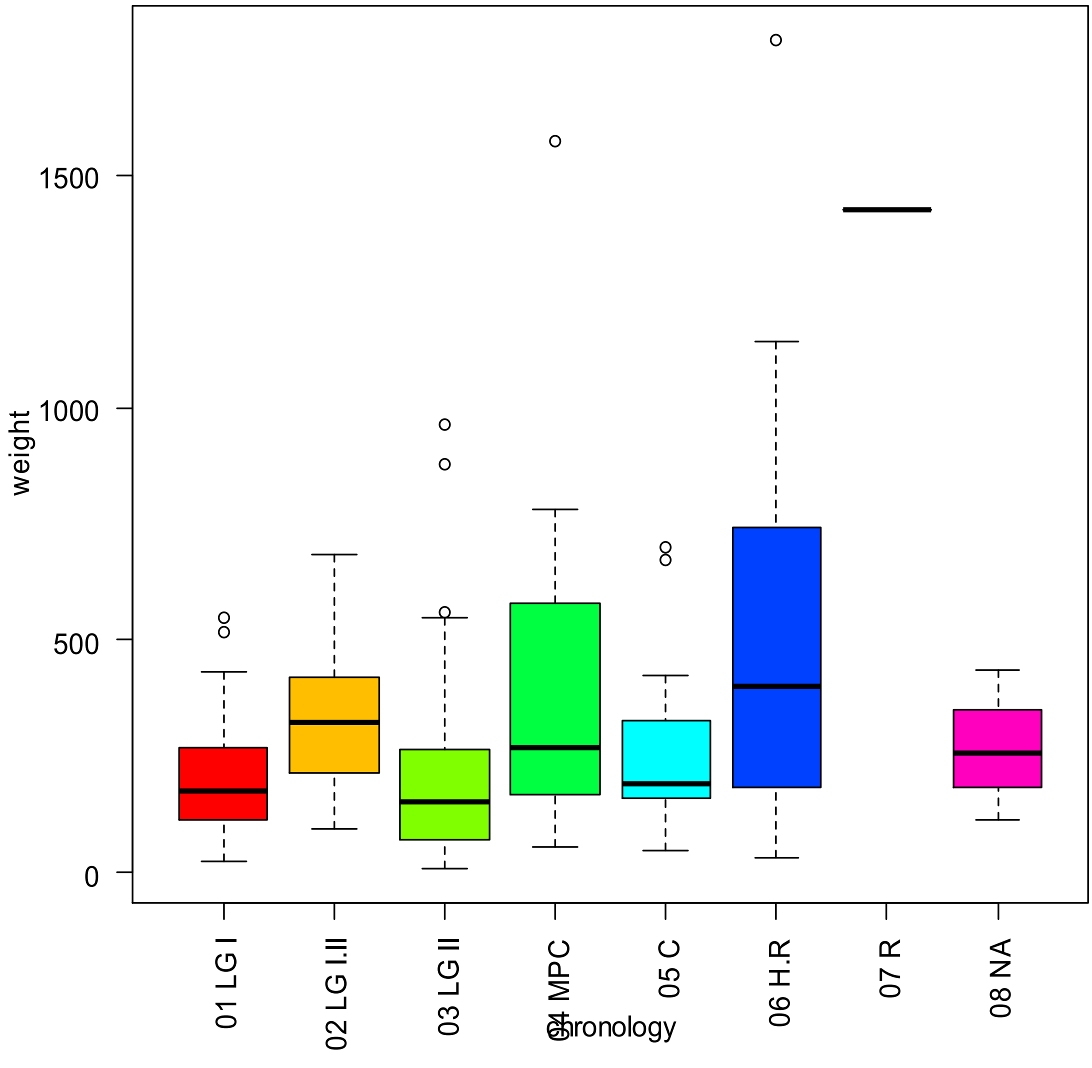


FIGURE 3.9 Distribution of the weights in the cremation sub-samples by chronology

The purple box in Figure 3.9 shows the range of weights among PTH II cremations in current absence of an exact chronology. The values do not deviate from the weight distribution attested in other periods, with the exception of the previously mentioned H.R and R cremations.

3.1.3 The Estimation of Minimum Number of Individuals (MNI)

The morphological and morphometrical assessment of the remains led to the evaluation of the Minimum Number of Individuals (MNI) for each funerary context. This result allowed to identify double and multiple burials that were previously defined as single on the basis of the material culture assemblage. Furthermore, it enabled to verify the cases in which the agglutination between two or more graves determined the commingling of the remains.

The anthropological analysis led to the identification of 402 individuals from 364 burials, 182 inhumations pertaining to 208 individuals and 182 cremations pertaining to 194 individuals (Appendix A). Figure 3.10 shows the chronological distribution of single and multiple burials in inhumation series. The percentage of double/multiple burials is 4% (LG I), 2.6% (LG I.II) and 6.7% (H.R). Taking into consideration the limitations of the samples, highly underrepresented with regard to inhumations referable to PTH I, it is important to reiterate that these remarks are purely descriptive and restricted to the osteological sample available for this analysis.

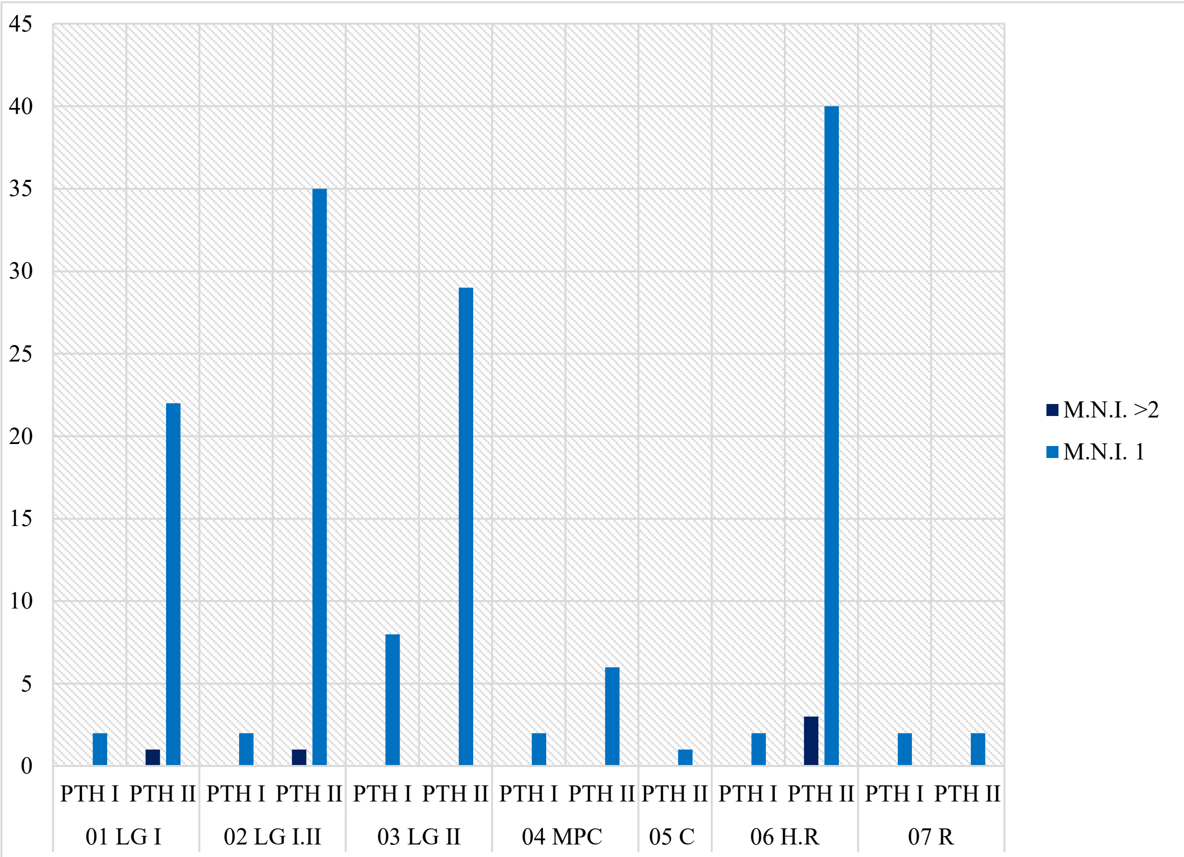


FIGURE 3.10 Distribution of the percentage of double/multiple burials in inhumation series

Regarding the early phase of Pithekoussai's graveyard, inhumation 954 is an example of double burial. It pertains to PTH II's subsamples and represents the only case of double inhumation from period LG I. The morphological assessment of the bones showed two different stages of skeletal development, resulting into a M.N.I. of two. PTH 954A is an individual of 3-4 age-at-death represented by a single portion of the right emimandible. Two deciduous teeth and one permanent tooth are still present *in situ*: LRm1 and LRm2 were erupted, and LRM1 was in eruption. The age-at-death was estimated following AlQahtani et al. (2010). Conversely, the individual PTH 954 B is represented by a portion of petrous bone, its dimensions are compatible with a fetal age (Scheuer and Black 2000).

At the transition between LG I and LG II, grave 835 (PTH II subsample) yielded skeletal remains of two individuals: PTH 835 A and PTH 835 B. During its excavation, the burial was mistakenly identified as pertinent to a child, maybe due to the size of the pit grave, a criterion often used by archaeologists in the past to determine the age-at-death of the deceased. This occurrence is particularly attested in Pithekoussai's literature: e.g. Buchner and Ridgway 1993; Nizzo 2007; Cinquantaquattro 2016). This research has allowed to re-evaluate the age-at-death estimations of a number of individuals, previously based on archaeological indicators. PTH 835 A was identified as a subadult represented by some deciduous and permanent teeth crowns and small fragments of the humerus diaphysis. The age-at-death was assessed on the stage of development of deciduous and permanent teeth according to AlQahtani et al. (2010). PTH 835 B was identified as an adult by the presence of mandibular fragments, whose size and morphology is not compatible with subadult PTH 835 A, and vertebrae portions, among which some showed osteophystic lipping of the posterior margin of the vertebral body (Buikstra 2019).

MNI results by chronology indicate that double and multiple burials are attested at Pithekoussai particularly between the Hellenistic and Roman phases. Inhumation 997 (PTH II subsample) yielded skeletal remains of seven individuals. Bones and teeth were labelled with the precise indication of their topographic collocation into the pit grave (*left side, behind last pile, part of skull+teeth of left skeleton*), as in the case of inhumation 1061, for which Buchner's notes described the position of the three skulls north (PTH 1061 A), south (PTH 1061b), and in the middle (PTH 1061 C) of the grave.

Inhumation 1166 is an interesting case. Buchner's note described inhumation 1166 as a double grave of a mother and child. The morphological analysis identified two inhumed individuals (PTH 1166 A, as an adult male, and PTH 1166 B, as infant aged 3-4 years) associated with a third cremated individual (PTH 1166 C). The commingling of inhumed and cremated remains could be explained as a result of the stratigraphic contamination between different funerary clusters, according to the often-cited agglutination phenomenon.

With regard to cremation series, the chronological distribution of single and multiple burial is shown in Figure 3.11. As for inhumations, the double burial in the cremation series is rarely attested. Some differences can be recognized between PTH I and PTH II subsamples. The latter shows a slightly higher frequency of double cremations compared to PTH I.

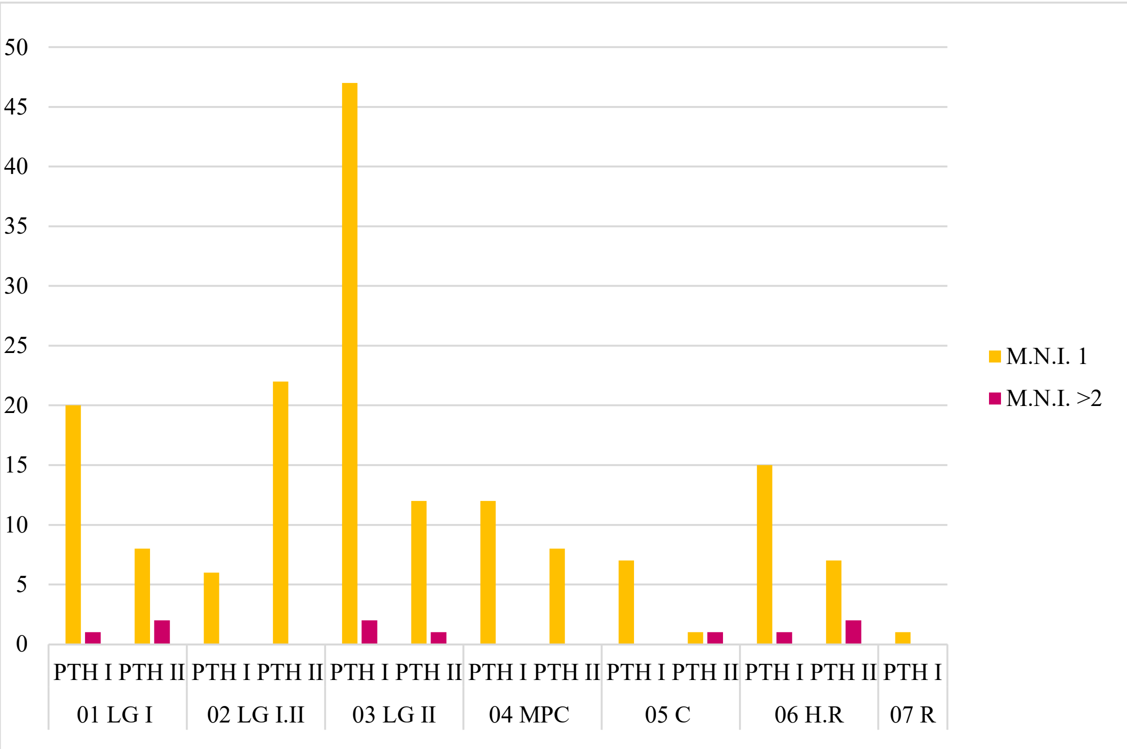
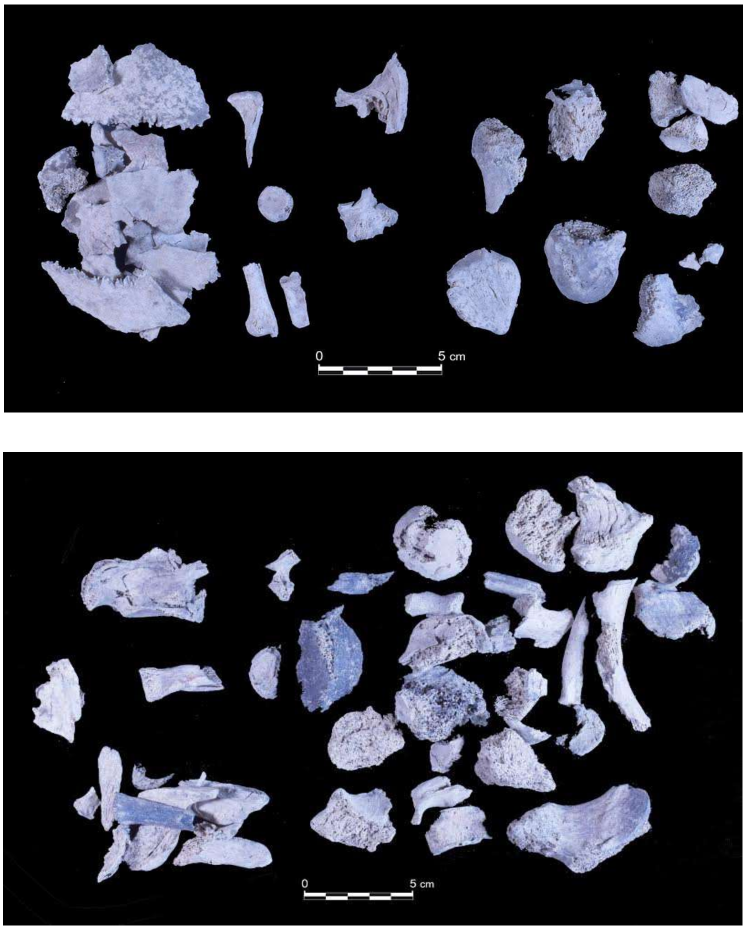


FIGURE 3.11 Distribution of the percentage of double/multiple burials in cremation series

Taking into account LG I and LG II, double cremations are attested in both PTH I and PTH II subsamples. Cremation 199 (PTH I subsample), dating to LG I, is an example of double burial. Differences in the features of dimorphic traits in skull and pelvis fragments (Acsàdi and Nemeskéri 1970; Ferembach et al. 1980; Buikstra and Ubelaker 1994; Hill 2000; Ubelaker and Volk 2000; Balci et al. 2005), as well as different patterns of gracility and robustness in long bones portions were used as criterion to identify an adult female (PTH 199 A) and an adult male (PTH 199 B).

Similarly, LG II's cremation 944 (PTH II subsample) contained commingled remains, resulting in two individuals (PTH 944 A and PTH 944 B) (Figure 3.12). According to Buchner and Ridgway, the grave goods assemblage identified cremation 944 as a female burial (Buchner and Ridgway 1993).



944a

944b

FIGURE 3.12 Double cremation 944. PTH 944a (*female*) and PTH 944b (*male*)

The MNI was determined using the presence of ipsilateral anatomic elements and a morphological and dimensional differentiation between skeletal elements. PTH 944 A is an adult female characterized by female features of the skull and a general gracility of long bones portions (Symes et al. 2008; Cavazzuti et al. 2019b); PTH 944 B is an adult male characterized by male features of the skull and a general high rubusticity of the postcranium.

The observation of the different developmental stages of the skeletons has allowed us to distinguish an adult female (PTH 916 A) and an infant (PTH 916 B) among the commingled cremains of burial 916 (LG II, PTH II subsample). The presence of the infant PTH 916 B could be an exception to Buchner's assumption of the cremation as a ritual restricted to the adults in the Pithekoussai's society (Buchner 1982; Buchner and Ridgway 1993; d'Agostino 2011; Chapter One, paragraph 1.3).

Beside double and multiple cremations *sensu stricto*, grave 772 is a remarkable case of the presence of a mother with her foetus from a cremation. This cremation is dated between fifth and fourth century BCE, representing the only case of "double" cremation of the Corinthian period in Pithekoussai. The morphological and morphometrical assessment of the remains indicates the presence of a young adult (PTH 772 A) and a foetus (PTH 772 B). The preservation of the cremains is shown in Figure 3.13.

Peculiar features of the surviving portions of the auricular surface of ilium and the partial fusion of the iliac crest indicate that PTH 772 A was a female aged between 16-18 years (Acsàdi and Nemeskéri 1970; Buikstra and Ubelaker 1994). In addition to the skeleton of female, there were 2 fragments of bones (3.86 grams) referring to a foetal individual, assessing by the dimension of the diaphysis of the tibia and the distal metaphysis of the humerus (Scheuer and Black 2000).

Most techniques for determining age-at-death of fetal remains depend on the size of the long bones, but in this case the phenomena of fragmentation and shrinkage, due to the heating of the pyre, do not enable to evaluate more accurately the age-at-death of the foetus. There is no way to determine if this foetus has been delivered, since the remains were gathered and mixed in the grave with PTH 772 A.

FIGURE 3.13 Mother (*PTH 772 A*) and foetus (*PTH 772 B*). The foetus remains are surrounded by yellow

However, experimental cremations of human foetuses alone have been found to take only 20 to 55 minutes to destroy completely the soft tissues and incinerate the bones (Fazekas and Kòsa 1978). The preservation of PTH 772 B's remains could be due to the partial protection of the mother's body during the cremation, supporting the hypothesis that this is a cremation of a pregnant woman and not a woman with a recently delivered infant.

3.1.4 The presence of faunal remains

The analysis of bone remains led to the finding of a discrete number of faunal remains (bones and teeth) associated with the human ones. Faunal remains are present in 62 burials, among which 5 inhumations and 57 cremations. The consistency of faunal specimens sorted by ritual and chronology is reported in Table 3.1.

GRAVE	RITUAL	CHRONOLOGY	SPECIES
42	CRM	H.R	Indeterminate
93	CRM	H.R	*Sus domesticus*
94	CRM	H.R	*Bos/Taurus**
114	CRM	H.R	*Ovis*
117	CRM	H.R	*Ovis*
154	CRM	LG II	*Ovis*
164	CRM	LG II	Indeterminate
167	CRM	LG II	*Ovis*
168	CRM	LG II	*Aves; Ovis; Canis familiaris;*
176	CRM	LG I.II	Indeterminate
180	CRM	LG II	Indeterminate
182	CRM	LG II	*Ovis*
184	CRM	LG I	*Ovis*
191	CRM	LG I	Indeterminate
199	CRM	LG I	*Ovis*
200	CRM	LG II	*Ovis*
206	CRM	LG II	*Ovis*

208	CRM	LG II	*Aves; Ovis; Sus domesticus*
209	CRM	LG II	*Ovis*
210	CRM	LG I.II	Indeterminate
215	CRM	LG II	*Sus domesticus*
216	CRM	LG I	*Ovis*
219	CRM	LG I	*Ovis/Sus**
220	CRM	LG I	*Sus domesticus*
223	CRM	LG I	*Sus domesticus*
224	CRM	LG II	*Ovis*
225	CRM	LG I.II	*Bos Taurus*
226	CRM	LG II	Indeterminate
227	CRM	LG I	*Sus domesticus*
229	CRM	LG I	Indeterminate
235	CRM	LG I	Indeterminate
236	CRM	LG I	Indeterminate
243	CRM	LG II	Indeterminate
508	INH	LG II	*Sus domesticus*
854	CRM	NA	*Sus domesticus*
855	CRM	LG II	*Canis familiaris; Sus domesticus*
863	CRM	LG I.II	*Ovis*
868	CRM	LG II	Indeterminate
899	CRM	LG I	*Ovis*
903	INH	LG II	*Equidae*
917	CRM	LG I.II	*Ovis*
921	CRM	LG II	*Ovis*
926	CRM	LG II	*Sus domesticus*
928	CRM	LG I.II	Indeterminate
929	CRM	LG I	Indeterminate

930	CRM	LG II	Indeterminate
939	CRM	NA	*Sus domesticus*
947	CRM	LG I	*Sus domesticus*
948	CRM	LG I.II	Indeterminate
987	CRM	NA	*Bos/Equus**
994	CRM	LG I.II	*Ovis*
996	CRM	LG II	*Ovis/Sus**
1004	CRM	LG II	*Ovis*
1006	INH	LG I	*Eques caballus*
1007	CRM	NA	*Sus domesticus*
1019	CRM	LG I.II	Indeterminate
1064	CRM	NA	*Ovis*
1118	CRM	NA	*Ovis*
1120	CRM	NA	*Ovis*
1166	CRM	NA	*Bos Taurus*
1208	CRM	NA	*Bos/Equus**
1064	INH	NA	Indeterminate

TABLE 3.1 List of faunal specimens sorted by ritual and chronology

Faunal remains were assessed in order to identify order/genus/ species of the specimens. Due to the high pattern of fragmentation and the state of incompleteness of the skeletons, the gross analysis was not always able to determine the taxonomy at the order or species level of the remains. Table 3.1 shows three more general classes of remains: *Bos/Taurus**; *Ovis/Sus**; *Bos/Equus**, adopted in 6 graves out of 62. Conversely, *Ovis* remains are attested in 53.3% of graves; *Sus domesticus* in 30.23%. *Bos* (4.6%), *Equus* (4.6 %), *Canis* (4.6%) and *Aves* (4.6%) are found more sporadically. Considering only the remains attributed at the taxonomic level, only in three cases (inhumation and cremation grave 168, 208 and 855; Table 3.1) portions of different taxa were buried in the same funerary unit. With some exceptions (the inhumation graves 508, 903, 1006, 1064 Table 3.1), faunal bones show traces of combustion similar to those documented on human burnt remains. This evidence is compatible with a simultaneous cremation of the individual and the animals, interpretable at most as offers for the deceased (Figure 3.14).

FIGURE 3.14 Faunal specimens from cremation 199 and cremation 208. The remains show traces of combustion similar to human cremains

Figure 3.15 shows the distribution of faunal remains by chronology and ritual. In cremation series an increased presence of faunal remains is attested, especially in periods LG I and LG II. Similarly, the only cases of faunal fragments were yielded in inhumation sub-sample of LG I and LG II. Less evidence of animals is found in the later phases of Pithekoussai's necropolis (Hellenistic-Roman phase returns four cremations with faunal remains).

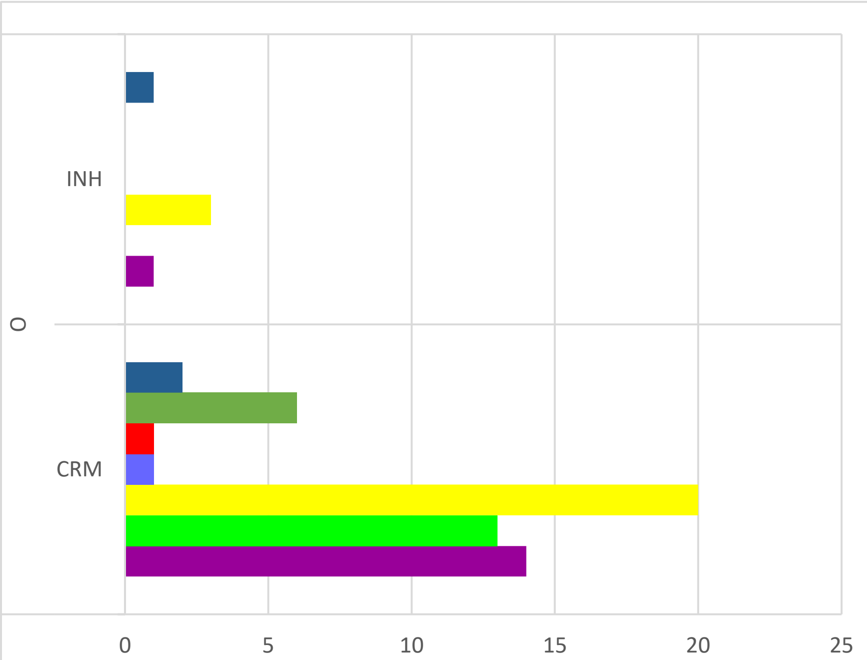


FIGURE 3.15 Distribution of faunal evidence in cremation and inhumation series from PTH I and PTH II sub-samples

Figure 3.16 shows the distribution of faunal specimens by age-classes, ritual and chronology. Faunal remains of animals are associated with both infants and adults. More accurately, within inhumation series, three infants (PTH 508, PTH 903, PTH 1006) aged between 1 year and 5 years-at-death were yielded with faunal remains. In two out of the three cases (PTH 903 and PTH 1006) the remains of an infant were found in association with remains of *Equidae*. These date back to LG I and LG II.

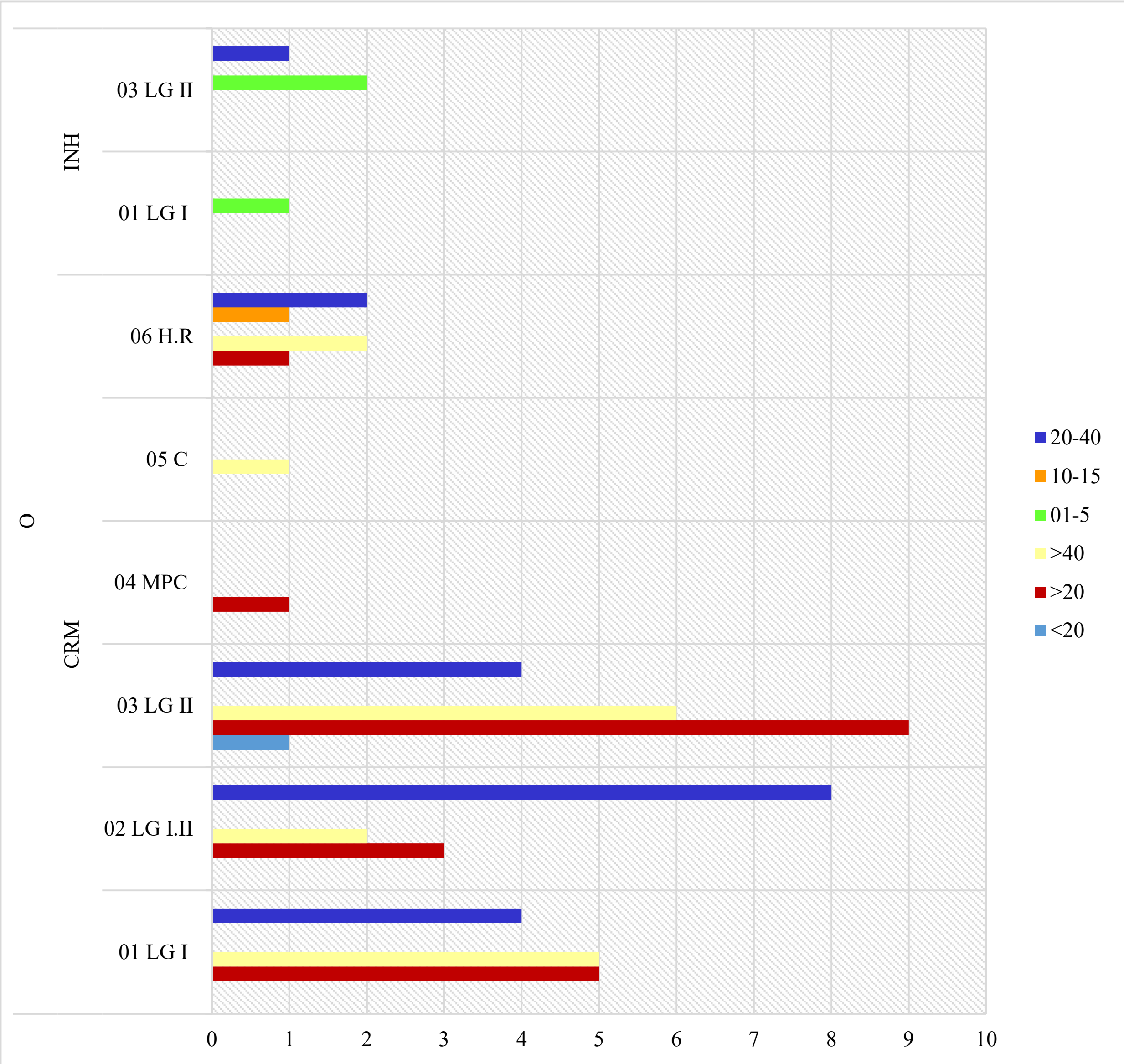


FIGURE 3.16 Distribution of faunal remains by ritual and age-at-death in cremation and inhumation series from PTH I and PTH II sub-samples

Within the cremation series, this occurrence is attested equally with adults and mature adults. At the turn of the LG I and LG II, faunal remains are mostly associated with adults aged between 20 and 40 years, as shown in five cases. The sample for the LG II is larger and indeed the faunal remains are distributed in infant burials as well as in cremation of young adult (<20 years-at-death), adults (>20 years-at-death), and mature adults (>40 years-at-death).

