Material Culture Change and Cultural Boundaries: Pottery Production, Distribution and Exchange at Monte Finocchito and Related Sites in South-Eastern Sicily

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GLOSSARY

Term	**Definition**
Early Greek colonisation	A process describing a movement of people from one place to another.
Geometric/Geometric decoration	Pottery made in Sicily with painted or incised/impressed geometric motifs, such as small concentric circles and triangular patterns combined with horizontal lines.
Greek ceramic	Ceramics imported from Greece.
Greek-style	Local imitation of imported greek pottery shapes and styles.
Imported ceramics	Pottery that is recognised as produced in Greece and imported to Sicily.
Local ceramics	Indigenous pottery made in Sicily.
Local imitations	Pottery resembling Greek ceramics (shapes and decoration) made in Sicily by indigenous ceramists at Finocchito.
Non-local ceramics	Pottery imitating Greek ceramics discovered at Monte Finocchito but manufactured (probably in Sicily) by Greeks or Sicilian ceramists from other indigenous sites.

Outlier	Ceramic sample that was created by different ceramic practices and/or the use of different clays. It is a local ceramic (indigenous ceramic types) but may be made outside Finocchito.
Protocorinthian ceramic	Protocorinthian pottery made in Greece.
Protocorinthian-style	Local pottery manufactured in Sicily and imitating Protocorinthian Greek ceramics.
‘Thapsos’ cup/‘Thapsos’ cup type	Local cup manufactured in Sicily and imitating the Greek Thapsos cup.

ABSTRACT

This study identifies and analyses evidence for cultural transformation in southeastern Sicily when indigenous populations came into contact with ancient Greek settlers between the late eighth and the early phase of the seventh centuries B.C. Historically, it was a crucial moment for Sicily because it initiated an irreversible process of modification of the original indigenous culture. Archaeologically, changes in material culture at indigenous sites in Sicily have long been interpreted as the consequence of interaction with Greeks and Greek culture, seen especially in the adoption of new shapes and decorative schemes in local pottery manufacture which derived from Greek sources. At the same time, certain types of Greek vessels do not appear to have found favour with local populations and do not appear at indigenous sites. This thesis examines indigenous pottery production and distribution, focussing on material from Monte Finocchito in southeastern Sicily and combining archaeological and anthropological approaches with the first archaeometric analyses ever carried out on this artefact assemblage: X-ray fluorescence (XRF), mineralogical X-ray diffraction (XRD) and petrographic thin-section analysis techniques have all been employed in a multidisciplinary research project. The thesis argues on the basis of analysis of pottery fabrics and techniques, as well as shapes and decoration, that indigenous populations maintained robust independent cultures in the early phase of their interaction with the Greeks, and that any shifts in material culture were the result of a deliberate process of selection and rejection. The significance of this research resides not only in its being the first study based on archaeometric analyses of pottery from Monte Finocchito and related sites, but also because it presents Finocchito not as an isolated case study but one which can contribute to the creation of broader pottery reference material and to the understanding of cultural interactions in Iron Age Sicily.

STATEMENT OF AUTHORSHIP

Except where reference is made in the text of the thesis, this thesis contains no material published elsewhere or extracted in whole or in part from a thesis accepted for the award of any other degree or diploma. No other person's work has been used without due acknowledgment in the main text of the thesis. This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution.

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CHAPTER 1

1. INTRODUCTION

The study of mobility, as a social phenomenon, explores the movement of people in different territories and everything is related to it, such as customs, language, ideas and goods. There are different reasons behind mobility of people and migratory flows, often including social tensions resulting from a range of factors such as war and ambitions of expansion beyond established boundaries, as well as resource supply and other environmental factors. The whole of human history is characterised by a continuous movement of people, within which causes and effects are always different on the basis of the surrounding environment, the historical period and the dynamic cultural interactions established (Van Dommelen 2012, 403-404; Van Dommelen 2014, 480). The movement of a group toward a foreign land and the inevitable social and cultural interaction with the indigenes could lead to substantial changes in customs and traditions. Usually, all parties involved experience, on different levels, a process of cultural transformation. This process of culture change is never immediate and it faces multifaceted complexities in part determined by social structures and strong identities. Anthropological studies focusing on social and culture interactions, especially in a colonial situation, view those groups, which recognise themselves as a community despite their cultural diversity, as more likely to become a community with a new common identity (Said 1978; White 1991; Gandhi 1998; Malkin 2004; Dietler 2010, 13; Van Dommelen 2012, 403).

In Classical and Mediterranean archaeology the term colonialism, which ‘refers to the presence of one or more groups of foreign people in a region at some distance from their place of origin’ (Van Dommelen 1997, 306), is not widely used. By contrast, preference is given to the term colonisation, used to describe mobility of people involved in a process of expansion and conquest. In particular, the terms ‘colony’ or ‘colonisation’ have been applied to the study of the ancient Mediterranean with regard to Greek overseas expansion in the south of Italy and Sicily from the late eighth century BC (MacIver 1931; Dunbabin 1948).

As detailed in chapter 4, these terms such as ‘colonies’, ‘colonisation’ and ‘colonialism’, are used in this study on the basis that their modern connotations and concomitant modern political significance are not applicable to the ancient Greek world (Van Dommelen 1997, 306). Modern 'colonial' terminology is derived from Latin (*colonia*) and the Roman world; thus, 'colony' is generally used to describe a collectivity of people (as well as a physical location) (Sommer 2012, 183), while 'colonisation' traditionally describes a movement of people from one place to another with the intent to expand their empire. (Dietler 2010, 17; Sommer 2011, 183; Van Dommelen 2014, 479). Likewise, colonialism defines a movement of people expanding their power through the occupation of new territories and the domination of a group of people from another culture (Sommer 2011, 189-190; Van Dommelen 2012, 397). This model, which relates particularly to the colonial empires of the nineteenth century, does not describe the events in the ancient Mediterranean in the Early Iron Age and Archaic period. The term the Greeks used to describe their overseas ventures was ***apoikia*** (α π ο ι κ ι α), a residence away from home (Wilson 2006, 28; Van Dommelen 2012, 396). However, 'colony' and its cognates are entrenched in modern scholarship, and so must be contextualised when applied to the ancient Greek world.

Interactions occuring in colonial contexts have often been as described unequal relationships, where indigenous people are a group without strong social structures, while the colonisers are often described as superior (Park and Burgess 1921, 735; Hodos 2000, 43-44). However, since the advent of the New Archaeology, more recent scholarship has recognised that the interactions between different cultures occurred in different contexts and with different effects and, as such, cannot be simplified or standardised (Dietler 2010). In such colonial contexts, two different ethnic groups encounter one another, creating a new reality through agreements and exchange, which are described as common or contact zones (Ferguson and Whitehead 1992; Pratt 1992). The place where both groups start a dialogue was described by Richard White as the 'Middle Ground' (White 1991). In accordance with White's theory, Malkin also provides a detailed description of such a phenomenon:

> Middle Ground is an area in which both [parties] play roles according to what each side perceives to be the other's perception of itself. In time this role-playing, the result of a kind of double mirror reflection, creates a civilisation that is neither purely native nor entirely colonial-imported. According to changing circumstances each side will also come to emphasize certain aspects of the image constructed of the other, either for the sake of

> meditation and coexistence or as justification of hostilities (Malkin 1998, 133).

Sicily, because of its central position in the Mediterranean Sea, is a meeting-place of different cultures. It has always been a land of encounters and coexistences, a place where there was mobility of goods and people. During the Iron Age, the Greeks intensified their overseas travel and founded permanent settlements (απoικια). From this moment on, a process of cultural transformation began in Sicily. Historically, it is a crucial moment as it initiated an irreversible process of modification for the indigenous culture. As noted above, it usually refers to this period as Greek colonisation, when migrants set out from their mother cities (Malkin 2016, 288-289). Colonisation is generally viewed as a phenomenon that differs from migration, since the former usually implies organised groups of settlers that founded new settlements overseas. However, it has been argued that the presence of Greeks in Sicily, probably small groups, at the end of the eighth century, cannot really be described as a phenomenon related to a colonial situation: as Malkin observes, in this early period, it is more likely that disorganised small groups, if not single individuals, migrated to the Western Mediterranean over long periods establishing small Greek outposts with a probable commercial purpose (Sommer 2011, 183-193; Malkin 2016, 289).

Malkin argues that the migration of Greeks in the ancient Mediterranean was a complex process covering a vast period and that it did not start at the end of the eighth century; instead migration from Greece was a phenomenon that had already occurred during the Dark Age. In an earlier phase the Greeks navigated towards maritime sites around the Mediterranean which they used as landing places for commercial reasons, while from the later eighth century they established more settled settlements in territories that they were already frequenting (Osborne 1998; Malkin 2016). Thus, travel and migration intensified at the end of the eighth century. As Van Dommelen observes (2012, 404) there are different types of migrations, repeated migration movements or temporary movement, having different strategies (i.e. seasonal labour; exchange or trades). The main question, as he highlights, is not 'whether people migrated in the past, it is clear, but rather what kind of migration it was' (Van Dommelen 2012, 395).

In view of the fact that the whole of human history is characterised by constant movement, a change in artefact types and styles inevitably became one of the main kinds of evidence that archaeology identified as a possible way to detect social interaction (Van Dommelen 2012). Archaeologically, changes in material culture within the indigenous sites of Sicily are interpreted as the consequence of the fact that Greek vessels, imported or imitations, were diffused amongst other goods throughout these sites. Archaeological research therefore finds a way to read alterations of traditional customs in the material culture.

In this regard, one of the ways to identify the development and trajectory of social change and shifting cultural boundaries is through the study of the production and distribution of ceramic materials. The adoption of new vessel forms, motifs and technology has often been explained through the models of acculturation or assimilation. Both terms, have been used in anthropological contexts to describe those societies that, in a colonial environment, came into contact with a group considered socially, economically and intellectually dominant. The assimilation of the dominant culture has been defined as an acculturation process (Herskovits 1937; Wolf 1982; Trigger 1989, 275; Dietler 2010, 47). Within this variation in ceramics, the differential circulation of specific classes of goods might reflect deliberate cultural behaviour (Dietler 2010, 193). The distribution across different sites of goods with a specific value, or of particular origins, represents avenues to interpret possible social systems within an archaeological context (Tite 1999; Maniatis 2009) and sometimes 'it is a process of symbolic construction of identity and political relations with important material consequences' (Sinopoli 1991; Dietler 2010, 193-194). As further discussed in chapter 4, since the beginning of the 1970s studies of colonialism have described the process related to initial contact in a colonial context through the theory of intercultural consumption, which defines how objects, introduced as a consequence of cultural contact, were utilised in a new social context (Douglas and Isherwood 1979; Colloredo Mansfeld 2005; Dietler 2010).

In southeastern Sicily, as well as other territories in the Mediterranean, encounters with Greeks were well underway by the end of the eighth century BC. During this phase, the indigenous populations occupying the southeastern coastline of Sicily underwent a significant cultural transformation as the result of a more permanent presence of Greeks in Sicily. This thesis focuses on social interactions of the indigenes of Sicily who engaged with Greeks at the end of the eighth century BC. In particular it looks at the relationship that indigenes from Monte Finocchito, located in southeastern Sicily, had with those from Heloros, a Greek outpost settled along the coastline in the late eighth century. Monte

Finocchito represents a crucial case study in the understanding of the social interaction between Greeks and the indigenes that populated the area from the ninth to the beginning of the seventh century BC.

First of all, we need to bear in mind that scholars used to define the interaction between indigenes of Sicily and Greeks through a Helleno-centric point of view and that these early encounters (also known as pre-colonisation) were described as preparatory to the proper colonisation (see for example Dunbabin 1948). However, in the light of modern studies of the archaeology of colonialism that are more inclined to consider different models of contact with the intent to document the complexity of such interactions (Boardman 1980, 160-189; Bouloumié 1981; Dietler 2005), and the consequences of cross-cultural contacts, this interpretation is no longer necessarily valid. Thus, this subject matter fully falls within the beginning of an early colonial period (Leighton 1999, 219), between the late eighth and the early seventh century.

In terms of material culture, Monte Finocchito's archaeological record shows how indigenes acquired new vessel types that were incorporated into the ceramic set that characterised funeral rituals and burial assemblages. The repertoire of Greek ceramics, mainly local imitations of Greek types as I will illustrate in the archaeometry chapters below, that indigenes of Monte Finocchito adopted in the mortuary sphere was mainly confined to drinking cups in Protocorinthian-style, such as the 'Thapsos' cup type, kyathoi, skyphoi (two handled drinking cup) and kotylai (cup with shaped cavity) ceramic types, oinochoai and cups (small rounded container for drinking).[1] In particular, this research focuses on indigenous ceramic production, the continuity of indigenous shapes and also the way it changes, arguably in reaction to social changes, resulting from contact with the Greeks. Ceramic remains from Monte Finocchito are examined here in the light of shifts in the interpretation of the nature and experience of culture contact. As Dietler observed, the acquisition of new different objects has to be studied in light of the consideration that 'foreign objects are of interest not for what they represent in the society of origin but for their perceived use and meaning in the context of consumption' (Dietler 2010, 55). The study presented here of material culture in this indigenous context employs different layers of interpretations, in particular use and technology. One of the main arguments of this thesis is in regard to the change of indigenous material culture. I

[1] The ceramics are divided by types following Frasca's catalogue (1981).

argue that the consumption of an object is the consequence of cultural contact and the use, as well as the function, of the archaeological object in a specific social context is fundamental to understanding the indigenous social logic that allowed the process of selecting and introducing only a few Greek products into the local culture. Methodologically, I examine what was adopted and how, and which goods and why some of them were accepted while others were refused.

Technology, namely the techniques and materials used in ceramic production, represents in this study a fundamental key of interpretation in terms of social interaction because the process of making ceramics involves several factors such as the exchange of skills that are recorded through a change in manufacture (Arnold 1985; 1999; Costin 2000; Martineau 2001; Santacreu 2014, 133). For example, the adoption of different clay and the mixing of several clay sources or a change in the firing process are all factors that suggest that a new model was introduced. Usually, a new model or different techniques occur when the traditional method is not sufficient anymore to make an object that differs from the common types produced. Such change in manufacture can be also the product of pure experimentation but usually, to avoid economic losses through failure during the manufacturing process, ceramists use techniques that they are familiar with (Santacreu 2014).

The aim of this study is to interpret continuity and change in the context of a culturally mixed environment, which plays a crucial role in the understanding of social and cultural life. To address issues of change in material culture, the following research questions have been investigated:

1) Can potential networks of contact and exchange be especially detected in relation to the Greek settlement of Heloros?
2) Is the adoption of a specific repertoire of Greek pottery vessels a reflection of indigenous choices or was the change in material culture a form of emulation?
3) Can any form of culture resistance be detected?
4) Does the change in material culture necessarily describe a change in social culture?

To answer these questions, this research uses a multi-disciplinary approach, investigating the phenomenon from different directions and trying to obtain detailed and wide-ranging information to provide a clearer understanding of this critical period in Sicily's history.

The development of ceramic styles, which combine both Greek and indigenous features, is here examined as a possible indicator of social transformation, yet it is also necessary to seek the reasons why only a few specific Greek ceramic types were introduced. Hence, the analyses of archaeological data have a value only if explained through an anthropological and sociological analysis capable of shedding light on the social and cultural processes, which might have resulted in the selection, rejection, or adaptation of specific artefact types. The style, vessel shape and decoration of the pottery are examined also with the support of archaeometric analyses: new technology and analytical techniques are increasingly providing fundamental information, which may support, reject or alter established theories and, importantly, furnishing new and broader interpretations. Since I argue that the process of making ceramics and its variability in technology is the consequence of social and cultural interaction between different groups (Arnold 1985; 1999; Martineau 2001; Santacreu 2014), archaeometric analyses are here employed to answer to the following questions:

1) Can archaeometric data detect potential networks between Finocchito and Heloros?
2) Is it possible to distinguish any change in making ceramic vessels? I.e. technology and variation in using clay sources?
3) Is the clay source local?

The significance of this research resides in it being the first scientific study based on archaeometric analyses of pottery from Monte Finocchito, Giummarito and Heloros. Archaeometric analyses have been applied to identify different ceramic groups, clay source, local ceramics and imports introduced to the indigenous site of Finocchito. This study contributes to creating and, in some cases, to amplifying the database for archaeometric information concerning indigenous ceramic production at sites in southeastern Sicily (Tanasi et al. 2016). Even though the use of archaeometric analysis has been increasing in the last few decades, studies based on scientific analyses of ceramics from southeastern Sicily are still minimal.

In order to answer these questions, archaeometric analyses have been conducted on a specific group of ceramics from the indigenous sites of Monte Finocchito, Giummarito and Heloros dating to between the ninth and the seventh centuries BC. In order to examine ceramic production, exchanges and imports, a variety of methods and different instruments have been utilized: X-Ray fluorescence (XRF) analysis, mineralogical X-Ray Diffraction (XRD) and thin-section analysis. The hand-held portable X-Ray fluorescence (XRF) device was used in order to recognise clustered groups and differences occurring between indigenous ceramics and pottery related to the Greek site of Heloros. Recognising local wares and non-local ceramics is an important method in understanding internal dynamics and relationships established between indigenes and newcomers. Meanwhile, mineralogical X-Ray diffraction (XRD) identified the geochemical elements characterising each ceramic sample, and thin-section analyses interpreted the data to identify technological processes and the source of the clay. Moreover, this thesis also contributes to a greater understanding of the potential of combining different instrumentation in characterisation studies of archaeological materials. Additionally, no previous studies in southeastern Sicily have attempted to utilize archaeometric analyses of ceramics dating to the Iron Age. Until now, the only exception is the study I published in collaboration with Robert Tykot and Andrea Vianello (Raudino et al. 2017).

I have organised this thesis into ten chapters, including this current introduction (chapter 1). Chapter 2 looks at the geographical and historical settings of Sicily with a particular focus on southeastern Sicily, in particular the territory corresponding with the Hyblaean Plateau. This is in addition to a general description of the topography of Monte Finocchito and Heloros. Within this chapter I also discuss climate, the vegetation characterising the physical landscape, and the environmental condition of both archaeological sites during the Iron Age. It is relevant to understand how the natural environment probably influenced indigenes and Greeks in terms of ceramic production. In other terms, if a clay source was closely available and it was used in the ceramic production, this could reveal how indigenes and subsequently the Greeks exploited the territory and its potentialities.

In chapter 3, I examine the cultural history of the indigenous sites of Sicily during the Iron Age, especially focusing on those sites along the southeastern side. I also focus on the chronological phases Frasca (1981) and Steures (1980; 1988) proposed for Monte Finocchito and coeval neighbouring sites. Additionally I outline the Greek settlement of Syracuse and its territory, in particular Heloros. In chapter 4, I analyse the modern concepts characterising the archaeology of colonialism and I discuss how these methodologies are applicable to Finocchito. In addition, I provide an account of the historical relationship between archaeology and colonialism, established during the eighteenth century, and how the recent European enterprises were used as a model that influenced the interpretation of colonisation in the ancient Mediterranean. Moreover, I discuss how different approaches, based on anthropological studies, have been applied in ancient colonial contexts and the position of the most recent researchers. I also propose, in relation to this case study, a methodology to adopt in terms of interpreting relationships indigenes established with Greeks. Finally, in the same chapter, I look at the study of material culture as a possible tool to read alterations of traditional customs.

In chapter 5, I describe ceramic types and motifs circulating in southeastern Sicily during the eighth century BC, while in chapter 6 particular attention is given to the ware types from Monte Finocchito, Giummarito and Heloros. In particular, I describe how new types, mainly influenced by Greek models, appeared within the indigenous site of Finocchito in the late eighth century BC and I analyse these as new and different models that were adopted or adapted to the local ceramic production. Moreover, I define each ceramic type (taking into account style and decoration) recorded at Finocchito from which the samples for archaeometric analysis were drawn. Each sample is named with a first letter describing the origin: F is for Finocchito, G for those samples from Giummarito and H for ware from Heloros. This is followed by a second letter that is specific to the ceramic type, for example B, which stands for bowl, followed by a specific number assigned to each vessel (see the catalogue i.e. FB01). In chapter 6, I also discuss the archaeometric methods adopted to analyse the ceramics. In chapter 7, I discuss the archaeometric methods and results obtained using the portable XRF technique carried out with the Bruker III-SD instrument and the Olympus DELTA Premium (DP 6000A) hand-held XRF analyser. Chapter 8 looks at the X-ray powder diffraction (XRD) analysis pointing out the process and the results. Meanwhile, chapter 9 deals with the thin-section analysis and a meticulous description of the process and results. With regard to the destructive analyses (pXRF Olympus Delta Premium, XRD and thin-section) the selection of these potsherds was limited by the museum's permission to proceed with destructive analyses. Moreover, the number of ceramic samples suitable for thin-section petrographic analysis was even lower, as most ceramics were too fragile to be cut in thin-section (see Chapter 9).

I discuss the results of these analyses in chapter 10 with the intent to use the data obtained through the archaeometric analysis to answer the archaeological questions. Moreover, the archaeometric data are interpreted through the lens of modern concepts of the archaeology of colonialism. In this final chapter I also discuss the implications of this research for archaeometric studies in general and in particular in relation to studies of ceramics from southeastern Sicily.

Finally, this research project looks at this wide phenomenon through a different perspective, namely from an indigenous point of view. The aim is to move from an exclusive Helleno-centric which that describes a one-way process of the adoption of ‘superior’ Greek culture with little influence traveling in the opposite direction. This study looks at Finocchito not as an isolated historical case of study but as offering further elements towards the understanding of the wider context involving two different groups. The research focuses mainly on the original stage of such encounters, as it is fundamental for our understanding of the transformation and the following events in relation to the wider phenomenon of Greek settlement in Sicily. For the purpose of this study, the indigenous Sicilians from Monte Finocchito will be characterised, as indigenous people unless otherwise stated. With regard to the chronological phases, these are always BC, unless otherwise noted. The chronological range here covers the end of the ninth and the early phase of the seventh century BC in southeastern Sicily.

CHAPTER 2

2. SICILY'S GEOGRAPHICAL SETTINGS

Sicily's geology and landscape are characterised by different features that have influenced human behaviour and economic activities. From a geological perspective, Sicily is part of the western central Mediterranean and African-European Plateau. The island has three main zones: the southeastern, dominated by the Hyblaean Plateau and its limestone canyons crossed by springs; the central western zone, which is composed of sandstones and marly limestone; and the western area, surrounded by gentle hills and plains (Restuccia et al. 2012, 1; Bonforte et al. 2015). These three geographical units are each characterised by a different morphology that has also determined their different histories. According to tradition, these three geographical units coincide with Sicily's three ancient ethnic groups (Figure 2.1): the Sicanians, Sicels and Elymians (Thuc. 6.2). The Greek historian Thucydides claimed that the Sicanians, the oldest inhabitants of Sicily, emigrated from the Iberian Peninsula while the Elymians were thought to be the second oldest group occupying western Sicily. The most recent group were the Sicels, from the Italian peninsula, who occupied eastern Sicily after defeating the Sicilians and forcing them to move to the south and west of the island (Thuc. 6.2).

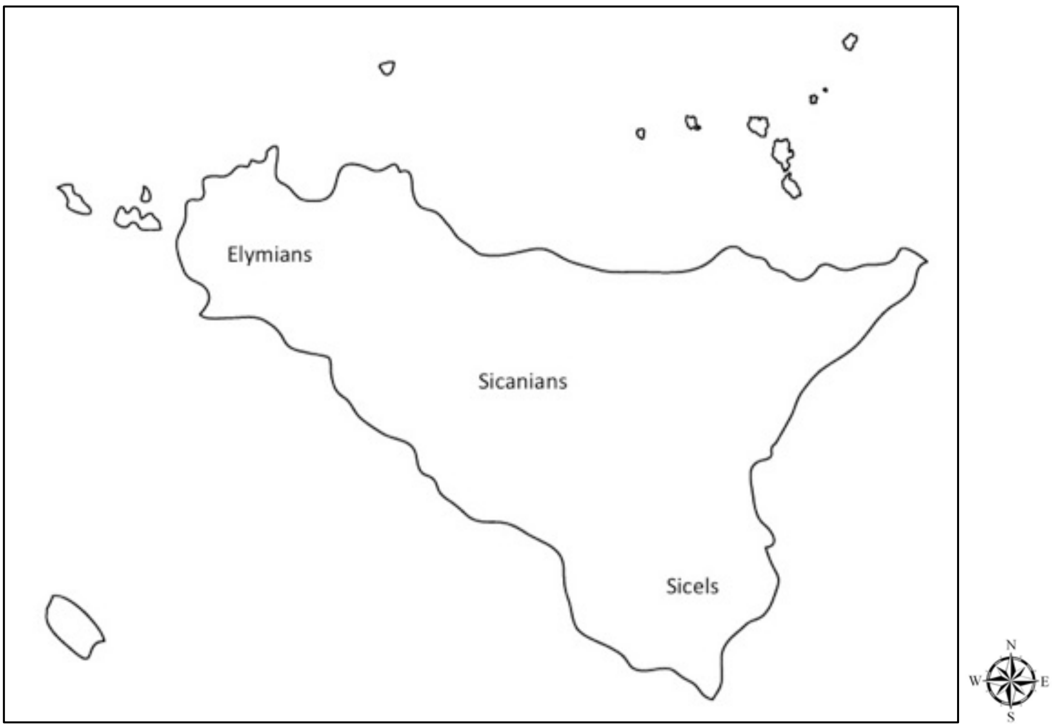


Figure 2. 1 Sicily's three ancient ethnic groups.

2.1 THE HYBLAEAN PLATEAU

The key area for this study is the Hyblaean Plateau (Figure 2.2), which lies in southeastern Sicily. Initial studies of the geology of this portion of Hyblaean territory were carried out by Lyell (1838), while the first geological map was created in 1886 by Baldacci. Modern studies on Sicily began in 1959, when the denomination 'Hyblaean Plateau' was first introduced (Rigo and Barberi 1959). Since that time, geo-morphological and bioclimatic studies have provided new data regarding the territory's geological history (Rigo and Cortesini 1961; Schmidt and Friedberg 1964; Patacca et al. 1979). Particular physical features characterise the Hyblaean Plateau, which consists of a continental crust type that differs from that found in the rest of Sicily (Avraham and Grasso 1991). This area represents an emerged portion (north-east/south-west oriented) of the African foreland and the extension of Malta (Figure 2.3).

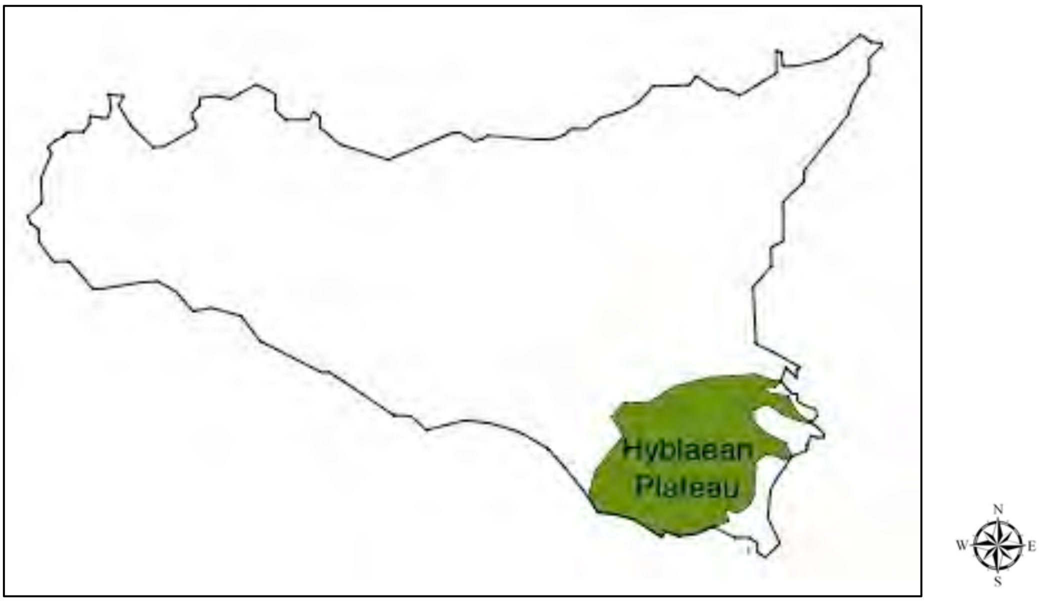


Figure 2. 2 The Hyblaean Plateau.

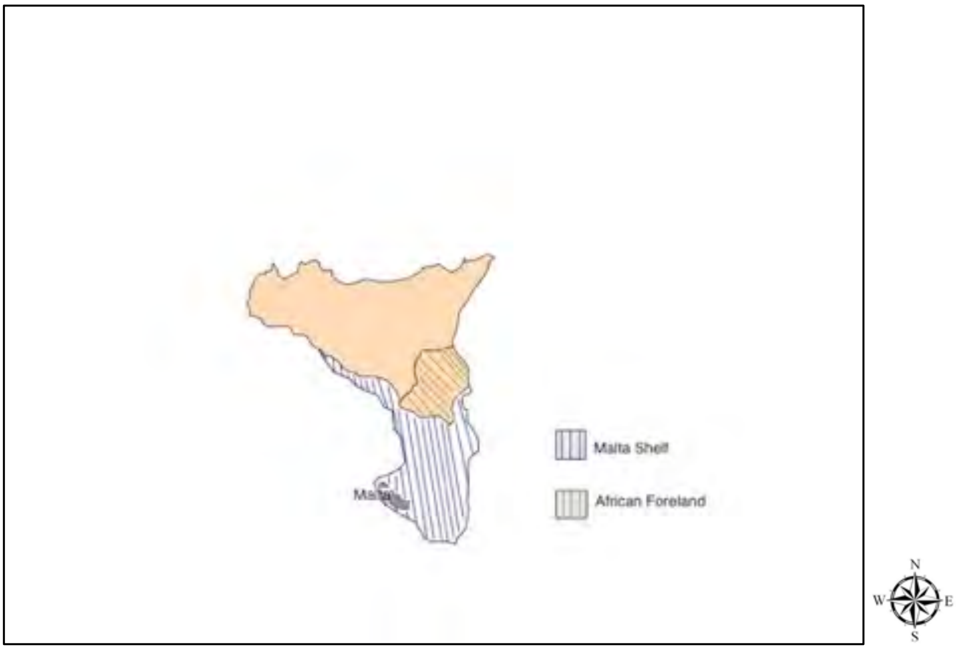


Figure 2. 3 The Hyblaean Plateau continental crust is the emerged portion of the African foreland and the southern extension of the Maltese island.

The Hyblaean and Maltese plateaux are a single crustal unit characterised by a limestone tableland. The Hyblaean Plateau is mostly composed of a carbonate (Miocene carbonate) platform succession, dating back to the Triassic and Quaternary periods. The Tellaro River, which crosses the Hyblaean Plateau's valley through an asymmetric distribution of fluvial terraces, divides the carbonate sequences into two tectonic domains; the Tellaro River Valley, which lies on the Hyblaean Plateau, and marks the passage between the Siracusa Plateau to the east and the Ragusa Plateau to the west (Figure 2.4) (Rigo and Barberi 1959; Finetti et al. 2005; Romagnoli et al. 2015).

Figure 2. 4 The Ragusa and Siracusa Plateaux.

The Tellaro River Valley is characterised by a coarse-grained clay deposit of whitish lime mudstones and yellowish soil, dating to the Early Messinian period. Geologically, the Early Messinian corresponds to the Mid-Late Miocene (5.3 million years to 11.6 million ago). Meanwhile, the Early-Middle Pleistocene phase of the Tellaro River's deposit is characterised by travertine red soil. Overall, the Hyblaean Plateau's geological shape is characterised by numerous varieties of white and yellowish calcarenite, fine grey limestone and soft marly limestone (Restuccia et al. 2012). The Tellaro's formation is mainly characterised by the Giarratana Marl Member and the Castelluccio Marl Member (Pedley 1981, 278-279) (Figure 2.5).

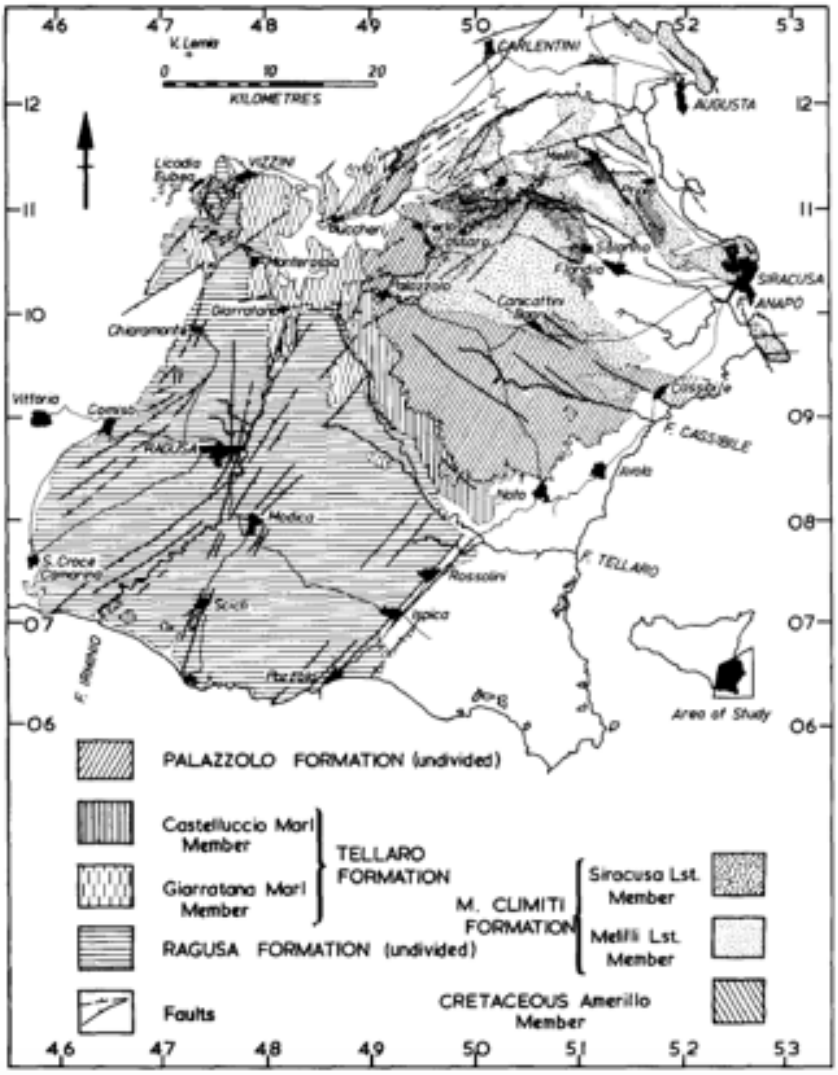


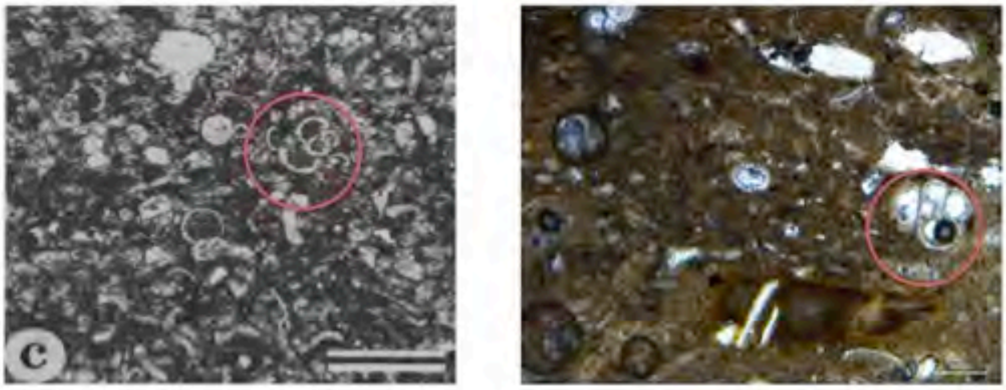
Figure 2. 5 Lithographical map of the Hyblaean Plateau region (Pedley 1981).

The Giarratana Marl Member has a greyish-yellow to white and also friable marl, and it is under the Plio-Pleistocene lavas. Thin-section studies suggested that the Serravallian planktonic foraminifera and marly micrite are associated with the Giarratana Marl, while bivalve moulds and pectinids also occur (Pedley 1981, 279). On the other hand the Castelluccio Marl Member is a grey to greyish-yellow marl and extends from Buscemi to Noto. In addition, Pedley’s studies suggest that both Marls in the Anapo valley were replaced by biomicrites, which is a form of limestone, of the Palazzolo formation which is the youngest division of the Hyblaean carbonates (Rigo and Barberi 1959). Three of them are the regional variations recognised in the Tellaro formation: Central, Northern and Southern area (Figure 2.6).

Figure 2. 6 Regional variation of the Tellaro River Valley’s geological formation.

The central area, which corresponds with Palazzolo Acreide, is characterised by yellowish-grey biomicrites and marl, while coralline algal carbonates are also detected. The northern area is characterised by pale coloured marl corresponding to that from the north of Buscemi and Castelluccio Member, while it becomes pale-brown to cream in the area east of Buccheri.

Within the Tellaro formation, Pedley (1981, 281) recorded a high percentage of planktonic foraminifera (Figure 2.7), especially in the northern regional area, corresponding to the Buccheri and Castelluccio formations.



a. Planktonic foraminifera from Palazzolo Acreide and Buccheri areas by Pedley (1981).

b. Planktonic foraminifera from ceramic sample 53 (Monte Finocchito).

Figure 2. 7 Planktonic foraminifera from Palazzolo Acreide and Buccheri areas (a) correspond to the planktonic type recorded in some of the ceramic samples from Monte Finocchito (b), which have been analysed in this study through petrographic thin-section analysis (see chapter 9).

The understanding of the geological formation of the Tellaro River Valley, and in particular the discovery of planktonic foraminifera, is fundamental in this study of ceramics from Monte Finocchito. Thus, as showed in chapter 9, petrographic thin-section analysis of ceramics pointed out that more than one ceramic fabric detected is characterised by planktonic foraminifera (Figure 2.7). As explained in chapter 9, the presence of foraminifera in the Tellaro formation enables us to establish the origin of the clay source the indigenes from Monte Finocchito employed in manufacturing the ceramics.

2.2 GEOGRAPHICAL SETTINGS OF INDIGENOUS SITES

Archaeo-historical events have altered the topography of the Hyblaean Plateau, especially during the nineteenth and twentieth centuries. Human activity has had a greater impact on coastal areas, territories near water resources, and on inland areas. The Hyblaean Plateau is characterised by several elevated hills traversed by rivers and seasonal streams that are dry in summer and often overflow in winter (Turner 2000, 52). In prehistoric times, various indigenous sites dotted the inland area. These sites were usually located in proximity to the two main rivers, the Asinaro and Tellaro, which represent the area's main water resources. During the Bronze Age, the indigenous site of Castelluccio (2200-1800 BC) occupied the northwestern side of the Hyblaean Plateau, overlooking the two main rivers (Orsi 1892b; 1893). Later, from the ninth century BC, the indigenous sites of Giummarito, Cava delle Murmure, Noto Antica and Monte Finocchito occupied hilltops defined by deep valleys (Figure 2.8).

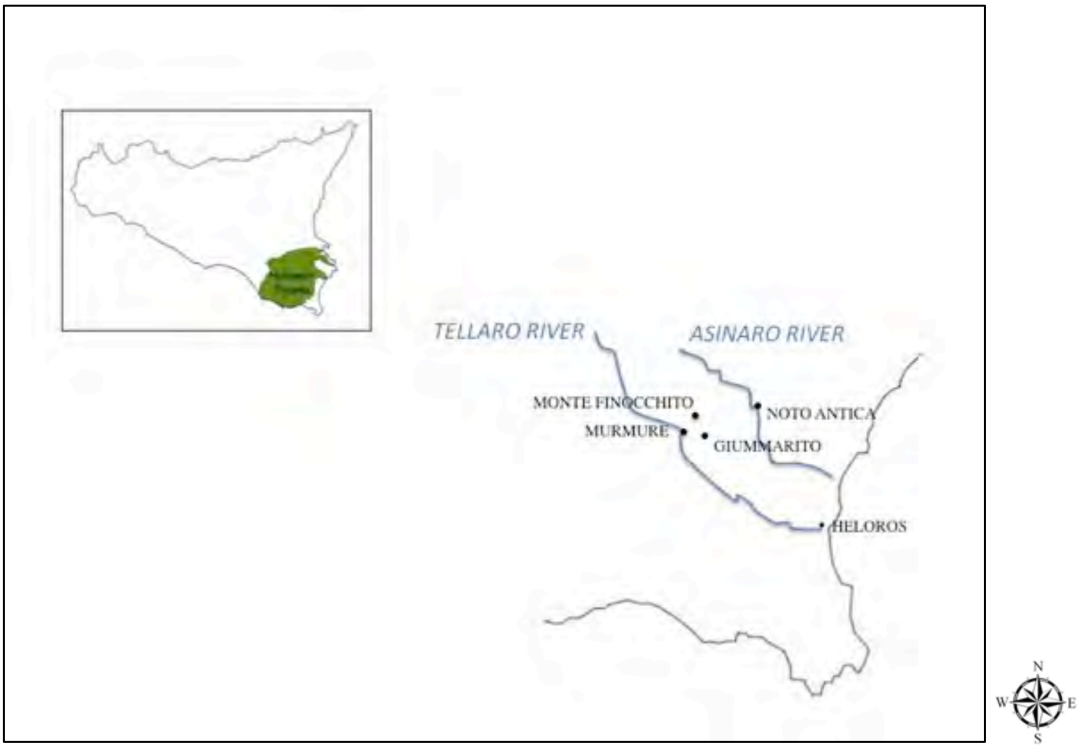


Figure 2. 8 Prehistoric indigenous sites overlooking the Asinaro and Tellaro Rivers.

Monte Finocchito, one of the major sites, occupied an elevated hill (47 m) to the southwest of Castelluccio. The archaeological area is 7.5 km west northwest from the modern town of Noto, while the distance between Monte Finocchito and the coeval site of Noto Antica (Alveria hill) is around four kilometres as the crow flies. The archaeologist Paolo Orsi described an isthmus that connected both sites, while steep slopes separated them in relation to the Cava di Lentini (the Lentini valley bottom) and Tre Fontane valley (Orsi 1894). Two other deep valleys lay six hundred metres to the south of Monte Finocchito: San Francesco and (to the east) Cava Piraino, which explain the presence of the precipitous valley of the indigenous site (northern side). The Bronze Age necropolis of Giummarito, which is 2.5 km south of Monte Finocchito and east of the Cava Fonda, lies on a small hill (also called Cozzo Scavo). Meanwhile, the necropolis of Murmuro was located to the west of the Cava di Lentini (around 500 m from Casa Teresena). According to the archaeological data, at the very end of the eighth century, the Greek site of Heloros was settled along the coast overlooking the Tellaro (or Helorus) River (Voza 1968-1969, 360-362; 1970; 1973a, 117-126; 1973b, 134-135; 1976; 1980).

Literary sources describe the Tellaro River as an active floodplain. Virgil describes Aeneas crossing the ‘stagnantis Helori’ (Virg. *Aen.* 3.698), while authors such as Tommaso Fazzello (1558) provide similar descriptions of the floodplain at the Tellaro River Valley’s mouth. In accordance with Fazzello, core analyses conducted along the mouth of the Tellaro River suggest that in the past it was characterised by a more dynamic estuarine floodplain (Turner 2000). Even though palaeo-environmental studies cannot provide a certain chronology for the Tellaro outlet, recent research suggests that during the Holocene (about 12,000 years ago), a higher percentage of coastal alluvial plains covered the area.

2.3 CLIMATE AND VEGETATION

For a long time, archaeological studies underestimated the impact of the physical landscape and environment on cultural processes and historical events. By contrast, recent studies have focused on reconstructing ancient ecosystems (Gras 1989; 1995; Leighton 1999; De Angelis 2000) and more importantly how societies and landscapes interacted (Martini and Chesworth 2011). With reference to Sicily, Leighton in his studies noted that in the later stage of the Upper Paleolitic (ca. 18,000) (Leighton 1999, 22-23) Sicily was already widely inhabited as the island, as he suggests, ‘is well endowed with fertile soils and other essential resources, to support substantial populations in different areas’

(Leighton 1999, 4). From the early Holocene the climate condition shifted from a cooler to a warmer and drier phase, due to a reduction in moisture, which favoured an increase in human activities (Leighton 1999, 17; Calò et al. 2012). Scholars divide the Holocene into two main periods: an early phase, a humid transition phase, and a late phase with drier weather (Magny et al. 2011). A climate oscillation recorded c. 2000 BC produced more humidity in middle Europe and the northwest Mediterranean and drier conditions in the eastern Mediterranean (Magny et al. 2011). Since the Bronze and Iron Ages, the climate has been cooler and drier. Moreover, according to paleo-climatologists, the temperature changed slightly between 850 and 750 BC, which may have facilitated a steady population growth in the Mediterranean (Bradley 1999, 15; Morris 2005). It is in this favourable climate and natural environment that the indigenous population of Finocchito was living.

2.4 ENVIRONMENTAL STUDIES OF SOUTHEASTERN SICILY

Environmental studies related to Sicily's southeastern coast claim that since the later Holocene this area has been affected by coastal flooding due to intense seismic activity and (the resultant) tsunamis (Turner 2000). In Sicily, paleo-climatic studies of the Late Holocene (ca. 12,000 cal years) are available for Lago Preola (Noti et al. 2009; Tinner et al. 2009; Magny et al. 2011; Calò et al. 2012) and Gorgo Basso (Tinner et al. 2009) in western Sicily. Data are also available for Biviere di Gela (Noti et al. 2009) in south Sicily and Lago di Pergusa (Sadori et al. 2007) in central Sicily. Two other dated sites are Urgo Pollicino (Marchetti et al. 1984) and the little lake known as Urio Quattrocchi (Bisculum et al. 2012) located in northern Sicily. The climatic reconstruction, based on accelerator mass spectronomy (AMS) radiocarbon dates, pollen analysis and charcoal data, shows a slight variability between these sites. This may be related to different environmental conditions between the coastal areas (these are usually warmer) and inland or upland areas (these are normally cooler) (Noti et al. 2009, 382). The Preola and Pergusa lakes provide evidence for a drier Late Holocene (after 2500 cal BP) and greater forest density. Meanwhile, pollen analyses from Biviere (Noti et al. 2009) and Gorgo Basso suggest an increase in land use and human activities around 2600 cal BP (650 BC). In particular, as vegetation conditions were stable until c. 2800 to 2600 cal BP (850-650 BC), Tinner (2009, 1507) correlates the forest decimation with Greek colonisation. Overall, the general vegetation composition was characterised by Mediterranean

Quercus-Olea forests (Calò et al. 2012, 118), despite intensive land use from the Neolithic (Noti et al. 2009). Recent archaeo-botanical investigations in western Sicily (Stika et al. 2008) provide evidence for how indigenes Sicilians, in early Iron Age, used the land and the vegetation they cultivated. Thus, the analysis of plant remains from the Monte Polizzo settlement revealed that indigenes produced and consumed cereals, mainly barley and legumes (Stika et al. 2008, 144-147).

2.5 TELLARO RIVER ENVIRONMENTAL STUDIES

Palaeo-environmental research conducted in the coastal zone of southeastern Sicily concerns the wetland sediments of the Tellaro estuary and the lagoon setting of Vendicari (Turner 2000). Turner's records are based on radiometric dating which provides a chronological control of variations in core sedimentology and depositional changes over the last two hundred years. Turner's study only focuses on a specific timeframe, from the current period to two hundred years ago. Neverthless the records collected by Turner regarding the last two hundred years of Hyblaean Plateau environmental history may have relevance for the reconstruction of the general conditions of this specific area during the Archaic Age, given the similarities between Turner's data for the Hyblaean Plateau and those collected for other areas of southeastern Sicily (for example Borgo Basso) for the full Holocene period. However, as mentioned before, the weather around the Hyblaean Plateau in the eighth century was probably drier compared to the Bronze Age. Perhaps forests surrounded the area; when the Tellaro River often overflowed, a marshy zone was created close to the coastal area. The sediment records suggest that the Tellaro River, due to a vertical change in the sediment sequence, underwent a period of great dynamism as an estuarine floodplain (with frequent overflow episodes), while the vegetation was characterised by salt marsh habitat plants. The characteristic vegetation of the southern coastal area of Vendicari and the 'Pantano Piccolo' (the smallest lagoon in the modern nature reserve of Vendicari) comprised garrigue (*garrique-macchie)*, phragmites and juncus *(phragmites-Juncus)*, salicornia (*salicornia sp.)* and salicornia glauca (*arthrocnemun glaucum).* Naturally produced salt used from prehistoric times was also specific to this area, due to the favourable climate and shallow waters (Guzzardi 1991-1992, 772-773; Tanasi 2008, 139-148). Similar vegetation types are also recorded at Borgo Basso (Tinner et al. 2009) and Pergusa Lake, where *juncus, salicornia* and *garrique-macchie* predominated, probably resulting from the increased and intensified land use (Sadori et al. 2007). Even considering that Turner's analysis focuses on a specific recent period, comparing these scientific analyses with data collected from other sites can be used to reconstruct the Hyblaean Plateau's environment, and in particular the environmental conditions of the Greek site of Monte Finocchito and Heloros. Indeed, radiocarbon and pollen analyses (Noti et al. 2009, 385) suggest that the current vegetation is similar to the Late Holocene flora.

CHAPTER 3

3. HISTORY OF SOUTH EASTERN SICILY IN THE IRON AGE

Sicily, situated in the central Mediterranean, has long been a land of encounter and coexistence. This has facilitated the creation of cultural boundaries characterised by meetings, exchanges and mediations. As Leighton noted, the 'island tradition and external influences, local responses to outside stimuli, and conservatism represent dialectical forces in Sicilian prehistory' (Leighton 1999, 6). Sicily has always been multi-cultural, populated by different groups (Leighton 1999, 217). Greek and Roman writers, in particular Thucydides (6.2) and Diodorus Siculus (5.6.3-4) recorded the names of population groups that occupied Sicily during the Iron Age. Three main cultural groups occupied Sicily; each is described as possessing a distinct ethnicity and living in a circumscribed territory. According to Thucydides (6.2), when the Greeks arrived in Sicily during the third quarter of the eighth century BC, the Sicels inhabited the eastern part of the island; they were also identified with population movements coming from the Italian peninsula. Sicanians populated the island's central area; this group is traditionally considered as the original population of Sicily. The Elymians occupied Sicily's west. The ancient authors were describing Sicily in the Iron Age and were writing a few centuries after that time, and indeed the archaeological record does not always align with historical references: material culture, especially pottery production, reveal a more complex reality (Leighton 1999, 217).

During the Iron Age, indigenous sites were mainly situated on the top of high mountains with a river valley at the bottom and were naturally and easily defended. Knowledge of this period and indigenous sites on the Hyblaean hills derives primarily from necropolis complexes excavated by Paolo Orsi between the late nineteenth and early twentieth centuries. These complexes are generally characterised by rock-cut chamber tombs preceded by a narrow corridor (*dromos*). From the beginning of the Iron Age, and even earlier, tombs were usually elliptical or semi-elliptical; then, during the eighth century, they also adopted funeral chambers with a rectangular shape (Leighton 2015, 193).

Pantalica and Finocchito are considered the most representative necropoleis amongst all of the indigenous sites of southeastern Sicily because of the large number of tombs that were recorded. In Pantalica tombs were semi-elliptical and circular in an initial phase (Pantalica Phases I and II), while Leighton notes that a rectangular shape was adopted in a later phase and it was associated with Phases III and IV (Leighton 2015, 193).

Semi-elliptical and rectangular rock-cut tombs are also documented at Finocchito (Steures 1988). Steures developed a study regarding the change in shape of the funeral chambers from Finocchito claiming that, on the basis of the seriation method[2], the rectangular shape occurred more often than the semi-elliptical or semi-circular chamber (Table 3.1) and the elliptical shape was not necessarily restricted to an early period (Steures 1988, 112). These rectangular chambers featured ledges cut from the rock, upon which the dead person's head rested. This particular feature was characteristic of Iron Age tombs, in particular those with grave goods dated to the second quarter of the eighth century (Leighton 2015, 193). The common burial type was inhumation, with an average of between one and four individuals laid out within the chamber (Frasca 1996, 139-145; Leighton 2015, 192).

Table 3. 1 Steures' plans of Monte Finocchito graves

	Rectangular	**Elliptic**
Phase I	22	1
Phase II Transitional	19	2
Phase II Late	44	3

3.1 CHRONOLOGY OF SOUTH EASTERN SICILIAN INDIGENOUS SITES

Southeastern Sicily was investigated for the first time by Paolo Orsi in 1892. Based on archaeological records, Orsi suggested the first general chronology for Sicilian prehistory (Orsi 1899a, 197-231) He identified four main phases (Table 3.2): the earliest phase he called the Siculan I period (beginning of the Bronze Age); the Middle and Final (Late) Bronze Age corresponded with the Siculan phase II and the most representative sites for

[2] Seriation is a relative dating technique that arranges archaeological materials into a presumed chronological sequence (Cowgill 1972; Marquardt 1978). Seriation orders the archaeological evidences by stylistic differences and locality assembling those types that are similar (Rowe 1961).

this phase, on the basis of current archaeological data, were Thapsos and Pantalica Nord, and later on Cassibile (Leighton 1983, 6; 1993b; 1999, 150). The final phase of the Sicilian culture (Sicul III), corresponding with the Iron Age, was represented by Finocchito (also known as Pantalica South phase). The Sicul IV period began when the Greeks settled along the Sicilian coast at the end of the eighth century (Leighton 1983, 6).

Table 3. 2 Paolo Orsi's Sicul periods

Sicul I	**Sicul II**	**Sicul III**	**Sicul IV**
Beginning of the Bronze Age	Middle and Final Bronze Age	Iron Age	Historical Period

Subsequently, in 1956, Peroni published a study based on the typological analysis of archaeological material from the Pantalica necropolis, using seriation to build the chronology. Peroni's absolute chronology was based on the chronology of the Bronze Age pottery discovered in Italy and in the island of Lipari. The chronology of this Bronze Age pottery was associated with Mycenaean imports in south Italy and Sicily (Holloway 1994, 43-44). Peroni proposed three main phases related to Pantalica (Table 3.3); the last of these, Pantalica III, also named Pantalica South or Finocchito, corresponded to the phase of the first Greek settlements in Sicily (Peroni 1956, 387-432).

Table 3. 3 Peroni's Pantalica Culture Phases

Pantalica I	**Pantalica II**	**Pantalica III**
1250-1150 BC	1150-1050/1000 BC	1050/1000-950 BC

Following this, in 1959, Müller-Karpe focused on southeastern Sicilian material, in particular Pantalica, in his west Mediterranean and European chronology. Müller-Karpe's recognition of Pantalica's importance within the island's indigenous context instigated a new chronology. Müller-Karpe based his study on the chronology of the Mycenaean Greek pottery from south Italy and Sicily. The initial Phase was dated around 1400-1100

BC (Müller-Karpe 1959; Holloway 2000, 43-44). He associated the Mycenaean pottery with local archaeological material creating a chronology that, in comparison to Peroni' chronology, shifted the time line by fifty years (Table 3.4). Peroni's chronology was based on the general chronology of the Bronze Age pottery from Italy and Sicily, which was influenced by Mycenaean imports, while the Müller-Karpe based chronology was directly influenced by the chronology of the Mycenaean Greek pottery discovered in south Italy and Sicily.

Table 3. 4 Müller-Karpe's Pantalica Culture Phases

Pantalica I	**Pantalica II**	**Pantalica III**	**Pantalica IV**
1200-1100 BC	1100-900 BC	900-800 BC	8th century BC

The traditional chronological framework of southeastern Sicilian prehistory was proposed by Luigi Bernabò Brea in 1958 (Bernabò Brea 1958; Steures 1980; 1988; Frasca 1981; Leighton 2015, 191-192). Bernabò Brea, studying the finds from Pantalica tombs, discovered by Paolo Orsi (1899b; 1912) between the 1895 and 1910, proposed four phases (Table 3.5): the first three related to the Pantalica culture, while the last phase was related to the Finocchito culture; this last phase was contemporary with the first phase of Greek settlements (Bernabò Brea 1958, 148-150).

Table 3. 5 Bernabò Brea's Pantalica Culture Phases

Pantalica I	**Pantalica II**	**Pantalica III**	**Finocchito phases**
1250-1000 BC	1000-850 BC	850-730 BC	730-650 BC

With regard to Pantalica II (or Cassibile) phase, Leighton re-defines this period since he argues that it lasted longer due to the fact that Cassibile-type material is still recorded in contexts related to the early contact between indigenes and Greeks. Therefore, he also reconsiders the Pantalica III (or South) phase dating it to the end of the later eighth and beginning of the seventh centuries (Leighton 1993b, 273-274).

3.1.1 PANTALICA AND FINOCCHITO

Pantalica and Finocchito, thanks to the extensive documentation, are the most relevant and probably the largest indigenous sites recorded in southeastern Sicily (Figure 3.1). Both sites occupy around 50 hectares and are about 12 kilometres from each other in distance (Leighton 2016, 143). Various studies, understanding the importance of these sites in the Iron Age, have claimed that Pantalica and Monte Finocchito were most likely important centres surrounding several smaller dependent sites (Albanese Procelli 2003, 48; Leighton 2005, 277-282). Albanese Procelli (2003) claimed that smaller villages, especially during the beginning of the Iron Age and usually located along the valley's bottom, were deployed in a long line probably acting as border controls. Therefore, she proposed that the small sites of Tremenzano, Giummarito and Cava delle Murmure (Figure 3.2) were probably the satellite sites related to Finocchito (Albanese Procelli 2003, 48). However, the archaeological record thus far indicates that the necropoleis of Tremenzano, Giummarito (also named Cozzo delle Giummare) and Cava delle Murmure were used only until the end of the Bronze Age (10^{th} century BC), while Finocchio's necropolis is mainly related to the Iron Age (around 900 BC) (Steures 1980; 1988; Frasca 1981). However, such theories are not supported by archaeological evidence and the data collected are only confined to the necropolis.

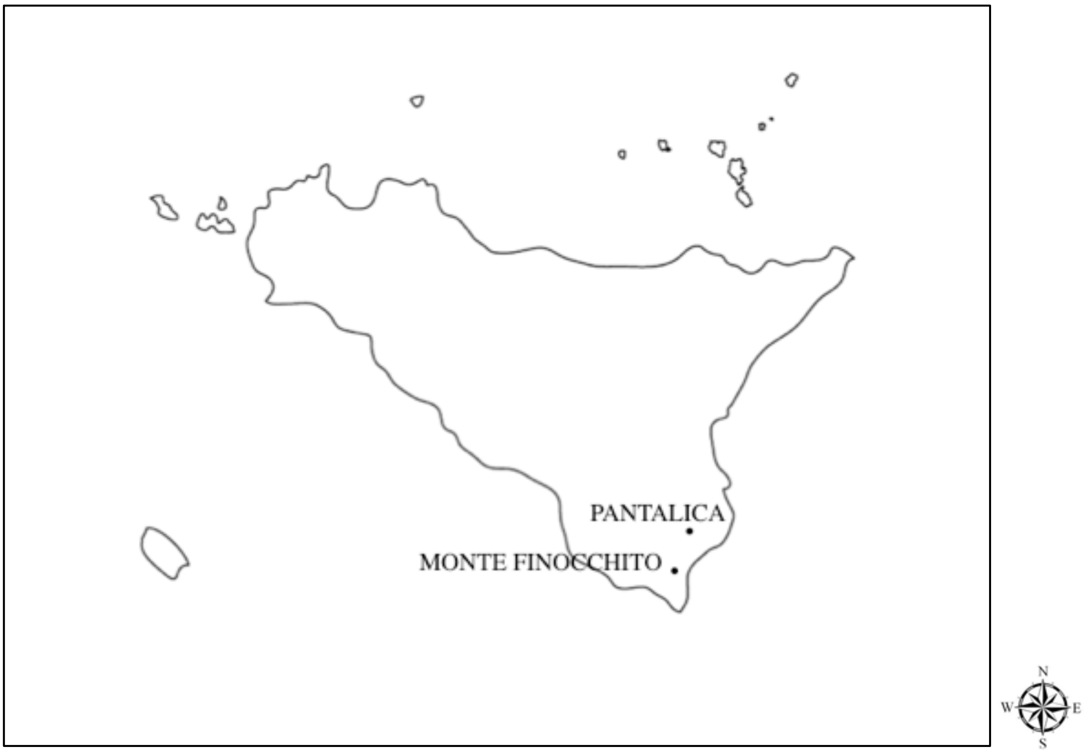


Figure 3. 1 Monte Finocchito and Pantalica.

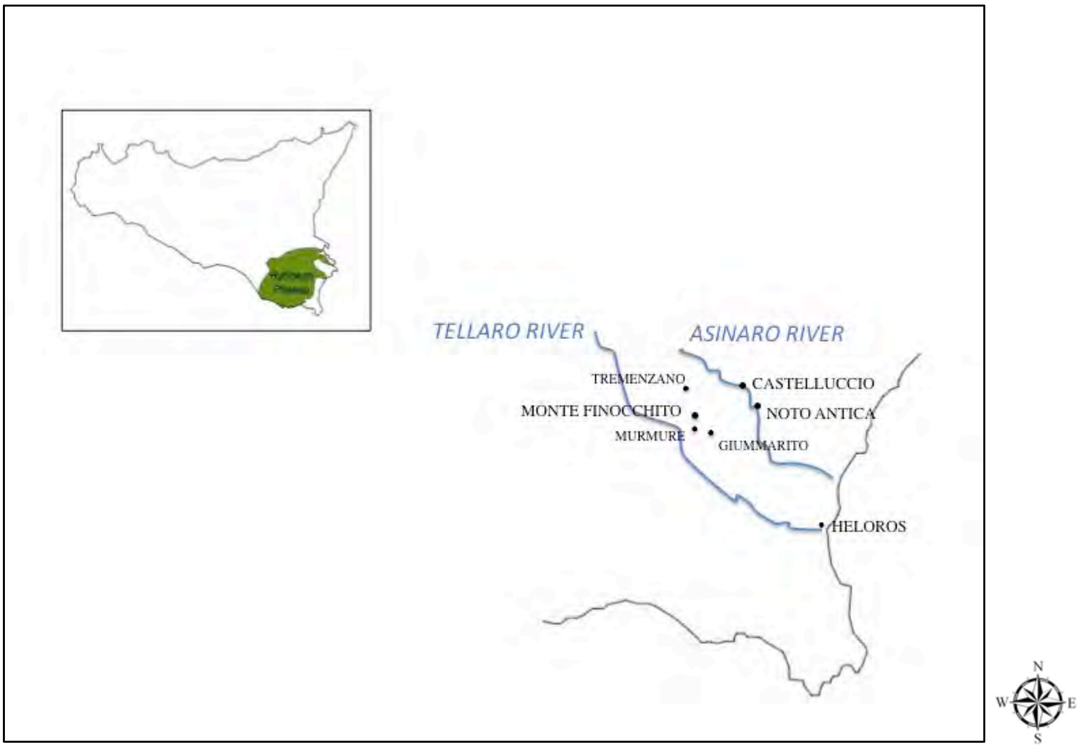


Figure 3. 2 Indigenous sites surrounding Monte Finocchito.

