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Critical Commodities:

Tracing Greek Trade in Oil and Wine

from the Late Bronze Age to the Archaic Period

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Archaeology

by

Catherine Elizabeth Pratt

2014

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ABSTRACT OF THE DISSERTATION

Critical Commodities:

Tracing Greek Trade in Oil and Wine

from the Late Bronze Age to the Archaic Period

by

Catherine Elizabeth Pratt

Doctor of Philosophy in Archaeology

University of California, Los Angeles, 2014

Professor Sarah P. Morris, Chair

Most studies of the Greek oil and wine industry focus either on the Late Bronze Age or the Classical Period, rarely mentioning the Early Iron Age (so often cast as a “Dark Age”) between the two. This dissertation attempts to fill this gap by investigating evidence for the continuity of a surplus economy between the Late Bronze Age and the Archaic period. Specifically, I examine what type of oil and wine economy existed in the Late Bronze Age (LBA), how this economy continued into the Early Iron Age (EIA), and how the Early Archaic period built upon these previously established, though smaller-scale, socio-economic networks.

Using data on the production, distribution, and consumption of large ceramic liquid transport containers, this study examines how the interaction between oil and wine manufacturers and central authority changed or remained constant during these periods of Greek antiquity. The first chapter puts transport containers into a context of oil and wine production in

the LBA by discussing the available archaeological and written evidence. This in-depth look at the importance of wine and oil in the LBA sets the stage for the following chapters.

The second chapter focuses on the most popular Greek transport jar of the LBA, the transport stirrup jar (TSJ). An examination of the production strategies of TSJs, their distribution throughout the Mediterranean, and their patterns of deposition within different regions, suggests that TSJs functioned within a commercial economy fueled by the palatial system, but by no means entirely controlled within it. Chapter Three of this dissertation discusses the ensuing Postpalatial period on Crete and the Greek mainland when the TSJ shape was slowly abandoned while the technologically simpler and more convenient amphora shape was adopted as the primary bulk liquid transport container.

Although the earlier part of the Protogeometric period has generally been regarded as one of isolation, the data presented in the fourth chapter on the North Aegean amphora (NAA) instead suggests that production became highly regionalized, concentrated in central Greece, Thessaly, and eventually the Thermaic Gulf. In addition, trade networks seem to have survived, continuing to link Greece with Asia Minor and eventually the central Mediterranean. In the ensuing Early Archaic period, the southern Greek response to the northern Greek NAA was the SOS amphora. Chapter Five discusses the importance of this amphora within a burgeoning socio-economic network that included not only Greeks and their colonies, but foreign agents as well.

The results of this research suggest that despite dramatic social and economic changes in the EIA, certain Greek societies maintained a level of surplus production of these two critical commodities and participated in an external commercial network. On a broader level, this dissertation addresses some larger problems concerning the relationship between economic organization and political hierarchy, especially in periods of dramatic political change.

The dissertation of Catherine Elizabeth Pratt is approved.

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University of California, Los Angeles

2014

For my grandmother, Betty Pratt,
who encouraged me to pursue my education above all else

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Introduction

While it is generally accepted that Late Bronze Age (LBA) Greece had palatial economies and the Archaic period saw flourishing polis economies with market exchange, the economy of the intervening Early Iron Age (EIA) is less clear. It is often thought that after the collapse of the LBA palaces, communities reverted to subsistence economies, and the surplus economy disappeared. It has also been assumed that, along with these changes, exports/imports were discontinued for 200 years until the Middle Protogeometric period when some Greek pottery made its way into the eastern Mediterranean regions (Crielaard 1999, 59). Yet this date for the reemergence of trade seems rather late since “market-based exchange systems such as that which existed in classical Athens do not emerge ex nihilo” (Parkinson et al. 2013, 413). Indeed, recent scholarship has brought to light earlier evidence for exchange during the Early Iron Age, suggesting the existence of a more advanced economic system than previously thought. But how do we discern the qualities of this Early Iron Age economy? Perhaps it is best to focus on a single genre of commodity, one that was prolifically exchanged during the previous LBA and in the subsequent Archaic period. This dissertation will therefore focus on bulk liquid commodities, specifically oil and wine. By tracing the transitions and transformations in the production, distribution, and consumption of these commodities, it may be possible to understand some of the interactions between the economy and the socio-political underpinnings of a rapidly changing Greek world. Some key questions related to these changing economic interactions in the EIA include: what happened to olive oil and wine trade in the EIA after the collapse of the Bronze Age palaces? Would oil and wine production continue, or be disrupted? Would Bronze Age trade routes be forgotten and replaced by completely new ones in the Iron Age? What is the connection, if any, between Early Iron Age trade in bulk liquids and Archaic trade in the same

commodities? How do the previous periods set the stage for the veritable economic explosion during the Archaic period? The research presented here seeks to answer or, at the very least, contribute to answering these core questions.

On a broader level, this dissertation tries to tackle some fundamental issues for Aegean history and prehistory, as well as broader problems concerning the relationship between economic organization and political hierarchy, especially in periods of dramatic political change. Answering the above questions will significantly impact our understanding of economic cultural processes over the long-term, particularly in circumstances of political “collapse.” Indeed, in recent years, the very notion of “collapse” has been increasingly debated (Railey and Reycraft 2008; Bachhuber and Roberts 2009; Middleton 2010; Mazarakis Ainian 2011). It has become relatively clear that total “collapse” is never the case for ancient societies. Instead, large-scale transformations and disruptions in economic and political situations change the flow of goods and relationships between producer and consumer. One of the broader aims of this dissertation, therefore, is to foster a reconsideration of the relationship between political and economic organization in early states (Parkinson et al. 2013). In particular, how the organization of production in bulk commodities relates to their shipment, distribution, and consumption. It has recently been acknowledged that “...to recognize the broader implications and significance of revenue generation...does not entail a resumption of direct political control over either production or exchange” (Feinman 2013, 456). It is therefore necessary to examine critically the mechanisms of production and distribution over a long period of time and through various socio-political transformations in order to understand how an economic system functions in multiple periods. To accomplish this, Earle (2010, 210) suggests, “Prehistoric economies should be conceptualized as organized into complicated, intertwined commodity chains for which

production, exchange, and use must be considered together as deeply embedded within social context of meaning and manipulation, and as joined social groups into “international” systems of connections affecting broad processes of social change.” By examining the production, distribution, and consumption of bulk liquid commodities over an extended period of Greek history, while taking into account the specific socio-cultural contexts of each time period, it may indeed be possible to discern the mechanisms of the early Greek economy and how these mechanisms were affected by changing social connections with the wider Mediterranean world.

As its basic premise, this dissertation investigates evidence for the continuity of a surplus economy between the Late Bronze Age and the Archaic period. The methods and theories applied differ greatly from previous studies. While previous scholarship has contributed greatly to our understanding of certain aspects of the EIA economy, there remains a need to consider the relationship between the economy and the changing social landscape from a more encompassing perspective. Much work on Early Iron Age commodities is very limited in chronological scope with a narrow focus. Although this trend is rapidly changing, many scholars have provided an in-depth examination of a particular part of the life-cycle of a commodity, either its production, distribution, or consumption, but rarely all three (see, for example, essays in Verdan et al. 2011). Other studies are beneficial to the field through focus on a single form of ceramic vessel. However, thoroughly examining the broader social contexts within which these vessels functioned seems to have been out of their scope (e.g., TSJs: Haskell et al. 2011; NAAs: Catling 1998, Gimatzidis 2010, Kotsonas 2012; SOS: Johnston and Jones 1978, Kotsonas 2012, Birzescu 2012). In contrast to these studies, others take a view of the ancient oil and wine economy, which is perhaps too broad, focusing on the social issues without overt attention to more concrete data and trends in the archaeological record, especially during the EIA when data are generally hard

to come by (Foxhall 2007; McGovern 2003). These broader studies, however, address many important aspects of ancient economies within which these two liquid commodities functioned. For example, in her recent book on the ancient economy and olive oil, Lin Foxhall (2007, 2) states that, “my larger purpose...is to enlarge our understanding of how specific agronomic and economic activities underpinned the functioning of Greek cities, and how they were in turn shaped by Greek social and political values.” Foxhall’s (2007, 15-16) rather short discussion of the EIA economy and its connection to the production of olive oil is a good demonstration of the necessity for further work in this area.