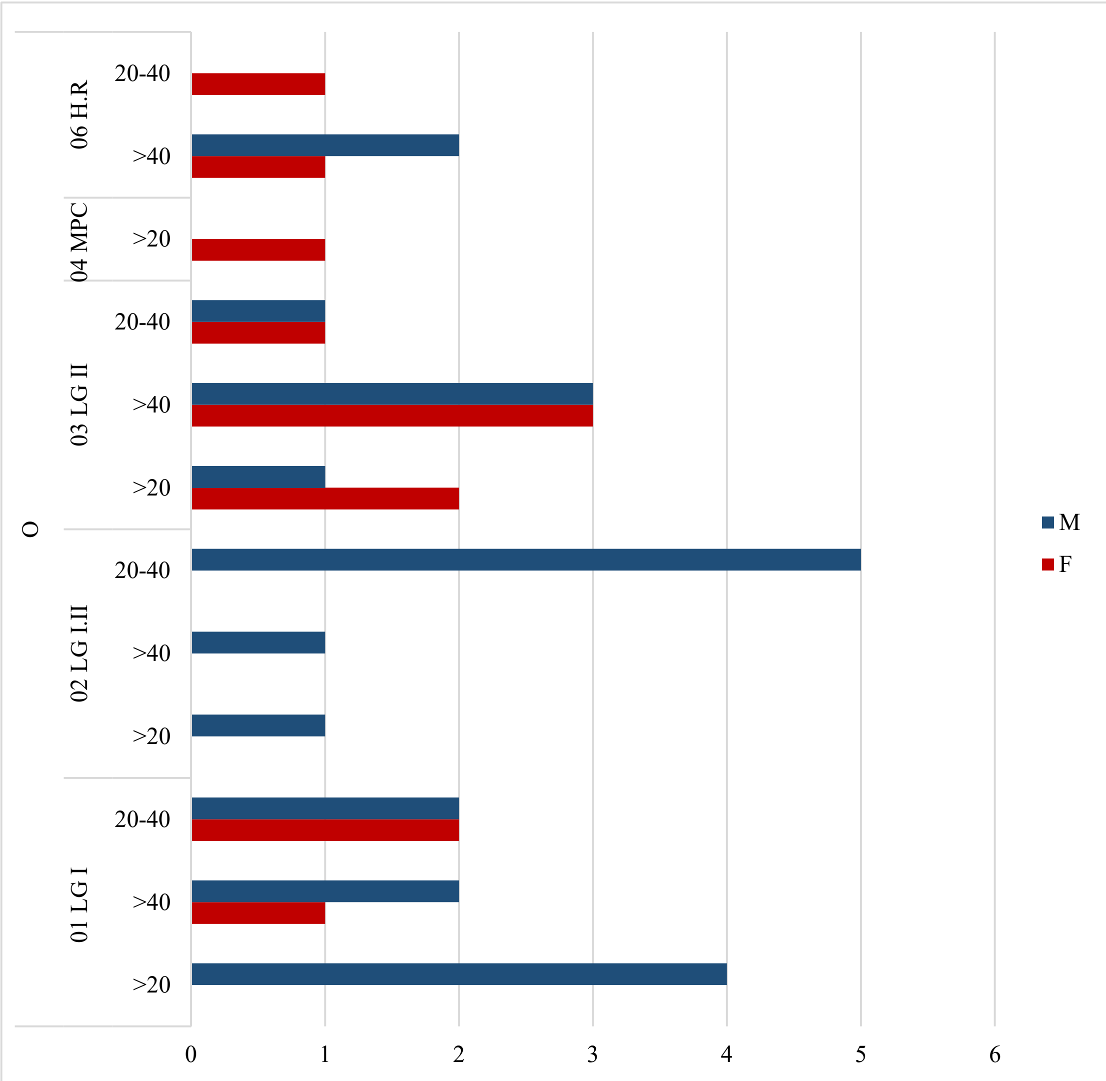


FIGURE 3.17 Distribution of faunal remains in the male and female subsamples

Conversely, faunal remains are associated indiscriminately in cremation of adults of different age-classes. Taking into account only the adult age-classes, Figure 3.17 shows the distribution of faunal remains in the male and female subsamples. Phase LG I is characterised by the presence of faunal remains associated with males aged >20 years-at-death. Among individuals aged >20 years and >40 years-at-death faunal portions are also attested in the female segment, but more rarely within >40 age-class. LG II shows a higher frequency of faunal remains in both male and female cremations. Conversely, for the later phases of Pithekoussai's graveyard, animals are attested in few cremations, with a slight prevalence of them in male cremations.

3.1.5 Sex and Age profiles

Demographic profiles of PTH I and PTH II subsamples were drawn taking into account the biological characteristics of individuals and analysing their ratios for the main chronological phases of the necropolis. The overall demographic results are presented in Table 3.2 and in Figure 3.18

AGE-AT-DEATH	INDETERMINATE	MALES	FEMALES	TOTAL
0-1	20			20
1-5	39			39
5-10	20			20
10-15	6			6
15-20	6	2	7	15
20-40	45	38	25	108
40>	5	47	19	71
<20	3			3
20>	53	38	29	120
Total	197	125	80	**402**

TABLE 3.2 Age-at-death and sex results of inhumed and cremated individuals

Age-at-death determinations for each individual are clustered in seven age-classes: (1) 00-1 year; (2) 1-5 years; (3) 10-15 years; (4) 15-20 years; (5) 20-40 years; (6) >40 years. The number of assessments is 402. As previously discussed, sex determination was performed only on adult individuals. As for age-at-death determination, in 123 cases the skeletal and dental remains did not allow to obtain a precise diagnosis. In these cases, the individuals were assessed as subadults

(<20, n =3) or generic adult (>20, n = 53). The subadult individuals (less than 15 years-at-death) represent the 21.6% of the total sample, while the infants (0-1 year-at-death) represent only the 5%. These date indicate an underrepresentation of young components of the community in the funerary ground. With regard to adult subsample, females are slightly more represented in the young adult class (6.2%) than in the older ages (4.7%). Conversely, the males are more represented in the older age class (11.7%). Overall males are more represented than females (sex ratio M/F = 1.6).

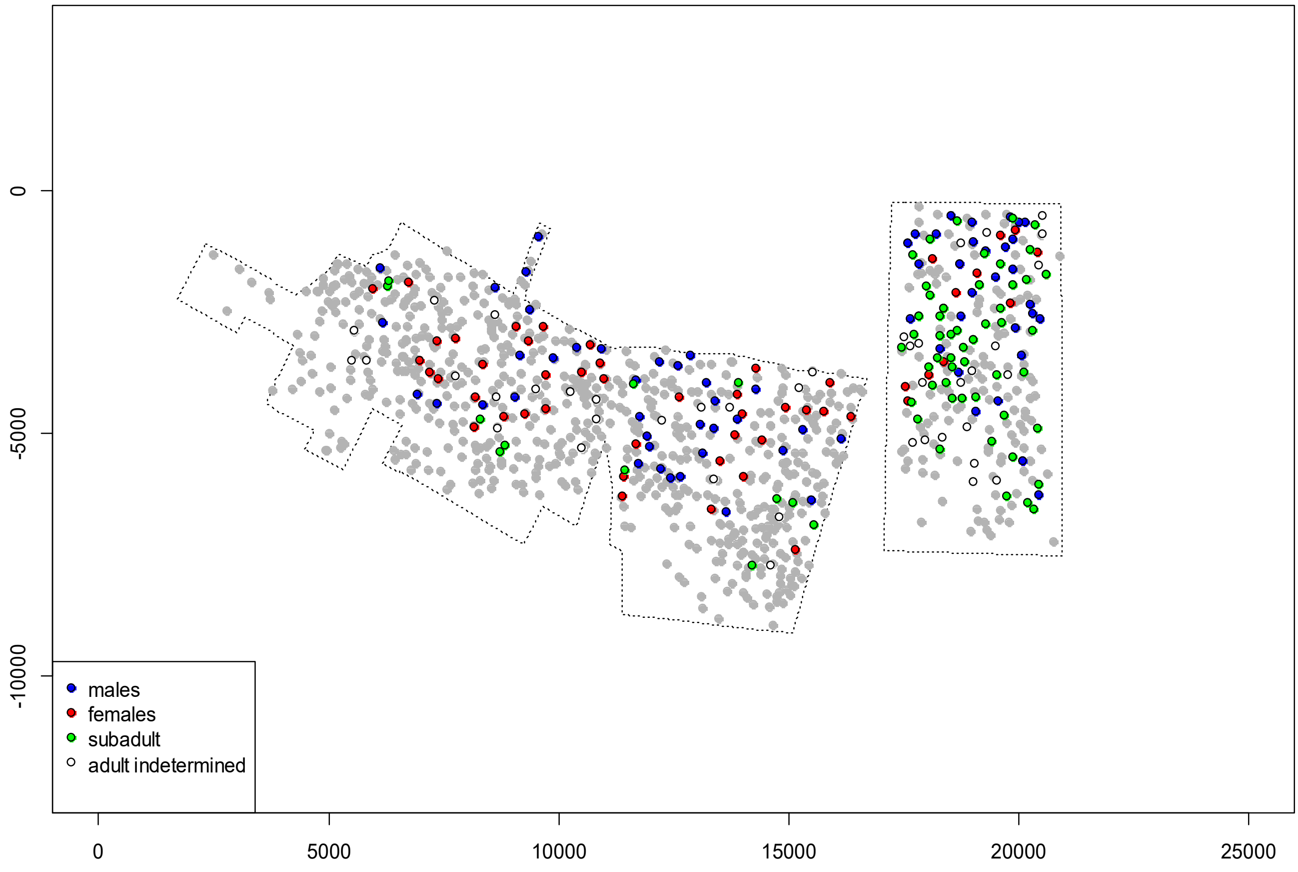


FIGURE 3.18 Distribution of age-at-death and sex determinations of inhumed and cremated individuals in PTH I and PTH II sub-samples

The *Juvenile Ratio* has given a value of 0.133. The value lies at the lower range expected according to the rate of child mortality in ancient population. A number of parameters can be calculated on the basis of the index. *Life expectancy at birth* is 31.1 years and the number of children per woman is 3.87. However, these results should be considered with some caution as they have considered the sample as a whole by combining the data referring to the different phases of use of the cemetery. Dividing the demographic profile by different chronologies, strong biases in the age-classes representation occur.

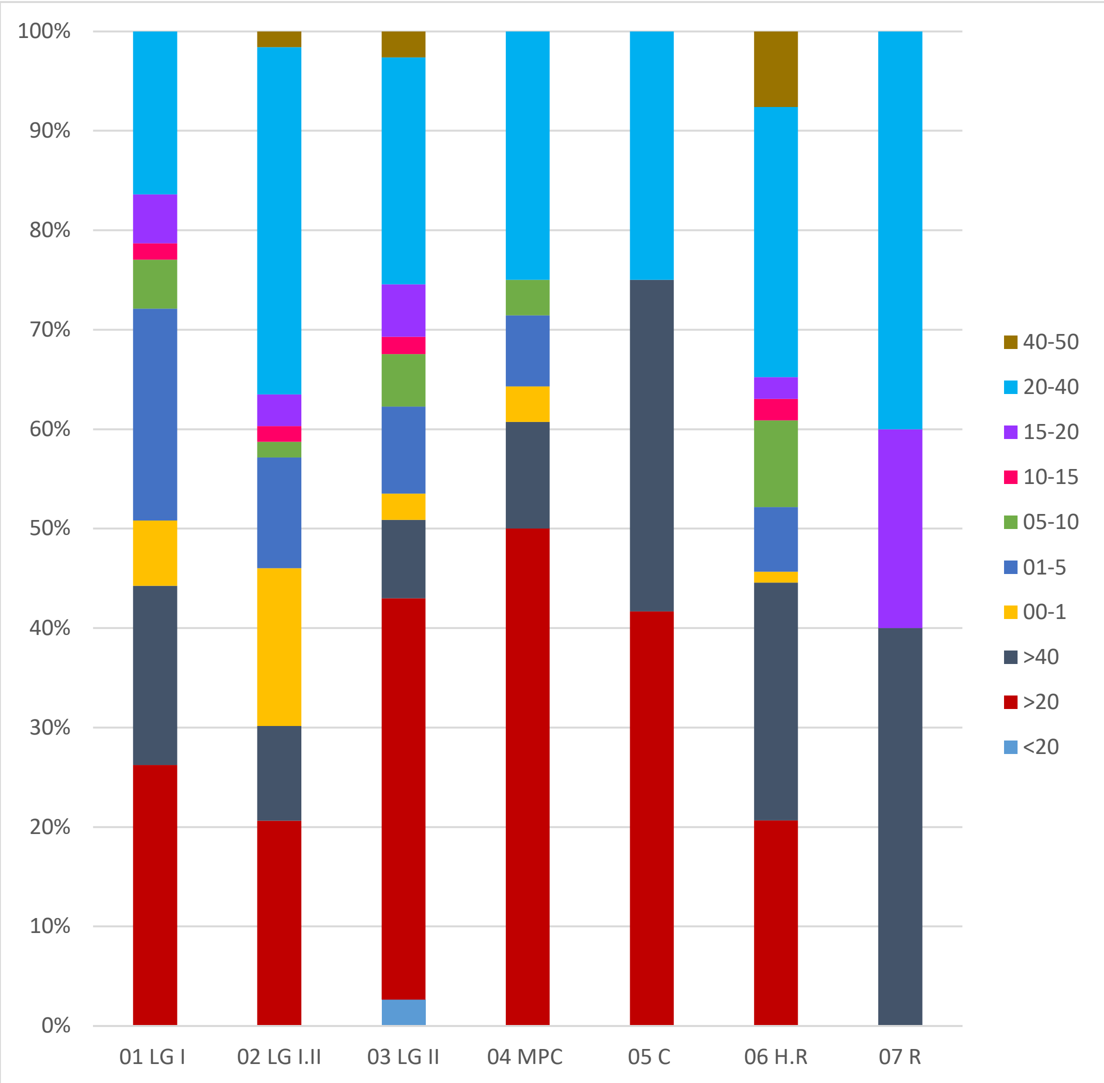


FIGURE 3.19 Distribution of age-at-death by chronology

Figure 3.19 described the age-at-death distributions by chronology. The results show an underrepresentation of <1 year-at-death individuals and diachronic differences for children of 1-5 years-at-death (18.1 % in the LG I and LG II, and 3.4% in later chronologies). New-borns and infants are completely absent within the Corinthian sub-sample, followed by absence of adolescents (10-15 age-class) within phases MPC and C. With regard to adult age-classes, the highest concentration falls in 20-40 years (22.80%) in LG II. Conversely, mature adults are better represented in LG I and in H.R respectively as 18.03% and 31.52% of the samples.

Figure 3.20 shows the distribution of males and females in the main chronological phases. Due to the poor completeness of the skeletons, the determination of sex has been performed on the 25.96% of inhumations series, and 78.86% of the cremations series.

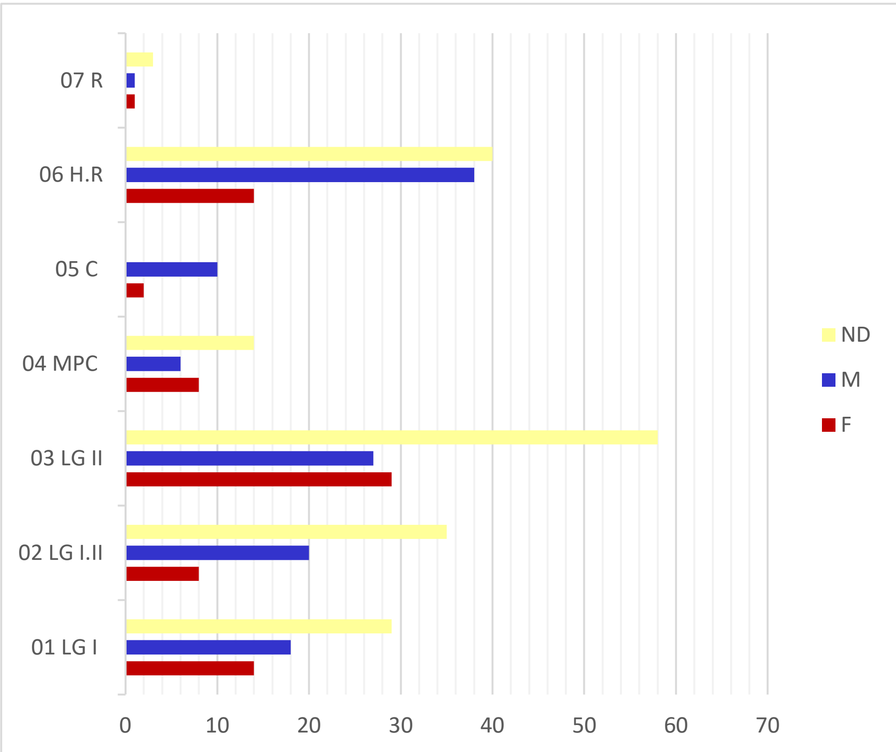


FIGURE 3.20 Distribution of males and females by chronology

Figures 3.21 and 3.22 show the M/F *ratio*, i.e. the *ratio* of the number of males to females within adults. In LG I and between LG I and LG II a greater presence of males is attested. The ratio between sexes differs across the time span and is exceptionally skewed in three phases out of the seven phases of the necropolis.

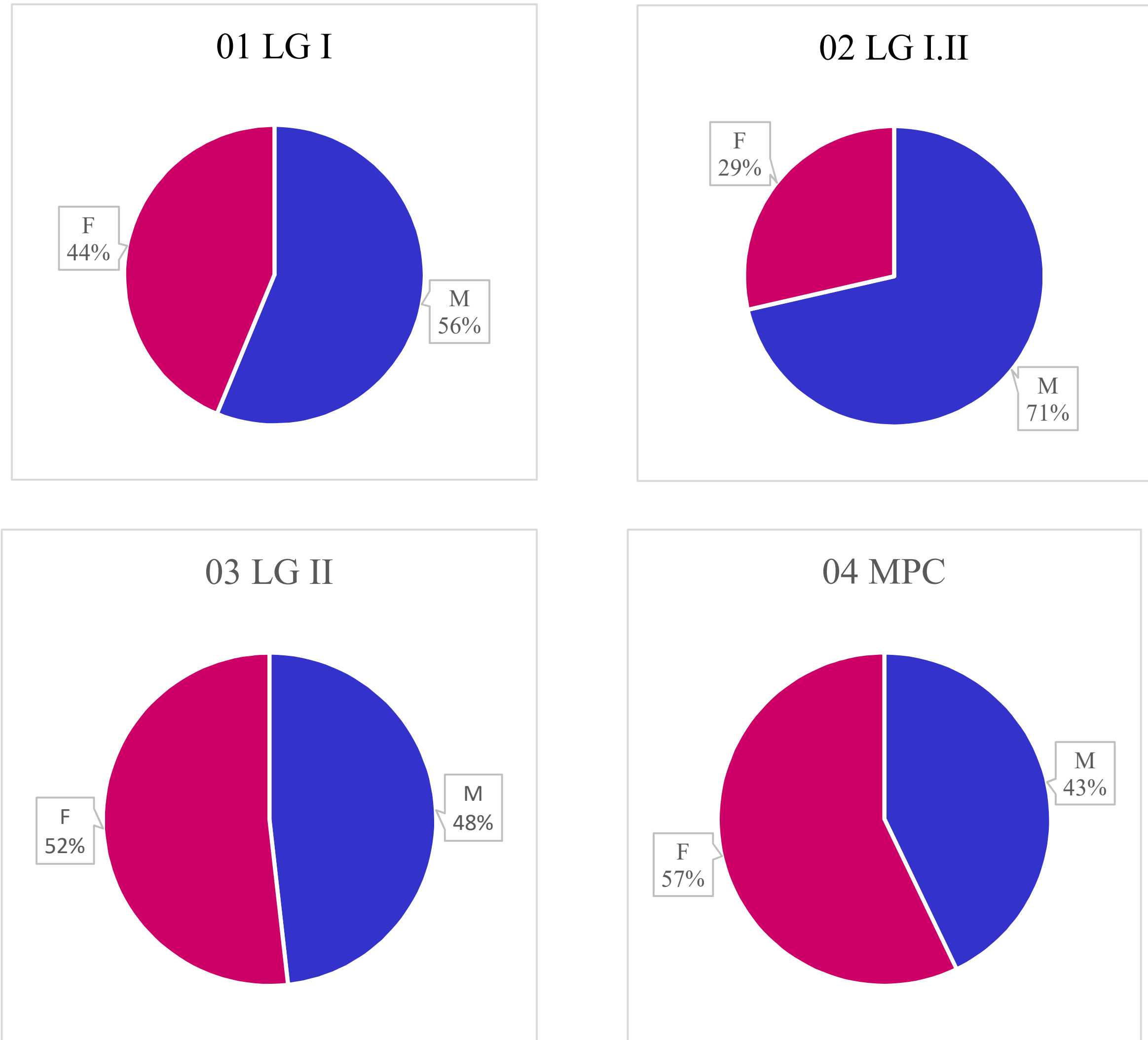


FIGURE 3.21 M/F *ratio* by chronology (*from LG I to MPC*)

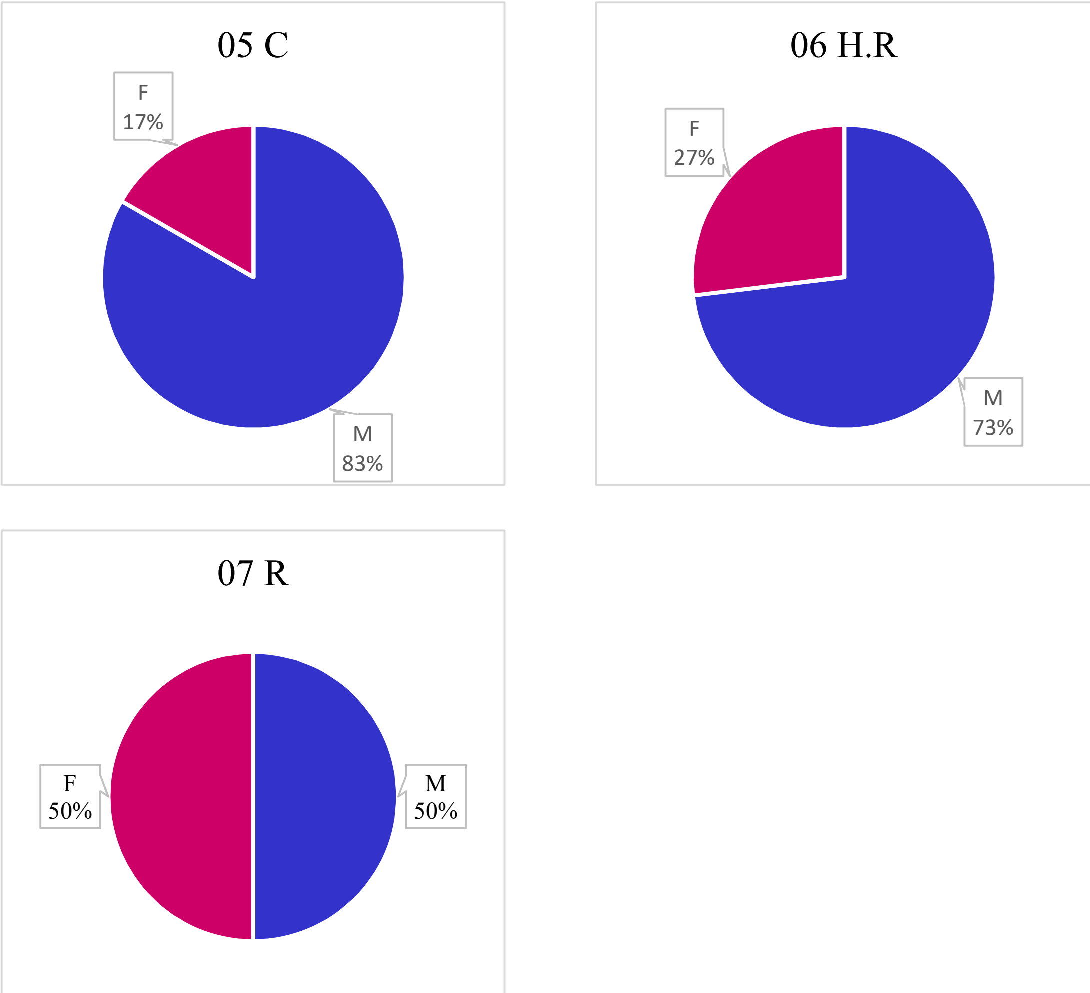


FIGURE 3.22 M/F *ratio* analysis by chronology (*from C to R*)

Figure 3.22 shows the distribution of weights for each cremated individual by sex and chronology. The drawn trend attested that males across different chronological periods have higher values of weight (from Later Geometric I and II to Hellenistic-Roman). As described above, a better completeness of the skeletons is attested during the later chronological phases of the necropolis.

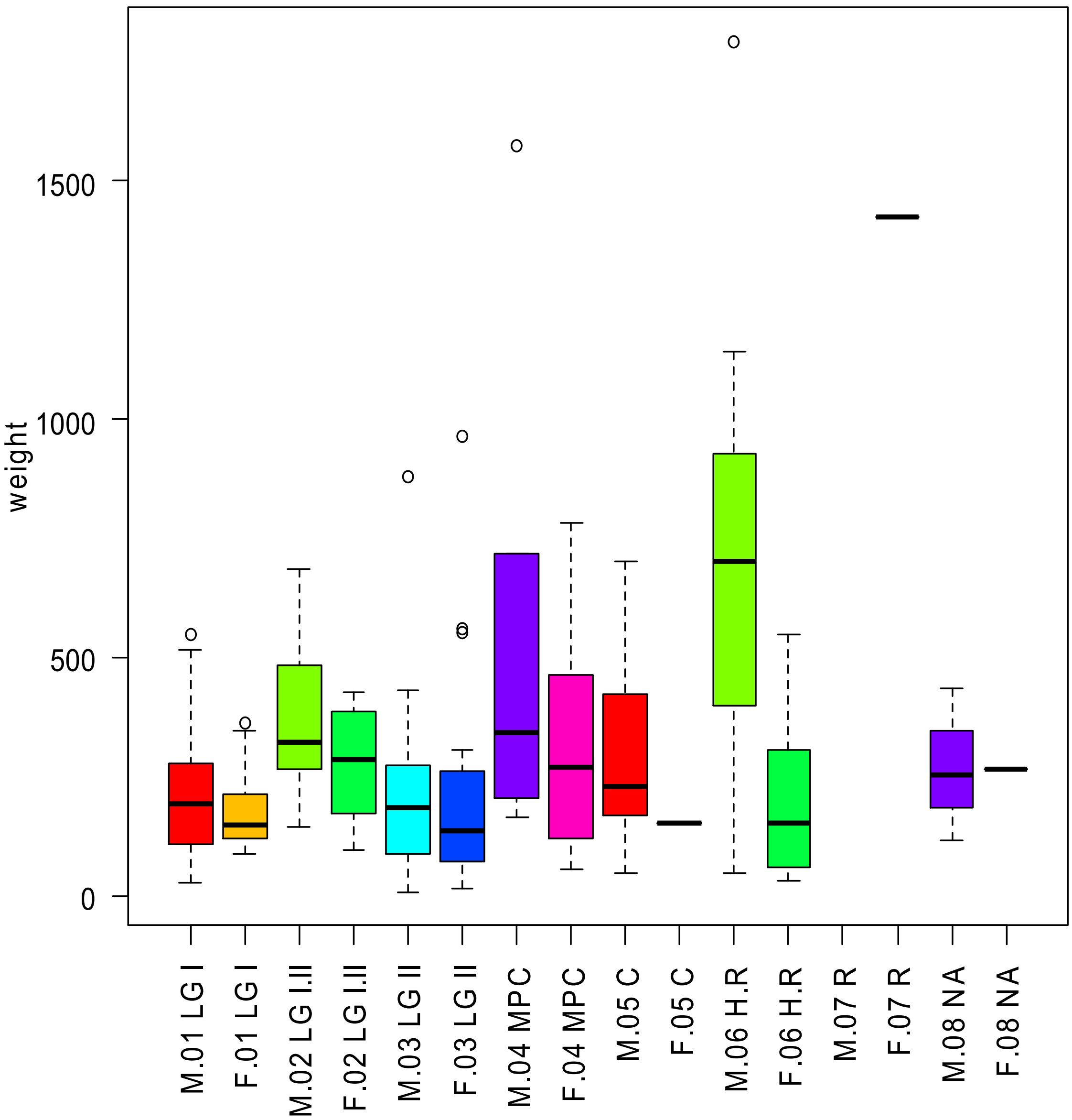


FIGURE 3.23 Distribution of weights for each cremated individual by sex and chronology

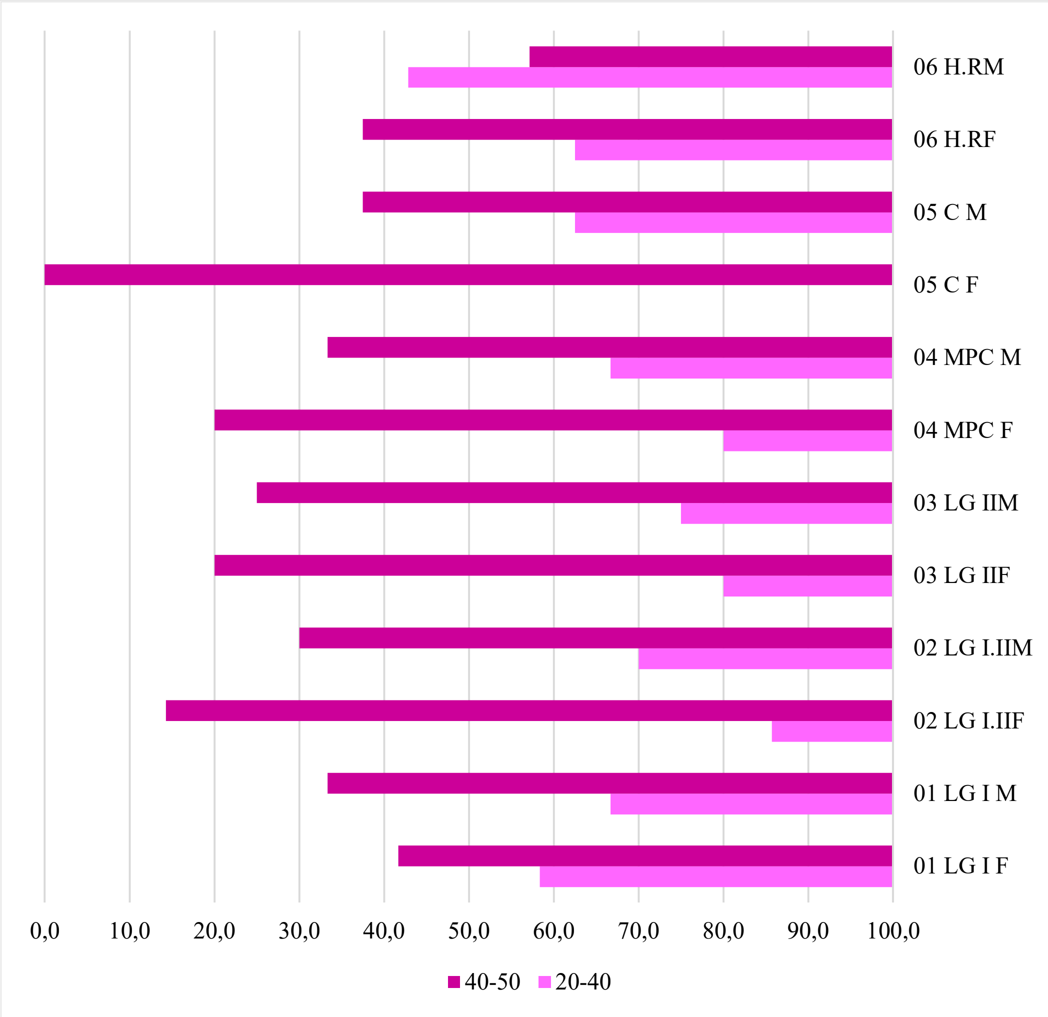


FIGURE 3.24 Distribution in percentage of males and females by age-classes (*20-40 and >40 years-at-death*) and by chronology

Figure 3.24 shows the distribution in percentage of males and females by age-classes (20-40 and >40 years-at-death) and by chronology. The mortality distribution in male's subsample shows a greater presence in LG I of males aged between 20 and 40 years (66.67% of the male sample), in agreement with female subsample, which shows a higher mortality in 20-40 years' age class in LG I as 58.63% of female series. On the contrary, between LG I and LG II, the females subsample shows a higher mortality between 20-40 years compared to males, where the attestation of deaths after 40 years is greater than 30% against the

14.29% for female samples. This trend is also confirmed for the later phases. In H.R, male mortality is attested in 57.14% of cases over the age of 40 years, against a female mortality of 37.50% within the same age class.