3.1.2 MONTE FINOCCHITO

This study focuses on Monte Finocchito, a crucial indigenous site for understanding the process of cultural transformation in Sicily during the eighth century. The site lies on the Hyblaean Plateau overlooking the Tellaro River (Figure 3.3), an area characterised by coarse-grain deposits of whitish lime mudstone and yellowish soil. Archaeological excavations have revealed that Monte Finocchito was surrounded by indigenous sites located short distances away: Tremenzano, Cozzo delle Giummare, Grotta delle Murmure and Noto Antica (Figure 3.2). These sites were populated until the end of the Bronze Age (Frasca 2016, 83-84). Meanwhile, a Greek outpost, Heloros, was settled along the coastline in the late eighth century.

Monte Finocchito, and in particular its necropolis, was investigated for the first time in 1892 (Orsi 1894; 1896; Orsi 1897a), with a later investigation undertaken in the twentieth century (Frasca 1978a, 116-118; 1978b; 1979; 1981). During the first exploration, Orsi discovered the East, West and the South Necropoleis, counting around 300 tombs. In 1896, Orsi explored the northwest section (with about 150 tombs) and the North Necropolis (around 84 tombs), as well as a small group located at the Piraino valley (about 20 tombs). Another small group is located at the San Francesco valley. Overall, Orsi counted at least 500 tombs, while Steures, after the most recent survey conducted in the 1980s counted at least 570 tombs (Steures 1988, 91-92). The necropoleis are characterised by rock-cut tombs with a rectangular or semi-elliptical chamber often preceded by a short *dromos*. Usually, the entrance was closed by a stone door-slab locked with a wooden bar. In proximity to the entrance was a low ledge on which the head of the dead was laid. The general tendency was to bury the dead with the head to the north and consequently the low ledge was sometimes located to the left, right side or opposite to the entrance (Steures 1988, 111-114). The corpse was laid out in a supine position. Normally, the dead were wearing ornaments for clothing, such as bronze and iron fibulae, rings (rectangular or convex), bronze foils and little chains. Vessels were placed close to the feet, around the body or deposited in corners of the tomb.

The first chronology proposed by Orsi recognised the Finocchito culture as one of the most representative of the third Sicul period (Table 3.2), with an initial phase beginning in the ninth century and the latest phase in the seventh century. In the 1980s, Frasca and

Steures, independently, revisited the archaeological material from Monte Finocchito, proposing a general chronology for the tombs based on goods typology (Figures 3.3 and 3.4). Frasca's chronology was based on the dating of the fibulae and their association with the ceramic vessels. He considered the fibula the most datable object as it was chronologically comparable to the other Sicilian and south Italy sites where the same types of fibulae had been discovered (Frasca 1981, 66-70). Frasca (1981) proposed three main phases for Monte Finocchito (Figure 3.3): the first (Phase I) runs from 850/800 to 735/730 BC and it was characterised by the bronze serpentine fibula with an eye on the bow; the second phase is sub-divided into two main periods (making three phases overall), Phase IIA and Phase IIB. Phase IIA (735/730 BC to 700 BC) was characterised by the lozenge boat fibula with a pair of side-knobs at the bow crest, which was discovered in grave goods associated with 'Thapsos' cups and oinochoai; the bronze boat fibula with a hollow crest decorated with a pair of side-knobs and the bronze boat fibula with longitudinal grooves on the bow crest, both of them found in grave assemblages with tall Kotylai and cups (Figure 3.5) (Frasca 1981, 66-70), were associated with Phase IIB, dated between 700 and 665 BC.

By contrast, Steures (1980; 1988) proposed a different chronology based on seriation: here, the earliest phase runs from 750 to 730 BC, while a transitional phase is dated between 730 and 715 BC, with a final period between 715 and 690 BC (Figure 3.4). Steures assumed that the beginning of the second phase was c. 730 BC, when the nearest Greek city, Syracuse, was founded. Meanwhile, she claimed that Monte Finocchito was abandoned just before the foundation of Heloros. Steures' typology for seriation is based on pottery shapes and decorations. Thus, she ordered the pottery from simple to sophisticated ceramic types (Steures 1998, 2-3). In particular, 'pottery types are defined here as groups of shapes and groups of decorations resulting from a series of choices on the part of the potter against or for the adding of extra trait, plus, in some cases, the choice between one extra trait and another' (Steures 1998, 3).

Seriation is useful for grouping types but due to the fact that it does not take into consideration possible culture variations, this approach might not be so accurate in definying chronologies (Dunnel 1970, 305). Thus, seriation is used to date the chronological order of artifacts that are from the same archaeological site or culture. In Steures' seriation ceramics are from Finocchito, however she includes within the same unit ceramic types in Greek style and indigenous ceramic types. Therefore, due to the fact that Steures uses the seriation technique on artefact assemblages from different cultures (indigenous ceramics and pottery in Greek style), the seriation program does not give valid results. This method is based on the idea that an artifact type initially grows in popularity and then steadily declines. Archaeological objects are organized into a sequence according to changes over time in their frequency of appearance. The technique shows how these items have changed over time and it is a way to establish a relative chronology.

In this study Frasca's and Steures' chronologies as well as typologies were taken into account as they both reveal important information. Both chronologies differ only slightly and it is difficult to choose one over the other in the light of the evidence currently available. What is most relevant for the purpose of this thesis is that both scholars recognised a transition phase that corresponds with the presence of new ceramic types, and identified possible imported ceramics within Monte Finocchito[3].

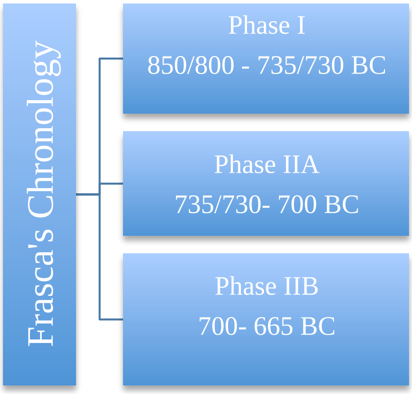


Figure 3. 3 Frasca's chronology.

[3] In discussion with Ted Robinson with regard to the European dendrochronology sequences, I agree that studies on chronologies arose in southern Mediterranean and based on European dendrochronology add important new information, however such studies have not been attempted in Sicily. Therefore, this study still relies on the traditional chronological framework.

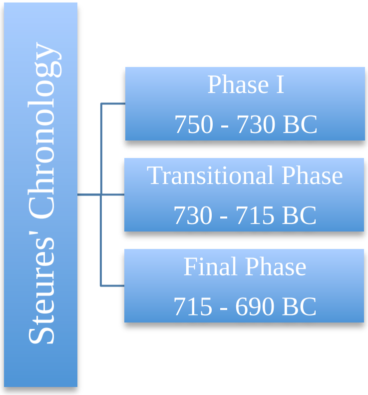


Figure 3. 4 Steure's chronology.

Figure 3. 5 Kotyle FKO2 and cups FC4 from Monte Finocchito that Frasca dated to between 700 and 665 BC because they are associated, within the same tomb, with the bronze boat fibula with a hollow crest and the bronze boat fibula with longitudinal grooves on the bow crest.[4]

[4] This chronology also accords with the final phase proposed by Bernabò Brea for the Sicilian Iron Age (Bernabò Brea 1958), dated between 730 and 650 BC.

With regard to the chronology of Phase II, Steures claimed that the population probably increased (Figure 3.6) during the final period (Steures 1988, 91, 110). Her assumption was based on the fact that:

> The community on the Finocchito had no other formal graves for its dead other than the rock-cut tombs in the low limestone ridges, which surround the flattish summit area of the hill. Secondly, I assume that Orsi's notes, hastily jotted down as they may be, are based on accurate observation, where possible, of the number of dead per grave (Steures 1988, 90).

On this basis, Steures estimated that the average population living in Monte Finocchito, and around its neighbouring sites, was numbered between 556 and 764 individuals, based on the total number of 570 tombs. This calculation was made considering the skeletal evidence recorded and the supposed calculation of the mortality rate per annum for an individual living at Finocchito (Steures 1988, 92). However, I argue that no studies of the skeletal evidence from Finocchito was possible as it is not well preserved and also because only in 105 graves is the number of individual dead known (Steures 1988, 92). She also claimed that during the transitional Phase II (730-715 BC), 'there was an influx of population in the time of the foundation of Syracuse' (Steures 1988, 98). Therefore, in the first phase (750-730 BC), the site grew suddenly due to significant migration. Meanwhile, the maximum population size was reached during the transitional Phase II (730-715 BC). Steures calculated that during this phase, Monte Finocchito was densely populated (Steures 1988, 110). From 715 BC, during the later stage of Phase II (lasting around 27 years), a gradual movement away from the site began. This lasted until 690 BC, when the site was abandoned, as the scholar theorised was a consequence of the foundation of Heloros. It is worth noting that Steures' estimation of the Finocchito population is based on an approximate calculation [5] and that she was influenced by personal opinions regarding the location of the indigenous site. She claimed that:

> Finocchito is not a nice place to live in. Its position between hill country and plain makes it windier than any other hill settlement of Pantalica culture. Only a population that felt it dangerous and had nowhere to go

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[5] The calculation is only approximate and it is not based on the real number of skeletal. Therefore, without any further scientific analysis on skeletal from Finocchito, it is hard to assume the mortality rate per annum.

would settle in such a place and it would stay as short as possible (Steures 1988, 92).

By contrast, Frasca proposed that the inhabitants of neighbouring indigenous sites moved to Monte Finocchito during the eighth century. This theory was also used to justify the increased number of multiple burials dated to the final phase (700-665 BC) of Monte Finocchito (Frasca 1981, 93). Conversely, as previously mentioned, Steures believed the population decreased rather than grew during the final period (715-689 BC) and that only a small number inhabited the hill at the beginning of the seventh century. Unfortunately, due to the high number of plundered burials, it is difficult to know the real number of those interred, and thus extrapolate this number to an estimated population figure (Steures 1980, 92-100). As the graph (Figure 3.6) below shows, both scholars claimed that at the beginning, during Phase I, Monte Finocchito was populated by a small group that increased during Phase II. During this transitional phase, while Frasca claimed that the number of indigenous people occupying Finocchito slightly grew, Steures argued that it is in this phase that it reached its peak and later decreased in Phase II. By contrast, as the last bar of the graph shows, Frasca declared that it is in this phase that Monte Finocchito was most densely populated (Frasca 1981, 93). I argue that the archaeological evidence, which mainly consists of disturbed tombs, is not enough to allow an accurate reconstruction in terms of population number. Despite Paolo Orsi providing us with detailed information regarding the excavation, we are not longer able to confirm the real number of individuals due to the fact that only a few bones are still stored at the Paolo Orsi Museum. Moreover, we are not certain that all of the tombs have been found or that everyone was buried in one of them.

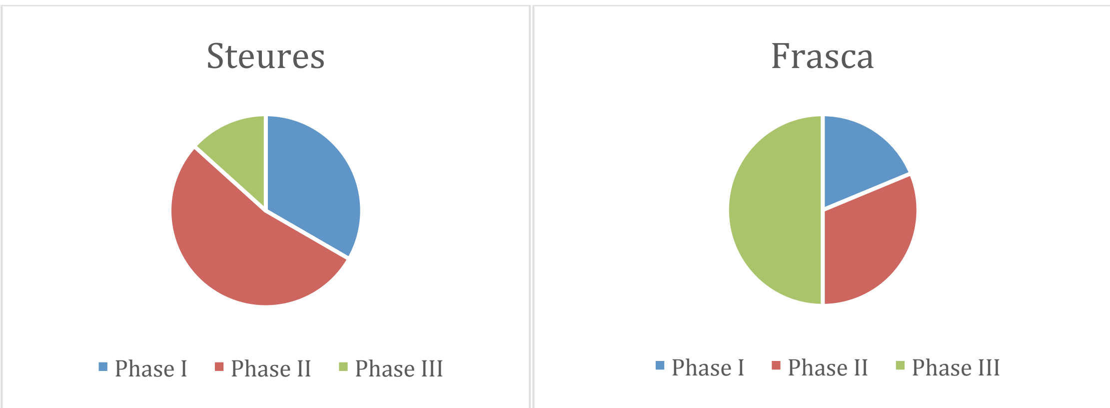


Figure 3. 6 Graphs with the estimated population of Monte Finocchito respectively proposed by Frasca (1981) and Steures (1988).

3.2 MONTE FINOCCHITO'S COEVAL SITES

3.2.1 PANTALICA

As previously noted, Pantalica is one of the most important sites in Sicilian prehistory, with occupation from the thirteenth century BC to the end of the eighth. The indigenous site, located on a limestone promontory between the Calcinara and Anapo Rivers, is about 23 kilometres away from Syracuse. Pantalica is surrounded by deep rivers and a gorge with just one access route from the west. It also has the largest concentration of rock-cut tombs in Sicily, with five major groups of tombs lying around the promontory (Leighton 2015, 191). Pantalica holds an extraordinary number of tombs that are visible from a significant distance (Figure 3.7). The largest number of tombs is recorded on the northern slope (1,203 tombs), followed by the North Western cemeteries (882 tombs), Filiporto with 779 tombs, the Southern necropolis with 648 tombs and the area known as Cavetta, with 204 tombs. The North cemetery is the most representative of Pantalica, as the entire valley is covered by tombs that are visible from some distance. This cemetery is traditionally associated with Pantalica Phase I (1250-1000 BC), and it includes those tombs from Cavetta and the northern slope.

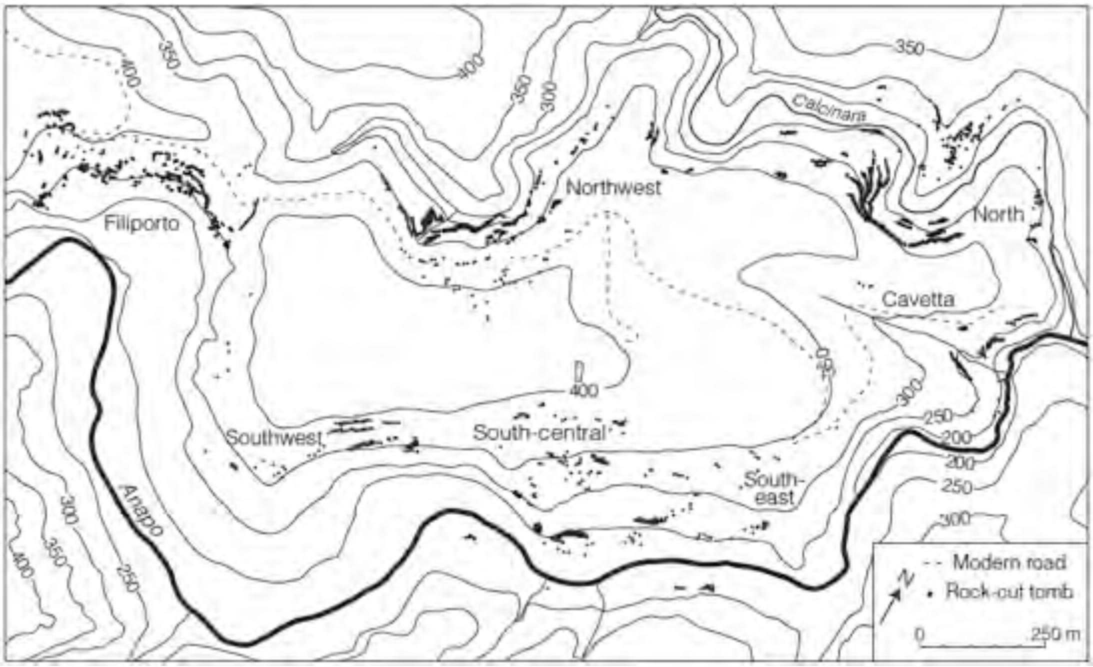


Figure 3. 7 Pantalica necropolis (Leighton 2014, Figure 5).

With regards to the North West cemetery, Orsi initially estimated there to be about 600 tombs but Leighton has since counted around 882 and took into account tombs that are not easily visible due to vegetation (Orsi 1899b). Filiporto is the main cemetery at the western approach to the site. During the first survey, Orsi calculated about 500 tombs in the Filiporto area, spread in a few groups clustered along the valley (Orsi 1899b, 68-71). Leighton estimated around 779 tombs (Leighton 2015, 191). Orsi divided the South cemetery into three main groups: southeast, south central and southwest. Orsi estimated about 1,000 tombs, while Leighton due to poor visibility during his exploration, estimated the presence of 600 tombs (Leighton 2015, 191). Leighton added three additional clusters plus a few isolated tombs close to the hillside south of the river. The South cemetery is associated with the third phase of Pantalica (850-730 BC). A smaller group of tombs was recorded in the Cavetta where all the tombs were located on precipitous slopes (Leighton 2015). Leighton estimated 204 tombs (Leighton 2015). Little is known about the settlement corresponding to the cemetery as the archaeological documentation is still poor and a large area has not yet been excavated.

As noted above, Bernabò Brea proposed a chronology (Table 3.5) characterised by three main phases to describe the Pantalica culture (Bernabò Brea 1957, 149-169). These are Phase I or Pantalica North (1250-1000 BC), Pantalica Phase II (1000-850 BC) and Pantalica III or Pantalica South (c. 850-730 BC).

3.2.2 NOTO ANTICA AND AVOLA ANTICA

Coeval with Monte Finocchito and Pantalica are two other indigenous sites, Avola and Noto Antica, both are located on the edge of the Hyblaean Plateau. Each was large enough to play an important role independent of Pantalica and Monte Finocchito.

3.2.3 NOTO ANTICA

Noto Antica (also known as Monte Alveria) is located between the Cassibile and Tellaro Rivers. Noto Antica covered around 120 hectares, occupying a wide, naturally defensive promontory and was surrounded by deep valleys with chamber tombs (Frasca 2016, 16). Noto Antica was explored for the first time by Orsi (Orsi 1897b), who discovered the Southern and Eastern Necropolis complexes with around 500 tombs. Unfortunately, these had already been plundered before his explorations. One main group (of around 200 tombs) was located on the southeastern slope, while the Northern Necropolis held about 120 tombs (Figure 3.8). The eastern group contained around 50 tombs, while the South-Western Necropolis held around 70 tombs (Orsi 1894). La Rosa (1971, 74-77) suggested that Noto Antica was already abandoned by the middle of the eighth century. In an attempt to understand the historical reasons behind the abandonment, La Rosa proposed two different scenarios. First, the inhabitants of Noto Antica moved to Finocchito because they were alarmed by the presence of Greeks along the coast (Frasca 1981, 94). Alternatively, Noto Antica was destroyed by Finocchito's population in order to obtain control and supremacy along the territory. While the theory of the shift of the population is intriguing, I argue that there is not enough evidence to prove it.

Figure 3. 8 Map of Noto Antica (La Rosa 1971).

3.2.4 AVOLA ANTICA

The Avola Antica necropolis is located at the Pisciarello valley on the edge of the Hyblaean Plateau. The necropolis at Avola is dated between the Pantalica South and Finocchito *facies* (Frasca 2016, 29-30). Tombs are between Cozzo Tirone and Ronchetto. Although the indigenous site of Avola Antica has never been investigated by systematic excavation, the small group of tombs and rock-cut chambers has been dated to sometime between the Late Bronze and the early Iron Age (Albanese Procelli 1978, 570-571). As previous studies suggest, the importance of this indigenous site may be linked to its strategic location along the coast (Albanese Procelli 1978). Due to this location and because Greek ceramic types were recorded within the graves, scholars have claimed that contact with the first Greek settlers was already in progress at the end of the eighth century (Orsi 1899c, 69-70).

3.3 SYRACUSE AND ITS FOUNDATION OF NEW SETTLEMENTS

From the eighth century Greeks migrated to south Italy and Sicily to settle their *apoikia*. Thucydides (6.3-5) described the foundation of these settlements, often giving the name of the *oikist*. Euboeans were among the first Greeks to move to Sicily, establishing the first Greek settlement in Sicily, Naxos, in 734 BC and not long after that they settled Leontinoi, Katane and Zancle (Thuc. 6.3.1; 6.4.5; 6.3.3). At the same time, the Corinthians founded Syracuse in 733 BC (Thuc. 6.4.1; Strab. 6.4.2; Dunbabin 1948, 8; Morris 1996, 56), while Gela was founded in 688 BC (Thuc. 6.4.1). As scholars have observed, these sites were probably located strategically to protect harbours, control and facilitate access across the island and to secure access to the fertile landscape (Boardman 1980, 38-46; Holloway 2000, 43). After the first settlers reinforced economic and political control, from the beginning of the seventh century, the main settlements also established sub-colonies (Hodos 2006, 90-91). Zankle settled Mylai in 716 BC and Himera in 648 BC, Megara Hyblaea founded Selinous in 628 BC and Gela founded Akragas in ca. 580 BC (Diod. Sic. 13.59.4; 13.62.4; Strab. 6.2.6; Thuc. 6.5.1; 6.4.2; 6.4.4). Syracuse founded its sub-colonies Heloros, at the end of the eighth century, and Akrai, Kasmenai and Kamarina between the seventh and the beginning of the sixth century (Albanese Procelli 2003, 139) (Figure 3.9). Cities such as Syracuse and Gela occupied a large territory and maintained strategic positions close to the optimum maritime approaches. The first colonies established sub-colonies and military outposts to secure strategic control of the main communication routes and they simultaneously fortified their relationships with indigenous territories by establishing alliances and agreements (Domínguez 2006, 328). The historical information regarding the Archaic period mainly refers to the foundation of the Greek *apoikia*, while the history of the early contact in which Greeks and indigenous people engaged in is not well-known (Domínguez 2006, 321). Likewise, archaeological explorations have not provided fundamental information regarding the early phase of these Greek sites, except for Syracuse, Megara Hyblaea and Heloros.

3.3.1 SYRACUSE

Based on Thucydides' account (6.3.1), Syracuse was settled one year after the first Greek colony of Naxos was settled (734 BC). Strabo also claims that Syracuse was founded around the time when Naxos and Megara were colonised (Strabo 6.2.4) and he notes, along with Thucydides, that the *oikist* of Syracuse was Archias. Geographically, Syracuse overlooked the sea on the eastern and southern side; the northern boundary overlooked the Anapo River, reaching the Hyblaean Mountains, while in the west Syracuse expanded the territory to the Dirillo River. In Thucydides' opinion, the Greek settlement of Syracuse was brutal and when settlers arrived on the island of Ortygia, they expelled the original indigenous population (Thucydides 6.3.2) and occupied the entire island. However, archaeological exploration in Piazza Duomo, suggests that there may have been a period of cohabitation of Greeks and indigenous in Ortygia (Pelagatti 1982, 125-140; Wilson, 1982-1987, 111; Frasca 1983, 570; Frasca 2016, 19, 70). This early Archaic phase was characterised by Greek quadrilateral houses (3.5 × 3.5 m) arranged along straight narrow streets. The Greek houses lie immediately above the level of an indigenous settlement consisting of circular and semi-elliptical huts with pottery dated between the Bronze Age and the Iron Age. This corresponds to the Pantalica South and Finocchito facies (Pelagatti 1982; Frasca 2016).

As noted above, during the Archaic period southeastern Sicily saw the hegemonic expansion of Syracuse through the foundation of new Greek settlements. The Syracusan advance is traditionally dated to the end of the eighth century with the foundation of Heloros. However, as I will describe below, the Greek outpost of Heloros was never mentioned amongst the Syracusan' sub-colonies and nothing is known about its possible foundation as a Greek settlement. The Syracusan expansion continued with the foundation of Akrai and Kasmenai and it ended in 599 BC with the establishment of Kamarina. The majority of the evidence derives from ancient written sources, which are often insufficient for this period as they only describe the foundation of the Greek colonies (Diod. Sic. 11.22-26; 13.59.4; 13.62.4; Hdt. 7; Strab. 6.2-4; Thuc. 6.3-5). Likewise, archaeological evidence regarding early Greek colonies is limited as the Greek sites have been only partially explored and usually very little is known about the early Archaic period.

3.3.2 HELOROS

Heloros, considered Syracuse's first sub-colony, was established at the end of the eighth century BC along the coastline and overlooking the indigenous site of Finocchito (Voza and Lanza 1994; 1999, 113-120). Ancient sources do not refer to its foundation, but only describe it as a Syracusan *phrourion* (Aelian, *Hist. An.*, 12.30). Scholars have claimed that Heloros was probably settled for military purposes, due to its strategic location between the Greek colony of Syracuse and the indigenous site of Monte Finocchito (Currò 1965; Asheri 1980, 119; Copani 2010). Syracuse, as one of the major settlements in southeastern Sicily, showed a clear interest in controlling the entire coastal strip, likely founding Heloros. The Greek settlement of Heloros was located along the coastline of the Hyblaean Plateau (Figure 3.2), 400 metres north of the Tellaro River and 30 km from Syracuse (Currò 1965; Gabba and Vallet 1980).

The first archaeological explorations were organised in 1899 and 1927 by Orsi (Currò 1965); this is when the site's Hellenistic phase was discovered. The archaeological data from Orsi's excavation were published only later by Currò (1965). The site was revisited later on by Militello in 1965 and then by Voza. During the excavation ceramics in Protocorinthian-style and local imitations of Greek ceramics as well as possible imports, were discovered just below the first phase of the earliest Greek houses of Heloros that were dated between the late of the eighth century and the early phase of the seventh century (Voza 1973a; 1973b). As further detailed in section 6.2, this archaeological material seems to also be coeval with the ceramics in Protocorinthian-style from Finocchito, which are dated to the same period the archaeologists dated the foundation of

Heloros, at the end of the eighth century BC, (Voza 1968-1969, 360-362; 1970; 1973a; 1973b; 1976; 1980; 1989; 159-163; Voza and Lanza 1994). Margaret Guido, based on such a discovery, claimed that 'possibly there was a native village on this site before it was colonised' (Guido 1967). However, as I will argue later on the basis of the archaeometric data, the lack of the archaeological evidence does not allow us to establish if and when indigenes previously occupied Heloros, but the presence of coeval ceramics does indicate that those living at Heloros probably established a relationship with the inhabitants of Monte Finocchito. Recent studies have proposed that due to its position, Greeks from Heloros were receptive to engagement in commercial relationships with indigenes (La Torre 2011, 73). Recently, Massimo Frasca has proposed that Heloros was probably a trade centre where merchants from Syracuse and other Sicilian harbours commercialised and exchanged their goods, which then spread around the indigenous necropolis of Finocchito (Frasca 2016, 76). However, as highlighted in chapters 7 and 10, I argue that the relationship Greeks and locals engaged might not have been of a primarily commercial nature due to the absence of Greek imports at Monte Finocchito.

3.3.3 AKRAI, KASMENAI AND KAMARINA

During the seventh century, Syracuse founded the sub-colonies of Akrai, Kasmenai and Kamarina, all located in southeastern Sicily. These sub-colonies are all mentioned by Thucydides. As Thucydides (6.5.2) states, the Greek colony of Akrai, was founded in 663 BC, followed by Kasmenai around 643 BC and Kamarina around 598 BC. Akrai and Kasmenai are inland sites, probably intended to secure control of the northern territory (Domínguez 2006, 285), while Kamarina was founded along the southern coast.

The ancient Greek site of Akrai is located 33 kilometres west of Syracuse in the territory of the modern town of Palazzolo Acreide. The Greek city lies on the Hyblaean Plateau, overlooking the Anapo River to the north and the Tellaro valley to the southwest (Bernabò Brea 1956, 4-6). The ancient sources only refer to Akrai because of its foundation and its alliance with Syracuse (Thuc. 6.5.2; *FGrH*. 3. 559. F. 5.), and not much more is known from the archaeological excavations. Most of the archaeological works at Akrai were carried out by Bernabò Brea (1956; 1986), who viewed Akrai as a settlement strategically located, due to its proximity to the Anapo and Tellaro River valleys. He also claimed that Akrai was located to facilitate communication with other

Greek city-states on the southern coast, including Kamarina, as well as with other Greek settlements in the interior (Bernabò Brea 1956; 1986; Fischer-Hansen 1996, 317-373). The section that was better explored is related to the Hellenistic phase of the city, while there is a lack of archaeological evidence for a pre-Greek settlement at Akrai (Bernabò Brea 1956, 7-16; Voza 1973d, 127-128).

Kasmenai was the third Syracusan settlement founded about twenty years after the foundation of Akrai. The Greek settlement occupied a wide valley with command of the Anapo and Irminio Rivers. It is considered a typical example of a seventh century Greek city, with a regular layout in a north-west and south-east direction (Di Vita 1956; Voza 1973c, 129-130). So far we know very little about the Archaic phase of Kasmenai. Paolo Orsi excavated the site between the 1920s and 1931 but the excavation is still unpublished. Archaeological explorations continued during the 1950s and 1960s, and from the 1970s the Soprintendenza organised more systematic excavations, which mainly explored the later phases of the Greek site (Rizza 1957, 205-207; Voza 1968-1969, 360; Pelagatti 2002).

Kamarina, founded in 599 BC, was the only sub-colony settled along the southern coast, not far from the mouth of the River Hypparis (Thuc. 6.5.3). Thucydides provides the name of the two *oikists*, Daskos and Menekolos. Archaeological excavations revealed a series of parallel streets running from the north-west to south-east, relating to the city's early stages (Di Stefano 1993-1994), while the archaeological record has revealed a harbour close to the River Hypparis dating to the Archaic phase (Fischer-Hansen 1996, 344-345). Scholars have claimed that this harbour enabled the development of the sub-colony's commercial interests during the sixth century through expanding trade infrastructure (Domínguez 2006, 289-290). In the course of archaeological exploration in the 1990s, the *agora* and the archaic necropolis were also investigated (Di Stefano 1993-1994). The necropolis incorporates more than 2,000 tombs related to the Archaic period (Pelagatti 1973; 1976b; 1976c; 1985). An Archaic temple was also discovered on the city's western side (Pelagatti 1985).

Figure 3. 9 Syracusan sub-colonies: Heloros, Akrai, Kasmenai and Kamarina.

CHAPTER 4

4. ARCHAEOLOGY OF ENCOUNTERS: INTRODUCTION

During the Iron Age, Sicily experienced a significant influx of people from Greece that influenced, as never before, the culture of the indigenous population as well as that of the ‘prospectors’ (Coldstream 2003, 221-243). The cultural interaction between indigenes and Greeks started in Sicily in the eighth century BC and the modalities of intercultural relationships between Greek and indigenes has been, and still is, widely debated.

Early studies of colonialism were influenced well into the twentieth century (see for example Dunbabin 1948) by thinking related to the recent European enterprises. The main assumption was that the early encounters Greeks established with the indigenous people were preparatory to what was commonly defined as colonisation (Finley 1968, 235-237). These studies focusing on archaeological colonial contexts were permeated by the idea of Greeks as the dominant culture. The term ‘colonisation’ and its cognates, such as ‘colonial’ or ‘colony’, were expressions often used to describe ancient Greek settlements in the Mediterranean and as Shepherd has noted, in Anglo-Saxon parlance at least, they were loaded with political significance (Shepherd 2009, 16).

The relationship between archaeology and politics has been widely debated. European colonisation was connected with the wider nationalism movement of the first half of the 19th century, promoting itself as genealogically related to the ancient world and ‘as the expression of a historical tradition of serial continuity’ (Anderson 1991, 195). The role of archaeology in relation to nationalism has been addressed as a phenomenon not related only to Europe but as a worldwide occurrence (Tsignarida and Kurtz 2002). For example in Israel, one of the most important archaeological sites, Masada, is considered the expression of the independence and heroism of Jewish people and it represents the identity of its nation (Abu El-Haj 2001). In Germany, archaeology became an instrument used by the Nazi party to support Hitler’s theory about the supremacy of the Germans and their descent from the Aryan race. About eighteen excavations were organised all around Europe and also in Iceland, Russia and North Africa in order to legitimise the idea that the German bloodline extended from this mythical population (Arnold 1990; 2006; Kohl 1998).

It is from the later twentieh century that, with post-colonial studies, the historiography of Greek colonisation has been critically evaluated and for the first time the interdependent relationship between archaeology and colonialism was pointed out. Said claimed that:

> [Colonialism] is by no means in direct, corresponding relationship with political power in the raw, but rather is produced and existed in an uneven exchange with various kinds of power, shaped to a degree by the exchange with power political (as with a colonial or imperial establishment), power intellectual (as with reigning science like comparative linguistics or anatomy, or any of the modern political sciences), power cultural (as with orthodoxies and canons of taste, texts, values), power moral (as with ideas about 'we' do and what 'they' cannot do or understand as 'we' do) (Said 1978, 12).

The advent of the post-colonialist movement has redefined the term colonialism, which describes a cultural and physical movement of people where material culture is one of the main ways to read possible alterations of traditional customs (Van Dommelen 1998, 17, 25-26; 2006; Antonaccio 2003; Hodos 2006, 8-17). Scholars have observed that the Western Mediterranean was not for the Greeks what the 'New World' represented for the Europeans in the nineteenth century (Osborne 1998, 251-252). The most recent debates focus on the way in which the archaeology of colonialism has been strongly influenced by preconceptions related to the European enterprises (Boardman 1980, 160-189; Bouloumié 1981, 75-81; Dietler 2005, 33-68). Meanwhile, modern analyses, based on anthropological research, look at the interaction between indigenes and Greeks in consideration of the role both groups played (Dietler 2010).

The main focus of this chapter, since the study of the early contacts in Sicily between Greeks and indigenes has been influenced by Helleno-centric ideologies, is to retrace the history of the archaeology of colonialism from the eighteenth century to recent anthropological and sociological studies undertaken since the 1970s. Thus, this chapter focuses on the studies of colonial encounters in the ancient Mediterranean and the way in which, during the nineteenth and earlier twentieth century, they relied on contemporary European colonial models, where the dominated groups always had a marginal role (MacIver 1931; Dunbabin 1948). In this specific context it is also important to clarify the meaning of the terms used in relation to colonisation as it has been discussed how this terminology (colonisation; colony; colonists) is not appropriate to describe the ancient

Greek enterprises (Osborne 1998, 251-252). It has been pointed out that the Greek colonisation, which refers to the settlements Greeks established in the ancient Mediterranean, differs from the colonialism of the period of European imperialism (Hall 2007, 92-94; Malkin 2016, 289).

One of the other main points here discussed regards the association of archaeology with ‘cultural history’ (Childe 1956; Hunt 1989, 7; Trigger 1989, 211-222) and in particular the relation between material culture and society. Post-processual archaeology pointed out that material culture is socially active, that artefacts, by definition, depend on humans as they were constructed by human purpose, which undergoes constant change (Hodder 1994, 393-402).

The interest my research shows in regards to the development of such studies is justified by the fact that previous analyses interpreting Monte Finocchito and its relationship with the Greeks were influenced by the idea that Greeks were the dominant group and that the relationship they engaged in with the indigenous people was uni-directional (Frasca 1981; Steures 1988). Likewise, in this chapter, special attention is dedicated to Italian archaeological studies in the sphere of the archaeology of colonialism, the study of which was mainly based on the analysis of the artefact itself as an artistic object.

4.1 ARCHAEOLOGY AND COLONIALISM

The principles upon which the concept of colonialism is based do not derive from the ancient world but belong to the eighteenth century, developed in Germany and propagated by the scholar Johann Joachim Wincklemann (1775). The German antiquarian’s ideologies were based on political-cultural models oriented to provide an identity for his country. During this historical period, more attention was given to the Greek classics, and German writers, such as Goethe and Schiller, undertook long journeys to Italy, Sicily and Greece, to discover those places where Hellenism originated. In those years, not only Germany but also the other European nations, such as France and Italy, related themselves, in response to their own national priorities, to Greeks or Romans (Held 2000, 2). It was a cultural phenomenon that spread out all around Europe. In the nineteenth century, European culture generally, including the arts and architecture, were inspired by Hellenic models (Jenkyns 1980; Turner 1981; Grafton 1992; Marchand 1996; Morris 1999). The idealisation of Greek and Roman values shifted from romantic idealisms to ideologies impregnated with nationalism and it was the moment when studies of archaeology, influenced by political ideologies, became an important instrument for those European countries that promoted excavation in the Mediterranean. For example, the impact that nationalism had on Italian archaeology resulted in a significant increase in archaeological discoveries on the Italian peninsula and Sicily where Paolo Orsi promoted intensive activity (Guidi 1987, 237-247). It is in this context that the term Hellenisation makes its entry with the intention of describing Greek colonisation in south Italy and Sicily, using the European enterprises as a model (Dietler 2005, 36-38; Lydon and Rizvi 2010, 17-33).

Both Hellenisation and European colonisation were considered civilising missions intent on educating barbarians (Goudineau 1990, 493). Hence, scholars debate whether archaeological studies were influenced by their contemporary events and therefore archaeological investigations of ancient colonial contexts tended, according to the European experience, to describe the encounters between indigenous people and colonists as articulated by violence, tension and conflict due to the necessity for the superior group to ‘civilise’ the inferior barbarians (Van Dommelen 2006).

4.2 MODERN COLONIALISM AND ANTHROPOLOGY

It was only in the 1970s that a new approach was used to study historical colonial contexts (Said 1978), when, with the contribution of sociological and anthropological research, it appeared clear that a process of transformation involved not only indigenous people, and not in a passive way: colonist and indigenous people were both involved in a process of cultural transformation (Dietler 1997, 296-297; Gandhi 1998, 2-4; Malkin 2004; Hodos 2006, 7). Braudel (1979) describes such relations as complex phenomena which always differed from each other due to the plurality of historical regions and their organisation (Roitman 2014, 104). Discussions of modern colonialism focus on the transformation that both groups experienced and how new cultural identities were formed, also revealing that a cultural alteration involves all parties; likewise, the colonial culture itself is transformed as part of the colonial experience. For the first time, through anthropological studies looking at western colonialism, a new concept was introduced to describe ‘common zones’ where two different groups encounter one another and where cultural differences are worked out through exchanges, agreements, creating (amongst other features) new languages, marriage, and violence too (Malkin 2011, 143-170). The contexts of such cultural encounters have been referred to by different terms, such as ‘contact zone’ (Pratt 1992) or ‘tribal zone’ (Ferguson and Whitehead 1992). In these common places indigenous people and colonists created a system to understand each other, to create new political or economic assessments, and often a new language. Colonialism is a complex historical process that sees two different groups, usually colonists and indigenous people, engaged and involved in a process of cultural transformation. Interests, political relations, social and economic transformation are all part of the same process.

Colonialism has often been associated with imperialism to describe a relationship between a dominant power and subjected societies. However, recent studies have pointed out that they are two different historical phenomena and while colonialism describes a relationship based on cultural influences, imperialism instead creates dependencies through the possession of a territory. Imperialism also describes a legalised domination by a society over another one, based on a complete dependency on the central power (Ho 2004, 210-246). Scholars describe it as a system used to control other people (Osterhammel 1997, 4), while Robert Young (2001, 19, 27) describes colonialism as a process that avoids a central control or simply it is interpreted as the occupation of a territory by foreign people (Ho 2004, 211, 225). One of the most recent interpretations comes from Dietler who describes colonialism as ‘the interaction between societies linked in asymmetrical relations of power and the processes of social and cultural transformation resulting from those practices’ (Dietler 2010, 18).

With post-colonial studies, the Helleno-centric vision defining the relations indigenes established with colonists during the Iron Age in the ancient Mediterranean was abandoned as a consequence of the anthropological studies’ influences (Gandhi 1998; Malkin 2004; Hodos 2006). Terms describing such encounters include ‘acculturation’ (Redfield et al. 1936, 149; Herskovits 1937, 259-264; Linton 1940, 463-465; Watson 1952, 12; Gordon 1964, 60-61; Angelo 1997, 8), ‘middle ground’ (White 1991) and ‘hybridisation’ (Hodos 2017).

4.2.1 ACCULTURATION

The term ‘acculturation’, as a product of anthropological studies, was strictly related to colonialism. Societies described by acculturation are those groups that came into contact with a dominant population and the term is also used to categorise the cultural responses of such contacts. It describes the consequences of contact for the original cultural patterns (Redfield et al. 1936; Herskovits 1937, 259-264; Spicer 1962, 567-580). Westerners looked at the indigenous population as a group without history or solid social structures and from a colonialist point of view, the only history the locals acquired was just in reaction to the contact with them (Wolf 1982, 4-7). The assimilation of western culture was defined as the process of acculturation (Dietler 2010, 47) and this process was not usually viewed as multi-directional cultural exchange but a uni-directional form of assimilation. Acculturation and assimilation often were used as synonyms to describe relations where one of the groups was recognised as 'superior' (Park and Burgess 1921, 735).

4.2.2 HYBRIDITY

The concept of hybridity is used to describe the interaction and negotiation between coloniser and colonised (Knapp 2008, 57; Hodos 2009, 222), where cultural boundaries overlap. It emphasises the dynamic relationship between colonists and indigenous people (Bhabha 1990, 207-221; Young 1995). In particular, it refers 'to the ways in which social, economic or ethnic groups of people construct a distinct identity within the colonial context and situate themselves with respect to the dominant' (Van Dommelen 1997, 309). Hybridity also describes a space characterised by sharing and sometimes it may involve cohabitation (Zemon 1995, 11; 2001, 26; Moussette 2003, 30).

When hybridity is applied in archaeological studies, it usually defines a change in material culture, often associated with a change within the group and the introduction of new components, in colonial context (Antonaccio 2003, 60). Archaeology observes this phenomenon, identifying if and how the material culture (for example pottery styles) changed and how those variations can be interpreted as the effect of a culture assimilation (Sackett 1977, 371).

Current archaeological studies believe that hybridity is a concept successfully applied in anthropological studies but it does not necessarily have the same validity in describing events related to an ancient period, especially because it tends to represent and describe colonial contexts (Van Dommelen 1997, 309; Dietler 2010, 50-53). Therefore, in different contexts such as Monte Finocchito in the Iron Age, the appearance of new ceramic types and new styles or variations adopted by indigenous groups cannot be always interpreted as a cultural alteration (Wiessner 1990, 106). Thus, as Dietler observes the risk of using hybridity in an indiscriminate way is that we could reduce such ancient phenomena to the only product of culture connections, while culture connections can have also experimented with different type of relations, such as economic or political relations (Dietler 2010, 51-52).

4.2.3 MIDDLE GROUND

The 'Middle Ground' is a term coined by the historian Robert White who, in his work *The Middle Ground: Indians, Empires, and Republics in the Great Lakes Region, 1650-1815* (1991) describes the encounters between indigenous people and colonists. The concept of middle ground 'involves a process of mutual invention' (White 1991, xi) between two different groups where there is not a prevalent culture. It describes the contact between two different groups which results in the construction of a mutually comprehensible world and it is used to understand the involvement between these two cultures (Mühlenbock 2015, 239-268). Sociologically, each side tends to perceive the other through the common and opposite values, with the result that a third culture model is born and it incorporates both native and coloniser patterns (Malkin 2002; Antonaccio 2003; Gosden 2004, 25; Malkin 2004; Hodos 2017). By contrast, as previously noted, hybridity tends to describe the cultural alteration of one group as it often refers to colonial contexts (Van Dommelen 1997, 309; Dietler 2010, 50-53). Malkin argues that the middle ground is also a real physical space where indigenous people and colonists interacted (Malkin 2004, 360). Recent studies claim that the concept of the middle ground is more applicable to the study of the ancient Mediterranean than hybridity or acculturation because of its 'insistence of historical contextualization and careful study of social practices and representations' (Malkin 2004, 357).

4.3 IDENTITY AND ETHNICITY

Studies of colonialism in an anthropological context are also linked to identity and ethnicity. Social anthropological studies claim that both identity and ethnicity are mutable concepts that can be perceived only in the long term (Jenkins 1997, 17-20; 2014, 43). Current ideas around ethnic groups appeared only in the 1960s when Barth, in his publication *Ethnic groups and Boundaries* (1969), shifted the notion of 'tribe', arguing that ethnic identity is dynamic and based on social interaction (Barth 1969, 10). It is a complex process that operates in several and different ways involving the nature of the encounters and the way both parties act (Barth 1969, 9-10). Modern studies suggest that ethnic identification is the consequence of collective interests, a reaction to social interactions which expresses itself in different ways, including through language, religion or ideologies (Jenkins 1997, 10). Ethnicity as a social identification is also associated with national identity (Jenkins 1997, 3). The word ethnicity comes from the ancient Greek *ethnos* and in antiquity it was used to describe a group of people with several levels of social identities, including groups belonging to a specific territory or region or groups having common myths of descent (Tonkin et al. 1989, 11-17). Synonyms of ethnos were *genos*, which meant groups with a shared ancestor (Hall 1997, 35-36), or *syngeneia* (Curty 1995), which included everyone who belonged to the same *genos*. Malkin argues that:

> Greek civilization of the Archaic period was a world of many gods and numerous, sovereign political communities sharing a sense of youthfulness and peripheral geographic situation. Ancient Greek political culture was diametrically different both from the ancient model of the vast, multi-ethnic empire and from the modern idea of a national state. Greeks lived in hundreds of small, sovereign, and autonomous city-states. This multiplicity of Greekness has various implications, complicating binarism and any sense of center from which the world is regarded, judged and colonised. Greek identity in the Archaic period was neither formed nor reinforced oppositionally, and the Greeks did not regard the civilizations to the east as peripheral, inferior, poor, or young (Malkin 2004, 345, 350).

Hall argues that during the Archaic period Greeks were not aware of belonging to an *ethnos* and they did not identify themselves as Greeks prior to the sixth century BC as a common sense of identity was established only in the Classical Age (Hall 2002, 175). As Hall (1997, 44-48) and Malkin observe, it was only during the Persian Wars that Greeks 'for the first time, since the mythical Trojan War, had fought a common enemy, sharpening their common identity on the whetstone of invasion' (Malkin 2004, 345).

Studies regarding Greek identity in the ancient world can be relevant to these studies to better understand how Greek and indigenes identified themselves at the end of the eighth century. As already mentioned, archaeological studies of Sicilian indigenes of the Iron

Age have been influenced by the historical description that comes from Thucydides who claimed that three main ethnic groups were living in Sicily (Thuc. 6.2): the Sicanian, the Sikels andthe Elymians. It is widely debated whether or not the three ethnic groups mentioned by the ancient author can really express a truly ethnic division as we intend in modern studies (MacEachern 1998; Antonaccio 2004, 61; Malkin 2016, 288-289). As observed, if the terms Sikels, as well as Sicanians or Elyminians, were not used with an ethnic intention, it is possible that they were describing groups of people occupying a specific territory (Antonaccio 2001, 113-157).

4.4 CHANGE IN MATERIAL CULTURE

The way in which archaeology interprets social boundaries in a colonialist context is through the material culture that is the tangible proof of such encounters and the context of such contacts. For decades scholars interpreted the artefact types and their style as the tool to delineate relations and social borders. For example, as noted here in section 5.1, all of the ceramic types with similarities and coming from the same territory were believed to represent specific cultures corresponding to definite ethnic groups. Gordon Childe, in his studies of material culture and their specific distribution in space and time, claimed that:

> similar assemblages of archaeological types are repeatedly associated together because they were made, used or performed by the same people at the same time. Different assemblages of associated types occur at the same time because they were made by different people (Childe 1956, 111).

In the 1960s, with the advent of the 'New Archaeology', and through the application of anthropological and sociological studies, it became clear that the relation between archaeological cultures and ethnic groups was not as straightforward as implied (Binford 1965; Clarke 1968). Thus, it became obvious that the interpretation of material culture requires an understanding of the social processes that might have produced it (Dietler and Herbich 1998, 233). Therefore, the modern archaeology of colonialism looks at material culture as a product originating in a specific social context and attempts to understand the social nature of the material culture. The study of material culture is characterised by different layers of interpretations: analysis of the product (e.g. ceramic), the style (shape and motifs), the technology (e.g. the technique and the material used in the production), the use (e.g. domestic or funeral) and the function of the archaeological object in a specific social context (Plog 1980, 17-18; Braun 1983, 114-126; Wright 1985; Bronitsky 1986). Through the approach of ethno-anthropological studies, the method of interpreting the change in material culture is slightly different as it observes the social activities that influenced a final artistic product, explained as the consequence of social internal factors, as well as the expression of group identity. Dietler claims that:

> even when the community of origin of a particular micro-style is clearly recognised, this is of little concern to the people who use the pots: ceramic style plays little role in the expression of group identity in the context of consumption (Dietler and Herbich 1998, 254).

Archaeologists have recognised that material culture has to be studied within its social context and that the exclusive analysis of the decoration is a sterile activity (Sackett 1982, 1990; Herbich and Dietler 1991; Dietler and Herbich 1994; 1998). Scholars claim that the analysis of material culture represents one of the main ways to understand the process behind colonial strategies.

In regard to the study of colonial contexts in the ancient Mediterranean, the current perspective tends to believe that presence of Greek material culture within an indigenous context was not the inevitable consequence of a cultural transformation. As previously noted, not all of the potentially available Greek products were introduced within the local culture, but only a few types. For example indigenes of Monte Finocchito, as detailed in chapter 6, selected a specific ceramic group characterised by drinking cups. This suggests that new types were incorporated within a specific indigenous context and that they were probably the reflection of indigenous choices. Thus, the introduction of foreign objects, if analysed within the context to which they belong, appears to be the result of a conscious appropriation by the indigenous population that endorsed the foreign goods according to values that were locally congruent.

4.5 COLONIALISM AND CONSUMPTION

A recent study of colonialism claims that intercultural consumption is the main process by which to understand the practices related to the initial contact in a colonial context (Dietler 2010). From an archaeological point of view consumption describes how objects or goods, introduced as a consequence of a culture contact, were utilised in a new social context. The main difference from traditional studies is that not only are the distribution and production of goods analysed through consumption, but also their uses. The study of consumption has gained increased recognition within socio-anthropological studies (Douglas and Isherwood 1979, 36-37; Colloredo-Mansfeld 2005), and it has been fundamental for those archaeologists studying cultural material in a colonial context (Mintz 1985, 174-150; Appadurai 1986; Dietler and Herbich 1998; 2005).

Archaeologists move away from the theoretical concept of acculturation embraces the idea that the adoption of foreign goods need not necessarily be interpreted as evidence of a loss of identity. With consumption, different models of cultures are defined, usually more dynamic ones where indigenous people negotiated their choices in relation to the colonists and selected what to adopt in accordance with internal social logics. This notion considers the political and also social interests linked with consumption. Dietler observes how the appropriation of new different objects has to be studied through a different point of view considering that 'foreign objects are of interest not for what they represent in the society of origin but for their perceived use and meaning in the context of consumption' (Dietler 2010, 55). As previously noted, in observing ancient colonial environments it is often the case that not all of the possible Greek products were introduced to the local culture, but only a few selected types. For example, Dietler has pointed out that the indigenous people of France in the Early Iron Age were very selective, introducing only wine and drinking paraphernalia from the Greeks (Dietler 2010, 68). The scholar's intention is to better understand the real motivation behind the acceptance and selection of specific material culture and the exclusion of other items.

Consumption as a cultural process is dynamic and it does not represent the final stage of an economic practice, but instead, like hybridism or assimilation, it develops through social relations. Anthropological studies claim that consumption, as a phenomenon, is culturally specific to a definite context and socially constructed on the base of the historical process pertinent to a specific historical setting. Recent archaeological studies claim that it is through its consumption that the culture is constructed and it passes through different ways of interaction (Douglas and Isherwood 1979, 36-37; Bourdieu 1984, 1-7; Comaroff and Comaroff 1997, 9-15; Van Dommelen 2006; Santacreu 2014) because 'the operation of culture is always a creative process of structured improvisation' (Dietler 2010, 60). Methodologically, the study of consumption in a context of ancient colonialism requires a more careful examination of what was consumed, which goods, and why some of them were accepted while others were refused. Indeed, to better understand the social dynamic, the study of consumption needs to understand the choices the indigenous people made.

4.6 ITALIAN ARCHAEOLOGY IN A CONTEXT OF COLONIALISM

During the eighteenth century, Italian archaeology, as in other European countries, was permeated by the ideology of romanticism. However, by the beginning of the following century, Italian archaeologists focused on a more practical archaeology. Because of Italy's extensive archaeological heritage, (Guidi 1987), Italian archaeologists documented and saved cultural heritage (Fiorelli 1881) through the study of the typology and classification of the heritage monuments (Barbanera 2015, 130-132). Amongst Italian archaeologists of the nineteenth century, Giuseppe Fiorelli and Edoardo Brizio were two of the most important figures. Fiorelli created the School of Italian Archaeology (*Scuola Italiana di Archeologia*), while Brizio, in 1888, occupied the position of professor of *Archeologia e Antichità greche e Romane*, created for the first time in Italy.

In regard to Sicily, the most eminent representative of the Italian archaeologists exploring the ancient remains was Paolo Orsi. This archaeologist widely excavated important indigenous and Greek sites in south Italy and Sicily and he applied in excavation a methodology scientifically valid for those years, which was influenced by the activities of his prehistorian colleague, Pigorini (Guidi 1987, 237-250). Therefore, the data we inherit are re-interpretable, due to Orsi's relatively methodical excavation and recording procedures.

During the period of Fascism the study of archaeology in Italy was influenced, even more than before, by political ideologies. In those years, scholars such as Giulio Quirino Giglioli, Pericle Ducati and Carlo Anti were strongly connected with the right wing, while a new progressive movement, influenced by Marxist ideologies that changed the story of Italian archaeology, was represented by the scholar Ranuccio Bianchi Bandinelli (1976). From this moment on, the relation between artistic production and its social context became fundamental but Bianchi Bandinelli's thinking, even though progressive, was still far removed from modern approaches that involve anthropological or sociological methodologies in the study of ancient art. Bianchi Bandinelli was able to interpret an artistic product as an expression of a specific society but at the same time the art historian neglected the way in which ancient groups aggregated, ancient production systems, and the social, political, and economic reasons behind it (Barbanera 2015, 169). Indeed, the use of anthropology as an instrument applied to the study of ancient societies entered common use only from the 1980s (Barbanera 2015).

4.7 SICILIAN ARCHAEOLOGY IN A CONTEXT OF COLONIALISM

In Sicily, more than in other archaeological contexts, due to its varied cultural heritage, Helleno-centrism influenced the way scholars interpreted Hellenic colonisation, and in particular approaches used to describe indigenous contexts. From the sixteenth century, historians and topographists travelled to Sicily, attracted to the island's complex historical heritage. One of the most important figures of that time was Tommaso Fazzello, author of the *De rebus Siculis decades duae*, which still represents an important fount of information as he described the ancient sites of Sicily as they appeared at that time (Fazzello 1558). In the following century Filippo Cluverio published a monograph about Sicily; *Sicilia antiqua cum minoribus insulis ei adiacentibus,* providing a geographical guide of the main historical sites of the island (Cluverio 1619). In the nineteenth century, studies of Sicily were mainly based on historical analyses such as *Histoire critique de l'établissement des colonies grecques* by Desiré Raoul Rochette and the *Recherches sur les établissements grecs en Sicile* (Rochette 1815), where the author, Wladimir Brunet de Presle, describes the Greek colonisation of Sicily (Brunet de Presle 1845). Amongst the works of this period, of particular importance was the monograph *Geschichte Siciliens im Alterthum* by Holm (1870), and the four-volume *History of Sicily*, by Edward Freeman, where the author analysed the historical phenomenon of the *apoikiai* (Freeman 1891-1894).

In 1894 Pais published *La Storia della Sicilia e della Magna Grecia.* He studied Greek colonisation disregarding the indigenous population of Sicily, but made an important point by highlighting for the first time that the stories of foundation transmitted by ancient literature were written centuries later. In 1912 Beloch published *Griechische Geschichte I*, which deals with Greeks in the Mediterranean.

The beginning of the twentieth century was inaugurated with the publication of works that included, as never before, data related to possible chronologies: Pareti published *Studi Siciliani e Italioti* where the author proposes a historical reconstruction through the interaction between literature and archaeological records (Pareti 1914). One of the most important works for the reconstruction of the history of Sicily, from the first Greek colonies till the Byzantine Age, was written by Ciaceri and titled *Storia della Magna Grecia* (Ciaceri 1924). The scholar, even if his studies were imbued with the idea that Greeks were superior, was the first one to look at the interaction between Greeks and indigenes of Sicily. A new approach to the interpretation of ancient sources arrived in the 1940s when Jean Bérard published *La colonisation grecque de l'Italie méridionale et de la Sicile dans l'Antiquité, l'historie et la Légend*, focusing on relationships between ancient literature and archaeological records. A few years later, Dunbabin published *The Western Greeks* analysing Greek activities in the south of Italy and Sicily from the eighth to the fifth centuries BC (Dunbabin 1948). The scholar promoted a Helleno-centric vision, which described the Greeks as the dominant group in relation to the indigenous populations. Influenced by British imperialist ideas, he compared the Greek enterprises in the south of Italy and Sicily with British colonialism. The studies by Bérard and Dunbabin were widely accepted, influencing Sicilian archaeology, which for a long time was interpreted through a Helleno-centric ideology. Meanwhile, studies relating to the indigenous population of Sicily lagged behind, as the Greek sites were favoured (De Angelis 2003, 22).

It was in the 1960s, influenced by anthropological research, that scholars understood that Greek colonisation was a more complex reality than the one traditionally described (Lewis 1973): for the first time scholars questioned the accuracy of the description of indigenous people as passive subjects absorbing Greek culture. New approaches, based on the studies of anthropology, observed the history from a different perspective, and investigated the impact the natives of Sicily had on the Greek settlers (Albanese Procelli 2003). In Italy, this new phase of scholarship was inaugurated in 1961 with the first congress *Studi sulla Magna Graecia* (Barbanera 2015, 201). The main intention was to create wide debate based on different interpretations used to define Greek colonisation; another main target was to find the right approach to use for future studies. One of the most significant contributions came from Moses Finley, who described the colonial world as an example of frontier history, as a place 'of contact and conflict between two different societies, two different social structures' (Finley 1968, 186); Greeks and indigenous people were not studied as two different groups, but as two entities that came into contact. Yet the ideas developed by Freeman and Dunbabin still lingered, especially in Anglophone studies; indeed John Boardman highlighted that in the West 'Greeks had nothing to learn, much to teach’ (Boardman 1964, 203).

From the 1980s onwards, concomitantly with post-processualism, scholarship mainly explored the colonial phenomenon through an indigenous point of view to better understand the interaction between Greeks and indigenes. An important contribution came from Snodgrass, which argued that studies of Greek archaeology needed to move closer to anthropological archaeology and that the concept of Greek superiority had lost relevance in the study of archaeology (Snodgrass 1987, 1-13). In 1998, Osborne, as the title of his book chapter ‘Early Greek colonization?’ makes clear, doubted that in Sicily and Magna Graecia a pre-colonisation period, during the second half of the eighth century, preceded Greek colonisation (Osborne 1998, 256). The scholar proposed a different model suggesting that the Greek expeditions were private enterprises, with possible commercial purposes. Subsequently, major attention has been given to the identity of Sicilian indigenes (Hall 2002; Malkin 2002; Lomas 2004, 1-14; Hodos 2006) focusing on the change in material culture (Hodos 2006, 120-133; Antonaccio 2009; Hodos 2009; 2017).

By contrast, Italian scholarship showed a tendency to accept the idea that the establishment of early *apoikiai* was in support of later colonisation. This theory has been recently expressed in Greco’s publication *Magna Grecia: città greche di Magna Grecia e Sicilia* (Greco 2012, 55-69). Meanwhile, an important study was undertaken by Albanese Maria Procelli who in 2003 published *Siculi, Sicani ed Elimi*, which focused on identities and different types of contacts in which indigenes and Greeks engaged and how they developed. The main instrument Albanese Procelli used to analyse indigenous material culture was the concept of acculturation.

CHAPTER 5

5. SICILIAN IRON AGE CERAMICS: POTTERY PRODUCTION

With regard to the production of Sicilian Iron Age pottery, although there is a large amount of archaeological material available, studies are lacking in terms of knowledge of manufacturing and the techniques the indigenous people used in the past. Scholars, analysing the material in terms of acculturation as observed in the previous chapter, have been influenced by the idea that the technology of indigenous ceramics become more sophisticated from the moment that the contact with Greeks intensified (Trigger 1989, 275). In most cases, archaeological studies have focused on, and continue to focus on, stylistic analyses and pottery typologies. Only recently have archaeometric studies been developed, which allow pottery production to be studied with the aim of discovering the abilities and expertise that characterise the ceramics which circulated during the late Bronze Age and the Iron Age all around the island (Barone et al. 2010; Barone et al. 2011; Rodríguez 2015; Tanasi 2013; Tanasi et al. 2016; Raudino et al. 2017).

The pottery characterising the Bronze Age, and often the early Iron Age in Sicily, was hand-made and wheel techniques, introduced during the Middle and Late Bronze Age by Mycenaean traders, was in use also (Bernabò Brea and Cavalier 1980, 565-566; Fatta 1983, 74-75; Di Noto 1995, 105; Albanese Procelli 2003). Traditionally the use of the wheel often signifies a change in technique which has been attributed to the Greeks; however, as I will argue later, in chapter 9, there is evidence that indicates how, at Monte Finocchito, a slow rotating turntable, used during the finishing phase, was most likely to be a tool pre-dating the arrival of the Greeks, in the 8th century BC. With the use of new tools, alongside ceramic types traditionally diffused amongst the indigenous communities, new styles appeared. This phase, characterised by the introduction of new models inspired by Greek prototypes, is clearly visible within the indigenous site of Monte Finocchito. The cultural and economic internal mechanisms, which led the indigenous ceramists to imitate Greek artefacts, are often difficult to interpret. Certainly, such a phenomenon implies contact between locals and Greek ceramists, and possibly Greeks living within, or close to, indigenous sites. From this perspective, as Albanese Procelli (2003, 188) has observed, we could explain how Greek types were suddenly adopted within indigenous contexts.