By following the vicissitudes of oil and wine production, exchange, and consumption in Greece from the Late Bronze Age to the Archaic period, this dissertation attempts to understand better the changing roles of elite management and its affects on oil and wine commerce. Yet how does one identify patterns of exchange? Dillian and White (2010, 7) suggest that, “Archaeologically, exchange is made visible by identifying artifacts and connecting them to their place of origin, noting spatial distributions and stylistic patterns.” It is necessary, therefore, to trace the production, exchange, and consumption of artifacts connected with bulk liquids (oil and wine). The best proxy for bulk liquids is the containers that stored and transported them; namely, large ceramic jars used specifically for movement of liquids. In the Late Bronze Age southern Aegean, the vessel of choice was the so-called “transport stirrup jar” (TSJ). This preference changed, however, after the Bronze Age collapse (Dickinson 2010) when the amphora was adopted in Greece as the primary liquid transportation ceramic vessel type, particularly the so-called “North Aegean amphora” (NAA)¹ during the Early Iron Age, and the so-called “SOS”

¹ The label “North Aegean amphora” has recently been questioned by Kotsonas (2012) who suggests “Thermaic Gulf amphora” would be a better term. This term, however, would only apply, with any certainty, to the latest version of this amphora, Type II, produced toward the end of the 8th century B.C.E. The term “North Aegean

amphora during the Late Geometric and Early Archaic period. Regarding large liquid containers, and specifically amphoras, Gras (2010, 112) suggests that “la fabrication d’amphores n’est pas le resultat d’une simple activité artisanale au sens traditionnel du terme mais la logique reste la même: la réponse à un besoin de la communauté.” The creation of amphoras, therefore, will only happen if there is a communal need for the capacity to transport bulk liquids.

A full appreciation of the oil and wine trade in the Early Iron Age requires a long-term perspective. Specifically, I examine what type of oil and wine economy existed before in the LBA, how this economy continued into the EIA, and how the Early Archaic period built upon the previously established, though smaller-scale, networks of the EIA, and even the LBA (Papadopoulos 2001). This long-term perspective avoids the quagmire of period-specific archaeological details by focusing on broader trajectories. In doing so it may be possible to gain insight into long-term economic or social trends that potentially carried over from one “era” to another. Indeed, we must remember that designations for different chronological time periods are solely devised by scholars (Papadopoulos 1993; 2012, 9). Although there are certainly changes in the archaeological record, those people living at these junctures were surely connected to what came before and what will come after.

In addition to broad chronological scope, this dissertation assumes a “total context approach” for the study of archaeological material (Rupp 2005, 48). This approach examines the production, distribution, and consumption of transport containers and, by proxy, their liquid contents. In doing so, we gain a window onto aspects of social organization during production, cultural contact, and economic networks during transport, as well as an insight into value as the products were consumed by both Greeks and non-Greeks alike. For amphoras, standardization of

amphora” will, therefore, be retained here, though it is possible that future research will demonstrate its inadequacy throughout the Early Iron Age.

production, the scope of their distribution, and how they and their contents were consumed reflect the interaction between farmer, potter, and politics on a local scale, as well as interaction between different cultures along a broader economic network. These two scales of interaction fluctuate as historical and environmental events alter political regimes, population sizes, and interaction with distant lands. Studying the life-cycle of the liquid transport container offers the opportunity to explore the “intricate relationships between social and cultural values, agricultural practices, the development and adoption of technology, and the workings of the economies of Late Bronze Age and Iron Age Greece—aspects of the ancient world which are sometimes studied in isolation from each other” (Foxhall 2007, 1).

An examination of the production of bulk liquid ceramic transport containers in the LBA, EIA, and Archaic period allows us to focus on a number of specific questions. What type of production strategy was employed: was it centralized or localized? How many production locations existed? Do these criteria correspond to a certain political situation? Does standardization in size, shape, volume and decoration reflect centralized vs. localized production strategies? How does the standardization reflect the economy within which the pots functioned? In relation to the socio-political situation of the period, is the production of surplus oil/wine and their containers connected to craft production as a means to power (elites as active agents manipulating specialized manufacture to promote the interests of some) or craft production as a means to autonomy (non-elites producing products within their own organization [individual to communities or factories])? Certainly in either case elites may have benefited in other ways, such as taxes levied on market exchanges (Schortman and Urban 2004, 197). The involvement of non-elites in craft production may be a response to economic stress, or possibly even economic freedom. In the case of EIA Greece, the collapse of the palaces may have generated a political

vacuum within which non-elites could produce their own organized surplus commodities and trade them. In other words, as a new, less centralized type of entrepreneur. Indeed, it seems that non-elite craft manufacture responds more to economic than to political processes and pressures (Schortman and Urban 2004, 199). In either situation, elite or non-elite craft production, increasing social differentiation would result as some manufacturers excelled beyond others. Consequently, we may ask what effect the level of control by the governing body had on the economic networks of the oil/wine trade? Does centralized production and oversight mean that there will be a more intricate network? Or can localized production strategies produce the same form of economic sophistication?

It is also important to note that analyzing the production of objects also allows us to discern the cultural and contextual value of those objects. Specifically, production instills initial object value through a series of mechanisms: scarcity and inherent properties of the raw materials; labor investment required to manufacture the object; creation of similar objects with identifiable differences that comprise gradations of value; relative size of objects; social identity of those involved with the production process (e.g. participation by elites for the production of objects with writing on them; Flad 2012, 311).

The distribution of transport containers in the LBA, EIA, and Archaic periods, respectively, will be informed by principles of network theory (Malkin 2011; Knappett 2011), network analysis (Evans et al. 2009; Knappett 2005, 2013), and network-based models (McGeough 2007). While each type of ceramic container will have a corresponding distribution map with locations and quantities of amphoras marked, it is nevertheless necessary to try to go beyond such a relatively simplistic view of dots on a map. Network theory has the intellectual capability of bringing to life these points on a map by connecting them in meaningful ways with

links representing material, social, and intellectual movements. One benefit of network analysis is that it moves beyond the descriptive value of the term “network” and attributes to it a dynamic, creative role (Malkin 2011, 12). Network analysis also has the capacity to span and articulate different scales of analysis (micro to global), to integrate both people and things, and to mediate between social and physical space. As Knappett (2013, 4) suggests, “It is also a heuristic for stimulating ideas about links and relations and not just nodes and entities.” An additional benefit of network analysis over other models, such as world systems, for example, is that network approaches do not bring necessary directionalities. They do not oblige the drawing of boundaries, zones, or territories based on limited information. Networks can be relational and/or spatial, so they do not succumb necessarily to the criticism of either spatial or social determinism and they can cross scales (Knappett 2013, 6).