3.2 Testing the melting pot: results of the $^{87}Sr/^{86}Sr$ ratio analysis

This paragraph shows the results of $^{87}Sr/^{86}Sr$ ratio analysis on Pithekoussai's odonto-skeletal remains. As mentioned in Chapter Two (paragraph 2.3.2), 45 permanent teeth (enamel mainly from first and second maxillary/mandibular molars) in inhumed adults, 49 petrous portions of the temporal bone in cremated and inhumed adults and sub-adults were collected. Figure 3.25 shows the specimens sorted by increasing $^{87}Sr/^{86}Sr$ ratio.

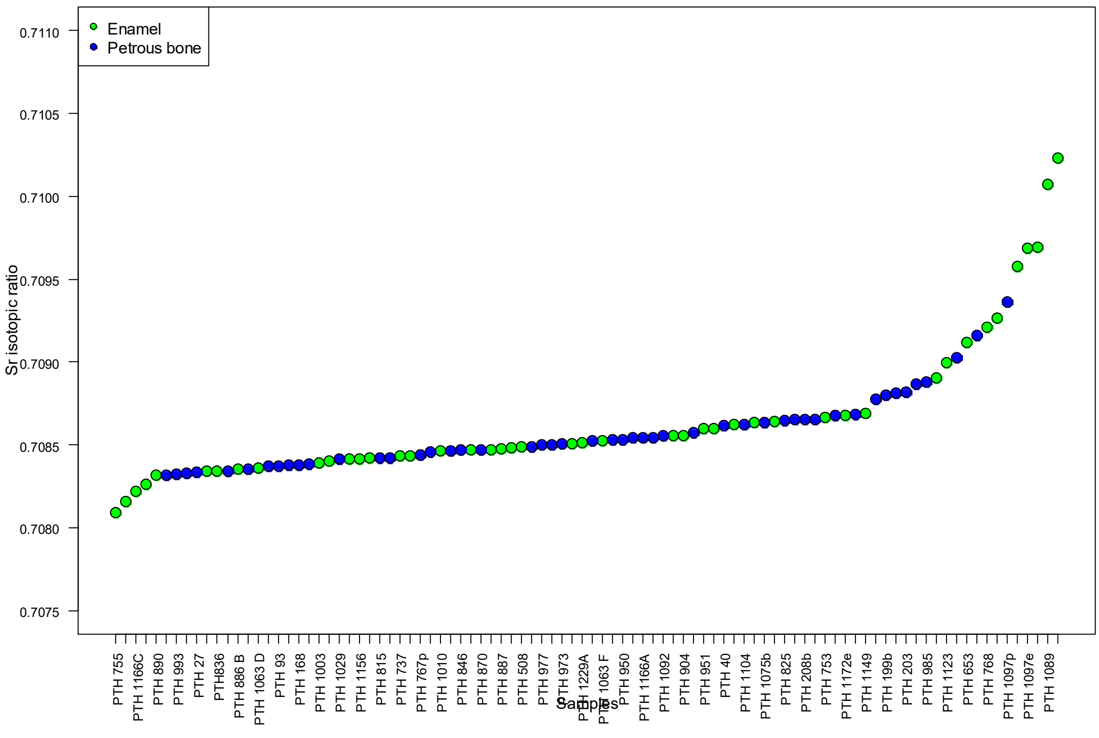


FIGURE 3.25 Distribution of enamel (*green*) and petrous bone (*blue*) specimens by increasing $^{87}Sr/^{86}Sr$ ratio

Among these, four inhumed individuals were subject to a double-check of both enamel and petrous bone. A list of the analysed individuals, with archaeological, osteological and $^{87}Sr/^{86}Sr$ ratio data is reported in Appendix B.

3.2.1 The results of $^{87}Sr/^{86}Sr$ Bioavailability of Ischia island

The biologically available strontium baseline was constructed through a multi-analytic strategy (Chapter Two, paragraph 2.3.1). The $^{87}Sr/^{86}Sr$ ratios of volcanic whole-rock samples from Ischia ranges {0.70631, 0.70648} (D'Antonio et al. 2012), together with the marine Sr isotopic ratio of 0.70917 (McArthur et al. 2001) and Sahara dust compositions with an average of 0.7194 (Grousset et al. 1998; Krom et al. 1999). Furthermore, this research produced 11 baseline values analysing: (a) ancient mammal (*Ovis vel Capra*) enamel (n = 1; from Pithekoussai's grave 1120) and (b) modern faunal enamel (n=1; from Mt. Epomeo); (c) shallow roots plants (n=7; from seven areas at different distances from the coastline; (d) burial soil (n=2; from the cremation 985 and inhumation 1123) (Figure 3.26).

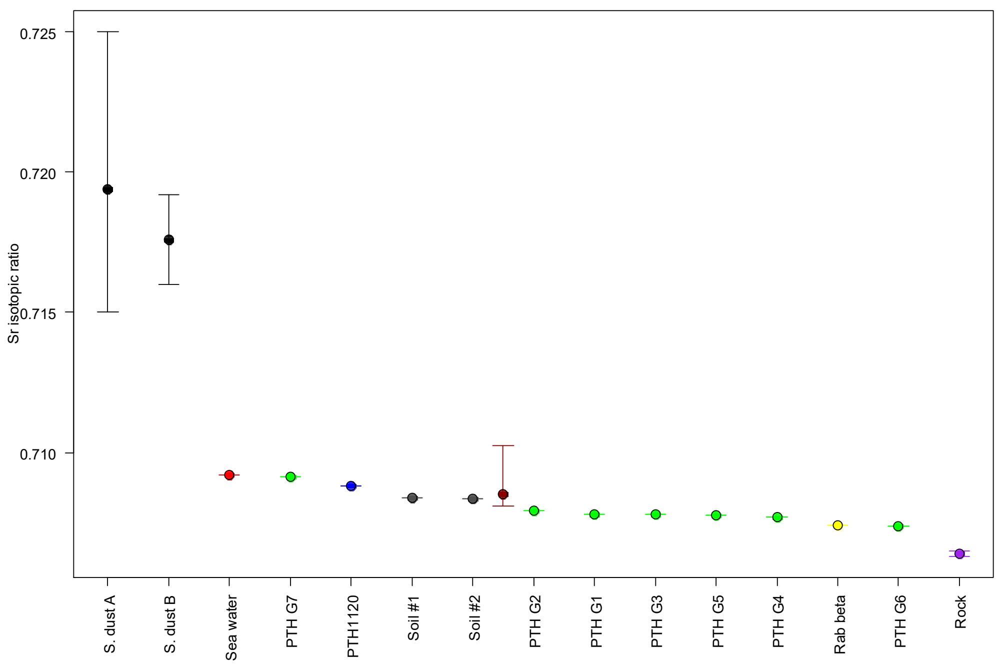


FIGURE 3.26 Distribution of $^{87}Sr/^{86}Sr$ ratio sources for the assessment of the $^{87}Sr/^{86}Sr$ bioavailability of Ischia island

According to the unradiogenic geogenic volcanic $^{87}Sr/^{86}Sr$ ratios below 0.707 (D'Antonio et al. 2012), all individuals could be considered as allochthonous, which is highly unlikely.

Thus, the published geological data are insufficient to confidently limit the local range of $^{87}Sr/^{86}Sr$. The presence of a substantial amount of marine food in the individuals' diet, the sea spray affecting the crops on the entire island, and the presence of highly radiogenic Sahara dust can be factors affecting the observed large discrepancy between all individuals and the volcanic $^{87}Sr/^{86}Sr$ signal. The sea spray effect is particularly evident in the $^{87}Sr/^{86}Sr$ of a grass sample (PTH G7), collected very close to the coastline, that shows the higher value (0.70914) among the grass samples, which range between {0.70738, 0.70792}. On the contrast, the value of the wild modern rabbit (Rab-beta) (0.70741) falls into the grass $^{87}Sr/^{86}Sr$ range. With regard to the burial soil samples, $^{87}Sr/^{86}Sr$ ratio values range between {0.70835, 0.70839}. The high $^{87}Sr/^{86}Sr$ values of the burial soils might be explained as results of the sea water contaminations. A number of tsunami phenomena have interested the Ischia island, and resulted in a flooding of Pithekoussai's graveyard in the past.

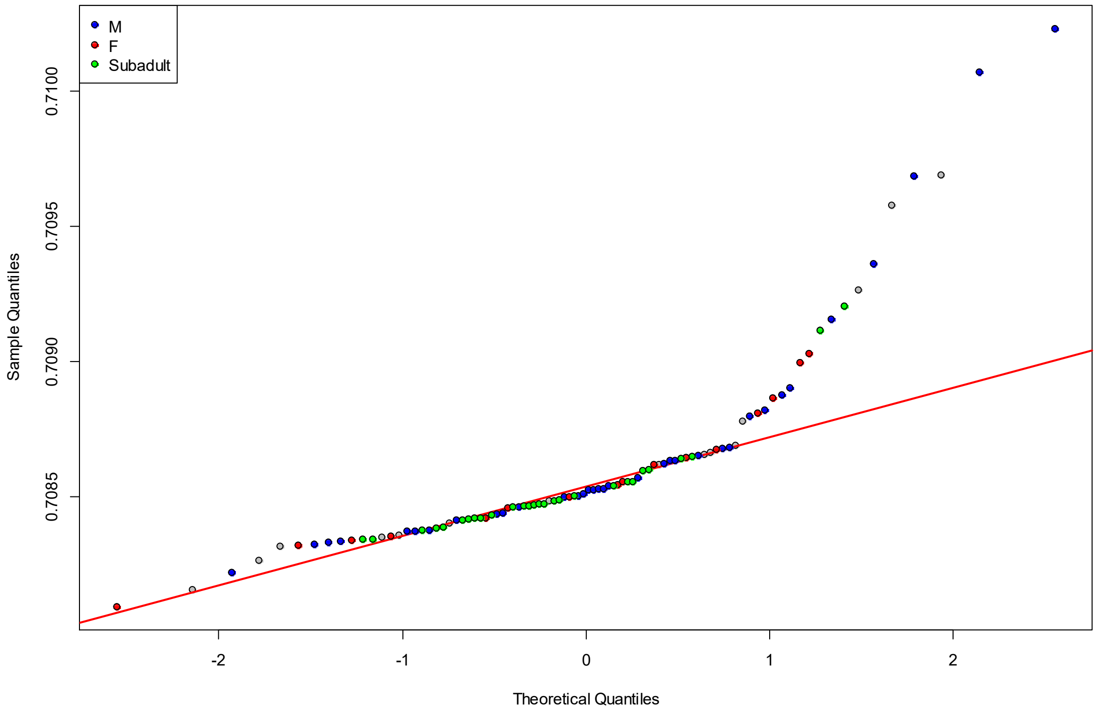


FIGURE 3.27 Quantile-quantile plot of the $^{87}Sr/^{86}Sr$ ratio in the human sample

The quantile-quantile plot (Figure 3.27) of $^{87}Sr/^{86}Sr$ ratio values in human samples clearly shows that highest values (n=19) deviate from normality. Figure 3.28 shows a number of possible statistical ranges that could be used, superimposed the density distribution of the $^{87}Sr/^{86}Sr$ ratio. Among the statistical parameters offered in literature: Turkey's interquartile range or the median deviation from the median (Lightfoot and O'Connell 2016).

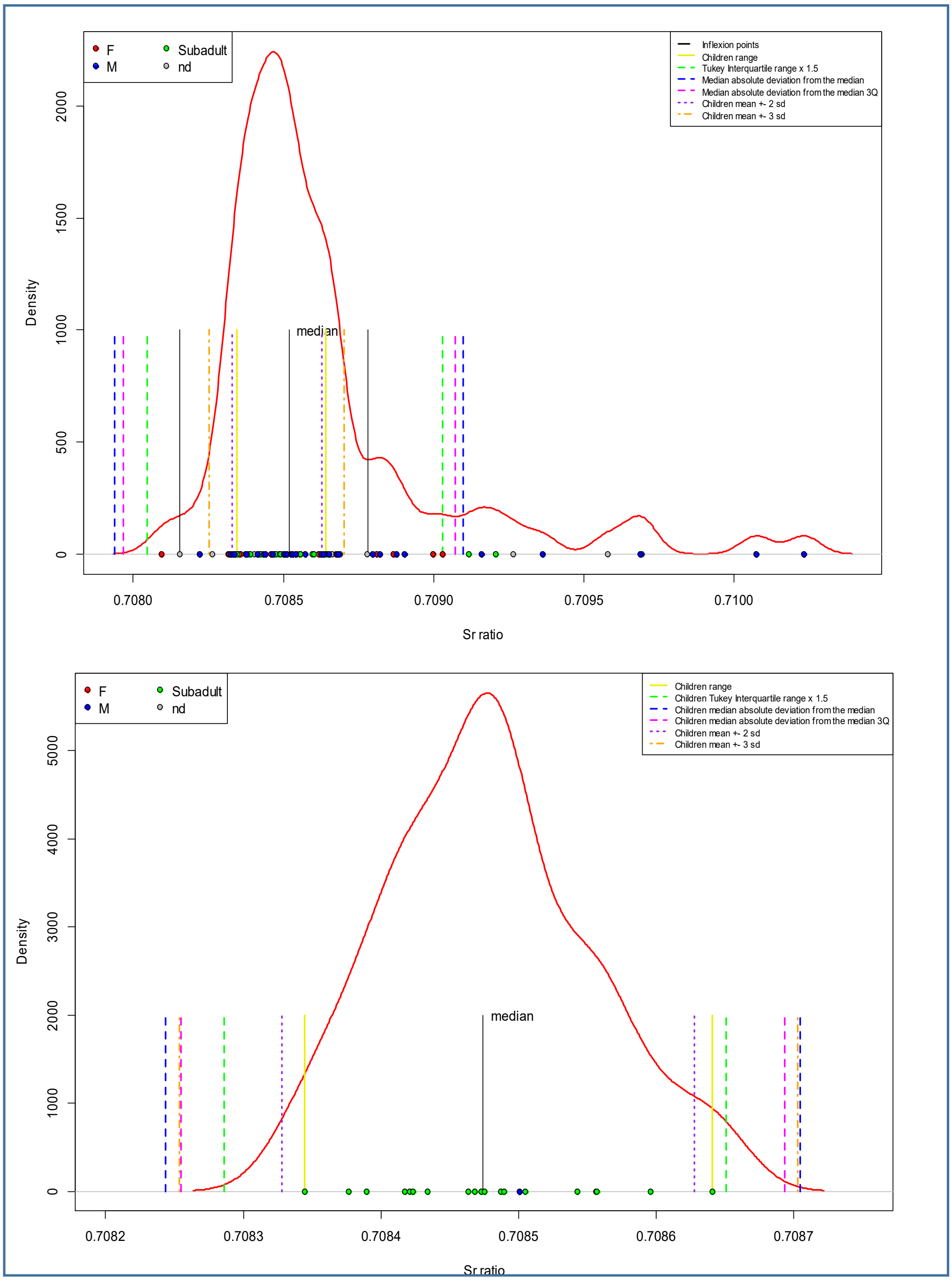


FIGURE 3.28 Density curves of the $^{87}Sr/^{86}Sr$ ratio values

The shape of the distribution suggests that there is a normally distributed "core" of individuals plus a significant number of outliers, that could be identified as non-local. Conversely, the median based ranges (Figure 3.28) include a number of individuals that are clearly very far from the central "core".

Therefore, a possible way to establish a reasonable $^{87}Sr/^{86}Sr$ range value in which to include the "local" individuals is to take into consideration bio-cultural factors. It is worth to note that all infants and children enter into a rather narrow range, thus suggesting that they died where they were born (Figure 3.28). New-borns are not taken into account due to the maternal isotopic imprint that affects the $^{87}Sr/^{86}Sr$ ratio signal. The $^{87}Sr/^{86}Sr$ range for age-classes of 1-10 years coincides with their mean ± 2 standard deviations. Therefore, it seems reasonable to assume $^{87}Sr/^{86}Sr$ ratio values for age-classes of 1-10 years as the $^{87}Sr/^{86}Sr$ local baseline for Ischia island ranges, which is {0.70834, 0.70864}.

3.2.2 Diagenesis

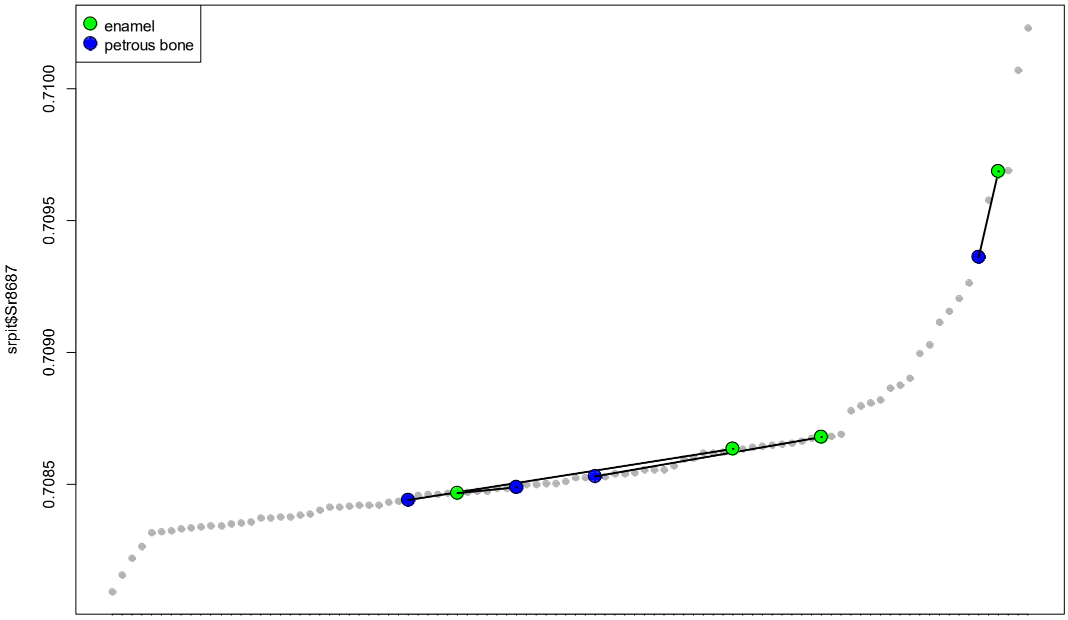


FIGURE 3.29 Distribution of the $^{87}Sr/^{86}Sr$ ratio values from the test of the correspondence

Figure 3.29 shows the results of the test of the correspondence between four enamel and four petrous bones in inhumation graves 767, 1093, 1097, 1172. The reliability of strontium isotope analysis of petrous portions seems to be confirmed by the similar value results from enamel and bone sample in graves 1093 (0.708468, 0.708489). Conversely, in the graves 1093, 1097, and 1172 a shift of the $^{87}Sr/^{86}Sr$ ratio values occurred in the bone samples, attesting an alteration of the original *in vivo* strontium value of bones during the post-mortem period. This result is indicated by the lower $^{87}Sr/^{86}Sr$ values of the petrous portions (that deviated from soil $^{87}Sr/^{86}Sr$ ratio signal) compared to those from the enamel. Unfortunately, this cannot be carried out for Pithekoussai's cremated individuals, due to the lack of dental crowns. However, it is worth to note that $^{87}Sr/^{86}Sr$ values from the petrous bone are always lower than the enamel, thus indicating a shift toward the soil values. The implication of this is that there is a possible underestimation, among cremated, of the amount of non-local individuals.

3.2.3 $^{87}Sr/^{86}Sr$ values ratio by chronology

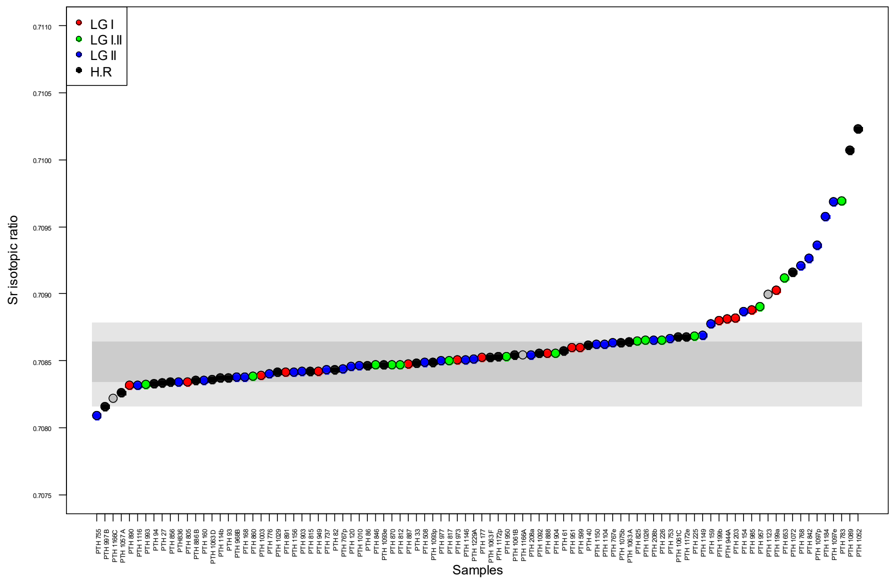


FIGURE 3.30 Distribution of the individual $^{87}Sr/^{86}Sr$ ratio values by chronology

Figure 3.30 shows the boxplot of individual $^{87}Sr/^{86}Sr$ ratio values by chronology. The picture emerging from the strontium isotope analysis is that of a community that shows different pattern of mobility across generations.

Given the purpose of this research and the role played by Pithekoussai in the Mediterranean archaeology as key settlement of Eastern presence in Italy during the Middle and the Late Iron Age, our attention has focused above all on the attempt to identify and quantify the residential mobility trends in Pithekoussai's society during the LG I and LG II. Unfortunately, as mentioned above, due to the scarce preservation of the remains, both teeth and bones, (the sampling criteria adopted in this study have already been described in Chapter Two, paragraph 2.3), we were only able to sample 62 specimens for the phases LG I and LG II, among which 41 inhumations and 19 cremations.

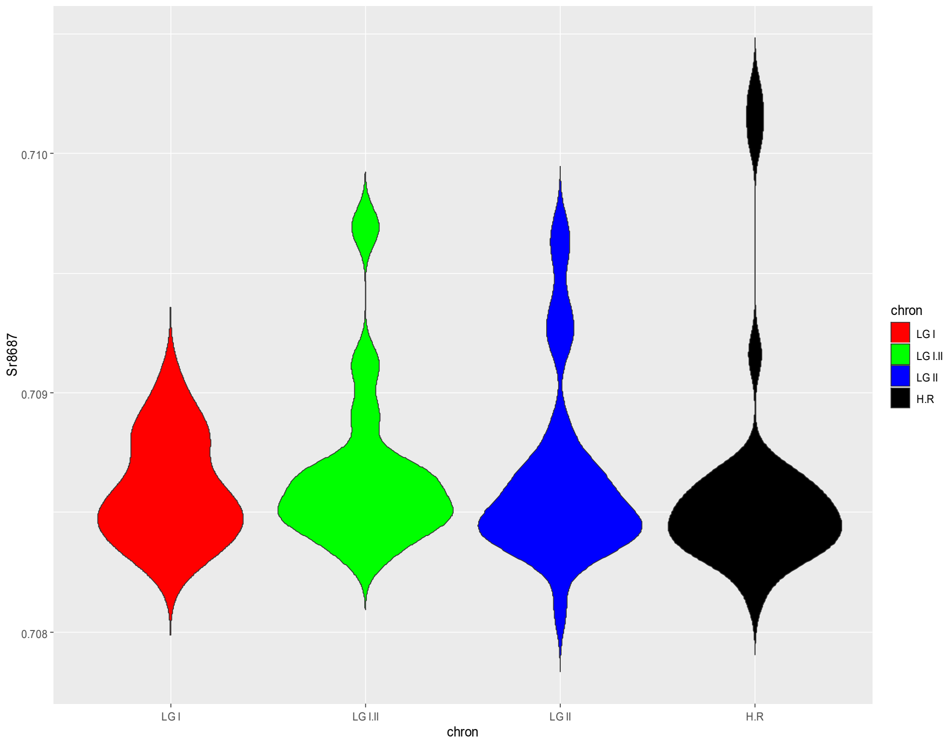


FIGURE 3.31 Violin plot of the $^{87}Sr/^{86}Sr$ values distribution by chronology

The violin graph (Figure 3.31) shows the large data range of the individual strontium values for the phases LG I, LG I.II, LG II and H.R. No samples were collected in phases MPC and C, due to the unsuitability of the teeth and bones; similarly, for the Roman period of Pithekoussai's graveyard, no samples were available for the $^{87}Sr/^{86}Sr$ ratio analysis. Figure 3.31 shows that the greater concentration of $^{87}Sr/^{86}Sr$ ratio values falls into the local range. Few individuals show $^{87}Sr/^{86}Sr$ ratios below the minimum local range value of 0.70834, while a wider variability is attested above the maximum local range value of 0.70864.

With regard to LG I, the isotopic analysis was performed on 16 samples. The lowest value recorded is that of the non-local individual PTH 890 as 0.708317, while the highest is the value of individual 199a as 0.709029. Most of the values (10 out of 16) falls within the local signal. As for the outliers, individual isotopic signals are rather homogenous and included in a range of {0.708797, 0.708877}, except for the aforementioned burial 890, which presents instead the lowest isotopic signal of LG I sub-sample.

The range of $^{87}Sr/^{86}Sr$ values attested at the turn between LG I and LG II is much wider. The individuals sampled are 15 with a percentage of non-locals of 46.6%. The value range from the minimum of 0.708325 for PTH 993 to the highest of 0.709692. Unlike the LG I, the $^{87}Sr/^{86}Sr$ range of non-local values is definitely much more variable.

The samples from LG II are more numerous (n=32) and allow for a more detailed analysis. The outliers represent 35.48% of the sample. The lowest recorded $^{87}Sr/^{86}Sr$ ratio values is 0.708094 of PTH 755, against the highest of 0.709687 of PTH 1097. Most of the non-local individuals are concentrated in two different clusters: the first includes five individuals characterized by $^{87}Sr/^{86}Sr$ ratio values between {0.707652, 0.708864}; the second includes four individuals with values between {0.709207, 0.709579}.

For later phases, 29 specimens were analysed. Most individuals (20 out of 29) are defined as local. With exception of two samples, PTH 1052 and PTH 1089 which have isotopic values of {0.710233, 0.710074} respectively, the outliers fall in a range of {0.707156, 0.707679}.