5.1 CERAMIC REPERTOIRE: TYPES AND MOTIFS

The ceramic repertoire circulating during the Iron Age amongst the indigenous sites of Sicily, and in particular between the very end of the eighth and the early phase of the seventh century, was varied and usually characterised by specific types and motifs that, in many cases, were typical of one specific territory rather than another. Indeed, as archaeologists have argued, often the differences in style and shapes allow us to recognise the origin of certain vessels and artefacts in general (Shepherd 2014): for example, while the Elymian and Sicanian material culture is very similar, especially in term of style and decorative motifs (Hodos 2006, 136), the pottery production from western Sicily is very different from the production from the eastern side (Blakeway 1932-1933; Åkerström 1943; Villard and Vallet 1956). Indigenous Elymian pottery products are generally incised or impressed with geometrical designs, such as the typical 'denti di lupo motif (Kolb et al. 2006) (Figure 5.1), or painted wares with stylized faces of humans or animals (Albanese Procelli 2003, Table 29). Ceramics from central Sicily bear a general affinity with the pottery decoration of the Elymian territory (Figure 5.2), the design of which is also characterised by incised and impressed geometrical motifs, such as small concentric circles, and triangular patterns combined with horizontal lines (Sant'Angelo Muxaro *facies*) (Albanese Procelli 2003, Table 19). Meanwhile, ceramics from southeastern Sicily (Figure 5.3) are mainly characterised by linear motifs and incised meanders (Pantalica III *facies*) (Albanese Procelli 2003, Table 24; Hodos 2006, 136).

Figure 5. 1 Amphora from Entella in western Sicily (Falsone 1980).

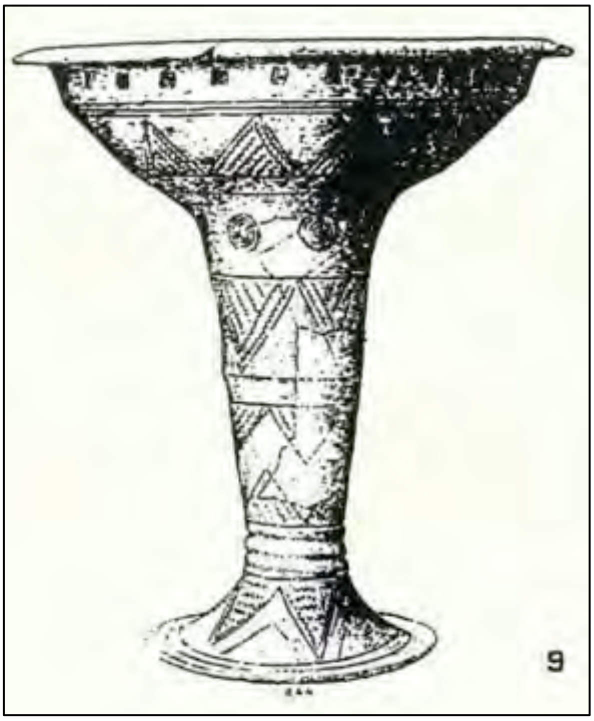


Figure 5. 2 Pottery from Sant'Angelo Muxaro in west-central Sicily decorated with incised and impressed geometric motifs (Albanese Procelli 2003).

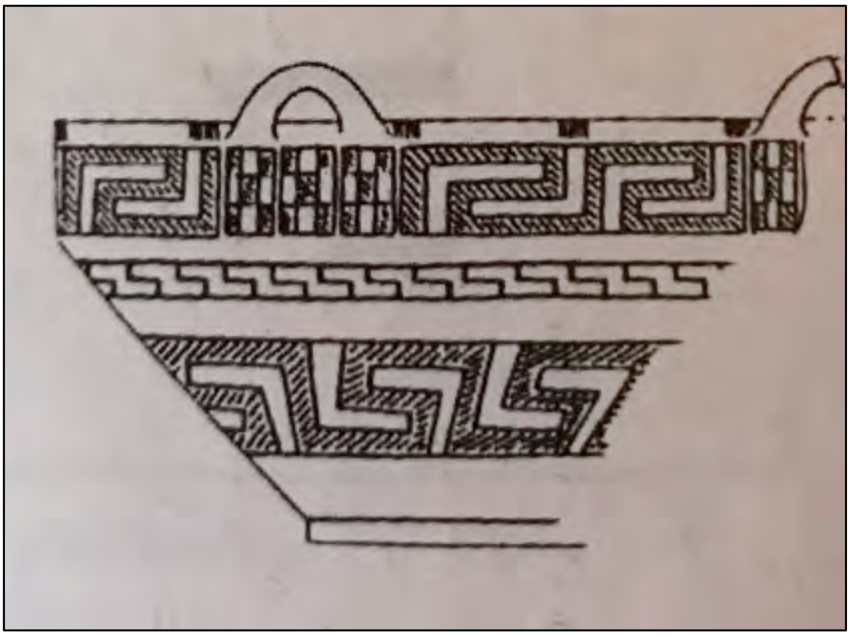


Figure 5. 3 Large bowl with incised meander from Pantalica in southeastern Sicily (Albanese Procelli 2003).

Archaeological data also supports the theory that specific territories and sites developed their own models and ceramic types. Although at the same time these models difused, they were sometimes absorbed by different indigenous groups, and circulated in various territories and over long distances within Sicily (Tusa 1983; Albanese Procelli 1995; Spatafora 1996). For instance, within a specific territory, such as southeastern Sicily, archaeologists recognise the presence of common models of ceramic types and motifs (Tables 5.1-5.3 and Figure 5.4), often specific to a certain period. However, scholars are also agreed that particular ceramic types were not necessarily pertinent to a specific culture, which could be for example the large bowl decorated with incised meanders (Figure 5.3) that was initially circulating at Finocchito but also adopted by the close indigenous group occupying Pantalica during the Pantalica South phase (Steures 1980, 49; Leighton 1993a, 60).

With regard to the typological studies of Sicilian pottery, scholars consider as main factors the shape of the vessel, its variations in style and the adoption of different decorative motifs. Scholars have argued that the ceramic types of the Early Iron Age of southeastern Sicily (Figure 5.4) derive from types circulating during the Late Bronze Age. It was from the eighth century, when indigenous people intensified their relationships with Greeks, that new forms and types appeared (Bernabò Brea 1957; Steures 1980; Frasca 1981; Albanese Procelli 2003).

Figure 5. 4 Bowl from Monte Finocchito painted with the flamed motif (Paolo Orsi musem Inv. number 16742).

Studies looking at the Sicilian ceramics of the Iron Age have suggested that the main types circulating during the Early Iron Age phase were bowls, jugs, askoi, pyxides, plates and amphorae (Trombi 1999, 278). During this early period, in a phase that runs from the end of the ninth to the beginning of the eighth century BC, indigenous pottery was characterised by two main styles: incised/impressed ware and painted ware. The incised/impressed wares were mostly characterised by features in relief, traditionally connected with the Ausonian ceramic culture (Leighton 1999, 11), or decorated with incisions (geometric motifs such as triangles and horizontal lines). The painted ware was typified by decorative geometric patterns. Generally, the inner and the external surfaces were painted with red and reddish/brown broad bands, or with plumed (also named 'flamed' or 'flabellum') decorations (Frasca 1996, 143) (Figure 5.4). In the case of painted ceramics, scholars have argued that due to a more sophisticated design, they were probably made by specialised pot-makers (Albanese Procelli 2003, 87).

The development of new types of ceramics and the specialisation of such, coincided historically with the settlement of Greeks in *apoikia* along the eastern coast of Sicily. The ceramic repertoire was enhanced with the introduction of new stylistic components influenced by Greek models; and from this moment on, craters, kotylai, kyathoi and cups appeared within indigenous sites (Figure 5.5). Previous types and motifs were gradually abandoned and in a few cases new forms were adapted to similar types already existing in the indigenous culture, for example the oinochoai at Finocchito, while new styles continued to appear (Frasca 1981, 86).

Figure 5. 5 Cup in Protocorinthian-style (FK01) and kyathos (FKY5) from Monte Finocchito.

The indigenous pottery of this phase, which corresponds with the period of the first contacts with Greeks, is described as pottery characterising the 'Siculan III phase', also called Siculan, Sikelo-geometric or matt-painted pottery (Orsi 1898, 305-366; Dunbabin 1948, 2; Leighton 1999, 187-268). The ware of the 'Siculan III phase' is characterised by local imitations and local ceramics influenced by the Greek style (Blakeway 1932-1933) painted or plain wares, usually circulating in southeastern Sicily from the eighth century (Antonaccio 2003, 58-59). One of the most representative indigenous material cultures of this phase is that of Finocchito, hence the designation 'Finocchito phase'. Paolo Orsi, on the basis of affinities with the ware of the 'Siculan I and II phases' and the presence of Greek ceramic types, argued that Finocchito was the later phase (Orsi 1894). In this period, as discussed below, Greek ceramic types were adopted and mixed with indigenous pottery. The Finocchito phase represents the period when pottery imitating Greek ceramics were adopted and associated with local ceramics within funeral contexts. It is succeeded by the latest phase known as the Licodia Eubea phase (Orsi 1898, 305-366) (Figure 5.6).

Table 5. 1 Paolo Orsi's Sicul phases

I Sicul Period	II Sicul Period	III Sicul Period	IV Sicul Period
Castelluccio phase (Beginning of the Bronze Age)	Thapsos phase (Middle and Final Bronze Age)	Finocchito phase (Iron Age)	Licodia Eubea phase (Archaic period)

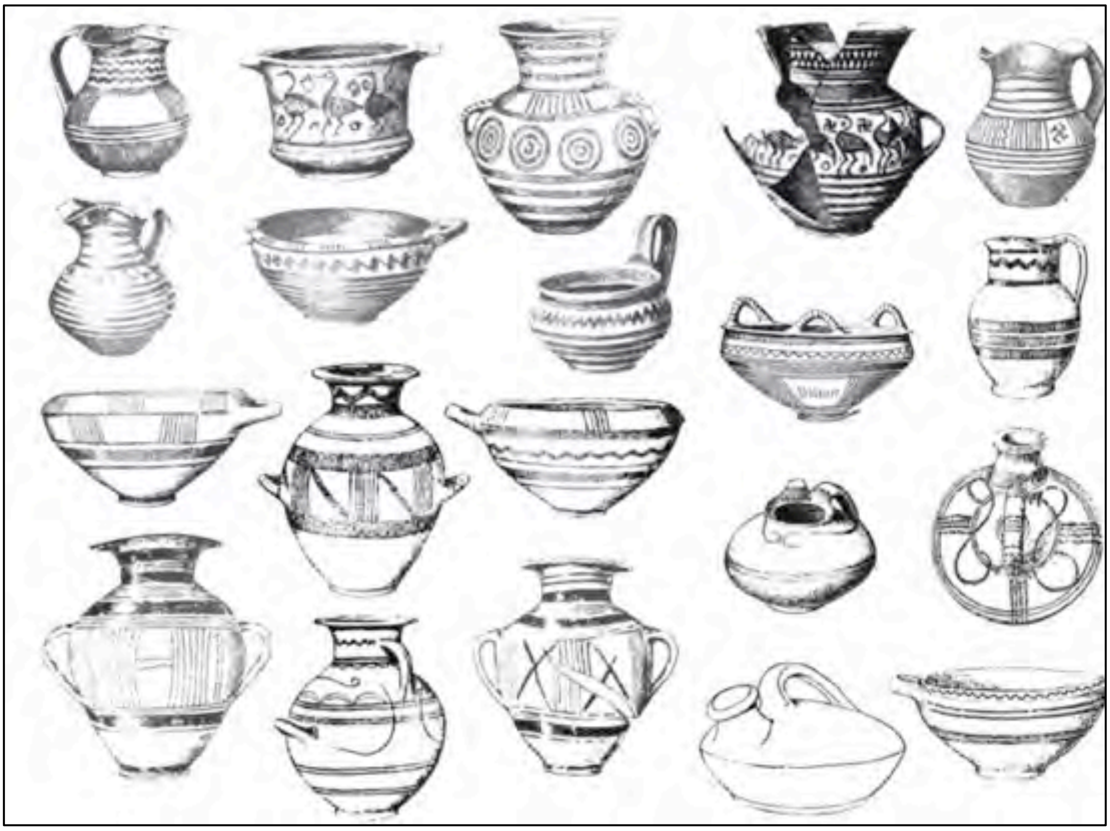
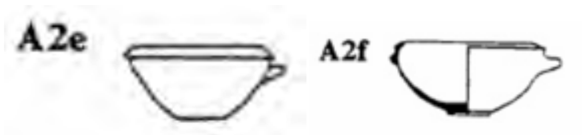
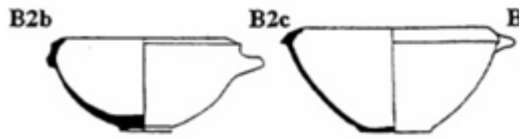


Figure 5. 6 Sicilian pottery with a Geometric design (Sicul period IV) from Lentini (Orsi 1898).

Recently, Trombi has proposed a classification of Sicilian ceramic types for the period running between the ninth and seventh centuries BC (Trombi 1999). This classification looks at motifs and ware types of the analysed ceramics. This general typology applies specific codes to certain types to easily identify ceramic vessels (for example bowl Ae2). The primary goal of Trombi's study was to organise the principal Iron Age ceramic types of Sicily. She selected twenty types based on their shape, decoration and place of origin.

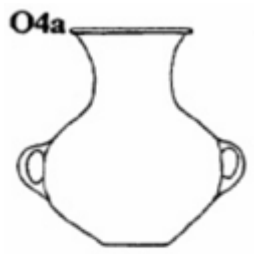
Trombi identified six main regions (named units) that, as the scholar highlighted, do not necessarily correspond to an ethnic cultural unit (Trombi 1999, 277-278). The area of our interest, the Hyblaean plateau, is identified as unit 6, where two main chronological phases have been distinguished (Trombi 1999, LXXXI, 1; Table. LXXXVII, 1; Table. LXXXIII, 1; Table. LXXXV, 1). Within Trombi's classification (Table 5.2), the main types recorded at Finocchito were the carinated conical bowl, the large bowl, the askos, the jug and the amphora (Trombi 1999, 285) (Tables 5.2 and 5.3).

Table 5. 2 Indigenous ceramic types circulating in the Hyblaean Plateau between the middle of the ninth and the third quarter of the eighth century.

Carinated conical bowl (Trombi 1999, Table LXXXI,1)	
Large bowl (Trombi 1999, Table LXXXI,1)	 
Askos (Trombi 1999, Table LXXXVII, 1)	

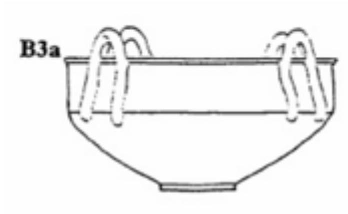
Jug
(Trombi 1999, Table
LXXXIII, 1)

Amphora
(Trombi 1999, Table
LXXXV,1)



Jug with a spherical shape
(Trombi 1999, Table
LXXXIII, 1)

Carinated large bowl
(Trombi 1999, Table
LXXXI,1)



Amphora with vertical handles
(Trombi 1999, Table
LXXXV,1)

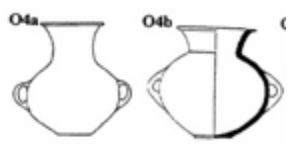


Table 5. 3 Monte Finocchito's types by Trombi's classification and chronology: ceramics types recorded at Monte Finocchito between the middle of the ninth and the third quarter of the eighth century.

	End 9th to the ¾ of the 8th BC.	**730 BC to the beginning of the 7th century BC.**
Carinated bowls	A2e A2f	
Large carinated bowls		B3a
Large bowls	B2a B2b B2c	
Askoi	R1a R2b R1c	
Jugs	G2	G1
Amphorae	O4a	O4b

The first point that emerges from this classification is that the most important phase for Finocchito, in terms of production of new indigenous pottery types, can be detected between the end of the ninth and the third quarter of the eighth century, while the latest phase saw the introduction of Greek types (B3a, G1, O4b) (Frasca 1981, 86-89; Trombi 1999). Thus, this phase coincides with the wide diffusion of Greek ceramic types at Finocchito, always combined with ceramics of traditional production. As previously noted, Finocchito's ceramics provide the designation for a chronological phase of indigenous culture; they have been recorded at several indigenous sites of southeastern Sicily. For example, the carinated conical bowl 'A2e' in Trombi's study was also recorded in the Belice Valley in southwestern Sicily (De La Geniere and Tusa 1978, 24), at the indigenous site of Polizzello in western Sicily (De Miro 1988, Table XVI, 2a) and at the Erean Mountains, in central Sicily (Adamesteanu 1958, 529, figure 203; Pancucci and Naro, 1992, figure 18c). Meanwhile, askos 'R1b' (Pancucci and Naro, 1992, figure 22a) and the large bowl 'B2c' (Leighton 1993a, Table 65, 12; Table 117, 377) were also recorded in central Sicily at the indigenous site of Monte Bubbonia (Pancucci and Naro

1992). With regard to the decoration, motifs are the plumed decoration, horizontal lines, and triangles (Trombi 1999, 288-289). In sum, as well as for specific ceramic types, particular decorations were associated with specific territories: the decoration patterns of the Hyblaean Plateau, mainly characterizing the ceramics dated between the ninth and the end of the eighth century, were the flabellum types, linear motifs and incised meanders (Figure 5.7).

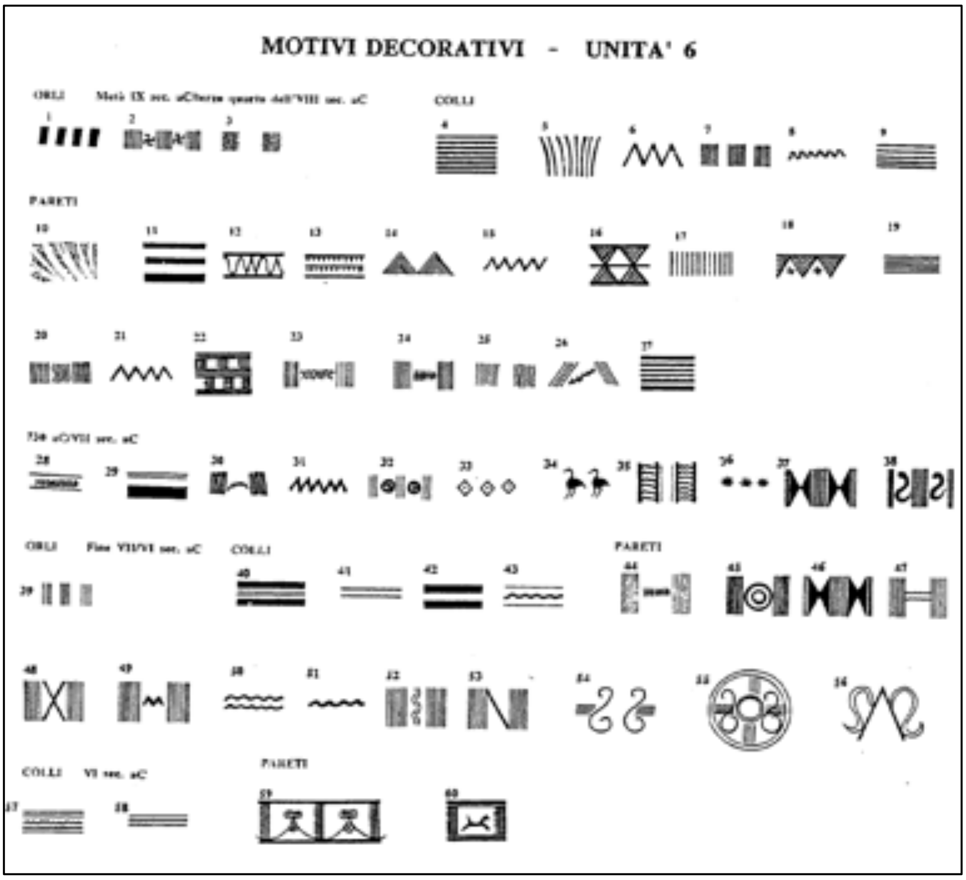


Figure 5. 7 Ceramic motifs of the Hyblaean Plateau between the middle of the ninth and the third quarter of the eighth century (Trombi 1999, Table XC).

5.1.1 GREEK POTTERY IN SOUTHEASTERN SICILY

The earliest Greek pottery and goods appearing in Sicily, after the Mycenaeans, were mainly Euboean-Cycladic products, such as the skyphos (cup) with chevron decoration, dated from the middle to the end of the eighth century (Leighton 1999, 224; Hodos 2006, 128-129). From the end of the century, Corinthian pottery, such as the Aetos 666 kotyle

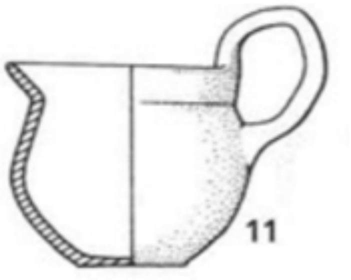
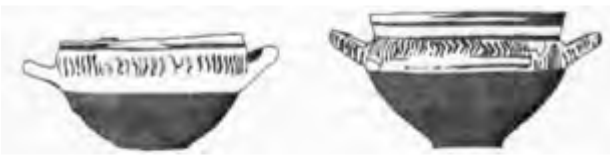
(Leighton 1999, 225), began spreading to indigenous sites, and increasingly during the seventh century (Hodos 2006, 129). The presence of these specific Greek ceramics in this early phase was, in Blakeway's opinion, Greek Late Geometric pottery traded in Sicily at the end of the eighth century (Blakeway 1932-1933). By contrast, Hodos argues that it is not possible to determine exactly when the Greek goods arrived in Sicily (Hodos 2006, 94-95). She argues that archaeological excavations showed that there is a large number of skyphoi or cups, 'Thapsos' cups type and kotylai that appeared within indigenous sites in the context that Albanse Procelli defines as non-colonial and therefore before the end of the eighth century (Albanese Procelli 1977, 511-520).

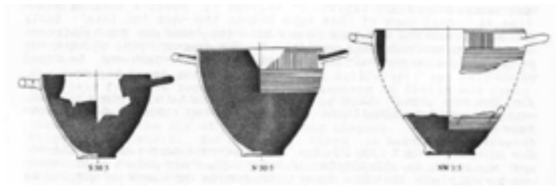
Hodos claims that:

> During the second half of the eighth century the Greek occurrence has to do with early Greek overtures, similar in type and manner to the xenia gifts made by Greeks to Near Eastern rulers. What the Greeks might have received in return is not materially preserved. While it may have been organic food, it may have even been something less materially tangible but more important for the Greeks' immediate livelihood and more significant for the long term repercussions of both communities: acknowledgement of Greek presence in Hyblaean territory and an agreement to peaceful co-existence. Trade in any commercial sense, as Blakeway and others have argued for, can no longer be substained (Hodos 2006, 95).

It appears that in this early phase of contacts, Greek ceramic types were not only characterised by imports but also by pottery imitating Greek wares, manufactured locally and usually influenced by the Euboean-Cycladic and Protocorinthian styles (Frasca and Agodi 2000, 43). Euboean material or ceramics imitating the Euboean style were predominant in the hinterland, surrounding the territory of Leontini (Leighton 1999, 244; Frasca and Agodi 2000), while Corinthian goods and imitations of the Protocorinthian-style ceramics circulated in proximity to the Greek colony of Syracuse (Blakeway 1932-1933, 184-185; Leighton 1999, 244; Hodos 2006, 129). In this early phase, Greek ceramic types, imitations as well as originals, which circulated in Sicily were mainly drinking vessels (Hodos 2006, 133), such as skyphoi, kotylai, kyathoi and 'Thapsos' cups (Table 5.4). These ceramics usually were decorated with linear motifs inspired by Protocorinthian ceramics (Frasca 1981, 13-102). Usually, 'Thapsos' cups have been interpreted as possible imports to Sicilian Corinthian settlements between the third and the fourth quarters of the eighth century (Pelagatti 1982, 125-140; Domínguez 2006, 272) but discoveries in Pithekoussai suggest that several were imitations of Greek types locally produced (Buchner and Ridgway 1993, 498, Table CLXVII, 147). Table 5.4 shows the types that circulated in southeastern Sicily at the end of the eighth century and that were original Greek vessels as well as local imitations of Greek types.

Table 5. 4 Greek ceramic types circulating in Sicily at the end of the eighth century

Greek ceramic types
Kyathos (probably local imitation)  (Badoni 2000)
Cup in Protocorinthian-style or Skyphos (probably local imitation)  (Steures 1998)
'Thapsos' cup  (probably local imitation)

(Steures 1998)
Kotyle  (Steures 1998)

A classification of the Greek ceramics recorded within indigenous sites in this early phase, before the establishment of Greek colonies along the Sicilian coast, was proposed by Blakeway, who classified the archaeological evidence in four main groups (Table 5.5):

Table 5. 5 Blakeway's ceramic classification

Class A: Greek Geometric imports	Pottery that is recognised as produced in Greece and imported to Sicily
Class B: Local Geometric pottery painted by Greek craftsman	Pottery resembling Greek ceramics made by Greek ceramists in Sicily
Class C: Local Geometric pottery painted by Sicels but copied directly from Greek Geometric originals	Pottery imitating Greek ceramics but manufactured in Sicily by indigenous ceramists
Class D: Local Geometric pottery of Barbarian type but with a few decorative details borrowed directly or indirectly from Greek imports	This class contains examples with decorative elements that are not Greek and neither Siculan. It mainly refers to those ceramics influenced by the Phoenician pottery

Blakeway notes that class A is the only class that can be easily distinguished because of the different clay and paint. Meanwhile, classes B, C, and D use similar clay, allowing Blakeway to believe that they are of local origin, yet because of the precision of the drawing, he supposed that class B was manufactured by Greek ceramists (Blakeway 1932-1933, 192).

With regards to Monte Finocchito, a general distinction between imported material and imitations of Greek types locally manufactured was initially put forward by Paolo Orsi (1894; 1896). He distinguished, as imitations of Greek Geometric pottery, a group of trilobate oinochoai which he claimed were manufactured by Greeks living along the Sicilian coast in a period that preceeded the establishment of the Greek settlers, while a second class, corresponding to oinochoai in Protocorinthian-style, was manufactured in Sicily by Greek ceramists during the eighth and the seventh century, when the first colonies were settled (Orsi 1894, 58; 1897a, 189-190). He also agreed that all the imports during the early phase were Euboean-Cycladic in origin, as they were absent during the later phase he defined as colonization period (Blakeway 1932-1933, 189-191). Subsequently Frasca and Steures in their respective studies, noted that imports as well as ceramics imitating Greek types were common (Table 5.6), but they did not form views regarding the ethnic origin of the craftsmen for the locally manufactured imitation pottery (Frasca 1980; Steures 1988; Berlinzani 2012, 236).

Frasca claims that the majority of the ceramics imitate Greek pottery in Protocorinthian-style, in particular the oinochoai. He classifies the trilobate oinochoai as ceramics of Greek influence and therefore as imitations. More generally, and for other indigenous sites such as Monte Casasia, Frasca claims that the trilobate oinochoai are likely to be locally manufactured (Frasca 1978a). Meanwhile, he classifies two Protocorinthian cups found at Finocchito, FPrc1 and FPrc2, as imports (Frasca 1981, 15-17). As outlined in chapter 7, the two Protocorinthian cups were analysed through pXRF to verify whether they were locally manufactured or, as Frasca argued, they were imports.

Steures (1988, 74-80) classified, the ‘Thapsos’ cups P22 type (Table 5.7) and the Protocorinthian kotylai P21 type (Table 5.7) as imported Greek pottery. Locally manufactured items are, in her opinion, skyphoi of Greek tradition (or Protocorinthian cups as described by Frasca) and the oinochoe P48 type (Table 5.7). All of these ceramic samples were analysed through the pXRF (chapter 7).

Table 5. 6 Imitations and imports at Finocchito

Class 1: Greek Geometric imports	Pottery imported from Greece
Class 2: Local pottery, copying Greek types and made in Sicily	Imitation of Greek ceramics

5.2 CERAMIC CLASSIFICATIONS AT MONTE FINOCCHITO: CERAMIC STYLES

When Paolo Orsi excavated the necropolis of Finocchito, he recognised the importance of this site because of the peculiarity of its material culture, identifying in it a transitional phase between the Sicul Period II and the Sicul period IV (Table 5.1). As previously noted, Monte Finocchito corresponds to the Sicul Period III, where Greek ceramics appeared in large quantities in funeral contexts and were mixed with indigenous ceramics. It was also defined as a transitional phase, as from the Archaic Age between the seventh and the fifth centuries, the ceramics circulating in southeastern Sicily were predominately Greek (Frasca 1981, 13-17).

Subsequent studies by Frasca and Steures in the 1980s, the results of which were published in two different publications, looked at the ceramics circulating at Finocchito from the ninth century and the early phase of the seventh century (Frasca 1981; Steures 1980, 1988). With regards to the ceramics dated to the end of the ninth century, both scholars held the view that the pottery of this phase was repeating models from the late Bronze Age (Steures 1980, 1988; Frasca 1981; Holloway 2000, 88). In this early phase, the pottery repertoire mainly included askoi, pots and jugs. According to a visual analysis, these ceramics are greyish with coarse clay and volcanic inclusions (Figure 5.8), while ceramic vessels with finer clay are yellow-reddish and the clay was slightly finer but the volcanic inclusions were still part of the clay mixture (Figure 5.9).

Figure 5. 8 (Sample FB13) Hand-made bowl with volcanic inclusions.

Figure 5. 9 (Sample FB35) Yellow-reddish potsherd with finer clay.

Decoration was mainly characterised by horizontal bands, wavy bands between two horizontal bands, triangles, irregular dots and plumed motifs. The plumed decoration, which is commonly found at Finocchito, is considered as the evolution of the burnished ceramics circulating in Sicily during the Late Bronze Age (Albanese Procelli, 2003).

From the late eighth century new types, influenced by Greek ceramics, as described in section 5.1.2, circulated at Monte Finocchito. This pottery was usually characterised by fine clay with a pinkish-beige colour.

One of the particularities of a few samples of Finocchito's pottery was the presence, especially in small bowls and oinochoai, of incised signs: 'X', 'V', 'Y' (Figure 5.10) were common in potteries dated to an early phase, while curved lines of three or four commas **')))' '))))'** were peculiar to potsherds of a later phase.

Figure 5. 10 Fragment of a small bowl with the incised sign 'V' (Monte Finoccito, Tomb 16 north-west).

Albanese Procelli argues that such marks were introduced during the Late Bronze Age, as a consequence of a highly specialised form of production. She suggests that they are very common in Sicilian geometric ceramics, named as such due to their similarity with the Greek geometric pottery (Orsi 1898, 305-366).

She believed that:

> I recipienti con marchi sono quindi opera di vasai della tecnica altamente specializzata. Essi forse frequentavano periodicamente diversi villaggi, portando prodotti finite o eseguendo in loco vasi che venivano cotti in

> fornaci comuni, il che poteva rendere necessario contrassegnare la propria produzione (Albanese Procelli 2003, 86-87). [6]

Another possible explanation is offered by Papadopoulos (1994, 437-507), who describes such marks as a 'reminder of the maker':

> Assuming that seasonality of potters' activity and healthy market demand are plausible for Early Iron Age pottery production, then the possibility of a potter specially marking a vase as part of a batch, whether for local client or export, need not be surprising. In such a situation, the mark itself would not necessarily denote specific maker or owner or specific destination (Papadopoulos 1994, 481).

A study regarding the decoration of the ceramics from Giummarito and Finocchito has been done by Sanahuja in collaboration with Vilar (1976, 135-139). The scholars organised Finocchito's ceramics in four main groups on the basis of Orsi's diaries. The first was pottery without decoration, usually including bowls, pots and askoi. The second group included vessels with painted geometric decoration (bowls, amphorae, pots, skyphoi, cups, kylikes and askoi). This type of decoration was characterised by painted horizontal lines and bands with metopes and plumed decoration. Incised decoration, usually horizontal lines or incised pattern with triangles, horizontal lines mixed with grooves, vertical-oblique bands and also incised meanders, was representative of the third group. The fourth group incorporated the pottery imitating Greek styles, which she believed was locally produced, with only a few possible samples of imports from Greece. Sanahuja and Vilar do not provide a list or a catalogue of the ceramic samples pertinent to each group.

In the 1980s the archaeologists Frasca (1981) and Steures (1988), using Orsi's diaries, proposed different classifications of the types and a general chronology (Tables 5.7 and 5.8). Both studies differ in the methodology used to classify the ceramics and also the

[6] In summary, Albanese Procelli claimed: that those ceramics having marks, usually on the bottom, were probably made by specialised ceramists. She assumed that pottery-makers moved from one village to another, producing and firing them in kiln that were in common with other ceramists. Therefore the mark was necessary to easily identify the ceramics.

chronology proposed. Steures created two different classifications, one focusing on the shape of the vessel, while the other one describing the decoration. By contrast, Frasca created one typology considering shape and decoration together.

With regard to the bowl, which is one of the most recurring types recorded in this indigenous context, Frasca listed twenty-one types on the basis of their function and the number of the handles (Table 5.8). On the other hand, Steures classified nineteen bowl types on the basis of shape and the presence or the absence of warts, handles, and the base ring, which she considered as chronologically related to the early phase. The Protocorinthian-style kotylai, representatives of phase II, were divided into two groups by Steures: imitations of Protocorinthian kotylai and original Protocorinthian kotylai (Table 5.7). Frasca, however, as previously noted in section 5.1.2, recognised only one type of Protocorinthian cup (FPrc1 and FPrc2), both of them described as imported (Frasca 1981, 15-17). The chronology Steures assigned to this group of kotylai (between 700/690 and 690/680 BC) was based on the changing proportions and/or dimensions of the kotylai over the passage of time (Steures 1988, 75-76). In the case of the ‘Thapsos’ cups, Frasca, who does not clarify whether they are imports or local imitations, distinguished three types, while Steures who classified the ‘Thapsos’ cups as possible Greek imports, placed them within one group; Steures proposed a date between 720 and 730 BC (Steures 1988, 74-75).

Further discrepancies are in the interpretation of the skyphos type: while Steures classified this class using the term skyphos, on the other hand Frasca describes this type as a cup in Protocorinthian-style. In my general classification, they are more generically described as cups in Protocorinthian-style (FPrc: Table 7.1). Steures, on the basis of other archaeological evidence, including skyphoi discovered in Campania (D’Agostino 1982, 55-68) and Lentini (D’Agostino 1974, 77), distinguished two groups of skyphoi: the low skyphos, which she believed derived from the Corinthian Late Geometric chevron-skyphos, dated to between 750 and 720 BC (Steures 1988, 78-79), and the high skyphos. In regard to the kyathos type, Steures recognised two groups, hand-made kyathoi and wheel-made kyathoi, while Frasca put together both hand-made kyathoi and wheel-made kyathoi isolating just a small group due to the presence of the handles. Meanwhile, pots were divided into two categories, pot and pyxis with geometric style, by Steures, while Frasca classified them as one class (Table 5.7).

Besides the bowl class, the other large group of ceramics at Finocchito includes the trefoil oinochoe (i.e FO3) and the oinochoe in Protocorinthian-style (i.e FO11). The oinochoai in Protocorinthian-style were painted with metopes, chevrons, and horizontal lines filled with ‘sigma’ motifs influenced, as Frasca suggested, by the Greeks’ pottery. Frasca proposed that the oinochoe with a swollen shape and a wide base was typical of the phase that he defined as IIa (Figure 5.11), while the final phase or phase IIb saw the development of an oinochoe with a rigid profile, everted lips and smaller bases (Figure 5.12).

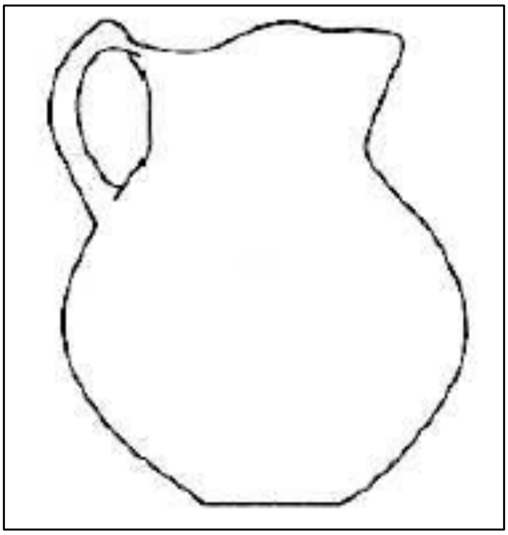


Figure 5. 11 Oinochoe with a swollen shape and a wide base was typical of phase IIa (by Frasca 1981, Figure 15).

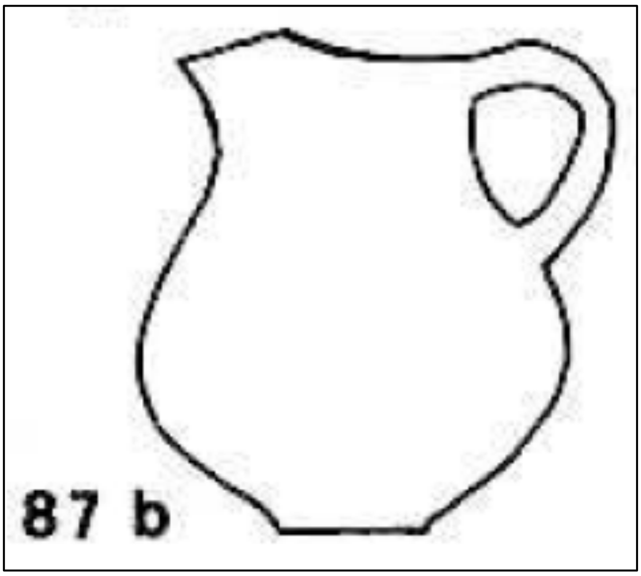
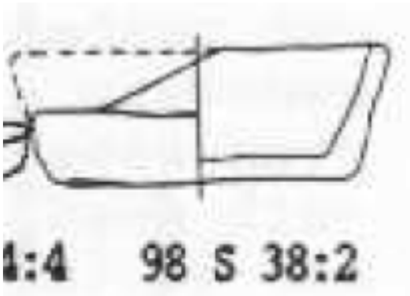


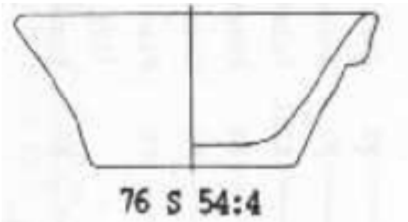
Figure 5. 12 Oinochoe with a rigid profile, everted lips and smaller bases typical of phase IIB (by Frasca 1981, 91).

Table 5. 7 Steures' Typology

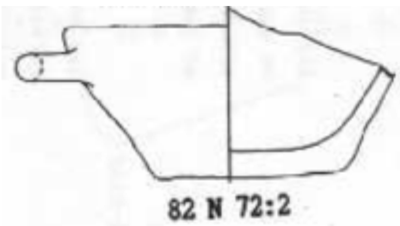
Bowl



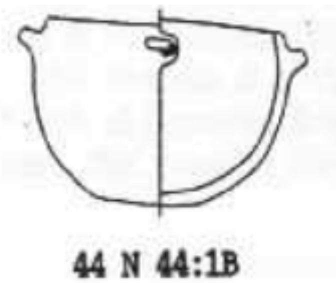
Type P1 (Small hand-made bowl)



Type P2 (Hand-made bowl)

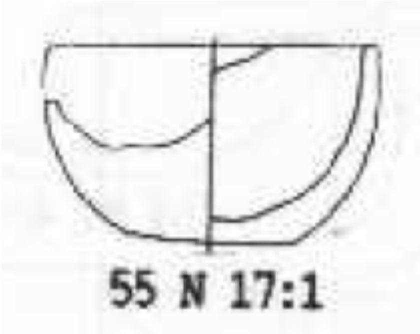


Type P3 (Hand-made bowl with handle)

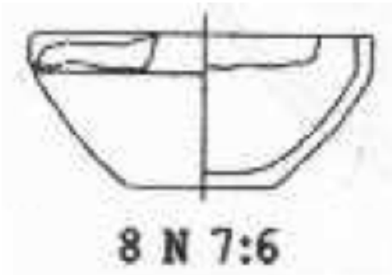


Type P4 (Convex hand-made bowl)

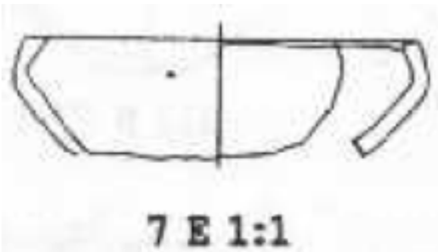
Type P5 (Flat bottomed convex hand-made bowl)



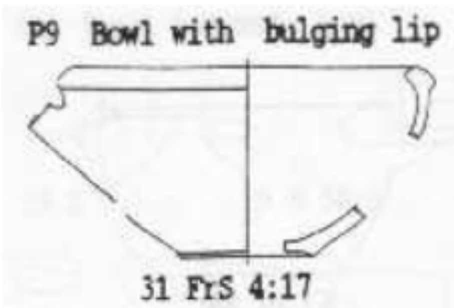
Type P6 (Hand-made bowl with vertical lip)

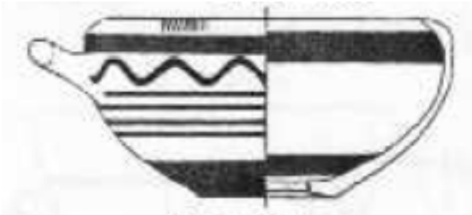


Type P7 (Carinated hand-made bowl)

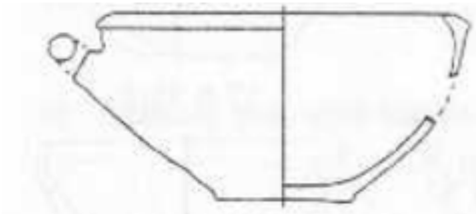


Type P9 (Bowl with bulging lip)

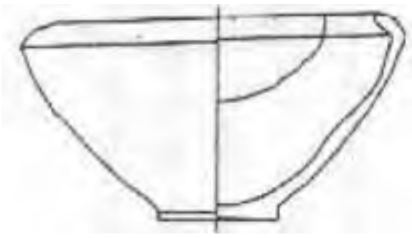




Type P10 (Bowl with unmarked inverted lip)



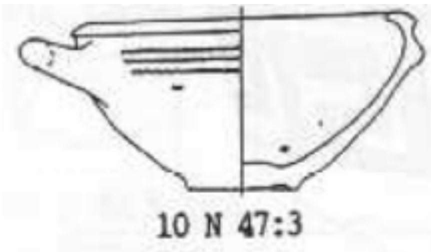
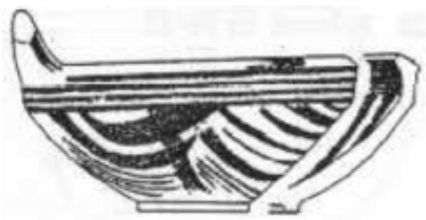
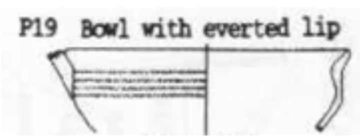
Type P11 (Convex bowl with marked lip)



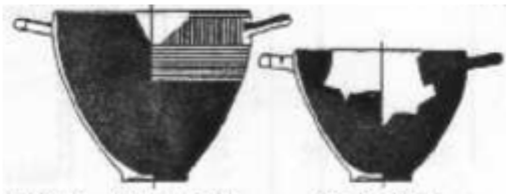
Type P12 (Conical bowl with marked lip)

Type P13 (Meander bowl)

Type P14 (Garland bowl)

	Type P15 (Bowl with horizontal incision)
	Type P16 (Horizontal bowl with horizontal handle)
	Type P17 (Grooved bowl with vertical handle)
	Type P18 (Small bowl with everted lip)
	Type P19 (Bowl with everted lip)
Kotyle 	Type P20 (Imitation of Protocorinthian kotyle)

Type P21 (Protocorinthian kotyle)



Type P22 (‘Thapsos’ cup)

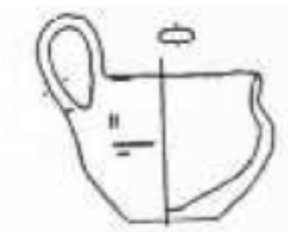
Skyphos

Type P23 (Low skyphos)

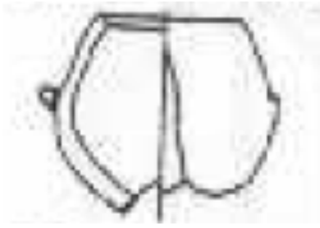
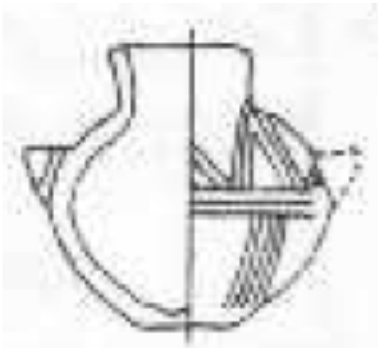
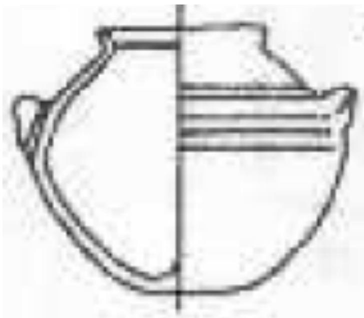
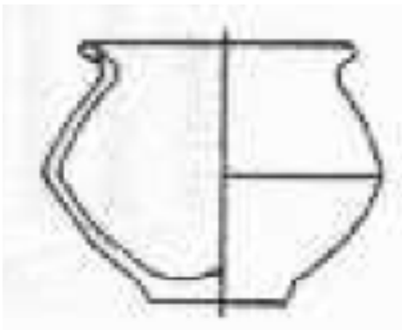
Type 24 (High skyphos)

Kyathos

Type P25 (Hand-made kyathos)

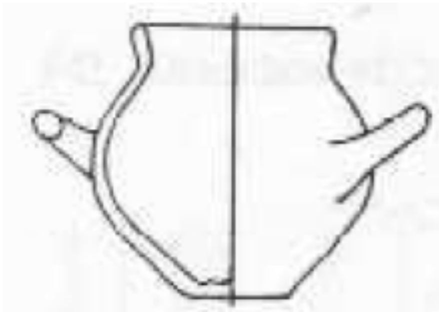


Type P26 (Wheel-made kyathos)

Pot	Type P27 (Pot with unmarked lip)
	
	Type P29 (Pot with marked lip)
	Type P30 (Wheel-made grooved pot)
	Type P31 (Wheel-made biconical pot)

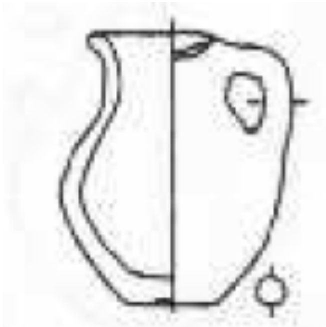
Geometric pyx

Type P32



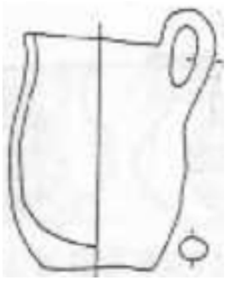
Jug

Type P33 (Small biconical jug)

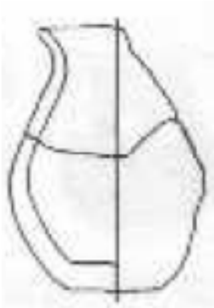


Type P34 (Small squat jug)

Type P35 (Jug with unmarked lip)

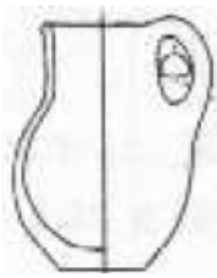


Type P36 (Jug with marked lip)

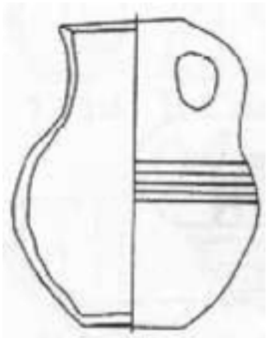
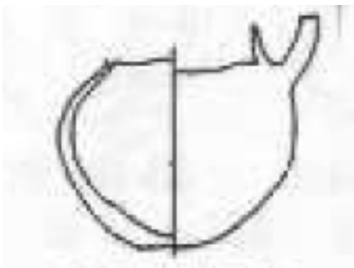


Type P37 (Jug with neck)

Type P38 (Jug with cilindrical neck)



Type P39 (Jug with tapering neck)

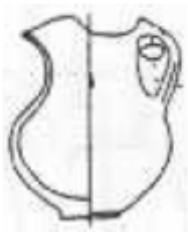
	Type P50 (Small grooved jug)
	Type P51 (Large grooved jug)
Oinochoe 	Type P40 (Oinochoe bottom unmarked)
	Type P41 (Oinochoe with wide base)

Type P42 (Oinochoe no distinct neck)

Type P43 (Globular oinochoe)

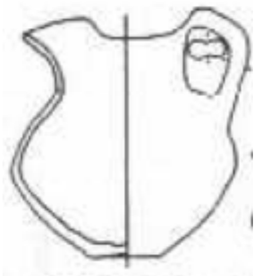
Type P44 (Biconical oinochoe)

Type P45 (Oinochoe with offset foot)



Type P46 (Squat oinochoe with offset foot)

Type P47 (Lip oinochoe)

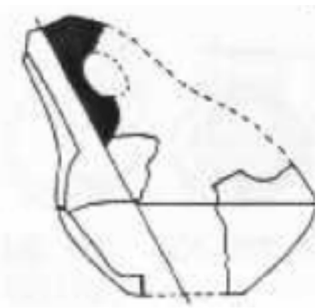


Type P48 (Shoulder oinochoe)

Askos

Type P52 (Hand-made askos)

Type P53 (Hand-made carinated askos)

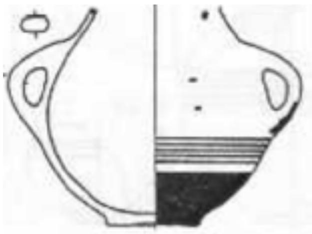


Type P54 (Small wheelmade askos without base-ring)

Type P55 (Larger wheel-made askos without base-ring)

Type P56 (Small wheel-made askos with base-ring)

Type P57 (Larger wheel-made askos with base-ring)

Amphora	Type P58 (Globular amphora)
	
	Type P59 (Biconical amphora)

Frasca's ceramic typology is characterised by several types (Table below) and he graphically represents the most representative wares, as shown in figures 5.13, 5.14 and 5.15, related to the three main chronological phases.

Table 5. 8 Frasca's Typology

Bowl	Type 33 (Hand-made tronco-conical bowl with vertical handle)
	Type 34 (Hand-made tronco-conical bowl with vertical handle)
	Type 35 (Hand-made carinated bowl with vertical handle)
	Type 36 (Wheel-made bowl with vertical handle, incised decoration and with base-ring)
	Type 37 (Wheel-made hemispheric bowl with one horizontal handle)
	Type 38 (Wheel-made tronco-conical bowl with one oblique handle and ring-base)
	Type 39 (Hand-made tronco-conical bowl with horizontal handle)
	Type 40 (Hand-made bowl with narrow base and two handles)
	Type 41 (Hand-made bowl with convex wall and two warts)
	Type 42 (Hand-made tronco-conical handle with two rectangular warts)
	Type 43 (Hand-made tronco-conical bowl with two rectangular warts)
	Type 44 ('Calotta' hand-made

	bowl with rectangular warts)
	Type 45 (‘Quadriansata’ hand-made bowl with a handle ‘a cordone’ and three rectangular warts)
	Type 46 (‘Quadriansata’ hand-made bowl with high tronco-conical foot)
	Type 47 (Wheel-made hemispherical bowl with handles ‘a cordone’)
	Type 48 (Wheel-made tronco-conical bowl with ‘orlo aggettante’ and incised motifs)
	Type 49 (Wheel-made bowl with three vertical handles)
	Type 50 (Wheel-made bowl without handles and tronco-conical foot)
	Type 51 (Hand-made bowl without handles)
	Type 52 (Little hand-made bowl without handles)
Kotyle	Type 103 (Protocorinthian kotyle)
‘Thapsos’ cup	Type 102
Cup	Type 100 (Cup with oblique handles)
	Type 101 (Cup with two horizontal handles)
	Type 104 (Cup decorated with sigma motif)
Kyathos	Type 80 (Hand-made and wheel-made kyathos)
	Type 81 (‘Boccale’ with handle)

Pot (Pyxis)	Type 63 (Hand-made Pyxis with handles)
	Type 64 (Hand-made Pyxis with ‘pervie’ handles)
	Type 65 (Hand-made/Wheel-made biconical pyxis)
	Type 66 (Hand-made and wheel-made rounded pyxis with ‘acuminate’ handles)
	Type 67 (Wheel-made rounded pyxis with ‘acuminate’ handles)
	Type 68 (Hand-made rounded pyxis with cylindrical handles)
	Type 69 (Hand-made conical pyxis with rectangular handles)
	Type 70 (Wheel-made pyxis with foot)
Oinochoe	Type 84 (Rounded handmade trefoil oinochoe)
	Type 85 (Wheel-made trefoil oinochoe with conical shape and base-ring)
	Type 86 (Wheel-made trefoil oinochoe with large base)
	Type 87 (Wheel-made trefoil oinochoe with rounded base and ribbon handle)
	Type 88 (Wheel-made oinochoe with hooked ribbon handle)
	Type 89 (Wheel-made globular oinochoe with narrow neck, bow-shaped handle and base-ring)
	Type 90 (Wheel-made globular oinochoe with wide offset neck,

	curved handle and base-ring)
	Type 91 (Wheel-made globular oinochoe)
	Type 92 (Wheel-made ovoidal oinochoe with curving handle and without foot)
	Type 93 (Ovoidal oinochoe with offset neck and curving handle)
	Type 94 (Ovoidal oinochoe with high handle)
	Type 54 (Rounded hand-made askos)
	Type 55 (Rounded hand-made askos with a ring-handle)
	Type 56 (Hand-made and wheel-made rounded askos with handle)
	Type 57 (Wheel-made hemispherical askos with handle ‘a ponticello’ and base-ring)
	Type 58 (Hand-made askos)
Amphora	Type 95 (Rounded hydria)
	Type 96 (Wheel-made rounded amphora with handle ‘a cordone obliquo’)
	Type 97 (Wheel-made large amphora)
	Type 98 (Wheel-made globular amphora with handles ‘a nastro’ and base-ring)
Olla	Type 59 (Hand-made olla with ‘estroflesso’ rim and two handles ‘a cordone’)
	Type 60 (‘Quadriansata’ olla with rectangular warts)

	Type 61 (Olla with sharpened warts)
	Type 62 (Bi-conical little olla without handles with a meander motif)

For the main purpose of this thesis, both typologies, though they differ, have been taken into account. Thus, this study used both typologies to look at those ceramics that Frasca and Steures identified as possible imports. Through the archaeometric analyses new important information have been added with regard to those ceramic samples identified as possible imports by both Frasca and Steures.

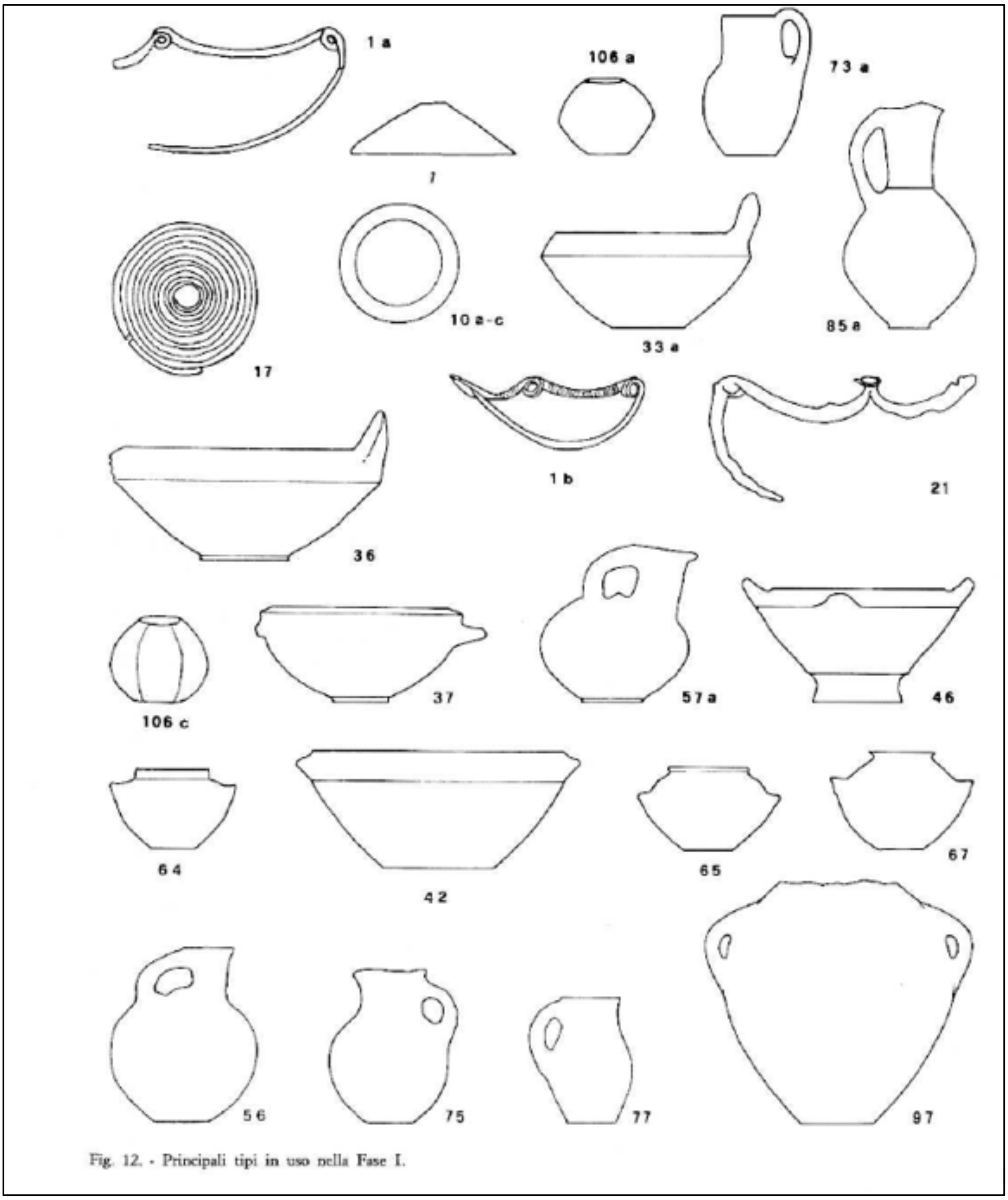


Figure 5.13 Most representative types of Phase I in Frasca's typology (Frasca 1981, 76, Figure 12).

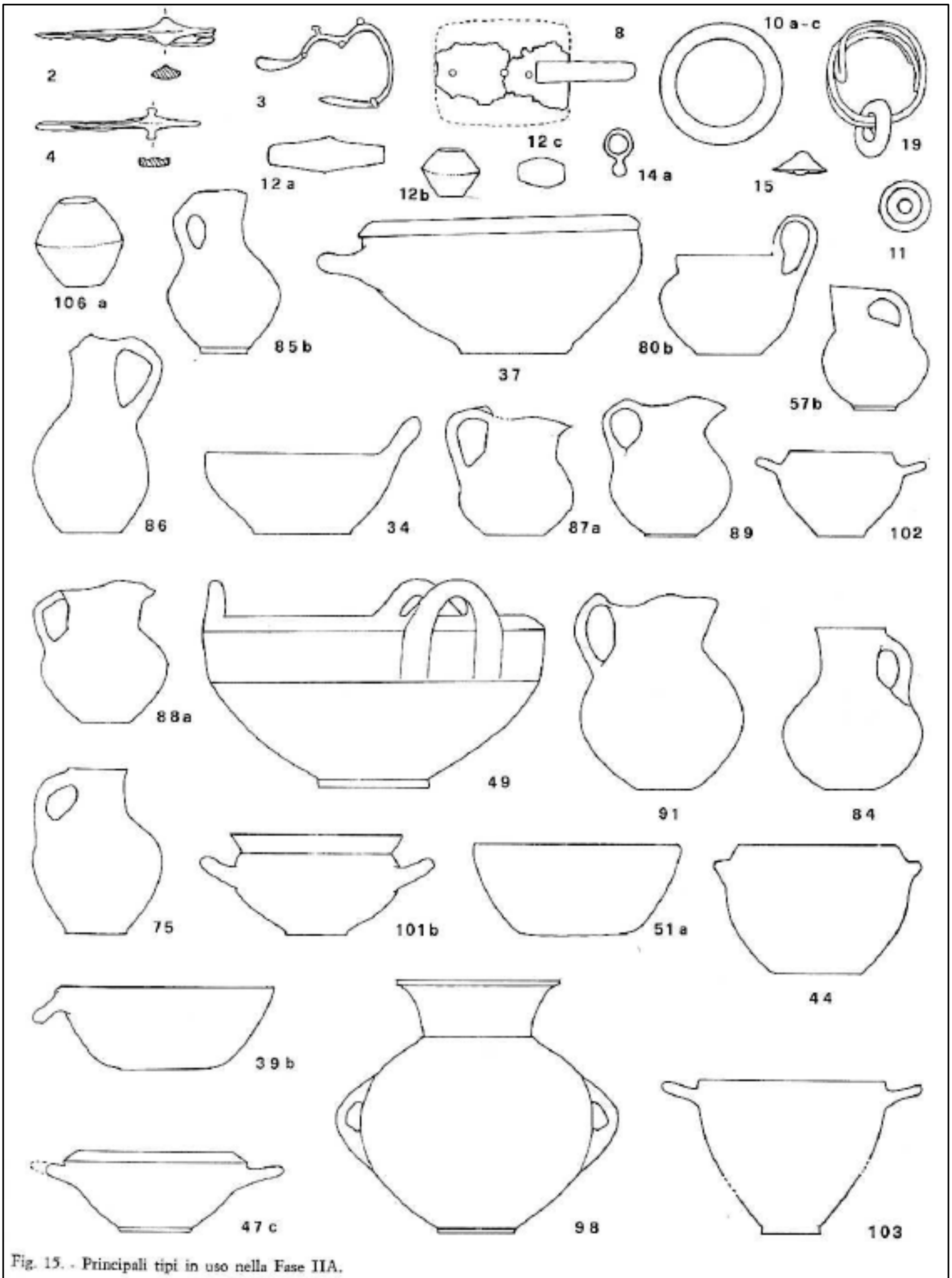


Fig. 15. - Principali tipi in uso nella Fase IIA.

Figure 5.14 Most representative types of Phase IIA in Frasca's typology (Frasca 1981, 85, Figure 16).