Along with network analysis come some practical methodologies. For one, it is necessary to define the nodes and links in a network: are nodes to be identified with settlements or people, or both? What are the directionality, frequency, and fidelity of links in a network (Knappett 2013, 4)? When identifying human nodes within economic networks of the periods addressed in this dissertation, the principles of a Network-Based-Model can be very helpful (McGeough 2007). Within a network-based approach, economic actions are seen as occurring in a network organization. The network itself is a complex, multi-variant system that is always changing. Within this network, each node should be understood as a situation of economic interaction between discrete groups or individuals. The first step, therefore, will be to identify these discrete groups or individuals engaging in an economic interaction within each temporal and economic context addressed in this study. Consequently, each chapter dealing with a specific type of container will have a section on “actors” and their roles within the economic networks of the

period. Special attention will be paid to how the particular economic actors convert their own nodal position within the network into political and economic advantage (power). For example, in McGeough's (2007) study, the palace at Ugarit was not "in control" of the economy, the palace was rather an individual economic agent, relatively more powerful than other agents because it was situated at a nodal point for so many exchange networks and social relationships. It is also necessary to recognize that no single mode of exchange was exclusive to the various actors. Market trade, reciprocity and redistribution (debt patronage) were open to all actors to some extent. In this way, McGeough (2007) concludes that "there is no 'economy' per se: economy should be understood as the emergent effect of a network of contingent exchange relations, not a thing in and of itself."

The main focus for links between geographical nodes (places) within distribution networks of transport containers will be the relative strength or weakness of the links and their directionality. Within an historical economic network, it is expected that one see both strong links and weak links and links that are stronger in one direction than the other. Given directionality, it becomes significant how one ranks a site, by inflow or outflow. A "busy" site with high inflow or outflow can be said to have high rank, regardless of its size. However, when rank and size are combined, one can talk of "impact" so a site with a large population and high rank will have high impact (Knappett 2013). Both rank and impact can help elucidate a network's centrality: which nodes acted as central hubs within an economic network.

Another major consideration for economic networks for oil/wine trade is their change over time. This diachronic approach can articulate the factors involved with shifts in network centrality or the appearance/disappearance of important nodes. In conjunction with the long-term approach adopted in this dissertation, it may be possible to see network continuity spanning key

points in Greek history. It may also be possible to identify the emergence of networks at points when links in previous networks have disappeared (van der Leeuw 2013). For example, did the EIA network emerge as new or was it a development from the previous BA network?

For the ancient Greek Mediterranean, Malkin (2010, 12) suggests that the term “decentralized network” seems apt. In this network, the sea is the center of “Greece,” which is perceived as a single sea stretching from the Black Sea to Spain. Within this decentralized network, connectivity and “distance” among nodes are measured by their degrees of separation rather than by physical distance (Malkin 2011, 12). By the Archaic period we can see the “self-organization of a complex system through the formation and rapid dynamics of decentralized, accessible, nonhierarchical, multidirectional, expansive and interactive networks” (Malkin 2011, 205-6). Network connectivity became faster and more efficient because it was enough for several random links to appear among distant nodes for the overall system to be connected, thereby “creating a ‘small world’ or in this case, Greek civilization” (Malkin 2011, 206). These increasingly widespread links between groups are facilitated and enabled by material culture. In this case, material culture can be viewed not simply as a proxy for social interactions, but as an integral part of them (Knappett 2013, 12). Combining the active role of material culture, a long-term diachronic perspective, and an explicit consideration of the articulation of geographical and social distance are some of the main themes with which archaeologists are grappling, and which are also adopted here.

Archaeology’s essential insight into consumption is its attention to comparative evidence of consumption across space and time. A narrow definition of consumption, often used by archaeologists, suggests that “consumption is simply a moment in the flow of goods throughout the social world, a discrete instance in a good’s life that is isolable from its manufacture,

marketing, and discard” (Mullins 2011, 134). It is also possible, however, to view consumption as a conceptual framework that could encompass any archaeological scholarship that examines “how people socialize material goods” (Mullins 2011, 134). This conceptual framework “embraces the agency of consumers and recognizes that goods assume meaning in a tension between structural and localized processes that cannot be described as being either wholly deterministic or disconnected from consumer symbolism” (Mullins 2011, 134-5). The meaning ascribed to goods within a particular social context can only be discerned through a careful examination of the archaeological contexts of deposition. Material culture reveals local systems of significance, focusing on how local consumers selected and exchanged import goods on the basis of local social, political, and material conditions (Mullins 2011, 138; Vives-Fernandez 2008). For example, Phoenician wine was consumed in hand-modeled indigenous vessels in northern Iberia, reflecting that the imported wine was “no longer Phoenician” (Vives-Fernandez 2008, 256). So even though imported items like wine were highly desired because of the social advantages that their possession, exchange, and consumption provided, they did not change people’s world visions merely by their (colonial goods) presence. Wine and oil have the benefit of being consumed within the body and are therefore connected to foodways and feasting: the culturally distinctive performances of status and social relations (Dietler 2001; Wright 2004). Food is closely linked to consumers’ agency over the symbolism of their own bodies (Mullins 2011, 138).

A discussion of an artifact’s consumption necessarily involves an understanding of the object’s value within the social context of its consumption. The term “value” is highly debated and socially constructed, thus “defined by the cultural context in which it is created” (Papadopoulos and Urton 2012, 1; see essays in Papadopoulos and Urton 2012). Each culture has

its own “regime of value” which “account[s] for the constant transcendence of cultural boundaries by the flow of commodities, where culture is understood as a bounded and localized system of meanings” (Appadurai 1986, 15). Appadurai (1986, 3) posits that, “what creates the link between exchange and value is *politics*...” and that the “source of politics is the tension between the tendency for elites to control and freeze the flow of commodities and the tendency for the contests between elites to invite a loosening of the rules and regulations” (Appadurai 1986, 15). Human transactions and motivations are therefore keys to understanding the meaning that humans attribute to things. For Graeber (2001, 2011), value is determined by “desire” in the sense that something is “desirable.” Desire here can be defined both in the sociological sense: conceptions of what is ultimately good, proper in human life; but also in the economic sense: the degree to which objects are desired, particularly as measured by how much others are willing to give up to get them. In this economic sense, “valuable objects or commodities are circulated by people, whether commercially exchanged in a market economy or as part of gifting in a nonmarket context, and are often deposited—or even destroyed—with the dead” (Papadopoulos and Urton 2012, 25). These constituent parts of determining the “value” of objects or commodities are necessary to keep in mind when examining the archaeological contexts of particular artifacts, in this case ceramic transport containers.

Since ceramic transport containers were consumed in various regions of the Mediterranean world, their position within a particular regime of value will differ considerably (Dietler 2005). The only way to tease out the specific values attached to Greek transport containers within these various social contexts is to examine their life histories (Flad 2012; Kopytoff 1986). This idea fits well with the “total context approach” adopted here. Flad (2012, 312) suggests that as objects are used and perceived by those other than the producers, their

values change from those initially instilled through the production process. Certain factors can affect the object's values in its use life including the identity of those who use the object; the degree to which an object is commodifiable and/or divisible; and the capacity an object has to accumulate history. Commodifiable objects can accumulate history more easily the farther they move from their original source in space and time. Indeed, "objects that are common, multiple or frequently commoditized in one context may become singular, highly valued objects in another" (Flad 2012, 312). Flad also highlights factors that can affect an object's value within the context of its final deposition. These include the degree to which contexts of final disposal are public or private, and whether they are intended for recovery or not. It is necessary to remember, however, that, "any attempt to reconstruct object value in ancient contexts will inevitably be limited by the aspects of production, use, and disposal that can be identified. Therefore, our understanding of object value will necessarily be partial and incomplete" (Flad 2012, 313).

The value of Greek transport containers within the contexts of their consumption can be discerned by careful attention to the archaeological record. Dietler (2005) has outlined a framework by which it may be possible to identify specific local patterns of consumption and demand. Specifically, one must examine the contexts of consumption (range of kinds of sites on which objects are found vs. those that are not found; the kinds of specific contexts where objects are found within those sites); the patterns of association of imported goods (what kinds of objects are found associated in what kinds of contexts); their relative quantitative representation (both in specific contexts and regionally); and their spatial distribution (both within sites and regionally). This dissertation adopts Dietler's framework as a way to understand the value of Greek transport containers within differing social contexts. At times, a comparative approach is adopted here to

highlight the differing contexts and patterns of consumption within different social groups, such as colonizing Greeks vs. indigenous groups during the Archaic period.