3.2.4 $^{87}Sr/^{86}Sr$ values ratio by rituals

As previously described (Chapter One, paragraph 1.3), Pithekoussai's graveyards revealed a diversification in the treatment of the body based, perhaps, on both age-at-death of individuals and social hierarchy. If the social and ethnic/cultural role of the cremations has not yet been explored in its complexity, the inhumations certainly have had a more inclusive character both in the representation of age-classes and in the social/ethnic and cultural origin of the deceased. Among the different nuances of inhumation funerary performance, the *enchytrismos* ritual was exclusive prerogative of individuals who died in the early childhood.

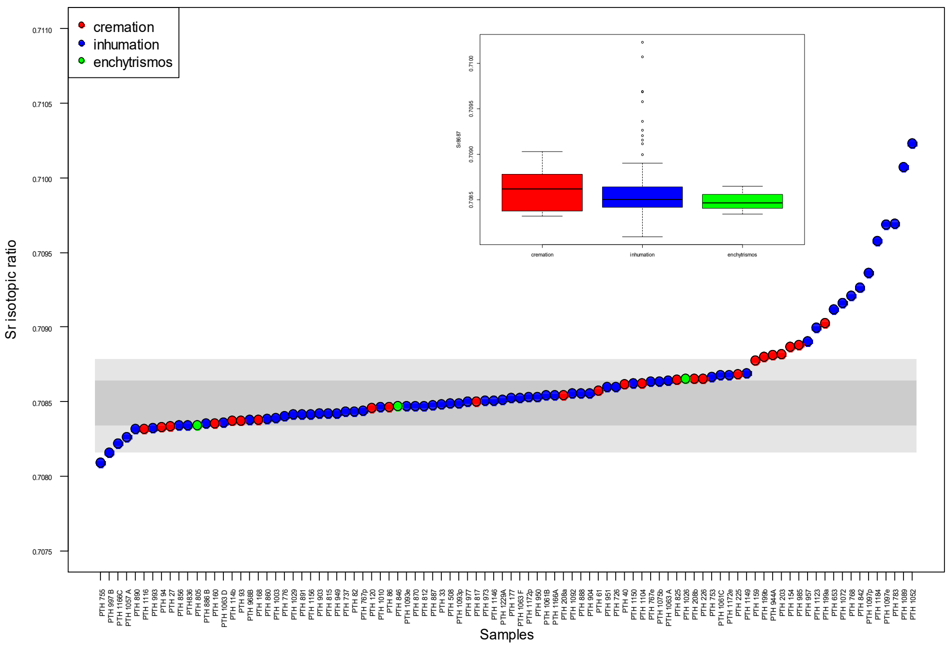


FIGURE 3.32 Distribution of $^{87}Sr/^{86}Sr$ values by different rituals of cremation, inhumation and *enchytrismos*

Figures 3.32 and 3.33 show the distribution of $^{87}Sr/^{86}Sr$ values by different rituals of cremation (n=26), inhumation (n=62) and, among the latter, *enchytrismos* (n=6).

42.03% of cremated individuals are allochthonous. Among these, the range of values $^{87}Sr/^{86}Sr$ is {0.708319, 0.709029}. The inclusivity of inhumations seems to be confirmed by the fact that across the generations, inhumed individuals show higher $^{87}Sr/^{86}Sr$ range values {0.708094, 0.710233}.

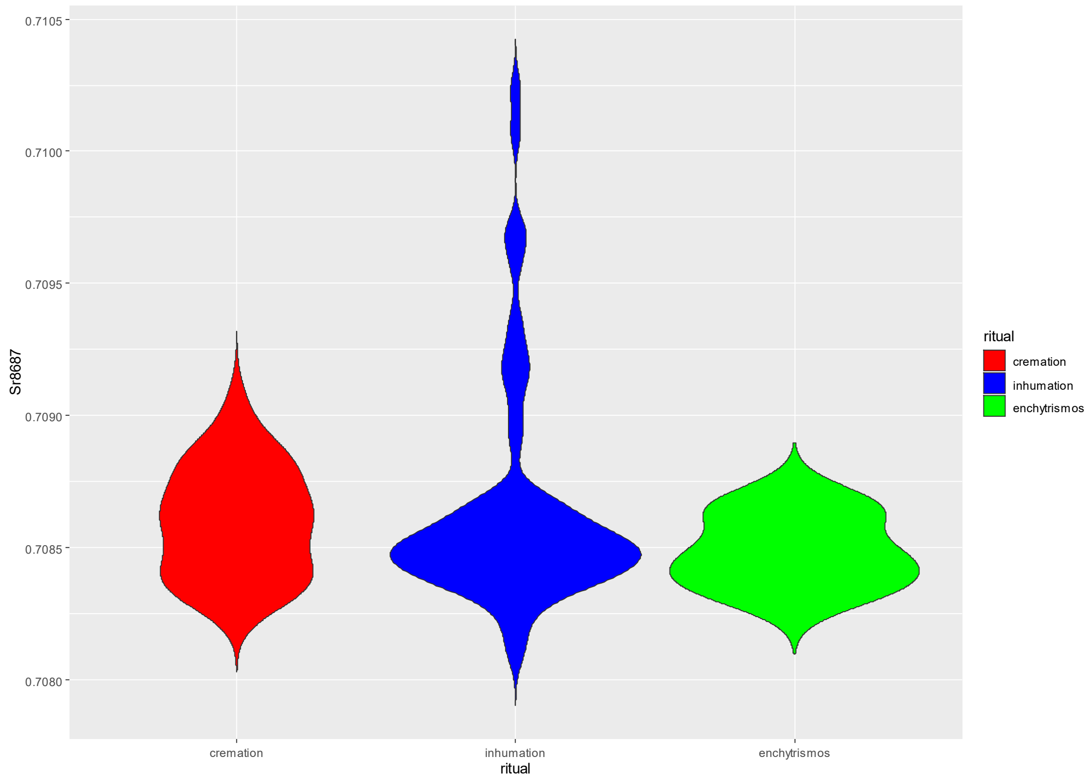


FIGURE 3.33 Violin plot of the $^{87}Sr/^{86}Sr$ values distribution by different rituals of cremation, inhumation and *enchytrismos*

As mentioned above (Chapter One, paragraph 1.3), in the periods LG I and LG II the crouching position of inhumed was detected as a probable ethnic/cultural marker. Among these, four individuals were collected for $^{87}Sr/^{86}Sr$ ratio analysis. The $^{87}Sr/^{86}Sr$ ratios indicate that three out of four individuals (PTH 753, PTH 783, and PTH 842) are allochthonous. $^{87}Sr/^{86}Sr$ values are rather different, and, in two cases particularly high. The strontium isotopic value of PTH 753 indicates the individuals as non-local. Inhumation 753 was located in a particular area of PTH II, characterized by the absence of cremation tumuli, except for cremation

771. Six out seven crouching inhumed are localised in the north-western area of tumulus 771. The local one (0.708414) is a female whose body was lying on her left side. It is worth to note that among the grave goods were found a silver scarab, places on the chest of the deceased, and an *impasto* fusaiola. According to Cerchiai (2014), the latter instrument could potentially be considered peculiar of the indigenous use and be interpreted as gender and ethnic/cultural marker.

With regard to *enchytrismoi*, except for the new-born of grave 1026 (0.708650), all infants' values fall into the local $^{87}Sr/^{86}Sr$ range of {0.708345, 0.708640}. The only exception is PTH 1026, sampled by petrous bone portion. As reported above (Chapter One, paragraph 1.2.1.1), *pars petrosa* begins its formation in utero at approximately 16th-18th gestational weeks and becomes fully ossified at the time of birth (Frisch et al. 2000; Kontopoulos et al. 2019). Thus, given the neonatal age-at-death of PTH 1026, it is assumed that his/her alloctonia is resuling from maternal isotopic imprint, and that his/her mother moved during pregnancy.

3.2.5 $^{87}Sr/^{86}Sr$ values ratio by sex and age-at-death

Figure 3.34 shows the results of $^{87}Sr/^{86}Sr$ ratio of each individual by sex. The majority of individuals show $^{87}Sr/^{86}Sr$ compositions that are compatible with the baselines. Among these, 11 females out of 20 samples, 18 males out of 32 samples, and four subadults out of six samples fall into the local range. As expected, adults are generally characterized by wider values than subadults. Among adults, males show a higher strontium ratio {0.708221, 0.710233} than the female values {0.70809, 0.709029}, possibly indicating a more distant provenance.

The individual values of $^{87}Sr/^{86}Sr$ ratio were analysed also taking into account the main chronological phases, funerary customs and material culture assemblages.

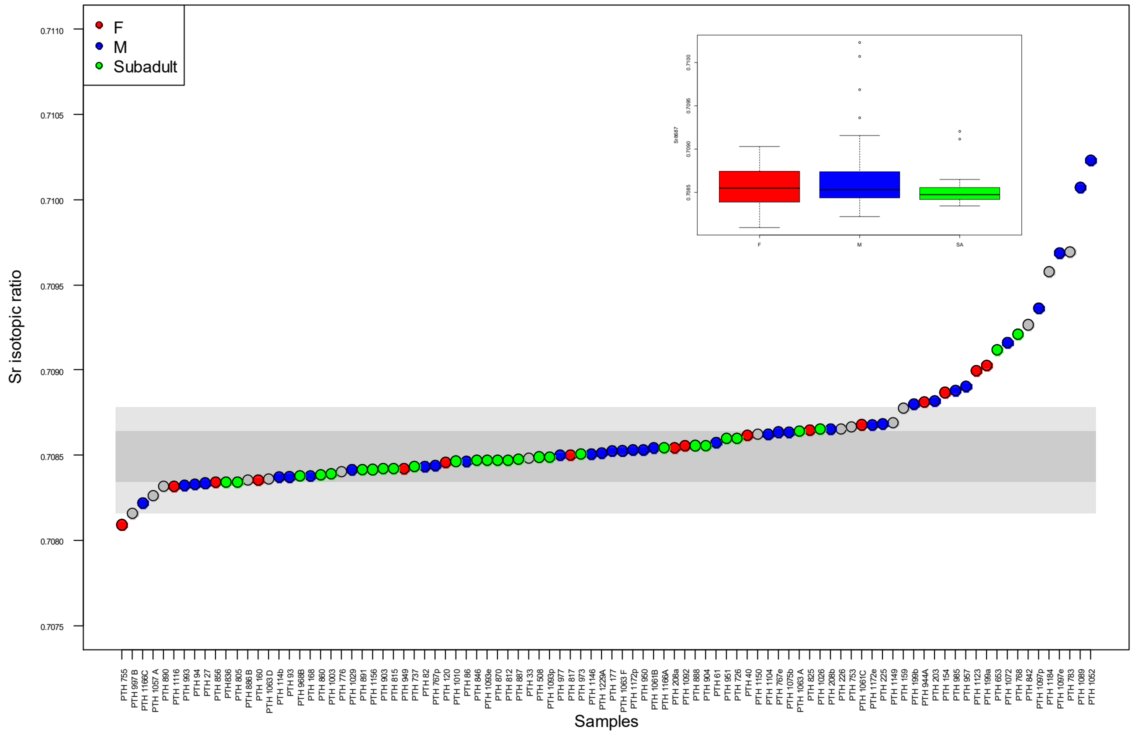


FIGURE 3.34 Distribution of $^{87}Sr/^{86}Sr$ values by age-at-death and sex

With regard to the female provenance for the LG I four individuals were sampled, both inhumed and cremated. Three out of four females are considered to be born elsewhere. Among cremations, all the samples are non-local. They are PTH 199a (0.709029), PTH 944a (0.708811) and PTH 890 (0.708317). Conversely the only local female is PTH 599 (0.708601). From an archaeological point of view, cremation 199 was defined as pertinent to a female, due to its material culture assemblage characterized by the presence of an *armilla* plated in gold and silver, as well as for an infant deposition (inhumation 574) below the cremation cairn and interpreted as the deposition of a mother and a child. However, as mentioned above for other cases, morphological analysis ascertained the presence of two individuals among the cremated remains: PTH

199a, as female and PTH 199b, as male. The isotopic assessment of $^{87}Sr/^{86}Sr$ ratio has highlighted an important fact: both individuals do not fall within the local range and they show very high strontium values of 0.709029 (female PTH 199a) and 0.708797 (male PTH 199b).

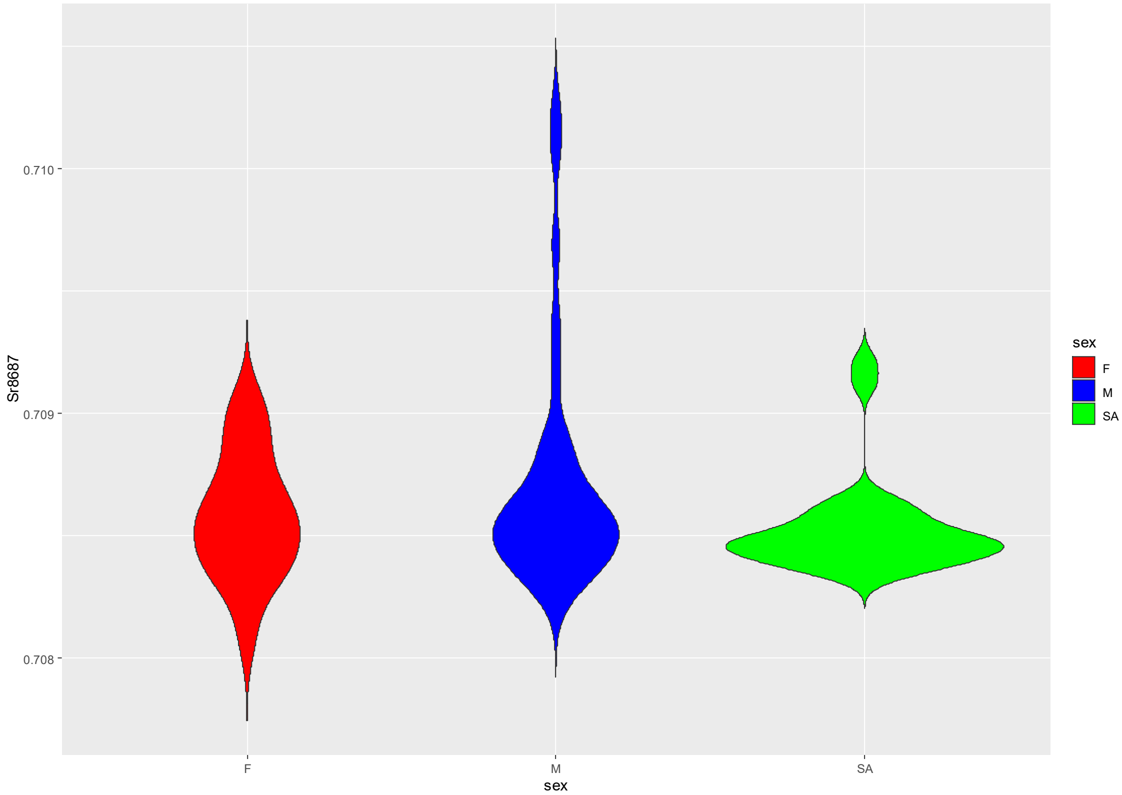


FIGURE 3.35 Violin plot of the $^{87}Sr/^{86}Sr$ values distribution by age-at-death and sex

Similar is the case of cremation 944, already described as an example of cremation archaeologically defined as a single deposition. The cairn is part of complex funerary cluster that included also cairns 945 and 946. Unfortunately, these latter do not yield suitable portions of *pars petrosa*. Archaeological evidence seemed to attest an intense network of relationship among the individuals buried in this area and the aristocratic ranks of Tyrrhenian communities, and in particular those that animated the circulation of goods and, perhaps, people from Capua and Pontecagnano (Cinquantaquattro 2016). As for cairn 944, it is interpreted as pertinent to an allochthonous woman integrated into the highest Pithekoussai's social rank, due to the association of the cremation ritual and the indigenous grave good found in it (Chapter One, paragraph 1.3). The $^{87}Sr/^{86}Sr$ ratio value identifying the woman as allochthonous (0.708811) could reinforce the archaeological reconstruction. In spite of the smaller number of female individuals (20 out of 32 males), males and female distributions do not differ considerably (Figure 3.35). However, among non-local males, two (PTH 1052 and PTH 1089) are recognized as coming from an even greater distance (0.710233, 0.710074 respectively). Strontium isotope ratios for the majority of adult males are concentrated in the range {0.708331, 0.708679}; conversely, the majority of adult females are concentrated in the range {0.708317, 0.708676}.

Between LG I and LG II, the female local sub-sample is deeply underrepresented by the only two PTH 817 (0.708501) and PTH 825 (0.708645) both of them local. Conversely, PTH 653 is an allochthonous young female (0.709118) buried in a pit-grave covered by a tumulus.

Regarding the LG II, seven females are sampled, six of which are cremations. The non-local component represents 42.85% of the sample (PTH 154, PTH 159 and PTH 755). In particular, the material culture assemblage of cremation 159 shows some common elements with cairn 944, among which the *impasto* amphora that refers to Etruscan-Latium area. The Sr ratio value of the non-local female PTH 159 is 0.708778, slightly lower than that of the female 944a (0.708811). Similarly, PTH 755 show an individual value of 0.707094, below the minimum value of the local range. The cremation yielded a rich grave good-set. In particular, it yielded the presence of a clay cup (*con ansa eretta sul labbro*) defined by scholars as a product of hybridization phenomena between the Pithekoussan and Italo-Geometric production, attested in Etruscan-Latium area and also in Capua and Pontecagnano centers (Nizzo 2007). An interesting case is represented by cremation 208. According to Cerchiai (2014) the cremation contained the remains of a woman of non-Greek origin to whom was granted the rite of incineration was reserved. Among the elements of the grave goods-set was found, a bronze pendant in jug shape of Macedonian type (*ibid*). According to Martinelli (1997) the circulation of this object falls into the Tyrrhenian circulation passing through the Veio. However, similarly to cremations 199 and 944, burial 208 yielded the remains of two individuals, both subjected to isotopic analysis. Female PTH 208 (0.7085544) is fully within the local isotopic range. Male PTH 208b falls just outside the local $^{87}Sr/^{86}Sr$ range with a ratio of 0.708652.

Among the later phases, the inhumation graves 856, 1061 and 1092 yielded female individuals who show $^{87}Sr/^{86}Sr$ values ranged {0.708340, 0.708676}. PTH 856 and PTH 1092 are defined as local; conversely, the young female PTH 1061C, a cremation included in a multiple burial, is non-local.

With regard to the male provenance, for LG I it was only possible to sample four individuals, all cremated. Male PTH 117 is the only local (0.708524). On the contrary, cremations 199 (mentioned above), 203 and 985 show the individual $^{87}Sr/^{86}Sr$ values ranged between {0.708797, 0.708877}, not dissimilar but lower than that of the allochthonous females of the same period which is included between {0.708811, 0.79029}.

Although the low number of samples (n=4) does not allow for a more comprehensive assessment, it was possible to observe that a similar trend of mobility is also attested for the male component during the phases of transition between the LG I and LG II. In this case, the samples pertain to three inhumations and one cremation. The latter refers to the individual PTH 225, who shows values of $^{87}Sr/^{86}Sr$ slightly below the local range (0.708684).

A case of great importance is inhumation 950, which yielded the remains of an individual who died in deprivation of liberty (Cinquantaquattro 2016). As mentioned above, among the various hypothesis advanced by archaeologists there is the possibility that he was a native chieftain perhaps included in a specific plot of the necropolis due to the link with the group that was buried there. This element would be reflected in the autochthony of the deceased, whose isotopic values of 0.708531 locates him among those born on the island. Among the non-locals it reports PTH 957 (0.708903) and PTH 993 (0.708325) both from inhumations.

For the period LG II, eight samples were collected from male sub-sample, including three cremations and five inhumations, among which appears the aforementioned PTH 208b (non-local), associated with the female PTH 208a (local).

Among these, the case of the Tomb of Nestor's Cup (cremation 168) is peculiar. The commingled nature of the remains was extensively discussed in Chapter Four. Due to the particular nature of this burial, the $^{87}Sr/^{86}Sr$ results of this tomb must be interpreted *cum grano salis*. Among the cremains of the grave it was collected a *pars petrosa* of temporal bone, assessed with sufficient confidence as pertinent to an adult. The isotopic $^{87}Sr/^{86}Sr$ ratio values of 0.708378 identifies the individual as local. Thus it is possible to state that among the human remains taphonomically associated with the sherds of Nestor's Cup there is an individual born on the island.

Two out of the four individual samples for the double check on enamel and *pars petrosa* also fall in this chronology. It was expected for these individuals (PTH 767 and PTH 1097) to be identified respectively as a local and non-local. However, the issue will be further investigated below. With regard to the local PTH 767 (0.708634), inhumation 767 is archaeologically among the graves that did not yield grave goods and is interpreted in terms of social marginality in relation to the Euboic component. On the contrary, individuals PTH 1104 (0.708625) and PTH 1229a (0.708513) are identified as local.

Among the later phases of the necropolis, the male sub-sample shows 62.5% of autochthonous individuals. In contrast, the $^{87}Sr/^{86}Sr$ ratio values for cremation 27 (0.708336), 94 (0.708331), and inhumations 1052 (0.710233), 1072 (0.710074), 1089 (0.710074) and 1172 (0.708679) indicate the males buried in them as outliers.

CHAPTER FOUR

WHAT WAS BURIED WITH NESTOR'S CUP? NEW GROSS OSTEOLOGICAL AND HISTOLOGICAL EVIDENCE FROM THE CREMATED REMAINS OF TOMB 168 (CA. 730 BCE)

The Tomb of Nestor's Cup (LG II, ca. 730 BCE) was discovered by Giorgio Buchner in October 1954. Due to its material culture assemblage, this cremation is widely considered one of the most intriguing finding within

Mediterranean and Pre-classical archaeology. Prior to the present anthropological re-assessment, Nestor's cremains were analysed by T.F. Spence and M. J. Becker, as part of PTH I osteological subsample (Buchner and Ridgway 1993; Becker 1995;1999). In the present research, results from morphological and morphometrical re-examination highlighted, for the first time, the presence of faunal remains commingled with human ones. Moreover, advanced histomorphometric analysis of the cortical bones confirmed this commingled nature of the skeletal record. The presence of more than one individual and different animals in the Tomb of Nestor's cup calls into question the previous interpretation of the tomb and the now re-opened question: who/what was buried with Nestor's Cup?

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The Tomb of Nestor's Cup (ca. 730 BCE, Ischia island) was uncovered by Giorgio Buchner at the end of the 1954 excavation campaign at Pithekoussai's graveyard. The archaeological investigation of the burial was then resumed in June 1955, after an eight-months suspension due to financial reasons (Buchner and Ridgway 1993; Nizzo 2007).

The cremation is called "of Nestor's Cup" due to a Geometric *kotyle* of Rhodian manufacture discovered in the grave. The *kotyle* was found in many scattered sherds which were embedded in a black ovoid lens (4 metres in diameter), below the levels of the cairn, and commingled with bone fragments and other twenty-six vases, fragmentary and likewise burnt. Among these, of great importance is the *plethora*-set for symposia (four craters, three *oinochoai*, one *kantharos* and the famous *kotyle*). The presence of craters is quite exceptional and never attested in other grave goods' assemblages at Pithekoussai's graveyard (Buchner 1966; Buchner and Ridgway 1993; d'Agostino 2000). Silver fragments of a fibula *ad arco serpeggiante* were also uncovered (Buchner and Ridgway 1993). The great relevance of the *kotyle* of

Nestor is due to an incised metrical inscription in three lines beard on its surface (SEG XIV:604). This graffito runs from right to left (retrograde inscription); the first line of the inscription is in iambic trimeter, while the second and the third lines are in dactylic hexameters (Buchner and Russo 1955; Webster 1956; Guarducci 1961; Buchner 1966; Watkins 1976; Powell 1991; Cassio 1994; Pavese 1996).

Chronological indication provided by both the typology of other vases and the horizontal stratigraphy agree with the assignment of the *kotyle* and its inscription to ca.. 730 BCE (Buchner and Ridgway 1993). Hence the inscription is among the oldest known documents of Greek script and represent the first piece of Homeric times poetry preserved in contemporary writing.

Beside the astonishing material culture assemblage, cremation 168 shows a complex stratigraphic context and, therefore, its archaeological sequences' reconstruction was contentious (Buchner and Russo 1955; Buchner and Ridgway 1993; Nizzo 2007).

The black lens of the cremation 168 showed an unusually longed ovoid shape. As described in Buchner and Ridgway (1993), an inlet on the NE side was also attested. Its limits were not very distinct and blended with the surrounding brownish earth. The lens showed three recesses of the ground. Furthermore, inhumation 455, oriented to NE-SW, cut through black lens in the SW corner. In another corner the cremation was disturbed by *enchytrismoi* 441 and 440, whose placement have caused the partial demolition of cairn 168. This occurrence led Buchner, a few months after the burial's excavation, to consider the possibility that it contained three distinct cremations, agglutinated through perimeter walls. However, this hypothesis was rejected by Buchner himself in the final edition of the necropolis *Pithekoussai I* (Buchner and Ridgway 1993) since the sherds of some vessels, among which those of the inscribed *kotyle*, were scattered throughout the entire perimeter of the lens.

Moreover, the examination of the scarce cremated skeletal remains had given no indication of belonging to more than one individual. A first assessment of skeletal material was performed in two different moments by T.F. Spence of Birmingham University and M. J. Becker of West Chester University. The morphological analysis of the specimens performed by the two anthropologists identified: (1) according to Spence, one individual aged 10 years; (2) according to Becker, one individual aged between 12 and 14 years (Buchner and Ridgway 1993; Becker 1995; 1999). No evidence of faunal remains was attested among the osteological record. The archaeological evaluation of the gender, based on the presence of the silver fibula fragments, determined the individual as male (Buchner and Ridgway 1993).

A huge body of archaeological literature attempted to explain the unique association between the astonishing material culture assemblage and the age-at-death of individual buried with it. Bruno d'Agostino (2011) pointed out that the Tomb of Nestor's Cup did not reflect the social condition of the subadult's parents and/or their belief system. On the contrary, the exceptional nature of the grave goods and their association with an adolescent would reflect an intrinsic condition of the deceased linked with the sacral and religious sphere (*idem*.).

The cremated remains from the Tomb of Nestor's Cup were moved from the Museo Archeologico Nazionale of Villa Arbusto in Lacco Ameno (Ischia island) to the Servizio di Bioarcheologia of Museo delle Civiltà (Rome) in July 2018, as part of the PTH I skeletal and dental collection.

The skeletal material associated with Nestor's Cup consists of 130 burned fragments of varying sizes (from sub-centimetres to ~14 centimetres) weighting overall 218.4 grams (Figure 4.1). It is worth to note that Becker reported instead a total weight of 289 grams (Becker 1995;1999). The bone fragments are affected by profound heat-induced alterations, including fractures, changes in strengths, modifications in size and shape (warping, shrinkage), and chromatic variations of the specimens from brownish-blackish to whitish-calcined white.

FIGURE 4.1 The skeletal remains from the Tomb of Nestor's Cup

The bones in their complex are poorly represented. The teeth are absent, except for a small piece of a dental root. Due to the high level of fragmentation and the poor state of preservation, the remains were cleaned without water using soft-bristle brushes. After pre-treatment (cleaning), morphological and morphometric analyses of the specimens were performed. A number of bone fragments were selected for histomorphometric analysis. The rational under the bone fragments selections based on the morphological assessment resulting into the selection of a total of 38 fragments chosen according to the various morphologies.

4.1 Morphological and histological methods

Morphological and morphometrical re-assessment of cremated remains in the Tomb of Nestor's Cup was performed in order to obtain (1) the Minimum Number of Individuals (MNI) and the presence of faunal remains, (2) the osteobiography of the individual/s (age-at-death and sex), as well as (3) determining the identification of fragments (element, side and portion), (4) the condition and preservation degree of specimens and (5) possible *post mortem* modifications.

The presence and degree of burning was assessed primarily on the basis of bone coloration, which allowed separation of specimens into three categories: (a) slight burning (light brown or reddish discoloration, often localized); (b) moderate burning (more extensive dark brown or black discoloration); (c) sever burning (calcined bone, white, grey or blue-grey in colour, often warped and shrunken) (Lemmers 2012; Depierre 2014; Pokines and Symes 2014). Morphological observations were made using a 10-power lens under artificial laboratory light. Not all of the data-sets could be collected for every specimen. Due to the very small dimension of the fragments and the absence of morphological diagnostic traits, the specimens could be assessed only to broad anatomical districts, such as skull, axis and pelvis, long bones (large-diameter long bone and small-diameter long bone), and short bones (hand and foot). Pieces found to conjoin were reconstructed using water-soluble glue. When the morphology of fragments was ambiguous for a taxonomic assessment (human or not-human), they were further analyzed and compared with the faunal reference collection kept at the Servizio di Bioarcheologia of the Museum delle Civiltà of Rome. This step led to identification of a number of faunal cremated remains commingled with human specimens.

Given that fifty years of publications and previous assessment of the burial remains concluded that the bones were all human and referable to a young individual (Buchner and Ridgway 1993; Becker 1995; 1999), this study was organised by three analytical phases: (1) separating human and non-human remains; (2) regarding human sub-sample, determining the MNI and the age-at-death of individuals; (3) regarding faunal sub-sample, attempting order/genus/species identifications. All the analytical phases combined gross morphology observations and histological analyses of long bone cortex. Due to the highly fragmented nature of the remains, not all the specimens were undoubtedly identifiable by morphological and morphometrical analysis. Thus, the first step was to select "recognized as human"; "recognized as animal"; "unidentified" fragments.

The histomorphometric analysis of cremains was performed at the Microscopy Laboratory at the Servizio di Bioarcheologia of Museo delle Civiltà. In order to guarantee the blind histological assessment, all selected specimens were labelled with a sequential alpha-numeric id. (PTH 168+a; b; c; d; etc…) with no taxonomic indication.