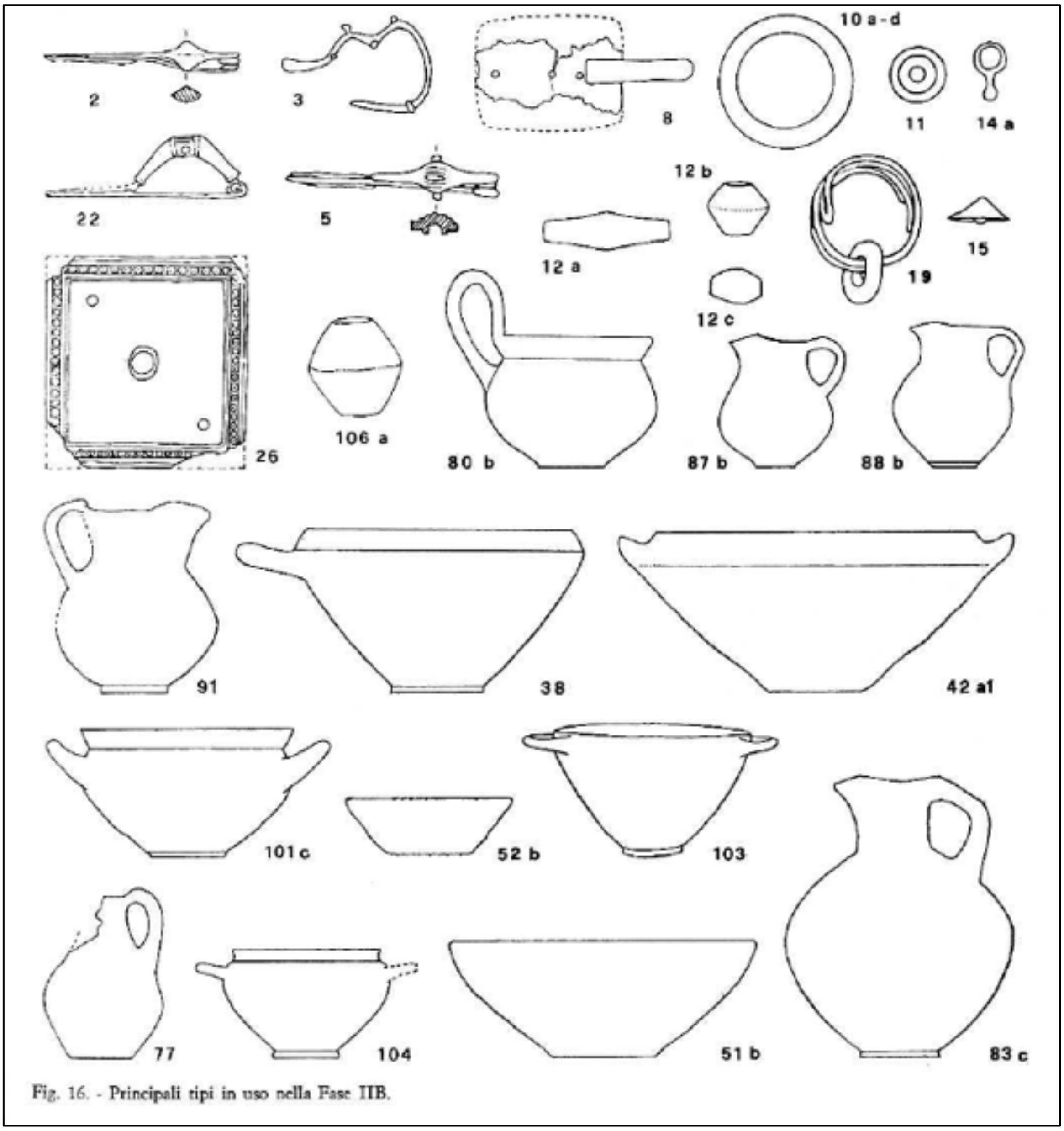


Figure 5.15 Most representative types of Phase IIB in Frasca's typology (Frasca 1981, 91, Figure 16).

5.2.1 CERAMIC MOTIFS

The ceramics recorded at Finocchito have a limited variety of motifs. Generally, the pottery was painted or incised. The initial phase or phase I (Frasca 850/800-735/730 BC; Steures 750-730 BC) was characterised by incisions such as triangles or meanders inserted into horizontal labels and in a few rare cases the decoration was impressed. When painted, the vessels were sometimes decorated internally, while the external surface was painted with broad bands in the plumed style (Frasca 1981). During the following phase or phase II (Frasca 735/730-665 BC; Steures 730-690 BC), influenced by ceramics in Protocorinthian-style, the incised decoration was relegated to the neck of a few oinochoai, and limited to incised horizontal lines. On the other hand, a larger percentage of decorations were painted with colours ranging from red to reddish brown (Frasca 1981).

5.3 GIUMMARITO

Besides Monte Finocchito pottery, the other ceramics analysed are from Giummarito. As described in chapter 3 (section 3.1.1), Giummarito is a necropolis close to Monte Finocchito that was used only until the end of the Bronze Age. Giummarito ceramics were included in this study to verify whether the indigenes of Finocchito, especially during the early phase (end of the ninth century) inherited cultural models in ceramic production from the indigenes of Giummarito.

Sanahuja and Vilar (1976) published a detailed study of the ceramics discovered in Giummarito's necropolis. In this study, both scholars described the ceramics from Giummarito as pertinent to one main type: hand-made pottery. All of the pots have a very squat shape and a pale clay (10YR 7/2 light grey), as well as a pinkish surface (7.5YR 7/3 pink), and are characterised by coarse and fine volcanic inclusions. A few vessels were also painted but because the surface is highly damaged, it is difficult to understand if they were covered with colour or if they were decorated with specific motifs. Compared to the pottery of the early phase of Monte Finocchito, Giummarito's wares are characterised by types peculiar to the Late Bronze Age (Sanahuja and Vilar 1976, 136). Chronologically, Giummarito's ceramics are dated to the end of the ninth century, but as the scholars argued, there are a few samples, (e.g. the pot Inv. number G16588 that with its globular/conical shape), which resemble types typical of Mycenaean production (Furumark 1941, 32-33). In particular, Giummarito's ceramics resemble types often associated with pottery recorded during the phase of Pantalica I phase (Table 3.5) and discovered in other coeval indigenous sites such as Thapsos, Finocchito (early phase), Noto Antica and Syracuse. During the Middle and Late Bronze Age, Mycenaean traders travelled towards Sicily expanding their commercial activity (Tomasello 2004; Malkin 2016, 289-290) and imports as well as local imitations of Greek types (Tanasi 2004, 338) are recorded in those Sicilian sites related to Pantalica I phase (La Rosa 2004). This may explain why Giummarito, coeval to the Pantalica I or North phase, is characterised by pottery with globular and conical shapes similar to the Mycenaean types. The same types were also recorded along the northerneastern coast, within the territory of Catania and in particular at Ossini, Monte Tabuto, and Valsavoia, Lentini, Paternò Modica and Coccolonzazzo di Mola (Sanahuja and Vilar 1976, 137).

CHAPTER 6

6. MONTE FINOCCHITO DATA COLLECTION AND ARCHAEOMETRIC METHODS

Archaeometric analyses have been applied in this study to identify different ceramic groups, possible clay sources, and to detect where exchanges of pottery and possible non-local ceramics were introduced to the indigenous site of Finocchito. The identification and the analysis of the ceramic samples analysed here were initially conducted at the Paolo Orsi Museum in Siracusa, where the ceramic material is stored. The Museum generously provided access to the archaeological material from Monte Finocchito, Giummarito and Heloros.

In order to answer one of the main aims of this study, to shed light on the techniques of local pottery making at Monte Finocchito, a group of ceramics recorded at Finocchito (Table 6.1) was selected from across the whole period between the late eighth to the early phase of the seventh century. The selected samples cover all vessels shapes recorded from Finocchito to ensure breath of analysis. All available samples hold at the Paolo Orsi museum were analysed[7]. Moreover, due to the proximity of Finocchito to the Bronze Age site Giummarito (Figure 3.2), in order to understand if Monte Finocchito inherited cultural models in ceramic production from this earlier site, a small group of six vessels from tomb XIII at Giummarito was analysed; this specific group of vessels was sufficiently well-preserved to be analysed. This study also focuses on the interaction between indigenous people from Monte Finocchito and Greeks occupying Heloros. Thus, Monte Finocchito's archaeological record shows how new vessel types resembling Greek pottery in shape and decoration, similar to those types that Militello recorded at Heloros (Figure 6.1), were incorporated within the sets of ceramics characterising the funeral rituals and burial assemblages. Due to the similarities, ceramics from Heloros were tested to investigate any possible correspondence with the indigenous pottery from Monte Finocchito. For this purpose, all available archaeological material at the Paolo Orsi

[7] Of the 306 pots from Monte Finocchito, in total 138 ceramic samples were analysed.

museum, thirty-two fragments, all from drinking cups dated to the late eighth century and to the seventh century, were analysed[8].

Prefixes describing the place of origin of the vessels were assigned to each sample: ‘F’ for ‘Finocchito’; ‘H’ for ‘Heloros’ and ‘G’ for ‘Giummarito’. The Heloros ceramics group includes all of the ceramic types recorded and in the table are generically named drinking cups. As shown in the following table, vessels are distinguished on the basis of their shape (Tables 6.1-6.3):

Table 6. 1 Monte Finocchito ceramic identification

FA	Askos
FB	Bowl
FC	Cup
FKO	Kotyle
FKY	Kyathos
FM	Miniaturistic oinochoe
FO	Oinochoe
FPL	Plate
FPrc	Protocorinthian-style cup
FP	Pyxis
FT	‘Thapsos’ cups (probably imitations)
FU	Unique/*Unicum* (can’t be related to any known shapes)

[8] There are no abvious “matches” (such as similar rims or broken edges) between the 32 fragments to suggest that two or more fragments may have derived from a single vessel. However, the possibility cannot be entirely excluded, but for the purpose of this thesis each fragment has been trated as deriving from a separate pot.

Table 6. 2 Giummarito ceramic identification

GB	Bowl
GJ	Jug
GU	Unique/*Unicum* (can't be related to any known shapes)

Table 6. 3 Heloros ceramic identification

H	Fragments of ceramics from Heloros (drinking cups)

In sections 6.1 and 6.2, Monte Finocchito and Heloros ceramics, on the basis of a visual examination with the naked eye, are subdived in to three main groups that correspond with possible distinctive fabrics. Monte Finocchito's fabrics correspond to Group A (coarse fabric), B (semi-fine fabric) and C, possible non-local ceramics (semi-fine fabric). Meanwhile, Heloros' ceramics are subdivided in semi-fine (Group A), fine (Group B) and fine very compact pottery (Group C) fabrics. The values reported for each group are approximate and based on visual analysis. These ceramic groups are also analysed with the Bruker III-SD (Chapter 7).

6.1 MONTE FINOCCHITO: FABRICS AND TECHNOLOGY

Through visual examination of the ceramic technology and the fabrics with the naked eye (Table 6.4), it is possible to identify three main groups from Monte Finocchito: coarse pottery (Group A), semi-fine pottery (Group B) and possible non-local ceramics (Group C) (Tables 6.4 and 6.5). These groupings have been made on the basis of fabric rather than stylistic or decorative features.

Group A is characterised by hand-made coarse pottery with medium and fine volcanic inclusions, mainly represented by hand-made bowls, small plates, jugs, kyathoi, pyxides and skyphoi (Table 6.5). With regard to the hand-made bowls, these types represent one of the most common ceramic vessel categories associated with the funeral repertoire of Finocchito, in the late eighth century the technique (hand-made) of this type never changed, even when it was associated with ceramics resembling Greek types. Included in this group are coarse pottery samples pertinent to the early phase dated to the end of the ninth and the beginning of the eighth century from Monte Finocchito and also from Giummarito. These ceramics are often characterised by a burnished surface (Belfiore et al. 2010; De Rosa et al. 2015).

Group B includes semi-fine vessels having fine volcanic inclusions and chamotte. This group includes trefoil oinochoai and pots belonging to a later phase (from the middle of the eighth to the early phase of the seventh century) and defined as types in the Protocorinthian-style. In consideration of Frasca's (1981) and Steures' (1988) studies, as outlined in section 5.1.2, I also included within this group those ceramic vessels that these scholars described as possible imports and local imitations of Greek ceramics (Frasca 1981, 15-17; Steures 1988, 74-85). Amongst the possible imported ceramics are, following Frasca and Steures suggestions, the Protocorinthian cups (FPrc1 and FPrc2) and 'Thapsos' cup type, while Protocorinthian-style oinochoai are classified as possible local ceramics imitating Greek types (Frasca 1978a; Steures 1988, 74-80) (Table 6.5).

Group C (Non-local ceramics) comprises those ceramics, both indigenous and Greek types that I identified as non-local due to the different type of clay (colour and texture). Non-local ceramics are those wares probably made in Sicily but not at the site of Monte Finocchito. In particular I distinguished two main different types. Type A includes three ceramic samples (FM2, FT2 and FU2) characterised by reddish clay. Those ceramics belonging to type A resemble Greek types. FM2 is a miniaturistic oinochoe, FT2 is a small 'Thapsos' cup, while sample FU2 is a hydria. FU2 is included within the group named 'unicum' (or unique) as it is the only hydria type recorded within the necropolis of Finocchito. Meanwhile type B is characterised by ceramics with a darkish surface and a larger amount of volcanic inclusions (FO13 and FO22).

Table 6. 4 Finocchito ceramic groups[9]

<table>
<tr><td>Group A

(Sample FB13)</td><td>Fine and medium volcanic inclusions (fine 10% and medium 15%) and quartz inclusions (5%). Pale body (10YR 7/3 very pale brown) with grey core while the inner surface is pinkish (7.5YR 8/6 reddish yellow).</td></tr>
<tr><td>Group B

(Sample FO2)</td><td>Semi-fine and porous with volcanic inclusions (from fine 10% to medium 5%) and chamotte enclosures (medium 5%). Pale surface (10YR 8/4 very pale brown) slip to pinkish (7.5YR 7/8 reddish yellow) and yellow (10YR 8/6 yellow).</td></tr>
<tr><td>Group C

(Sample FT2)</td><td>Type A: (Reddish surface) Fine and soft powdery fabric with micro calcareous inclusions (very fine 5% and fine 10%), chamotte (very fine 3%) and fine volcanic enclosures (3%). Pale body (10YR 7/4 very pale brown) slip to reddish surface (7.5yr 7/6 reddish yellow). The surface is painted with a red pattern;

Type B: (greyish surface) Fine hard fabric with micro quartz (very fine 5%), volcanic inclusions (very fine 10%) and calcareous enclosures (fine 5%). Yellowish body (2.5 Y 6/3 light yellowish brown).</td></tr>
</table>

[9] Percentages are estimations only based on visual analysis in order to provide a sense of relative proportions.

The Table below shows which samples are included in each group:

Table 6. 5 Ceramic samples within Finocchito groups

Group A (49 samples)	FA1; FA2; FA3; FB5; FB6; FB7; FB8; FB9; FB10; FB11; FB13; FB14; FB15; FB18; FB19; FB20; FB21; FB22; FB23; FB24; FB25; FB26; FB27; FB31; FB32; FB33; FB34; FB37; FB38; FB39; FB40; FB41; FB42; FB43; FB44; FC5; FC6; FKY1; FKY2; FKY3; FPx1; FPx2; FPx3; FO1; GB1; GJ1; GJ2; GJ3; GU1
Group B (61 samples)	FB1; FB2; FB3; FB4; FB12; FB16; FB17; FB28; FB29; FB30; FB35; FB36; FC1; FC2; FC3; FC4; FKO1; FKO2; FKO3; FKO4; FM1; FKY4; FKY5; FKY6; FO2; FO3; FO4; FO5; FO6; FO7; FO8; FO9; FO10; FO11; FO12; FO14; FO15; FO16; FO17; FO18; FO19; FO20; FO21; FO23; FO24; FO25; FO26; FO27; FO28; FO29; FO30; FO31; FO32; FO33; FPrc1; FPrc2; FPrc3; FPrc4; FT1; FT3; FU1
Group C (Non-locals) (6 samples)	FM2; FT2; FU2 FO13; FO22; FO34

6.2 HELOROS

As noted in chapter 3 (section 3.3.2), several excavations have been carried out at the Greek site of Heloros, including that directed by Paolo Orsi (Currò 1965), followed by Elio Militello (1965) and later on by Giuseppe Voza (1968-1969). During these explorations, around the southern side of the urban area below the first phase of the earliest Greek houses (Voza 1973a; Voza 1973b), local imitations of Greek ceramics in Protocorinthian-style with horizontal lines that Militello (1965) and Voza (1977, 135) associated with the Sicul IV phase (Table 3.2), were discovered. Meanwhile, belonging to the first phase of the earliest Greek houses, are imported Greek vessels in Protocorinthian-style and also local imitations of Protocorinthian ceramics, mainly cups, lekythoi and kylikai (Militello 1965, 301-302).

Militello dated the fragments recorded below the first phase of the earliest Greek houses to the very end of the eighth and the beginning of the seventh century BC. He also observed that because they were found below the early Greek houses, the ceramics in Protocorinthian-style were probably related to a previous phase when a group of indigenous people occupied Heloros in a dependent relationship with Syracuse, and in a phase that just preceded the establishment of the Greek settlement (Militello 1965, 301-302). Thus, as noted in section 3.3.2, the question related to Heloros' foundation is quite ambiguous, as it is not mentioned amongst the Greek colonies founded by Syracuse. However, because scholars and archaeologists believe that Heloros was the first Syracusan sub-colony, several theories, based on the discovery of such early ceramics, have been proposed. In this respect, Militello argued that because Heloros was from the beginning under the dominion of Syracuse, that relationship became more solid soon thereafter and therefore it was not mentioned as it was never considered as a new sub-colony (Militello 1965, 302). Militello also claimed that the ceramics were locally produced, by which he presumably means within the vicinity, possibly Syracuse, in particular those samples having a grainy reddish compact clay that he supposed came from Syracuse (Figure 6.1).

Later on, Voza, also dated this group of ceramics between the late eighth century to the early seventh century, and accordingly reviewed the first phase of the earliest Greek houses of Heloros as coeval with the habitations discovered in Ortygia (Syracuse) and Megara Hyblaea (Vallet, Villard and Auberson 1976; Voza 1977, 134-135; Pelagatti

1977, 119-123; Pelagatti 1982, 113-180; Martin and Vallet 1980, 325; Gras et al. 2004. In particular, the archaeological investigations at Megara Hyblea show that ‘Thapsos’ cup and wares with motifs in Protocorinthian-style, (characterised by fine horizontal lines, generally located on the top shoulder of the ceramic vessel, while larger bands covered the lower part of the body vessel), were similar to those recorded at Heloros and coeval with the early phase of the Heloros’ Greek houses (Gras et al. 2004, 151). Moreover, the scholars Pelagatti and Voza, after the discovery of similar ceramic types in other surrounding necropoleis (for example Marcellino’s necropolis: Voza 1977), established that local imitations and imports of Greek types were already circulating along the eastern coast of Sicily during the third quarter of the eighth century (Pelagatti 1976a, 113-180; Voza 1977, 134-135). Voza claimed that besides local imitations of Greek ceramics in Protocorinthian-style, there were also imported ceramics (Voza 1977, 135). The importance of this discovery is related to the fact that this pottery from Heloros, mainly local imitations of Protocorinthian ceramics, if dated to between the third quarter of the eighth century and the early phase of the seventh century (Voza 1977, 134-135; Pelagatti 1982, 113-180), is coeval with some of the ceramic types in Protocorinthian-style from Monte Finocchito (Frasca 1981).

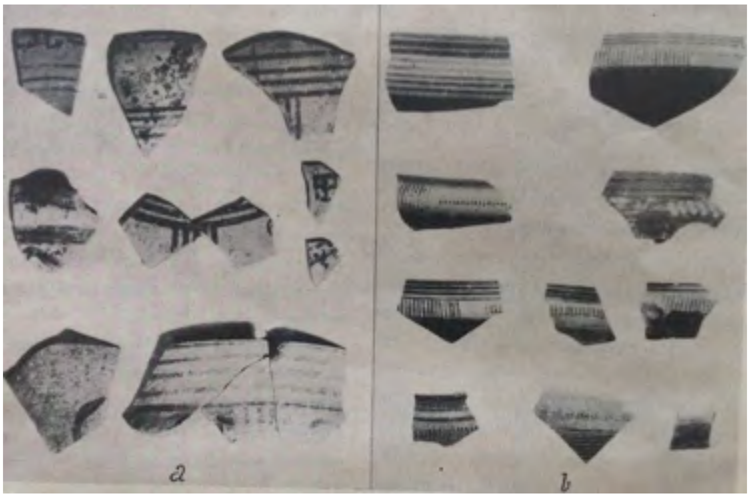


Figure 6. 1 Ceramics in Geometric style (a) and in Protocorinthian-style from Heloros (Militello 1975, 302).

Chronologically, Voza and Militello defined two main phases: the end of the eighth century for those fragments from the most ancient layers of Heloros, while all of the other samples were assigned to the seventh century. A detailed distinction between imports and imitations was not made and details regarding which ceramic fragments belonged to each phase were not provided. Following Militello's description, even if the recorded ceramics are too fragmented to identify their original shape or even to establish if they were imports or local imitations of Greek pottery, the Heloros ceramics can be clustered in four main group-types (Table 6.6):

Table 6. 6 Militello Heloros ceramic types

Type A: Cups (Protocorinthian-style)/Skyphoi and 'Thapsos' cups	Beige/Pinkish clay with a geometric decoration characterised by brownish horizontal line
Type B: Lekythoi in Protocorinthian-style	Pinkish clay with a decoration characterised by brownish horizontal and transversal lines
Type C: Kotylai in Protocorinthian-style	Decorated with reddish lines and chevrons; Painted decoration characterised by horizontal lines
Type D: Kylikes in Protocorinthian-style	Fine pottery painted with a reddish/brown polished paint. Usually the base and the lower body were totally painted, while the upper body was decorated with vertical lines and dots.

Looking at Militello's notes, it seems that Types A and B (fragments with a beige/pinkish clay and a decoration characterised by brownish horizontal lines) may group those ceramic fragments discovered below the early Greek houses (Figure 6.1 section a) (Militello 1965, 302, fig. 53a); meanwhile a second group (Types C and D) with ceramic fragments in Protocorinthian-style, local imitations and imports, characterised by a darker yellowish clay (Figure 6.1 section b) may belong to the first phase of the colony and derived from the archaeological layer of the first Greek houses (Militello 1965, 302, figure 53b; Voza 1970; Voza 1973a; 1973b). Unfortunately, the lack of archaeological records, the fragmented state of the ceramics and the generality of the publications cause difficulties in recognising which fragments were from the early phase and those pertinent to the earliest Greek houses.

The Heloros ceramic samples selected for this study were the only available ones at the Paolo Orsi Museum, and they come from the excavation conducted during the 1970s (Militello 1965). For these samples, as previously mentioned, I maintained the inventory number displayed at the museum, adding ‘H’ to distinguish this group from the ceramics from Monte Finocchito (F) and Giummarito (G). The Paolo Orsi museum inventory number, reported on the inner side of each fragment, is included in the description (see the Catalogue: eg. Inv. II Eloro 206).

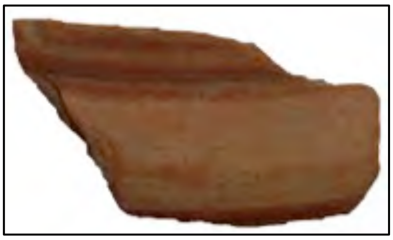
Taking into account Militello’s report and through a visual examination with the naked eye of the fragments, I have been able to identify three main groups:

Group A (semi-fine) corresponds to Militello’s Types A and B (Table 6.6). On the basis of the archaeological literature, in particular Militello’s description (1965, 302-304) and the visual analysis of the decorative motifs and the ceramic fabric, I presumed that Group A could coincide with those samples coming from the earliest archaeological layer and thus corresponding to the phase Militello described as preceding the colonisation. Therefore Group A should be datable to the very end of the eighth and the beginning of the seventh century BC. This group is mainly represented by fragments of hemispheric cups, probably local imitations of Greek types as Militello assumed (Militello 1965, 301-302), and is characterised by potsherds with a light beige/pinkish and grainy clay decorated with large reddish/brown bands. Usually the paint was discoloured, especially if compared with the other fragments. More important, this first group has strong similarities with those latest types recorded at Finocchito: the clay, and in a few cases the decoration, was very similar. In particular, this group has similarities with the Monte Finocchito’s cups in Protocorinthian-style (FPrc2; FC3; FPrc1; FPrc3; FPrc4; FC4; FC5), oinochoai (H9; H10; H11; H12; H13; H14; H15; H16; H17; H18; H19; H20; H21; H23; H24), kyathoi (FKY1; FKY2; FKY3; FKY4; FKY5; FKY6) and kotylai (FKO1; FKO2; FKO3; FKO4).

Group B (fine) corresponds to Militello’s Type C (Table 6.6). This group is mainly represented by ‘Thapsos’ cups, both imports and local imitations as Militello assumed (Militello 1965, 301-302), decorated with brown multiple lines on the upper part and often a panel between the handles with a sigma pattern, while the clay is grainy and yellowish. These types, well known in Megara Hyblaea and Syracuse, are dated to the beginning of the seventh century (ca. 740-715 BC) (Pelagatti 1976a, 113-180; Voza 1977, 134-135).

Group C (fine and compact pottery) mainly corresponds to Militello's Type D. It is characterised by a fine and compact pottery with a precise decoration: the inside is painted from a line left unpainted below the rim, while the exterior surface of the lower basin is totally painted and a panel between the handles carries a sigma pattern, while rays radiate from the foot of the vase (Lorimer 1912, 328).

Table 6. 7 Heloros ceramic groups

Heloros - Group A (8 samples) **End of the 8th century**  Sample H168A	H1; H168A; H168B; H168C; H173A; H173B; H183; H213.
Heloros – Group B (20 samples) **7th century**  Sample H20	H20; H21; H23; H30; H32; H33; H34; H41; H42; H43; H46; H51; H52; H53; H54; H55; H56; H62; H176; H201.
Heloros – Group C (5 samples) **7th century**  Sample H45	H45; H47; H48; H49; H50.

6.3 RESEARCH METHODS: ARCHAEOMETRICAL APPROACH

In this study, variation in material culture at the indigenous site of Monte Finocchito has been investigated via archaeometric analyses. From an archaeological point of view, this variation in material culture is often recorded because of the change in pottery shape and the introduction of new motifs and types (Taylor 1948; Binford 1965; Hodder and Orton 1976; Schiffer 1976; Roberts and Vander Linden 2011, 1-21). Often, ceramic technology reflects cultural connections, economic systems, dietary habits, costumes, daily life and sometimes rituals (Tite 1999; Maniatis 2009). The distribution across different sites of goods with a specific value, or of particular origins, represents, in an archaeological context, models to interpret possible social systems and changes in them over time (Sinopoli 1991). Usually change in material culture is visible due to the presence of foreign objects in local contexts (Gorogianni et al. 2016), but as Dietler notes, it embraces several layers of cultural aspects. The appropriation of an item, in relation to the new use and significance that it acquires when it changes context, is one of the most important aspects (Dietler 2007). Van Dommelen notes that change in material culture is not necessarily a cultural change:

> Appropriation should not be seen as a thing in itself but rather as a process embedded in an array of social practices. It may account for ways of understanding the meanings of actions and the role of objects as culturally contingent constructions, in addition to representing stressed values, symbolic communications and webs of social relations and power. It involves wider aspects such as continuity or transformation and poses the question whether other people's values were adopted or not (Van Dommelen and Knapp 2010).

The ceramics under study here, from the eighth and seventh century, reflect the introduction of new styles of ceramic vessels: some are probably non-local and some are copies made from local materials, varying widely in quality and skill (Table 6.5). At Finocchito we see the adoption, in the late eighth century, of some Greek ceramic types that were grouped (Table 6.4) within two main clusters, Group B, probably wares of local manufacture (copies of imports), and Group C, which I described as possible non-local ceramics. The indigenes adopted new vessel types associated with Greek ceramic types that were incorporated and diffused around this site, and in particular within the set of ceramics characterising the funeral rituals. It is possible that Greek ceramics were also employed in other contexts, religious or domestic, but as already noted, the archaeological records are limited to the excavated necropolis. The repertoire of Greek ceramics that indigenes of Monte Finocchito adopted in the mortuary sphere was confined to drinking cups: 'Thapsos' cup, kotylai, kyathoi, skyphoi, and oinochoai and cups in Protocorinthian-style. They are all probably local imitations influenced by Greek imports.

Even if we take it as an unequivocal fact that during the eighth century the indigenous ceramics of Monte Finocchito were influenced by Greek ceramic models, this development surely represents a period of transition and social/cultural encounters that may not necessarily represent a cultural change or a change of social identities (Van Dommelen and Knapp 2010). As part of this investigation into possible connections in pottery manufacture and to what degree Greek models influenced indigenous production at Monte Finocchito, archaeometric analyses were undertaken using portable X-ray fluorescence (pXRF), X-ray diffraction (XRD) and the petrographic analysis of thin-sections. This was done to obtain a wider view of the sources of variation in ceramics, to fill this gap in knowledge, and to gain detailed information regarding the chemical components of the vessels' fabrics and techniques used. These methodologies use different techniques, each of them suitable for a specific purpose and all necessary to obtain a more complete picture and to cross-reference the evidence.

Portable XRF is useful for detecting material variation of artefacts and for identifying coherent groups. It has been employed in the study to distinguish variations in Monte Finocchito ceramics which are not readily observed using traditional visual analysis; the trace elements thorium (Th), rubidium (Rb), strontium (Sr), yttrium (Y), zirconium (Zr) and niobium (Nb) were particularly useful in this regard, and have been used in other studies of ceramics (Tanasi et al. 2017, 227). In addition, pXRF is applicable for large-scale analyses of museum samples because the instrument is portable and it can analyse unbroken ceramic vessels. Thus, pXRF is able to detect which ceramics used the same clay and group them into different clusters, but it is not capable of identifying the raw materials that form the clay.

By contrast, X-ray diffraction (XRD) identifies the mineralogy of clays and inclusions. It can also recognise the sintering (or firing) process through the minerals that are present.

XRD is complemented by minero-petrographic analysis of thin-sections, which can confirm the identity of clays and inclusions, and provides additional information related to the technique ceramists used in manufacturing a vessel as well as the firing temperature (Reedy et al. 2014, 252-268).

The main difference between XRD and thin-section analysis is that while both aim to recognise the mineral content composition, the latter is crucial in terms of textural analysis (Amaral et al. 2006). Both methods are useful when investigating the origin of the clay and the technology employed to produce the ceramics. Furthermore, the employment of different methodologies allows a comparison between these techniques, and the range of data obtained provides a wider and fuller body of information.

In the following chapter I will discuss the pXRF methods and results, while in chapters 8 and 9 I will discuss the X-ray powder diffraction (XRD) and thin-section analyses.

CHAPTER 7

7. NON-DESTRUCTIVE pXRF SPECTROMETRY ANALYSIS

Portable XRF spectrometry is carried out using a hand-held instrument capable of non-destructive, high-resolution analysis to determine the bulk chemical composition of the analysed specimen. This technology uses the interaction of X-rays with a specific sample to determinate its elemental composition. A filter, designed for specific materials, may be used to increase the precision of the results.

Since pXRF usually penetrates only <1mm (Tykot et al. 2013, personal communication), the surface of the sample has to be flat, without slips, and clean because if the surface is irregular it is difficult to obtain reliable results, as the low-energy X-rays are sensitive to interference (Forster et al. 2011; Tykot 2016, 42-56). Generally, 1mm is a standard used for this type of surfaces. In particular, a flat surface allows multiple assays on each sample, and the surface of each sample has to be cleaned to avoid any possible contamination. In addition the pottery surface needs to be perfectly positioned on the instrument (Tykot 2016). Portable XRF, as I will explain in more detail in section 7.5, can be also used as a traditional XRF destructive analytical method (Tanasi et al. 2017).

The increasing deployment of portable XRF spectrometry (pXRF) in archaeology is a recent phenomenon and it is related to its portability and the fact that it is a non-destructive method. Initially, pXRF was applied for lithic analysis (Torrence 1986; Frahm 2014; Frahm et al. 2014), but recent studies have shown that it can also be successfully used on ceramic analyses (Barone et al. 2010; Barone et al. 2011; Forster et al. 2011; Frankel and Webb 2012; Tanasi 2013; Rodríguez et al. 2015). One of the main concerns about pXRF analysis is its lower level of precision in comparison with traditional non-portable XRF. Recent results show clearly that traditional XRF is often more accurate than pXRF, since the portable XRF seems to be sensitive to possible interferences on the potsherd surface such as porosity, irregularity or temper (Forster et al. 2011). However, one of the main benefits of using pXRF is its very portability, the fact that it allows the researcher to conduct non-destructive analysis in museums or on-site during fieldwork (Liritzis and Zacharias 2011; Shackley 2011; 2012; Tanasi et al. 2017). The other advantage is the fast processing of elemental data (Tanasi et al. 2017): the instrument is usually able to detect the chemical data in a few minutes. Nevertheless the lower sensitivity of the instrumentation means that the overall accuracy and precision of pXRF are not as great as for traditional laboratory XRF methods.

In this study, two portable XRF devices and two different techniques, non-destructive and destructive were used, to ensure that accurate and comparable data were collected. The hand-held Bruker III-SD was used during the analysis at the Paolo Orsi museum on intact ceramic pots, as only non-destructive analyses were possible at the museum. The analyses with the Bruker III-SD were supervised and managed by Prof. Robert Tykot (University of South Florida). Under his guidance flat as well as clean and unpainted pots were selected due to the fact the low energy X-rays are sensitive to interference. When trace element concentrations were found to be inconsistent or dfferent, due to possible paint or slip on one surface, the result was removed from calculation (Tykot personal communication). Three readings, on flat surfaces, were taken on each vessel having different fabrics as described in paragraphs 6.1 and 6.2. However only one value is given and it corresponds to the median value (Tykot personal communication). The Olympus Delta Premium handheld (DP6000 A) was used on a smaller group of ceramic fragments for destructive analyses carried out at the School of Molecular Science (La Trobe University), in collaboration with Prof. John Webb.

The Bruker III-SD used a voltage of 40kV/10μA and filter (12 μm Al, 1 μm Ti, 6 μm Cu) and was used to analyse Fe (iron), thorium (Th), rubidium (Rb), strontium (Sr), yttrium (Y), zirconium (Zr) and niobium (Nb), because previous studies have demonstrated that these elements can discriminate ceramic groups (Baxter 1994, 513-527; Tykot 2002; Speakman 2012; Tanasi et al. 2016; Tykot 2016; Wilke et al. 2016). In particular, Tykot selected all of those elements that can be useful and readable when analysing a ceramic sample. He selected Fe (iron) and Nb (niobium) as these are the only metal elements useful for analysing pottery. Y (yttrium) and Rb (rubidium) were selected because they are elements that the pXRF instrument can easily recognise, while Sr (strontium) and Zr (zirconium) were also included as they are silicates strongly associated with clay minerals. The raw data were calibrated by Robert Tykot using the 2008 MURR calibration software; peak intensities for the K peaks of Rb, Sr, Y, Zr and Nb, and the L peak of Th were calculated as ratios to the Compton peak of Rhodium and converted to parts per million (ppm). The calibrated values were averaged for all measurements on external and internal surfaces (Tanasi et al. 2017).

Table 7. 1 Instrument Bruker III-SD details

Instrument model	Bruker III-SD
Tube Voltage	40kV
	10mm^2 XFlash^8 SDD
Software version	Innov-X Delta Advanced PC Software

7.1. BRUKER III-SD

The archaeometric analysis at the Paolo Orsi museum using the Bruker III-SD instrument, excluded glazed or painted potsherds, since painting on a potsherd surface could alter the results. For this reason the majority of vessels selected for this project are unpainted, while in the rare instances when painted vessels were included, analyses were conducted on the surface areas free from paint. For a better result, each sample was cleaned before the analysis to eradicate any contamination from soil or dust, and analyses were taken on flat surfaces on both the inner and outer surfaces and if possible, the edge to obtain the general chemical composition (Tykot et al. 2013, 240). In total, each pot was shot three times.

All of the ceramic samples were larger than 5 x 7mm and thicker than 2mm (Shackley 2011; Tykot 2016, 44), since previous studies suggest that to obtain a good level of accuracy the sample size cannot be smaller than 10mm in dimension or thinner than 2mm (Shackley 2012). If one of the test locations selected proved to be not fully cleaned, or it was irregular, the instrument was able to use the data collected from the other surface. This method is used to avoid delays with the analyses. Each ceramic sample was positioned on the top of the Bruker III-SD (Figure 7.1) and analysed for 120 seconds, which is the usual preselected time frame that this instrument uses (Tykot 2016). The raw compositional data were opened in an Excel spreadsheet and calibrated using a set of reference standards for the Bruker III-SD (Tykot 2016, 44-47). As noted above (footnote 7), of the 306 pots from Monte Finocchito and recorded in Frasca's and Steures' catalogue, in total 138 ceramic samples were analysed with the Bruker III-SD.

Figure 7. 1 An indigenous kyathos (FKY1) from Monte Finocchito positioned on the top of the Bruker III-SD for analysis.

The analyses with the Bruker III-SD were conducted during two different study periods. In 2015 fifty bowls were analysed to test whether this type of archaeometric analysis was successful with this specific type of pottery. Since good results were achieved with this first experiment, in the following year (2016) a larger group was tested, including all the pottery types known from the grave assemblages of Monte Finocchito, Giummarito, and the Greek site of Heloros. With regard to Monte Finocchito, the types tested included hand-made and wheel-made medium and large bowls which represent the most common vessel in the funeral sphere. Other shapes include amphorae, jugs, askoi, pots, trefoil oinochoai and later types, influenced by Greek manufacture (Figures 7.2 and 7.3) (such as kyathoi, kotylai, 'Thapsos' cups and kylixes), and also indigenous large carinated bowls with two or three handles and incised decoration (Albanese Procelli 2009, 327-340; Frasca 2011, 83-276).

Figure 7. 2 Hand-made bowl FB17 (see catalogue).

Figure 7. 3 Hand-made kyathos FKY4 (see catalogue).

The aims of using pXRF in this research were twofold: to collect scientific data related to ceramic production at Monte Finocchito and to shed light for the first time on the techniques of local pottery making. Hence, the ceramics selected up until this point allow data to be gathered from across the whole period that runs from the late eighth to the seventh century. Moreover, due to the proximity of Finocchito to the Bronze Age indigenous site of Giummarito and the Greek settlement of Heloros, a group of ceramics from both sites was selected and analysed to detect any correspondence, as well as differences, in material culture technique and manufacture. In particular, Giummarito ceramics were analysed and compared with Finocchito wares to test if the indigenes of Finocchito (Iron Age) inherited cultural models in ceramic production from the indigenes of Giummarito, which was already populated at the end of the Bronze Age. Therefore, one of the main aims was also to understand if any relationship between Giummarito and Finocchito is detectable, especially because previous studies, as noted in chapter 3, claimed that the small site of Giummarito was probably a satellite site related to Finocchito (Albanese Procelli 2003, 48). Therefore, to test if any differences exist, in terms of ceramic technology, between the Late Bronze Age production of Giummarito and the early Iron Age ceramics of Monte Finocchito, and to ascertain if the source of the raw material was the same, a small group of six vessels from Giummarito was tested. Only a small group of samples was available for the analyses and therefore an entire set of ceramics related to the same grave was selected. The selection of these specific goods arises from the fact that, compared with the other ceramics from the same site, they were well preserved and the types selected, in particular bowl and jugs, were the same as those analysed here from Finocchito. This set derives from the same tomb (Tomb XIII) (Steures 1980, 164-165) and it is composed of three hand-made jugs (GJ1, GJ2, GJ3), one bowl with horizontal handles and vertical lip (GB1) and the ceramic vessel GU1 which can't be related to any known shapes (categorised as unique/*unicum* in the catalogue).

In addition, this study investigates, through the analysis of archaeological materials, how Greeks influenced the indigenous culture of Monte Finocchito. The increased occurrence of ceramics imitating Greek goods and possible Greek imported pottery within Finocchito have been considered main indicators of the interaction between these two groups.

Accordingly, ceramics from Heloros were tested to investigate any possible correspondence between the ceramics discovered at both sites. The samples available in the museum were restricted to a small quantity, and the samples selected include: ‘Thapsos’ cups dated ca. 750-690; closed vessels generically dated to the seventh century; kotylai dated to between the end of the eighth century and the seventh centuries; cups related to the seventh century and a ceramic fragment of an Argive krater dated to the beginning of that century (Voza 1968-1969, 360-362; Voza 1970, 297-301; Voza 1973a, 117-126; Voza 1973b, 134-135; Voza 1976, 382-383; Voza 1977, 134-135; Voza 1980, 545-553; Voza 1980-1981, 685-688; Voza 1989, 159-163; Voza and Lanza 1994, 462-463; Voza 1999, 113-120).

Table 7. 2 Heloros’ ceramics analysed through pXRF Bruker III-SD

‘Thapsos’ cup (ca. 750-690)	Closed vessels 7^{th} BC	Kotylai End of the 8^{th} to 550 BC.	Cups 7^{th} BC.	Argive Krater 7^{th} BC.
H1	H30	H168B	H201	H62
H20	H32	H183	H50	
H21	H33	H41	H51	
H23	H34	H42	H52	
H168A		H43	H53	
H168C		H45	H54	
H173A		H46	H55	
H173B		H47	H56	
H213		H48	H176	
		H49		

7.2. DATA RESULTS: MONTE FINOCCHITO

The data from the samples (Monte Finocchito, Giummarito and Heloros) tested with the Bruker III-SD, as well as those ceramic samples examined with the Olympus Delta Premium, were analysed using Microsoft 2013, as this program is useful for basic analyses to create bivariate plots (Tables 7.3-7.5). Considering that just a small number of elements were analysed for each ceramic samples and because the number of source areas investigated in this study was quite low, it was possible to methodically examine the relationships between individual elements across the total dataset using bivariate plots. This approach, which follows the principles of Exploratory Data Analysis (Tukey, 1977), identifies where the variation in the geochemical data lies. The primary reason why bivariate analysis was applied in this study is because it has some advantages over multivariate methods such as Principal Components Analysis (PCA), which may include non-diagnostic elements that obscure significant compositional patterns (Michelaki and Hancock, 2011). Thus, the bivariate analysis provided in this study selected, as already mentioned in paragraph 7, those elements that Tykot recognises as useful and readable when analysing a ceramic sample. More importantly, bivariate plots promote the comparison of new data with previous analyses, while multivariate analysis must be completely rerun when new data is incorporated. The elements are here expressed as ppm (parts per million).

The analyses combined all of the elements Fe (iron), Rb (rubidium), Sr (strontium) Y (yttrium), Zr (zirconium) and Nb (niobium). When the general outcome, combining all of the elements is the same only the scatterplot that cleary shows the variation between the pottery samples is included here. On the other hand, if graphs show different results each scatterplot with divergent outcome is shown. Despite the variation in the results for niobium (see Table 7.3), this element did not prove diagnostic when mapped into a scatterplot.

Table 7. 3 Trace elemental composition (ppm) for Monte Finocchito

Sample	Fe	Rb	Sr	Y	Zr	Nb
FA3	22383	81	857	16	150	22
FB1	21961	24	499	17	110	15
FB2	21272	67	2451	15	186	21
FB3	23258	56	1370	14	127	5
FB4	19616	60	1438	12	124	8
FB5	19890	70	230	22	146	18
FB6	19585	37	947	19	166	8
FB7	21815	56	1374	14	115	5
FB8	26195	23	1937	14	98	0
FB9	21728	39	982	16	83	5
FB10	22058	66	706	18	119	9
FB11	23496	66	1785	12	120	0
FB12	20602	35	1159	19	121	7
FB13	23405	57	1242	14	127	7
FB14	22164	56	1572	16	105	1
FB15	22965	61	1312	12	90	3
FB16	21905	42	800	17	94	9
FB17	22094	62	2069	12	123	5
FB18	24095	54	1630	12	101	
FB19	23370	71	1261	15	109	6
FB20	28036	48	1866	12	92	3
FB21	20033	80	572	17	122	12
FB22	24925	54	1473	13	133	7
FB23	22442	49	1014	14	103	6
FB24	23982	62	1381	11	115	14
FB25	25098	54	2343	8	110	
FB26	22841	29	1194	16	84	
FB27	23826	58	1892	9	97	1
FB28	20488	67	1094	15	120	6
FB29	18091	41	666	21	139	13
FB30	16879	42	729	21	148	14
FB31	16375	61	568	20	126	14
FB32	18995	56	2062	17	164	20
FB33	23084	82	1939	8	101	
FB34	20119	56	1475	16	152	6
FB35	18072	46	1725	13	151	7
FB36	21776	43	686	24	139	14
FB37	25247	72	1599	10	130	6
FB38	19612	51	1194	16	147	8

FB39	22212	56	2195	10	115	11
FC1	27840	62	734	23	197	18
FC2	32845	62	1468	20	180	15
FC3	32309	46	655	20	135	18
FC4	31540	41	1511	23	190	17
FC5	20079	56	1656	17	124	12
FK01	26909	39	342	25	123	12
FK02	28615	63	1838	20	147	9
FK03	15105	34	291	26	151	13
FK04	27522	77	223	24	120	12
FKY1	34141	55	1936	14	151	8
FKY2	29262	31	861	22	154	17
FKY3	28459	45	1749	15	94	1
FKY4	34086	54	1821	16	142	8
FKY5	34176	68	1966	12	114	5
FKY6	33013	46	1593	20	188	21
FM1	33597	36	1782	18	151	9
FM2	27675	63	390	30	334	19
FO1	25552	40	1186	17	93	0
FO2	28023	38	1263	21	169	13
FO3	28263	66	514	24	192	16
FO4	34497	81	540	22	159	17
FO5	31551	29	1077	20	130	11
FO6	32379	57	1454	20	155	14
FO7	29761	33	2592	16	134	0
FO8	24764	62	1695	19	201	18
FO9	25234	36	754	24	171	16
FO10	34170	33	2138	16	144	12
FO11	33885	88	1731	16	220	11
FO12	28179	35	1484	20	139	8
FO13	31302	50	3588	11	181	2
FO14	32626	76	2633	11	141	6
FO15	23692	16	1685	17	100	3
FO16	32436	35	2063	18	155	13
FO17	26083	26	1309	16	97	5
FO18	30004	39	1175	21	176	17
FO19	34119	65	1454	20	200	13
FO20	31887	45	2044	16	146	7
FO21	32350	29	740	22	157	16
FO22	13578	33	5178	4	89	
FO23	34134	40	762	22	152	17

FO24	32309	37	1137	19	146	15
FO25	19925	89	470	18	228	10
FO26	33313	52	1397	22	239	21
FO27	31716	47	1518	20	211	19
FO28	26755	48	1606	18	200	18
FO29	22431	41	1386	21	186	19
FO30	29925	46	1473	21	220	17
FPL1	22044	45	1181	16	105	4
FPrc1	32314	79	1319	16	190	17
FPrc2	34103	41	1130	19	146	11
FPrc3	33463	30	1306	20	141	12
FPrc4	30018	86	667	20	162	15
FPx1	21906	64	1502	16	133	7
FT1	34131	57	535	21	150	11
FT2	28993	76	352	24	247	21
FT3	30058	54	1402	14	120	6
FU1	16149	34	2242	18	161	29
FU2	28884	54	270	29	342	23

Table 7. 4 Trace elemental composition (ppm) Giummarito

Sample	**Fe**	**Rb**	**Sr**	**Y**	**Zr**	**Nb**
GB	29107	59	1694	14	123	5
GJ1	31984	72	1537	14	132	8
GJ2	32861	66	2582	12	137	1
GJ3	34404	89	1154	14	133	7
GU1	29846	62	1179	14	100	7

Table 7. 5 Trace elemental composition (ppm) Heloros

Sample	**Fe**	**Rb**	**Sr**	**Y**	**Zr**	**Nb**
H1	29744	100	1411	14	160	8
H20	33413	83	365	22	106	7
H21	33688	62	1571	15	111	4
H23	34400	90	423	19	93	5
H30	33524	45	632	20	100	4
H32	33856	101	425	20	121	9
H33	32553	116	645	19	111	7
H34	31497	125	529	19	101	9
H41	31699	147	682	18	102	7

H42	30284	132	665	19	101	7
H43	30444	146	741	19	100	7
H45	31184	131	539	21	103	8
H46	33168	124	579	18	103	7
H47	30387	116	563	19	101	7
H48	32676	126	429	21	107	6
H49	33711	129	666	18	102	7
H50	32873	124	582	16	103	5
H51	31358	110	240	23	129	8
H52	30032	102	430	22	113	10
H53	32456	71	553	20	109	9
H54	29871	123	544	19	106	7
H55	29967	81	702	23	113	9
H56	34493	125	687	16	99	4
H62	34161	80	642	21	224	16
H156	27583	67	765	24	198	18
H168A	34242	89	409	25	294	17
H168B	34456	90	392	23	289	16
H168C	34430	79	352	23	263	14
H173A	33473	83	364	24	264	17
H173B	33547	87	397	27	308	15
H183	31926	97	1288	17	149	9
H201	33502	86	364	23	263	16
H213	28921	44	1589	13	99	

The outcome suggests that Rb (rubidium), Fe (iron), Y (yttrium), Sr (strontium) and Zr (zirconium) are the most useful of the elements analysed and the combination of them is illustrated in the following scatterplots. The first scatterplot A (Sr and Rb) suggests that Monte Finocchito (blue dots) and Giummarito (green dots) samples are clustered within one main group, while Heloros (red dots) ceramics partially differ from the Monte Finocchito group (Figure 7.4). The analysis shows that amongst the Heloros ceramics, two ceramic vessels in Protocorinthian-style, H21 and H213, fall within the Monte Finocchito/Giummarito clustered group (Figure 7.4). The scatterplot below also shows that there is an overlap between Finocchito's and Heloros' samples. Those Finocchito samples overlapping Heloros samples belong to Monte Finocchito Groups A and five samples also from Finocchito Group B (FC1; FC3; FKO4; FO4 and FPrc4).

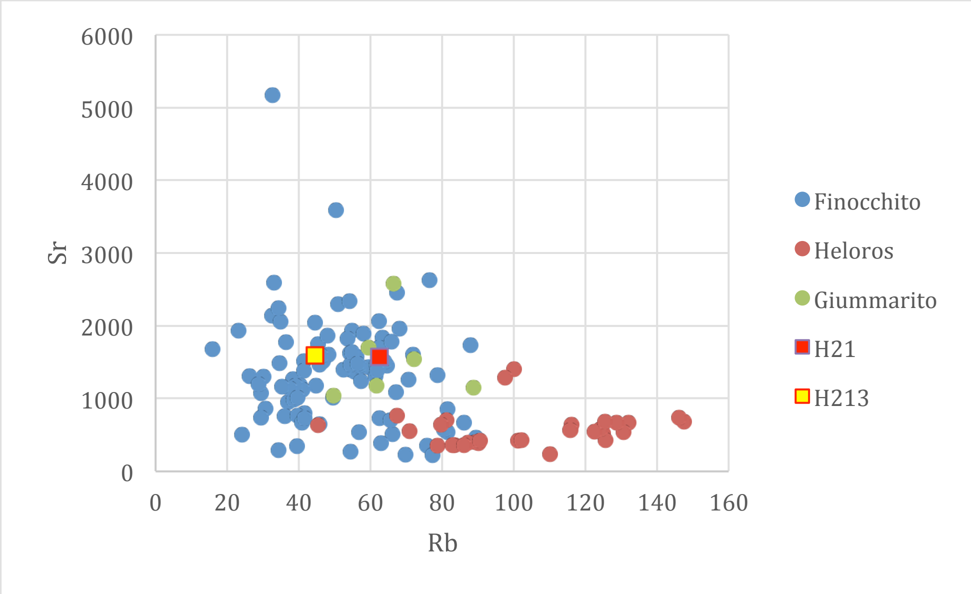


Figure 7. 4 Scatterplot A with the combination of strontium (Sr) and rubidium (Rb), here expressed as ppm, showing the ceramic samples analysed with Bruker III-SD.

To identify the non-local ceramics, the two main groups identified in figure 7.4 (Monte Finocchito/Giummarito and Heloros) were plotted separately. For the Finocchito/Giummarito group, scatterplots of Y/Fe (Figure 7.5) and Sr/Zr (Figure 7.6) show the ceramics from Monte Finocchito and Giummarito are clustered in one main group (blue dots). This suggests that the clay used for Finocchito potsherds was the same for the whole period, from the end of the ninth to the early phase of the seventh century. In both scatterplots non-local ceramics occur. In particular, the analysis detected the presence of a small group of possible non-local ceramics: oinochoe FO13, oinochoe FO22, kotyle FKO3 oinochoe FM2, 'Thapsos' cup FT2 and hydria FU2 (Figures 7.5 and 7.6), which resemble Greek types in shape. The term non-local, as explained in the glossary, refers to those ceramic samples not manufactured at Finocchito.

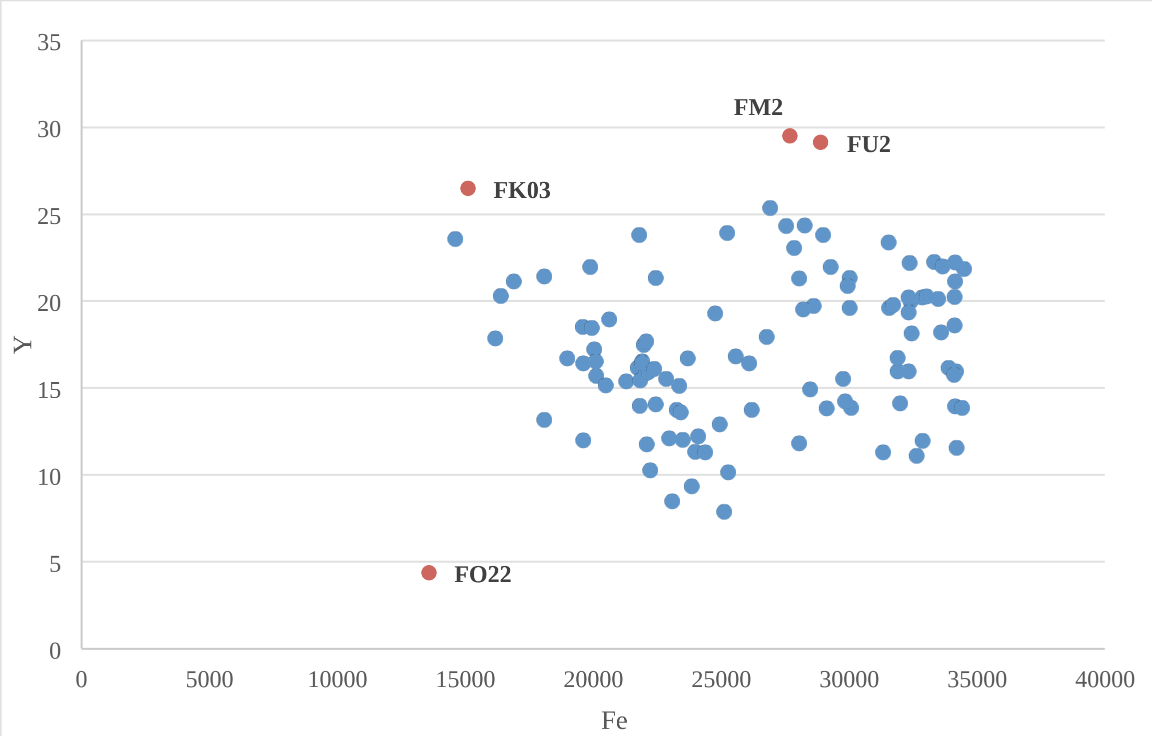


Figure 7. 5 Scatterplot B with the combination between iron (Fe) and yttrium (Y), here expressed as ppm, shows Finocchito and Giummarito ceramics (blue dots) clustered in one main group, while possible non-local ceramics (orange dots) were identified.

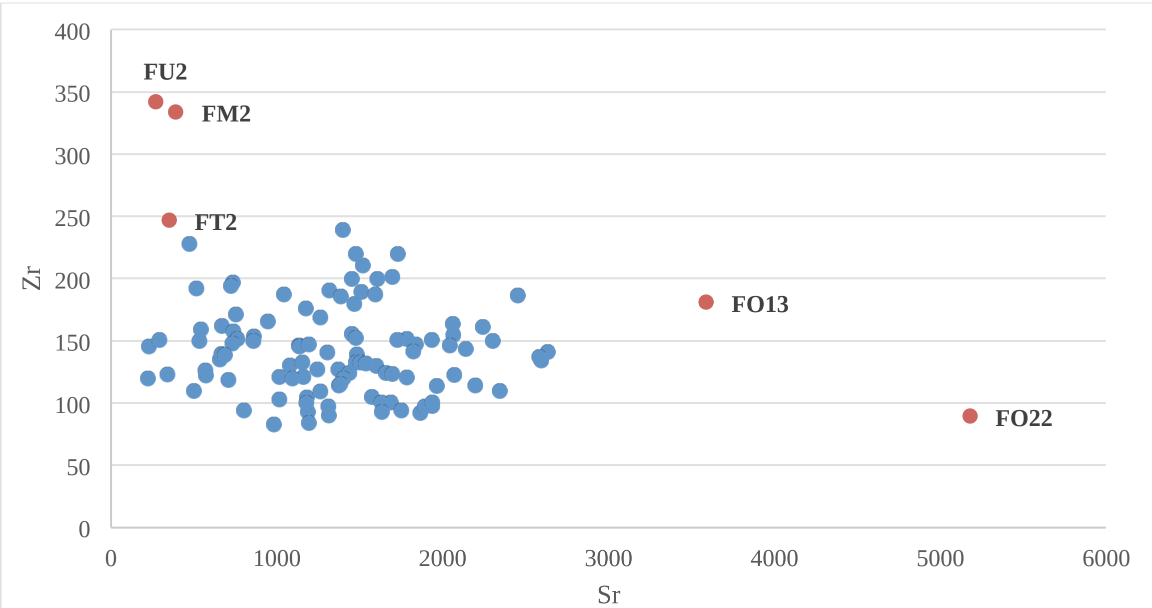


Figure 7. 6 Scatterplot C with the combination between strontium (Sr) and zirconium (Zr), here expressed as ppm, shows Finocchito and Giummarito ceramics (blue dots) where non-local ceramics (orange dots) were identified.

These ceramics had already been classified as possible non-local ceramics (Table 6.5), except for Kotyle FKO3, clustered in Finocchito Group B (Table 6.5), which has similarities with those Heloros' fragments grouped in Heloros Group A (section 6.2).

Figure 7. 7 Detail of the outlier FO13.

Figure 7. 8 'Thapsos' cup FT2.

Figure 7. 9 Miniaturist oinochoe FM2.

Figure 7. 10 Hydria FU2.

With regard to the two ceramics in Protocorinthian-style from Heloros, H21 (Figure 7.11) and H213 (Figure 7.12), which fall within Monte Finocchito clustered group (Figure 7.4), they were classified as belonging to Heloros Groups A and B (Table 6.7) and therefore dated between the third quarter of the eighth century and the early phase of the seventh century (Voza 1977, 134-135; Pelagatti 1982, 113-180).

Figure 7. 11 Ceramic sample H21 in Protocorinthian style from Heloros.

Figure 7. 12 Ceramic sample H213 (Protocorinthian-style cup) characterised by pinkish clay with brown and reddish horizontal and vertical lines.

Table 7. 6 Monte Finocchito's non-local ceramics

FO13
FM2
FT2
FU2
FO22
FKO3

With regard to Frasca's and Steures' theories, discussed in chapter 5, this final outcome suggests that the cups in Protocorinthian-style FPrc1 and FPrc2 are locally made and they are not imports as Frasca proposed (Frasca 1981, 15-17). However, in accord with Frasca, pXRF analysis suggests that Protocorinthian-style oinochoai from Finocchito are locally made. Meanwhile, in Steures' classification (1988, 74-80) the 'Thapsos' cups P22 were described as imports, but the pXRF results suggest that only the FM2 'Thapsos' cup type is a non-local ceramic. The Protocorinthian kotylai P21 type (Table 5.7) that Steures classified as imports are in fact locally made. This final outcome suggests that just a low number of potsherds can be probably identified as non-local ceramics, while the majority of the Finocchito/Giummarito ceramics are locally made (Raudino et al. 2017; Raudino 2018).

7.3 HELOROS

Ceramic samples from Heloros were analysed using the Bruker III-SD instrument. The main aim was to investigate any similarities between the ceramics from Finocchito and those vessels from Heloros that Voza in his archaeological report described as potsherds in Protocorinthian-style (Voza 1970, 297-301). The use of these specimens was determined by the fact that they were the only ceramic samples available for archaeometric analysis at the museum. However, this sample contains material comparable to that from Monte Finocchito in terms of shape, style and fabric, and so provides a useful selection for analysis and comparison. Based on the archaeometric results two possible data grouping can be distinguished (Table 7.7).

Table 7. 7 Two main groups of clustered ceramics from Heloros

Group A (red circle)	Group B (green circle)
H20	H1
H21	H32
H23	H33
H30	H34
H53	H41
H55	H42
H62	H43
H156	H45
H168A	H46
H168B	H47
H168C	H48
H173A	H49
H173B	H50
H201	H51
H213	H52
	H54
	H56
	H183

The Rb/Fe scatterplot (Figure 7.13) of the Heloros ceramics shows two possible main groups which can be partially correlated with the groups previously identified (Table 6.7): Group A (red circle) and Group B (green circle). The groupings are visible as different clusters as shown by the circles; no statistical tests were carried out.