This dissertation adopts a research design with a wide range of approaches that should lead to a better understanding of the scale and organization of oil and wine trade in the Early Iron Age Aegean. By tracing the production, distribution, and consumption of bulk liquid transport containers from the Late Bronze Age to the Early Archaic period, one can discern patterns in the archaeological record that reflect changing socio-political and economic situations. It is hoped that this project will produce better insight into the economy of the EIA and the question of continuity between the Late Bronze Age and Archaic economies.

Chapter Review

The first chapter puts transport containers into a context of oil and wine production in the Late Bronze Age. A discussion of the archaeological evidence available for both wine and oil production is followed by a detailed analysis of written evidence in the form of both Linear A and B tablets. By taking an inclusive look at oil and wine production, instead of immediately jumping to ceramics, we can situate these two critical commodities within the societies that produced, regulated, and used them. Special attention is paid to the consumption of oil and wine within Mycenaean society including feasting, ritual, and domestic applications. This in-depth look at the importance of wine and oil in the Late Bronze Age will set the stage for the following chapters, since written evidence is no longer available in the Early Iron Age. The following chapters will then closely examine the production, distribution, and consumption of liquid commodity containers as a proxy for their contents.

The transport vessel *par excellence* in the Bronze Age is no doubt the Transport Stirrup Jar (TSJ), the subject of Chapter Two. Invented in the Middle Minoan (MM) II period, probably

around the same time as an increase in oil and wine production, the TSJ quickly spread to islands in the Cyclades and even to areas of Asia Minor. Only in the Late Minoan (LM) IIIA period, after the collapse of the Minoan palatial society, does this vessel shape make its way to the Greek mainland and the people living there, the Mycenaeans. In the Late Bronze Age the TSJ was produced in mass quantities and shipped all over the Mediterranean from Italy in the west to Troy in the north and Egypt in the south.

With the collapse of the Mycenaean palaces around 1200 B.C.E., a significant shift in transport vessel technology occurred. Chapter Three of this dissertation will discuss the afterlife of the TSJ and the path to a newly adopted transport vessel, the amphora. While TSJs continued to be produced on Crete in the Postpalatial period, their distribution is more limited and their shape changes to be more suitable as a storage vessel. At the same time, clues excavated in Crete and the mainland including hybrid shapes and altered use patterns point to an increased employment of the amphora shape as a transport vessel along with some consumer and/or producer dissatisfaction with TSJs. This whole process culminated in the Submycenaean period with the abandonment of the TSJ shape altogether and the whole-sale adoption of amphoras as the exclusive transport vessel for oil and wine.

Some scholars might attribute this shift to a change in subsistence practices and a possible decline in olive oil and wine production after the loss of palatial management (Hanson 1999). However, the importance of olive oil and wine to Greek society coupled with recent archaeological discoveries suggests that production, shipment and consumption of these two liquids continued well into the Protogeometric period (Foxhall 2003). Chapter Four is concerned mainly with the so-called North Aegean Amphora (NAA). Although the name of the vessels is derived from its first find spots, it was initially produced at sites in Greece and possibly even

Asia Minor in the Submycenaean period. The vessel and its contents were subsequently shipped to distant locations in Macedonia and even Troy. Early versions were found in funerary, settlement and sacred contexts displaying the range of values attributed to imported liquids during this putative “Dark Age.” The evolution of the NAA shape throughout the Geometric period suggests an increase in production scale and standardization alongside an increase in demand and complexity of distribution networks. By the Late Geometric period, the production zone of the NAA had shifted northward to the eastern coast of Macedonia, likely in Pieria and the Chalkidike, while being shipped to places like Pithekoussai in southern Italy. This large-scale production of oil and wine is no doubt the precursor to the northern Greek production of Classical Mendean wine, so coveted by ancient authors and politicians alike (Papadopoulos and Paspalas 1999).

The Late Geometric period marks a turning point in Greek history. As Greeks set sail from their metropoleis to found colonies throughout the Mediterranean and Black Sea, wine and oil production diversified. The southern Greek response to the northern Greek NAA was the SOS amphora. Chapter Five will discuss the invention and intricacies of this transport vessel including both innovations and imitations that allowed it to thrive in an increasingly crowded arena of regions vying for their own niche in the wine and oil market. Invented in Late Geometric Athens, and simultaneously produced on Euboea, the SOS amphora was distinctive and desired not only for its contents, but also as a status marker for individuals able to import one, along with its contents, to their colony from Athens, as they are found often in Greek-Italian tombs. However, the SOS amphora was rather short-lived, going out of use in the 6th century with the introduction of the Panathenaic games and their prize amphoras, modeled after the SOS and containing olive oil, though distributed primarily as prizes (Valavanis 1986; Bentz 1998). But before delving into

the main topic of this dissertation—ceramic transport containers—it is crucial to discuss the liquids contained in the containers.

The Intricacies of Olive and Grape Cultivation

It is quite clear that olive oil and wine are the most prominent liquids in the LBA and EIA, at least within the southern Aegean. The ability to grow the corresponding flora and the technological knowledge required to produce these liquids, however, is far from straightforward. Early Mediterranean farming communities started domesticating grape vines and olive trees as soon as they realized that they could basically breed the best plants (see below). Instead of planting from seeds, which takes too long to generate a fruit-bearing plant, farmers use the technique of vegetative propagation. In this process, farmers choose the best individual that produces the best fruit and graft or clone it to keep that particular genetic line going. Mass clonal reproduction will in turn affect the genetic make-up of any nearby wild grapes and olives because of pollen cross-breeding. For the grape vine, important traits include hermaphroditic, self-pollinating flowers, a thicker stem, and larger, juicier fruit (Palmer 1994, 13). Interestingly, as plants are manipulated, they become more dependent on human care. For example, one effect of the thicker-stemmed free-standing vines is that the plants need constant attention—trenching, fertilizing, pruning and weeding every year or they will be unproductive (Palmer 1994, 14). In this way, ancient and modern farmers have to weigh the benefits of domesticated plants against the amount of time and attention they need during the year while other crops are also vying for care.

But the time it takes during the year to care for olive trees and vines is only a fraction of the commitment. Both are long-term investments that may not pay off for at least ten years. For grape vines, it takes ten years for a vine to bear a significant crop and 15 years to reach full

productivity. Vines and other tree crops are, therefore, the mark of a fully sedentary, stable agricultural community (Palmer 1999, 14). This also results in a certain measure of commitment to land and crops. Neglecting or abandoning grapes would result in another ten years before any fruits and their products could be produced. Between olive trees and vines, vines require the most intensive labor, although only for short periods of the year and grapes are the most sensitive to adverse weather changes during their growing season (Palmer 1994, 14). The main limiting factor for the growth of olive trees is water. The labor required for pruning olive trees and trenching grape vines (digging holes around the base to allow water and sun to reach the roots) requires a consistent work-force throughout the year. During harvest, the labor is intensified and a large group of people would be needed since grapes and olives ripen all at once. However, unlike grapes, olive trees only crop biennially: one year it produces fruit, the next it does not. But this cycle can be disturbed if there is a drought in an off year. It may take several years before the trees return to their “normal” cycle (Foxhall 2007, 8).