Thin sections of cortical bone were obtained using the method proposed by Nava et al. (2017) for the preparation of dental thin section, with some modification. In the specimen under analysis is fixed with the proper orientation in a mould, specifically chosen to fit inside the microtome holder, using a small amount of light-curing composite resin (Charisma, Heraus Kulzer). The composite is polymerized using a cure light (Mectron Bluelight) for 60 seconds. The specimen is then completely embedded in epoxy resin, obtained mixing the resin with the hardener (Epo-Fix, Buehler Ltd) in the ratio 50g resin for 10 g hardener. The mould is inserted in a vacuum chamber for 15 minutes to remove air bubbles and then leaved curing for 24 hours at room temperature. Bone is sectioned using a Diamond Blade Microtome (Leica 1600, Leica AG or Buheler Isomet low speed). A first cut is done to remove the external part of resin block and to expose the inner surface of bone fragment. The holder is repositioned 600 μm under the exposed surface to obtain a 300 μm thick section. A microscope slide previously treated with liquid silane (3 M RelyX Ceramic Primer) is attached on the exposed surface before sectioning using a light cure adhesive (3 M Scotchbond Multi-Purpose Adhesive) polymerized for 60 seconds. A thin section averaging 300 μm is cut with the microtome arm advancing at medium-low speed. The section is reduced to a thickness of ~100 μm. This step is performed by means of a motorized grinder (Minimet 1000 Automatic Polishing Machine, Buehler) with water resistant abrasive paper of two different grits (400 and 1200, Carbimet, Buehler Ltd). To remove the grooves leaved from the blade and the grinding procedure, the section is polished using the motorized grinder with a micro-tissue (Buehler Ltd) and diamond past with 1 μm size (DB-Suspension, M, Struers) for at least 15 minutes.

Micrographs of the samples are obtained using a transmitted light microscope (Olympus BX 60) under polarized light with magnification of 40x (Figure 2). Overlapping pictures are taken for each specimen (typically 20-30 images at 40x) using a camera (NIKON mod. DS-Fi3) attached to the microscope and then assembled in a single image (Figure 4.2) using dedicated software (Fiji-plugin MosaicJ, Thevenaz and Unser 2007) and ICE 2.0 – Image Composite Editor (Microsoft Research Computational Photography Group).

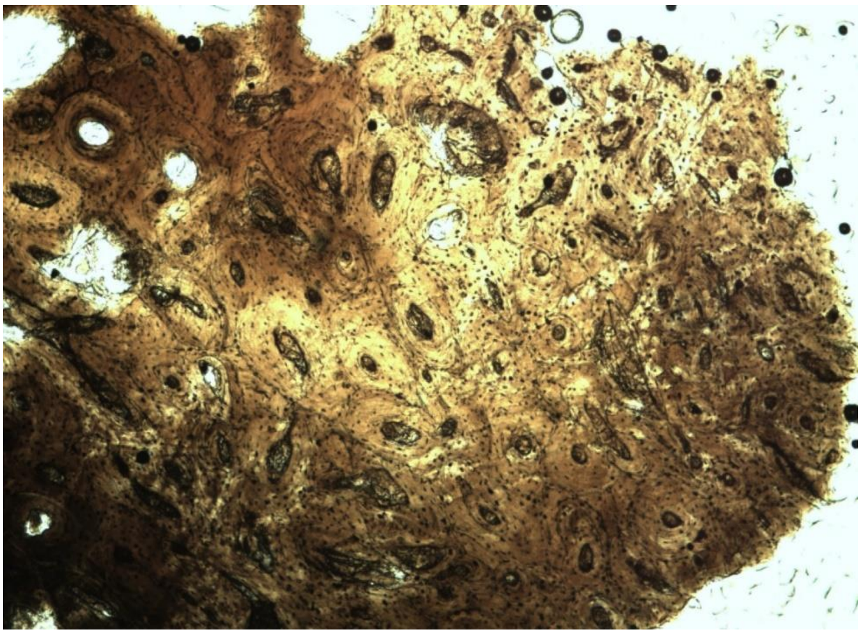

FIGURE 4. 2 Micrograph of the sample PTH 168 B (40x)

The histological analysis of long bone cortex was performed to evaluate: (1) microstructural differences related to interspecies variations (human vs. non-human specimens); (2) *intra* species variation (age-at-death of human specimens). A testable hypothesis was stated as a means for focusing this research towards understanding the nature of the fragmentary remains. Our null hypothesis H_0 was: "there is no difference in micro-anatomy among the bones from the Tomb of Nestor's Cup".

The test of this hypothesis was performed collecting histological data with the following variables (Stout and Paine 1992; Horni 2002; Walter et al. 2004):

1. the presence of primary bone with primary osteons;
2. the presence of primary bone in form of plexiform bone;
3. the presence of secondary bone with secondary osteons;
4. Secondary Osteon Area measurement (On. Ar.) mm^2;
5. Intact Secondary Osteons (On): number of secondary osteons with an intact Haversian canal bounded by a scalloped reversal line;
6. Fragmentary Secondary Osteons (Fg. On.): number of secondary osteons with a partial visible Haversian canal that has been breached either by a neighbouring osteon or a resorptive bay and secondary osteons with no remnants of a Haversian canal present;
7. Osteon Population Density (OPD): sum of Intact Secondary Osteons (OPD (I)) per mm_2 and Fragmentary Osteon Density (OPD (F)) per mm^2;

Human bone typically does not exhibit primary tissue as plexiform bone (Crescimanno and Stout 2011); the presence of this bone formation would call into question our assumption about the specific species origin for each fragment. Additionally, human secondary bone is characterized with the abundance of secondary osteons and Haversian canals (Pitfield et al. 2016; Mahoney et al. 2018). These Haversian systems tend to variate in size and frequency within human bone. Bone sections with osteons that were smaller than expected or with considerable low frequency would also call into question the biological origin of the fragment and its age-at-death.

4.2 Results of the morphological analysis

A detailed scoring of all the bone fragments allowed to identify humans and non-human remains.

4.2.1 Human remains analysis

Remains tentatively recognized as human amount of 161.1 grams out of 218.4 grams. The representativeness of the human skeletal elements is shown in Figure 4.3. The most represented elements are from the skull and long bones. Furthermore, they also show a minor degree of fragmentation, with some elements measuring more than 5 centimetres. Chromatic variation of the bones results mostly grey and white, with only few fragments presenting a black colouring. The high degree of warping, deformation and fragmentation of the cremains attests a high efficiency of combustion (Lemmers 2012; Depierre 2014)

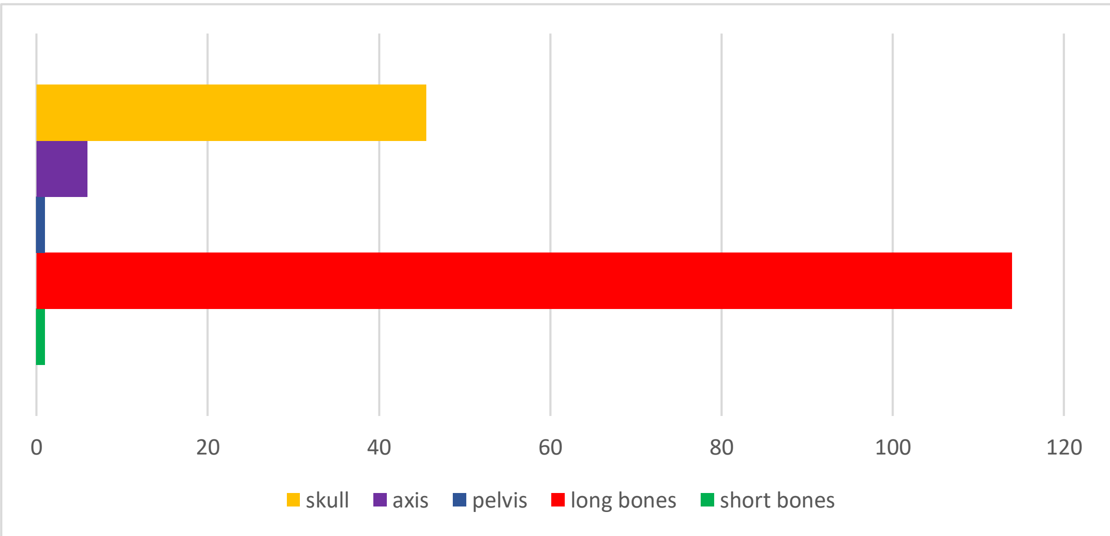

FIGURE 4.3 Human skeletal elements representation by weight in grams

From the macroscopic perspective, inside the human sub-sample, some degree of age-related incompatibility between some long bones fragments was observable. Therefore, an in-depth analysis of these fragments suggested the possible presence of multiple individuals inside the grave 168.

4.2.2 Faunal remains analysis

Faunal remains consist of 45 burned fragments of varying size (from 1 centimeter to ~ 5 centimetres), weighting overall 52.3 grams out of 218.4 grams. Identification of the specimens was particularly meticulous and was carried out using both bone atlases (e.g Schmid 1972, Barone 1995) and the reference collection of the Archaeozoology Laboratory of the Museo delle Civiltà. Two out of 45 fragments were recognized as ovicaprines, possibly *Ovis aries* (epistropheus and proximal portion of the ulna) (Halstead et al. 2002; Zender and Pilaar 2010). The thickness and morphology of few elements may indicate the presence of medium-sized carnivores, possibly dog, and in some cases also of birds; however, the absence of specific diagnostic features does not allow us to be fully confident with the diagnosis. Nevertheless, the most frequent elements are diaphysis fragments of undetermined long-bones belonging to medium mammals. Faunal remains present a combustion degree similar to that documented on human elements. Such evidence indicates that animals, or portions of them underwent similar processed as humans and that they may represent food offerings for the deceased(s) of companions in the journey to the afterlife.

4.3 Results of the Histological analysis

Thirty-eight bone fragments (human as well as faunal) have been selected from the Nestor's tomb for histomorphometric analysis on the basis of the morphological determination. A blind observation of the thin sections to divide human and non-human bones have been performed. This assessment for identifying animal bone fragments was done using micro-anatomical features such as the presence of plexiform bone, degree of primary bone, presence of osteon banding (Figure 4.4).

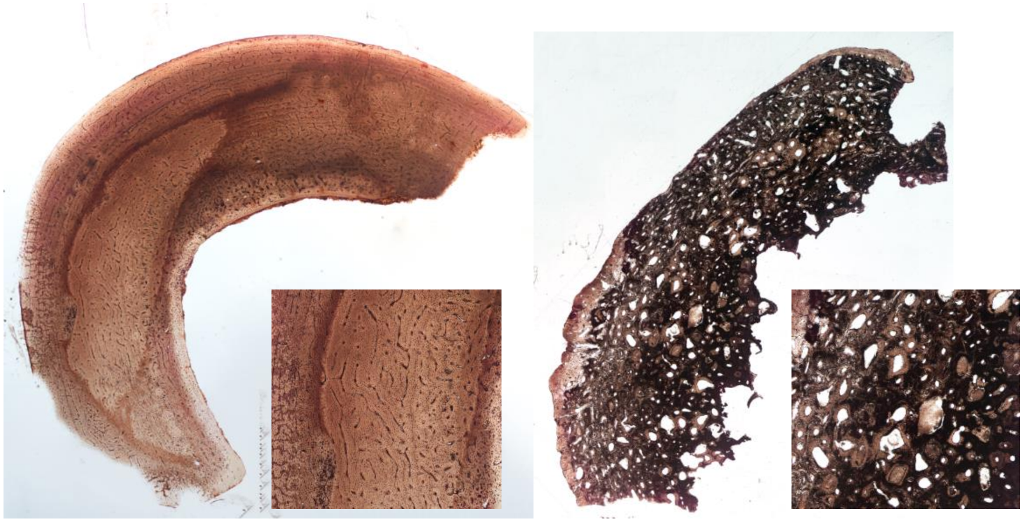

FIGURE 4.4 Comparison of peculiar microfeatures between a transversal thin section from the faunal specimen from faunal specimen PTH 168h (*on the left*) and human specimen PTH 168A (*on the right*)

Table 4.1 illustrates the matching between the morphological assessment of the bone fragments and the blind assessment of the histological observations of the thin sections.

ID. SAMPLE	MORPHOLOGY ASSESSMENT	HISTOLOGY ASSESSMENT
168A	Human	Human
168B	Human	Human
168C	Human	Human
168D	Human	Human
168E*	Human	Human
168F	Human	Human
168G	Human	Human
168H	Human	Human

168J	Human	Human
168 M II	Human	Human
168 N	Human	Human
168 O	Human	Human
168 P	Human	Human
168 Q	Human	Human
168 R	Human	Human
168 S	Human	Human
168 T	Human	Human
168 U	Human	Human
168 X	Human	Human
168 a*	*Aves* (?)	NA
168 b*	*Aves* (?)	Animal
168 c*	MSM	Animal
168 d	SSM	Animal
168 e	MSM	Animal
168 f	MSM	Animal
168 g*	MSM	Animal
168 h*	MSM	Animal
168 i	*Aves* (?)	Animal
168 l*	*Aves* (?)	Animal
F 2*	MSM	Animal
F 3*	MSM	Animal
F 4*	*Aves* (?)	Animal
F 5*	*Aves* (?)	Animal
F 6*	MSM	Animal
F 7	MSM	Animal
F 8	MSM	Human
F 10*	*Ovis*	Animal

TABLE 4.1. Compared assessment of Nestor's bones identification by morphological and histological evaluation. * specimens recognized as human or faunal remains using micro-anatomical features in the blind test.

However, due to the poor readability of the specimens, more detailed quantitative analyses, i.e. Secondary Osteon Area and Osteon Population density measurements, were not taken on these samples. *SSM (*Small Size Mammalian*); *MSM (*Medium Size Mammalian*)

Results show that in 100% of cases the morphological assessment as human match with the histological assessment. There is 94.4% agreement between the faunal assessment with the histological observation of them. One over eighteen faunal thin sections have been re-assessed as humans. Among the faunal sub-sample, there are several fragments that exhibit only primary bone with bands of primary osteons and these samples are highly suggestive of animal remains. We suggest they might represent the remains of a carnivore, possibly that of dog phalanges.

When possible, in order to confirm the results of blind test, the average of Secondary Osteon Area measurement (On. Ar.) mm^2 was calculated. Any specimens exhibited an average of less than 0.025 were considered animal. The results are reported in Table 4.2.

ID. SAMPLE	ON. AR. [mm^2]	Min [mm^2]	Max [mm^2]
168 A	0.036	0.015	0.081
168 B	0.045	0.045	0.046
168 C	0.074	0.040	0.131
168 D	0.062	0.047	0.060
168 F	0.034	0.013	0.071
168 G	0.030	0.018	0.040
168 H	0.105	0.032	0.501
168 J	0.044	0.026	0.076
168 K	0.052	0.030	0.073

168 L	0.036	0.022	0.056
168 M	0.022	0.012	0.035
168 N	0.022	0.013	0.034
168 O	0.012	0.008	0.020
168 P	0.029	0.016	0.038
168 Q	0.048	0.029	0.076
168 R	0.031	0.010	0.068
168 S	0.030	0.014	0.046
168 T	0.043	0.015	0.070
168 U	0.056	0.032	0.102
168 X	0.034	0.010	0.049
168 d	0.076	0.015	0.034
168 e	0.295	0.018	0.055
168 f	0.225	0.023	0.035
168 i	0.022	0.006	0.054
F7	0.022	0.013	0.015
F8	0.045	0.027	0.061

TABLE 4.2 Results of the Secondary Osteon Area measurement (On. Ar.) mm^2.

Once the human remains were confirmed and/or identified though histology, then OPD values were determined for this sub-sample. This was done by counting the number of fragmentary and intact secondary osteons per cortical bone area (Stout and Paine, 1992). Given that the bones were from different skeletal regions of the body; a specific age was not assigned to them but we were able to determine OPD value clusters that suggest that there were more than one individual represented Table 4.3

Sample Id.	Cortical region of interest area [mm^2]	N osteons	OPD
168 A	15.3	296	19.3
168 B	11.1	218	19.7
168 C	2.0	40	19.6
168 D	13.5	189	14.0
168 E	14.7	214	14.6
168 F	16.4	101	6.2
168 G	18.6	137	7.4
168 H	46.1	676	14.7
168 J	21.0	213	10.1
168 K	24.3	192	7.9
168 L	25.4	320	12.6
168 MII	11.9	78	6.6
168 N	16.5	99	6.0
168 O	2.0	23	11.2
168 P	5.1	33	6.5
168 Q	9.1	98	10.7
168 R	17.7	192	10.8
168 S	24.6	159	6.5
168 T	33.9	202	6.0
168 U	48.1	521	10.8
168 X	27.8	311	11.2

TABLE 4.3 Results of OPD (Osteon Population Density) of the human specimens.

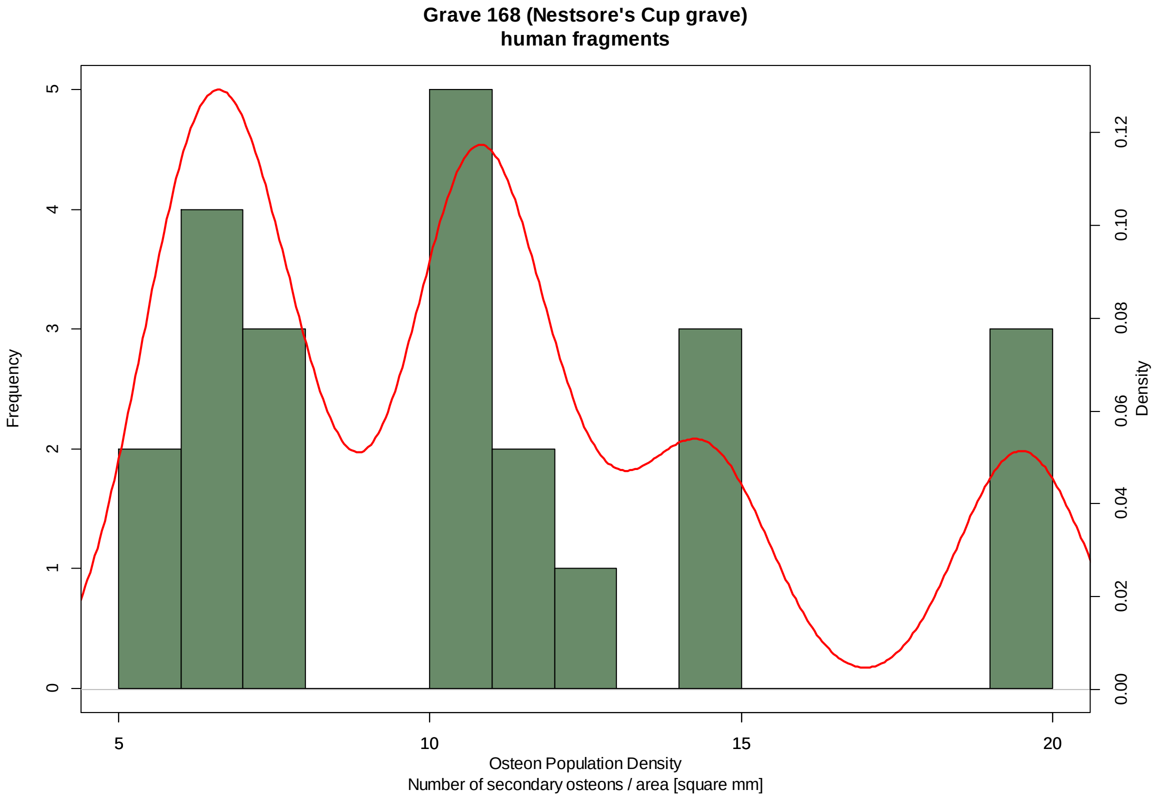

FIGURE 4.5 Distribution of the OPD (Osteon Population Density) values of human specimens.

The OPD values of human bones ranges from 5.96 to 16.65. The density plot of the OPD distribution values, as well as the histogram, show three different inflection points and three groups of OPD ranges (Figure 4.5). OPD values cluster in three different classes: (1) {5.96, 7.9}, eight specimens; (2) {10.14, 14.68} eleven specimens, (3) {19.28, 19.65} three specimens. This evidence suggests that there might three individuals represent at this feature. Critically, these OPD values are found on three separate humeral fragments, morphologically different, and suggest that there might be three different individuals represented by Nestor's bone fragments.

It is to be stressed that, according to the literature, osteon counts as well osteon size tend to match among bones from the same individual. According to

S. Stout (1978), despite the bone origin (femur, humerus, tibia, fibula, ulna and radius) of the thin sections, the OPD clusters represent separate individual and not micro-anatomical variation.

Regarding age at death estimation, the cremated nature of the bones does not allow the use of regression formulae, present in the literature (Stout and Paine, 1992). However, the micro-anatomy of the Nestor's bone fragments shows the relatively greater presence of intact secondary osteons in respect to the fragmentary ones. This fact suggests a general age at death of all the three individuals less than 30 years.

4.4 $^{87}Sr/^{86}Sr$ isotopic ratio analysis

Among the human commingled remains of Nestor's grave, a left *pars petrosa* of the temporal bone was collected. This bone portion was assessed with sufficient confidence as pertinent to an adult (Figure 4.6).

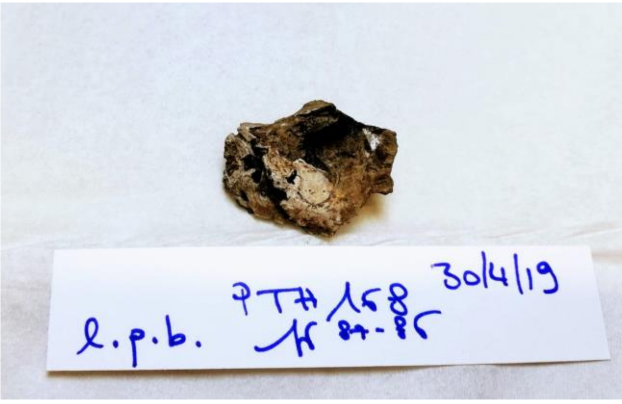

FIGURE 4.6 The left *pars petrosa* of the temporal bone from the Tomb of Nestor's Cup before cutting.

The $^{87}Sr/^{86}Sr$ determination of the specimen has taken place at the Geochemistry Laboratory of the Institut für Geowissenschaften of the Goethe Universität in Frankfurt, in collaboration with Prof. Dr. Wolfgang Müller. The isotopic $^{87}Sr/^{86}Sr$ ratio value of 0.708378 falls into the local range of Ischia island, estimated between {0.70834, 0.70864}. Thus, it is possible to state that there is an adult born on the island, among the human remains taphonomically associated with Nestor's Cup.

4.5 Discussion and conclusion

During the last fifty-years since the discovery and early assessment of the Tomb of Nestor's Cup there has been considerable debate about the nature of the osteological remains and of who these remains represented. Much of this debate has been focused on the astonishing material culture and, in particular, on the extraordinary association of the Cup with a child. In this preliminary study, it was possible documented via morphological and histological observations that at least some of the skeletal burnt remains from the Nestor's grave are not human. The skeletal remains support the notion that the fragments represent at least three humans, on two relatively older and one younger, along with animal (ovicaprid, bird, and possibly carnivore [dog?]) bones is significant. Regarding the faunal remains, no single methodological approach can determine species type; general microstructures provided an indication as to whether the bone fragment is human or nonhuman (Hillier and Bell 2007). These findings may give some pause towards how the burial/feature has been interpreted throughout these decades, providing a clear understanding of the origin of the skeletal remains associated with the Nestor's Cup and thus answering the question: who was buried with the Nestor's Cup?

CHAPTER FIVE

DISCUSSIONS

5.1 Discussion of the results of morphological and morphometrical analysis

The anthropological assessment was performed on 364 burials, among which 182 inhumations and 182 cremations from both areas of Pithekoussai's graveyard, known as Pithekoussai I (Buchner's excavations 1952-1961) and Pithekoussai II (Buchner's excavations 1965-1982). The morphological analysis led to the identification of 402 individuals (Appendix A). Both the inhumation and the cremation series show a strong underrepresentation of the skeletal remains. As far as inhumations are concerned, this occurrence is to be ascribed mostly to the burying of the remains in the warm volcanic sediment, which led to a massive degradation of the osteological material. In cremations, on the other hand, the individual weights of the series are considerably lower than what is theoretically expected for a body subjected to cremation. In fact, experimental studies on the reduction in weight of the skeleton due to the effects of the fire on modern samples indicate average values between 3379.3 and 2288 grams for males and between 2305.2 and 1550 grams for females (Warren and Maples 1997; Bass and Jantz 2004; Mays 2010). These values are difficult to attest in ancient samples, due to different burial customs (selective gathering of remains in secondary cremations, for example) as well as taphonomic phenomena. A comparison between the Pithekoussan data-set and that of the cremations from the necropolis of Pontecagnano (Colucci's excavations, third-quart of eighth century BCE; d'Agostino and Gastaldi 2011) shows in the latter a weight average of 1491±331 grams for the male sub-sample against an average value of slightly less than 1126±401 grams for female individuals; the weight values available for Pithekoussai's series show an inferior average weight in both male and female sub-samples: 352.26 grams for the former and 237.51 grams for the latter. Finally, analysing the weight consistencies in relation to the main chronological phases, they seem rather constant in the underrepresentation of skeleton, at the least up to the Corinthian period. Likewise, there are no marked differences in weight values in relation to sex.

With regard to PTH I sub-sample, the anthropological data obtained in this research was checked against the data published by M. Becker, who, as mentioned above, performed the first assessment of a number of inhumations and cremations from Buchner's excavations 1952-1961. The comparison between new data and the ones published by Becker (1995;1999) revealed discrepancies in the diagnosis of sex and age-at-death of individuals. In 68.38% of the cases our sex diagnoses agree with

Becker's. However, in 8.55% of the cases the individuals determined as female by Becker are recognized as males in this study. In one case a male (according to Becker) is assessed in this study as female. The case is that of cremation 159, identified by the same author as a male of 75 years-at-death on the basis of his long bone rubusticity. By contrast, the grave goods suggested that the deposed may be a female. Becker's further hypothesis is that it might be a robust female, member of a high status family, or alternatively, a case of a male playing a female role (Becker 1995; 1999). The morphological and morphometrical analysis performed in this study identified the presence of a number of skeletal elements that show a different thickness of the cortical bone. Among these, we were able to attest a generic gracility of the skeletal portions. This has led us to the hypothesis that individual PTH 159 might actually be a female. On the other hand, the presence of a few elements incompatible with PTH 159 could be due to a stratigraphic contamination between different cremation lenses.

Discrepancies are also recorded in the MNI documented in some cremations by Becker, as is the case for cremations 140 and 220, which - according to Becker- are pertinent respectively to two infants (grave 140) and to two females of different ages (grave 220). In our opinion they are both single (Appendix A). Further discrepancies are also found in the weight of the cremations previously analyzed by Becker and re-examined in this study.

Figure 5.1 shows the distribution of the weights from the cremations of PTH I series and the individual weights recorded for the same burials by Becker (1995; 1999). Some of these deviate from the distribution, showing inconsistencies in weights. Among these we report, by way of example, the case of cremation 166 weighing 182.38 grams versus 289 grams in Becker (1995), cremation 206 weighing 109.87 grams versus 870 grams in Becker (1995); as well as the aforementioned 168, weighing 218.4 grams versus 289 grams in Becker (Chapter Four, paragraph 4. 2.1). As previously mentioned, given the consistency of the sample, the demographic profiles assessed in this research represent a partial picture of the real demographic trend of the pithekoussana community over time. In particular, this clearly emerges in the representation of perinatal and infant classes. The ratio by age group shows how the perinatal and infant segment is markedly under-represented. Based on demographic models and historical data, in pre-antibiotic communities' mortality during the first year of life could reach values above 30% (Weiss 1973).

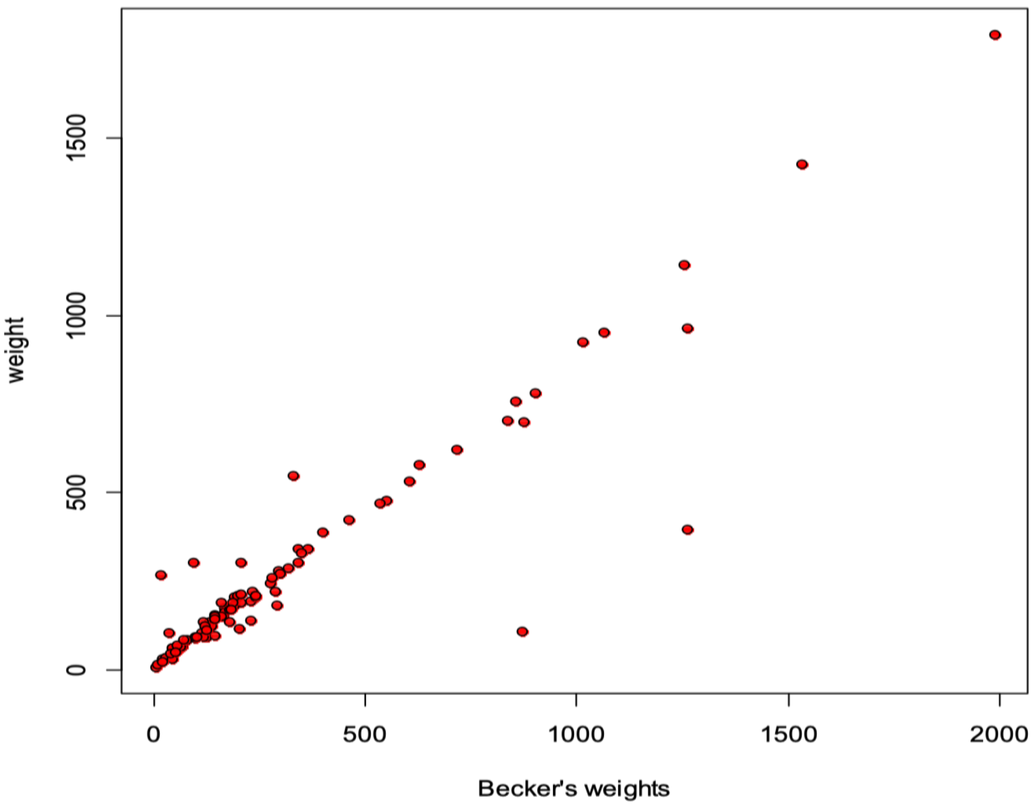

FIGURE 5.1 Distribution of cremations weights from PTH I and the weights recorded for the same burials in Becker 1995 and 1999

However, this proportion is rarely mirrored in the archaeological samples, and Pithekoussai is a clear illustration of this. However, it is worth to point out that, in Pithekoussai's case, anthropological and archaeological data show a remarkable bias when it comes to the attestation of infantile and perinatal classes. We need to bear in mind that our sample consistency is strongly flawed by the small number of depositions made available to the anthropological examination, rather than by the actual Pithekoussai's funerary representation. Indeed, focusing on PTH I subsample, due to the massive underrepresentation of new-borns and infants, we compared our anthropological results with the archaeological evidence published in Buchner and Ridgway (1993). *Enchytrismos* inhumations, a ritual designated in Pithekoussai's graveyard only for new-borns, according to the archaeological record, are attested archaeologically as 18% in LG I, 28% in LG II, at least 10% in MPC and C. The number of new-borns is higher than that shown in anthropological record, which assessed it as 6.55% in LG I, 2.63% in LG II, and from 3.57% to 1.08% for later phases. The attestation of the adult and non-adult classes is an indication of the full representativeness of the necropolis from a demographic point of view. This is in according to a model verified in Campania also in the Orientalising necropolis of Pontecagnano, where the ratio of adults / infants is approx. 40% -60%. (Cuozzo 2003; Pellegrino et al. 2017, Sperduti et al. 2019). For example, the full visibility of the infant component in the Orientalising Pontecagnano constitutes an important change with respect to the early Iron Age and a significant difference with respect to the numerous contemporary contexts, first of all Lazio, where a general exclusion of children from formal burials is documented the frequent burial within the settlements (Bietti Sestieri 1992).