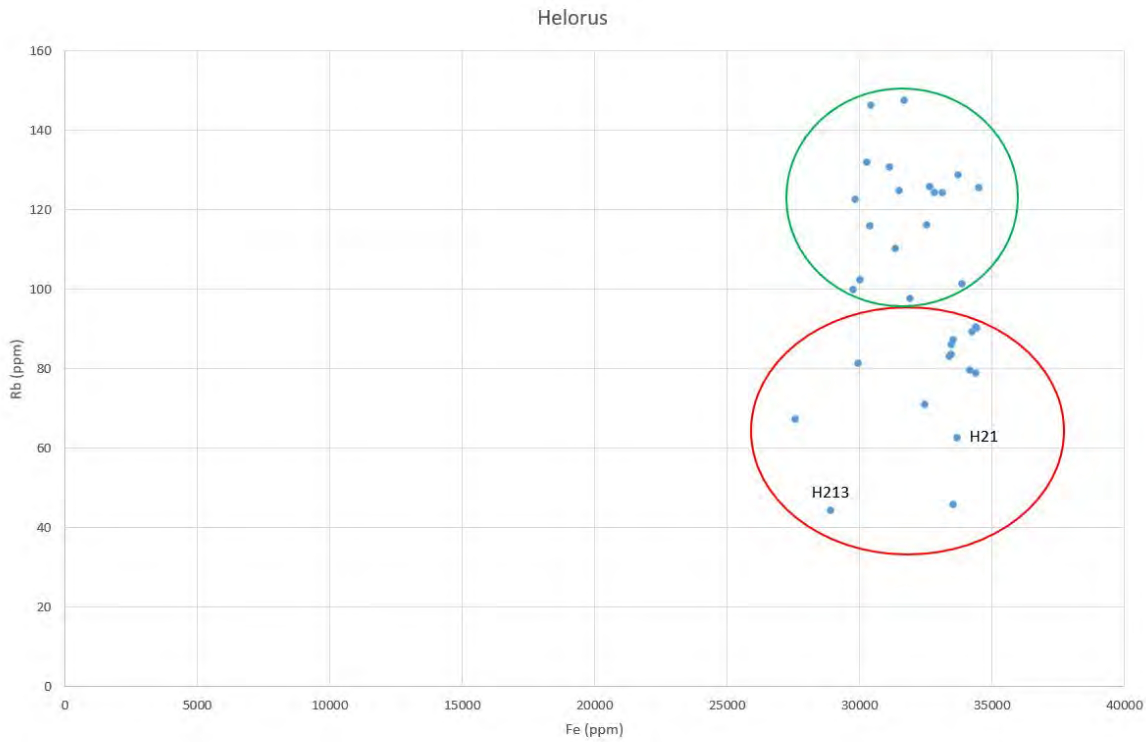


Figure 7. 13 Scatterplot D with the combination of iron (Fe) and rubidium (Rb), here expressed as ppm, shows Heloros ceramics clustered in two main groups. Group A (red circle) and Group B (green circle).

Group A (red circle) is mainly characterised by Protocorinthian-style cups with a fine and porous light-pinkish clay (7.5YR 7/8), decorated with brownish vertical and horizontal lines, where usually the first layer of colour looks lighter than the final layer of colour, which is typically brownish. These ceramic samples are decorated with painted light brownish lines, usually double brushed with the first painted layer lighter in colour. What is more significant is that Group A includes samples H21 and H213, which in scatterplot A showed a similar trace element signature to that of the potsherds of Monte Finocchito (Figure 7.4). As previously discussed, ceramic samples H21 and H213 probably correspond to the most ancient ceramics from Heloros discovered under the earliest Greek habitations (Militello 1965, 302). Moreover, these two fragments, in comparison to Monte Finocchito samples, in particular Protocorinthian-style cup FB35 (Figure 7.14) and cups in Protocorinthian-style FPrc1, FPrc2, FPrc3 (Figure 7.14), and FPrc4, show strong stylistic similarities. To this Group A belong those Heloros samples that in Table 6.7 I classified as semi-fine and fine ceramics.

As explained in chapter 6, Militello does not provide a list of those ceramic fragments from Heloros which were discovered below the earliest phase of the Greek houses; he only provides a general stylistic description. Therefore, I can only assume, on the basis of his description and the archaeometric results, which ceramics belong to the phase preceding Heloros and which ceramics instead belong to the early Greek houses. Having said that, the final outcome suggests that Heloros Group A, which also includes samples H21 and H213, may correspond to the early ceramic fragments from Heloros locally manufactured and coeval with the Protocorinthian-style ceramics from Finocchito (Figure 6.1; Militello 1965, 302, Figure a). These data may further confirm that a group of indigenous people or Greeks occupied Heloros in the late eighth century, and manufactured those ceramics clustered within Heloros Group A using a clay mixture similar to the clay indigenes used at Finocchito.

Figure 7. 14 Ceramic samples FB35 and FPrc3.

Group B, dated to the seventh century, is clustered in one group as clay source and paste differ from Group A. Ceramics from Heloros Group B (green circle) is a group of Protocorinthian-style ceramics, in particular kotylai and cups in Protocorinthian style with a yellowish compact clay decorated with fine horizontal lines along the rim, while the body, where visible, was completely covered by a brownish colour (Munsell soil colour chart 7.5 YR 7/4). Beside the typical decoration, characterised by fine horizontal lines along the vessel’s body, new motifs are also visible, such as floral patterns and dots (i.e. H48 and H49) (Figure 7.15). Within Group B are those Heloros samples (see Table 6.7) that I previously identified as fine (Group B) and fine-compact pottery (Group C).

Figure 7. 15 Ceramic fragment H48 decorated with rosettes and dots.

Heloros Groups B might correspond to those fragments that Militello generically described as possible imports, as well as local ceramics made by Greek craftsmen and dated to the seventh century (Figure 6.1; Militello 1965, 302, figure b). In sum, the archaeometric analysis suggests that the seventh century pottery from Heloros is quite different from the earliest group A (late eighth century), indicative of new and different producers and also production methods, during the seventh century.

7.4 PXRF OLYMPUS DELTA HANDHELD XRF ANALYZER

Besides the non-destructive pXRF analyses, destructive pXRF analysis of twenty-four potsherds from Monte Finocchito was undertaken using an Olympus DELTA Premium hand-held XRF (DP 6000A) (Table 7.8). The selection criteria of the ceramic samples, as well as for the non-destructive analyses, provided that at least one example of each type recorded at Finocchito was selected and analysed. In this specific case, three main groups were identified: coarse/hand-made pottery, fine ceramics and possible non-locals, whenever detectable. Within these three main groups, five ceramic types were selected: pyxis, bowl, askos, oinochoe and cup. The pyxis types (sample FPx2 and FPx3) and askoi (FA1 and FA2) are chronologically related to the earlier phase of Monte Finocchito, while the cups (FC5 and FC6) and oinochoai (FO12, FO15, FO31, FO32, FO33, F34) are dated to the end of the eighth century. Beside these types, hand-made and bowls finished on a slow wheel, produced and used throughout the eighth century, were also selected. Amongst these ceramic samples, eight were previously analysed, as earlier described, using the Bruker III-SD (Table 7.9). The selection of these twenty-four potsherds was limited by the museum's permission to proceed with destructive analyses (pXRF Olympus Delta Premium; XRD and thin-section), so this small group of ceramic fragments was all selected from already broken and very damaged pots (Figure 7.16).

The askoi (FA1 and FA2), pyxides FPx2 and FPx3 and cups FC5 and FC6 are part of Finocchito Group A (section 6.1), which is characterised by hand-made coarse pottery with medium and fine volcanic inclusions. Also included in this group are all of the hand-made bowls (FB6; FB7; FB19; FB20; FB21; FB38; FB40; FB41; FB42; FB43; FB44). The oinochoai are mainly grouped in B (section 6.1).

Figure 7. 16 Broken Bowl FB42.

Because the presence of material heterogeneity can be one of the main problems when analysing ceramics with portable XRF, as the crystal structure and grain size can affect the results, destructive analyses to homogenise the samples are recommended. As discussed in recent studies (Hunt and Speakman 2015), it is only through the use of pressed pellets that we can obtain fully quantitative analysis of archaeological material, as trace elements can be more easily detected. Therefore, the twenty-four ceramic samples from Monte Finocchito (Table 7.9), selected for destructive analyses were powdered into very fine grains, as recommended by Olympus (Olympus Delta Premium DP 6000A user manual 2015, 102), using a mortar, and then pressed into pellets (Figure 7.17). Subsequently, these pellets were positioned on the Olympus test stand and analysed once each using the soil mode for 270 seconds (Figure 7.18).

Table 7. 8 Olympus DELTA Premium hand-held XRF (DP 6000A)

Instrument model	Delta Premium (DP6000A)
Excitation source	4 Watt X-ray tube, Rhodium anode
Tube Voltage	40kV
	$30mm^2$ Silicon Drift Detector
Software version	2008 MURR calibraton software

Table 7. 9 The table shows those ceramic samples from Finocchito analysed with Olympus DELTA Premium (DP 6000A) and those samples that were also analysed with Bruker-III SD.

Types	Olympus-Delta Premium/XRD	Bruker-III SD
Bowl	SAMPLE	SAMPLE
	FB6	FB6
	FB7	
	FB19	FB19
	FB20	FB20
	FB21	FB21
	FB35	
	FB38	
	FB40	
	FB41	
	FB42	
	FB43	
	FB44	
Askos	FA1	
	FA2	
Oinochoe	FO12	FO12
	FO15	FO15
	FO31	
	FO32	
	FO33	
	FO34	
Cup	FC5	FC5
	FC6	
Pyxis	FPx2	
	FPx3	

Figure 7. 17 Powdered samples in pressed pellets.

Figure 7. 18 Olympus DELTA Premium (DP 6000A): Pellet positioned on the Olympus test-stand.

The analyses were calibrated by multiplying the measured value for each element by the calibration factor (Table 7.10). The calibration factors were obtained by analysing certified standards (Table 7.11) and using a linear regression model to plot the measured values against the certified values for each element. Two standards were used to verify machine performance: std 2710a and std 2711a. The analyses to create bivariate plots combined all of the elements and because the outcome from the analyses was the same the graph that shows in a more effective way the result was shown (Table 7.12). Olympus Delta Premium analyses differ from the examination undertaken with the Bruker III-SD. Destructive analyses were undertaken using the Olympus Delta Premium instrument and this allows the instrument to read a wider number of elements (see Table 7.12). Meanwhile, the elements used for a non-destructive analysis are lower in number to better detect the clay structure. Statistical analyses combined all of the elements in Table 7.12. Only those scatterplots which revealed variation between samples on the basis of particular elements are included here, other scatterplot did not reveal any useful information.

Table 7. 10 The Olympus DELTA Premium (DP 6000A) calibration factors:

K	Ca	Ti	V	Cr	Mn	Fe
1.0646	1.009	1.0956	1.8187	1.0953	1.104	0.9923

Ni	Cu	Zn	As	Rb	Sr
1.0232	0.8701	1.5393	1.1487	1.0179	0.9662

Y	Zr	Nb	Ta	Pb	Th
1.2636	0.8102	0.7701	0.3672	1.0868	1.0632

Table 7.11 The calibration factors were obtained by analysing certified standards

Manufacturer	**Standard**	**Rock Type**
USGS	SBC-1	Brush Creek Shale
USGS	SCO-1	Cody Shale
USGS	SGR-1	Green River Shale
USGS	SDC-1	Mica Schist
USGS	STM-1	Nepheline Syenite

USGS	DNC-1	Diabase (dolerite)
USGS	BIR-1	Icelandic Basalt
USGS	BHVO-2	Haiwaiian Basalt
NIST	NIST-278	Obsidian
NBS	NBS-688	Obsidian
NIST	NIST2780 180-650	Obsidian Rock

Table 7.12 Trace elemental composition for Monte Finocchito (Olympus DELTA)

	Al	Si	P	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	As	Rb	Sr	Y	Zr	Nb	Ta	Pb	Th
FA1	61487.02	113871.9	3525.11	7388.25	113550.3	4503.23	45.06	123.14	313.75	42360.17	47.66	42.01	117.06	5.43	67.9	534.82	24.36	156.64	17.75	27.49	28.44	13.71
FA2	58130.61	199792.7	4236.9	13066.89	65423.38	6533.76	83.78	99.96	886.05	56452.46	40.2		130.51	6.91	76.04	737.18	30.49	267.91	42.32	72.59	26.34	34.51
FB6	59900.19	125720.8	2804.44	4692.5	149912.3	4152.79	48.34	71.08	252.75	39920.64	40		85.61	8.17	36.97	847.93	22.84	148.58	21.42	36.23	22.45	20.96
FB7	47906.51	112021.5	2932.79	5245.56	145670.2	3612.615	55.805	101.34	296.18	32605.43	44.095	31.745	98.825	6.4	48.77	976.435	21.095	136.45	16.905	43.145	17.8	19.88
FB19	44901.73	112954.5	3052.81	5734.07	168933.2	3361.54	49.05	98.88	246.99	28896.29	35.85	22.6	82.99	6.72	52.8	883.14	18.12	119.1	13.23	40.94	14.12	17.35
FB20	44585.06	98025.85	2773.965	5187.485	183747	3331.27	61.62	71.56	279.725	30912.25	44.845	17.34	83.07	7.505	43.17	876.795	18.6	118.575	14.225	31.265	18.235	23.97
FB21	48584.81	121263.9	2596.96	6233.74	171330.4	3197.93	52.74	75.79	250.38	29116.22	43.83	10.33	92.1	7	52.53	1111.92	17.67	116.59	12.63	35.99	13.04	14.68
FB35	55836.15	136180.1	3363.38	5378.35	132834.3	4190.25	48.49	149.41	261.81	42853.9	59.39	11.82	111.77	7.28	44.83	976.53	26.47	147.84	18.81	41.72	20.36	22.79
FB38	56889.19	139568.7	2943.66	5795.35	152485.6	4244.11	53.14	101.53	338.19	38051.27	59.93	16.67	113.88	6.93	42.57	980.43	21.48	143.5	14.11	47.73	15.53	25.7
FB40	34836	81279.11	2975.7	3122.65	224425.9	2468.23	37.54	0	248.71	21652.77	40.78	16.35	84.88	3.67	29.12	929.06	18.98	94.94	11.87	36.37	9.99	23.97
FB41	50367.91	112279	3431.2	6898.09	172929.8	3836.85	58.55	85.28	285.38	34858.1	51.83	32.13	106.4	4.45	54.22	909.18	20.31	130.65	18.69	39.22	18.27	24.35
FB42	33429.89	87264.32	2237.18	3571.55	204676.7	2826.05	45	76.86	198.67	25387.84	44.05	0	59.9	4.86	30.69	1102.96	17.63	105.13	8.89	32.83	14.85	0
FB43	71299.95	135488.1	3867.57	4736.99	55472.49	5904.05	72.11	137.35	301.05	50439.42	51.76	21.21	109.93	12.15	36.02	423.02	32.15	240.84	28.28	36.78	27.35	0
FB44	40200.4	96451.71	2490.23	4211.08	163887	3653.29	47.57	97.77	465.84	33247.73	61.01	18.75	100.1	6.41	38.89	795.42	19.03	110.44	15.25	39.28	15.22	22.21
FC5	54015.61	126027.7	3173.35	4251.33	138515.6	4025.99	47.77	114.26	236.38	40461.99	50.92	0	104.13	9.28	27.71	861.84	26.44	139.89	17.3	50.12	19.04	27.46
FC6	69305.6	219294.2	6125.25	13274.13	256271	9264.64	118.09	209.96	622.08	86498.76	102.73	32.24	248.85	32.62	71.21	1256.19	32.87	115.64	25.56	84.4	36.51	66.79
FO12	57234.09	129356.8	6271.27	3007.69	120907.2	5068.35	0	117.61	295.79	49756.03	36.78	0	146.78	9.04	27.41	705.43	27.64	158.03	21.14	42.33	28.24	24.56
FO15	37843.66	111261.8	3319.02	239.57	198270.3	3152.84	0	0	359.45	26294.59	48.08	11.76	97.46	0	5	1080.84	25.9	107.29	17.27	42.57	7.57	23.39
FO31	66360.54	151655.7	5620.13	6077.4	84149.24	5363.84	65.31	93.69	404.49	47800.12	64.05	22	141.17	9.15	53.32	519.75	30.42	176.19	21.64	49.82	26.59	17.08
FO32	54017.17	120203.5	5044.39	1606.04	152673.7	3993.99	32.46	116.11	194.83	35970.64	53.07	22.42	85.55	11.66	20.63	575.02	21.65	132.34	18.38	24.76	14.54	0
FO33	63010.28	176314.9	3680.99	11423.55	36241.47	5517.88	79.23	121.3	350.8	48100.69	52.04	0	137.82	8.08	82.89	382.45	23.89	184.41	24.33	61.5	20	13.27
FO34	65713.47	158049.5	3156.88	8006.89	115008.2	4754.82	67.71	80.995	279.77	47139.41	67.35	0	159.12	10.48	68.86	770.4	23.42	144.94	21.58	55.69	22.97	24.39
FPx2	50574.96	131390.1	2876.21	5002.16	112195.7	4027.5	46.2	82.57	212.17	37416.49	49.58	0	114.63	8.53	48.7	1013.98	20.66	130.84	17	45.18	17.73	28.87
FPx3	37849.14	95273.28	2437.65	2877.2	186107.3	3066.85	49.43	112.91	213.24	25652.47	43.02	17	89.2	7.42	30.46	712.87	17.24	105.41	13.14	39.37	11.43	0

In reference to the Olympus DELTA and Bruker III-SD instruments, one of the main aims of using different instruments was to establish whether or not the data obtained from both analyses could match. This is in the context of the open debate amongst those scientists using portable XRF, who denounce the absence of definitive calibration data in pXRF analysis which mean the analyses are not comparable between different instrument and techniques (Hunt et al. 2014). Indeed, portable XRF, in different laboratories, has different calibration for different materials (e.g. ceramic, rocks and metals). It is necessary to calibrate an instrument and or/create a true empirical matrix-matched calibration (Hunt et al 2014, 505-512). To date a systematic approach does not exist, and this influences the accuracy of the results and the validity of the values obtained from the analyses (Frahm 2014, 106). For the same results to be obtained using different instruments, a correlation between datasets must be determined (Hunt et al. 2014), usually based on calibration with standards (Speakman and Shakley, 2013).

7.5 RESULTS

The values of the ceramic samples tested with the Olympus Delta Premium (DP 6000A) were analysed using Microsoft Excel 2013. As mentioned in the previous paragraph, the analyses to create bivariate plots combined all of the elements. However, only the scatterplot combining Zr/Ni revealed variations and for this reason it is the only scatterplot presented here. The Zr/Ni scatterplot (Figure 7.19), shows that the ceramic samples from Monte Finocchito are clustered within one main group and that no distinction amongst classes can be recorded, i.e. the clay used was the same for coarse/hand-made pottery (Finocchito Group A) and fine ceramics (Finocchito Group B). Besides that, the results (Figure 7.19) suggest that amongst the Finocchito's ceramics four pots (red dots in Figure 7.19), askos FA2, bowl FB43, cup FC6 and oinochoe FO33, are probably not locally produced. With the pXRF analysis it is not possible to verify if they are locally produced using a different type of clay or if they were imported. It will be through the XRD analysis, as described in the following chapter, that more details regarding the mineralogical composition of these ceramic vessels will emerge.

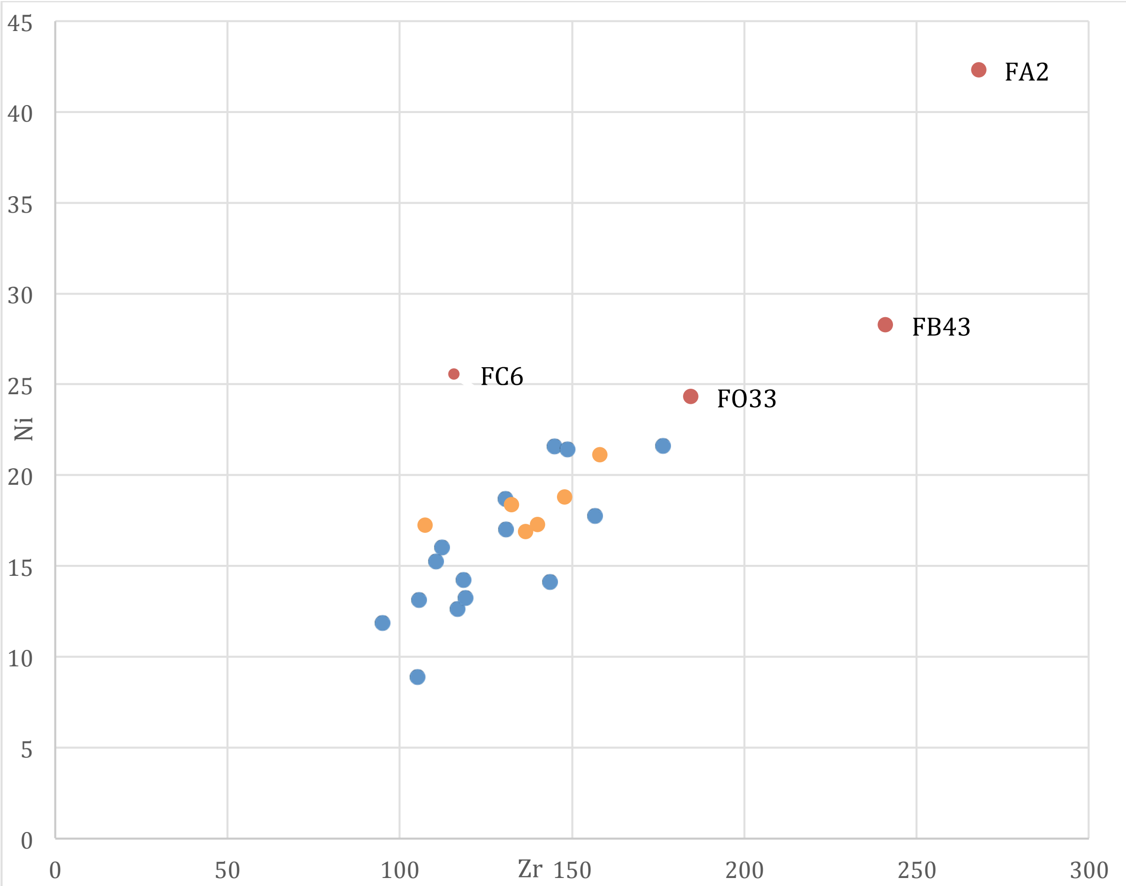


Figure 7. 19 The scatterplot with the combination of nickel (Ni) and zirconium (Zr) (ppm is the unit of measurement) shows coarse (Group A blue dots) and fine (Group B orange dots) ceramics from Monte Finocchito clustered in one group and that four ceramic samples (outside the red circle) differ from the main clustered group.

Askos FA2 (Tomb North 32, Inv. number 13136), if compared to the common types from Monte Finocchito, is atypical because of its darkish clay with small and medium volcanic grains. Usually, the most common clay of Finocchito's ceramics is beige/pinkish, with a sporadic presence of volcanic inclusions. Askos FA2 is defined by large incised horizontal lines, which is not a common decoration within Finocchito, along the main body of the potsherd and the shape is characterised by a pronounced rounded belly. A presumable volcanic origin is also detectable for oinochoe FO33, which is characterized by grey/darkish volcanic clay. In both potsherds, the section wall is thicker and less fragile than the other recorded ceramics. On the other hand, the wheel-made bowl FB43, with a marked flat lip, is a type common at Finocchito but this specific potsherd differs from the other samples because of its clay, which is definitively more compact and with a larger presence of very small and fine volcanic inclusions. FC6 was grouped within Finocchito Group B and classified as semi-fine pottery (Tables 6.4 and 6.5).

7.6 BRUKER III-SD AND OLYMPUS DELTA PREMIUM (DP 6000A): DATA COMPARISON

A comparison of the results obtained from the different instruments (Figure 7.20), shows that the Monte Finocchito ceramics, analysed using the Bruker III SD (blue dots in figure 7.20), partially overlap with those ceramics from Monte Finocchito analysed with the Olympus Delta (see red dots in figure 7.20), due to the different calibrations. The analyses to create bivariate plots combined all of the elements and the graph that in a more effective way shows the final outcome is shown (figure 7.20). The graph below shows that, despite some overlap, the red and blue dots form two distinct relatively compact clusters. Even if these results cannot be closely compared as the calibration used for the instruments was different, the general results of each analysis are valid. All of the elements were combined through the bivariate analyses and the graph below that combines Nb and Y, is the scatterplot that more effectively shows the result.

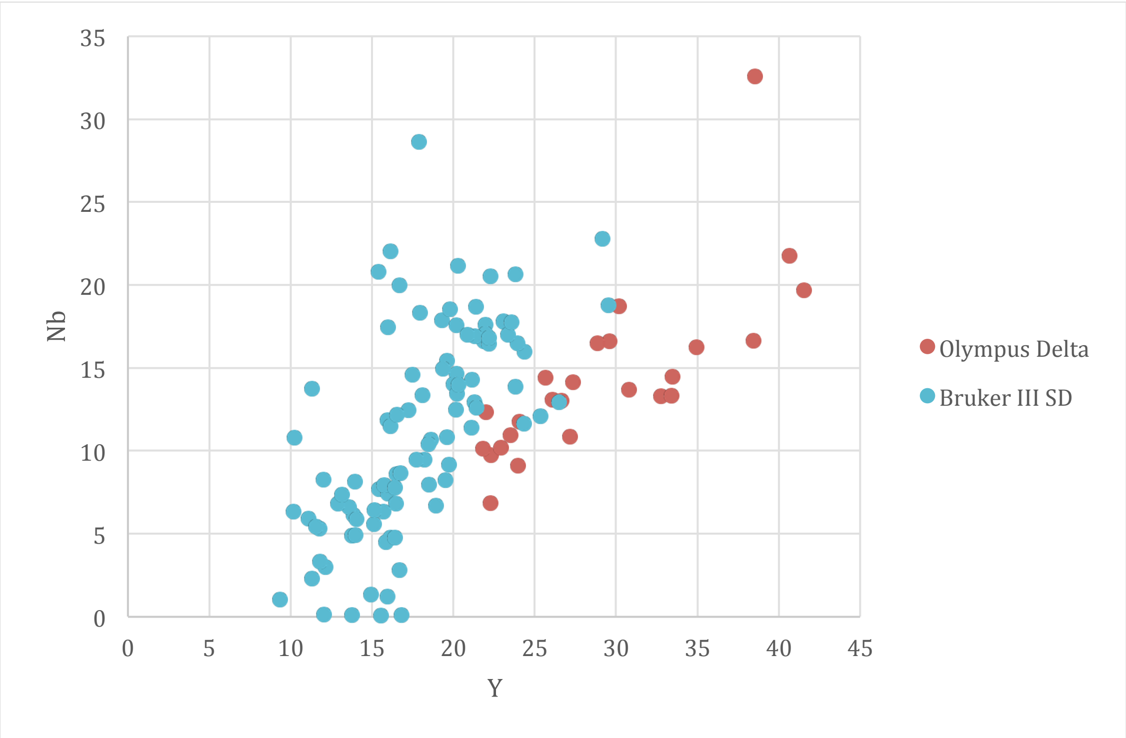


Figure 7. 20 Scatterplot E shows that the ceramics analysed with the Olympus Delta (red dots) partially overlap with the ceramics analysed with the Bruker III SD. The graph also shows that the overall picture is the same for both instruments (Monte Finocchito ceramics are clustered in one main group).

In the following chapters 8 and 9, I will analyse the X-ray powder diffraction (XRD) and thin-section methods as well as the results they produced-

CHAPTER 8

8. X-RAY POWDER DIFFRACTION (XRD) ANALYSIS

X-ray powder diffraction (XRD) is a fundamental tool in those studies that intend to determine the mineralogical composition of archaeological ceramics (Jenkins and Snyder 2012; Heimann 2017, 327-341; Pevenage and Vandenabeele 2017, 536). As previously explained in section 6.3, the main difference between XRF and XRD analysis is that the XRF or portable XRF instrument produces information regarding the chemical composition of a ceramic sample, while XRD determines the mineralogy; including identification of different types of clays.

In the X-ray diffraction technique a beam of X-rays interacts with a crystal's atoms producing a diffraction pattern (Heimann 2017, 330). When the atoms in a mineral are arranged in a periodic array, as in a crystal, then the direction and intensity of the scattered X-rays produces a diffraction pattern that is characteristic of that particular mineral. Therefore the identification of a crystalline phase can be made from the diffraction peaks (Nakai and Abe 2011). Ceramics contain either crystalline compounds or phases, in which the constituting atoms are arranged in a geometrically well-ordered three-dimensional periodic array, or amorphous (glassy) solids with lost symmetry and periodicity (Heimann 2017, 327). Only the crystalline phases can be identified using XRD.

8.1 MATERIALS AND METHOD

The same group of ceramic samples from Monte Finocchito, analysed with the Olympus DELTA (Table 7.9), were also analysed with the X-ray powder diffraction pattern (XRD). No other ceramic samples were available for destructive examination. Analyses were undertaken (Table 8.1) using a Siemens D5000 powder X-ray diffractometer (Figure 8.1). The portable XRF results identified the presence of four outliers; XRD analysis isolated the mineralogical difference(s) between the outliers and the clustered group of ceramics. X-ray diffraction is here used in conjunction with petrography analysis (thin-section) (see chapter 9). In particular, the study focused on identifying potential different clay sources and varieties in ceramic paste composition, which can aid in the identification of samples with a common manufacturing origin, or those which were manufactured by different ceramists.

Table 8. 1 List of ceramic samples analysed by Siemens D5000 powder X-ray diffractometer.

Types	Siemens D5000 powder X-ray diffractometer
Bowl	SAMPLE (Catalogue Inv.)
	FB6
	FB7
	FB19
	FB20
	FB21
	FB35
	FB38
	FB40
	FB41
	FB42
	FB43
	FB44
Askos	FA1
	FA2
Oinochoe	FO12
	FO15
	FO31
	FO32
	FO33
	FO34
Cup	FC5
	FC6
Pyxis	FPx2
	FPx3

Figure 8. 1 Siemens D5000 powder X-ray diffractometer.

8.2 SAMPLE PREPARATION AND EQUIPMENT

The procedure entailed that inner and external surfaces of the ceramic samples were brushed and washed in distilled water and then dried. After that, these samples were crushed into an agate mortar and pestle. The uniformity of the powder ensures that all possible crystallite orientations are present in each sample (Zhu et al. 2004). The Siemens D5000 powder X-ray diffractometer has a sample holder that is a 2mm thick plate with a 20mm square hole in the centre. The powdered samples were spread on the plate and smoothed flat. The software package used to acquire the elemental data was 'Diffract Plus', which presents the data as a diffractogram.

8.3 RESULTS

The results derived from the X-ray diffraction analysis suggest the presence of four main petrographic fabrics. Fabric 1, which contains the largest group of ceramics, is characterised by more abundant calcite (cal) than quartz (qtz) and clay (Figure 8.2); some samples contain minor plagioclase (probably within volcanic fragments). The clay has a consistent broad peak at 6-8° and a sharper peak at 19.8°; it is probably a mixture of illite and dioctahedral smectite (Ulrike Troitzsch, pers. comm.).

Fabric 1

cal>qtz, clay

no plag

Type	Sample
Askos	FA1
Bowl	FB6
Bowl	FB7
Bowl	FB19
Bowl	FB20
Bowl	FB21
Bowl	FB38
Bowl	FB40
Bowl	FB41
Bowl	FB42
Bowl	FB44
Cup	FC6
Oinochoe	FO32
Pyxis	FPx2
Pyxis	FPx3

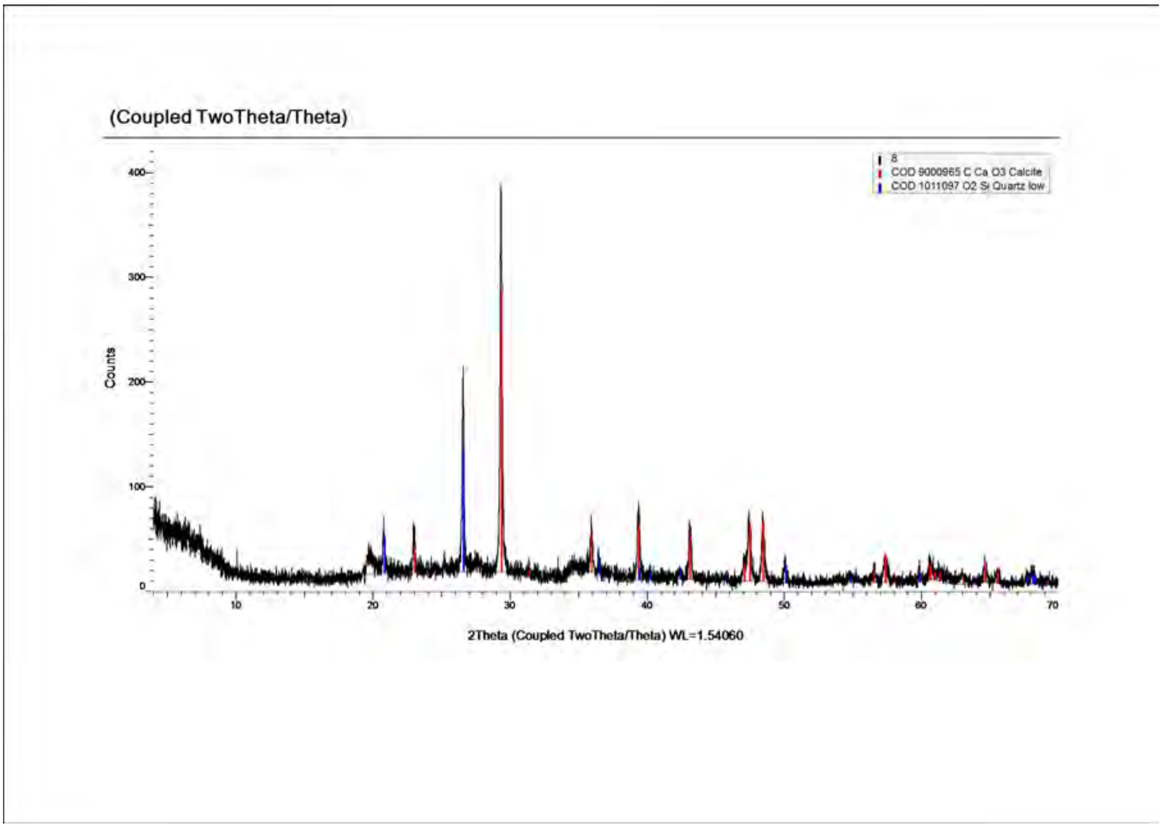


Figure 8. 2 X-ray diffraction chart of sample FPx2 Fabric 1. The graph shows a larger amount of calcite (red peak) than quartz (blue peaks) and clay (peak at 19.8°).

Fabric 2a differs from Fabric1, because quartz (qtz) is more abundant than calcite (cal); the same clay is present (peak at 19.8°) (Figure 8.3)[10].

Fabric 2a

qtz>>cal, clay, plagioclase

Type	Sample
Oinochoe	FO12 FO31

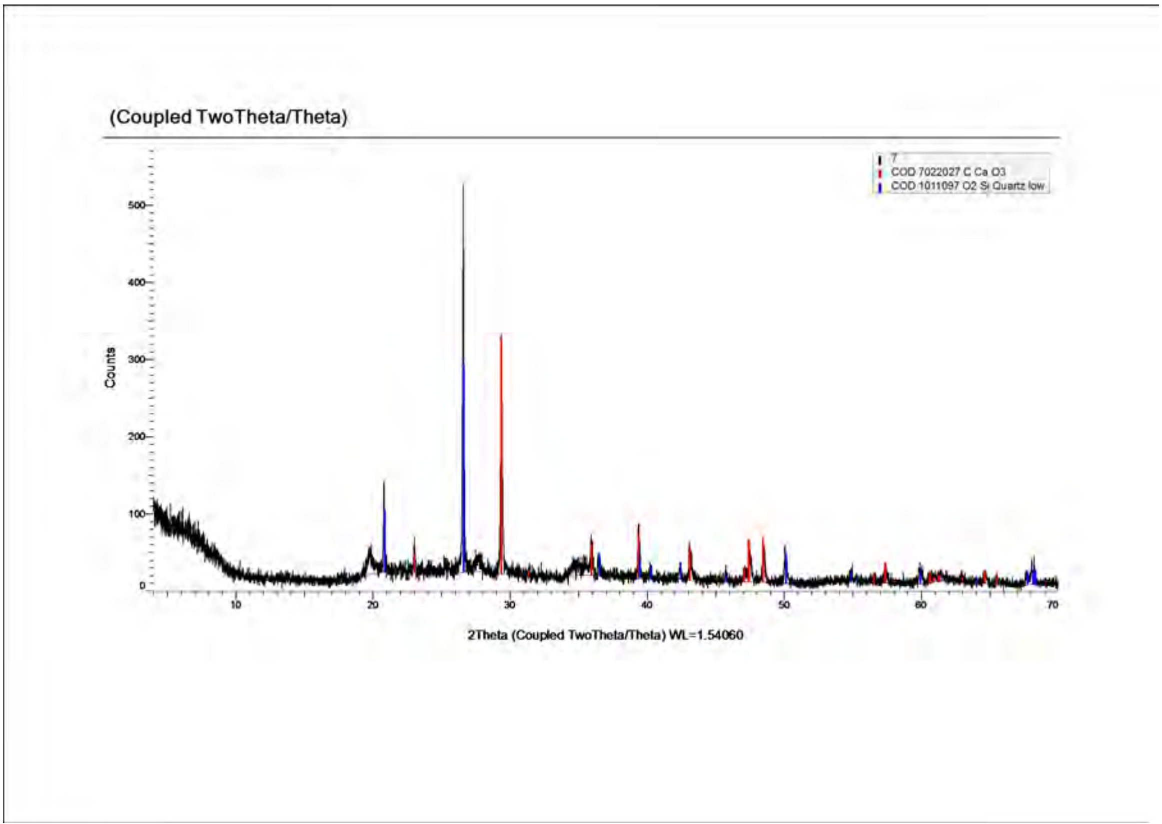


Figure 8. 3 X-ray diffraction chart of sample F31 Fabric 2a. The graph shows a larger amount of quartz (blue peaks), than calcite (red peaks). Clay is also present (peak at 19.8°).

---

10 As Ted Robinson has suggested, it might be that an optional tempera was applied but further analyses, for example thin-section analyses, are necessary to clarify that. Unfortunately I was unable to analyse ceramics from Fabric 2a with the thin-section.

Fabric 2b differs from fabric 2a in that there is quartz, relatively little, calcite and no plagioclase; only sample FO34 belongs to it (Figure 8.4);

Fabric 2b

qtz>cal

Type	Sample
Oinochoe	FO34

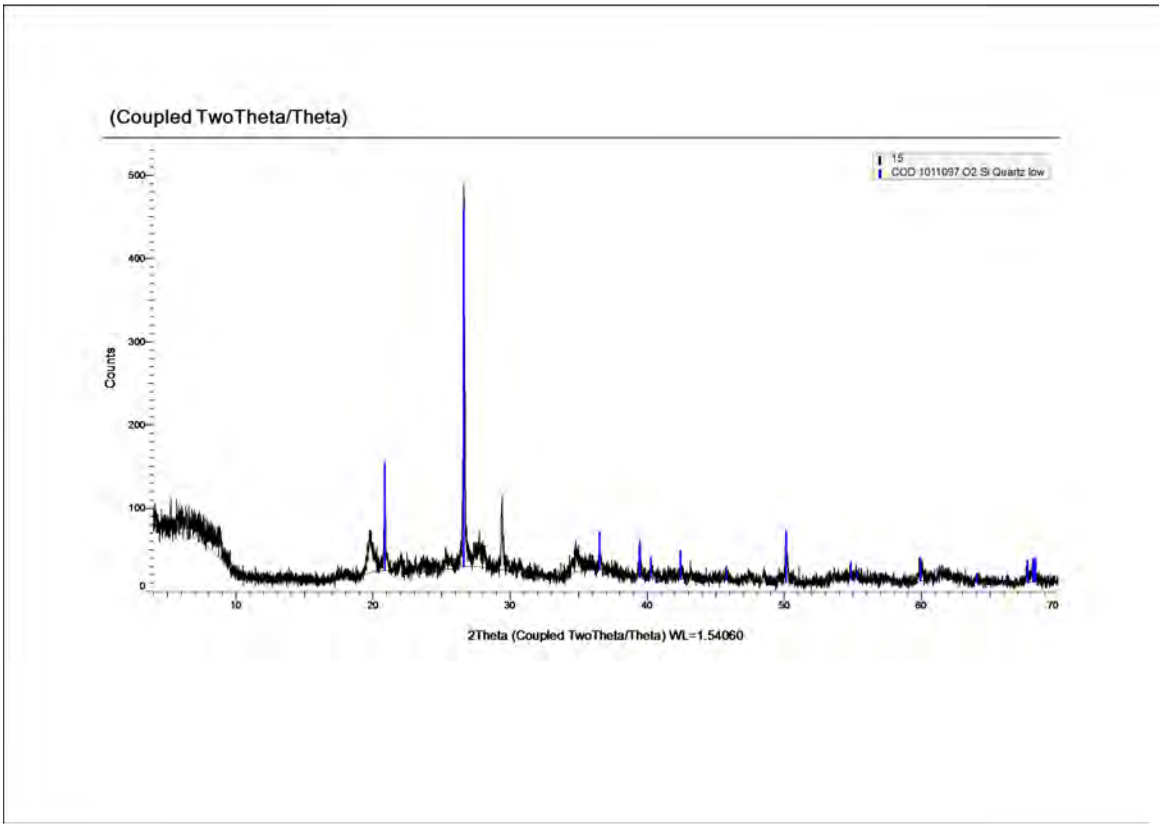


Figure 8. 4 X-ray diffraction chart of sample FO34 Fabric 2b. The graph shows a large amount of quartz (blue peaks) and calcite (peak at 29.6°). Clay is present (peak at 19.8°).

Fabric 3 (Figure 8.5) is composed of abundant quartz, plagioclase and minor calcite. No clay peaks are evident.

Fabric 3

qtz>>cal, plag

Type	Sample
	FA2

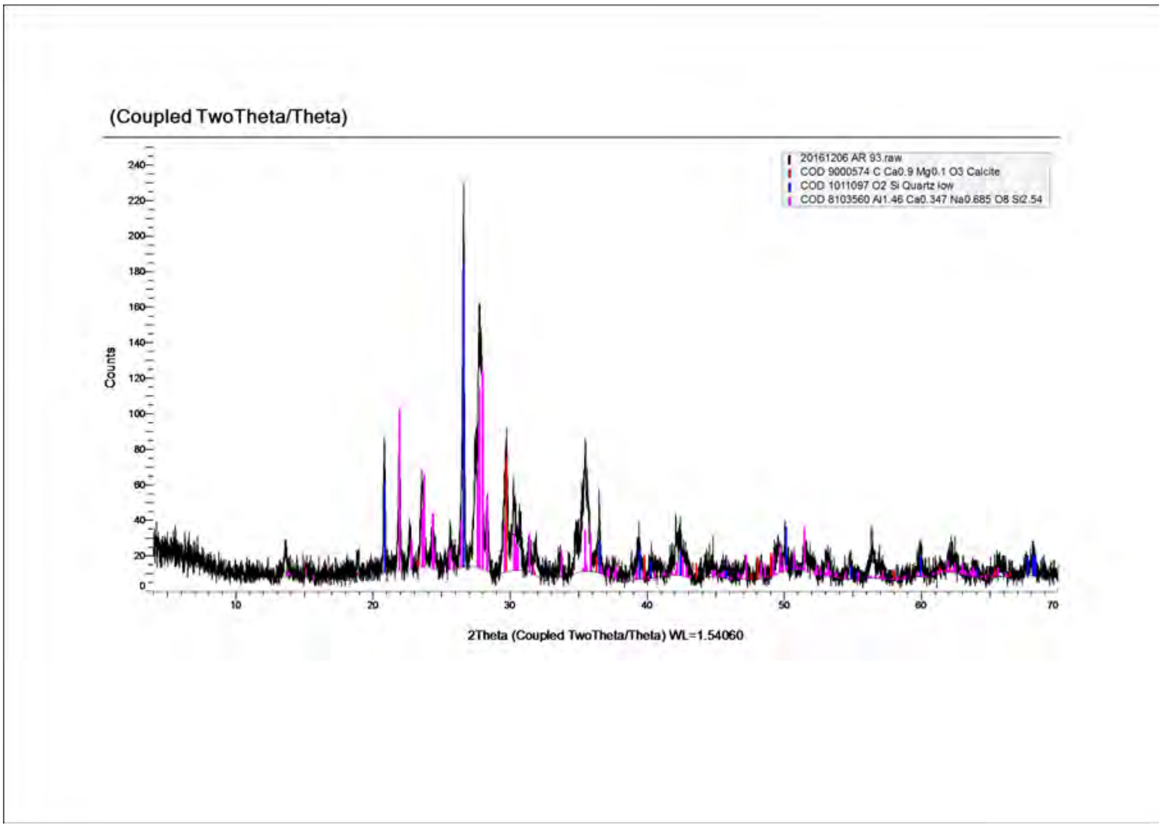


Figure 8. 5 X-ray diffraction chart of sample FA2 Fabric 3. The graph shows a large amount of quartz (blue peaks) as well as calcite (red peaks) and plagioclase (purple peaks). No clay peaks are present.

Fabric 4 is the second largest group identified and it is characterised by a varying proportion of calcite, quartz, and minor plagioclase, but lacks clay. Within Fabric 4 incorporates four sub-fabrics (Fabrics 4a-4d). The main mineralogical component is the same and the difference between these sub-fabrics is the relative proportion of calcite, quartz and plagioclase (see below):

- Fabric 4a:calcite>>quartz, minor plagioclase (Figure 8.6).
- Fabric 4b: calcite>quartz, small traces of plagioclase (Figure 8.7).
- Fabric 4c:calcite>>quartz, no plagioclase (Figure 8.8).
- Fabric 4d: quartz>calcite, trace of plagioclase (Figure 8.9)

Fabric 4a

cal>>qtz, plag

Type	Sample
Cup	FC5
Bowl	FB35

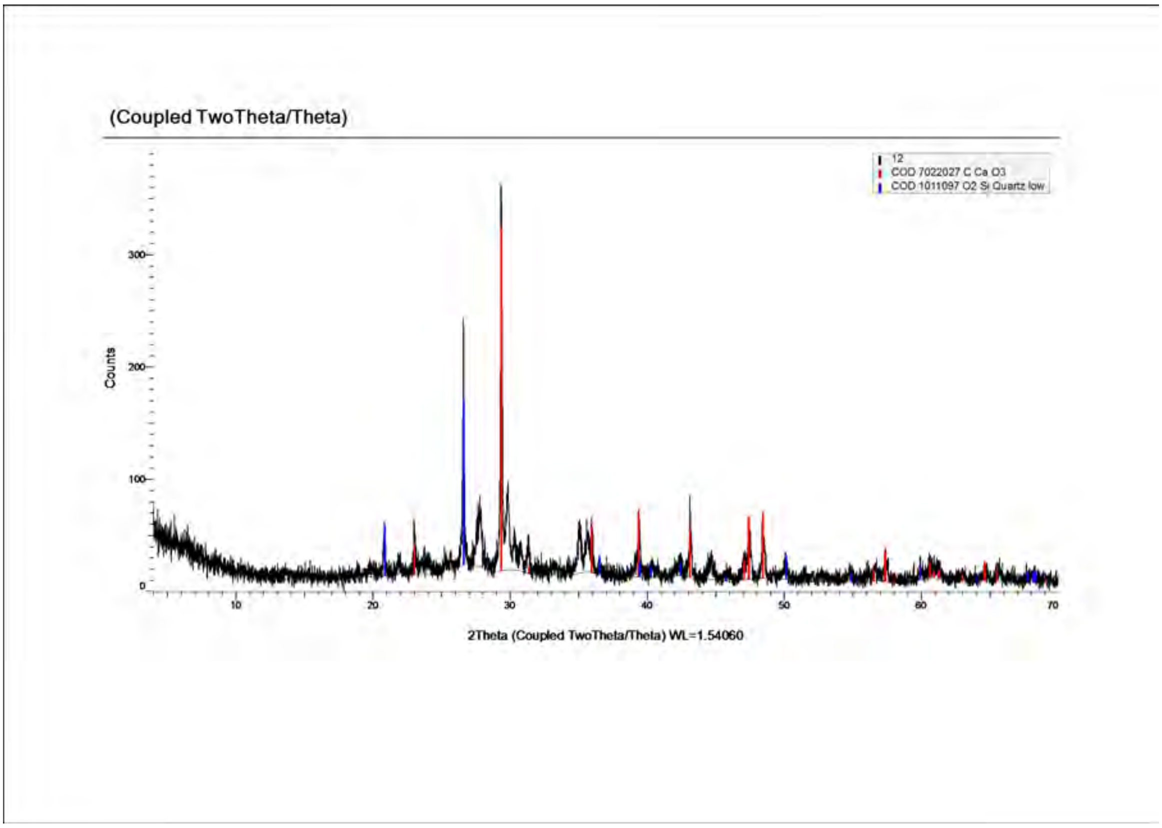


Figure 8. 6 X-ray diffraction chart of sample FC5 Fabric 4a. The graph shows a significant presence of calcite (red peaks), a minor presence of quartz (blue peaks) and plagioclase (peak at 27.9°).

Fabric 4b

cal>qtz, trace of plag

Type	Sample
Oinochoe	FO33

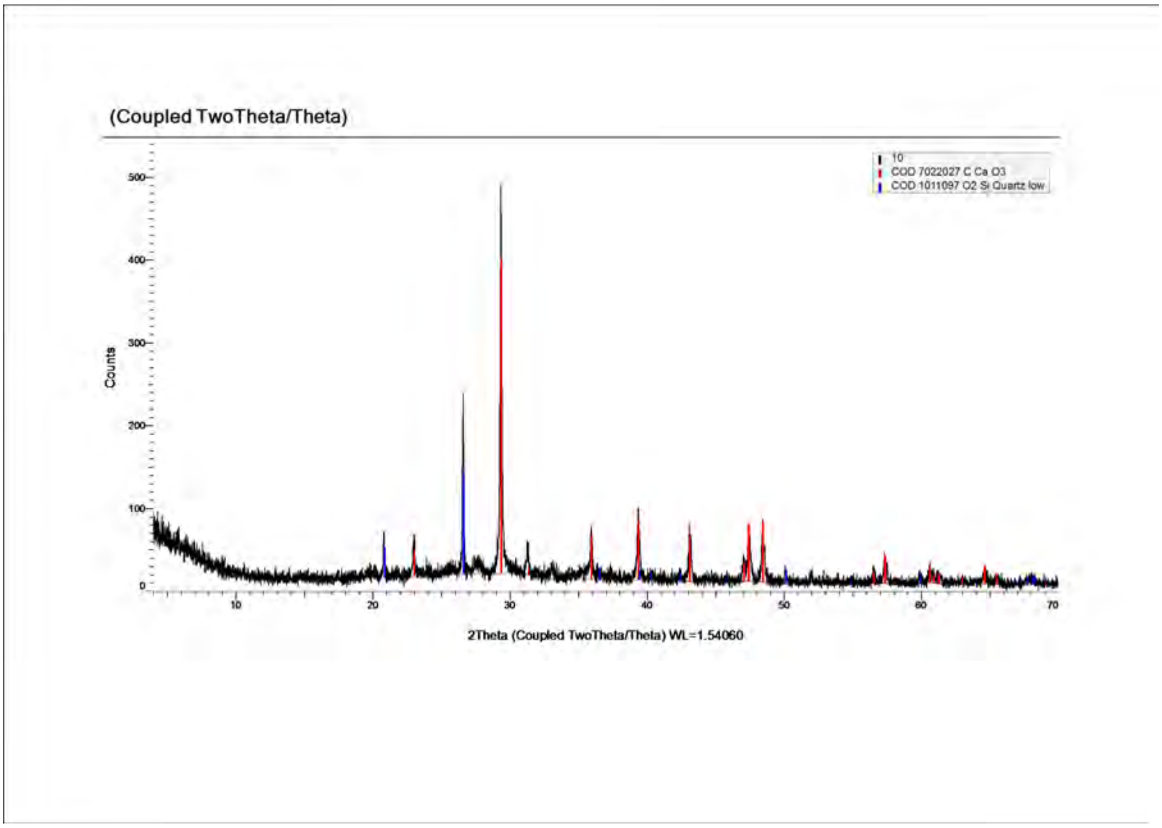


Figure 8. 7 X-ray diffraction chart of sample FO33 Fabric 4b. The graph shows a greater presence of calcite (red peaks) compared to quartz (blue peaks) and small traces of plagioclase (peak at 27.9°).

Fabric 4c

cal>>qtz, no plagioclase

Type	Sample
	FO15

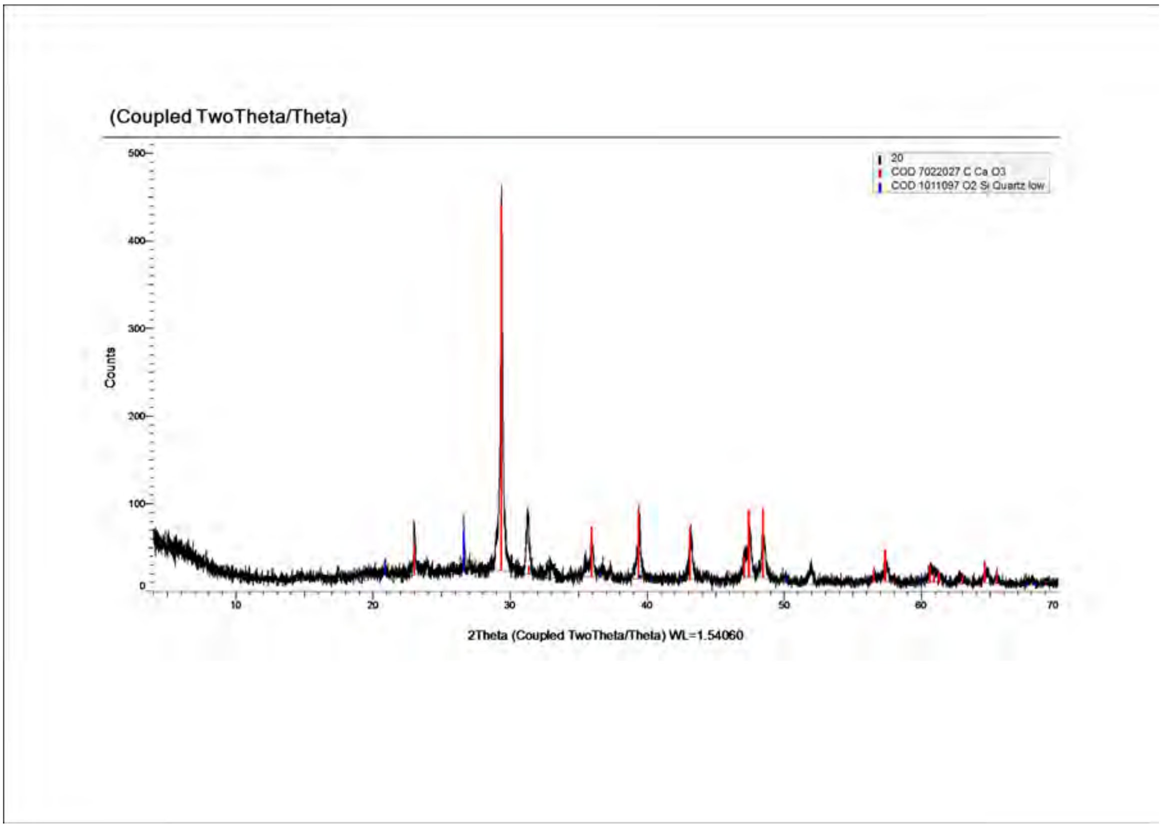


Figure 8. 8 X-ray diffraction chart of sample FO15 Fabric 4c. The graph shows a greater presence of calcite than quartz.

Fabric 4d

qtz>cal, trace of plagioclase

Type	Sample
Bowl	FB43

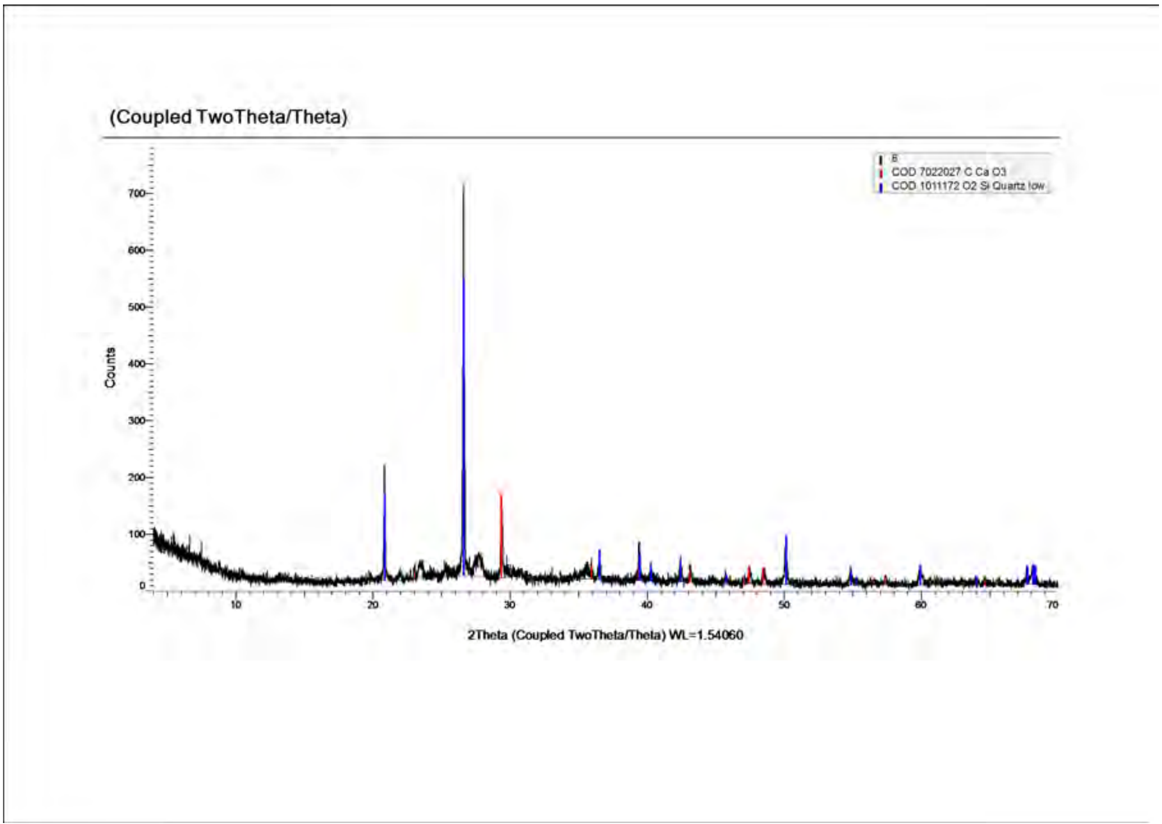


Figure 8. 9 X-ray diffraction chart of sample FB43 Fabric 4d. The graph shows a greater presence of quartz than calcite, and a trace of plagioclase (peak at 27.9°).

The general results suggest that Fabric 1 and Fabric 4, and their respective sub-fabric groups, are characterised by abundance of calcite, due to the presence of foraminifera (for further information on foraminifera see chapter 9); foraminifera are composed of calcite (Jacob et al. 2017). Fabrics 1 and 4 include most of the Monte Finocchito ceramics, and are most likely locally produced. Calcite is a minor component of Fabrics 2 and 3. The outcomes demonstrate how the samples FA2 (Fabric 3) and FO34 (Fabric 2) differ from the ceramic samples belonging to the other two fabrics (Fabric 1 and Fabric 4). In particular, sample FA2 contains a large amount of plagioclase, more than in any other ceramic sample analysed. These current data support the observation previously made with regard to the results obtained with the portable XRF Olympus Delta that defined sample FA2 as an outlier. This analysis also shows that FO34 is another possible non-local ware, confirming the fact that samples FA2 and FO34 are unlikely to be locally produced. Moreover, if compared with the pXRF Olympus Delta Premium analysis, these results suggest that the three of the original non-local samples, FC6, FO33 and FB43 (see Figure 7.19) are in fact local (Table 8.2), while samples FO34, FO12 and FO31 which were identified as local are here included in Fabric 2. To verify the origin of the possible clay source, thin section analyses were undertaken and the results are discussed in chapter 9. The table below lists all of the samples analysed with pXRF Delta Olympus Premium and the Siemens D5000 powder X-ray diffractometer showing the fabric identified, in correlation with the ceramic groups identified through visual analysis.

Table 8.2 Fabrics and ceramic groups

Sample	**Fabric**	**Group A**	**Group B**	**Group C**
FB6	Fabric 1	✓		
FB7	Fabric 1	✓		
FB19	Fabric 1	✓		
FB20	Fabric 1	✓		
FB21	Fabric 1	✓		
FB35	Fabric 4a		✓	
FB38	Fabric 1	✓		
FB40	Fabric 1	✓		
FB41	Fabric 1	✓		
FB42	Fabric 1	✓		
FB43	Fabric 4d	✓		
FB44	Fabric 1	✓		
FA1	Fabric 1	✓		
FA2	Fabric 3	✓		
FO12	Fabric 2a		✓	
FO15	Fabric 4c		✓	
FO31	Fabric2a		✓	
FO32	Fabric 1		✓	
FO33	Fabric 4b		✓	

FO34	Fabric 2b			✓
FC5	Fabric 4a	✓		
FC6	Fabric 1	✓		
FPx2	Fabric 1	✓		
FPx3	Fabric 1	✓		

CHAPTER 9

9. HISTORY OF THIN-SECTION ANALYSIS

Petrography (or petrography thin-section) was initially used in the 19th century to study fossilised wood and identify different species of wood (Nicol 1834). The first scientist to study rocks and minerals in thin-section was Henry Clifton Sorby (1858), who developed methodologies that could be employed within petrographic ceramic studies. The first study of petrographic thin-sections applied to archaeology was published in 1879 by Ferdinand Fouqué (Fouqué 1879), who studied artefacts from the Bronze Age site of Akrotiri on the volcanic island of Thera (Santorini). Fouqué was the first scholar to use a petrographic microscope to study the clay source of the ceramics from the archaeological site. In the 20th century large scale petrographic analyses of archaeological ceramics were undertaken by Anna Shepard (1942) and Wayne Felts (1942). Anna Shepard is considered a pioneer of thin-section analysis as she used petrographic studies as a tool to study the cultural interaction between two different groups.

Following Shepard's studies, other archaeological studies focusing on the ceramic temper identification and mineral inclusions developed (Whitbread 1995; Allen 1997; Quinn 2009; 2013, 16). Whitbread defined archaeological ceramic thin-sections by composition, size and shape of the inclusions (Whitbread 1989). Soon enough thin-section became an established research method applied to different archaeological materials such as metal (Sahlen 2011) and stone artefacts (Tykot 2016).

9.1 APPLICATION OF THIN-SECTION ANALYSIS IN ARCHAEOLOGY

Ceramic petrography characterises ceramic artefacts through the use of the microscope. It is used to identify the clay matrix and inclusions (fossils or crystals) (Hugh 1911), which provides information related to the technique (Reedy et al. 2014), and the specific clay sources. Knowledge of clay source sites can contribute to the understanding of trade and exchange networks (Whitbread 1995).