Once grapes are picked they can be pressed for wine immediately or allowed to sit in the sun, which concentrates the sugar, producing a better fermentation. In fact, this is exactly what the Archaic poet Hesiod suggests in *Works and Days* 611-613. Pressing olives can happen over a longer period of time, and it is common that one olive press would be shared by an entire town or group of farmers. Olive presses must be made of stone to withstand the pressure required for pressing the olive pips, while grape pressing beds can be ceramic, (or baskets on a ceramic bed) portable and relatively easy to acquire, allowing multiple households to own one.

When it comes to making olive oil and wine, there are a few key steps that will affect what archaeologists find in the material record. First, deciding whether to produce white or red wine will determine the type of juicing mechanism. If the fresh pressed juice is exposed to the

skins and stems, a red wine is produced, but if during pressing the juice is strained immediately the wine will be white. This can be done using basketry or a bag where the juice immediately escapes (Palmer 1994, 16; Immerwahr 1992, 124-25). Unfortunately this would also mean that the equipment would not be present in the archaeological record. The initial juice extraction, normally produced by human treading, is called “first-run.” The next step squeezes the remaining 1/3 of the grape juice out of the fruit by pressing or twisting grape mash in a bag. This second pressing is called “second run” and produces lower quality wine that will spoil more quickly because of its impurities. The best quality wine comes from juice that oozes out under the weight of the grape itself. This is called “free-run” and is very limited but sweet and will last much longer on the shelf. The liquid produced from these processes is not yet wine, but is called “must.” Must is the term used for juice that has been exposed to *saccharomyces* yeast which is located naturally in the skins and stems. This term is used for the liquid while it is fermenting. The fermenting process—turning sugar into alcohol—will stop once the alcohol content has reached 13-16%.

When studying the entire life-cycle of wine and oil production, it is necessary to take into account timing and human involvement that may affect the archaeological record. For example, wine can be transported as must just after pressing and also after fermentation is complete, but not during fermentation (Palmer 1994, 17). This means that when we find vessels that have been used to move liquids, we can assume that it is already fermented wine, not fresh must. Additionally, when wine has stopped fermenting it is then removed from its container and strained into other vessels to remove more impurities and be distributed. Olive oil, on the other hand, does not need to be fermented or treated, just separated from the water that is also

produced when crushing olives. This can be done either by a vessel that drains the water from the bottom, allowing the oil to float to the top or by simply skimming the oil off the top.

The cultivation of olives and grapes needs to be a deliberate, long-term decision by a community. A farmer's decision to grow grapes or olives balances the availability of land and labor against the value and desirability of the crop (Palmer 1994, 23). Because of this, it would be unusual for a community to abandon an orchard or vineyard once it has reached its potential fruit yield. Indeed, there must be a very serious problem, such as a long drought, to cause olive trees and grape vines to stop producing their fruit. A drought, if long enough, could stop the capability of a tree to produce olives for years, since they bear fruit only every other year. This hiatus could be prolonged due to the propensity for olive trees over a wide area to be synchronized so that most bear fruit in the same year. Understanding the intricacies of growing, processing, and storing olives and grapes is a necessary step for a study of ancient wine and oil industries. The creation of oil and wine is, therefore, inextricably linked to the dynamics of the natural and social environment.

Chapter 1

Oil and Wine as Cultural Commodities

Introduction

We are all, in one way or another, accustomed to the pervasiveness of olive oil and wine. Some of us may actively use one or the other daily, such as a glass of red wine with dinner for health. Others may actively shun one or the other as a policy against alcohol or polyunsaturated fats. But these are all common practices, mundane and profane. What about sacred? As this dissertation will touch upon at several points, oil and wine were more than food and drink to the ancient Greeks. They were part of their cultural identity, intertwined in social activities and ritual, even aligned with gods and divinity. Some of us today may even experience this in the Christian Eucharist: wine is the blood of Jesus Christ. Although the religion and certainly the era are different, a similar quality is attached to this particular liquid—something about wine is other-worldly. In the ancient Greek world it was the god Dionysus who was purveyor of wine and the goddess Athena of olive oil. The Classical tradition holds that Athena was chosen against Poseidon as patron deity of Athens because of her gift: the olive tree. In the same era, the god Dionysus received three large citywide festivals every year: the Anthesteria, the Great Dionysia and the Lenaia (Burkert 1985, 237-241; Hamilton 1992; Goldhill 1987; Cole 2010; Peirce 1998).

It is clear from other evidence, however, that oil and wine were important commodities long before the Greek Classical period. This chapter will explore the very beginnings of olive oil and wine use in the Greek world, focusing first on the various forms of archaeological evidence that supports the production and consumption of these two liquids. Most of this evidence dates to the Bronze Age and was found on the island of Crete. The second half of this chapter will

discuss Bronze Age documentary evidence from palaces on both Crete and mainland Greece that pertains to the production, distribution, and consumption of olive oil and wine. By examining bureaucratic palatial involvement with these two industries it is possible to put their production into a socio-cultural and economic context. Documentary evidence in the form of Linear A and Linear B texts provides us with the only first-hand account of the social importance of these two liquids and how they were used and valued within an established cultural system. During this discussion I will address both practical and ritual aspects of olive oil and wine in Bronze Age Greece, as well as the extent of the central authority's control over their production, distribution, and consumption. An in-depth look at olive oil and wine in the Bronze Age will set the stage for liquid commodity production in the ensuing Early Iron Age when documentary evidence does not exist and the archaeological record is far less visible.

Archaeological Evidence for Ancient Oil and Wine

The exact date when the olive was pressed purposefully for oil and the grape for wine is unknown. Yet through archaeology, it is possible to place it at some point during the Neolithic period, but not necessarily in Greece. Most evidence for the use of grapes and olives comes from the coast of the ancient Near East, what is called the Levant. The Jordan Valley, and especially the site of Teleilat Ghassoul, is considered the birthplace of the domesticated olive (Hadjisavvas 2003, 117). The first use of wild olives, however, was discovered off the Carmel coast in Israel, where archaeologists have found hundreds of olive pips resting on stone grinding surfaces and in pits at the site of Athlit-Yam, suggesting some sort of processing as early as the Pottery Neolithic period (Hadjisavvas 2003, 117; Foxhall 2007, 13). Grapes were purposefully cultivated and wine produced by about 3200 B.C.E. in the Near East, although we know wild grapes were used much earlier (Hansen 2002, 55). On Cyprus in the Pre-pottery Neolithic period we find the same type

of evidence at the sites of Cape Andreas Kastros and Chirokitia, along with what might be grape-pressing beds. Continuing westward, it is only in the Late Neolithic period that the first evidence for processing olives and grapes occurs in the Aegean. Crete seems to be the first Aegean region for which there is evidence of grape and olive processing. Sites in northern Greece, such as Makriyalos, provide evidence of feasting, but it is unclear whether fermented wine and pressed oil accompanied the meals (Valamoti et al. 2007, 54-61; Valamoti 2004, 29-30). Wild grapes, *Vitis Vinifera* subspecies *Sylvestris*, were present on Crete by at least 5000 B.C.E. from which the domesticated *Vitis Vinifera L.* later developed (Hansen 2002, 55). In the Early and Middle Bronze Age, this most southerly Aegean island was inhabited by people we call the Minoans (the name they called themselves remains unknown). The Minoans seem to be the first of the “Greeks” to transform olives and grapes into oil and wine. Unfortunately, direct archaeological evidence is rather scarce, has many problems, and has already been addressed thoroughly by others (Blitzer 1993; Hamilakis 1996; Hansen 2002; Foxhall 2007; Morris 2008; Margaritis 2013). I will therefore provide here a brief overview of each category of evidence for oil and wine production to set the stage for more detailed and focused analyses in this dissertation. The following archaeological evidence comes from a few categories: archaeological and architectural installations for the activity of pressing, archaeobotanical remains in the forms of pips, seeds and pollen, iconographic representations of the plants, and last but not least, storage and transport equipment specifically for liquids, such as specialized pots.²

² Ceramic containers for the consumption of oil and, more often, wine such as kylikes, kraters and small jugs or pitchers, are not addressed here in detail, but have been treated by others very thoroughly in recent years (Hamilakis 1998; Platon 2002; Hallager 2002; Morris 2008).