With regard to Pithekoussai's infantile segment, noteworthy is the presence of double cremations of an adult female individual and an infant. Leaving out the mother-foetus burial 772 - already discussed above - cremation 916 from LG I yielded the remains of an infant between the 1 and 5 years and a female older than 20 years of age. Given that cremation 916 overlapped with infant burial 951, the possibility of a stratigraphic contamination between the two burials has been taken into account. However, the hypothesis was rejected since the infant bones were burned. The co-presence in the same burial of an infant and an adult is also attested in the inhumation series, for example in burial 835 (LG I. LG II)

Taking into account the basic biological information, i.e. sex and age at death, enabled us to evaluate the spatial distribution of the male / adult - female / adult - infant categories. The analysis of the density of evidences was performed only for the PTH II area since, as previously mentioned (Chapter One, paragraph 1.3), PTH I series is strongly under-represented, especially in the inhumation sub-sample, almost completely absent in our study.

Focusing on PTH II sample, we observed the spatial distribution of the skeletal remains in the batch published by Cinquantaquattro (2016) and pertinent to the burials investigated by Buchner and Ridgway during the years 1965 and 1967.

With regard to male distribution, a greater density is attested along the entire northern edge of the trench, with other micro-areas of density especially along the north-eastern edge of the area.

As for the female sub-sample (Figure 5.3), instead, the greatest concentrations of burials are attested in the western area of the excavation trench, with densities also present in the north-western areas, towards the center of the trench. A slight concentration of female burials is also attested in the south-eastern area of the excavation. In the north-eastern area, male and female burials are strongly buried. An interesting datum comes from the distribution of infant burials (Figure 5.4), which largely overlaps the north-western concentration areas of PTH II area, for the most part ascribable to female depositions.

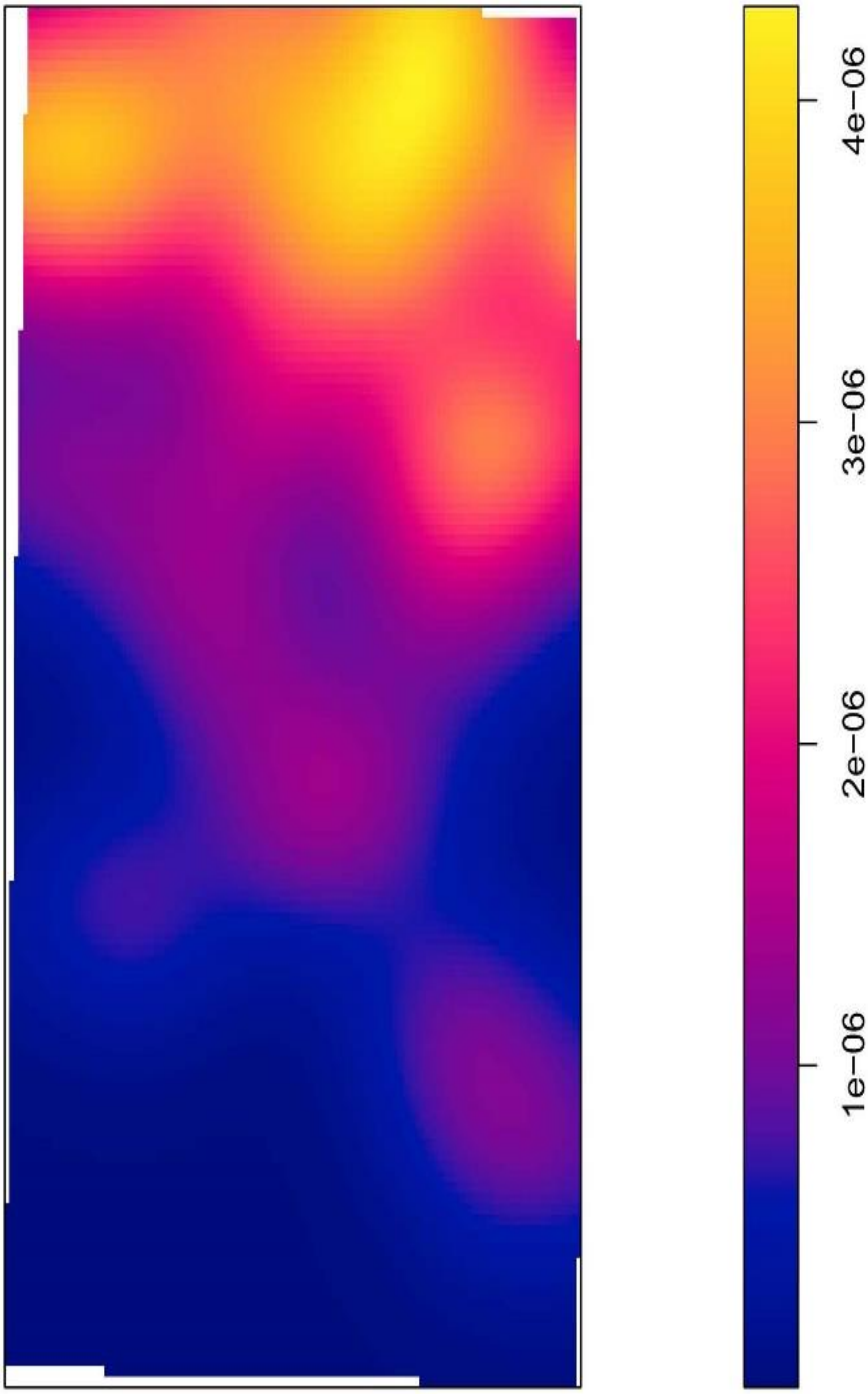

FIGURE 5.2 Density plot of the male graves in PTH II area, sub-sample 1965-1967 (*Cinquantaquattro 2016*)

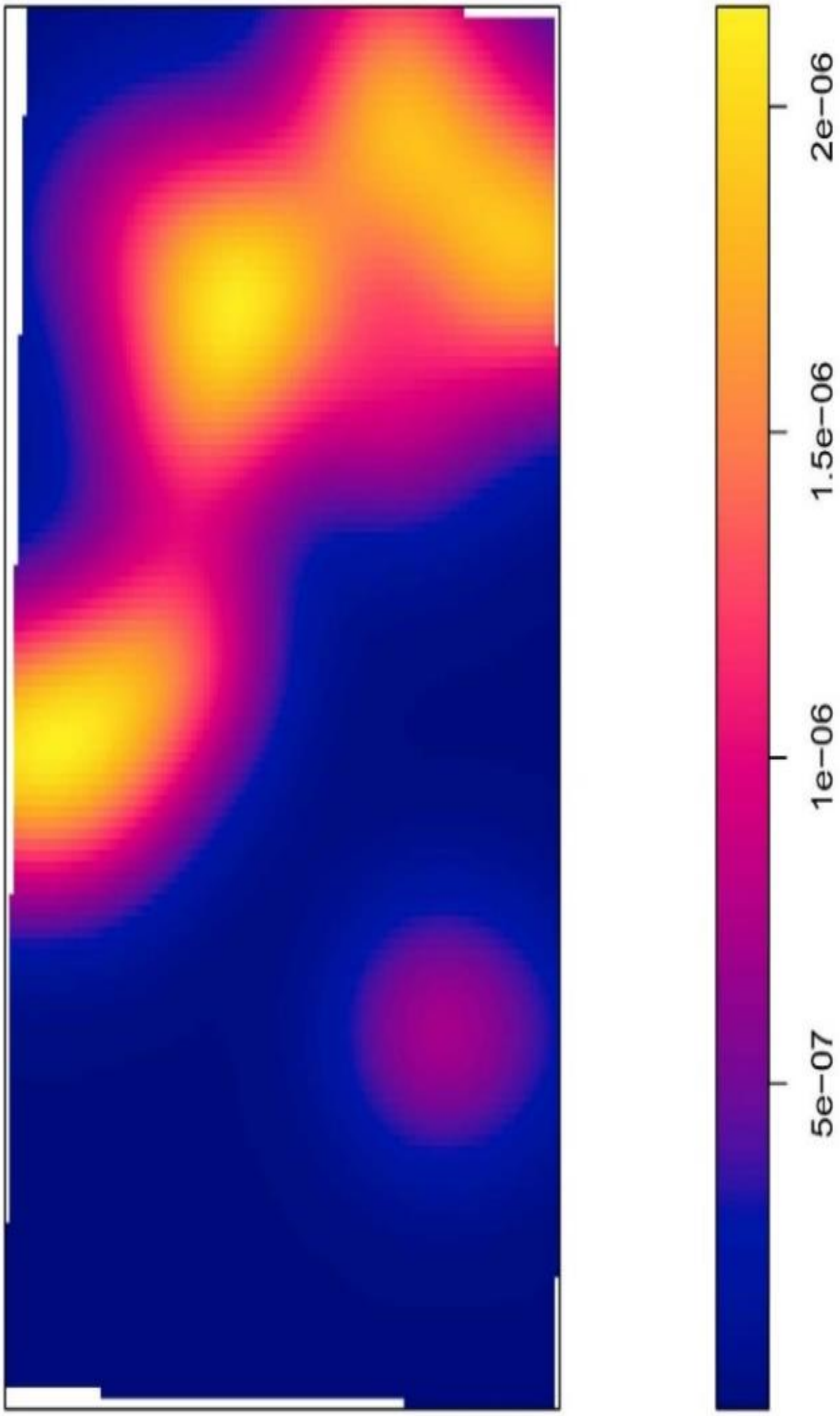

FIGURE 5.3 Density plot of the female graves in PTH II area, sub- sample 1965-1967 (*Cinquantaquattro 2016*)

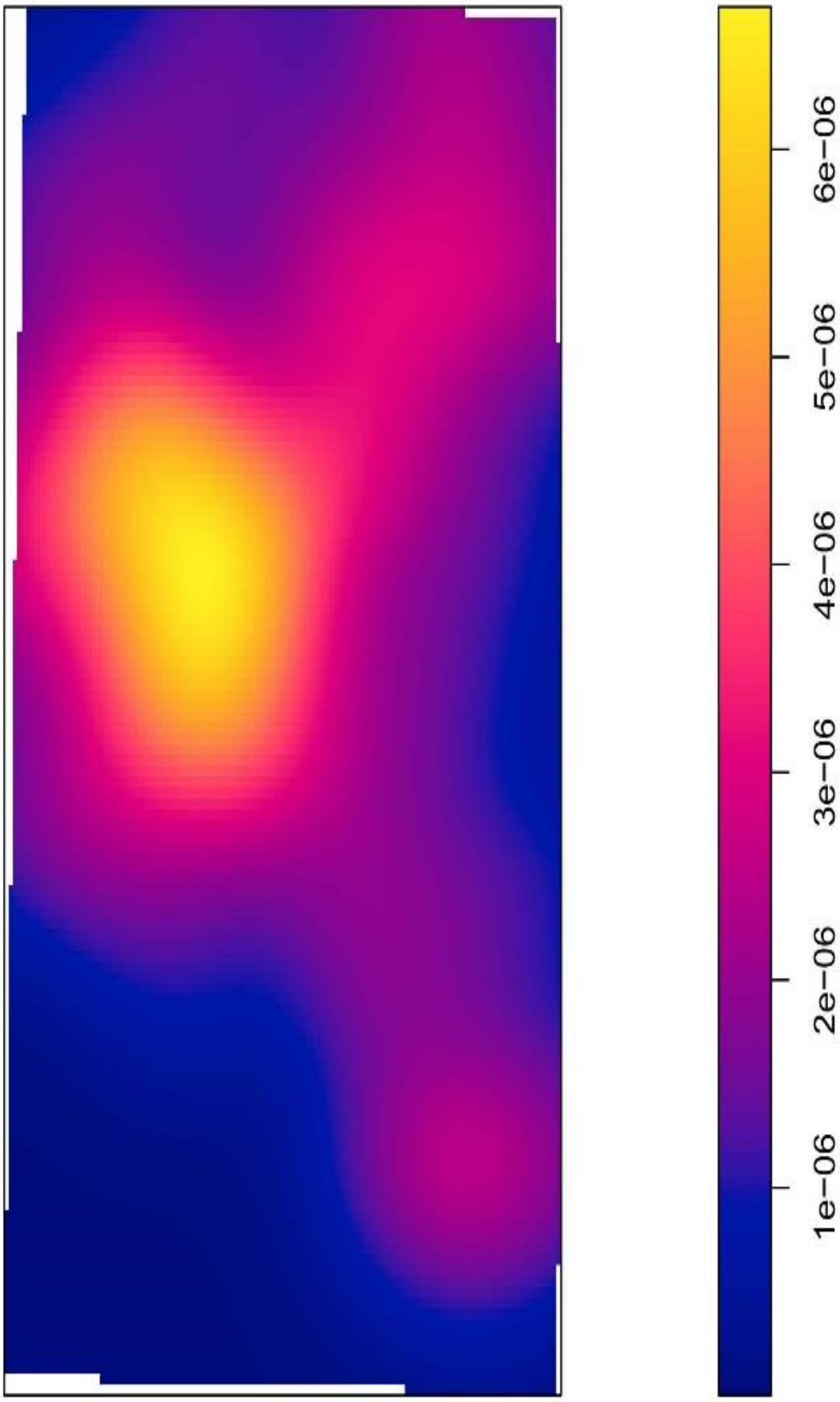

FIGURE 5.4 Density plot of the infant graves in PTH II area, sub-sample 1965-1967 (*Cinquantaquattro 2016*)

5.2 Discussion of the $^{87}Sr/^{86}Sr$ results in environmental and human samples

The core aim of this research is to determine the proportions between allochthonous and allogenous individuals in Pithekoussai's graveyard from period LG1 to period C, in order to deeply understand the bio-cultural dynamics of interactions occurred during the Italian Iron Age among natives and foreigners.

For this purpose, we have performed the largest analysis known so far of $^{87}Sr/^{86}Sr$ isotopic ratio for a single graveyard (N= 94 determinations on human remains + 11 determinations for the baseline assessment). Moreover, a consistent number of cremated remains were included in the analysis using the pars petrosa of the cranium as sampling anatomical portion.

Moreover, this pilot study aims to build, for the first time, the Sr isotopic bioavailability for Ischia island, through a multi-analytical approach that takes into account environmental sources as well as atmospheric and anthropogenic inputs. However, the complex interactions between the Sr local availability and the dietary habits of the individuals (the possible strong influence of marine food), did not allow us to draw a reasonable and consistent "local isotopic ratio range" from the environmental data (Chapter Three, paragraph 3.2.1).

Alternatively, we used a series of statistical approaches trying to extract the "core" of local born individuals from the shape of their distribution and adopting measures such as Turkey's interquartile range or the deviation from the median (Lightfoot and O'Connell 2016; Chapter Three, paragraph 3.2.1). Again, this attempt at determining the local range was unsuccessful, given the highly asymmetric (skewed towards radiogenic values) shape of the Sr isotopic ratio distribution (Figure 3.28), as well as the strong kurtosis of the distribution.

Finally, we have adopted a mixed approach, using "bio-cultural" factors and verifying them on the dataset. Almost all infants and children (1<age <10) lie in the center of the Sr isotopic distribution, considering that it is highly probable that this segment of the population was less subjected to long distance movement. It is worth to note that this interval almost coincides with the mean of the infant+child Sr values ± 2 standard deviations. We excluded the individuals aged less than one year, because their Sr values could have been strongly affected by the mother's diet and movement. Therefore, we adopted the $^{87}Sr/^{86}Sr$ local range for the study area as {0.70834, 0.70864}. The results of our $^{87}Sr/^{86}Sr$ analysis for human samples are reported in Appendix B.

As mentioned above (Chapter Three, paragraph 3.2.2, p.135), the double check performed on four enamel and petrous bone samples in the same individuals shows the different $^{87}Sr/^{86}Sr$ values of the petrous portions (that deviated from soil $^{87}Sr/^{86}Sr$ ratio signal) compared to those from the enamel. More accurately, $^{87}Sr/^{86}Sr$ values from the petrous bone are always lower than the enamel, thus indicating a shift towards soil values. The implication of this is that there is a possible underestimation, among cremated, of the amount of non-local individuals.

The analysis of the Sr isotopic ratio resulted in a number of interesting findings:

1. the pattern of mobility seems to confirm the expectations of archaeological and historiographic sources: overall males show a higher strontium ratio {0.708221, 0.710233} than females {0.70809, 0.709029}, possibly indicating a more distant provenance; infants and children are locals. The only exception is *enchytrismos* 1026 (0.70865). However, as discussed in Chapter Three (paragraph 3.2.4), it is assumed that his/her alloctonia is resulting from maternal isotopic imprint, and that his/her mother moved during pregnancy;

2. in period LG I (the earliest phase of the Greek settlement on Ischia island), females tend to move as much as males (3 females out 4 are non-locals; 3 males out 4 are non-locals);

3. in period LG I the individuals identified as allochthonous tend to cluster around a rather narrow range {0.708797 – 0.708877}, thus suggesting a possible common provenance;

4. different patterns of mobility seem connected, across the generations, to different ritual treatments: 42.03% of the cremated individuals are allochthonous. Among these, the range of values $^{87}Sr/^{86}Sr$ is {0.708319, 0.709029}. The inclusivity of inhumations seems to be confirmed by the fact that across the generations, inhumated individuals show higher $^{87}Sr/^{86}Sr$ range values {0.708094, 0.710233}.

In spite of the sample limitations, this pilot study has allowed us to confirm the presence of allogenic individuals in Pithekoussai since the earliest phases of the Greek settlement. In contrast to what hypothesized in the archaeological research (i.e. the question of intermarriage between Greek males and native females; Chapter One, paragraph xxx), the results of the $^{87}Sr/^{86}Sr$ ratio analysis within female sub-sample seem to open to new and more complex interpretative scenarios with regard to the degree of intermingling between allochthonous and allogenous individuals as a phenomenon that involved both males and females. These results, in association with the case studies discussed in Chapter Three (pp.136-140), show the dynamics of interaction and human mobility, in their complexity and nuances, are still to be unveiled.

CHAPTER SIX

CONCLUSIONS

Reconstructing the patterns of life and death in ancient populations from their skeletal and dental remains is a rather complex analytic process, and often an impossible one. Nevertheless, the high informative value of odontoskeletal remains as biological data-source in archaeological studies has increasingly been acknowledged. These data are certainly more informative if handled in a multi-analytic approach that combines - in an interdisciplinary frame - the individual information and the archaeological contexts and issues. Today new technologies and, consequently, new methodologies provide us powerful tools that significantly increase the amount of information we are able to extract, and subsequently interpret, from archaeological specimens.

The present research aims to explore the biological sources from Pithekoussai's graveyard, combining for the first time the morphological and morphometric analysis with a Sr isotopic ratio investigation.

Described by ancient written sources as the first Greek settlement in the western Mediterranean Sea (Strabo, *Geographia*, V, 9; Livy, *Ab Ube Condita*, VIII, 22), Pithekoussai and the puzzling nature of its society have been a prominent theme in Mediterranean and Classical archaeology, with much research focusing on the ancient Greek colonisation and migration towards the Tyrrhenian coasts (e.g. Buchner 1954; Bérard 1963; Buchner 1966; Buchner and Boardman 1966; Buchner 1969; Ridgway 1981; Buchner 1982; 1983a; 1983b; Ridgway 1984; Buchner and Ridgway 1993; Bartoloni 1994; Boardman 1994; Gialanella 1994; d'Agostino 1994; Gras 1994; Malkin 1994; Asheri 1996; Boardman 1996; van Dommelen 1997; Bats and d'Agostino 1998; d'Agostino and Soteriou 1998; Osborne 1998; Bailo Modesti and Gastaldi 1999; Cerchiai 1999; d'Agostino 1999a; 1999b; De Caro 1999; Jannelli 1999; Purcell 1999; Schnapp 1999; Coldstream 2000; d'Agostino 2000; De Polignac 2000; Mele 2003; d'Agostino 2006; Hall 2006; Tsetskhladze 2006; Blandin 2007; Nizzo 2007; Brun et al. 2008; Greco 2008; Ridgway 2009; Dietler 2010; d'Agostino 2011; Greco 2011; Knappett 2011; Malkin 2011; Kelley 2012; Burmeister 2013; Black 2013; Cerchiai et al. 2013; Cinquantaquattro 2016; Donnellan 2016). However, the historical and archaeological debates about the mixed origins of Pithekoussai's community remain contentious.

This research is part of a complex interdisciplinary scheme which brings together the analysis of artefacts, cultures and technologies and the anthropological analysis of the mobility of people, in order to achieve a more in-depth and nuanced comprehension of human history in the Mediterranean Iron Age. The archaeological contextualization of demographic and isotopic data-set has enabled us to explore the integration patterns between autochthonous and allochthonous components of Pithekoussai's society, reinforcing archaeological hypotheses about the site.

In this perspective, an extension of the isotopic study to additional Iron Age contexts will allow for an integration of the results of our study in a wide-ranging regional and archeological framework. The analysis of single case studies shows how Pithekoussai's archaeology, far from being linear in its manifestations, represents the quintessence of the bio-cultural hybridization phenomena characterising the Mediterranean Sea and the all-Greek experience of the Megálē Hellàs.

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Appendix A

ID	1
SERIES	PTH I
GRAVE N	14
INDIVIDUAL ID	PTH 14
CHRONOLOGY	07 R
RITUAL	INH
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	2
SERIES	PTH I
GRAVE N	19
INDIVIDUAL ID	PTH 19
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	19
WEIGHT	30.69

ID	3
SERIES	PTH I
GRAVE N	21
INDIVIDUAL ID	PTH 21
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	43
WEIGHT	62.08

ID	4
SERIES	PTH I
GRAVE N	27
INDIVIDUAL ID	PTH 27
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	ND
AGE BECKER	70
BECKER'S WEIGHT	1062
WEIGHT	950.5

ID	5
SERIES	PTH I
GRAVE N	33
INDIVIDUAL ID	PTH 33
CHRONOLOGY	07 R
RITUAL	INH
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	45
BECKER'S WEIGHT	
WEIGHT	-

ID	6
SERIES	PTH I
GRAVE N	40
INDIVIDUAL ID	PTH 40
CHRONOLOGY	07 R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	1531
WEIGHT	1424.97

ID	7
SERIES	PTH I
GRAVE N	42
INDIVIDUAL ID	PTH 42
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	M
AGE BECKER	70
BECKER'S WEIGHT	834
WEIGHT	701.59

ID	8
SERIES	PTH I
GRAVE N	61
INDIVIDUAL ID	PTH 61
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	55
BECKER'S WEIGHT	197
WEIGHT	207.44

ID	9
SERIES	PTH I
GRAVE N	62
INDIVIDUAL ID	PTH 62
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	50
BECKER'S WEIGHT	716
WEIGHT	621.07

ID	10
SERIES	PTH I
GRAVE N	82
INDIVIDUAL ID	PTH 82
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	11
SERIES	PTH I
GRAVE N	86
INDIVIDUAL ID	PTH 86
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	40-50
SEX BECKER	M
AGE BECKER	70
BECKER'S WEIGHT	1014
WEIGHT	925.68

ID	12
SERIES	PTH I
GRAVE N	87
INDIVIDUAL ID	PTH 87
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	187
WEIGHT	184.04

ID	13
SERIES	PTH I
GRAVE N	91
INDIVIDUAL ID	PTH 91
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	40-50
SEX BECKER	M
AGE BECKER	55
BECKER'S WEIGHT	1255
WEIGHT	1143.26

ID	14
SERIES	PTH I
GRAVE N	93
INDIVIDUAL ID	PTH 93
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	10-15
SEX BECKER	ND
AGE BECKER	10
BECKER'S WEIGHT	854
WEIGHT	759.34

ID	15
SERIES	PTH I
GRAVE N	94
INDIVIDUAL ID	PTH 94
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	70
BECKER'S WEIGHT	1988
WEIGHT	1792.15

ID	16
SERIES	PTH I
GRAVE N	95
INDIVIDUAL ID	PTH 95
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	M
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	17
SERIES	PTH I
GRAVE N	114
INDIVIDUAL ID	PTH 114 A
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	2
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	21
BECKER'S WEIGHT	16
WEIGHT	267.81

ID	18
SERIES	PTH I
GRAVE N	114
INDIVIDUAL ID	PTH 114 B
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	2
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	65
BECKER'S WEIGHT	1263
WEIGHT	396.72

ID	19
SERIES	PTH I
GRAVE N	115
INDIVIDUAL ID	PTH 115
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	46
WEIGHT	48.3

ID	20
SERIES	PTH I
GRAVE N	117
INDIVIDUAL ID	PTH 117
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	45
BECKER'S WEIGHT	365
WEIGHT	342.18

ID	21
SERIES	PTH I
GRAVE N	118
INDIVIDUAL ID	PTH 118
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	70
BECKER'S WEIGHT	201
WEIGHT	116.28

ID	22
SERIES	PTH I
GRAVE N	119
INDIVIDUAL ID	PTH 119
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	65
BECKER'S WEIGHT	548
WEIGHT	479.5

ID	23
SERIES	PTH I
GRAVE N	120
INDIVIDUAL ID	PTH 120
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	142
WEIGHT	157.2

ID	24
SERIES	PTH I
GRAVE N	135
INDIVIDUAL ID	PTH 135
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	53
WEIGHT	55

ID	25
SERIES	PTH I
GRAVE N	136
INDIVIDUAL ID	PTH 136
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	189
WEIGHT	204.64

ID	26
SERIES	PTH I
GRAVE N	137
INDIVIDUAL ID	PTH 137
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	340
WEIGHT	344.19

ID	27
SERIES	PTH I
GRAVE N	138
INDIVIDUAL ID	PTH 138
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	23
WEIGHT	53.6

ID	28
SERIES	PTH I
GRAVE N	139
INDIVIDUAL ID	PTH 139
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	65
BECKER'S WEIGHT	167
WEIGHT	176.93

ID	29
SERIES	PTH I
GRAVE N	140
INDIVIDUAL ID	PTH 140
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	ND
AGE BECKER	<20
BECKER'S WEIGHT	3
WEIGHT	4

ID	30
SERIES	PTH I
GRAVE N	142
INDIVIDUAL ID	PTH 142
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	23
BECKER'S WEIGHT	196
WEIGHT	208.92

ID	31
SERIES	PTH I
GRAVE N	145
INDIVIDUAL ID	PTH 145
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	20
BECKER'S WEIGHT	131
WEIGHT	137

ID	32
SERIES	PTH I
GRAVE N	146
INDIVIDUAL ID	PTH 146
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	60
BECKER'S WEIGHT	40
WEIGHT	61.3

ID	33
SERIES	PTH I
GRAVE N	147
INDIVIDUAL ID	PTH 147
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	26
WEIGHT	35.94

ID	34
SERIES	PTH I
GRAVE N	148
INDIVIDUAL ID	PTH 148
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	78
WEIGHT	84.07

ID	35
SERIES	PTH I
GRAVE N	149
INDIVIDUAL ID	PTH 149
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	2
WEIGHT	7.7

ID	36
SERIES	PTH I
GRAVE N	150
INDIVIDUAL ID	PTH 150
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	173
WEIGHT	174.73

ID	37
SERIES	PTH I
GRAVE N	152
INDIVIDUAL ID	PTH 152
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	5
WEIGHT	14.95

ID	38
SERIES	PTH I
GRAVE N	154
INDIVIDUAL ID	PTH 154
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	1263
WEIGHT	964.76

ID	39
SERIES	PTH I
GRAVE N	155
INDIVIDUAL ID	PTH 155
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	ND
AGE BECKER	>20
BECKER'S WEIGHT	3
WEIGHT	5.6

ID	40
SERIES	PTH I
GRAVE N	156
INDIVIDUAL ID	PTH 156
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	60
BECKER'S WEIGHT	204
WEIGHT	190.19

ID	41
SERIES	PTH I
GRAVE N	157
INDIVIDUAL ID	PTH 157
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	233
WEIGHT	220.88

ID	42
SERIES	PTH I
GRAVE N	158
INDIVIDUAL ID	PTH 158
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	40-50
SEX BECKER	F
AGE BECKER	60
BECKER'S WEIGHT	227
WEIGHT	196.74

ID	43
SERIES	PTH I
GRAVE N	159
INDIVIDUAL ID	PTH 159
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1 (?)
SEX	F (???)
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	75
BECKER'S WEIGHT	296
WEIGHT	138

ID	44
SERIES	PTH I
GRAVE N	160
INDIVIDUAL ID	PTH 160
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	60
BECKER'S WEIGHT	295
WEIGHT	279

ID	45
SERIES	PTH I
GRAVE N	161
INDIVIDUAL ID	PTH 161
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	50
BECKER'S WEIGHT	398
WEIGHT	389.37

ID	46
SERIES	PTH I
GRAVE N	162
INDIVIDUAL ID	PTH 162
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	341
WEIGHT	302.95

ID	47
SERIES	PTH I
GRAVE N	163
INDIVIDUAL ID	PTH 163
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	134
WEIGHT	126.51