Thin-section analysis of ceramic looks at three main components: clay matrix, inclusions and voids. All together define the fabric of an archaeological ceramic (Quinn 2013, 102).

Thin-section analysis is a destructive process, as it requires that a small section of a potsherd is cut in any orientation. The standard dimension requested for a ceramic sample is 5g in weight, with dimensions of about 5 x 7 cm (Murphy et al. 1985, 16; Quinn 2013, 21). The first step in thin-section analysis is to select the sample, cut the ceramic flake with a low-speed laboratory saw and set it in a resin block (Insley and Fréchette 1995). To provide a smooth flat surface for bonding the sample to the microscope slide, it is polished with powdered silicon carbide (SiC) mixed with water (Quinn 2013, 25-27). After that the polished sample is bonded to a glass microscope slide, cut off using a small saw, and then the thin slice of ceramic adhering to the glass slide is ground down to 0.03mm thickness, polished and covered with a thin glass overslip. The standard measurements of the slide are 76 x 26 mm (Reedy 2015, 117). Finally, a paper label is attached to the slide with the sample number (see Table 9.3).

The thin-section of the ceramic sample is examined using a petrographic/polarizing light microscope (Reedy 2015) using more than one objective (x25, x40, x100) (Insley and Fréchette 1995). The polarizing light microscope can examine thin-sections using either plane polarised light (PPL), which is very similar to daylight, and crossed polar light (XP), which creates an optical effect because the light is polarised in two different directions (Figures 9.1 and 9.2) (Quinn 2013, 4; 22). The use of the microscopes aids the identification of different minerals, sheds light on the technologies involved in the ceramic manufacture and is helpful in deducing the source of the clay (Quinn 2013, 4-7).

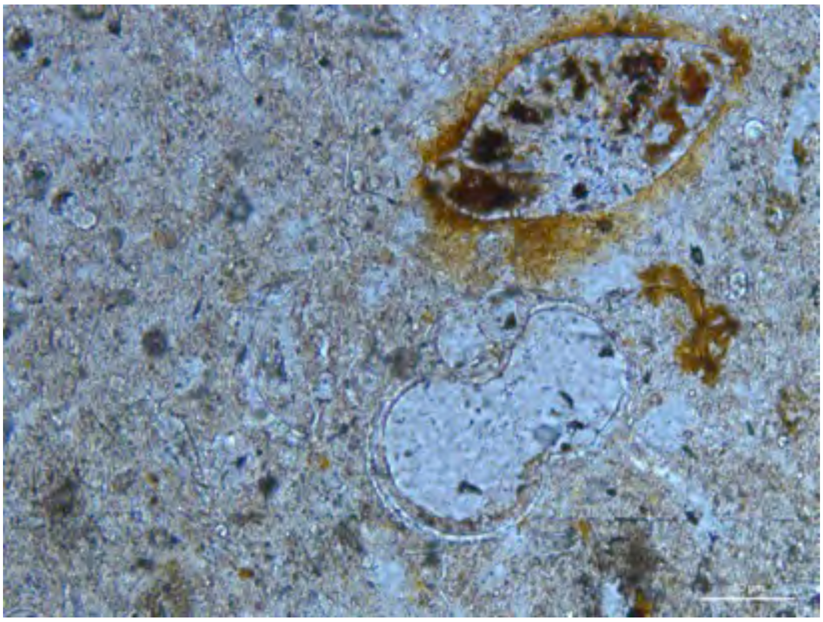


Figure 9. 1 Foraminifera from sample FPx2 under a polarised light (PPL).

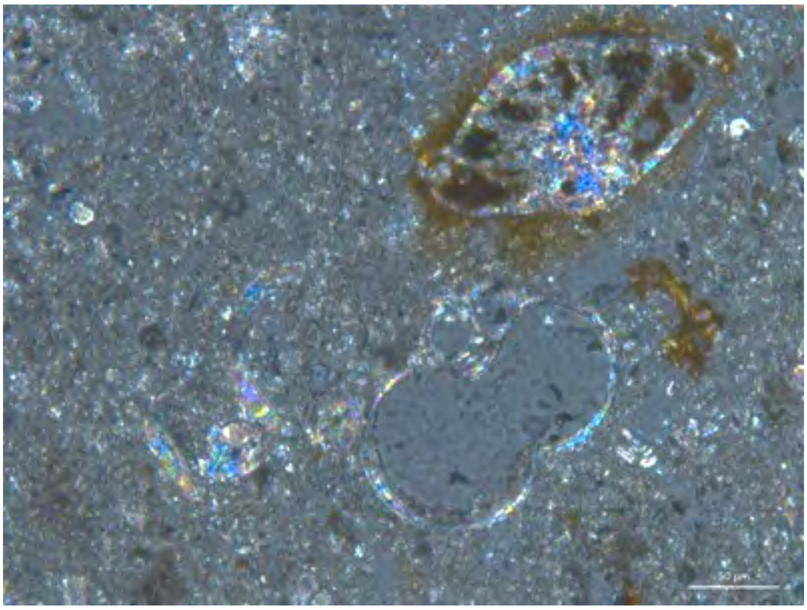


Figure 9. 2 Foraminifera from sample FPx2 under a crossed polarised light (XP).

9.1.1 CLAY MATRIX

The clay matrix of ceramics is derived from rock weathering and is composed of aluminium silicate minerals, which are often too small to be detected individually through the microscope. The identification of different clays and clay colours is useful in recognising the composition of the raw materials and also the firing technology. Using a crossed polar light (XP) allows calcareous crystallized material and aluminium-silicate clays to be distinguished.

9.1.2 INCLUSIONS

Inclusions in ceramics are often the most distinctive element in a fabric. They vary in size, from coarse (0.5-2 mm), medium (0.25-0.5mm), or fine and very-fine grains (0.0625 mm-0.25 mm), while the shape varies from elongated to equidimensional (Quinn 2013). Inclusions are usually rocks (particularly volcanic fragments), minerals (e.g. quartz, plagioclase), shells, bones, microfossils, plant matter and argillaceous inclusions (Quinn 2013, 46-47), and can provide important information regarding the raw material, the source of the clay and ceramic technology. Microfossils, especially foraminifera, ostracods and nannofossils, can help to determine the origin of the clay through identifying the age and environment of deposition of the clay, e.g. marine or freshwater. Moreover, they are useful in deducing the technology used and the firing temperature, as microfossils can be destroyed by firing above a particular temperature (Quinn 2013, 140).

In regard to the argillaceous inclusions, Whitbread (1989) proposed four main classes: argillaceous rock fragments, for example mudstone and marl; grog that corresponds to crushed sherds; clay pellets or natural clay, and clay temper. Whitbread differentiated these using their boundaries: sharp, clear, diffuse or merging (Figure 9.3). The shape of these fragments is acquired during the forming of the vessel.

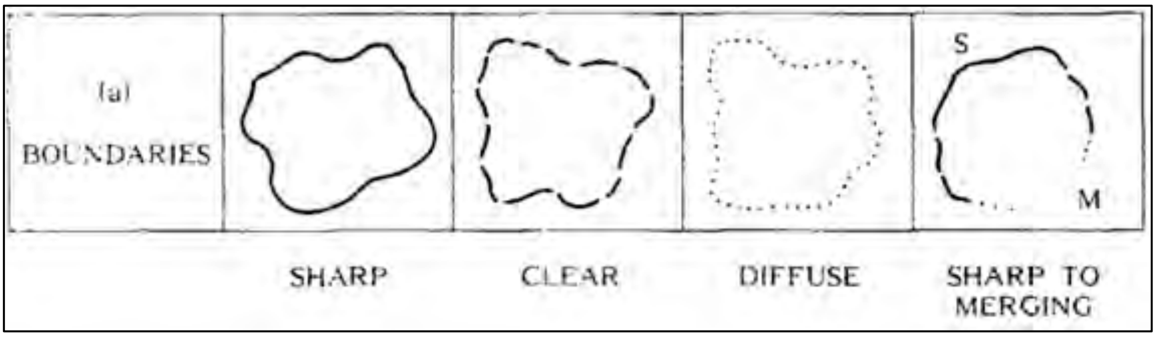


Figure 9. 3 Inclusion boundaries can be highly defined (sharp) or not very defined (clear) (Whitbread 1986, 80, Table 1).

Grog (Figure 9.4) is a fired and crushed inclusion intentionally included into the clay mixture and, if it does not derive from fabric similar to the ceramic, it is recognisable because of a different colour. Other criteria for identifying a grog are its elongated shape, an orientation that differs from the other inclusions, and sometimes it is surrounded by a shaped ring that indicates how the original firing temperature of the grog has been exceeded (Figure 9.4). Sometimes grog can be identified within the clay matrix as it is larger than other inclusions (Quinn 2013, 165). A visual analysis of the fabric of a ceramic using the low magnification in XP and PPL allows the examination of clay matrix, inclusions and voids, so that different fabrics can be classified.

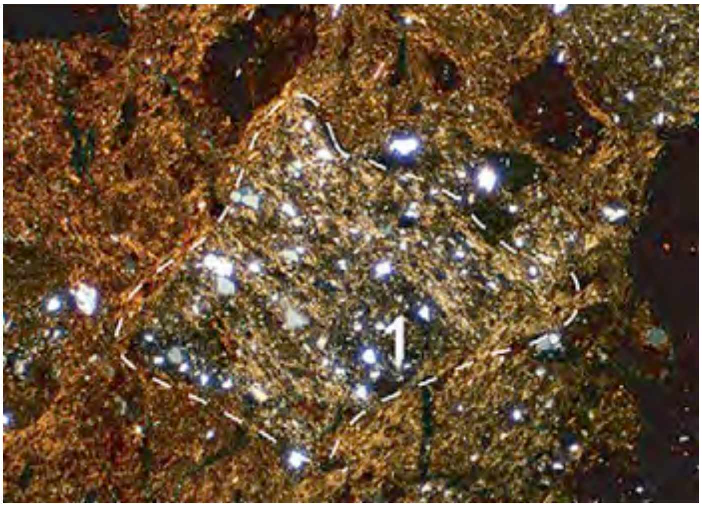


Figure 9. 4 Example of grog with an elongated shape (Quinn 2009, 1047, Figure 4).

Clay pellets are plastic inclusions that are part of the original clay matrix, and often have an elongated rounded and distorted shape because of vessel manufacturing, while the colour is generally darker than the clay matrix.

9.1.3 VOIDS

Voids are holes in the ceramic and the cause of their formation, natural or not, can help to determine the technology used to make the ceramic (Figure 9.5). Voids can be part of the raw material or introduced, as Quinn suggests 'at several stages in the life history of an artefact' (Quinn 2013, 61). There are three types of voids: rounded vesicles produced by the vitrification of the clay matrix at high temperature; planar or channel voids with an elongated shape that are the remnants of organic inclusions like plant matter that disintegrated during firing; and vughs with an irregular spherical shape (Figure 9.5). Micro voids usually represent the natural spaces between the clay minerals, and large voids can be holes between clay clumps created either while the clay was kneaded and air entered or during the drying (Quinn 2013, 64-65, 97). They might form during the firing: for example, they can be created through the disintegration of plant matter or other types of inclusions during firing.

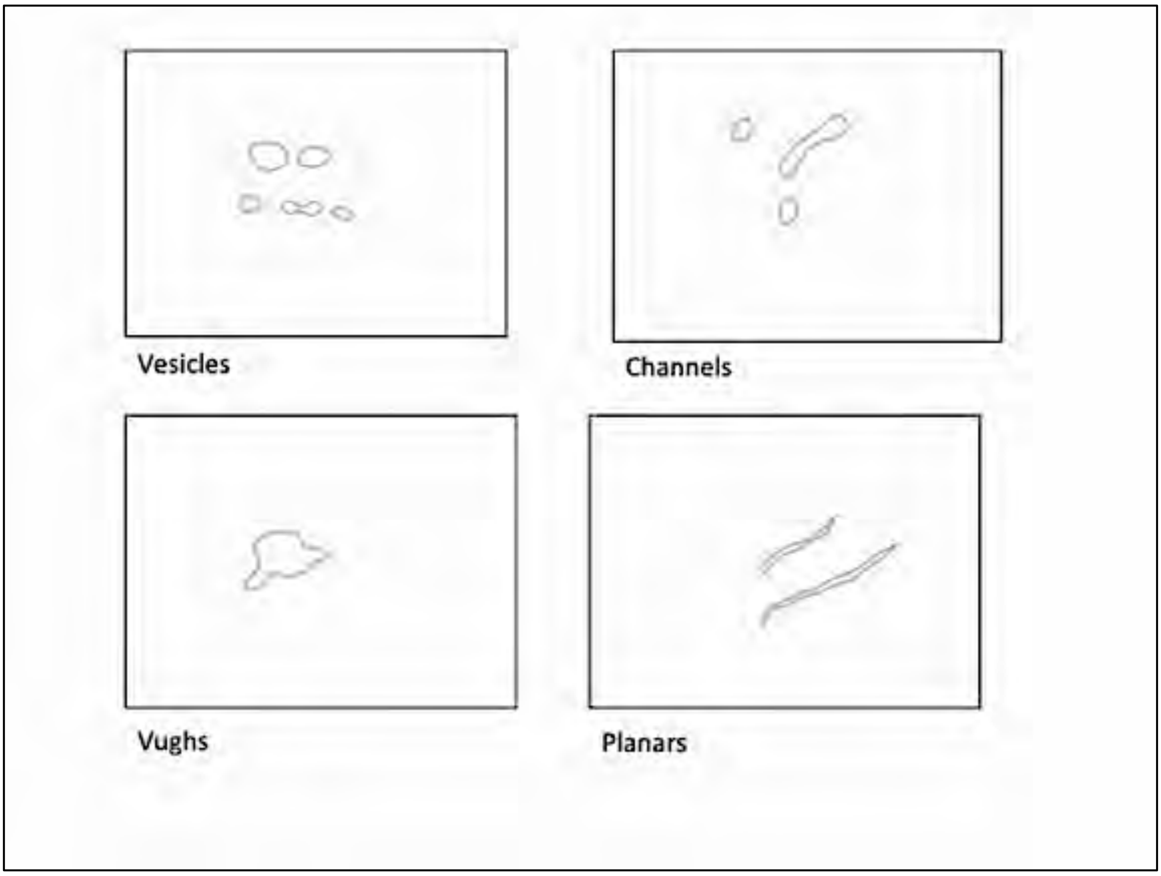


Figure 9. 5 Void shapes in archaeological ceramic thin-section.

9.2 TEXTURE

The texture of a ceramic is the grain size distribution of the inclusions. There are five main classes: very well and well sorted ones have inclusions with a similar size, whereas moderately and poorly sorted grains are characterised by inclusions with different sizes, and very poorly sorted inclusions have a wide range of different sizes, often because of different types of inclusions (Whitbread 1989; Quinn 2013, 85) (Figure 9.6).

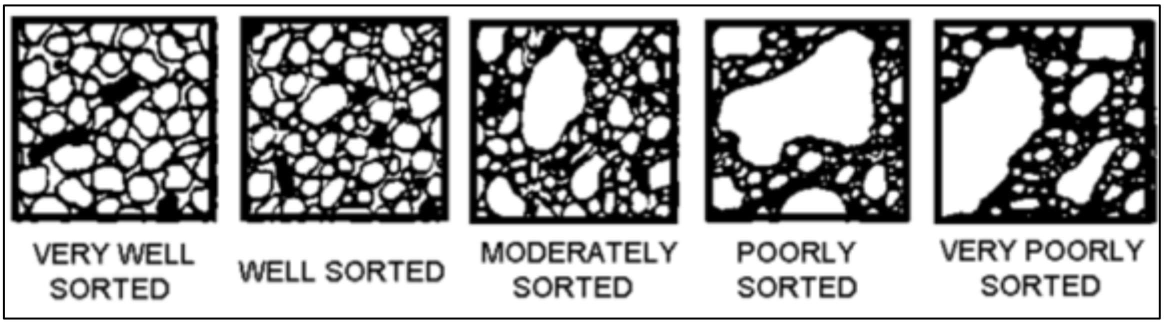


Figure 9. 6 Sorting in clastic sediments and sedimentary rocks in archaeological ceramic thin-section (Compton 1962, 214).

9.3 TECHNOLOGY

From an archaeological point of view, the origin of an artefact is usually detected through visual analysis, where the shape of a specific vessel, motifs and style are peculiar to a particular culture, territory and often period. On the other hand, the compositional analysis based on the identification of the raw material can address the source more specifically. To identify the technology used to manufacture the ceramic, visual analysis is required to look for marks that the pottery makers left such as a fingerprint or the 'wheel marks', internal striations created by the action of the throwing wheel, and additional evidence from observation through a microscope.

Interpretation of the ceramic technology requires an understanding of the production process of a ceramic vessel. First of all, clay and other raw materials are selected and collected. Usually, to remove impurities that can affect the plasticity of the clay, pottery makers remove inclusions, through sieving and smoothing. They may also add new elements (e.g. grog) combining different types of raw material, in order to produce a suitable clay paste. Sometimes inclusions such as bones, shells and rocks, when added, are crushed and acquire a sharp easily recognisable shape, while inclusions that are naturally part of the sediment tend to be rounded in shape (Quinn 2013, 168). Water is added to moisturize the clay and then it is left for a few days while drying.

9.4 SHAPING PROCESS

Thin-section petrography also provides information regarding the shaping process of a pot, including different techniques such as pinching, coil building and wheel throwing (Rye 1981). As Tite describes:

> A wide range of methods has been used in forming pottery vessels, sometimes with different methods being used for different parts of a vessel or sometimes with two or more methods being used sequentially. The primary techniques, which transform the shapeless clay into the basic shape, include modelling from a lump of clay by pinching, drawing, or beating using a paddle and anvil; pressing or pounding into a mold; building up from coils or slabs, and throwing on a wheel (Tite 1999, 185-186).

In the coiling technique, coils are constructed with lengths of rolled clay joined and then shaped with a tool or thinned through the pressure of the potter's finger. Meanwhile in the wheel-coiling technique, the hand-built ceramic vessel is set on the wheel and then shaped with a tool (Roux 1998, 748; Thér 2015) (Figure 9.7). With regard to the wheel, we need to distinguish between the fast wheel, used for throwing, and the slow rotating turntable, which is used to aid hand building and finish pottery (Tite 1999, 186).

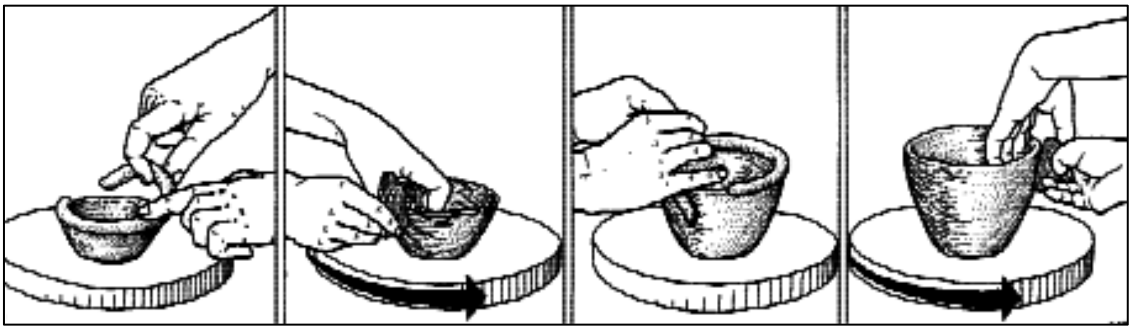


Figure 9. 7 Wheel-coiling technique (Roux 1998, 748, Figure 1).

These techniques can be detected within the thin-section by looking at the orientation, the degree and the alignment of inclusions (Degryse and Braekmans 2016, 255-256), which result from the external forces used in giving a specific shape to the pot. For example, if a throwing wheel was used, the forces determined by the rotation of the wheel can be detected within a thin-section as elongated inclusions and voids producing a parallel alignment within the wall section (Degryse and Braekmans 2016, 256) (Figure 9.8). On the other hand, if the vessel was hand-built using, for example, the coiling technique (overlapping clay cords), voids and inclusions appear within a thin-section via a circular or concentric distribution (Figure 9.9) (Quinn 2013, 176-177). Meanwhile, if the ceramic vessel is built through the wheel-coiling technique with the support of a slow rotating turntable (Figure 9.7) and shaped with a tool, voids and inclusions within the thin-section still have a circular or concentric distribution but they acquire a gentle alignment.

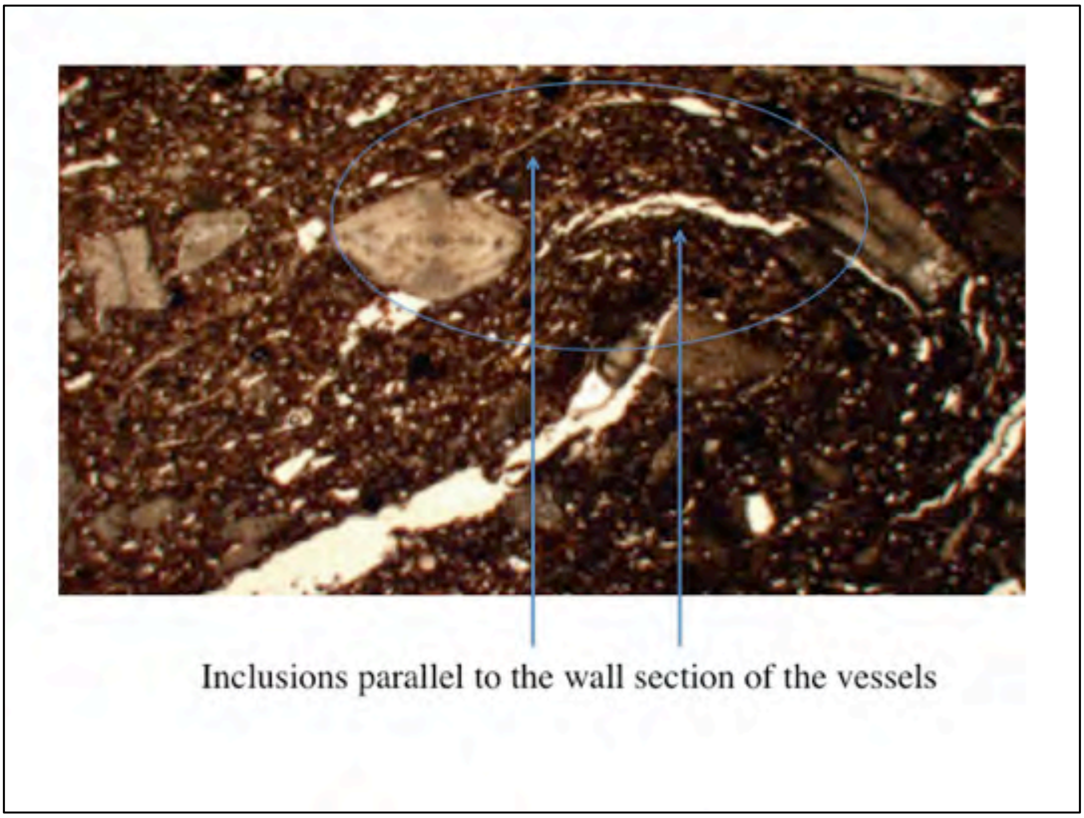


Figure 9. 8 Example of inclusions parallel to the wall section of the vessels due to the shaping process (Nicosia and Stoops 2017, 209, Figure 25.2).

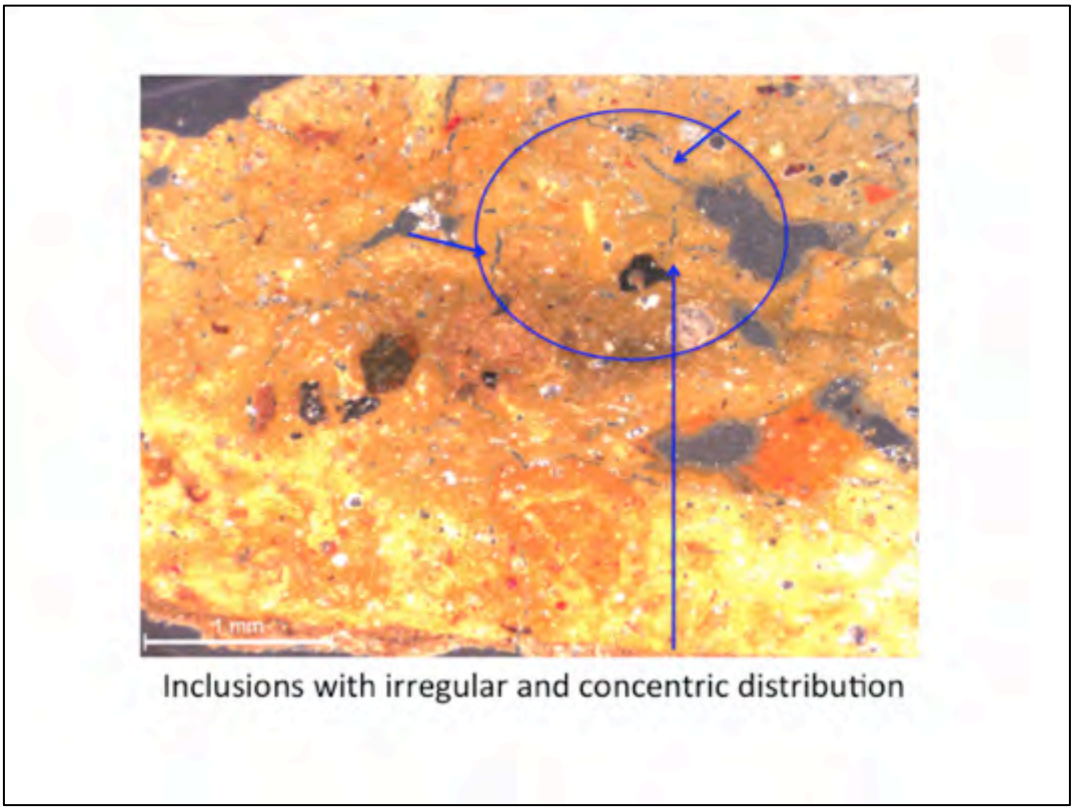


Figure 9. 9 FB41 ceramic sample. Example of inclusions with irregular and concentric distribution.

9.5 FIRING

The last phase of a pot's production is the firing, characterised by several steps. One of the most important is the sintering when the particles combine together: it begins at temperatures of 600 °C, while the vitrification, which involves the melting of clay minerals, starts around 900 °C-1110 °C. Depending on the level of firing, archaeological ceramics begin sintering but do not always reach the vitrification phase (Quinn 2013, 188-189).

Pottery can be fired using open and closed firings. Open firing employs a hole in the ground where the ceramic vessels are positioned, and the fuel, such as wood and dry leaves, is placed over or among the ceramic vessels (Nicholson 2010, 2). In closed firing a kiln is employed (Hodges 1981, 35-41). Usually open firings have a lower maximum temperature and therefore vitrification may not occur or not be complete, and organic elements may remain intact. On the other hand, closed firing reaches higher temperatures, but has variation in firing and therefore atmospheric conditions, often visible because of the black or grey discoloration on the pot surface. Atmosphere or length of firing are variables which can affect the firing temperature estimate. In addition, different part of a pot, may absorb the heat differently, for example, a base ring or the handles compared to the main body.

9.6 METHODOLOGY

In the present work, to better achieve a quantitative characterisation of the mineral composition of the ceramics from Monte Finocchito, eight potsherds (Table 9.1) selected from the ceramic samples previously analysed with X-ray diffraction (XRD), were also subjected to petrographic analyses. Amongst the ceramic samples analysed by XRD only a small group was suitable for thin-section petrographic analysis, as most were too fragile to be cut in thin-section because they were already broken pots, so only the thicker samples were selected for thin-section analyses. Ideally, analysis of samples from Fabric 2 (as a potential non-local fabric) would also have been carried out. However, only Fabric 1 samples, but no ceramics resembling Greek forms from Monte Finocchito, was available for destructive analyses.

The thin-sections of the ceramic samples were examined using a Zeiss (Axio Cam MRC5-scope A1) petrographic/polarizing light microscope (Figure 9.10) with low magnification in XP and PPL. Plane polarised light (PPL) and crossed polar light (XP) with a trinocular head (x25, x40 and x100 magnifications) were both employed to better identify inclusions and to detect microfossils.

Table 9. 1 Monte Finocchito ceramic samples subjected to petrographic analyses

Type	Sample
Askos	FA2
Bowl	FB6
Bowl	FB38
Bowl	FB41
Bowl	FB43
Bowl	FB44
Cup	FC6
Pyxis	FPx2

Figure 9. 10 Zeiss Axio Cam MRC5 (scope A1) microscope.

9.7 RESULTS

The results from the thin-section analysis in terms of technology showed similarities between the ceramics analysed, but nevertheless each potsherd is a unique piece that carries distinctive characteristics (Table 9.3). The technical actions of a ceramist manufacturing a pot were not always replicated: the materials and technical choices made during the production and the pressure the potter applied all affected the formal properties of the final product.

The thin-section analysis suggests that the ceramic vessels here analysed were hand-built using the coiling technique, as the voids and inclusions have a concentric distribution. The circular orientation of the inclusions was probably a consequence of coils being rolled or squeezed out by hand, applying a circular movement. Furthermore, the gentle horizontal orientation of the rounded and elongated voids in some samples suggests these pots were shaped with a tool, probably while sitting on a slow rotating turntable (Figure 9.7; Table 9.2). This indicates that a slow rotating turntable was in use in Monte Finocchito.

Table 9. 2 Ceramic vessel techniques

Coiling with slow rotating turntable	Coiling
FA2	FB38
FB6	FB41
FB43	FB44
FC6	
FPx2	

The surface of one sample, FC6, appears to have been altered, before being fired, for aesthetic reasons (Figure 9.11; Table 9.3), as it shows an external thin layer of clay having a similar colour to the ceramic. This was probably applied to the exterior of the sample as a slip (Santacreu 2014, 82); as the water absorbs into the body of the ceramic, a separate distinguishable layer appears. Because the colour is very similar to the body of the pot, the layer is probably not a pigment.

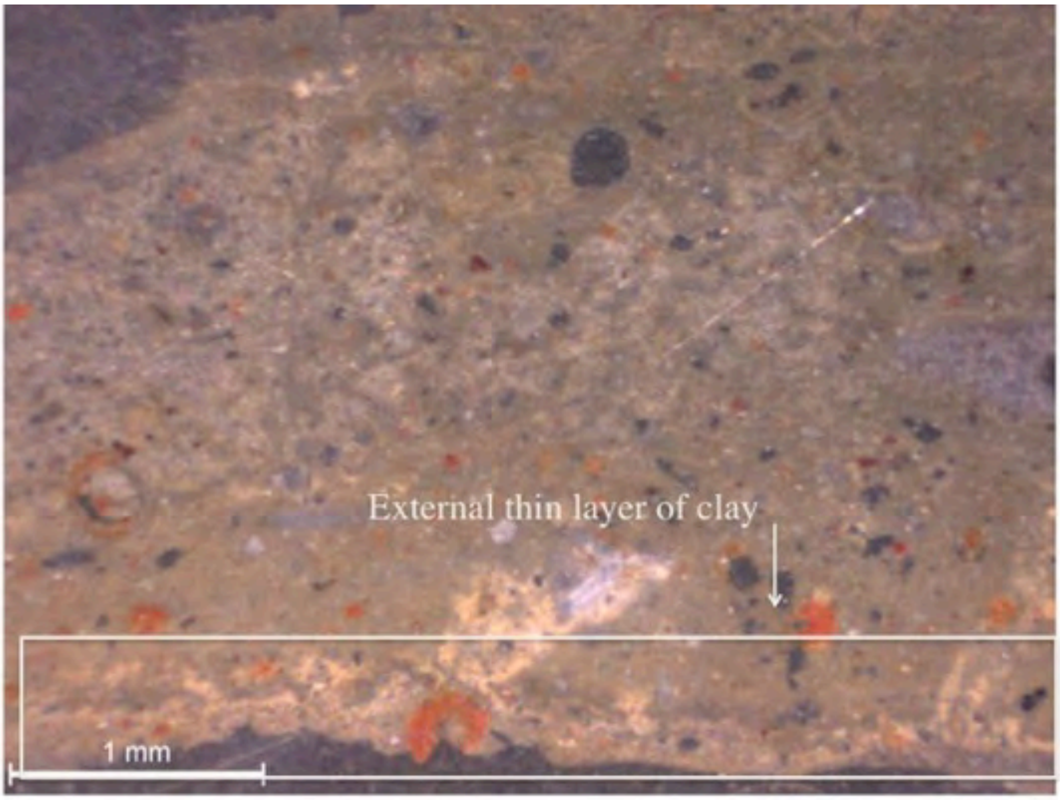


Figure 9. 11 External thin layer of clay and water applied to the exterior of the sample FC6.

The only sample that is characterised by a completely different raw material is pot FA2, where volcanic fragments are the predominant inclusions (Table 9.3), and foraminifera were not detected. In comparison, the other sections contain abundant foraminifera, and relatively few volcanic fragments, and these often have a yellow glass matrix that is completely absent in the volcanic fragments in FA2. Therefore, as already suggested by the XRD analysis, sample FA2 is definitively a non-local ware.

In terms of firing, some samples (FC6 and FB41; Table 9.3) have a dark core, which indicates that the iron as well as organic matter in the core of these samples was not oxidised. This may have been due to a short firing duration, low firing temperatures (Szakmàni and Starnini, 2007) and/or relatively high porosity of the ceramics. Samples FC6, FB41 and FB44 (Table 9.3) have narrow oxidised margins, which may indicate that the firing was uncovered near the end, or that the artefact was cooled in air when still hot (Quinn 2013, 202). The presence of abundant, well preserved foraminifera (Figures 9.12 and 9.13), suggests that the heat was generally low because calcite is usually destroyed above 600 °C-800 °C. When the temperature of firing is high, the morphology of the microfossils is degraded and they cannot be accurately identified (Santacreu 2014, 94). This result suggests that the pots were fired in open firing or pit firing, which never reached high temperatures (Santacreu 2014, 88).

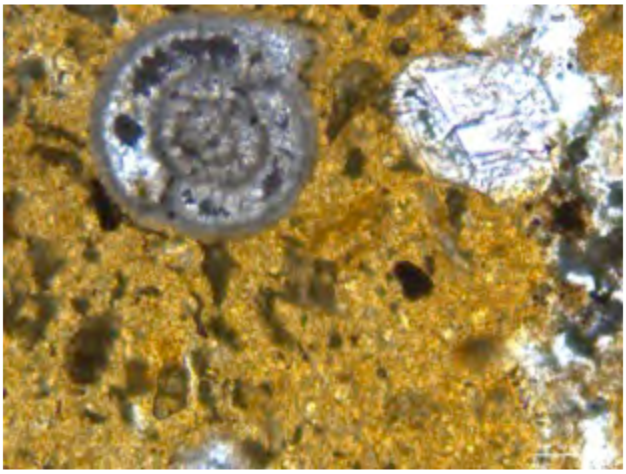


Figure 9. 12 Foraminifera in sample FB41.

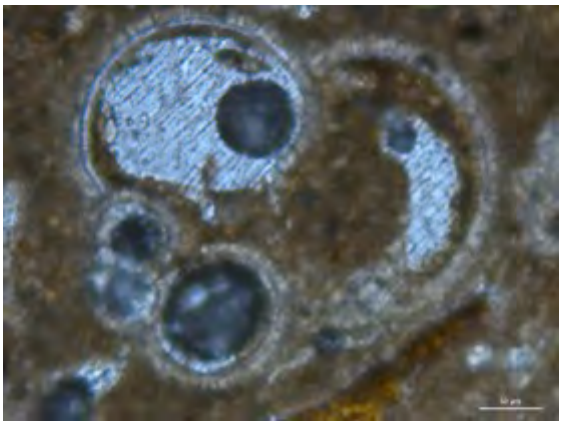
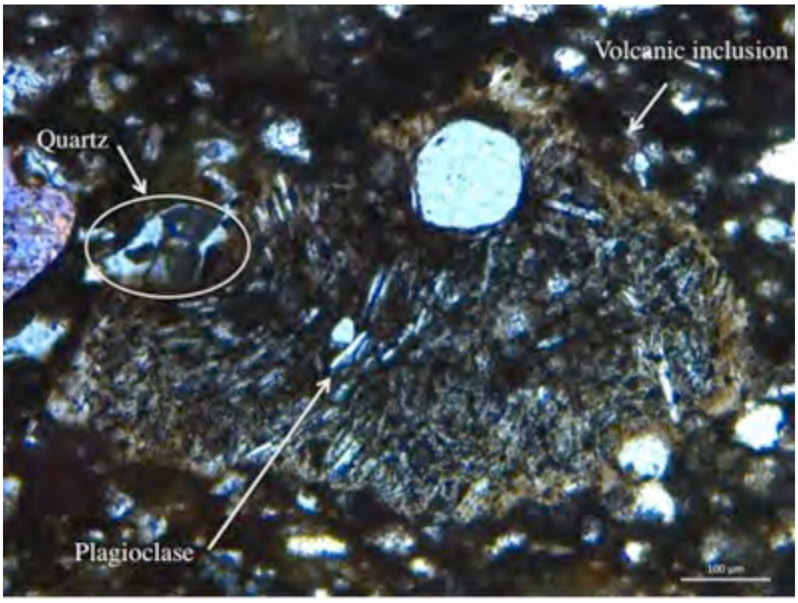


Figure 9. 13 Foraminifera in sample FB38.

Table 9. 3 Thin-sections

SAMPLES	DESCRIPTION
FA2 	Ceramic sample characterised by coarse inclusions of volcanic rocks and quartz. **Inclusions**: Volcanic rocks; Plagioclase and quartz. **Inclusion orientation**: horizontal alignment of inclusions. **Technique**: coiling technique and shaped with a tool, probably while sitting on a slow rotating turntable. 

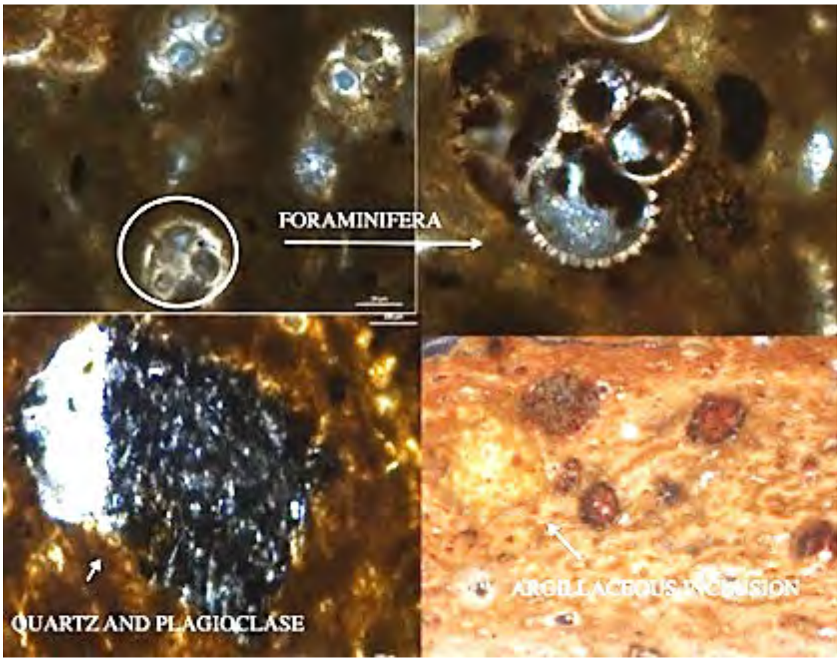
FB6

Ceramic sample with elongate sub-rounded and rounded inclusions.

Inclusions: abundant foraminifera; rounded plastic argillaceous inclusion (clay-rich plastic inclusion or clay pellets); low presence of quartz and plagioclase.

Inclusion orientation: poor alignment of rounded inclusions

Technique: coiling technique and shaped with a tool, probably while sitting on a slow rotating turntable.



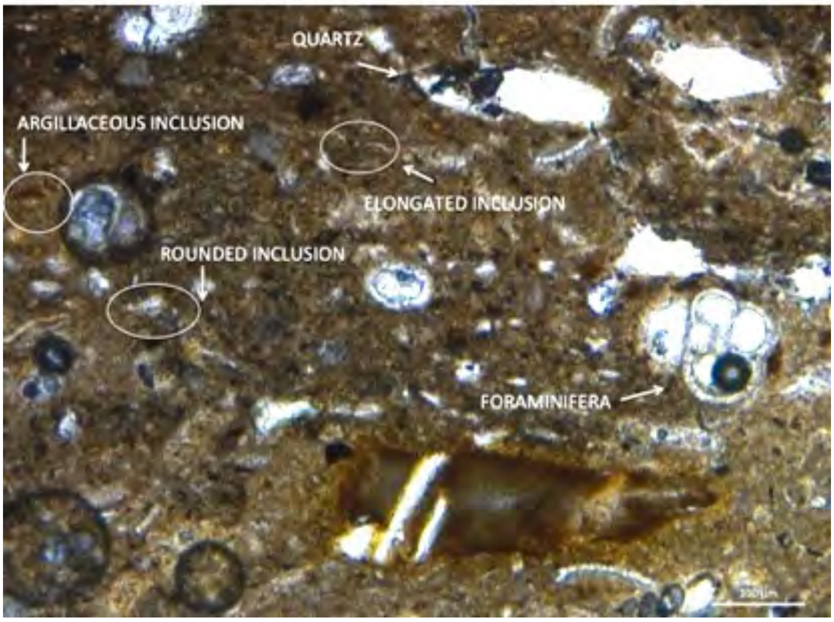
FB38

Ceramic sample with a poorly sorted sub-angular from equant rounded to elongate sub-rounded and elongate rounded inclusions.

Inclusions: abundant foraminifera; rounded plastic argillaceous inclusion; low presence of plagioclase and quartz.

Inclusion orientation: Poor alignment of elongated and rounded inclusions.

Technique: coiling.



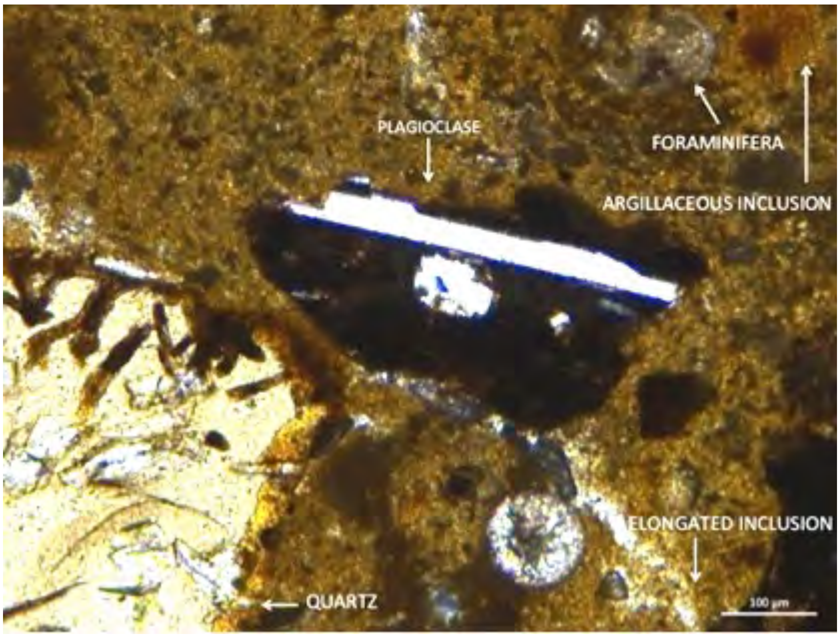
FB41

Ceramic sample with a poorly sorted sub-angular from elongate sub-rounded to elongate rounded inclusions.

Inclusions: abundant foraminifera; rounded plastic argillaceous inclusions; low presence of plagioclase and quartz.

Inclusion orientation: Poor alignment of elongate and rounded inclusions. Circular orientation.

Technique: coiling technique.



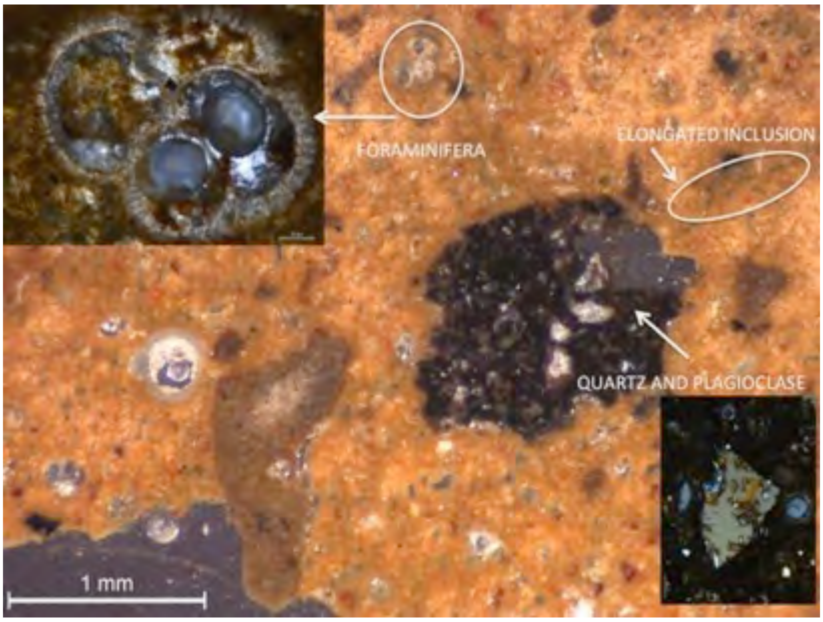
FB43

Ceramic sample with a poorly sorted sub-angular from elongate sub-rounded to elongate rounded inclusions.

Inclusions: foraminifera; plagioclase and quartz.

Inclusion orientation: poor alignment of elongate and rounded inclusions with a horizontal orientation.

Technique: coiling technique and shaped with a tool, probably while sitting on a slow rotating turntable.



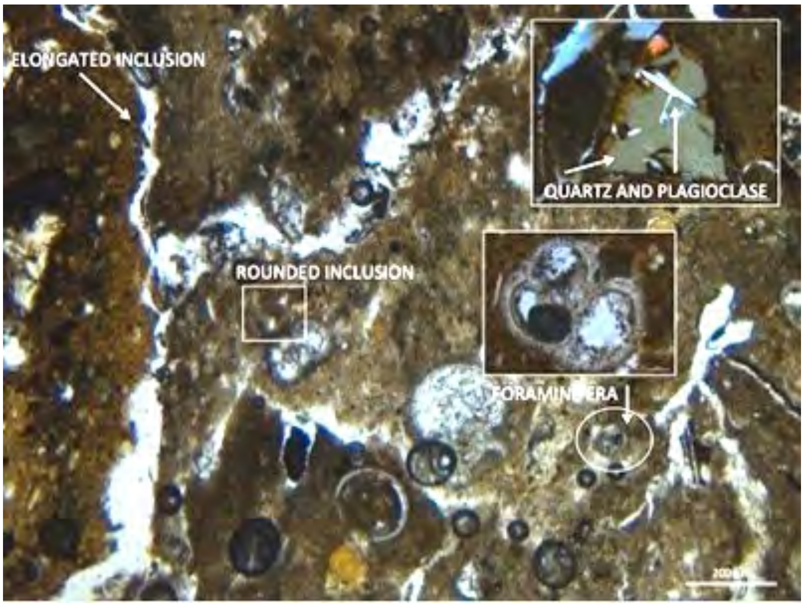
FB44

Ceramic sample with a poorly sorted sub-angular from elongate sub-rounded to elongate rounded inclusions.

Inclusions: abundant foraminifera; rounded plastic argillaceous inclusions; low presence of plagioclase and quartz.

Inclusion orientation: poor alignment of elongate and rounded inclusions. Circular orientation.

Technique: coiling



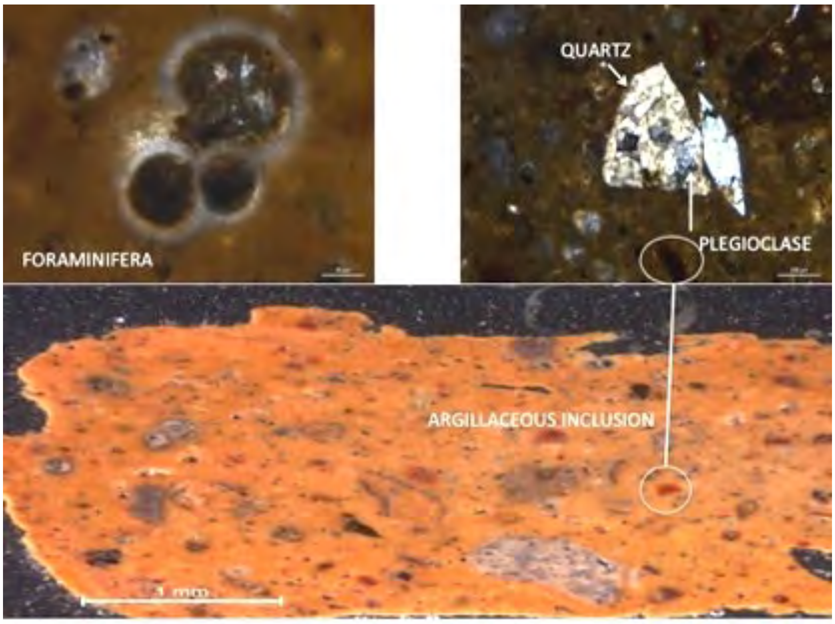
FC6

Ceramic sample with a poorly sorted sub-angular rounded and elongate inclusions.

Inclusions: abundant foraminifera; rounded plastic argillaceous inclusions and low presence of plagioclase and quartz.

Inclusion orientation: poor alignment of elongate and rounded inclusions.

Technique: coiling technique and shaped with a tool, probably while sitting on a slow rotating turntable.



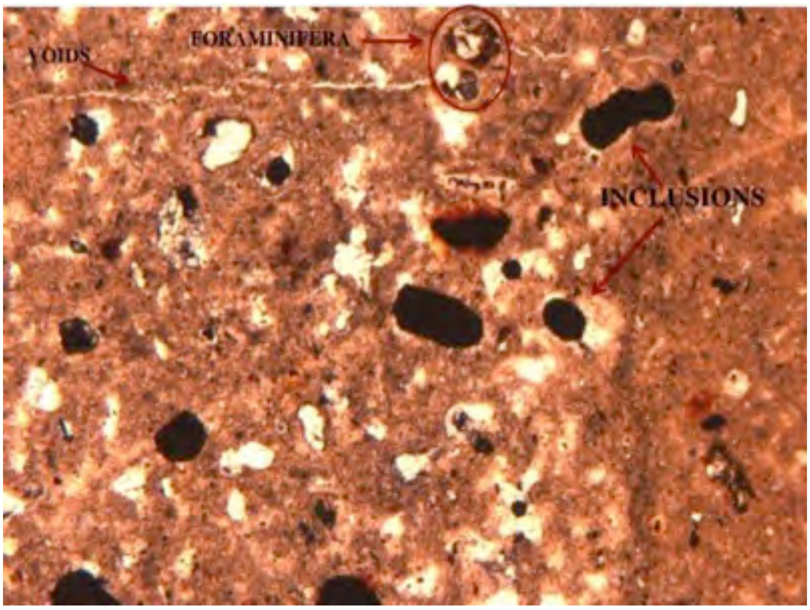
FPx2

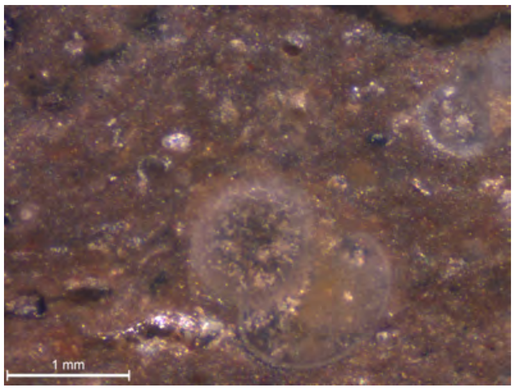
Ceramic sample with a poorly sorted sub-angular from sub-rounded to rounded elongate inclusions.

Inclusions: abundant foraminifera; rounded plastic argillaceous inclusion

Inclusion orientation: poor alignment of elongate inclusions relative to the margins of the ceramic sample.

Technique: coiling technique and shaped with a tool, probably while sitting on a slow rotating turntable.





9.8 DISCUSSION

As shown in the previous descriptions, all of the ceramic samples, except for the askos FA2, are characterisd by abundant foraminifera. As well as indicating the firing temperature, as previously discussed, the foraminifera indicate the origin of the clay source, which tells us where the inhabitants of Finocchito might have collected the clay. These samples belong to Fabrics 1 and 4 (Table 9.4), and as argued in the previous chapter, probably represent local fabrics.

Table 9. 4 Samples with abundant foraminifera

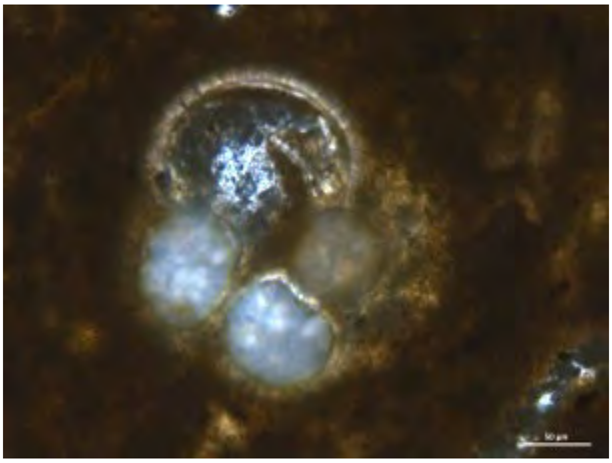
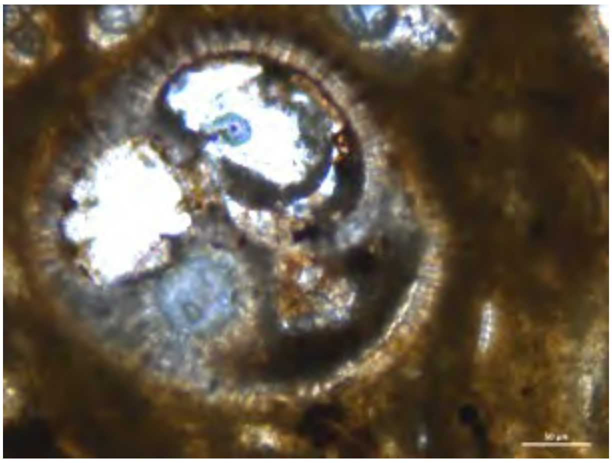
Sample	Fabric
FB6	Fabric 1
FB38	Fabric 1
FB41	Fabric 1
FB43	Fabric 1
FB44	Fabric 1
FC6	Fabric 1
FPx2	Fabric 1

Identification of the foraminifera by Dr Barry Fordman (pers. comm.) show that they have an age of Mid-Miocene to present. In particular, he identified as certainly related to this period the following foraminifera: Truncorotalia Truncatulinoides, Praeorbulina Glomerosa and Truncorotalia (Table 9.5). The geological map of the Hyblaean Plateau (southeastern Sicily) shows the Tellaro River Formation, a grey marl (calcareous clay) with abundant foraminifera of mid-Miocene age (Pedley 1981, 279-281), outcrops around the flanks of Monte Finocchito (Figure 9.14) (Di Stefano et al. 2008; Di Stefano et al. 2011). The lithology and foraminifera in this unit correspond to those recorded in the ceramic samples from Finocchito, suggesting that the source of the clay for the Monte Finocchito pottery (Fabrics 1 and 4) derived from the flanks of the Hyblaean Plateau region where the Tellaro River Formation outcrops. In particular, the outcrops of the Tellaro River Formation along the eastern side of the valley are close to Monte Finocchito, so it is plausible that the pottery clay might derive from one or more quarries in the steep sides of the Plateau (Figure 9.14).

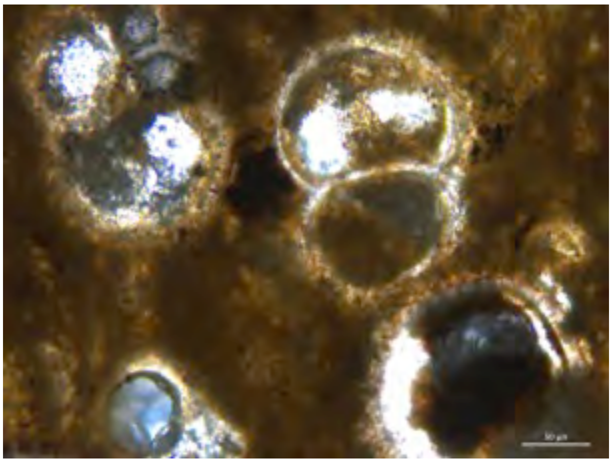
With regard to sample FA2 (Fabric 3), which contains abundant volcanic fragments different from those in the other fabrics and no foraminifera, the clay source unit may have been different. There are two nearby volcanic areas in southeastern Sicily, Etna (volcano) and Monte Lauro (Figure 9.14). The Monte Lauro volcanic area is as close as

20-25 km northwest of the Finocchito necropolis. Therefore, the clay source of FA2 (Fabric 3; chapter 8) may be the closest volcanic area of Monte Lauro, instead of Etna, which is less accessible. However, further studies are required to establish the source of the clay of this fabric.