Installations

The main problem with in situ stone or ceramic pressing installations is determining whether the liquid produced was olive oil or wine (or something else entirely). Hamilakis (1996) suggests that those installations made of ceramic with higher walls must have been for crushing grapes, since grapes produce more liquid volume than olives do oil. Installations made of stone with shallow walls, or merely a depression, were used to produce olive oil since a very hard surface was needed to crush the pips (olive stones). Both installations had spouts, the olive oil spout possibly being narrower reflecting the smaller amount of liquid emanating from the crushing bed. In addition, both installations would have had some sort of catchment mechanism, either a basin or large ceramic container. Platon and Kopaka (1993) recorded 41 of these installations on Crete and divided them into three types: Type I “Dispositifs á cuv  tronconique,” Type II “Dispositifs á compartiment superieur,” and Type III “Dispositifs á plaque concave” (**Figure 1**). The majority of these installations are of Type I (32), followed by Type III (6) and finally Type II (3). Type I may have been used for wine making, with Type III for olive pressing. The high number of Type I installations, coupled with their placement inside larger houses near entries with good ventilation, suggests that individual households may have pressed their own grapes and fermented the wine in-house (Platon and Kopaka 1993, 72). Type I installations are most frequently found in Neopalatial contexts (the very beginning of the Late Bronze Age), but then decrease in frequency once the Mycenaean period begins. Type III installations are primarily dated to the time of the Mycenaean era on Crete (a.k.a. the Monopalatial period). Two of the best preserved of these installations come from the port town of Kommos. In the LMII period two large-scale work stations for pressing oil were constructed within the settlement in the “House with the Press” and in a cubicle directly to the east of the “House with the Snake Tube” (Blitzer

1995, 528). Blitzer (1995, 528) suggests that these new constructions may indicate a change from individual household oil processing to communal processing for the creation of surplus product. I shall return to Kommos and its oil production, storage, and shipment during my discussion of Late Bronze Age transport vessels, including their Postpalatial transformation.

Iconography

Artistic depictions of olive trees, olives, vines, and grapes reflect a certain awareness of the two fruits and their use in everyday life. A Neopalatial wall painting from Knossos on Crete, the so-called “Sacred Grove fresco,” depicts a group of people around what appears to be olive trees. On the nearby island of Thera, the Minoan-like town of Akrotiri produced two frescoes with olive branches, including the crocus pickers fresco (Hadjisavvas 2008). Of course, in all cases of wall paintings, flora can only be speculatively identified. A few cases of iconography prove more promising, including an ivory seal from Chrysolakkos on Crete dated to MMI-MMII. The scene inscribed seems to depict a single person crushing grapes with their feet in a small, cylindrical vat that resembles Type I installations (Platon and Kopaka 1993, 86).

Outside of Crete, contemporary cultures have produced more informative iconography for the methods of wine and oil making. In Egypt, a wall painting from the tomb of Nakht at Thebes (XVIII Dynasty) depicts a detailed rendering of wine production (**Figure 2**). While two men pick grapes from vines, another two men crush grapes in what appears to be a permanent installation. This installation has a spout out of which pours grape must (unfermented grape juice). Here, a fifth man reaches down into the liquid, and above him stand four amphoras presumably used for fermenting the wine. Other Egyptian tomb paintings display the other, more tedious, steps in the wine production process. After grapes are initially crushed, they are then squeezed using a sackpress to release the remaining juices. Three wall paintings display the

various methods for extracting the liquids: one uses a man standing between the sticks and the other uses a frame to stretch the sack (Hallager 2002, 62-63). Other Egyptian wall paintings depict the sealing or corking of amphoras using a stopper of straw or inverted pottery saucers. Some paintings even display scribes taking notes as these actions are taking place (Hallager 2002, 63). Although these wall paintings are incredibly detailed for each step in the wine making process, the archaeological record is almost entirely silent. This fact certainly provides some hope for the scanty material record from both Crete and mainland Greece during the same time period.

Macro- and Microbotanical Remains

The physical plant remains of grapes and olives as they proceed through the olive oil and wine-making processes are excellent means of identifying the mechanisms, qualities, and quantities of the liquids produced within their original social contexts. Unfortunately, all of this palaeobotanical debris is hardly ever preserved in the hot and humid climate of Greece. Whereas cereals or legumes can be preserved in storage conditions, olive and grape remains are much less likely to survive in unburnt form. Archaeologists are more likely to find both olive and grape pips preserved in garbage pits or used as fuel for fires, such as at the LMI pottery kiln from Mochlos, Crete (Hamilakis 1996, 3). Adding to this dearth of botanical remains is the fact that archaeologists are unlikely to collect fragmented olive pip remnants from the actual crushing technique needed to produce olive oil. What we tend to collect is whole olive pips. For example, olives have been found in cups in ritual deposits, palatial contexts, and elite buildings (Hamilakis 1996, 7). Archaeologically visible concentrations of grape seeds, especially coupled with skins, increase the probability that they are from wine-making (Hamilakis 1996, 3; Margaritis 2013). The best evidence for cultivation of grapes in Greece comes from Kastanas in Macedonia and is

dated to about 3000 B.C.E. (Kroll 1983). As with the available data for olive pips, most grape remains are also found in palatial contexts, villas, or large towns. Unfortunately, none of the ten sites that have produced evidence of grape processing have more than 70 seeds, and most have less than five, almost all with unspecified contexts (Hansen 2002, 58). In the three cases where contexts are secure, Myrtos, Phaistos, and Monastiraki, the contexts were all large ceramic pithoi. This evidence does not help distinguish between grapes used for wine, raisins, or eating. Other problems arise when dealing with larger debris like leaves and wood from vines and olive trees. These two remains may only indicate that the plants existed in the environment around the site, not that olive trees and vines were domesticated or exploited.

The main source of microbotanical remains comes from pollen. The *Olea* species produces large quantities of pollen that can be measured using sedimentary cores from lakebeds. The first issue with this source of information is that climactic and geological conditions in Crete are not favorable for pollen preservation. The second is that it is not yet possible to discern wild from domesticated olive tree pollen. In the case of *Vitis*, wild vines produce large amounts of pollen, but the domesticated version is self-pollinated, consequently producing little pollen (Hamilakis 1996, 4). Again, it is not possible to calculate the ratio of wild to domesticated plants and the existence of wild plants does not necessitate their use for oil and wine. In fact, we know, based on pollen presence, that wild grape vines were present on Crete from 7500 B.C.E. It is also interesting to note that, in the Early Minoan (EM) period wild *Olea* pollen is very prevalent, but then suffers a dramatic decrease in the Middle Minoan period. This may be due to a change in aridity, where the arid EM period allowed olive trees to flourish, while hindering the growth of deciduous trees. When the climate of Crete became less arid and more moist in the Middle Minoan period, deciduous trees flourished, thereby overtaking the land once occupied by wild

olive trees (Hamilakis 1996, 14). Recent research suggests that another climactic change occurred in the Late Bronze Age, shifting back towards a more arid environment that lasted until the Roman Period (Drake 2012). This may explain the sudden increase in olive oil production in the LM/LH III period, especially on Crete, and its continued production into the Early Iron Age.