ID	48
SERIES	PTH I
GRAVE N	164
INDIVIDUAL ID	PTH 164
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	ND
AGE BECKER	>20
BECKER'S WEIGHT	66
WEIGHT	67.2

ID	49
SERIES	PTH I
GRAVE N	165
INDIVIDUAL ID	PTH 165
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	ND
AGE BECKER	>20
BECKER'S WEIGHT	195
WEIGHT	107.1

ID	50
SERIES	PTH I
GRAVE N	166
INDIVIDUAL ID	PTH 166
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	15-20
SEX BECKER	ND
AGE BECKER	NA
BECKER'S WEIGHT	289
WEIGHT	182.39

ID	51
SERIES	PTH I
GRAVE N	167
INDIVIDUAL ID	PTH 167
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	ND
BECKER'S WEIGHT	34
WEIGHT	106.04

ID	52
SERIES	PTH I
GRAVE N	168
INDIVIDUAL ID	PTH 168
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	I
GENDER	M
MNI	4
SEX	ND
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	14
BECKER'S WEIGHT	289
WEIGHT	218.4

ID	53
SERIES	PTH I
GRAVE N	168
INDIVIDUAL ID	PTH 168
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	I
GENDER	M
MNI	4
SEX	ND
AGE CLASSES	<20
SEX BECKER	M
AGE BECKER	14
BECKER'S WEIGHT	289
WEIGHT	218.4

ID	54
SERIES	PTH I
GRAVE N	168
INDIVIDUAL ID	PTH 168
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	I
GENDER	M
MNI	4
SEX	ND
AGE CLASSES	<20
SEX BECKER	M
AGE BECKER	14
BECKER'S WEIGHT	289
WEIGHT	218.4

ID	55
SERIES	PTH I
GRAVE N	168
INDIVIDUAL ID	PTH 168
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	I
GENDER	M
MNI	4
SEX	ND
AGE CLASSES	<20
SEX BECKER	ND
AGE BECKER	14
BECKER'S WEIGHT	289
WEIGHT	-

ID	56
SERIES	PTH I
GRAVE N	169
INDIVIDUAL ID	PTH 169
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	110.72

ID	57
SERIES	PTH I
GRAVE N	170
INDIVIDUAL ID	PTH 170
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	ND
AGE BECKER	>20
BECKER'S WEIGHT	34
WEIGHT	35.64

ID	58
SERIES	PTH I
GRAVE N	172
INDIVIDUAL ID	PTH 172
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	ND
AGE BECKER	60
BECKER'S WEIGHT	166
WEIGHT	174.98

ID	59
SERIES	PTH I
GRAVE N	173
INDIVIDUAL ID	PTH 173
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	63
WEIGHT	68.59

ID	60
SERIES	PTH I
GRAVE N	174
INDIVIDUAL ID	PTH 174
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	50
BECKER'S WEIGHT	349
WEIGHT	330.03

ID	61
SERIES	PTH I
GRAVE N	175
INDIVIDUAL ID	PTH 175
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	60
BECKER'S WEIGHT	240
WEIGHT	207.57

ID	62
SERIES	PTH I
GRAVE N	176
INDIVIDUAL ID	PTH 176
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	60
BECKER'S WEIGHT	317
WEIGHT	287.25

ID	63
SERIES	PTH I
GRAVE N	177
INDIVIDUAL ID	PTH 177
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	41
WEIGHT	31.75

ID	64
SERIES	PTH I
GRAVE N	178
INDIVIDUAL ID	PTH 178
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	ND
AGE BECKER	60
BECKER'S WEIGHT	38
WEIGHT	45.8

ID	65
SERIES	PTH I
GRAVE N	179
INDIVIDUAL ID	PTH 179
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	ND
AGE BECKER	>20
BECKER'S WEIGHT	77
WEIGHT	85.38

ID	66
SERIES	PTH I
GRAVE N	180
INDIVIDUAL ID	PTH 180
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	60
BECKER'S WEIGHT	
WEIGHT	24.94

ID	67
SERIES	PTH I
GRAVE N	181
INDIVIDUAL ID	PTH 181
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	55
WEIGHT	70.85

ID	68
SERIES	PTH I
GRAVE N	182
INDIVIDUAL ID	PTH 182
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	48
WEIGHT	49.9

ID	69
SERIES	PTH I
GRAVE N	183
INDIVIDUAL ID	PTH 183
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	70
BECKER'S WEIGHT	275
WEIGHT	245.51

ID	70
SERIES	PTH I
GRAVE N	184
INDIVIDUAL ID	PTH 184
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	ND
AGE BECKER	>70
BECKER'S WEIGHT	238
WEIGHT	209.72

ID	71
SERIES	PTH I
GRAVE N	185
INDIVIDUAL ID	PTH 185
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	ND
AGE BECKER	>20
BECKER'S WEIGHT	9
WEIGHT	14.68

ID	72
SERIES	PTH I
GRAVE N	186
INDIVIDUAL ID	PTH 186
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	ND
AGE BECKER	>20
BECKER'S WEIGHT	12
WEIGHT	23.6

ID	73
SERIES	PTH I
GRAVE N	188
INDIVIDUAL ID	PTH 188
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	13
WEIGHT	19.8

ID	74
SERIES	PTH I
GRAVE N	189
INDIVIDUAL ID	PTH 189
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	161
WEIGHT	153.07

ID	75
SERIES	PTH I
GRAVE N	190
INDIVIDUAL ID	PTH 190
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	60
BECKER'S WEIGHT	460
WEIGHT	422

ID	76
SERIES	PTH I
GRAVE N	191
INDIVIDUAL ID	PTH 191
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	45
BECKER'S WEIGHT	873
WEIGHT	700.46

ID	77
SERIES	PTH I
GRAVE N	192
INDIVIDUAL ID	PTH 192
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	65
BECKER'S WEIGHT	164
WEIGHT	164.43

ID	78
SERIES	PTH I
GRAVE N	193
INDIVIDUAL ID	PTH 193
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	M
AGE BECKER	40
BECKER'S WEIGHT	179
WEIGHT	169.79

ID	79
SERIES	PTH I
GRAVE N	194
INDIVIDUAL ID	PTH 194
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	185
WEIGHT	190.41

ID	80
SERIES	PTH I
GRAVE N	195
INDIVIDUAL ID	PTH 195
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	50
BECKER'S WEIGHT	153
WEIGHT	151.48

ID	81
SERIES	PTH I
GRAVE N	196
INDIVIDUAL ID	PTH 196
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	50
BECKER'S WEIGHT	627
WEIGHT	580.54

ID	82
SERIES	PTH I
GRAVE N	197
INDIVIDUAL ID	PTH 197
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	70
BECKER'S WEIGHT	534
WEIGHT	471.3

ID	83
SERIES	PTH I
GRAVE N	198
INDIVIDUAL ID	PTH 198
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	45
BECKER'S WEIGHT	903
WEIGHT	781.67

ID	84
SERIES	PTH I
GRAVE N	199
INDIVIDUAL ID	PTH 199 A
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	2
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	228
WEIGHT	139.36

ID	85
SERIES	PTH I
GRAVE N	199
INDIVIDUAL ID	PTH 199 B
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	19
WEIGHT	25.61

ID	86
SERIES	PTH I
GRAVE N	200
INDIVIDUAL ID	PTH 200
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	647
WEIGHT	34.47

ID	87
SERIES	PTH I
GRAVE N	201
INDIVIDUAL ID	PTH 201
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	70
BECKER'S WEIGHT	329
WEIGHT	549.15

ID	88
SERIES	PTH I
GRAVE N	203
INDIVIDUAL ID	PTH 203
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	60
BECKER'S WEIGHT	91
WEIGHT	304.19

ID	89
SERIES	PTH I
GRAVE N	204
INDIVIDUAL ID	PTH 204
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	110
WEIGHT	104.53

ID	90
SERIES	PTH I
GRAVE N	206
INDIVIDUAL ID	PTH 206
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	870
WEIGHT	109.87

ID	91
SERIES	PTH I
GRAVE N	208
INDIVIDUAL ID	PTH 208 A
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	2
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	50
BECKER'S WEIGHT	203
WEIGHT	304.81

ID	92
SERIES	PTH I
GRAVE N	208
INDIVIDUAL ID	PTH 208 B
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	50
BECKER'S WEIGHT	97
WEIGHT	88.77

ID	93
SERIES	PTH I
GRAVE N	209
INDIVIDUAL ID	PTH 209
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	65
BECKER'S WEIGHT	203
WEIGHT	213.45

ID	94
SERIES	PTH I
GRAVE N	210
INDIVIDUAL ID	PTH 210
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	19
BECKER'S WEIGHT	97
WEIGHT	93.68

ID	95
SERIES	PTH I
GRAVE N	211
INDIVIDUAL ID	PTH 211
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	44
WEIGHT	47.75

ID	96
SERIES	PTH I
GRAVE N	212
INDIVIDUAL ID	PTH 212
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	55
BECKER'S WEIGHT	68
WEIGHT	87.8

ID	97
SERIES	PTH I
GRAVE N	213
INDIVIDUAL ID	PTH 213
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	70
BECKER'S WEIGHT	299
WEIGHT	274

ID	98
SERIES	PTH I
GRAVE N	215
INDIVIDUAL ID	PTH 215
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	157
WEIGHT	150.58

ID	99
SERIES	PTH I
GRAVE N	216
INDIVIDUAL ID	PTH 216
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	ND
AGE BECKER	>60
BECKER'S WEIGHT	124
WEIGHT	94.5

ID	100
SERIES	PTH I
GRAVE N	217
INDIVIDUAL ID	PTH 217
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	345.9

ID	101
SERIES	PTH I
GRAVE N	218
INDIVIDUAL ID	PTH 218
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	15-20
SEX BECKER	F
AGE BECKER	50
BECKER'S WEIGHT	141
WEIGHT	98.07

ID	102
SERIES	PTH I
GRAVE N	219
INDIVIDUAL ID	PTH 219
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	183
WEIGHT	171.48

ID	103
SERIES	PTH I
GRAVE N	220
INDIVIDUAL ID	PTH 220
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	285
WEIGHT	220.29

ID	104
SERIES	PTH I
GRAVE N	221
INDIVIDUAL ID	PTH 221
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	M
AGE BECKER	60
BECKER'S WEIGHT	
WEIGHT	279.03

ID	105
SERIES	PTH I
GRAVE N	222
INDIVIDUAL ID	PTH 222
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	
WEIGHT	22

ID	106
SERIES	PTH I
GRAVE N	223
INDIVIDUAL ID	PTH 223
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	60
BECKER'S WEIGHT	
WEIGHT	134.29

ID	107
SERIES	PTH I
GRAVE N	224
INDIVIDUAL ID	PTH 224
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	M
AGE BECKER	65
BECKER'S WEIGHT	
WEIGHT	221.1

ID	108
SERIES	PTH I
GRAVE N	225
INDIVIDUAL ID	PTH 225
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	603
WEIGHT	531

ID	109
SERIES	PTH I
GRAVE N	226
INDIVIDUAL ID	PTH 226
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	99
WEIGHT	49.68

ID	110
SERIES	PTH I
GRAVE N	227
INDIVIDUAL ID	PTH 227
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	M
AGE BECKER	40
BECKER'S WEIGHT	176
WEIGHT	136.31

ID	111
SERIES	PTH I
GRAVE N	229
INDIVIDUAL ID	PTH 229
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	144
WEIGHT	152.94

ID	112
SERIES	PTH I
GRAVE N	230
INDIVIDUAL ID	PTH 230
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	55
BECKER'S WEIGHT	117
WEIGHT	137.31

ID	113
SERIES	PTH I
GRAVE N	231
INDIVIDUAL ID	PTH 231
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	
WEIGHT	95.52

ID	114
SERIES	PTH I
GRAVE N	232
INDIVIDUAL ID	PTH 232
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	117
WEIGHT	93.21

ID	115
SERIES	PTH I
GRAVE N	235
INDIVIDUAL ID	PTH 235
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	60
BECKER'S WEIGHT	120
WEIGHT	125.62

ID	116
SERIES	PTH I
GRAVE N	236
INDIVIDUAL ID	PTH 236
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	61
WEIGHT	63.82

ID	117
SERIES	PTH I
GRAVE N	238
INDIVIDUAL ID	PTH 238
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	143
WEIGHT	143.15

ID	118
SERIES	PTH I
GRAVE N	239
INDIVIDUAL ID	PTH 239
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	40-50
SEX BECKER	M
AGE BECKER	60
BECKER'S WEIGHT	278
WEIGHT	261.64

ID	119
SERIES	PTH I
GRAVE N	240
INDIVIDUAL ID	PTH 240 A
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	M
AGE BECKER	40
BECKER'S WEIGHT	101
WEIGHT	93.73

ID	120
SERIES	PTH I
GRAVE N	241
INDIVIDUAL ID	PTH 241
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	M
AGE BECKER	>20
BECKER'S WEIGHT	156
WEIGHT	191.07

ID	121
SERIES	PTH I
GRAVE N	242
INDIVIDUAL ID	PTH 242
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	13
WEIGHT	24.64

ID	122
SERIES	PTH I
GRAVE N	243
INDIVIDUAL ID	PTH 243
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	>20
BECKER'S WEIGHT	124
WEIGHT	114.16

ID	123
SERIES	PTH I
GRAVE N	266
INDIVIDUAL ID	PTH 266
CHRONOLOGY	04 MPC
RITUAL	INH
AGE ARCHAEOLOGY	A
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	F
AGE BECKER	18
BECKER'S WEIGHT	
WEIGHT	-

ID	124
SERIES	PTH I
GRAVE N	305
INDIVIDUAL ID	PTH 305
CHRONOLOGY	04 MPC
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	M
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	125
SERIES	PTH I
GRAVE N	311
INDIVIDUAL ID	PTH 311
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	126
SERIES	PTH I
GRAVE N	498
INDIVIDUAL ID	PTH 498
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	M
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	127
SERIES	PTH I
GRAVE N	507
INDIVIDUAL ID	PTH 507
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	10-15
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	128
SERIES	PTH I
GRAVE N	508
INDIVIDUAL ID	PTH 508
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	M
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	M
AGE BECKER	3
BECKER'S WEIGHT	
WEIGHT	-

ID	129
SERIES	PTH I
GRAVE N	609
INDIVIDUAL ID	PTH 609
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	130
SERIES	PTH I
GRAVE N	652
INDIVIDUAL ID	PTH 652
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	131
SERIES	PTH I
GRAVE N	653
INDIVIDUAL ID	PTH 653
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	SA
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	132
SERIES	PTH I
GRAVE N	654
INDIVIDUAL ID	PTH 654
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	M
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	133
SERIES	PTH I
GRAVE N	696
INDIVIDUAL ID	PTH 696
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	134
SERIES	PTH I
GRAVE N	706
INDIVIDUAL ID	PTH 706
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	135
SERIES	PTH I
GRAVE N	573
INDIVIDUAL ID	PTH 573
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	136
SERIES	PTH I
GRAVE N	599
INDIVIDUAL ID	PTH 599
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	137
SERIES	PTH II
GRAVE N	737
INDIVIDUAL ID	PTH 737
CHRONOLOGY	04 MPC
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	138
SERIES	PTH II
GRAVE N	753
INDIVIDUAL ID	PTH 753
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	40-50
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	139
SERIES	PTH II
GRAVE N	755
INDIVIDUAL ID	PTH 755
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	140
SERIES	PTH II
GRAVE N	767
INDIVIDUAL ID	PTH 767
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	141
SERIES	PTH II
GRAVE N	768
INDIVIDUAL ID	PTH 768
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	142
SERIES	PTH II
GRAVE N	769
INDIVIDUAL ID	PTH 769
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	143
SERIES	PTH II
GRAVE N	771
INDIVIDUAL ID	PTH 771
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	F
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	260

ID	144
SERIES	PTH II
GRAVE N	771
INDIVIDUAL ID	PTH 771 (bis)
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	145
SERIES	PTH II
GRAVE N	772
INDIVIDUAL ID	PTH 772 B
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	2.89

ID	146
SERIES	PTH II
GRAVE N	772
INDIVIDUAL ID	PTH 772 A
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	F
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	548

ID	147
SERIES	PTH II
GRAVE N	773
INDIVIDUAL ID	PTH 773
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	M
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	148
SERIES	PTH II
GRAVE N	775
INDIVIDUAL ID	PTH 775
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	149
SERIES	PTH II
GRAVE N	776
INDIVIDUAL ID	PTH 776
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	150
SERIES	PTH II
GRAVE N	777
INDIVIDUAL ID	PTH 777
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	151
SERIES	PTH II
GRAVE N	779
INDIVIDUAL ID	PTH 779
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	152
SERIES	PTH II
GRAVE N	781
INDIVIDUAL ID	PTH 781
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	153
SERIES	PTH II
GRAVE N	783
INDIVIDUAL ID	PTH 783
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	154
SERIES	PTH II
GRAVE N	786
INDIVIDUAL ID	PTH 786
CHRONOLOGY	04 MPC
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	155
SERIES	PTH II
GRAVE N	787
INDIVIDUAL ID	PTH 787
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	156
SERIES	PTH II
GRAVE N	788
INDIVIDUAL ID	PTH 788
CHRONOLOGY	04 MPC
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	157
SERIES	PTH II
GRAVE N	795
INDIVIDUAL ID	PTH 795
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	158
SERIES	PTH II
GRAVE N	799
INDIVIDUAL ID	PTH 799
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	159
SERIES	PTH II
GRAVE N	803
INDIVIDUAL ID	PTH 803
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	160
SERIES	PTH II
GRAVE N	804
INDIVIDUAL ID	PTH 804
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	50

ID	161
SERIES	PTH II
GRAVE N	805
INDIVIDUAL ID	PTH 805
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	162
SERIES	PTH II
GRAVE N	812
INDIVIDUAL ID	PTH 812
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	163
SERIES	PTH II
GRAVE N	813
INDIVIDUAL ID	PTH 813
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	164
SERIES	PTH II
GRAVE N	815
INDIVIDUAL ID	PTH 815
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	165
SERIES	PTH II
GRAVE N	817
INDIVIDUAL ID	PTH 817
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	360

ID	166
SERIES	PTH II
GRAVE N	821
INDIVIDUAL ID	PTH 821
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	167
SERIES	PTH II
GRAVE N	822
INDIVIDUAL ID	PTH 822
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	168
SERIES	PTH II
GRAVE N	823
INDIVIDUAL ID	PTH 823
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	169
SERIES	PTH II
GRAVE N	824
INDIVIDUAL ID	PTH 824
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	170
SERIES	PTH II
GRAVE N	825
INDIVIDUAL ID	PTH 825
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	428

ID	171
SERIES	PTH II
GRAVE N	826
INDIVIDUAL ID	PTH 826
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	53

ID	172
SERIES	PTH II
GRAVE N	830
INDIVIDUAL ID	PTH 830
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	173
SERIES	PTH II
GRAVE N	832
INDIVIDUAL ID	PTH 832
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	174
SERIES	PTH II
GRAVE N	835
INDIVIDUAL ID	PTH 835 B
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	M
MNI	2
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	175
SERIES	PTH II
GRAVE N	835
INDIVIDUAL ID	PTH 835 A
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	176
SERIES	PTH II
GRAVE N	836
INDIVIDUAL ID	PTH 836
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	177
SERIES	PTH II
GRAVE N	837
INDIVIDUAL ID	PTH 837
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	178
SERIES	PTH II
GRAVE N	840
INDIVIDUAL ID	PTH 840
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	179
SERIES	PTH II
GRAVE N	841
INDIVIDUAL ID	PTH 841
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	180
SERIES	PTH II
GRAVE N	842
INDIVIDUAL ID	PTH 842
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	181
SERIES	PTH II
GRAVE N	846
INDIVIDUAL ID	PTH 846
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	182
SERIES	PTH II
GRAVE N	847
INDIVIDUAL ID	PTH 847
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	183
SERIES	PTH II
GRAVE N	849
INDIVIDUAL ID	PTH 849
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	40-50
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	184
SERIES	PTH II
GRAVE N	853
INDIVIDUAL ID	PTH 853
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	411

ID	185
SERIES	PTH II
GRAVE N	854
INDIVIDUAL ID	PTH 854
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	45

ID	186
SERIES	PTH II
GRAVE N	855
INDIVIDUAL ID	PTH 855
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	187
SERIES	PTH II
GRAVE N	856
INDIVIDUAL ID	PTH 856
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	188
SERIES	PTH II
GRAVE N	857
INDIVIDUAL ID	PTH 857
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	189
SERIES	PTH II
GRAVE N	858
INDIVIDUAL ID	PTH 858
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	10-15
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	190
SERIES	PTH II
GRAVE N	859
INDIVIDUAL ID	PTH 859
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	191
SERIES	PTH II
GRAVE N	860
INDIVIDUAL ID	PTH 860
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	192
SERIES	PTH II
GRAVE N	863
INDIVIDUAL ID	PTH 863
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	386

ID	193
SERIES	PTH II
GRAVE N	868
INDIVIDUAL ID	PTH 868
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	49

ID	194
SERIES	PTH II
GRAVE N	870
INDIVIDUAL ID	PTH 870
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	195
SERIES	PTH II
GRAVE N	878
INDIVIDUAL ID	PTH 878
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	196
SERIES	PTH II
GRAVE N	879
INDIVIDUAL ID	PTH 879
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	10-15
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	197
SERIES	PTH II
GRAVE N	880
INDIVIDUAL ID	PTH 880
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	198
SERIES	PTH II
GRAVE N	881
INDIVIDUAL ID	PTH 881
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	199
SERIES	PTH II
GRAVE N	883
INDIVIDUAL ID	PTH 883
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	200
SERIES	PTH II
GRAVE N	884
INDIVIDUAL ID	PTH 884
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	201
SERIES	PTH II
GRAVE N	886
INDIVIDUAL ID	PTH 886 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	202
SERIES	PTH II
GRAVE N	886
INDIVIDUAL ID	PTH 886 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	203
SERIES	PTH II
GRAVE N	887
INDIVIDUAL ID	PTH 887
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	204
SERIES	PTH II
GRAVE N	888
INDIVIDUAL ID	PTH 888
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	205
SERIES	PTH II
GRAVE N	889
INDIVIDUAL ID	PTH 889
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	206
SERIES	PTH II
GRAVE N	890
INDIVIDUAL ID	PTH 890
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	207
SERIES	PTH II
GRAVE N	891
INDIVIDUAL ID	PTH 891
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	10-15
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	208
SERIES	PTH II
GRAVE N	894
INDIVIDUAL ID	PTH 894
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	209
SERIES	PTH II
GRAVE N	896
INDIVIDUAL ID	PTH 896
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	210
SERIES	PTH II
GRAVE N	897
INDIVIDUAL ID	PTH 897 A
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	232.68

ID	211
SERIES	PTH II
GRAVE N	897
INDIVIDUAL ID	PTH 897 B
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	229.02

ID	212
SERIES	PTH II
GRAVE N	898
INDIVIDUAL ID	PTH 898
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	86

ID	213
SERIES	PTH II
GRAVE N	899
INDIVIDUAL ID	PTH 899
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	F
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	256

ID	214
SERIES	PTH II
GRAVE N	901
INDIVIDUAL ID	PTH 901
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	215
SERIES	PTH II
GRAVE N	902
INDIVIDUAL ID	PTH 902
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	216
SERIES	PTH II
GRAVE N	903
INDIVIDUAL ID	PTH 903
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	217
SERIES	PTH II
GRAVE N	904
INDIVIDUAL ID	PTH 904
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	218
SERIES	PTH II
GRAVE N	916
INDIVIDUAL ID	PTH 916 A
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	363

ID	219
SERIES	PTH II
GRAVE N	916
INDIVIDUAL ID	PTH 916 B
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	7

ID	220
SERIES	PTH II
GRAVE N	917
INDIVIDUAL ID	PTH 917
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	685

ID	221
SERIES	PTH II
GRAVE N	921
INDIVIDUAL ID	PTH 921
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	262

ID	222
SERIES	PTH II
GRAVE N	925
INDIVIDUAL ID	PTH 925
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	550

ID	223
SERIES	PTH II
GRAVE N	926
INDIVIDUAL ID	PTH 926
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	265

ID	224
SERIES	PTH II
GRAVE N	927
INDIVIDUAL ID	PTH 927
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	126

ID	225
SERIES	PTH II
GRAVE N	928
INDIVIDUAL ID	PTH 928
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	327

ID	226
SERIES	PTH II
GRAVE N	929
INDIVIDUAL ID	PTH 929
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	177

ID	227
SERIES	PTH II
GRAVE N	930
INDIVIDUAL ID	PTH 930 A
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	438

ID	228
SERIES	PTH II
GRAVE N	930
INDIVIDUAL ID	PTH 930 B
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	3

ID	229
SERIES	PTH II
GRAVE N	931
INDIVIDUAL ID	PTH 931
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	155

ID	230
SERIES	PTH II
GRAVE N	938
INDIVIDUAL ID	PTH 938
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	299

ID	231
SERIES	PTH II
GRAVE N	939
INDIVIDUAL ID	PTH 939
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	112

ID	232
SERIES	PTH II
GRAVE N	941
INDIVIDUAL ID	PTH 941
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	233
SERIES	PTH II
GRAVE N	944
INDIVIDUAL ID	PTH 944 B
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	268

ID	234
SERIES	PTH II
GRAVE N	944
INDIVIDUAL ID	PTH 944 A
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	F
MNI	2
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	115

ID	235
SERIES	PTH II
GRAVE N	945
INDIVIDUAL ID	PTH 945
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	123

ID	236
SERIES	PTH II
GRAVE N	946
INDIVIDUAL ID	PTH 946
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	207

ID	237
SERIES	PTH II
GRAVE N	947
INDIVIDUAL ID	PTH 947
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	431

ID	238
SERIES	PTH II
GRAVE N	948
INDIVIDUAL ID	PTH 948
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	241

ID	239
SERIES	PTH II
GRAVE N	949
INDIVIDUAL ID	PTH 949
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	240
SERIES	PTH II
GRAVE N	949
INDIVIDUAL ID	PTH 949 (S)
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	241
SERIES	PTH II
GRAVE N	950
INDIVIDUAL ID	PTH 950
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	242
SERIES	PTH II
GRAVE N	951
INDIVIDUAL ID	PTH 951
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	M
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	243
SERIES	PTH II
GRAVE N	954
INDIVIDUAL ID	PTH 954 A
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	244
SERIES	PTH II
GRAVE N	954
INDIVIDUAL ID	PTH 954 B
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	245
SERIES	PTH II
GRAVE N	955
INDIVIDUAL ID	PTH 955
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	246
SERIES	PTH II
GRAVE N	956
INDIVIDUAL ID	PTH 956
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	247
SERIES	PTH II
GRAVE N	957
INDIVIDUAL ID	PTH 957
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	248
SERIES	PTH II
GRAVE N	967
INDIVIDUAL ID	PTH 967
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	249
SERIES	PTH II
GRAVE N	968
INDIVIDUAL ID	PTH 968
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	250
SERIES	PTH II
GRAVE N	972
INDIVIDUAL ID	PTH 972
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	251
SERIES	PTH II
GRAVE N	973
INDIVIDUAL ID	PTH 973
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	252
SERIES	PTH II
GRAVE N	975
INDIVIDUAL ID	PTH 975
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	253
SERIES	PTH II
GRAVE N	977
INDIVIDUAL ID	PTH 977
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	254
SERIES	PTH II
GRAVE N	978
INDIVIDUAL ID	PTH 978
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	76

ID	255
SERIES	PTH II
GRAVE N	981
INDIVIDUAL ID	PTH 981
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	455

ID	256
SERIES	PTH II
GRAVE N	982
INDIVIDUAL ID	PTH 982
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	M
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	516

ID	257
SERIES	PTH II
GRAVE N	984
INDIVIDUAL ID	PTH 984
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	430

ID	258
SERIES	PTH II
GRAVE N	985
INDIVIDUAL ID	PTH 985
CHRONOLOGY	01 LG I
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	364

ID	259
SERIES	PTH II
GRAVE N	987
INDIVIDUAL ID	PTH 987
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	142

ID	260
SERIES	PTH II
GRAVE N	989
INDIVIDUAL ID	PTH 989
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	162

ID	261
SERIES	PTH II
GRAVE N	990
INDIVIDUAL ID	PTH 990
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	31

ID	262
SERIES	PTH II
GRAVE N	992
INDIVIDUAL ID	PTH 992
CHRONOLOGY	04 MPC
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	263
SERIES	PTH II
GRAVE N	993
INDIVIDUAL ID	PTH 993
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	264
SERIES	PTH II
GRAVE N	994
INDIVIDUAL ID	PTH 994
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	316

ID	265
SERIES	PTH II
GRAVE N	995
INDIVIDUAL ID	PTH 995
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	117

ID	266
SERIES	PTH II
GRAVE N	996
INDIVIDUAL ID	PTH 996
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	877

ID	267
SERIES	PTH II
GRAVE N	997
INDIVIDUAL ID	PTH 997 D
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	ND
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	268
SERIES	PTH II
GRAVE N	997
INDIVIDUAL ID	PTH 997 E
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	ND
AGE CLASSES	40-50
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	269
SERIES	PTH II
GRAVE N	997
INDIVIDUAL ID	PTH 997 F
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	270
SERIES	PTH II
GRAVE N	997
INDIVIDUAL ID	PTH 997 G
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	271
SERIES	PTH II
GRAVE N	997
INDIVIDUAL ID	PTH 997 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	272
SERIES	PTH II
GRAVE N	997
INDIVIDUAL ID	PTH 997 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	273
SERIES	PTH II
GRAVE N	997
INDIVIDUAL ID	PTH 997 C
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	274
SERIES	PTH II
GRAVE N	999
INDIVIDUAL ID	PTH 999 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	275
SERIES	PTH II
GRAVE N	999
INDIVIDUAL ID	PTH 999 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	276
SERIES	PTH II
GRAVE N	1002
INDIVIDUAL ID	PTH 1002
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	190

ID	277
SERIES	PTH II
GRAVE N	1003
INDIVIDUAL ID	PTH 1003
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	278
SERIES	PTH II
GRAVE N	1004
INDIVIDUAL ID	PTH 1004
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	66