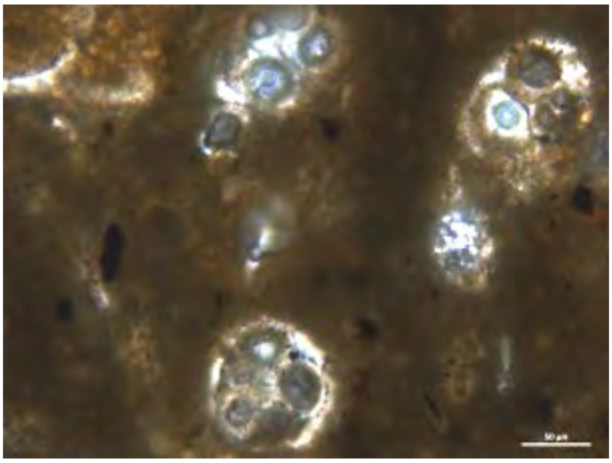
Table 9.5 Foraminifera identification by Dr Barry Fordman

Sample	Foraminifera
FB6	Globigerinid  Globigerinodes/Globoquadrina 

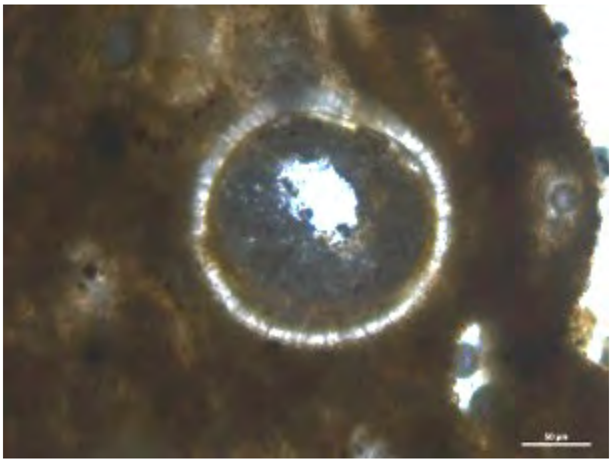
Globigerinids



Globular Turborotaliids

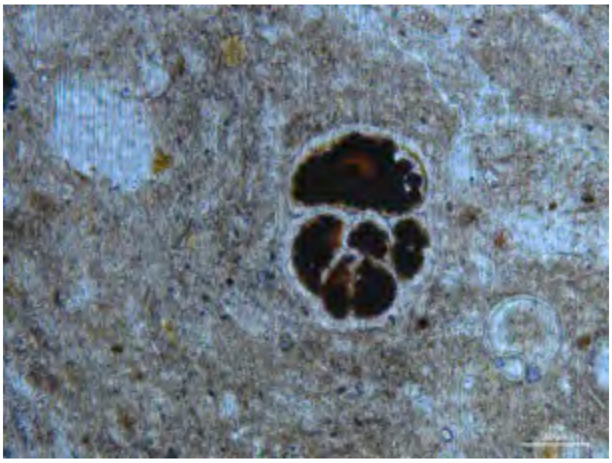


Orbulina

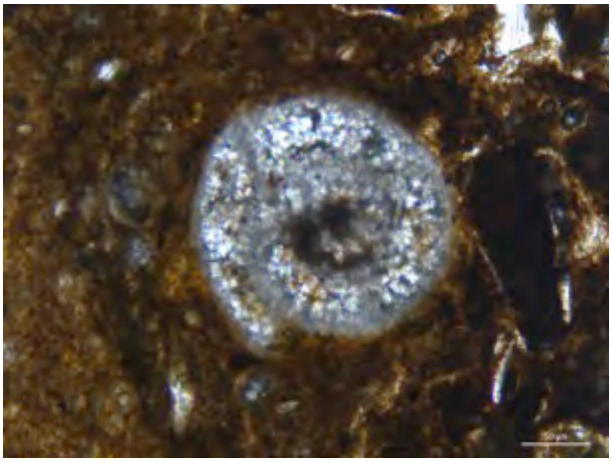


FB38

Praeorbulina curva/sicanus

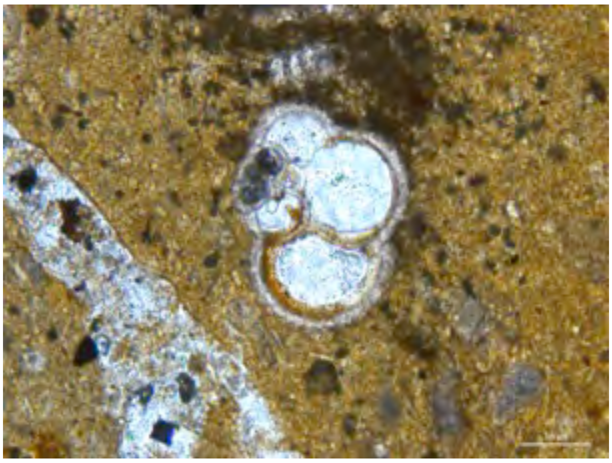


Truncorotalia

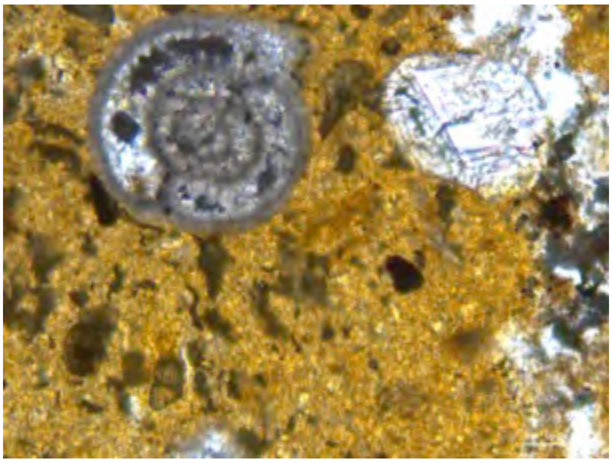


FB41

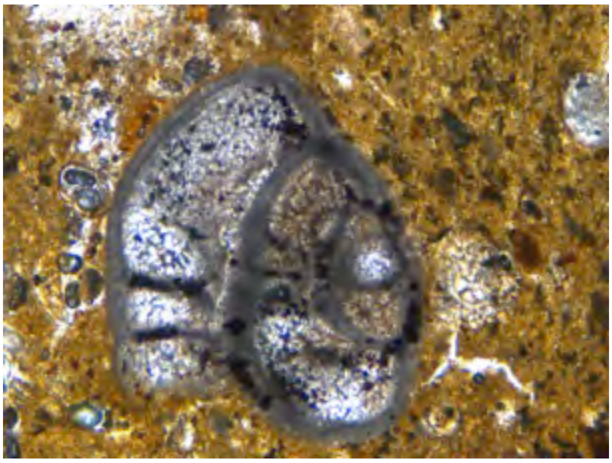
Globigerinella



Truncorotalia Truncatulinoides



Pulleniatina

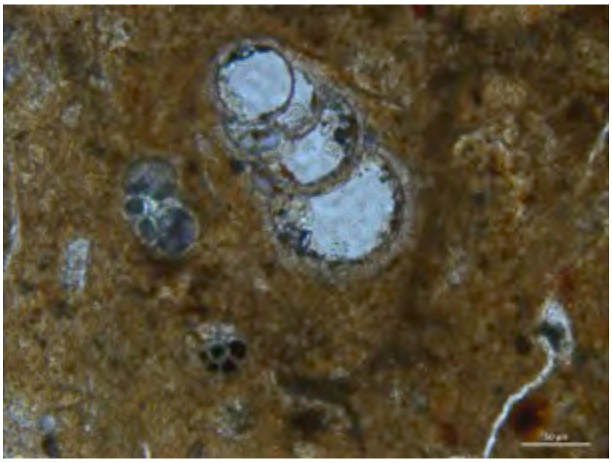


FB43

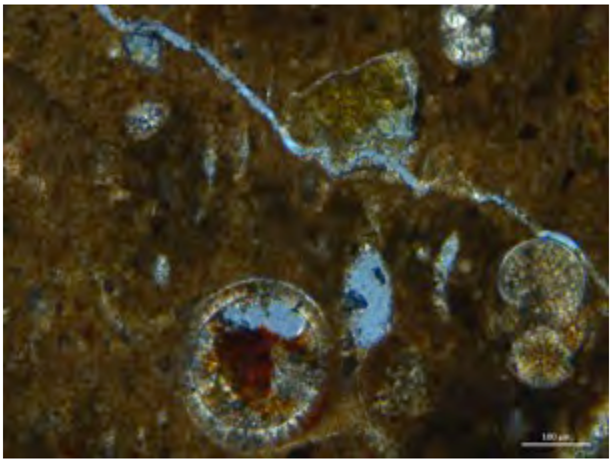
Lenticular benthic

FB44

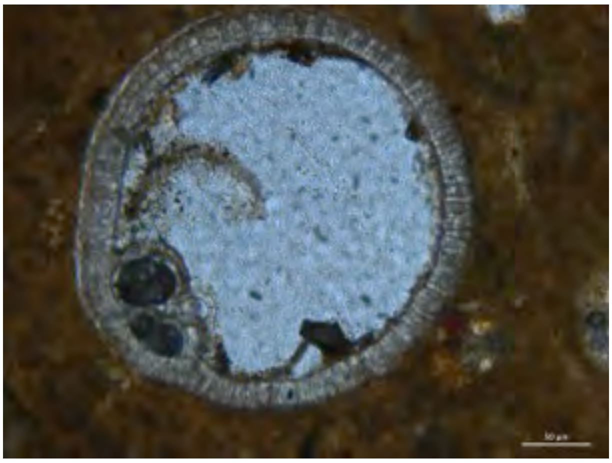
Globular Turborotaliid



Orbulina

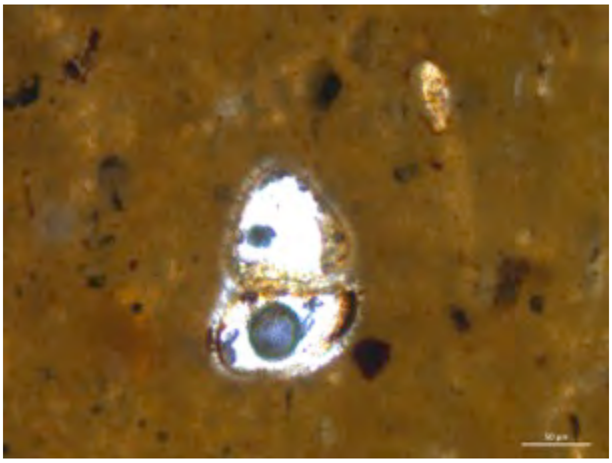


Praeorbulina Glomerosa

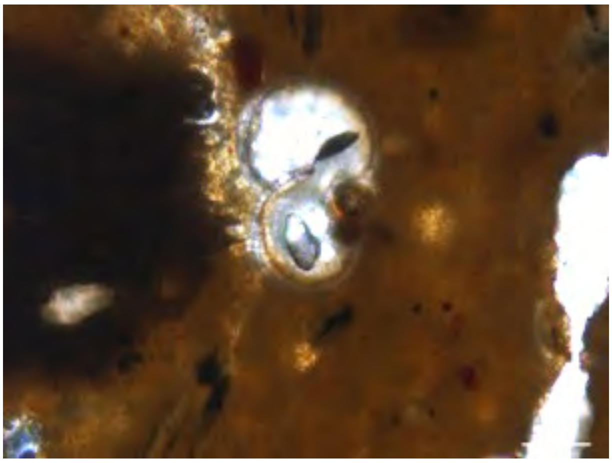


FC6

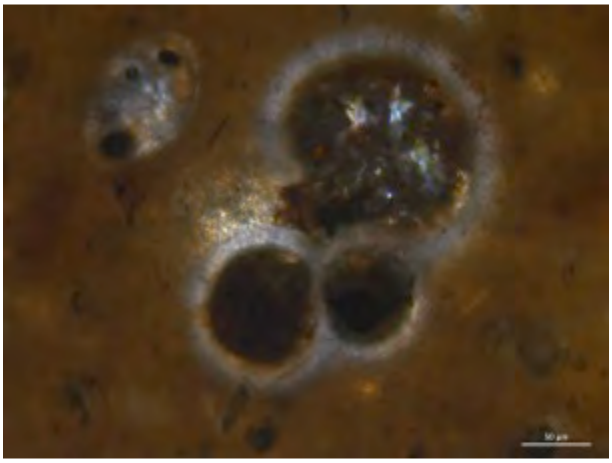
Globoconella with rounded periphery



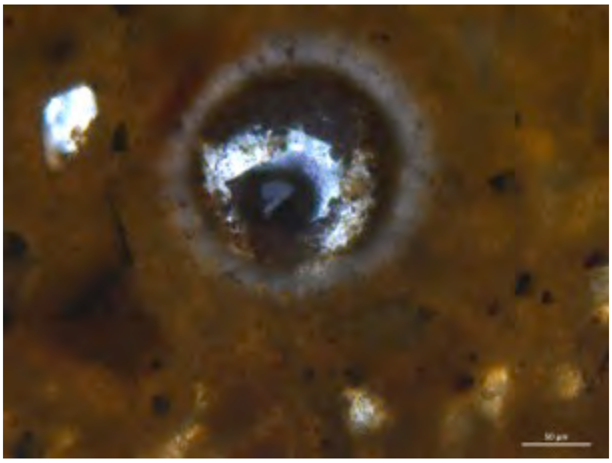
Neogloboquadrina



Turborotaliid



Orbulina/Praeorbulina



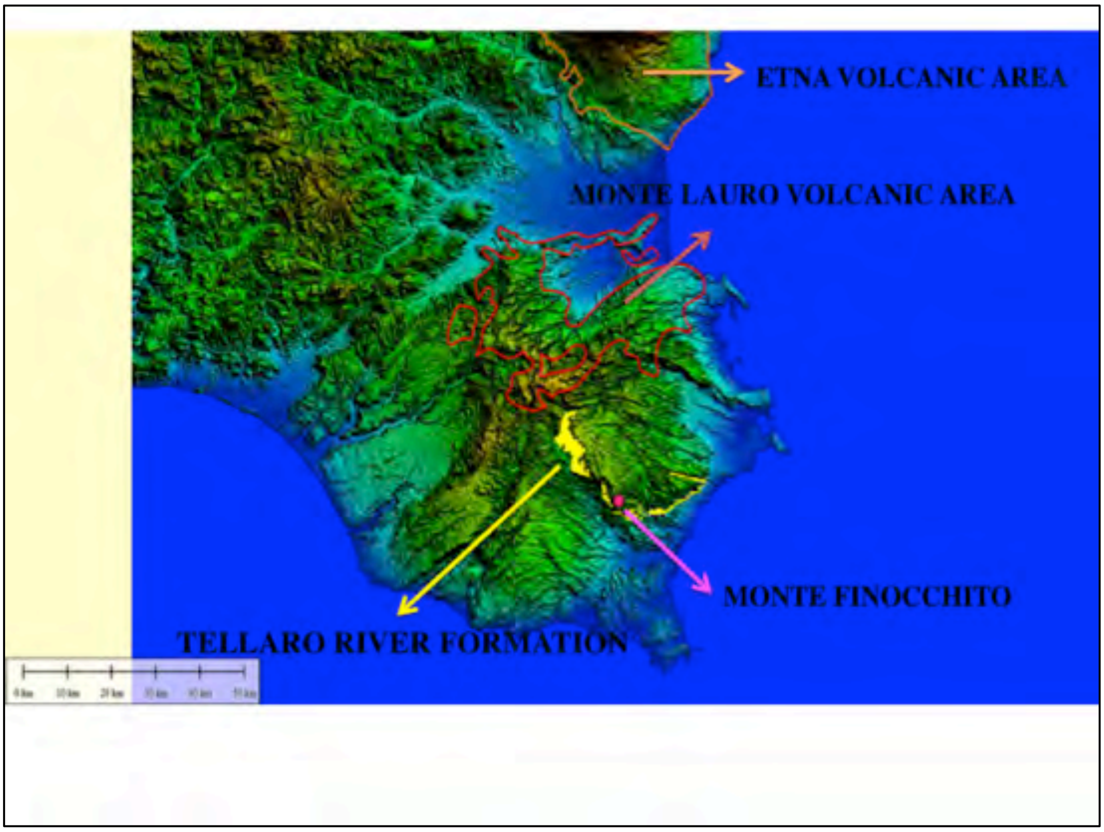


Figure 9. 14 Geological map of southeastern Sicily.

CHAPTER 10

10. CONCLUSIONS

In the late eighth century a process of cultural transformation began in Sicily and it involved the indigenous site of Monte Finocchito (Frasca 1981; Steures 1988). Change in artefacts, which is one of the main kinds of evidence that archaeology has identified as a possible way to detect social interactions, has been documented at Finocchito and it is the reflection of a migration of Greeks towards Sicily. This study has focused on the change in material culture within the indigenous site of Monte Finocchito, and it has definitively identified local ceramics and their fabrics, isolating a small group of non-local pottery. Theories of cultural consumption have been engaged to answer to the main questions involving change in material culture, while archaeometric analyses have been applied to identify variations in techniques and manufacturing as they can reflect social interactions. In particular, this is the first time a study concerning indigenous ceramics from Monte Finocchito of the Early Iron Age and from Heloros has carried out scientific analyses and established that the clay source used was local (chapter 9).

With regard to the archaeometric analyses, this study looked first at the materials and different techniques characterising the indigenous production of ceramics, and then the interpretation of such technological features. The first step, through the support of the portable XRF (pXRF) analyses, was to cluster together ceramic vessels with similar properties, having similar raw material, and then compare different ceramic assemblages using different source clays and technologies. As shown in chapter 7, the general outcome from pXRF analyses suggests that the clay pot-makers used for Finocchito potsherds was the same for the whole period, from the late eighth to the early seventh century BC, and was applied consistently for all of the types analysed. Scatterplot A in chapter 7 (Figure 7.4) shows that the majority of the ceramic types from Monte Finocchito are clustered within the same large group (Finocchito/Giummarito group).

Due to the complexity of the process involving ceramics and the social implications that link production and possible interaction between different groups of pottery-makers (Arnold 1985; Longacre 1999; Costin 2000; Martineau 2001), further petrographic analyses, XRD and thin-section, were employed. Thus, the number of different elements within a pottery sample required multiple and different types of analyses, to better understand the production and manufacturing. As noted in chapter 8, X-ray diffraction

(XRD) analysis detected the presence of two local fabrics (Fabric 1 and Fabric 4 and their sub-fabric groups). A high presence of foraminifera characterises these local fabrics and it allowed, through thin-section analyses, the identification of the Tellaro River valley, which is formed of grey marls with a high percentage of planktonic foraminifera (Pedley 1981, 279-281; Figure 2.7), as the main clay source (Table 9.5; Figure 9.14). XRD and thin-section analyses confirm that indigenous ceramists from Monte Finocchito manufactured ceramic vessels employing similar kinds of clay mixture from the same source and using it for a range of different types of vessels. The technological choices of using the same clay source were probably influenced by the proximity of the raw material and knowledge of the material itself; indigenous ceramists knew how to easily mix inclusions into the clay to create the most effective paste.

With regard to the technique the general outcome from thin-section analyses suggests that the coiling was the main technique used by the indigenous ceramists. For example, all the coarse hand-made bowls were manufactured using the coiling technique. This is shown by the voids and inclusions that appear within the thin-section via a concentric distribution (Table 9.3). On the other hand, fine ceramics, such as FC6, were still made with the coiling technique but most likely finished with the support of a slow rotating turntable, used during the shaping phase, as shown by the gentle horizontal orientation of the rounded and elongated voids in thin-section (Table 9.2). The thin-section results also suggest that indigenous ceramists used open firing. This assumption seems supported by the fact that a high presence of foraminifera was detected in Fabrics 1 and 4 (Figures 9.12 and 9.13). Generally, when the temperature in the firing process exceeds 600 °C the morphology of the microfossils is affected and it precludes an accurate identification of the foraminifera (Santacreu 2014, 94). In this case study, the foraminifera's morphology seems intact, suggesting that the heat was generally low; and therefore it is possible that an open firing, which cannot reach a very high temperature, was employed (Santacreu 2014, 88).

In terms of possible non-local ceramics from Monte Finocchito a small group of pottery was identified. Portable XRF analyses, through the use of the Bruker III-SD instrument, detected the presence of four ceramics (FO13, FM2 FT2, FKO3, FO22 and FU2) that likely were not manufactured at Monte Finocchito. Another small group of possible non-local ceramics was identified through the Olympus Delta Premium hand-held XRF (DP 6000A): askos FA2, bowl FB43, cup FC6 and oinochoe FO33. These three ceramic samples were also subjected to XRD examination (chapter 8) which established that the fabric pertinent to sample FA2 is certainly non-local as well as FO12, FO31 and FO34. In particular, XRD analysis identified two main local fabrics (Fabrics 1 and 4 and their sub-fabrics) and two non-local fabrics (Fabrics 2 and 3). Meanwhile, thin-section analysis established that Fabric 2 is definitively non-local and suggested that those ceramics belonging to this fabric were from one of the closest volcanic areas, such as Monte Lauro or Mount Etna (Figure 9.13). Therefore, the archaeometric results suggest that all of the Greek types from Finocchito were locally made, and that even the clay used for those ceramics from Heloros clustered in Heloros Group A (for example H21 and H213 samples) was probably collected along the outcrops around the flanks of Monte Finocchito (Figure 9.14).

In sum, the general outcome, including the pXRF analyses, suggests that "Greek" types from Monte Finocchito are likely to be locally made and that the clays used for Finocchito's ceramics and Heloros' Group A pots are geologically similar. Thus, thin-section analyses suggest that the source of the clay for the Monte Finocchito pottery (Fabrics 1 and 4) derived from the flanks of the Hyblaean Plateau region where the Tellaro River Formation outcrops. The outcrops of the Tellaro River Formation along the eastern side of the valley are close to Monte Finocchito, so it is very plausible that the pottery clay might derive from one or more quarries in the steep sides of the Plateau.

Based on the fact that the adoption of new types passes through a long learning process and experimentation (Santacreu 2014), it might be possible that these locally made 'Greek' vessels were manufactured by Greek ceramists rather than indigenous pot-makers. In this sense, the paste processing, the forming methods as well as the firing procedures involve a learning system that requires specific knowledge as well as specific potter's skills. As argued in chapter 7, even if a range of ceramists were getting their clay from source geologically similar sources, the Greek ceramists could have been those Greeks occupying Heloros at the end of the eighth century. Thus, wares of Heloros Group A and pottery in Protocorinthian-style from Monte Finocchito used similar clay sources (chapter 7). As Malkin proposes with regard to the Greek immigration in this early phase (Malkin 2016, 289), it might be possible that a small group of Greeks, amongst whom were Greek pottery-makers or even young apprentices, worked in collaboration with local ceramists using clay from local sources (Papadopoulos 1996, 450-461; Raudino et al.

2017).

Because the archaeometric results show a similarity in ceramic types in Protocorinthian-style recorded at Heloros and Finocchito, I suggest that Heloros at the end of the eighth century was occupied by a small group of Greeks who maintained relationships with the indigenous people. It has been also argued that due to the position occupied by the Greek outpost, Heloros was probably a trade centre where merchants from Syracuse and other Sicilian harbours commercialised and exchanged their goods (La Torre 2011, 73; Frasca 2016, 76). In answer to that, on the basis of the archaeometric results, it seems that the absence of actual Greek imports at Monte Finocchito and the presence of only a small group of non-local ceramics (Greek ceramic types manufactured in Sicily but outside Monte Finocchito) are not significant enough to justify substantial trading of ceramics between these groups. However, it still might be possible that in this early phase these two groups established commercial relationships but the primary traded products were not ceramics.As observed in chapter 7, the two Protocorinthian-style cups, FPrc1 and FPrc2, which Frasca classifies as imports (Frasca 1981, 15-17), and the ‘Thapsos’ cups P22 type and the Protocorinthian kotylai P21 type, which Steures classifies as imported Greek pottery, are local. Equally, local ceramics resembling Greek artistic products are recorded at Monte Finocchito, indicating that an interaction between these groups certainly occurred. On the basis of the artefacts it is difficult to assess the type of interactionbetween the indigenous people and the Greeks. The archaeological records suggest that, at least in the late eighth century BC, it may not have been of a primarily commercial nature but it might be possible that these early contacts incorporated the exchange of skilled labour (Raudino et al. 2017). We must bear in mind that we have no evidence thus far that in the late eighth century at Monte Finocchito there were samples of original Greek vessels to imitate.

In this study, the technical aspects have been taken into consideration as one of the major factors that characterise ceramic production. It is possible, as shown in other studies (Santacreu 2014), that different actors actively participated in the manufacturing process – for example, the ceramist who manufactured the vessels and who interacted with the foreign culture and incorporated new models and techniques within his own practice. Buyers, who would be attracted to different shapes, might also had an important role in the market and hence production. Usually, the final product of a ceramic vessel is determined by technological choices made by the ceramist and by techniques or material they used during the production. The availability of raw material and social traditions, as well as innovations brought in through contacts and exchanges, influence the technological choices (Arnold 1985; Matson 1995). Therefore, this study aimed to establish what potential clay sources were available within the Monte Finocchito territory. As shown in the geological map of chapter 9 (Figure 9.14) the eastern side of the Tellaro River valley is formed by grey marls and it corresponds to the area where ceramists collected the clay.

This study required a careful examination to better understand what indigenes from Monte Finocchito adopted from Greeks and which goods were accepted. The general outcome suggests that in this archaeological context indigenous people negotiated their choices in relation to the Greeks and selected what to adopt and adapt in accordance with internal social priorities. The archaeological record shows that only a specific repertoire imitating Greek ceramics was adopted and, as previously observed, it was confined to drinking containers. This suggests that, based on consumption theory (Dietler 2010, 55-56) and, as discussed in chapter 4, a choice was made, and the presence of selected patterns seems to be the reflection of indigenous choices. The indigenous population of Monte Finocchito adopted drinking containers. This new ceramic repertoire was always associated with locally produced ceramics and it was complementary to possible food consumption vessels, such as bowls and plates, of indigenous production. For instance, from the earliest period, the traditional set of ceramics belonging to the funeral sphere of Monte Finocchito was characterised by the presence of large and medium bowls, small plates and drinking vessels, such as oinochoai and cups. This suggests a range of possibilities: it might be that the funeral ritual was characterised by the consumption of food or beverages in general or that possible containers of food offered for the dead. The predominance of bowls and cups implies the importance of liquids or semi-solid food. Large bowls may have been used as containers for liquid or semi-liquid food that was poured and consumed in the smaller bowls or plates, while the drinking, evidenced by the occurrence of jugs and oinochoai, may have been part of the funeral ceremony. Drinking vessels, jugs and trefoil oinochoai were also a common repertoire occurring in the indigenous funeral sphere.

From this perspective, those Greek pottery types which indigenous people adopted were functionally similar to already existing indigenous vessel forms. The Greek beverage containers were important within the Greek symposium and the consumption of wine, which was a component of it (Dietler 1990, 361). Meanwhile, little is known about indigenous rituals and which food or beverage products they consumed (Stika et al. 2008). Therefore, the adoption of Greek drinking containers by the indigenous population might reveal something more, such as that indigenes recognised Greek rituals as familiar. The Greek practice found an existing resonance in indigenous culture, but possibly some adoption of more ‘Greek’ practice also occurred. The Greek ceramic types were adopted within a context that might have already incorporated similar ceremonies with the consumption of food and beverages. It is also perfectly possible that they adopted new practices as a form of differentiation, especially within a potentially competitive funerary arena. These new types incorporated within Monte Finocchito were the reflection of indigenous choices, the result of a conscious appropriation by the indigenes that endorsed the foreign Greek goods, mainly imitation of Greek ceramics, according to values that were locally congruent.

The observation of the change in material culture within Monte Finocchito and the results given by the archaeometric analyses indicate that indigenes and Greeks interacted by sharing knowledge, as they used similar source of clay, shared the resources (for example, the clay) and presumably they created a system for communicating. Thus, it is through the exchange of knowledge, rather than the simple trade of an object, that the integration process began. In this framework, where new vessel forms appeared and technology was adapted to the new requirements, pottery-makers became fundamental protagonists, whose strategies and choices were influenced by technical and social factors that generated the final product. Looking at the final data, I argue that while alterations in form and style of ceramic assemblages and the adoption of new types took place, certain techniques based on specific clays, pastes and fabrics remained quite unchanged for a long time. Thus, the procedures behind the preparation of the paste or the procurement of the clay were very stable amongst the indigenous ceramists of Monte Finocchito. This may have been because such techniques were part of the tradition, as well as due to the high abundance of raw material conveniently in the area which meant no other clay source had to be sought. On the other hand, it might be possible that indigenous people were learning from Greece new techniques to manufacture Greek style pottery. It might be possible that indigenous people showed the available clay source to the Greeks who in turn thought them new manufacturing techniques.

To conclude, the observation of the change in material culture within Monte Finocchito, and the results given by the archaeometric analyses, show that indigenes and Greeks interacted in sharing knowledge and created a system where they were able to communicate. The adoption of new types of drinking containers, particularly important in Greek culture and to which the the indigenous community of Monte Finocchito could relate, may reflect the cultural practices that may have become fundamental communication channels between the two groups. Finally, the sharing of techniques in ceramic manufacturing and using the same clay source implies social interactions and transmission of knowledge.

Monte Finocchito provides a specific case study that could also become a model to use in understanding the variety and the modalities of the relationships between indigenes of southeastern Sicily and Greeks in their early phases. However, much has still to be explored and future research can make further contributions, especially by analysing ceramics from other indigenous and Greek sites. Thus, it would very useful to extend the petrographic analysis to other Sicilian indigenous sites in this early phase of contacts with the Greeks. Further examination of Fabrics 2 and 3 could be worthwhile to clarify the specific origin of the clay source and explore territorial connections amongst indigenes. The application of the same approach in studying other indigenous sites, especially in southeastern Sicily, may allow us to finally establish the role indigenes had when they interacted with Greeks in the late eighth century and, more importantly, to better understand the modalities of their interactions.

CATALOGUE

The catalogue lists the ceramics subjected to the archaeometric analyses. In the catalogue, each sample is identifiable by an initial letter F (Finocchito), G (Giummarito) and H (Heloros), followed by a second letter descring the typology (e.g. B) and a serial number (e.g. FB1: F=Finocchito; B=Bowl; 1=serial number). Unique/*Unicum* are those ceramic samples that can't be related to any shapes (e.g. FU; GU). The catalogue also shows the Paolo Orsi museum's inventory number (Inv. or Inv. na=no inventory number). and the tomb of origin (T.), for example Inv. 13215-T. 4 East or Inv. na-T. 4 East. If a ceramic sample, even if suitable for the archaeometric analysis, was too fragmented, the photo is replaced with Steures' drawings. The drawing matches with the piece I analysed which has become more damaged since the Steures publication.

FINOCCHITO

FA	Askos
FB	Bowl
FC	Cup
FKO	Kotyle
FKY	Kyathos
FM	Miniaturistic oinochoe
FO	Oinochoe
FPL	Plate
FPrc	Protocorinthian-style cup
FPx	Pyxis
FT	'Thapsos' cup (probably imitations)
FU	Unique/*Unicum*

GIUMMARITO

GB	Bowl
GJ	Jug
GU	Unique/*Unicum*

HELOROS

H	Fragments of ceramics from Heloros (drinking cups)

MONTE FINOCCHITO **Inv. sample-Tomb**

ASKOS

FA1 Inv. 13208-T. 28 East

FA2 Inv. 13136-T.2 West

FA3 Inv. 16725-T. 91 North-West

BOWL

FB1 Inv. 13215-T. 3 West

(Steures 1980, 69)

FB2 Inv. na.-T. 26 East

FB3 Inv. na-T. 40 South

FB4 Inv. na.-T. 27 East

FB5 Inv. na.-T. 57 South

FB6

Inv. 13232-T. 44 South

(Steures 1988, 9)

FB7

Inv. 13241-T. 52 South

FB8

Inv. 16716-T. 83 North-West

FB9

Inv. 16731-T. 93 North-West

FB10

Inv. 16715-T. 89 North-West

FB11 Inv. na.-T. 89 North-West

FB12 Inv. 13247-T. 53 South

FB13 Inv. 13188-T. 23 East

FB14 Inv. 13189-T. 23 East

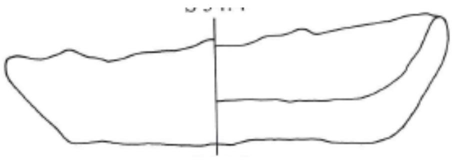
FB15 Inv. na.-T.23 East

FB16 Inv. na.-T.29 North-West

FB17 Inv. 13237 bis-T. 51 South

FB18 Inv. 16848-T. 72 North

FB19 Inv. na.-T. 54 South



(Steures 1980, 55)

FB20 Inv. na.-T. 57 South

FB21 Inv. na.-T. 7 North

FB22 Inv. 13098-T. 1 East

FB23 Inv. 13099-T. 1 East

FB24

Inv. 13249-T. 54 South

FB25

Inv. 16760-T. 17 North

Inv. 16818-T. 49 North

FB26

FB27

Inv. 16841-T. 58 North

FB28 Inv. 16660-T. 35 North-West

FB29 Inv. na.-T. 28 East

FB30 Inv. 16750-T. 14 North

FB31 Inv. na.-T. 22 East

FB32 Inv. na.-T. 27 East

FB33 Inv. na.-T. 3 East

FB34 Inv. na.-T. 39 South

FB35 Inv. na.-T. 51 South

FB36

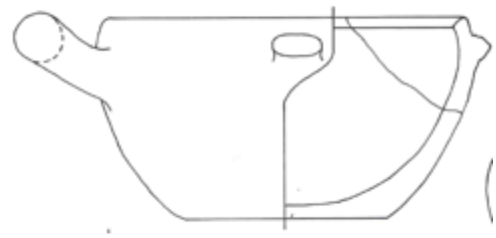
Inv. na.-T. 80 North - West

FB37

Inv. na.-T. 53 South

FB38

Inv. 16713-T. 88 North-West



(Steures 1980, 107)

FB39

Inv.na.-T.39 South

FB40 Inv. 16615-T.3 North-West

(Steures 1980, 75)

FB41 Inv.16695-T.72 North-West

(Steures 1980, 103)

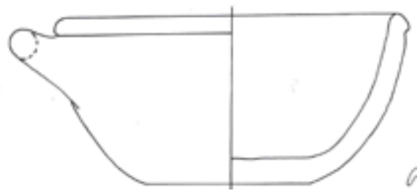
FB42 Inv. 13118-T.13 East

FB43

Inv. na.-T.55 South

FB44

Inv. 16655-T. 25 North-West



(Steures 1980, 87)

CUP

FC1 Inv. na.-T. 40 South

FC2 Inv. 16786-T. 37 North

FC3 Inv. na.-T. 22 North-West

FC4 Inv. 16714-T. 89 North-West

FC5 Inv. 13239-T. 51 South

FC6 Inv. na.-T.32 North

KOTYLE

FKO1 Inv. na.-T. 30 North

FKO2 Inv. 16801-T. 44 North

FKO3 Inv. na.-T. 1 North-West

FKO4 Inv. 13220-T. 38 South

KYATHOS

FKY1 Inv. 16758-T. 16 North

FKY2 Inv. 13284-T. 62 S. Fr.

FKY3 Inv. 16650-T. 29 North-West

FKY4 Inv. na.-T. 51 South

FKY5 Inv. 16633-T. 13 North-West

FKY6 Uncertain Tomb

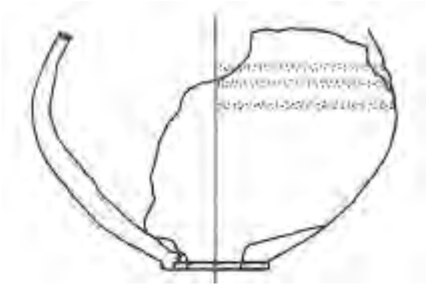
MINIATURISTIC OINOCHOE

FM1 Inv. 13271-T. 61 S. Fr.

FM2 Inv. 16651-T. 29 North-West

OINOCHOE

FO1 Inv. na.-T. 28 East



(Steures 1980, 43)

FO2 Inv. 16757-T. 16 North

FO3 Inv. 16614-T. 3 North-West

FO4 Inv. 16800-T. 43 North

FO5 Inv. 16738-T.4 North

FO6 Inv. 16669-T. 45 North-West

FO7 Inv. 16694-T. 72 North-West

FO8 Inv. 16733-T.93 North-West

FO10 Inv. 13279-T. T. 62 S. Fr.

FO11

Inv. 16690-T. 71 North-West

FO12

Inv. na.-T. 61 San Francesco.

FO13

Inv. 16658-T. 31 North-West

FO14

Inv. 16794-T. 41 North

FO15 Inv. 16761 – T. 17 North

FO16 Inv. 13167-T. 15 East

FO17 Inv. 16780-T. 35 North

FO18 Inv. na.-T. 29 North-West

FO19 Inv. 13190-T. 24 East

FO20

Inv. 13191-T. 24 East

FO21

Inv. na.-T. 45 North

FO22

Inv. 16811-T. 45 North

FO23

Inv. 16810-T. 45 North

FO24

Inv. 13239-T. 51 South

FO25

Inv. 16847-T. 72 North

FO26

Inv. 16734-T. 93 North-West

FO27

Inv. 13109-T. 7 East

FO28

Inv. 13273-T. 61 San Francesco

FO29

Inv. 13166-T. 15 East

FO30

Inv. 13250-T. 54 South

FO31

Inv. na.-T.66 North-West

FO32 Inv.na-T.32 North

FO33 Inv. na.-T.2 North

FO34 Inv. 16759-T. 16 North

(Steures 1980, 121)

PLATE

FPL1 Inv. 16731-T.93 North-West

PROTOCORINTHIAN-STYLE CUP

FPrc1

Inv. 16688-T. 71 North-West

FPrc2

Inv. 13281-T. 62 S. Fr.

FPrc3

Inv. 13274-T. 61 S. Fr

FPrc4

Inv. 13258-T. 60 S. Fr

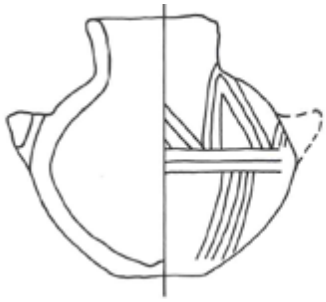
PYXIS

FPx1

Inv. 13163-T. 19 East

FPx2

Inv. 13162-T.19 East



(Steures 1980, 35)

FPx3

Inv. 13245-T. 53 South

‘THAPSOS’ CUP

FT1

Inv. 16821-T. 50 North

FT2

Inv. 16823-T. 52 North

FT3

Inv. 16776-T. 32 North

FINOCCHITO UNICUM

FU1 | Inv. 16849-T. 74 North

FU2 | Inv. na.-T. 20 East

GIUMMARITO

BOWL

GB Inv. 16584-T.13

JAR

GJ1 Inv. 16585-T. 13

GJ2 Inv. 16587-T. 13

GJ3 Inv. 16588-T.13

GIUMMARITO UNICUM

GU1 Inv. 16590-T. 13

GU2 INV.16583-T. 13

HELOROS

H1 Inv. II Eloro E1

H20 Inv. II Eloro 215

H21 Inv. II Eloro 212 VI/40

H23 Inv. II Eloro 225

H30 Inv. II Eloro 185C

H32 Inv. II Eloro 213A

H33 Inv. II Eloro 166B

H34 Inv. II Eloro 206A

H41 Inv. II Eloro 203B

H42

Inv. II Eloro 167 B

H43

Inv. II Eloro 17A

H45

Inv. II Eloro 203B

H46

Inv. II Eloro 211

H48

Inv. na.

H49

Inv. II Eloro 213A

H50

Inv. II Eloro 203/VIII 2

H51

Inv. II Eloro 213A VI/30

H52

Inv. na.

H55

Inv. II Eloro 203B V/A2

H56 Inv. II Eloro 203/B V/A3

H62 Inv. II Eloro 175 IX-2

H168A Inv. II Eloro 168/A

H168B Inv. II Eloro 168/B

H168 C Inv. II Eloro 168/C

H173A Inv. II Eloro 173/A

H173B Inv. II Eloro 173/B

H156

Inv. na.

H183

Inv. II Eloro 183A

H201

Inv. II Eloro 201

H213

Inv. II Eloro 213

BIBLIOGRAPHY

Abu El-Haj, N. 2001, *Facts on the Ground: Archaeological Practice and Territorial Self Fashioning in Israeli Society*, The University of Chicago Press, Chicago.

Adamesteanu, D. 1956, “Le fortificazione ad aggere nella Sicilia centro-meridionale”, *Rendiconti Accademia Nazionale dei Lincei* 8(11), 358-372.

Adamesteanu, D. 1958, “Butera: Piano della Fiera, Consi e Fontana Calda”, *Monumenti Antichi* 44, 205-672.

Agostiniani, L. 2012, “Alfabetizzazione della Sicilia pregreca”, in G. Bagnasco and F. Cordano (eds), *Convivenze Etniche e Contatti di Culture. Atti del Seminario di Studi Università degli Studi di Milano (23-24 Novembre 2009), Aristonothos (Scritti per il Mediterraneo Antico)* 4, Tangram Edizioni, Trento, 139-164.

Agozzino, P. 2005, “Preliminary report on gas chromatography analysis of residues in storage vessels (1)”, *Memoirs of the American Academy of Arts and Sciences* 48, 298-302.

Åkerström, Å. 1943, *Der geometrische Stil in Italien. Archäologische Grudlagen der frühesten historischen Zeit Italiens*, Acta Institutu Romani Regni Suecuae, IX, Upsala.

Alaimo, R., Giarrusso, R., Montana, G. and Quinn, P. S. 2007, “Petrographic and Micropalaeontological Data in support of a Sicilian Origin for the Statue of Aphrodite”, *Workshop on the Cult Statue of a Goddess Summary of Proceedings from a Workshop Held at the Getty Villa on May* 9, 2007, 23-28.

Albanese Procelli, R. M. 1977, “Le etnie dell’Età del Ferro e le prime fondazioni coloniali”, in S. Tusa (ed.), *Prima Sicilia. Alle origini della società siciliana: Albergo dei Poveri, Palermo 18 Ottobre-22 Dicembre 1997*, vol. 2, Ediprint, Syracuse, 511-520.

Albanese Procelli, R. M. 1978, “Avola Antica”, *Studi Etruschi* 46, 569-571.

Albanese Procelli, R. M. 1991, “Importazioni greche nei centri interni della Sicilia in età arcaica: aspetti dell’acculturazione”, *Cronache di Archeologia e Storia dell’Arte, Università di Catania* 30, 97-111.

Albanese Procelli, R. M. 1995, “Contacts and exchanges in Protohistoric Sicily”, in T. Fischer-Hansen (ed.), *Ancient Sicily. Acta Hyperborea 6*, Museum Tusculanum Press, University of Copenhagen, Copenhagen, 33-49.

Albanese Procelli, R. M. 2003, *Sicani, Siculi, Elimi: forme d’identità, modi di contatto e processi di trasformazione*, Longanesi, Milano.

Albanese Procelli, R. M. 2009, “La céramique grise monochrome en Sicile à l’Âge Archaïque”, *Pontica (Supplement I: Pontic Grey Wares)* 42(1), 327-340.

Allen, H. 1977, “Distribution of Pottery Styles in Greece, South Italy and Sicily and the Pantalica III Chronology”, *American Journal of Archaeology* 81, 365-368.

Amaral, P. M., Cruz F. J. and Guerra R. L. 2006, “A comparison between X-ray Diffraction and Petrography Techniques used to determine the Mineralogical Composition of Granite and Coomparble Hard Rocks”, *Materials Science Forum* 514-516, 1628-1632.

Anderson, B. 1991, *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, Verso, London.

Angelo, M. 1997, “The Sikh Diaspora: Tradition and change in an immigrant community”, in N. G. Franklin (ed.), *Asian Americans. Reconceptualizing Culture, History, Politics*, Garland Publishing, New York, 3-249.

Antonaccio, C. 2001, “Ethnicity and Colonization”, in I. Malkin (ed.), *Ancient Perceptions of Greek Ethnicity*, Center for Hellenic Studies Colloquia 5, Harvard Press, 113-157.

Antonaccio, C. 2003, “Hybridity and the cultures within Greek culture”, in C. Dougherty and L. Kurke (eds), *The Cultures Within Ancient Greek Culture: Contact, Conflict, Collaboration*, Cambridge University Press, Cambridge, 57-74.

Antonaccio, C. 2004, “Siculo-Geometric and Sikels: ceramics and identity in eastern Sicily”, in B. B Shefton and K. Lomas (eds), *Greek identity in the Western Mediterranean*, Brill, Leiden and Boston, 55-81.

Antonaccio, C. 2009, “(Re) Defining Ethnicity: Culture, Material Culture, and Identity”, in T. Hodos and S. Hales (eds), *Visual Culture and Social Identity in the Ancient Mediterranean*, Cambridge University Press, Cambridge, 32-53.

Appadurai, A. 1986, “Introduction: commoditie and the politics of value”, in A. Appadurai (ed.), *The Social Life of Things: Commodities in Cultural Prospective*, Cambridge University Press, Cambridge, 3-36.

Arnold, B. 1990, “The Past as Propaganda: Totalitarian Archaeology in Nazi Germany”, *Antiquity* 64(244), 464-479.

Arnold, B. 2006, “Arierdammerung: Race and Archaeology in Nazi Germany”, *World Archaeology* 38(1), 8-31.

Arnold, D. 1985, *Ceramics theory and cultural process*, Cambridge University Press, New York.

Arnold, D. 1999, “Does the standarization of ceramic pastes really mean standarization?”, *Journal of Archaeological Method and Theory* 7, 333-375.

Asheri, D. 1980, “La colonizzazione greca”, in E. Gabba and G. Vallet (eds), *La Sicilia antica* I(1): *Indigeni, Fenici-Punici e Greci*, Società Editrice Storia di Napoli e della Sicilia, Naples, 89-142.

Avraham, Z. B. and Grasso, M. 1991, “Crustal structure variations and transcurrent faulting at the eastern and western margins of the eastern Mediterranean”, *Tectonophysics* 169(3-4), 269-277.

Baldacci, L. 1886, *Descrizione Geologica dell’Isola di Sicilia*, Tipografia Nazionale, Rome.

Barbanera, M. 2015, *Storia dell'archeologia classica in Italia, dal 1764 ai nostri giorni*, Laterza, Bari.

Barone, G., Crupi, V., Longo, F., Majolino, D., Mazzoleni, P., Tanasi, D. and Venuti, V. 2010, "FT-IR spectroscopic analysis to study the firing process of prehistoric ceramics", *Journal of Molecular Structure* 993, 147-150.

Barone, G., Mazzoleni, P., Tanasi, D. and Veca C. 2011, "La tecnologia della produzione ceramica nel Bronzo Medio siciliano: il caso dei pithoi di Monte San Paolillo (Catania)", *Rivista di Scienze Preistoriche* 61, 173-196.

Barth, F. 1969, *Ethnic Groups and Boundaries: The Social Organisation of Culture Difference*, Waveland Press Inc., Illinois.

Baxter, M. J. 1994, "Standardization and Trasformation in Principal Component Analysis, with Applications to Archaeometry", *Journal of the Royal Statistical Society* 44(4), 513-527.

Belfiore, C. M., Di Bella M., Triscari M. and Viccaro, M. 2010, "Production technology and provenance study of archaeological ceramics from relevant sites in the Alcantara River Valley (North-eastern Sicily, Italy)", *Materials Characterization* 61, 440-451.

Beloch, K. J. 1912, *Griechische Geschichte I*, Erster Band, Strassburg.

Ben Avraham, Z. and Grasso, M. 1990, "Collisional zone segmentation in Sicily and surrounding areas in the Central Mediterranean", *Annales Tectonicae* 4(2), 131-139.

Bérard, J. 1941, *La colonisation grecque de l'Italie méridionale et de la Sicile dans l'Antiquité, l'historie et la Légend*, De Boccard, Paris.

Berlinzani, F. 2012, *Convivenze etniche, scontri e contatti di culture in Sicilia e Magna Grecia*, Tangram Edizioni Scientifiche, Trento.

Bernabò Brea, L. 1953-1954, "La Sicilia Prehistórica y sus relaciónes con Oriente y con la península Ibérica", *Ampurias* 15-16, 120-126.

Bernabò Brea, L. 1956, *Akrai*, Società di Storia Patria per la Sicilia Orientale, Catania.

Bernabò Brea, L. 1957, *Sicily before the Greeks*, Praeger, New York.

Bernabò Brea, L. 1958, *La Sicilia prima dei Greci*, Il Saggitore Editore, Milano.

Bernabò Brea, L. 1964-1965, “Leggenda ed Archeologia nella protostoria siciliana”, *Kokalos* 10, 10-11.

Bernabò Brea, L. 1967, “La necropoli di Longane”, *Bullettino di Paletnologia Italiana*, 18(76), 181-254.

Bernabò Brea, L. 1986, *Il Tempio di Afrodite di Akrai*, Centre Jean Bérard, Naples.

Bernabò Brea, L. and Cavalier, M. 1980, *Meligunìs Lipára: L’acropoli di Lipari nella preistoria*, Flaccovio, Palermo.

Bertolani Marchetti, C. A., Accorsi, D., Arobba, M., Bandini Mazzanti, M., Bertolani, E., Blondi, G., Braggio, C., Ciuffi, T., De Cunzo, S., Della Ragione, L., Foriani, A. M., Guido, F., Lolli, C., Montanari, P., Paoli, F. M., Raimondo, M. and Rossitto, G. 1984, “Recherches géobotaniques sur les Monts Madonie (Sicile du Nord)”, *Geobotanical researches on Madonie mountains* 38(1), 329-348.

Bhabha, H. K. 1990, “The third space”, in J. Rutherford (ed.), *Identity: community, culture, difference,* Lawrence & Wishart, London, 207-221.

Bhabha, H. K. 1994, *The Location of Culture*, Routledge, London and New York.

Bianchi Bandinelli, R. 1976, *Introduzione all’archeologia come storia dell’arte antica*, Laterza, Bari.

Bietti Sestieri, A. M. 1979, “I processi storici nella Sicilia orientale tra la tarda Età del Bronzo e gli inizi dell’Età del ferro sulla base dei dati archeologici”, *Il Bronzo finale in Italia: Atti della XXI riunione scientifica dell’Istituto Italiano di Preistoria e Protostoria*, Istituto Italiano di Preistoria e Protostoria, Florence, 599-629.

Bietti Sestieri, A. M. 2009, “Specificità e trasformazioni del ruolo della Sicilia nell’interazione mediterranea tra l’Età del Bronzo e l’Età del ferro”, in C. Ampolo (ed.), *Immagine e immagini della Sicilia e di altre isole del Mediterraneo antico,* Edizioni della Normale, Pisa, 421-36.

Binford, L. R. 1965, “Archaeological systematics and the study of culture process”, *American Antiquity* 31, 203-210.

Bisculum, M., Colombaroli, D., Vescovi, E., Van Leeuwen, J. F. N., Henne, P. D., Rothen, J., Procacci, G., Pasta, S., La Mantia, T. and Tinner, W. 2012, “Holocene vegetation and fire dynamics in the supra-mediterranean belt of the Nebrodi Mountains”, *Journal Quaternary Science* 27(7), 687-698.

Blakeway, A. 1932-1933, “Prolegomena to the study of Greek Commerce with Italy, Sicily and France in the 8th and 7th Centuries B.C.”, *Annual of the British School at Athens* 33, 170-208.

Boardman, J. 1964, *Greek Art*, Thames and Hudson, New York.

Boardman, J. 1980, *The Greeks Overseas: Their Early Colonies and Trade*, Thames and Hudson (1st ed.), New York.

Boardman, J. 2006, *The History of Greek Vases*, Thames and Hudson, New York.

Bonforte, A., Catalano, S., Maniscalco, R., Pavano, F., Romagnoli, G., Sturiale, G. and Tortorici, G. 2015, “Geological and Geodetic Constraints on the Active Deformation along the Active Northern Margin of the Hyblaean Plateau”, *Tectonphysics* 640-641, 80-89.

Bouloumié, B. 1981, “Le vin étrusque et la première hellènisation du Midi de la Gaule”, *Revue Archéologique de l’Est* 32, 75-81.

Bourdieu, P. 1984, *Distinction: A Social Critique of the Judgement of Taste*, Harvard University Press, Cambridge (Massachusetts).

Bradley, R. 1999, *Paleoclimatology*. *Reconstructing Climates of the Quaternary*, University of Massachusetts, Amherst (Massachusetts).

Braudel, F. 1979, *Civilization and Capitalism, 15th-18th Century: The perspective of the world* (vol. 3), Collins, London.

Braun, D. 1983, “Pots and tools”, in J. A. Moore and A. S. Keene (eds), *Archaeological Hammers and Theories*, Academic Press, New York, 107-134.

Bray, L. T. 1995, “The Panzaleo Puzzle: Non-Local Pottery in Northern Highland Ecuador”, *Journal of Field Archaeology* 22(2), 137-156.

Brokaw, C. 1964, “The Dating of the Protocorinthian Kotyle”, in L. F. Sandler (ed.), *Essays in Memory of Karl Lehmann*, Institute of Fine Arts, New York, 49-54.

Bronitsky, G. 1986, “The use of materials science techniques in the study of pottery construction and use”, *Advances in Archaeological Method and Theory* 9, 209-276.

Brunet de Presle, W. 1845, *Recherches sur les ètablissements grecs en Sicile*, Imprimerie Royale, Paris.

Buchner, G. 1975, “Nuovi aspetti e problemi dagli scavi di Pithecusa con particolari considerazioni sulle oreficerie di stile orientalizzante antico”, in P. Auberson (ed.), *Contribution à l’étude de la Société et de la colonisation eubéennes* 78, Centre Jean Bérard, Naples, 59-86.

Buchner, G. and Ridgway, D. 1993, *Pithekoussai I. La necropoli: Tombe 1-723 scavate dal 1952 al 1961*, Monumenti Antichi (Serie monografica e miscellanea), Bretschneider, Roma.

Calò, C., Henne, P., D., Curry, B., Magny, M., Vescovi, E., La Mantia, T., Pasta, S., Vannière, B. and Tinner, W. 2012, “Spatio-temporal patterns of Holocene environmental change in southern Sicily”, *Palaeogeografy, Palaeoclimatology, Palaeoecology* 323-325, 110-122.

Canciani, F. 1974, Corpus Vasorum Antiquorum. Museo Archeologico Nazionale Tarquinia, *Italia* 55(3), 43.

Carr, E. H. 1961, *What is History?*, Penguin, London.

Cavallari, F. S. 1887, “Cava Ruccia”, *Notizie degli Scavi*, 301-304.

Childe, V. G. 1956, *Piecing together the past: the interpretation of archaeological data*, Routledge and Paul, London.

Ciaceri, E. 1924, *Storia della Magna Grecia: La fondazione delle colonie greche e l'ellenizzamento di città nel'Italia antica 1*, Dante Alighieri, Roma.

Clarke, D. L. 1968, *Analytical Archaeology*, Methuen, London.

Cluverio F. 1619, *Sicilia antiqua cum minoribus insulis ei adiacentibus*, Ex officina Elseviriana, Lugduni Batavorum.

Cohn, B. 1996, *Colonialism and its forms of knowledge: The British in India*, Princeton University Press, Princeton.

Coldstream, J. N. 2003, *Geometric Greece 900-700 BC*, Routledge (2nd ed.), London.

Colloredo Mansfeld, R. 2005, " 'Dirty Indians'. Radical Indìgenas, and the Political Economy of Social Difference in Modern Ecuador", *Bulletin of Latin American Research. Journal of the Society for Latin American Studies* 17(2), 185-205.

Comaroff J. L. and Comaroff, J. 1997, *Of Reveletation and Revolution (vol. 2). The Dialects of Modernity on a South African Frontier,* University of Chicago Press, Chicago.

Compton, R. R. 1962, *Manual of Geology*, Wiley, New York.

Cook, R. M. 1997, *Greek Painted Pottery*, Routledge (3rd ed.), London and New York.

Cook, R. M. and Dupont, P. 1998, *East Greek Pottery*, Routledge, London and New York.

Cooper, E. 2002, *Ten Thousand Years of Pottery*, British Museum Press, London.

Cooper, J. M. 2007, *Traditions in profile. A Chronological Sequence of Western Sicilian ceramics (7th- 6th BC.)*, (unpublished Doctoral dissertation), Buffalo, New York.

Copani, F. 2010, "Greci e indigeni ad Eloro", in H. Tréziny (ed.), *Grecs et indigènes de la Catalogne à la Mer noire: actes des recontres du programme européen Ramses (2006-2008),* Centre Camille Jullian, Paris, 689-693.

Cordsen, A. 1995, “The Pastas House in Archaic Greek Sicily”, in T. Fischer-Hansen (ed.), *Ancient Sicily. Acta Hyperborea 6*, Museum Tusculanum Press, University of Copenhagen, Copenhagen, 103-121.

Costin, C. 2000, “The use of Ethnoarchaeology for the Archaeological Study of Ceramic Production”, *Journal of Archaeological Method and Theory* 7(4), 377-403.

Cowgill, G. L. 1972, “Models, methods and techniques for seriation”, *Models in Archaeology*, 381-424.

Currò, M. T. 1965, “P. Orsi, Eloro. I. Campagna di scavo del 1899”, *Monumenti Antichi* 47, 206-287.

Curty, O. 1995, “Les parentés légendaires entre cités grecques. Catalogue raisonné des inscriptions contenant le terme suggeneία et analyse critique”, *Topoi. Orient-Occident* 8(1), 331-334.

D’Agostino, B. 1970, “Tombe della prima età del Ferro a San Marzano del Sarno”, *Mélanges de l’École Française de Rome* 82(2), 571-619.

D’Agostino, B. 1974, “La civiltà del ferro nell’Italia meridionale e nella Sicilia”, *Popoli e Civiltà dell’Italia Antica* 2, 1-91.

D’Agostino, B. 1982, “La ceramica greca o di tradizione greca nell’VIII sec. in Italia meridionale”, *La céramique*, 55-68.

Day, Z. 2016, “Preliminary Studies in Using X-Ray Diffraction for Analyzing the Atomic Structure of Central Plains Tradition Constituents”, *Anthropology Department Theses and Dissertations* 42. University of Nebraska, Lincoln.

De Angelis, F. 2000, “Estimating the Agricultural Base of Greek Sicily”, *Papers of the British School at Rome* 68, 111-148.

De Angelis, F. 2003, “Equations of Culture: the Meeting of Natives and Greeks in Sicily (ca. 750-450 BC.)”, *Ancient West and East* 2(1), 19-50.

De Angelis, F. 2009, “Colonies and colonization”, in B. Graziosi, P. Vasuni and G. Boys-Stones (eds), *The Oxford Handbook of Hellenic Studies*, Oxford University Press, Oxford, 48-64.

Degryse, P. and Braekmans, D. 2017, “Petrography: Optical Microscopy”, in A. Hunt (ed.), *The Oxford Handbook of Archaeological Ceramic Analysis*, Oxford University Press, Oxford, 233-265.

De Juliis, E. 1996, *Magna Grecia. L’Italia meridionale dalle origini leggendarie alla conquista romana*, Edipuglia, Bari.

De La Geniere, J. and Tusa, V. 1978, “Saggio a Segesta. Grotta Vanella”, *Sicilia Antica* 11, 10-29.

Delgado, A. and Ferrer, M. 2007, “Cultural Contacts in Colonial Settings: The Construction of New Identities in Phoenician Settlements of the Western Mediterranean”, *Stanford Journal of Archaeology* 5, 1-25.

De Miro, E. 1988, “Polizzello centro della Sicania”, *Quaderni dell'Istituto di Archeologia della Facoltà di Lettere e Filosofia dell'Università di Messina* 3, 25-42.

De Miro, E. 2004, “Archai della Sicilia. Presenze Egeo-Cipriote sulla costa meridionale dell’isola. L’emporio miceneo di Cannatello”, *La colonisation Greque en Méditerranée Occidentale. Actes de la Recontre Scientifique en Hommage à Georges Vallet Organisée par le Centre Jean-Bérard, l’École Française de Rome, l’Instituto Universitario Orientale et degli Studi di Napoli “Federico II”, (Rome-Naples 15-18 Novembre 1995), Mélanges de l’École Française de Rome*, Rome, 71-81.

De Rosa, B., Mameli, P., Rendeli, M. and Arce Cueto, L. 2015, “Archaeometric and technological analyses of pottery from the nauragic site of Sant’Imbenia (Alghero, Sardinia): Ambiente 51”, *Metrology for Archaeology, 1st International Conference Benevento, October 22-23, 2015, Proceedings, volume I,* Università Studi del Sannio, Benevento, 309-313.

De Vido, S. 1997, *Gli Elimi: storie di contatto e di rappresentazioni*, in P. Anello, G. Martorana and R. Sammartano (eds), *Ethne e religioni nella Sicilia antica*, Bretschneider, Roma.

Dietler, M. 1989, “Greeks, Etruscans and thirsty barbarians: Early Iron Age interaction in the Rhône Basin of France”, in T. Champion (ed.), *Centre and Periphery. Comparative Studies in Archaeology*, Routledge, London, 127-141.

Dietler, M. 1990, “*Driven by Drink: The role of drinking in the political economy and the case of Early Irone Age France*”, Journal of Anthropological Archaeology 9(4), 352-406.

Dietler, M. 1996, “Feasts and Commensal Politics in the Political Economy: Food, Power, and Status in Prehistoric Europe”, *Food and the Status Quest*, 87-126.

Dietler, M. 1997, “The Iron Age in the Mediterranean France: Colonial Encounters, Entanglements, and Transformations”, *Journal of World Prehistory* 11(3), 269-358.

Dietler, M. 2005, “The archaeology of colonization and the colonization of archaeology: Theoretical challenges from an ancient Mediterranean colonial encounter”, in G. J. Stein (ed.), *The Archaeology of Colonial Encounters: Comparative Perspectives*, School of American Research Press, Santa Fe, 33-68.

Dietler, M. 2007, “Culinary Encounters: Food, Identity, and Colonialism”, in K. Twiss (ed.), *The Archaeology of Food and Identity*, Southern Illinois University Press, Carbondale, 218-242.

Dietler, M. 2010, *Archaeologies of Colonialism: Consumption, Entanglement, and Violence in Ancient Mediterranean France*, University of California Press, Berkeley, Los Angeles.

Dietler, M. and Herbich, I. 1994, “Ceramics and ethnic identity: Ethnoarchaeological observation on the distribution of pottery styles and the relationship between the social context of production and consumption”, in D. Binder and J. Courtin (eds), *Terre cuite et société: la céramique, document technique, économique, culturel. XIVe Recontre Internationale d’Archéologie et Historie d’Antibes*, Éditions APDCA, Juan-les-Pins, 459-472.

Dietler, M. and Herbich, R. 1998, “Habitus, techniques, style: an integrated approach to the social understanding of material culture”, in M. T. Stark (ed.), *The Archaeology of Social Boundaries*, Smithsonian Institution Press, Washington, 232-263.

Di Grande, A. and Romeo, M. 1981, “Caratteri-lito-biostratigrafici dei depositi messiniani nell’area iblea (Sicilia sud-orientale)”, *Rivista italiana di paleontologia* 86(4), 855-916.

Di Noto, C. A. 1992, ”Rocca d’Entella: la ceramica indigena incisa ed impressa”, in L. Biondi, A. Corretti, S. de Vido, M. Gargini and M. A. Vaggioli, *Giornate Internazionali di Studi sull’Area Elima (Gibellina 19.22 Settembre 1991, Pisa-Gibellina),* Scuola Normale Superiore di Pisa, Pisa-Gibellina, 245-255.

Di Noto, C. A. 1995, “La ceramica indigena a decorazione geometrica incisa ed impressa”, in G. Nenci (ed.), *Entella I,* Scuola Normale Superiore di Pisa, Pisa, 77-110.

Di Stefano, G. 1993-1994, “Il relitto di Punta Braccetto (Camarina), gli emporia e i relitti di età arcaica lungo la costa meridionale della Sicilia”, *Kokalos* 39-40, 111-133.

Di Stefano, A., Foresi, L. M., Lirer, F., Iaccarino, S. M., Turco, E., Amore, F. O., Mazzei, R., Morabito, S., Salvatorini, G. and Abdul-Aziz, H. 2008, “Calcareous plankton high resolution bio-magnetostratigraphy for the Langhian of the Mediterranean area”, *Rivista di Paletnologia e Stratigrafia* 114, 51-76.

Di Stefano, A., Verducci, M., Maniscalco, R., Speranza, F. and Foresi, L. M. 2011, “High-resolution stratigraphy of the Contrada Pesciarello borehole succession (SE Sicily): a lower Langhian reference section for the Mediterranean region”, *Stratigraphy* 8(2), 111-124.

Di Vita, A. 1956, “La penetrazione siracusana nella Sicilia sud-orientale alla luce delle più recenti scoperte archeologiche”, *Kokalos* 2, 177-205.

Dixon, C. 2004, “Notes on the Ceramic Assemblage”, in C. Mühlenbock and C. Prescott (eds), *The Scandinavian Sicilian Archaeological Project Field Reports 1998-2001*, 53-68.

Domínguez, A. J. 1989, *La colonización griega en Sicilia. Griegos, indígenas y púnicos en la Sicilia Arcaica: Interacción y aculturación*, British Archaeological Reports International Series 549, Oxford.

Domínguez, A. J. 2006, “Greeks in Sicily”, in G. R Tsetskhladze (ed.), *Greek colonisation. An account of Greek colonies and other settlements overseas*, Brill, Leiden, 253-357.

Dougherty, C. and Kurke, L. 2003, *The Cultures within Ancient Greek Culture: Contact, Conflict, Collaboration*, Cambridge University Press, Cambridge.

Douglas, M. and Isherwood, B. 1979, *The World of Goods: Towards an Anthropology of Consumption,* Routledge, London.

Drake, B. L. 2012, “The influence of climate change on the late Bronze Age Collapse and the Greek Dark Ages”, *Journal of Archaeological Science* 39, 1862-1870.

Drews, R. 1993, *The End of the Bronze Age: Changes in Warfare and the Catastrophe ca. 1200 B.C.*, Princeton University Press, Princeton.

Dunbabin, T. J. 1948, *The Western Greeks: the history of Sicily and South Italy from the foundation of the Greek colonies to 480 B.C.*, Clarendon Press, Oxford.

Edel, E. 1984, “Die Sikeloi in den agyptischen Seevolkerntexten”, *Biblische Notizien* 23, 7-8.

Epossi Ntah, Z. L., Sobott, R., Fabbri, B. and Bente, K. 2017, “Characterization of some archaeological ceramics and clay samples from Zamala-Far-northern part of Cameroon (West Central Africa)”, *Ceramica* 63, 413-422.

Fatta, V. 1983, *La Ceramica Geometrica di Sant'Angelo Muxaro: analisi e classificazione della collezione del Museo di Palermo*, Fondazione Giuseppe Whitaker, Palermo.

Fazzello, T. 1558, *De rebus Siculis decades duae*, Typis excudebant Ioannes Matthaeus Mayda et Franciscus Carrara, Panormi.

Felts, W. A. 1942, “Petrographic Examination of Potsherds from Ancient Troy”, *American Journal of Archaeology* 68, 221-228.

Ferguson, R. B. and Whitehead, D. 1992 "The violent edge of Empire", in R. B. Ferguson and D. Whitehead (eds), *War in the Tribal Zone: Expanding States and Warfare*, School of American Research Press, Santa Fe, 1-30.

Finetti, I. R., Lentini, F., Carbone S., Del Ben A., Di Stefano A., Forlin E., Guarnieri P., Pipan M. and Prizzon, A. 2005, "Geological outline of Sicily and Lithosferic Tectono-Dynamics of its Tyrhenian Margin from New CROP Seismic Data", in I. R. Finetti (ed.), *CROP project: Deep Seismic exploration of the Mediterranean Region*, Elseveir Science, Amsterdam, 319-375.