Ceramics

Installations may help elucidate the production processes, pits and seeds with specific sources and quantities of fruit, but pots have the ability to help us piece together the entire life-history of oil and wine in ancient Greece from production to distribution, and the many forms of consumption. It is most likely that the number and types of pots involved with olive oil and wine in the Bronze Age and subsequent periods varied. Some, like pithoi, were as tall as a human and mostly used for long-term storage. Others were only a few inches in diameter and were used for storage of precious finished products. Different aspects of ceramic vessels can contribute to our interpretation of the consumption of oil and wine. In the Bronze Age, changes in vessel shapes, relative quantities, decoration, and contexts can reflect changes in habits of people who use and made them (Platon 2002, 24). For example, an increase or decrease in the number of large pithoid storage jars in a settlement may reflect an intensification or reduction in agricultural production (Christakis 2005, 2008; Lis and Rückl 2011). When it comes to the production and consumption of wine on Crete in the Bronze Age, Platon (2002, 24) states that,

“the development of these vessel types [pressing vats, pithoi, jars, amphora, stirrup jars, krater, kylix/cup, rhytons] and differences in the frequency with which they are found in the Later Minoan period are indicative of changes in the habits of Prehistoric men in the Aegean, both with regard to the importance and use of wine. Shortly before the collapse of the Minoan Palace system, two new principles became apparent: Firstly, wine acquired the status of a limited “luxury good.” Secondly, consumption was widespread, though controlled, at both ritual and secular symposia.”

On the Greek mainland, assemblages of feasting and drinking vessels have been used to inform how we interpret building uses and hierarchical social structures within them. At Pylos, the analysis of thousands of kylix drinking cups found in different groups led to the conclusion that the palace was a site for both elite drinking parties and large festival gatherings (Whitelaw 2001). Transitions in use of specific containers can also be connected to socio-political changes. In Chapter Three, this type of change will be discussed in relation to bulk liquid transport vessels.

Ceramic vessels are also useful for information derived from their decoration. During the Late Bronze Age, pictorial decoration on drinking equipment, such as large kraters for mixing wine and water, can provide clues to the social context of, in this case, wine use. A number of these vessels have been found painted with a feasting scene where seated people raise up what looks to be a stemmed kylix drinking cup (**Figure 3**). On some scenes, one seated person stands out and may represent royalty or a deity. These vessels and their associated activity are surely meant to display elite ideology since almost all of the pictorial decoration on kraters involves costly activities, such as chariot driving or other-worldly creatures, such as sphinxes. The fact that pictorial kraters were commonly exported from the Greek mainland to Cyprus and the Near East may suggest that the Aegean was particularly well known for its wine consumption (Steel 2004; A. Papadopoulos 2011).

Ceramic vessels provide other information on the oil and wine industry when they are marked as such. Most of these vessels are storage or transport types that participated in palatial activities. For example, on Crete we have direct written evidence that connects wine to at least some pithoi. Eight pithoi have been incised with the ideogram for wine in Linear A: one from Epano Zakro and six from Knossos (Hallager 2002, 64). Since Linear A was only used in palatial contexts, it can be assumed that the palaces had direct interests in wine production and storage at

this time. Of course, it is also possible that these pithoi were marked in order to distinguish their use for wine from their intended use as containers of other goods. On the Greek mainland, large pithoi were found sunk into the floor at Pylos in a room that has been named the “Wine Magazine.” A cache of clay balls (or nodules) marked with the Linear B sign for wine and stamped with seals was found inside of the doorway, suggesting that this room was used for incoming shipments of wine (Palmer 1994, 146). In addition, transport stirrup jars at Mycenae were found with their clay stoppers preserved with seal impressions on them. These various means of marking and recording wine and oil containers provides insight into the palatial mechanisms for controlling these two commodities.

Finally, ceramic vessels can be tested to determine what was once held inside through chemical residue analyses. Residue analysis has the potential to identify whether a vessel was used to contain oil, wine, or another liquid substance. Unfortunately, there are currently many complications hindering this process, including the ancient reuse of containers for different liquids, their contamination by other substances, and the rather imprecise results generated by chemical analysis methods. Although producing olive oil and producing wine are similar processes of transformation using similar methods and technologies, the main reason for lumping the two together—“oil and wine”—is that presently there is no way of knowing for sure whether or not a vessel held one or the other. Advances in chemical analysis of organic remains using Gas Chromatography-Mass Spectrometry (GCMS) can occasionally pinpoint whether a vessel held a fat (like oil) or an acid (like wine). For example, a transport stirrup jar from LMIII Kastelli Khania on Crete (EUM 253) had pelargonic acid, a “degradation product of oleic acid, which is the principal fatty acid of olive oil, and palmitic acid, which is ubiquitous in both plant and animal fats” (Beck et al. 2008, 29). However, as will be discussed further in the chapter on the

Late Bronze Age, we are now certain that these large vessels were reused multiple times. It is not possible, therefore, to be absolutely certain that the residues picked up by GCMS are from initial, intentional, or exclusive use of the vessel. In addition, there is some evidence from residue analysis that these liquids may have been blended together in what Patrick McGovern (2003, 264) calls “Greek grog,” a combination of resinated wine, barley beer, and honey mead. According to his study, McGovern tested three transport stirrup jars from Kastelli Khandia and determined that they had held this Greek grog (McGovern 2003, 267). In addition to transport containers, examples of smaller conical cups, kylikes, and cooking pots from shrine and tomb contexts all tested positive for this liquid mixture. It is possible, however, that these vessels were reused with one liquid, then the others. Alternatively, these vessels were mostly found at tomb and shrine contexts, which might suggest that the Greek grog is a special libation. Indeed, even passages in the Homeric epics describe drinks made from mixing Pramnian wine, goat’s milk cheese and white barley meal (*Iliad* 11.648-649) or Pramnian wine, cheese, barley and honey (*Odyssey* 10.234-243).³

Based on this evidence and the insufficient accuracy of current residue testing techniques, the only thing we are absolutely sure about is whether a vessel held some sort of liquid (based on

³ The Homeric epics were shaped within a Greek oral-poetic tradition and cannot necessarily be used as historical “evidence.” Nevertheless they encompass important reflections, albeit somewhat distorted, of social, economic, and political situations within the Aegean world, especially for the Early Iron Age. The point at which the Homeric poems were transformed from a purely oral-poetic state into a written version, i.e. the point of “textualization” or “text-fixation,” is highly debated. The major viewpoints fall into two groups: one that maintains the older view that textualization occurred in the 8th century B.C.E. (Snodgrass 1971; Desborough 1972; Coldstream 1977; Janko 2012; Morris 1986), and the other which uses an “evolutionary model of the genesis of epic” to suggest a textualization during the 6th or even 5th century B.C.E. but accepting a “formative status” of the poems in the 8th century B.C.E. (Nagy 2004; Nagy 2001, 174; Andersen and Haug 2012, 7). Others, led by the work of Martin West (2012, 235-237), believe that the *Iliad* was only composed in the mid-seventh century and the *Odyssey* in the late-seventh to early-sixth century B.C.E., therefore reflecting the society of the Archaic period and social memories associated with the Early Iron Age.

morphology); everything else is guesswork. This being the case, I could be very cautious and use the term “bulk liquid transport vessels” throughout, but this would be cumbersome and preclude any discussion of cultural context and meaning attached to said liquids. Therefore, I shall maintain the position that these vessels most likely carried olive oil and/or wine, but will support this claim with the following discussion of olive oil and wine in Late Bronze Age Greek society, as a way to set the stage for chapters to come.