ID	279
SERIES	PTH II
GRAVE N	1006
INDIVIDUAL ID	PTH 1006
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	280
SERIES	PTH II
GRAVE N	1007
INDIVIDUAL ID	PTH 1007
CHRONOLOGY	02 LG I.II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	508

ID	281
SERIES	PTH II
GRAVE N	1008
INDIVIDUAL ID	PTH 1008
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	282
SERIES	PTH II
GRAVE N	1010
INDIVIDUAL ID	PTH 1010
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	283
SERIES	PTH II
GRAVE N	1011
INDIVIDUAL ID	PTH 1011
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	284
SERIES	PTH II
GRAVE N	1013
INDIVIDUAL ID	PTH 1013
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	285
SERIES	PTH II
GRAVE N	1015
INDIVIDUAL ID	PTH 1015
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	286
SERIES	PTH II
GRAVE N	1016
INDIVIDUAL ID	PTH 1016
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	287
SERIES	PTH II
GRAVE N	1018
INDIVIDUAL ID	PTH 1018
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	288
SERIES	PTH II
GRAVE N	1019
INDIVIDUAL ID	PTH 1019 (riempimento fossa)
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	F
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	289
SERIES	PTH II
GRAVE N	1026
INDIVIDUAL ID	PTH 1026
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	I
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	290
SERIES	PTH II
GRAVE N	1028
INDIVIDUAL ID	PTH 1028
CHRONOLOGY	01 LG I
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	291
SERIES	PTH II
GRAVE N	1029
INDIVIDUAL ID	PTH 1029
CHRONOLOGY	05 C
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	292
SERIES	PTH II
GRAVE N	1034
INDIVIDUAL ID	PTH 1034
CHRONOLOGY	07 R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	293
SERIES	PTH II
GRAVE N	1035
INDIVIDUAL ID	PTH 1035
CHRONOLOGY	07 R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	294
SERIES	PTH II
GRAVE N	1040
INDIVIDUAL ID	PTH 1040
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	295
SERIES	PTH II
GRAVE N	1041
INDIVIDUAL ID	PTH 1041
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	296
SERIES	PTH II
GRAVE N	1044
INDIVIDUAL ID	PTH 1044
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	297
SERIES	PTH II
GRAVE N	1046
INDIVIDUAL ID	PTH 1046
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	298
SERIES	PTH II
GRAVE N	1047
INDIVIDUAL ID	PTH 1047
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	299
SERIES	PTH II
GRAVE N	1049
INDIVIDUAL ID	PTH 1049
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	300
SERIES	PTH II
GRAVE N	1050
INDIVIDUAL ID	PTH 1050
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	10-15
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	301
SERIES	PTH II
GRAVE N	1051
INDIVIDUAL ID	PTH 1051 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	302
SERIES	PTH II
GRAVE N	1051
INDIVIDUAL ID	PTH 1051 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	303
SERIES	PTH II
GRAVE N	1052
INDIVIDUAL ID	PTH 1052
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	40-50
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	304
SERIES	PTH II
GRAVE N	1053
INDIVIDUAL ID	PTH 1053 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	305
SERIES	PTH II
GRAVE N	1053
INDIVIDUAL ID	PTH 1053 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	306
SERIES	PTH II
GRAVE N	1057
INDIVIDUAL ID	PTH 1057 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	307
SERIES	PTH II
GRAVE N	1057
INDIVIDUAL ID	PTH 1057 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	308
SERIES	PTH II
GRAVE N	1060
INDIVIDUAL ID	PTH 1060
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	309
SERIES	PTH II
GRAVE N	1061
INDIVIDUAL ID	PTH 1061 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	3
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	310
SERIES	PTH II
GRAVE N	1061
INDIVIDUAL ID	PTH 1061 C
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	3
SEX	F
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	311
SERIES	PTH II
GRAVE N	1061
INDIVIDUAL ID	PTH 1061 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	3
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	312
SERIES	PTH II
GRAVE N	1062
INDIVIDUAL ID	PTH 1062
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	313
SERIES	PTH II
GRAVE N	1063
INDIVIDUAL ID	PTH 1063 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	314
SERIES	PTH II
GRAVE N	1063
INDIVIDUAL ID	PTH 1063 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	315
SERIES	PTH II
GRAVE N	1063
INDIVIDUAL ID	PTH 1063 C
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	316
SERIES	PTH II
GRAVE N	1063
INDIVIDUAL ID	PTH 1063 D
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	317
SERIES	PTH II
GRAVE N	1063
INDIVIDUAL ID	PTH 1063 E
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	M
AGE CLASSES	40-50
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	318
SERIES	PTH II
GRAVE N	1063
INDIVIDUAL ID	PTH 1063 F
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	319
SERIES	PTH II
GRAVE N	1063
INDIVIDUAL ID	PTH 1063 G
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	7
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	320
SERIES	PTH II
GRAVE N	1064
INDIVIDUAL ID	PTH 1064
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	321
SERIES	PTH II
GRAVE N	1066
INDIVIDUAL ID	PTH 1066
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	322
SERIES	PTH II
GRAVE N	1067
INDIVIDUAL ID	PTH 1067
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	323
SERIES	PTH II
GRAVE N	1068
INDIVIDUAL ID	PTH 1068
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	324
SERIES	PTH II
GRAVE N	1069
INDIVIDUAL ID	PTH 1069
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	325
SERIES	PTH II
GRAVE N	1071
INDIVIDUAL ID	PTH 1071
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	326
SERIES	PTH II
GRAVE N	1072
INDIVIDUAL ID	PTH 1072
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	327
SERIES	PTH II
GRAVE N	1074
INDIVIDUAL ID	PTH 1074 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	328
SERIES	PTH II
GRAVE N	1074
INDIVIDUAL ID	PTH 1074 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	329
SERIES	PTH II
GRAVE N	1075
INDIVIDUAL ID	PTH 1075 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	330
SERIES	PTH II
GRAVE N	1075
INDIVIDUAL ID	PTH 1075 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	331
SERIES	PTH II
GRAVE N	1079
INDIVIDUAL ID	PTH 1079
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	332
SERIES	PTH II
GRAVE N	1081
INDIVIDUAL ID	PTH 1081
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	333
SERIES	PTH II
GRAVE N	1085
INDIVIDUAL ID	PTH 1085
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	251

ID	334
SERIES	PTH II
GRAVE N	1086
INDIVIDUAL ID	PTH 1086
CHRONOLOGY	08 NA
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	335
SERIES	PTH II
GRAVE N	1087
INDIVIDUAL ID	PTH 1087
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	336
SERIES	PTH II
GRAVE N	1088
INDIVIDUAL ID	PTH 1088
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	42

ID	337
SERIES	PTH II
GRAVE N	1089
INDIVIDUAL ID	PTH 1089
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	40-50
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	338
SERIES	PTH II
GRAVE N	1090
INDIVIDUAL ID	PTH 1090 A
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	400

ID	339
SERIES	PTH II
GRAVE N	1090
INDIVIDUAL ID	PTH 1090 B
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	54

ID	340
SERIES	PTH II
GRAVE N	1091
INDIVIDUAL ID	PTH 1091
CHRONOLOGY	08 NA
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	40-50
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	435

ID	341
SERIES	PTH II
GRAVE N	1092
INDIVIDUAL ID	PTH 1092 A
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	342
SERIES	PTH II
GRAVE N	1092
INDIVIDUAL ID	PTH 1092 B
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	343
SERIES	PTH II
GRAVE N	1093
INDIVIDUAL ID	PTH 1093
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	344
SERIES	PTH II
GRAVE N	1095
INDIVIDUAL ID	PTH 1095
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	263

ID	345
SERIES	PTH II
GRAVE N	1096
INDIVIDUAL ID	PTH 1096
CHRONOLOGY	06 H.R
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	744

ID	346
SERIES	PTH II
GRAVE N	1097
INDIVIDUAL ID	PTH 1097
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	347
SERIES	PTH II
GRAVE N	1100
INDIVIDUAL ID	PTH 1100
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	348
SERIES	PTH II
GRAVE N	1103
INDIVIDUAL ID	PTH 1103
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	166

ID	349
SERIES	PTH II
GRAVE N	1104
INDIVIDUAL ID	PTH 1104
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	1574

ID	350
SERIES	PTH II
GRAVE N	1107
INDIVIDUAL ID	PTH 1107
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	52.37

ID	351
SERIES	PTH II
GRAVE N	1108
INDIVIDUAL ID	PTH 1108
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	716

ID	352
SERIES	PTH II
GRAVE N	1109
INDIVIDUAL ID	PTH 1109
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	280

ID	353
SERIES	PTH II
GRAVE N	1113
INDIVIDUAL ID	PTH 1113
CHRONOLOGY	08 NA
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	253

ID	354
SERIES	PTH II
GRAVE N	1115
INDIVIDUAL ID	PTH 1115
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	256

ID	355
SERIES	PTH II
GRAVE N	1116
INDIVIDUAL ID	PTH 1116
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	561

ID	356
SERIES	PTH II
GRAVE N	1118
INDIVIDUAL ID	PTH 1118
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	86

ID	357
SERIES	PTH II
GRAVE N	1120
INDIVIDUAL ID	PTH 1120
CHRONOLOGY	03 LG II
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	243

ID	358
SERIES	PTH II
GRAVE N	1122
INDIVIDUAL ID	PTH 1122
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	359
SERIES	PTH II
GRAVE N	1123
INDIVIDUAL ID	PTH 1123
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	360
SERIES	PTH II
GRAVE N	1134
INDIVIDUAL ID	PTH 1134
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	361
SERIES	PTH II
GRAVE N	1144
INDIVIDUAL ID	PTH 1144
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	362
SERIES	PTH II
GRAVE N	1146
INDIVIDUAL ID	PTH 1146
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	15-20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	363
SERIES	PTH II
GRAVE N	1149
INDIVIDUAL ID	PTH 1149
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	364
SERIES	PTH II
GRAVE N	1150
INDIVIDUAL ID	PTH 1150
CHRONOLOGY	04 MPC
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	365
SERIES	PTH II
GRAVE N	1151
INDIVIDUAL ID	PTH 1151 B
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	366
SERIES	PTH II
GRAVE N	1151
INDIVIDUAL ID	PTH 1151 A
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	367
SERIES	PTH II
GRAVE N	1152
INDIVIDUAL ID	PTH 1152
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	368
SERIES	PTH II
GRAVE N	1153
INDIVIDUAL ID	PTH 1153
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	369
SERIES	PTH II
GRAVE N	1154
INDIVIDUAL ID	PTH 1154
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	370
SERIES	PTH II
GRAVE N	1156
INDIVIDUAL ID	PTH 1156
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	371
SERIES	PTH II
GRAVE N	1157
INDIVIDUAL ID	PTH 1157
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	05-10
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	372
SERIES	PTH II
GRAVE N	1158
INDIVIDUAL ID	PTH 1158
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	40-50
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	373
SERIES	PTH II
GRAVE N	1159
INDIVIDUAL ID	PTH 1159
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	374
SERIES	PTH II
GRAVE N	1160
INDIVIDUAL ID	PTH 1160
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	375
SERIES	PTH II
GRAVE N	1161
INDIVIDUAL ID	PTH 1161
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	376
SERIES	PTH II
GRAVE N	1162
INDIVIDUAL ID	PTH 1162
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	377
SERIES	PTH II
GRAVE N	1166
INDIVIDUAL ID	PTH 1166 B
CHRONOLOGY	08 NA
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	3
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	11

ID	378
SERIES	PTH II
GRAVE N	1166
INDIVIDUAL ID	PTH 1166 A
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	379
SERIES	PTH II
GRAVE N	1166
INDIVIDUAL ID	PTH 1166 C
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	3
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	380
SERIES	PTH II
GRAVE N	1168
INDIVIDUAL ID	PTH 1168
CHRONOLOGY	04 MPC
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	386

ID	381
SERIES	PTH II
GRAVE N	1170
INDIVIDUAL ID	PTH 1170
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	00-1
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	382
SERIES	PTH II
GRAVE N	1172
INDIVIDUAL ID	PTH 1172
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	383
SERIES	PTH II
GRAVE N	1181
INDIVIDUAL ID	PTH 1181
CHRONOLOGY	02 LG I.II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	384
SERIES	PTH II
GRAVE N	1182
INDIVIDUAL ID	PTH 1182
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	385
SERIES	PTH II
GRAVE N	1184
INDIVIDUAL ID	PTH 1184
CHRONOLOGY	04 MPC
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	386
SERIES	PTH II
GRAVE N	1196
INDIVIDUAL ID	PTH 1196
CHRONOLOGY	06 H.R
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	387
SERIES	PTH II
GRAVE N	1205
INDIVIDUAL ID	PTH 1205
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	388
SERIES	PTH II
GRAVE N	1206
INDIVIDUAL ID	PTH 1206
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	389
SERIES	PTH II
GRAVE N	1208
INDIVIDUAL ID	PTH 1208
CHRONOLOGY	08 NA
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	195

ID	390
SERIES	PTH II
GRAVE N	1210
INDIVIDUAL ID	PTH 1210
CHRONOLOGY	08 NA
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	263

ID	391
SERIES	PTH II
GRAVE N	1219
INDIVIDUAL ID	PTH 1219
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	392
SERIES	PTH II
GRAVE N	1223
INDIVIDUAL ID	PTH 1223
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	393
SERIES	PTH II
GRAVE N	1226
INDIVIDUAL ID	PTH 1226
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	F
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	394
SERIES	PTH II
GRAVE N	1229
INDIVIDUAL ID	PTH 1229 A
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	395
SERIES	PTH II
GRAVE N	1229
INDIVIDUAL ID	PTH 1229 B
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	2
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	396
SERIES	PTH II
GRAVE N	1230
INDIVIDUAL ID	PTH 1230
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	01-5
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	397
SERIES	PTH II
GRAVE N	1231
INDIVIDUAL ID	PTH 1231
CHRONOLOGY	03 LG II
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	398
SERIES	PTH II
GRAVE N	1232
INDIVIDUAL ID	PTH 1232
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

ID	399
SERIES	PTH II
GRAVE N	
INDIVIDUAL ID	PTH 1083 A
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	>40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	48

ID	400
SERIES	PTH II
GRAVE N	
INDIVIDUAL ID	PTH 1083 B
CHRONOLOGY	05 C
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	674

ID	401
SERIES	PTH II
GRAVE N	
INDIVIDUAL ID	PTH 1064 B
CHRONOLOGY	08 NA
RITUAL	CRM
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	M
AGE CLASSES	20-40
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	114

ID	402
SERIES	PTH I
GRAVE N	
INDIVIDUAL ID	PTH ex SP 218- 586 (?)
CHRONOLOGY	08 NA
RITUAL	INH
AGE ARCHAEOLOGY	NA
GENDER	NA
MNI	1
SEX	ND
AGE CLASSES	>20
SEX BECKER	NA
AGE BECKER	NA
BECKER'S WEIGHT	
WEIGHT	-

Appendix B

grave	225
ID	PTH 225
typology	petrous bone
ritual	cremation
chronology	LG I.II
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708684
standard error	0.000005
notes	

grave	226
ID	PTH 226
typology	petrous bone
ritual	cremation
chronology	LG I.II
gender	
sex	
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708655
standard error	0.000004
notes	

grave	508
ID	PTH 508
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	SA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708487
standard error	
notes	

grave	653
ID	PTH 653
typology	enamel
ritual	inhumation
chronology	LG I.II
gender	
sex	SA
age at death	15-20
age	J
age class	J
86/87 Sr	0.709118
standard error	
notes	

grave	599
ID	PTH 599
typology	enamel
ritual	inhumation
chronology	LG I
gender	
sex	F
age at death	15-20
age	J
age class	J
86/87 Sr	0.708601
standard error	
notes	

grave	737
ID	PTH 737
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708434
standard error	
notes	

grave	753
ID	PTH 753
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	
age at death	>40
age	MA
age class	A
86/87 Sr	0.708663
standard error	0.000003
notes	

grave	755
ID	PTH 755
typology	enamel
ritual	inhumation
chronology	LG II
gender	F
sex	F
age at death	15-20
age	J
age class	J
86/87 Sr	0.708094
standard error	0.000002
notes	

grave	767
ID	PTH 767p
typology	petrous bone
ritual	inhumation
chronology	LG II
gender	M
sex	M
age at death	15-20
age	J
age class	J
86/87 Sr	0.708440
standard error	
notes	

grave	767
ID	PTH 767e
typology	enamel
ritual	inhumation
chronology	LG II
gender	M
sex	M
age at death	15-20
age	J
age class	J
86/87 Sr	0.708634
standard error	
notes	

grave	768
ID	PTH 768
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	SA
age at death	15-20
age	J
age class	J
86/87 Sr	0.709207
standard error	
notes	

grave	776
ID	PTH 776
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708404
standard error	
notes	

grave	783
ID	PTH 783
typology	enamel
ritual	inhumation
chronology	LG I.II
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.709692
standard error	
notes	

grave	805
ID	PTH 805
typology	petrous bone
ritual	enchytrismos
chronology	LG I
gender	
sex	SA
age at death	00
age	PN
age class	PN
86/87 Sr	0.708345
standard error	
notes	

grave	812
ID	PTH 812
typology	enamel
ritual	inhumation
chronology	LG I.II
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708473
standard error	
notes	

grave	815
ID	PTH 815
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708423
standard error	
notes	

grave	817
ID	PTH 817
typology	petrous bone
ritual	cremation
chronology	LG I.II
gender	F
sex	F
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708501
standard error	
notes	

grave	825
ID	PTH 825
typology	petrous bone
ritual	cremation
chronology	LG I.II
gender	F(??)
sex	F
age at death	>40
age	MA
age class	A
86/87 Sr	0.708645
standard error	
notes	

grave	836
ID	PTH836
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708344
standard error	
notes	

grave	842
ID	PTH 842
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	
age at death	20-40
age	A
age class	A
86/87 Sr	0.709266
standard error	0.000004
notes	

grave	846
ID	PTH 846
typology	petrous bone
ritual	enchytrismos
chronology	LG I.II
gender	
sex	SA
age at death	00
age	PN
age class	PN
86/87 Sr	0.708468
standard error	
notes	

grave	856
ID	PTH 856
typology	enamel
ritual	inhumation
chronology	H.R
gender	F
sex	F
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708340
standard error	
notes	

grave	860
ID	PTH 860
typology	petrous bone
ritual	inhumation
chronology	LG I.II
gender	
sex	SA
age at death	00
age	PN
age class	PN
86/87 Sr	0.708382
standard error	
notes	

grave	870
ID	PTH 870
typology	petrous bone
ritual	inhumation
chronology	LG I.II
gender	
sex	SA
age at death	00
age	PN
age class	PN
86/87 Sr	0.708471
standard error	
notes	

grave	886
ID	PTH 886 B
typology	enamel
ritual	inhumation
chronology	H.R
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708351
standard error	
notes	

grave	887
ID	PTH 887
typology	enamel
ritual	inhumation
chronology	LG I
gender	
sex	SA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708475
standard error	
notes	

grave	888
ID	PTH 888
typology	enamel
ritual	inhumation
chronology	LG I
gender	
sex	SA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708556
standard error	
notes	

grave	890
ID	PTH 890
typology	enamel
ritual	inhumation
chronology	LG I
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708317
standard error	
notes	

grave	891
ID	PTH 891
typology	enamel
ritual	inhumation
chronology	LG I
gender	
sex	SA
age at death	10-15
age	AD
age class	J
86/87 Sr	0.708414
standard error	
notes	

grave	903
ID	PTH 903
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708421
standard error	
notes	

grave	904
ID	PTH 904
typology	enamel
ritual	inhumation
chronology	LG I.II
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708557
standard error	
notes	

grave	944
ID	PTH 944A
typology	petrous bone
ritual	cremation
chronology	LG I
gender	F
sex	F
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708811
standard error	
notes	

grave	949
ID	PTH 949
typology	petrous bone
ritual	inhumation
chronology	LG I
gender	NA
sex	NA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708423
standard error	
notes	

grave	950
ID	PTH 950
typology	petrous bone
ritual	inhumation
chronology	LG I.II
gender	M
sex	M
age at death	>40
age	MA
age class	A
86/87 Sr	0.708531
standard error	
notes	

grave	951
ID	PTH 951
typology	enamel
ritual	inhumation
chronology	LG I
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708596
standard error	
notes	

grave	957
ID	PTH 957
typology	enamel
ritual	inhumation
chronology	LG I.II
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708903
standard error	
notes	

grave	968
ID	PTH 968B
typology	petrous bone
ritual	inhumation
chronology	LG II
gender	
sex	SA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708377
standard error	
notes	

grave	973
ID	PTH 973
typology	petrous bone
ritual	inhumation
chronology	LG I
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708504
standard error	
notes	

grave	977
ID	PTH 977
typology	petrous bone
ritual	inhumation
chronology	LG II
gender	M
sex	M
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708500
standard error	
notes	

grave	985
ID	PTH 985
typology	petrous bone
ritual	cremation
chronology	LG I
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708877
standard error	
notes	

grave	993
ID	PTH 993
typology	petrous bone
ritual	inhumation
chronology	LG I.II
gender	M
sex	M
age at death	>40
age	MA
age class	A
86/87 Sr	0.708325
standard error	
notes	

grave	997
ID	PTH 997 B
typology	enamel
ritual	inhumation
chronology	H.R
gender	
sex	
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708156
standard error	
notes	

grave	27
ID	PTH 27
typology	petrous bone
ritual	cremation
chronology	H.R
gender	M(?)
sex	M
age at death	>40
age	OA
age class	A
86/87 Sr	0.708336
standard error	0.000010
notes	

grave	33
ID	PTH 33
typology	enamel
ritual	inhumation
chronology	H.R
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708484
standard error	0.000006
notes	

grave	40
ID	PTH 40
typology	petrous bone
ritual	cremation
chronology	H.R
gender	F
sex	F
age at death	>40
age	OA
age class	A
86/87 Sr	0.708618
standard error	0.000007
notes	

grave	61
ID	PTH 61
typology	petrous bone
ritual	cremation
chronology	H.R
gender	M(?)
sex	M
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708572
standard error	0.000008
notes	

grave	82
ID	PTH 82
typology	enamel
ritual	inhumation
chronology	H.R
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708435
standard error	0.000005
notes	

grave	86
ID	PTH 86
typology	petrous bone
ritual	cremation
chronology	H.R
gender	M
sex	M
age at death	>40
age	MA
age class	A
86/87 Sr	0.708464
standard error	0.000006
notes	

grave	93
ID	PTH 93
typology	petrous bone
ritual	cremation
chronology	H.R
gender	M(???)
sex	M
age at death	10-15
age	AD
age class	J
86/87 Sr	0.708375
standard error	0.000008
notes	

grave	94
ID	PTH 94
typology	petrous bone
ritual	cremation
chronology	H.R
gender	M
sex	M
age at death	>40
age	OA
age class	A
86/87 Sr	0.708331
standard error	0.000005
notes	

grave	114
ID	PTH 114b
typology	petrous bone
ritual	cremation
chronology	H.R
gender	M
sex	M
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708373
standard error	0.000007
notes	

grave	120
ID	PTH 120
typology	petrous bone
ritual	cremation
chronology	LG II
gender	F(???)
sex	F
age at death	>40
age	OA
age class	A
86/87 Sr	0.708458
standard error	0.000005
notes	

grave	154
ID	PTH 154
typology	petrous bone
ritual	cremation
chronology	LG II
gender	F(??)
sex	F
age at death	>40
age	OA
age class	A
86/87 Sr	0.708864
standard error	
notes	

grave	159
ID	PTH 159
typology	petrous bone
ritual	cremation
chronology	LG II
gender	
sex	F
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708778
standard error	
notes	

grave	160
ID	PTH 160
typology	petrous bone
ritual	cremation
chronology	LG II
gender	F
sex	F
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708353
standard error	
notes	

grave	168
ID	PTH 168
typology	petrous bone
ritual	cremation
chronology	LG II
gender	M
sex	M
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708378
standard error	
notes	

grave	177
ID	PTH 177
typology	petrous bone
ritual	inhumation
chronology	LG I
gender	M(???)
sex	M
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708524
standard error	
notes	

grave	199
ID	PTH 199b
typology	petrous bone
ritual	cremation
chronology	LG I
gender	M
sex	M
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708797
standard error	
notes	

grave	199
ID	PTH 199a
typology	petrous bone
ritual	cremation
chronology	LG I
gender	F
sex	F
age at death	20-40
age	YA
age class	A
86/87 Sr	0.709029
standard error	
notes	Double cremation burial. Male+female

grave	203
ID	PTH 203
typology	petrous bone
ritual	cremation
chronology	LG I
gender	M
sex	M
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708820
standard error	
notes	

grave	208
ID	PTH 208a
typology	petrous bone
ritual	cremation
chronology	LG II
gender	F
sex	F
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708544
standard error	
notes	

grave	208
ID	PTH 208b
typology	petrous bone
ritual	cremation
chronology	LG II
gender	M
sex	M
age at death	>40
age	OA
age class	A
86/87 Sr	0.708652
standard error	
notes	Double cremation burial. Male+female

grave	1003
ID	PTH 1003
typology	enamel
ritual	inhumation
chronology	LG I
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708390
standard error	0.000005
notes	

grave	1010
ID	PTH 1010
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	SA
age at death	00-01
age	I
age class	C
86/87 Sr	0.708463
standard error	0.000009
notes	

grave	1026
ID	PTH 1026
typology	petrous bone
ritual	enchytrismos
chronology	LG I.II
gender	
sex	SA
age at death	00
age	PN
age class	PN
86/87 Sr	0.708650
standard error	
notes	

grave	1029
ID	PTH 1029
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708414
standard error	
notes	

grave	1052
ID	PTH 1052
typology	enamel
ritual	inhumation
chronology	H.R
gender	M
sex	M
age at death	>40
age	MA
age class	A
86/87 Sr	0.710233
standard error	
notes	

grave	1057
ID	PTH 1057 A
typology	enamel
ritual	inhumation
chronology	H.R
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708264
standard error	
notes	

grave	1061
ID	PTH 1061B
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708542
standard error	
notes	

grave	1061
ID	PTH 1061C
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	F
sex	F
age at death	15-20
age	J
age class	J
86/87 Sr	0.708676
standard error	
notes	

grave	1063
ID	PTH 1063 D
typology	enamel
ritual	inhumation
chronology	H.R
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708359
standard error	
notes	

grave	1063
ID	PTH 1063 F
typology	enamel
ritual	inhumation
chronology	H.R
gender	M
sex	M
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708528
standard error	
notes	

grave	1063
ID	PTH 1063 A
typology	enamel
ritual	inhumation
chronology	H.R
gender	
sex	SA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708641
standard error	
notes	

grave	1072
ID	PTH 1072
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.709159
standard error	
notes	

grave	1075
ID	PTH 1075b
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	M
sex	M
age at death	>40
age	OA
age class	A
86/87 Sr	0.708634
standard error	0.000007
notes	

grave	1089
ID	PTH 1089
typology	enamel
ritual	inhumation
chronology	H.R
gender	M
sex	M
age at death	>40
age	MA
age class	A
86/87 Sr	0.710074
standard error	
notes	

grave	1092
ID	PTH 1092
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	F(???)
sex	F
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708555
standard error	
notes	

grave	1093
ID	PTH 1093e
typology	enamel
ritual	inhumation
chronology	H.R
gender	
sex	SA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708468
standard error	
notes	

grave	1093
ID	PTH 1093p
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	
sex	SA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708489
standard error	
notes	

grave	1097
ID	PTH 1097p
typology	petrous bone
ritual	inhumation
chronology	LG II
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.709362
standard error	
notes	

grave	1097
ID	PTH 1097e
typology	enamel
ritual	inhumation
chronology	LG II
gender	M
sex	M
age at death	20-40
age	YA
age class	A
86/87 Sr	0.709687
standard error	
notes	

grave	1104
ID	PTH 1104
typology	petrous bone
ritual	cremation
chronology	LG II
gender	M
sex	M
age at death	20-40
age	GA
age class	A
86/87 Sr	0.708625
standard error	0.000008
notes	

grave	1116
ID	PTH 1116
typology	petrous bone
ritual	cremation
chronology	LG II
gender	F
sex	F
age at death	15-20
age	J
age class	J
86/87 Sr	0.708319
standard error	
notes	

grave	1123
ID	PTH 1123
typology	enamel
ritual	inhumation
chronology	NA
gender	F
sex	F
age at death	15-20
age	J
age class	J
86/87 Sr	0.708997
standard error	
notes	

grave	1146
ID	PTH 1146
typology	enamel
ritual	inhumation
chronology	LG II
gender	M
sex	M
age at death	15-20
age	J
age class	J
86/87 Sr	0.708505
standard error	
notes	

grave	1149
ID	PTH 1149
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708689
standard error	
notes	

grave	1150
ID	PTH 1150
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.708620
standard error	0.000005
notes	

grave	1156
ID	PTH 1156
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	SA
age at death	5-10
age	OC
age class	C
86/87 Sr	0.708417
standard error	0.000003
notes	

grave	1166
ID	PTH 1166C
typology	enamel
ritual	inhumation
chronology	NA
gender	M
sex	M
age at death	20-40
age	A
age class	A
86/87 Sr	0.708221
standard error	0.000005
notes	

grave	1166
ID	PTH 1166A
typology	petrous bone
ritual	inhumation
chronology	NA
gender	
sex	SA
age at death	1-5
age	C
age class	C
86/87 Sr	0.708542
standard error	
notes	

grave	1172
ID	PTH 1172p
typology	petrous bone
ritual	inhumation
chronology	H.R
gender	M(??)
sex	M
age at death	>40
age	OA
age class	A
86/87 Sr	0.708529
standard error	
notes	

grave	1172
ID	PTH 1172e
typology	enamel
ritual	inhumation
chronology	H.R
gender	M(??)
sex	M
age at death	>40
age	OA
age class	A
86/87 Sr	0.708679
standard error	
notes	

grave	1184
ID	PTH 1184
typology	enamel
ritual	inhumation
chronology	LG II
gender	
sex	
age at death	20-40
age	YA
age class	A
86/87 Sr	0.709579
standard error	
notes	

grave	1229
ID	PTH 1229A
typology	enamel
ritual	inhumation
chronology	LG II
gender	M
sex	M
age at death	>40
age	OA
age class	A
86/87 Sr	0.708513
standard error	
notes	