Finley, M. I. 1968, *A History of Ancient Sicily: Ancient Sicily to the Arab Conquest,* Chatto and Windus, London.

Fiorelli, G. 1881, *Leggi, ordinanze e provvedimenti generali emanate dai Cessati Governi d'Italia per la Conservazione dei Monumenti e le esportazioni delle opera d'arte*, Ministero della Pubblica Istruzione, Direzione Generale per le Antichità e Belle Arti, Rome.

Fischer-Hansen, T. 1996, "The Earliest Town-Planning of the Western Greek Colonies, with Special Regard to Sicily", in M. H. Hansen (ed.), *Introduction to an Inventory of Poleis (Symposium August, 23-26 1995), Acts of the Copenhagen Polis Centre* vol. 3, Munksgaard, Copenhagen, 317-373.

Fitzjohn, M. 2007, "Equality in the colonies: concepts of equality in Sicily during the eighth to sixth centuries BC", *World Archaeology* 39(2), 215-228.

Forster, N., Grave, P., Vickery, N. and Kealhofer, L. 2011, "Non-destructive analysis using PXRF: methodology and application to archaeological ceramics", *X-ray Spectometry* 40(5), 389-398.

Fouqué, F. A. 1879, *Santorini and Its Eruptions*, Johns Hopkins University Press, Baltimore.

Frahm, E. 2014, "Characterizing obsidian sources with portable XRF: accuracy, reproducibility, and field relationships in a case study from Armenia", *Journal of Archaeological Science* 49, 105-125.

Frahm, E., Doonan, R. and Kilikpglou, V. 2014, “Handheld Portable X-Ray Fluorescence of Aegean Obsidians”, *Archaeometry* 56(2), 228-260.

Frankel, D. and Webb, J. M. 2012, “Pottery production and distribution in prehistoric Bronze Age Cyprus. An applcation of pXRF analysis”, *Journal of Archaeological Science* 39(5), 1380-1387.

Frasca, M. 1978a, “Intervento al Convegno su Insediamenti Coloniali in Sicilia nell'VIII e VII secolo a.C.”, *Cronache di Archeologia e Storia dell’Arte* 17, 116-118.

Frasca, M. 1978b, “Monte Finocchito”, *Studi Etruschi* 46, 580-582.

Frasca, M. 1979, “Nuovi rinvenimenti nella necropoli del Monte Finocchito (Noto)”, *Sicilia Archeologica* 12, 79-92.

Frasca, M. 1981, “La necropoli di Monte Finocchito”, *Cronache di Archeologia e Storia dell’Arte* 20, 13-103.

Frasca, M. 1983, “Una nuova capanna ‘sicula’ a Siracusa, in Ortigia: tipologia dei materiali”, *Mélanges de l’École Française de Rome* 95(2), 565-598.

Frasca, M. 1995, “Ceramica indigena and Ceramica greca in Monte Casasia (Ragusa): Campagne di scavo 1966, 1972–1973 nella necropolis indigena”, *Notizie degli Scavi*, 323-583.

Frasca, M. 1996, “Iron Age settlements and cemeteries in southeastern Sicily: a short review in Early Societies in Sicily”, in R. Leighton (ed.), *Early Societies in Sicily. New developments in archaeological research*, Accordia Research Centre, London, 139-145.

Frasca, M. 2011, “Grey Ware in Sicily, between East and West”, in R. G. Gürtekin-Demir, H. Cevizoğlu, Y. Polat and G. Polat (eds), *Keramos/Ceramics:a Cultural Approach. Proceedings of the First International Conference at Ege University (May 9-12, 2011)*, Bilgin Kültür Santa Yayinlari, Kizilay, 83-276.

Frasca, M. 2016, *Archeologia degli Iblei. Indigeni e Greci nell’altopiano ibleo tra la prima metà e la seconda età del Ferro*, Edizioni Storia e Studi Sociali, Ragusa.

Frasca, M. and Agodi, S. 2000, “La ceramica di impasto orientalizzante in Sicilia”, in F. P. Badoni (ed.), *Ceramiche d’impasto orientalizzante in Italia. Dizionario terminologico*, Palombi, Rome, 43-46.

Freeman, E. A. 1891, *The History of Sicily from the Earliest Times I: The Native Nations. The Phoenician and Greek Settlements*, Clarendon Press, Oxford.

Furumark, A. 1941, *The Mycenaean Pottery: Analysis and Classification*, Petterson, Stockholm.

Gabba, E. and Vallet, G. 1980, “Eloro”, in E. Gabba (ed.), *La Sicilia antica* I(3), Società editrice storia di Napoli e della Sicilia, Naples, 545-553.

Gandhi, L. 1998, *Postcolonial Theory: a critical introduction*, Columbia University Press, New York.

Garnsey, P. 1988, *Famine and Food Supply in the Greco-Roman World. Responses to Risk and Crisis*, Cambridge University Press, Cambridge.

Giangiulio, M. 2010, “Deconstructing ethnicities: Multiple identities in archaic and classical Sicily”, *Bulletin Antieke Beschaving* 85, 13-23.

Giddens, A. 1994, “Living in a Post-Traditional Society”, in U. Beck, A. Giddens and S. Lash (eds), *Reflexive Modernization*, Standford University Press, Redwood, 56-110.

Gordon, M. 1964, *Assimilation in American Life: The role of race, religion, and national origins*, Oxford University Press, Oxford.

Gorogianni, E., Abell, N. and Hilditch, J. 2016, “Reconsidering Technological Transmission: The Introduction of the Potter’s Wheel at Ayia Irini, Kea, Greece”, *American Journal of Archaeology* 120(2), 195-220.

Gosden, C. 2004, *Archaeology and Colonialism: Cultural Contact from 5000 B.C. to the Present*, Cambridge University Press, Cambridge.

Goudineau, C. 1990, *César et la Gaule*, Collction De la Gaule à la France, Errance Edition, Paris.

Grafton, A. 1992, “Germany and the West 1930-1900”, in K. J. Dover (ed.), *Perceptions of the Ancient Greeks*, Blackwell, London, 225-244.

Gras, M. 1989, “L’economia”, in G. Pugliese Carratelli (ed.), *Un secolo di ricerche in Magna Grecia: atti del ventottesimo convegno di studi sulla Magna Grecia (Taranto, 7-12 ottobre 1998)*, Istituto per la Storia e l’Archeologia della Magna Grecia, Taranto, 395-420.

Gras, M. 1995, *La méditerranèe archaïque*, Armond Colin, Paris.

Gras, M., Tréziny, H. and Broise, H. 2004, “Mégara Hyblaea 5, Le ville archaïque. L’escape urbain d’une cité grecque de Sicile orientale”, *Mélanges d’archéologie et d’historie, Suppléments 1(5)*, École Française de Rome, Rome.

Greco, E. 2010, “On the Origin of Western Greek Poleis”, *Ancient West and East* 10, 233-242.

Greco, E. 2012, *Magna Grecia: città greche di Magna Grecia e Sicilia*, in E. Greco (ed.), Istituto della Enciclopedia Italiana fondata da Giovanni Treccani S.P.A, Roma, 55-69.

Guido, M. 1967, *Sicily: an archaeological guide*, Faber and Faber, London.

Guidi, A. 1987, “The development of Prehistoric Archaeology in Italy: a Short Review”, *Acta Archeologia* 58, 237-247.

Guzzardi, L. 1991-1992, “Insediamento dell’età del bronzo a Vendicari (Noto) con ceramiche del tipo di Thapsos, Tarxien Cemetery e Borg-in-Nadur”, *Rassegna Archeologica* 10, 772-773.

Hall, J. M. 1997, *Ethnic Identity in Greek Antiquity*, Cambridge University Press, Cambridge.

Hall, J. M. 2002, *Hellenicity: Between Ethnicity and Culture*, University of Chicago Press, Chicago.

Hall, J. M. 2007, *A History of Archaic Greek World*, University of Chicago Press, Chicago.

Heimann, R. 2017, “X-Ray Powder Diffraction (XRPD)”, in A. Hunt (ed.), *The Oxford Handbook of Archaeological Ceramic Analysis*, Oxford University Press, Oxford, 327-341.

Hein, A., Day, P. M., Cau, M. A. and Kilikoglou, V. 2004, “Red clays from Central and Eastern Crete: geochemical and mineralogical properties in view of provenance studies on ancient ceramics”, *Applied Clay Science* 24, 245-255.

Heinzel, C. and Kolb, M. 2011, “Holocene land use in western Sicily: a geoarchaeological perspective”, *Geological Society* 352, 97-107.

Held, D. 2000, “Hellenism, Nationalism, and the Ideology of Research in Humboldt University”, Paper presented at *Transformation and Continuity in the History of Universities* (*International Commission for the History of Universities Oslo, 10-11 Aug. 2000*), Oslo, 1-10.

Hencken, H. 1968, *Tarquinia. Villanovians and Early Etruscans, I-II*, Peabody Museum Bulletin 28, Cambridge (Massachussetts).

Herbich, I. and Dietler, M. 1991, “Aspects of the ceramic system of the Luo of Kenya”, *Töpferei- und Keramikforschung* 2, 105-135.

Herskovits, M. J. 1937, “The significance of the study of acculturation for anthropology”, *American Anthropologist (New Series)* 39(2), 259-264.

Ho, E. 2004, “Empire through diasporic eyes: A view from the other boat”, *Journal of Comparative Studies in Society and History* 46 (2), 210-246.

Hodder, I. 1994, “The interpretation of documents and material culture”, in N. K, Denzin and Y. S. Lincoln (eds), Handbook of qualitative research, Sage Publications Inc., Thousand Oaks, 393-402.

Hodder, I. 2012, *Entangled: An Archaeology of the Relationships between Humans and Things,* Wiley-Blackwell, Oxford.

Hodder, I. and Orton C. 1976, *Spatial Analysis in Archaeology. New Studies in Archaeology,* vol. 1, Cambridge University Press, London.

Hodges, H. 1981, *Artifacts: An introduction to early materials and technology*, Baker, London.

Hodos, T. 2000, “Wine wares in protohistoric eastern Sicily”, in C. Smith and J. Serrati (eds), *Ancient Sicily: Archaeology and History from Aeneas to Augustus*, Edinburgh University Press, Edinburgh, 41-54.

Hodos, T. 2006, *Local Responses to Colonization in the Iron Age Mediterranean*, Routledge, London.

Hodos, T. 2009, “Colonial Engagements in the Global Mediterranean Iron Age”, *Cambridge Archeological Journal* 19 (2), 221-241.

Hodos, T. 2017, “Globalization: some basics. An introduction to The Routledge Handbook of Archaeology and Globalization”, in T. Hodos (ed.), *The Routledge Handbook of Archaeology and Globalization*, Routledge, London, 3-11.

Holloway, R. R. 1994, *The Archaeology of Early Rome and Latium*, Routledge, London.

Holloway, R. R. 2000, *The Archaeology of Ancient Sicily*, Routledge (1st ed.), London.

Holm, A. 1870, *Geschichte Siciliens im Alterthum*, Verlag von Wilhelm Engelmann, Leipzig.

Hugh, C. 1911, *Petrology*, Encyclopedia Britannica 11, Cambridge University Press, Cambridge.

Hunt, L. 1989, *The new cultural history*, University of California Press, Berkeley.

Hunt, A. M. W., Dvoracek, D. K., Glascock, M. D. and Speakman, R. J. 2014, “Major, minor and trace element mass fractions determined using ED-XRF, WD-XRF and INAA for five certified clay reference materials: NCS DC 60102–60105; NCS DC 61101 (GBW 03101A, 03102A, 03103, and 03115)”, *Journal of Radioanalytical and Nuclear Chemistry* 302(1), 505-512.

Hunt, A. and Speakman, R. J. 2015, “Portable XRF Analysis of Archaeological Sediments and Ceramics”, *Journal of Archaeological Science* 53, 626-638.

Insley, H. and Fréchette, V. D. 1995, *Microscopy of ceramics and cements: Including glasses, slags, and foundry sands*, Academic Press-Elsevier, New York.

Jacob, D. E., Wirth, R., Agbaje, O. B. A., Branson, O., and Eggins, S. M. 2017, "Planktic foraminifera form their sheels via metastable carbonate phases", *Nature Communications* 8, 1265.

Jenkins, R. 1997, *Rethinking Ethnicity, Arguments and Explorations*, Thousand Oaks, California.

Jenkins, R. and Snyder, R. 2012, "*Introduction to X-ray powder diffractometry"*, in J. D. Winefordner (ed.), *Chemical analysis. A series of monographs on analytical chemistry and its applications* vol. 138, John Wiley and Sons, New York, 1-322.

Jenkyns, R. 1980, *The Victorians and Ancient Greece*, Blackwell, Oxford.

Kaniewski, D., Van Campo, E., Guiot, J., Le Burel, S., Otto, T. and Baeteman, C. 2013, "Environmental roots of the Late Bronze Age crisis", *Public Library of Science One* 8(8), e71004.

Key, M. and Gaskin, E. 2000, "Geoarchaeology of native American pottery from the prehistoric Davis site in Lancaster County, Virginia", *Quarterly Bulletin of the Archeological Society of Virginia* 55(3), 161-169.

Killian, K. 1970, *Früheisenzeitliche Funde aus der Südostnekropole von Sala Consilina (Provinz Salerno)*, Archäologische Forschungen in Lukanien III, Kerle Verlag, Heidelberg.

Kingery, W. D. 1984, "Interactions of ceramic technology with society", *Pots and Potters: Current Approaches in Ceramic Archaeology* 24, 171-178.

Knapp, A. B. 2008, *Prehistoric and Protohistoric Cyprus*, Oxford University Press, Oxford.

Kohl, P. L. 1998, “Nationalism and Archaeology: On the Constructions of Nations and the Reconstructions of the Remote Past”, *Annual Review of Anthropology* 27(1), 223-246.

Kolb, M. J. 2007, “The Salemi Survey Project: long-term landscape change and political consolidation in interior western Sicily 3000 BC-AD 600”, in M. Fitzjohn (ed.), *Uplands of Ancient Sicily and Calabria: the archaeology of landscape revisited* 13, Accordia Research Institute, London, 171-185.

Kolb, M. J. and Speakman, R. J. 2005, “Elymian regional interaction in Iron Age western Sicily: a preliminary neutron activation study of incised/impressed tablewares”, *Journal of Archaeological Science* 32, 795-804.

Kolb, M. J., Tusa, S. and Speakman R. J. 2006, “La decorazione a “Denti di Lupo”. Identità sociale e interazione nell’Età del Ferro in Sicilia occidentale”, *Sicilia Archeologica* 39(104), 33-46.

Kolb, M. J., Osborn, R., Tyers, C. and Heinzel, C. 2007, “Contrada Pitrazzi: Late Bronze Age re-use of a Late Copper Age chamber tomb”, in M. Fitzjohn (ed.), *Uplands of Ancient Sicily and Calabria: the archaeology of landscape revisited* 13, Accordia Research Institute, London, 187-195.

Kolb, M. J., Tusa, S. and Speakman, R. J. 2008, “La decorazione a “Denti di lupo”: Identità sociale e interazione nell’Età del Ferro in Sicilia occidentale”, *Sicilia Archeologica* 104, 33-46.

Lagona, S. 1971, “La Necropoli di Ossini-S. Lio”, *Cronache di Archeologia e di Storia dell’Arte* 10, 16-40.

Lagona, S. 1973, “Lentini: La Necropoli di Sant’Eligio”, *Archeologia nella Sicilia Sud Orientale*, 64-65.

La Rosa, V. 1971, “Archeologia sicula e barocca: per la ripresa del problema di Noto Antica”, *Atti e Memorie Istituto per lo Studio e la Valorizzazione di Noto e delle sue Antichità (I.S.V.N.A.*) 2, Jonica Editore, Noto, 43-102.

La Rosa, V. 2004, “Le presenze micenee nel territorio siracusano: per una storia del problema”, in V. La Rosa (ed.), *Le presenze Micenee nel Territorio Siracusano. I Simposio Siracusano di Preistoria Siciliana in Memoria di Paolo Orsi. Siracusa, 15-16 Dicembre 2003,* Bottega d’Erasmo, Padova, 9-44.

La Torre, G. 2011, *Sicilia e Magna Grecia. Archeologia della colonizzazione greca d'Occidente*, Laterza, Bari.

Lehmann, C. A. 1979, “Die Sikalaju - ein neues Zeugnis zu den "Seevölker"-Heerfahrten”, *Ugarit-Forschungen* 11, 481-494.

Leighton, R. 1983, *From Late Bronze Age to Early Iron Age in south east Sicily: Studies on the material remains from the cemeteries of Pantalica, Dessueri, Caltagirone and Cassibile* (unpublished Ph.D. Thesis, University of Edinburgh).

Leighton, R. 1993a: The Protohistoric Settlement of the Cittadella, *Morgantina Studies,* vol. IV, Princenton University Press, Princeton.

Leighton, R. 1993b: “Sicily during the Centuries of Darkness”, *Cambridge Archaeological Journal*, 3(2), 271-276.

Leighton, R. 1999, *Sicily before History: An Archaeological Survey from the Paleolithic to the Iron Age*, Cornell University Press, Ithaca.

Leighton, R. 2005, “Later Prehistoric settlement patterns in Sicily: old paradigms and new surveys”, *European Journal of Archaeology*, 8(3), 261-287.

Leighton, R. 2011, “Pantalica (Sicily) from the Late Bronze Age to the Middle Ages: A New Survey and Interpretation of the Rock-Cut Monuments”, *American Journal of Archaeology* 115(3), 447-464.

Leighton, R. 2015, “Rock-cut tombs and funerary landscapes of the Late Bronze and Iron Ages in Sicily: New fieldwork at Pantalica”, *Journal of Field Archaeology*, 40(2), 190-203.

Leighton, R. 2016, “Cassibile revisited: rock-cut monuments and the configuration of Late Bronze Age and Iron Age sites in southeast Sicily”, *Praehistorische Zeitschrift* 9(1), 124-148.

Lemonnier, P. 1993, *Technological choices. Transformation in material culture since the Neolithic*, Routledge, New York.

Lemos, I. S. 2001, “The Lefkandi connection: networking in the Aegean and the eastern Mediterranean”, in L. Bonfante and V. Karageorghis (eds), *Italy and Cyprus in Antiquity, 1500-450 BC, Proccedings of an International Symposium held at the Italian Academy for Advanced Studies in America at Columbia University (November 16-18, 2000),* Costakis and Leto Severies Foundation, Nicosia, 215-226.

Lemos, I. S. 2003, *The Protogeometric Aegean: The Archaeology of the Late Eleventh and Tenth Centuries BC,* Oxford University Press, Oxford.

Lentini, F., Carbone, S. and Catalano, S., 1994, “Main structural domains of the central mediterranean region and their Neogene tectonic evolution”, *Bollettino di Geofisica Teorica e Applicata* 36, 141-144.

Lewis, D. 1973, “Anthropology and Colonialism”, *Current Anthropology* 14(5), 581-602.

Linton, R. 1940, “Acculturation and the processes of culture change”, in R. Linton (ed.), *Acculturation in Seven American Indian Tribes*, D. Appleton-Century Co., New York and London, 463-482.

Liritzis, I. and Zacharias, N. 2011, “Portable XRF of Archaeological Artefacts: Current Research, Protocols and Limitations”, in M. S. Shackley (ed.), *X-Ray Fluorescence Spectometry (XRF) in Geoarchaeology*, Springer, New York, 109-142.

Livingstone, S. A. 2000, “Processing clay for pottery in northern Cameroon: Social and technical requirements”, *Archaeometry* 42, 21-42.

Lomas, K. 2004, “Introduction”, in K. Lomas (ed.), *Greek Identity in the Western Mediterranean, Papers in Honour of Brian Shefton*, Brill, Leiden, 1-14.

Longacre, W. 1999, “Standardization and specialization: what’s the link?”, in J. M. Skibo and G. M. Feinman (eds), *Pottery and People,* University of Utah Press, Salt Lake City, 44-58.

Lorimer, H. L. 1912, “Notes on the sequence and distribution of the fabrics called proto-corinthian”, *Journal of Hellenic Studies* 32, 326-353.

Lydon, J. and Rizvi, U. Z. 2010, “Introduction: Postcolonialism and Archaeology”, in J. Lydon and U. Z. Rizvi (eds), *Handbook of Postcolonial Archaeology,* Left Coast Press, California, 17-33.

Lyell, C. 1838, *Principles of geology: or The Modern Changes of the Earth and its Inhabitants considered asIllustrative of Geology*, The University of Adelaide, Adelaide (South Australia).

MacEachern, S. 1998, “Scale, style, and cultural variation: technological traditions in the northern Mandara mountains”, in M. T. Stark (ed.), *The Archaeology of Social Boundaries*, Smithonian Institution Press, Washington, 107-131.

MacIver, D. R. 1931, *Greek Cities in Italy and Sicily*, Clarendon Press, Oxford.

Magny, M., Vannière, B., Calo, C., Millet, L., Leroux, A., Peyron, O., Zanchetta, G., La Mantia, T. and Tinner, W. 2011, “Holocene hydrological changes in south-western Mediterranean as recorded by lake-level fluctuations at Lago Preola, a coastal lake in southern Sicily, Italy”, *Quaternary Science Reviews* 39(19-20), 2459-2475.

Magny, M., Peyron, O., Sadori, L., Ortu, E., Zanchetta, G., Vanniére, B. and Tinner W. 2012, “Contrasting patterns of precipitation seasonality during the Holocene in the south- and north- central Mediterranean”, *Journal of Quaternary Science* 27(3), 290-296.

Malkin, I. 1998, *The Returns of Odysseus: Colonization and Ethnicity*, University of California Press, Los Angeles.

Malkin, I. 2002, “A colonial middle ground: Greek, Etruscan, and local elites in the Bay of Naples*”*, in C. L. Lyons and J. K, Papadopoulos (eds), *The Archaeology of Colonialism*, The Getty Research Institute, Los Angeles, 151-181.

Malkin, I. 2004, “Postcolonial concepts and ancient Greek colonziation”, *Modern Language Quarterly* 65(3), 341-364.

Malkin, I. 2011, *Small Greek World: Networks in the Ancient Mediterranean,* Oxford University Press, Oxford.

Malkin, I. 2016, “Migration and Colonization. Turbulence, Continuity, and the Practice of Mediterranean Space (11th -5th centuries BCE)”, in M. Dabag, D. Haller, N. Jaspert and A. Lichtenberger (eds), *New Horizons: Mediterranean Research in the 21st Century*, Ferdinand Schöningh, Pederborn, 285-307.

Manganaro, G. 1985, “Eloro”, *Enciclopedia Virgiliana* 2, Istituto della Enciclopedia Italiana Treccani, Roma, 211-212.

Maniatis, Y. 2009, “The Emergence of Ceramic Technology and its Evolution as revealed with the Use of Scientific Techniques”, in A. J. Shortland (ed.), *From Mine to Microscope: Advances in the Study of Ancient Technology*, Oxbow Books, Oxford, 1-18.

Mannino, G. and Spatafora, F. 1995, *Mokarta la necropoli di Cresta di Gallo*, Regione siciliana, Assessorato dei Beni Culturali e Ambientali e della Istruzione, Palermo.

Marchand, S. L. 1996, *Archaeology and Philhellenism in Germany 1750-1970,* Princeton University Press, Princeton.

Marchetti, D. B., Accorsi, C. A., Arobba D., Bandini Mazzanti, M., Bertolani, M. B., Biondi, E. B., Graggio, G., Ciuffi, C., De Cunzo, T., Della Ragione, S., Forlani, L., Guido, A. M., Lolli, F., Montanari, C., Paoli, P., Raimondo, F.M., Rossitto, M. and Trevisan Grandi, G. 1984, “Ricerche geobotaniche sulle Madonie”, *Journal of Plant Taxonomy and Geography* 38, 329-348.

Marquardt, W. H. 1978, “Advances in archaeological seriation”, *Advances in Archaeological Method and Theory* 1, 260-314.

Martin, R. and Vallet, G. 1980, “L’architettura domestica”, in E. Gabba and G. Vallet (eds), *La Sicilia antica 1(2), Le città greche di Sicilia*, Società Editrice Storia di Napoli e della Sicilia, Naples, 321-354.

Martineau, R. 2001, “Methodology for the archaeological and experimental study of pottery forming techniques”, in S. Di Pierro (ed.), *Ceramics in the Society: Proceedings of the 6th European Meeting of Ancient Ceramics,* Department of Geosciences, Mineralogy and Petrography, University of Fribourg, Fribourg, 209-215.

Martini, I. P. and Chesworth, W. 2011, “Summaries of the Contributions and a Few Considerations”, in I. P. Martini, W. Chesworth (eds), *Landscapes and Societies: Selected Cases*, Springer, New York, 3-18.

Matthaüs, H. 2001, “Studies on the interrelations of Cyprus and Italy during the 11th to 9th centuries: a pan-Mediterranean perspective”, in L. Bonfante and V. Karageorghis (eds), *Italy and Cyprus 1500-450BC: Proceedings of an international symposium held at the Italian Academy for Advanced Studies in America at Columbia University, (November 16-18, 2000 Nicosia)*, The Costakis and Leto Severis Foundation, Nicosia, 153-214.

Matson, F. 1995, “Ceramic Ecology”, *American Journal of Archaeology* 99(1), 108-111.

McGregor M. F. 1957, “*La colonisation grecque de l’Italie méridionale et de la Sicile dans l’antiquité. L’histoire et la legend”, American Historical Review* 63(1), 90-91.

Militello, E. 1965, “Eloro. III. Relazione degli scavi del 1958-59”, *Monumenti Antichi* 47, 299-335.

Mintz, S. 1985, *Sweetness and Power: The Place of Sugar in Modern History*, Penguin, New York.

Morel, J. P. 1983, “Greek colonization in Italy and in the West (problems of evidence and interpretation)”, in T. Hackens, N. D. Holloway and R. R. Holloway (eds), *Crossroads of the Mediterranean,* Archaeologia Transatlantica 2, Joukowsky Institute for Archaeology & the Ancient World, Brown University, Providence, 123-161.

Morris, I. 1994, “Archaeologies of Greece”, in I. Morris (ed.), *Classical Greece: Ancient Histories and Modern Archaeologies*, Cambridge University Press, Cambridge, 8-49.

Morris, I. 1996, “The absolute chronology of the Greek colonies in Sicily”, *Acta Archaeologica* 67, 51-59.

Morris, I. 1999, *Archaeology as Cultural History. Words and Things in Iron Age Greece*, Blackwell, Oxford.

Morris, I. 2003, “Mediterraneanization”, *Mediterranean Historical Review* 18(2), 30-55.

Morris, I. 2005, *The eighth-century revolution,* Standford Working Papers, Princeton.

Moussette, M. 2003, “An encounter in the Baroque Age: French and Amerindians in North America”, *Historical Archaeology* 37(4), 29-39.

Mühlenbock, C. 2008, “Fragments from a Mountain Society: Tradition, Innovation and Interaction at Archaic Monte Polizzo, Sicily”, *Gothenburg Archaeological Thesis* 50 (unpublished Ph.D. thesis).

Mühlenbock, C. 2015, “Expanding the Circle of Trust. Tradition and Change in Iron Age in Communities in Western Sicily”, in J. Fejfe, M. Moltesen and A. Rathje (eds), *Tradition, Transmission of Culture in the Ancient World, Acta Hyperborea* 14, Tusculanum Press, Denmark, 239-268.

Müller-Karpe, H. 1959, *Beiträge zur Chronologie der Urnenfelderzeit nördlich und südlich der Alpen,* De Gruyter, Berlin.

Murphy, C. P., McKeague, J. A., Bresson L. M., Bullock, P., Kooistra M. J., Miedema, R. and Stoops, G. 1985, “Description of soil thin section: an international comparison”, *Geodema* 35(1), 15-37.

Nakai, I. and Abe, Y. 2011, “Portable X-ray powder diffractometer for the analysis of art and archaeological materials”, *Applied Physics A. Material Science and Processing* 106, 279-293.

Nicholson, P. T. 2010, “Kilns and Firing Structures”, in C. Spieser (ed.)*, Encyclopedia of Egyptology* 1(1), University of California (*UCLA),* California, 1-10.

Nicol, W. 1834, “Observation on the Structure of Recent and Fossil Conifera”, *The Edinburgh New Philosophical Journal* 16, 137-157.

Nicosia, C. and Stoops, G. 2017, *Archeological Soil and Sediment Micromorphology*, Wiley-Blackwell, Oxford.

Noti, R., Van Leeuwen, J. F. N., Colombaroli, D., Vescovi E., Pasta, S., La Mantia, T. and Tinner, W. 2009, "Mid- and late-Holocene vegetation and fire history at Biviere di Gela, a coastal lake in southern Sicily, Italy", *Vegetation History and Archaeobotany* 18(5), 371-387.

Orsi, P. 1892a, "Il sepolcreto di Tremenzano", *Bullettino di Paletnologia Italiana* 18, 84.

Orsi, P. 1892b, "La necropoli sicula di Castelluccio (Siracusa)", *Bullettino di Paletnologia Italiana* 18, 13.

Orsi, P. 1893, "Scarichi del villaggio siculo di Castelluccio", *Bullettino di Paletnologia Italiana* 19, 30-51.

Orsi, P. 1894, "La necropoli sicula del terzo periodo al Finocchito presso Noto (Siracusa)", *Bullettino di Paletnologia Italiana* 20, 23-26, 37-94.

Orsi, P. 1896, "Noto. Necropoli sicula del Monte Finocchito", *Notizie degli Scavi*, 242.

Orsi, P. 1897a, "Nuove esplorazioni nella necropoli sicula del Monte Finocchito presso Noto", *Bullettino di Paletnologia Italiana* 23, 157-197.

Orsi, P. 1897b, "Noto Vecchio/Netum. Esplorazioni archeologiche", *Notizie degli Scavi*, 69-90.

Orsi, P. 1898, "Le necropoli di Licodia Eubea e i vasi geometrici del quarto periodo siculo", *Römische Mitteilungen* 13, 305-366.

Orsi, P. 1899a, "Contributi all'archeologia preellenica sicula", *Bullettino di Paletnologia Italiana* 15, 158-188, 197-231.

Orsi, P. 1899b, "Pantalica e Cassibile", *Monumenti Antichi* 9, 33-146.

Orsi, P. 1899c, "Avola. Sepolcri siculi e catacombe cristiane", *Notizie degli Scavi* 7, 69-70.

Orsi, P. 1912, "La Necropoli Sicula di Pantalica", *Monumenti Antichi* 21, 301-346.

Orsi, P. 1913, “Le necropoli sicule di Pantalica e Monte Dessueri”, *Monumenti Antichi dei Lincei* 9, 301.

Orsi, P. 1914, “Sepolcri Siculi di Centuripe”, *Bullettino di Paletnologia Italiana* 9, 6-12.

Osborne, R. 1998, “Early Greek Colonization? The Nature of Greek Settlement in the West”, in N. Fisher and H. Van Wees (eds), *Archaic Greece: New Approaches and New Evidence*, Duckworth, London, 251-269.

Osborne, M. A. 1999, “Introduction: The Social History of Science, Technoscience and Imperialism”, *Science, Technology and Society* 4(2), 161-170.

Osterhammel, J. 1997, *Colonialism: A Theoretical Overview*, Ian Randle Publishers, Princeton.

Pais, E. 1894, *La Storia della Sicilia e della Magna Grecia*, Arnaldo Forni Editore, Bologna.

Pancucci, D. and Naro, M. C. 1992, *Monte Bubbonia, Campagne di scavo 1905, 1906, 1955*, Bretschneider, Roma.

Papadopoulos, J. K. 1994, “Early Iron Age Potter’s Marks in the Aegean”, *Hesperia* 63(4), 437-507.

Pareti, L. 1914, *Studi siciliani ed italioti*, Seeber, Firenze.

Park, R. E. and Burgess, E. W. 1921, *Introduction to the Science of Sociology*, The University of Chicago Press, Illinois.

Patacca, E., Scandone, P., Giunta G. and Liguori V. 1979, “Mesozoic paleotectonic evolution of the Ragusa Zone (Southeastern Sicily)”, *Geologica Romana* 18, 331-369.

Patroni, G. 1896, “La fibula nella necropoli siracusana del Fusco”, *Bullettino di Paletnologia Italiana* 22, 33-42.

Pedley, H. M. 1981, “Sedimentology and paleo-environment of the southeast Sicilian Tertiary platform carbonates”, *Sedimentary Geology* 28, 273-291.

Pelagatti, P. 1973, “L’entroterra di Camarina”, in P. Pelagatti and G. Voza (eds), *Archeologia nella Sicilia sud-orientale,* Centre Jean Bérard, Naples, 151-158.

Pelagatti, P. 1976a, “I più antichi materiali di importazione a Siracusa, a Naxos e in altri siti della Sicilia orientale”, in G. Vallet (ed.), *La Céramique Grecque ou de tradition Grecque au VIII Siècle en Italie central et méridionale*, Centre Jean Bérard, Naples, 113-180.

Pelagatti, P. 1976b, “Nuove ricerche lungo la costa di Camarina e alla foce dell'Ippari”, *Sicilia Archeologica* 9, 15-24.

Pelagatti, P. 1976c, “Ricerche antropologiche per una miglior conoscenza del mondo greco coloniale. Nuovi dati sui riti funebri a Camarina”, *Sicilia Archeologica* 30, 37-49.

Pelagatti, P. 1977, “Siracusa. Elementi dell’abitato di Ortigia nell’VIII e nel VII secolo a.C.”, *Cronache di Archeologia e Storia dell’Arte* 17, 119-123.

Pelagatti, P. 1982, “I più antichi materiali di importazione a Siracusa, Naxos e in altri siti della Sicilia Orientale”, in G. Vallet (ed.), *La Céramique Grecque ou de tradition Grecque au VIII Siècle en Italie central et méridionale*, Centre Jean Bérard, Naples, 113-180.

Pelagatti, P. 1985, “Ricerche nel quartiere orientale di Naxos e nell’agora di Camarina”, *Kokalos* 30-31, 679-694.

Pelagatti, P. 2002, “Incinerazione primaria a Camarina e a Monte Casale”, in F. Cordano, M. Di Salvatore and P. Pelagatti (eds), *Il Guerriero di Castiglione di Ragusa: greci e siculi nella Sicilia sud-orientale: atti del Seminario,* L’Erma di Bretschneider, Rome, 141-148.

Pelagatti, P. and Del Campo, E. 1971, “Abitati Siculi: Castiglione”, *Sicilia Archeologica* 16, 30.

Peroni. R. 1956, “Per una distinzione in fasi delle necropoli del secondo periodo siculo a Pantalica”, *Bullettino di Paletnologia Italiana* 65, 387-432.

Pevenage, J. V. and Vandenabeele, P. 2017, "Raman Spectroscopy and the Study of Ceramic Manufacture", in A. Hunt (ed.), *The Oxford Handbook of Archaeological Ceramic Analysis*, Oxford University Press, Oxford, 531-543.

Plog, S. 1980, *Stylistic Variation in Prehistoric Ceramics*, Cambridge University Press, Cambridge.

Pratt, M. L. 1992, *Imperial Eyes: Travel Writing and Transculturation*, Routledge, London.

Procelli, E. 1978, "Cassibile", *Studi Etruschi* 47, 569-571.

Publiese Carratelli, G. 1986, *Storia civile, Sikanìe: storia e civiltà della Sicilia greca*, Unione Topografico-Editrice Torinese, Turin.

Quinn, P. 2009, "Keeping an eye on your pots: the provennce of Neolithic ceramics from the Cave of Cyclops, Youra, Greece", *Journal of Archaeological Science* 37(5), 1042-1052.

Quinn, P. 2013, *Ceramic Petrography: The Interpretation of Archaeological Pottery and Related Artefacts in Thin Section*, Information Press, Oxford.

Raudino, A. 2016, "Monte Finocchito from an indigenous point of view", in H. L. Reid and D. Tanasi (eds), *Philosopher Kings and Tragic Heroes. Essays on Images and Ideas from Western Greece*, Parnassos Press, Iowa, 317-328.

Raudino, A., Tykot, R. H. and Vianello, A. 2017, "Monte Finocchito and Heloros pottery production: New evidence through technological studies and material analysis", *Open Archaeology* 3, 247-254.

Raudino, A. 2018, "Variation in Material Culture: Adoption of Greek ceramic types in an indigenous Sicilian site (8^{th} century BCE)", *Ex Novo-Journal of Archaeology*, 3, (*in press*).

Redfield, R., Linton, R. and Herskovits, M. J. 1936, "Memorandum for the study of acculturation", *American Anthropologist* 38(1), 149-152.

Reedy, C. L. 2015, “Petrographic and Image Analysis of Thin Sections of Classic Wares of Song Dynasty”, in S. Ningchang, M. Jianmin (eds), *Proceedings of Internationl Symposium on Science and Technology of Five Great Wares of the Song Dynasty*, 381-390.

Reedy, C. L., Anderson, J., Reedy, T. J. and Liu Y. 2014, “Image Analysis in Quantitative Particle Studies of Archaeological Ceramic Thin Sections”, *Advances in Archaeological Practice* 2(4), 252-268.

Restuccia, F., Fianchino C., Galizia, M. and Santagati C. 2012, “The stone landscape of the Hyblaean Mountains: the geometry, structure, shape and nature of the muragghio”, in G. Tampone, R. Corazzi and E. Mandelli (eds), *Domes in the World. Congress Proceedings Florence (March 19-23 2012),* Nardini, Florence, 1-14.

Rigo, M. and Barberi, F. 1959, “Stratigrafia pratica applicata in Sicilia”, *Bollettino del Servizio Geologico d’Italia* 80, 1-98.

Rigo M. and Cortesini A. 1961, “Contributo alla conoscenza strutturale della Sicilia sud-orientale”, *Bollettino del Servizio Geologico d’Italia* 81(2-3), 349-369.

Rizza, G. 1957, “Giarratana (Ragusa). Resti di fortificazione greca su Monte Casale” *Notizie degli Scavi di Antichità*, 205-207.

Roberts, B. W. and Vander Linden, M. 2011, “Investigating Archaeological Cultures: Material Culture, Variability, and transmission”, in B. W. Roberts and Vander Linden, M. (eds) *Investigating Archaeological Cultures: Material Culture, Variability, and Transmission*, Springer, New York, 1-21.

Rochette, D. R. 1815, *Histoire critique de l’établissement des colonies grecques*, Tome Deuxieme, Paris.

Rodríguez, C., Coronel-Prats, R. B., Barone, G., Cultrone, G., Mazzoleni, P. and Tanasi, D. 2015, “Petrographic and chemical characterization of Bronze Age pottery from the settlement of Mount San Paolillo (Catania, Italy)”, *Accademia Nazionale dei Lincei* 26, 485-497.

Roitman, J. 2014, *Fiscal Disobedience: An Anthropology of Economic Regulation in Central Africa*, Princeton University Press, Princeton.

Roller, L. E. 1991, “East Greek Pottery in Sicily: Evidence for Forms of Contact”, *Cronache di Archeologia e Storia dell’Arte* 30, 89-95.

Romagnoli, G., Catalano, S., Pavano, F. and Tortorici, G. 2015, “Geological map of the Tellaro River Valley (Hyblaean Foreland, southeastern Sicily, Italy)”, *Journal of Maps* 11(1), 66-74.

Roux, V. 1998, “Identification of wheel-fashioning methods technological analysis of 4th-3rd Millennium BC. Oriental ceramics”, *Journal of Archaeological Science* 25, 747-763.

Rowe, J. H. 1961, “Stratigraphy and seriation”, *American Antiquity* 26, 324-330.

Rye, O. S. 1981, *Pottery Technology. Principles and Reconstruction*, Taraxacum, Washington.

Sackett, J. R. 1977, “The meaning of style in archaeology: a general model”, *American Antiquity* 42(3), 369-380.

Sackett, J. R. 1982, “Approaches to style in lithic archaeology”, *Journal of Anthropological Archaeology* 1, 59-112.

Sackett, J. R. 1990, “Style and ethnicity in archaeology: the case for isochrestism”, in M. W. Conkey and C. A. Hastorf (eds), *The Uses of Style in Archaeology*, Cambridge University Press, Cambridge, 32-43.

Sadori, L., Zanchetta, G. and Giardini, M. 2007, “Last Glacial to Holocene palaeoenvironmental evolution at Lago di Pergusa (Sicily, Southern Italy) as inferred by pollen, microcharcoal, and stable isotopes”, *Quaternary International* 181(1), 4-14.

Sahlen, E. D. 2011, *Ceramic technology and technological traditions: the manufacture of metalworking ceramics in late prehistoric Scotland*, (unpublished Ph.D. thesis, University of Glasgow).

Said, E. W. 1978, *Orientalism*, Pantheon Books, New York.

Sanahuja, Y. and Vilar, V. V. 1976, “La necrópolis de Cozzo delle Giummare (Noto-Siracusa, Sicilia oriental), *Pyrenae* 12, 117-140.

Santacreu, D. A. 2014, *Materiality, Techniques and Society pottery production. The technological study of archaeological ceramics through paste analysis*, De Gruyter Open, Warsaw.

Schiffer, M. B. 1976, *Behavioral Archaeology*, Academic Press, New York.

Schmidt D. and Friedberg, P. 1964, "Litostratigrafia petrolifera della Sicilia", *Rivista Minerologica Siciliana* 88-90, 198-217.

Serrati, J. 2000, "Sicily from pre-Greek times to the fourth century" in C. Smith and J. Serrati (eds), *Sicily from Aeneas to Augustus: New Approaches in Archaeology and History, Edinburgh University Press, Edinburgh*, 9-14.

Shackley, M. S. 2011, "An Introduction to X-Ray Fluorescence (XRF) Analysis in Archaeology" in M. S. Shackley (ed.), *X-Ray Fluorescence Spectrometry (XRF) in Geoarchaeology*, Springer, London, 7-44.

Shackley, M. S. 2012, "Portable X-ray Fluorescence Spectometry (pXRF): The Good, the Bad and the Ugly", *Archaeology Southwest Magazine* 26(2), 1-8.

Shepard, A. O. 1942, *Rio Grande Glaze Paint Ware: A Study illustrating the Place of Technological Analysis in Archaeological Research*, Carnegie Institution of Washington, vol. 528(39), Washington.

Shepherd, G. 2009, "Greek 'Colonisation' in Sicily and the West. Some Problems of Evidence and Interpretation Twenty-Five years on", *Pallas* 79, 15-25.

Shepherd, G. 2014, "Archaeology and Ethnicity. Untangling Identities in Western Greece", *Dialogues d'historie ancienne, Supplement* 10, 115-143.

Sinopoli, C. 1991, *Approaches to Archaeological Ceramics*, Plenum Press, New York.

Snodgrass, A. M. 1987, *An Archaeology of Greece. The Present State and Future Scope of a Discipline*, University of California Press, Berkeley.

Sommer, M. 2011, "Colonies-Colonisation-Colonalism: A Typical Reappraisal", *Ancient West and East* 10, 183-193.

Sorby, H. C. 1858, “On the microscopical structure of crystals, indicating the origin of minerals and rocks”, *Quarterly Journal of the Geological Society* 14, 453-500.

Spatafora, F. 1996, “Gli Elimi e l’età del Ferro nella Sicilia Occidentale”, in R. Leighton (ed.), *Early Societies: New Developments in Archaeological Research,* Accordia Research Centre, London, 155-165.

Spatafora, F. 2000, “La ceramica dalla “Zona E”dell’abitato di Mozia”*, Atti delle Terze Giornate Internazionali di Studi sull’Area Elima, Gibellina-Erice-Contessa Entellina (23-26 ottobre 1997, Pisa-Gibellina 2000)* vol. 2, Scuola Normale Superiore di Pisa, Pisa, 919-956.

Spatafora, F. 2003, *“Monte Maranfusa”, Di terra in terra, nuove scoperte archeologiche nella provincia di Palermo,* Soprintendenza dei Beni Culturali e ambientali di Palermo, Palermo.

Spatafora, F. 2008, “Indigeni e Greci negli emporia fenici della Sicilia”, *Bollettino di Archeologia online I 2010/vol. speciale, Session: Identità e multiculturalità nella Sicilia di età coloniale (VIII-IV sec. A.C.),* 34-46.

Speakman, R. J. 2012, *Evaluation of Bruker’s Tracer Family Factory Obsidian Calibration for Handheld Portable XRF Studies of Obsidian, Report prepared for Bruker AXS,* Kennewick, WA.

Speakman, R. J. and Shackley M. S. 2013, “Silo Science and Portable XRF in Archaeology: A Response to Frahm”, *Journal of Archaeological Science* 40, 1435-1443.

Spicer, E. 1962, *Cycles of Conquest: The Impact of Spain, Mexico and the United States on the Indians of Southwest, 1533-1960,* University of Arizona Press, Tucson.

Steures, D. C. 1980, *Monte Finocchito Revisited. Part 1: The Evidence,* Allard Pierson Series, Amsterdam.

Steures, D. C. 1988, *Monte Finocchito Revisited. Part 2: Seriation and Demography,* Allard Pierson Series, Amsterdam.

Stika, H., P., Heiss, A. G. and Zach, B. 2008, “Plant remains from the early Iron Age in western Sicily: differences in subsistence strategies of Greek and Elymian sites”, *Vegetation History and Archaeology* 17(1), 139-148.

Stoltman, J. B. 1991, “Ceramic Petrography as a technique for documenting cultural interaction: an example from the Upper Missisippi Valley”, *American Antiquity* 56 (1), 103-120.

Sundwall, J. 1943, *Die Älteren Italischen Fibeln*, De Gruyter and Company, Berlin.

Szakmámy, G. and Starnini, E. 2007, “Archaeometric research of the first pottery production in the Carpathian Basin: Manufacturing traditions of the early Neolotich, Körös culture ceramics”, *Archeometriai Mühely* 2, 5-19.

Tanasi, D. 2004, “Per un riesame degli elementi di tipo miceneo nella cultura di Pantalica Nord”, in V. La Rosa (ed.), *Le presenze Micenee nel Territorio Siracusano. I Simposio Siracusano di Preistoria Siciliana in Memoria di Paolo Orsi. Siracusa, 15-16 Dicembre 2003*, Bottega d’Erasmo, Padova, 337-383.

Tanasi, D. 2008, “La Sicilia e l’arcipelago maltese nell’età del Bronzo Medio”, *Vegetation History and Archaeobotany* 17, 139-148.

Tanasi, D. 2013, “A case study for an archaeometric characterisation of Sicilian Middle Bronze Age Pottery (15th-13th BC)”, *Swiatowit: Annual of the Institute of Archaeology of Warsaw University* 40(52)/A, 47-66.

Tanasi, D., Hassam, S., Pirone, F., Raudino, A., Trapani, P., Tykot, R. H., and Vianello, A. 2016, “Chemical Characterization of Early Bronze Age/Middle Bronze Age Pottery from Ognina (Sicily): A Comparison of XRF and pXRF for Analysis of Ancient Pottery”, *Annual Meeting of the Archaeological Institute of America (AIA) and the Society for Classical Studies (SCS), 6-9 January 2016.*

Tanasi, D., Tykot, R. H., Pirone, F. and McKendry, E. 2017, “Provenance Study of Prehistoric ceramics from Sicily: A comparative Study between pXRF and XRF”, *Open Archaeology* 3, 222-234.

Taylor, W. W. 1948, *A study of archaeology*, Memoir of the American Anthropological Association 69, Southern Illinois University Press, Illinois.

Thér, R. 2015, “Identification of Pottery-Forming Techniques using Quantitative Analysis of the Orientation of Inclusions and Voids in Thin Sections”, *Archeometry* 58(2), 222-238.

Tinner, W., Van Leeuwen, J. F. N. , Colom-Baroli, D., Vescovi, E., Van der Knaap, W. O., Henne, P. D., Pasta, S., D’Angelo, S. and La Mantia, T. 2009, “Holocene environmental and climatic changes at Gorgo Basso, a coastal lake in southern Sicily, Italy”, *Quaternary Science* 28(5-16), 1498-1510.

Tite, M. S. 1999, “Pottery Production, Distribution, and Consumption. The Contribution of the Physical Sciences”, *Journal of Archaeological Method and Theory* 6(3), 181-233.

Tomasello, F. 2004, “L’architettura ‘micenea’ nel Siracusano. To-ko-do-mo a-pe-o o de-me-o-te?” in V. La Rosa (ed.), *Le Presenze Micenee nel territorio Siracusano. I simposio Siracusano di Preistoria Siciliana in Memoria di Paolo Orsi, Siracusa, 15-16 Dicembre 2003*, Bottega d’Erasmo, Padova, 187-215.

Tonkin, E., McDonald, M. and Chapman, M. 1989, “Introduction. History and Social Anthropology”, in E. Tonkin, M. McDonald and M. Chapman (eds), *History and Ethnicity*, Routledge, London, 1-21.

Torrence, R. 1986, *Production and Exchange of Stone Tools. Prehistoric Obsidian in the Aegean*, Cambridge University Press, Cambridge.

Trigger, B. 1984, “Alternative archaeologies: Nationalist, colonist, imperialist”, *Manuscripta* 19, 355-370.

Trigger, B. 1989, *A History of Archaeological Thought*, Cambridge University Press, Cambridge.

Trombi, C. 1999, “La ceramica indigena dipinta della Sicilia dalla seconda metà del IX sec. a.C. al V sec. a.C.”, in M. Barra Bagnasco, E. De Miro and A. Pinzone (eds), *Magna Grecia e Sicilia: stato degli studi e prospettive di ricerca*, Messina 1999, 275-293.

Tsignarida, A. and Kurtz, D. 2002, *Appropriating Antiquity. Saisir l'Antique: Collections et collectionneurs d'antiques en Belgique et en Grande-Bretagne au XIXe siècle*, Le Livre Timperman, Brussels.

Turner, F. M. 1981, *The Greek Heritage in Victorian Britain*, Yale University Press, New Haven.

Turner, S. D. 2000, *High resolution palaeoenvironmental analyses of coastal wetland sediments from south east Sicily*, Agricultural Information Data providers (unpublished thesis, Brunel University).

Tusa, S. 1983, La *Sicilia nella preistoria*, Sellerio Editore, Palermo.

Tusa, S. 1998-1999, "Sicani ed Elimi", *Kokalos* 34-35, 47-73.

Tusa, S. 2004, "Historical Reference Frame in Western Sicily from the End of II to the Beginning of I Millennium BC.", in C. Mühlenbock and C. Prescott (eds), *The Scandinavian Sicilian Archaeological Project: Archaeological Excavations at Monte Polizzo Sicily, Reports 1998-2001*, Göthenborg University, Göthenborg, 17-26.

Tusa, S. and Nicoletti, F. 2002, "L'epilogo sicano nella Sicilia occidentale: il caso di Mokarta. Capanna 1", *Atti del convegno delle terze giornate internazionali di studi sull'area Elima, (Gibellina-Erice 23-26 Ottobre 1997, Pisa-Gibellina 2000)* vol. 2, Scuola Normale Superiore di Pisa, Pisa, 963-977.

Tusa, S., Facella, A. and Capelli, C. 2016, "The Greeks in the West: genetic signatures of the Hellenic colonisation in southern Italy and Sicily", *European Journal of Human Genetics* 24, 429-436.

Tykot, R. H. 2002, "New Approaches to the Characterization and Interpretation of Obsidian from the Mediterranean Island Sources", in P. B. Vandiver, M. Goodway, J. R. Druzik and J. L. Mass (eds), *Materials Issues in Art and Archaeology VI*, Materials Research Society Proceedings 712, Warrendale, 143-157.

Tykot, R. H. 2016, "Using Non-Destructive Portable X-Ray Fluorescence Spectrometers on Stone, Ceramics, Metals, and Other Materials in Museums: Advantages and Limitations", *Applied Spectroscopy* 70(1), 42-56.

Tykot, R. H., White, N. M, Du Vernay, J. P., Freeman, J. S., Hays, C. T., Koppe, M., Hunt, C. N., Weinstein, R. A. and Woodward, D. S. 2013, “Advantages and Disadvantages of pXRF for Archaeological Ceramic Analysis: Prehistoric Pottery Distribution and Trade in NW Florida”, in R. A. Armitage and J. H. Burton (eds), *Archaeological Chemistri VIII. Symposium Series 1147*, American Chemical Society, Washington, 233-244.

Valentino, M. 2003, “La ceramica da fuoco e da cucina”, in F. Spatafora (ed.) *Monte Maranfusa. Un insediamento nella media valle del Belice*, Regione Siciliana, Palermo, 255-268.

Vallet, G. 1962, “La colonisation chalcidienne et l’hellénisation de la Sicile orientale”,

Kokalos 8, 30-51.

Vallet, G. 1978, “Problemi di urbanistica nella Megara arcaica”, *Cronache di Archeologia e Storia dell’Arte* 17, 23-5.

Vallet, G. 1983, “Topographie historique de Mégara Hyblaea et problèmes d’urbanisme

colonial”, *Mélanges de l’École Française de Rome* 95(2), 640-647.

Vallet, G. and Villard, F. 1955, “Mégara Hyblaea V, Lampes du VII siècle et chronologie des coupes ioniennes”, *Mélanges de l’École Française de Rome* 65, 18-33.

Vallet, G., Villard, F. and Auberson, P. 1976, *Mégara-Hyblaea I. Le quartier de l’agora archaïque* 29(2), *Mélanges de l’École Française de Rome* 1, Rome.

Van Dommelen, P. 1997, “Colonial constructs: colonialism and archaeology in the Mediterranean”, *World Archaeology* 28(3), 305-323.

Van Dommelen, P. 1998, *On colonial Grounds: A comparative Study of Colonialism and Rural Settlement in First Millennium BC West Central Sardinia*, Archaeology studies Leiden University 2, (unpublished Ph.D.).

Van Dommelen, P. 2006, “The Orientalizing phenomenon: hybridity and material culture in the western Mediterranean”, in C. Riva and N. C. Vella (eds), *Debating Orientalization: multidisciplinary approaches to change in the ancient Mediterranean*, Equinox, Sheffield, 135-152.

Van Dommelen, P. 2012, “Colonialism and Migration in the Ancient Mediterranean”, *Annual Review of Anthropology* 41, 393-409.

Van Dommelen, P. 2014, Moving on: Archaeological Perspectives on Mobility and Migration, World Archaeology 46(4), 477-483.

Van Dommelen, P. and Knapp, A. B. 2010, “Material connections: mobility, materiality and Mediterranean, in P. Van Dommelen, A. B. Knapp (eds), *Material Connections in the Ancient Mediterranean: mobility, materiality and identity*, Routledge, London, 1-18.

Villard, F. 1999, “Le cas de Mégara Hyblaea est-il exemplaire?”, in G. Vallet (ed.), *La Colonisation Grecqueen Méditerranée Occidentale, Mélanges de l’École Française de Rome*, Rome, 133-40.

Villard, F. and Vallet G. 1956, “Géométrique grec, géométric sicéliote, géométric sicule. Étude sur le premier contacts entre Grecs et indigènes sur la côte orientale de Sicile”, *Mélanges de l’École Française de Rome* 66, 7-27.

Voza, G. 1968-1969, “L’attività della Soprintendenza alle Antichità della Sicilia Orientale fra il 1965 e il 1968”, *Kokalos* 14-15, 360-362.

Voza, G. 1970, “Eloro”, *Enciclopedia dell’Arte Antica Classica e orientale* (*Supplemento)*, 297-301.

Voza, G. 1973a, “Eloro”, in P. Pelagatti and G. Voza (eds), *Archeologia nella Sicilia Sud-Orientale*, Centre Jean Bérard, Naples, 117-126.

Voza, G. 1973b, “Eloro in età protoarcaica”, in P. Pelagatti and G. Voza (eds), *Archeologia nella Sicilia sud-orientale,* Centre Jean Bérard, Naples, 134-135.

Voza, G. 1973c, “Kasmenai (Monte Casale)”, in P. Pelagatti and G. Voza (eds), *Archeologia nella Sicilia sud-orientale,* Centre Jean Bérard, Naples, 129-130.

Voza, G. 1973d, “Akrai”, in P. Pelagatti and G. Voza (eds), *Archeologia nella Sicilia sud-orientale,* Centre Jean Bérard, Naples, 127-128.

Voza, G. 1973e, “La necropolis della Valle del Marcellino presso Villasmundo”, in P. Pelagatti and G. Voza (eds), *Archeologia nella Sicilia sud-orientale,* Centre Jean Bérard, Naples, 58-62.

Voza, G. 1976, “Heloros”, in R. Stillwell (ed.), *The Princeton Encyclopedia of Classical Sites*, Princeton University Press, Princeton, 382-383.

Voza, G. 1977, “Heloros in età protoarcaica”, *Insediamenti coloniali Greci in Sicilia nell’VIII e VII secolo a.C. (Atti della 2° riunione scientifica della scuola di perfezionamento in archeologia classica dell’università di Catania, Siracusa, 24-26 Novembre 1977),* Università degli Studi di Catania, Catania, 134-135.

Voza, G. 1979, “La Sicilia prima dei Greci”, in E. Gabba and G. Vallet (eds), *La Sicilia antica* I, Storia di Napoli e della Sicilia, Società Editrice, Naples, 5-42.

Voza, G. 1980, “Eloro”, in E. Gabba and G. Vallet (eds), *La Sicilia Antica I.3. Città greche e indigene di Sicilia: documenti e storia,* Storia di Napoli e della Sicilia, Società Editrice, Naples, 544-553.

Voza, G. 1980-1981, “L’attività della Soprintendenza alle Antichità della Sicilia Orientale” *Kokalos* 26-27(2-1), 685-688.

Voza, G. 1982, “Bilancio degli scavi a Siracusa sulla terraferma”, *Annuario della Scuola di Archeologia di Atene* 60, 165-167.

Voza, G. 1985, “I contatti precoloniali col mondo Greco”, in G. Pugliese Carratelli (ed.), *Sikanie. Storia e civiltà della Sicilia Greca,* Garzanti, Milano, 543-561.

Voza, G. 1989, “Eloro. Storia della ricerca archeologica”, *Bigliografia topografica della colonizzazione greca in Italia e nelle isole tirreniche* 7, 159-163.

Voza, G. 1999, *Nel segno dell’antico. Archeologia nel territorio di Siracusa*, Lombardi Editore, Palermo.

Voza, G. and Lanza, M. T. 1994, “Eloro”, *Enciclopedia dell’Arte Antica Classica e Orientale* 2, 462-463.

Watson, J. B. 1952, “Cayuá culture change: a study in acculturation and methodology”, *American Anthropologist* 54(2), 1-144.

Whitbread, I. K. 1986, “The characterisation of argillaceous inclusions in ceramic thin sections”, *Archaeometry* 28(1), 79-88.

Whitbread, I. K. 1989, “A proposal for the systematic description of thin sections towards the study of ancient ceramic technology”, in Y. Maniatis (ed.), *Archaeometry: Proceedings the 25th International Symposium*, Elsevier, Amsterdam, 127-138.

Whitbread, I. K. 1995, *Greek transport amphorae: A petrological and archaeological study*, British School of Athens, Athens.

White, R. 1991, *The Middle Ground: Indians, empires, and republics in the Great Lakes Region, 1650-1815*, Cambridge University Press, Cambridge.

Whitehouse, R. D. and Wilkins, J. B. 1989, “Greeks and natives in south-east Italy: approaches to the archaeological evidence”, in T. C. Champion (ed.), *Centre and Periphery. Comparative Studies in Archaeology*, Routledge, London, 102-126.

Wiessner, P. 1983, “Style and social information in Kalahari San projectile points”, *American Antiquity* 48, 253-276.

Wiessner, P. 1990, “Is there a unity to style?”, in M. W. Conkey and C. A. Hastorf (eds), *The Uses of Style in Archaeology*, Cambridge University Press, Cambridge, 105-112.

Wilke, D., Rauch, D. and Rauch. P. 2016, “Is Non-destructive Provenancing of Pottery Possible With Just a Few Discriminative Trace Elements?”, *Science and Technology of Archaeological Research* 2(2), 141-158.

Wilson, R. J. A. 1987, “Archaeology in Sicily, 1982-1987”, *Archaeological Reports* 34, 59-123.

Wilson, J. P. 2006, “Ideologies of Grek Colonization”, in G. Bradley and J. P. Wilson (eds), *Greek and Roman Colonization: Origins, Ideologies, and Interactions*, The Classical Press of Wales, Swansea, 25-57.

Wincklemann, J. J. 1755, *Reflections on the Painting and Sculpture of the Greeks: with instructions for the connoisseur and an Essay on Grace in Works of Art* (Translation 1765 by A. M. H. Fuselli), Printed for the Translator, and sold by A. Millar, London.

Wobst, M. 1977, "Stylistic behaviour and information exchange", in C. E. Cleland and J. B. Griffin (eds), *For the Director: Research Essays in Honor of James B. Griffin*, Museum of Anthropology, University of Michigan, Michigan, 317-342.

Wolf, E. 1982, *Europe and the People without History,* University of California Press, Berkeley.

Wright, R. 1985, "Technology and style in ancient ceramics", in D. Kingery (ed.), *Ceramics and Civilization, Ancient Technology to Modern Science,* The American Ceramics Society, Columbus, 5 -25.

Wright, D, K. 2017, "Paleoenvironmental Science: Methods", *Oxford Research Encyclopedia of African History*, 1-24.

Yntema, D. 2000, "Mental landscapes of colonization: The ancient written sources and the archaeology of early colonial-Greek southeastern Italy", *Bullettin Antieke Beschving* 75, 1-49.

Yntema, D. 2011, "Archaeology and the Origo Myths of the Greek Apoikiai", *Ancient West and East* 10, 243-266.

Young, R. J. C. 1995, *Colonial Desire: Hybridity in Theory, Culture and Race,* Routledge, London.

Young, R. J. C. 2001, *Postcolonialism: An Historical Introduction,* Wiley Blackwell, New Jersey.

Zefi, F. 1978, "Castel Decima (Roma)", *Notizie degli Scavi,* 280.

Zemon, D. N. 1995, "Métissage culturel et méditation historique", *Le Monte (18-19 Juin 1995),* 11.

Zemon D. N. 2001, "Polarities, hybridities: what strategies for decentering?", in G. Warkentin and C. Podruchny (eds), *Decentering the Renaissance: Canada and Europe in* *multidisciplinary perspective, 1500-1700*, University of Toronto Press, Toronto, 19-32.

Zhu, J., Shan, J., Qui, P., Qin, Y., Wang, C., He, D., Sun, B., Tong, P. and Wu, S. 2004, "The multivarite statistical analysis and XRD analysis of pottery at Xigongqiao site", *Journal of Archaeological Science* 31, 1685-1691.