Oil as a Cultural Commodity: Documentary Evidence in Context

The evidence for how olive oil was made, regulated, and used in the Bronze Age comes from a number of different documentary sources. The Minoans and Mycenaeans both used writing systems: Linear A and Linear B, respectively. Unfortunately they do not record historical events in detail, list names of kings, or recount belief systems. These texts were used to record mainly inventory lists and personnel records. For the purposes of this dissertation, and anyone interested in broader aspects of the ancient economy, these texts, though limited, are still useful. Found in most palaces of the Late Bronze Age, Linear B tablets record what comes in and goes out of the palace, both finished and raw materials, including the person who brought the items, the person who owed the items, or is in debt for the items. One of the recorded items is olives, represented by the ideogram *122 OLIV, and recorded by dry measurement. Olive oil is a separate ideogram, *130 OLE, and is recorded with liquid measurements. Another item frequently associated with olive oil is jars, presumably to store the quantities of oil listed. Linear B, although it has been deciphered, still holds some secrets. The ideogram for olives and that for olive oil are both modified by a number of syllabograms in ligature or accompanying adjectives. The syllabograms most commonly in ligature with the OLIV ideogram are TI and A, possibly representing different types of oil. Melena (1983), responding to J. Chadwick’s (1976, 121) initial suggestion,

argued that A (short for “agrios” or “wild”) represented oil from wild olives, while TI signified oil from cultivated trees (“tithasos” or “domesticated”). He suggested that the large amounts of wild olives in the Linear B tablets (proportion of seven wild to two domesticated; Hadjisavvas 2003, 117) were specifically for producing perfumed oils. This seems to be supported by the ancient author Dioscorides (I.30) who says that oil from wild olives is more suitable for being squeezed out because wild olives have a low grease index (Melena 1983, 102). However, this argument is only speculative and based solely on one ancient author. Lin Foxhall (2007) draws attention to ethnographic examples that show the unsuitability of wild olives for producing large quantities of high-quality olive oil. In particular, the ratio of olives to oil is about 20:1 for wild olives and 5-6:1 for domesticated olives (Foxhall 1995, 242 n. 12). She therefore proposes that A and TI represent two qualities of oil (Foxhall 1995, 242).

It is clear, even without knowing the exact meaning of the syllabograms modifying Linear B ideograms for olives and oil, that the trees, their fruits, and the oil produced from them were cultivated and processed in great numbers during the Late Bronze Age. For example, the totaling tablets (*a-pu-do-si*) of oil contributions to the Knossos Palace (tablets Fh 336+5503 and Fh 367+5460) produce ca. 4,000 trees and ca. 3,960 trees, respectively. This corresponds to 81,261 liters of olives, from which ca. 8,288 liters of oil might be pressed out (Melena 1983, 105). Keeping in mind that this calculation is based on only two tablets, we must assume that the actual amounts were far greater. For comparison, in the 1950s, 13 million olive trees were growing on Crete alone (Melena 1983, 106). It is also necessary to bear in mind that olive trees only produce fruit every other year and there tends to be a regional pattern for these fluctuating harvests. In other words, all of the olive trees in a certain area will either produce fruit, or not.

There will not be some that do and some that do not. This may account for why numbers of trees and amounts of oil on tablets are relatively small in some situations (Foxhall 1995, 242).

The detailed recording of olives and oil in the palatial Linear B texts leads to the question of how the palace elite controlled such resources. There has been a general consensus lately that, although the palaces did control some choice pieces of land, which they doled out accordingly, they did not own outright the vast stretches of land needed to produce the large quantities of goods recorded in the tablets. To compensate, the central authorities must have made themselves essential to small-scale subsistence cultivators by other means. In the Near East, this dependence was accomplished by controlling water sources. Greece, however, was not quite arid enough for this tactic to work. Foxhall (1995) proposes that the risk-buffering assistance these central authorities provided was either bailing farmers out after crop failure, or offering them access to inputs like capital or labor. While both may be correct, more evidence is available to support the latter. Paul Halstead's (1999, 2007) work on wheat, flax, and cattle hypothesizes that the palace of Pylos, at least, supplied expensive cattle to farmers during plowing season and personnel during reaping season. In return, the palaces received a certain share of the finished product. In the case of olive oil, the central authorities may have been able to mobilize the labor needed to harvest olives, as well as control the equipment and knowledge for production of the oil.

How was olive oil used by Bronze Age people (and which people in particular) and how was its production, distribution, and consumption socially constructed? Oil was presumably used for mundane activities such as cooking and bathing, industrial activities such as leather tanning and textile production, as well as the base for perfume and unguents. Both archaeological and textual evidence supports these assertions. Evidence for oil used in cooking activities comes from multiple mainland and Cretan sites including Mycenae, Thebes, and Midea. Based on

analytical results showing the use of edible olive oil in cooking vessels, Lambrou-Phillipson and Phillipson (2002, 73) assert that, “we can dispense with the hesitations to accept the use of olive oil in cooking in prehistoric Greece.” That olive oil may have also been used in industrial activities is suggested by multiple Linear B tablets recording olive oil disbursements to textile workers and tanners. For example, a tablet from the House of the Oil Merchant at Mycenae (MY Fo 101) was found among many transport stirrup jars and pithoi and records oil (presumably from those storerooms) to be distributed to textile workers (Tournavitou 1995). It is also possible, however, that these oil distributions were intended as compensation or for some other use not associated with textiles or tanning.

It is clear, however, that the main palatial use of olive oil was for specialized productions such as perfume and unguent manufacture. Linear B texts indicate that the perfumed oil industry was the most prolific of the palace-controlled activities, producing tons of different scented oils including rose-scented and sage-scented. These were then bottled and shipped to other sites both within the Greek world and beyond. Hamilakis (1996, 1999) labels olive oil production and the secondarily produced perfumes/unguents as markers of elite status, used to portray a person’s level of hierarchical power. After a survey of the available archaeological evidence for oil production, it is clear that oil was not mass produced until the Neopalatial period on Crete, and only intensified in the Monopalatial or Mycenaean period. During both periods, however, oil production and storage was concentrated at palaces, highly ranked towns, and elite villas (Hamilakis 1996). This restriction stems from the fact that olives are more labor intensive to harvest, olive trees are a long-term investment (they can take up to 10 years to produce fruit and then only produce fruit every other year), and they are very sensitive to risks (such as climatic change). Hamilakis proposes that production of olive oil was therefore not determined by

environmental conditions or microeconomic calculations by those living in the Late Bronze Age. Rather, the large-scale production of olive oil might have been a “response to demand and consumption requirements triggered by broader social and political developments” (Hamilakis 1999, 50). These broader social and political developments included large feasts, drinking parties and festivals, all aimed at legitimizing a ruler’s power or reasserting their control over a given population and region. For this reason Hamilakis (1999, 50) postulates that, “wine and oil, rather than being the indicators of a flourishing civilization as they are usually portrayed, are likely to represent a barometer of the constant and endemic instabilities in Minoan societies,” a point that we will return to during a discussion of the Early Iron Age.

Archaeological evidence, more so than the Linear B tablets, indicates that olive oil was not only locally consumed by the elite, but it was bottled and shipped to different areas of the Mediterranean. According to Shelmerdine (1985) large transport stirrup jars (TSJs) were used to ship plain olive oil from Crete to the mainland where it was stored or decanted into pithoi, which may also be the case at the House of the Oil Merchant at Mycenae (Haskell et al. 2011, 128). Precious perfumed oil was then stored and shipped in fine decorated stirrup jars, found all over the eastern Mediterranean, primarily in tombs. What this may suggest is that olive oil played multiple roles. Hamilakis is correct in directing attention away from the nutritional and economic values of oil in favor of its social values. However, olive oil’s economic value (i.e., as a valuable commodity used within a larger trade network) cannot be neglected. Clearly, Mycenaean olive oil and perfumed oils in particular had a high value in the economic network of the Late Bronze Age Mediterranean. TSJs are found in great quantity at Near Eastern ports like Tell Abu Hawam and Ugarit. Cyprus was also the recipient of many TSJs, and even southern Italy has produced a few examples (Haskell et al. 2011, Ben-Shlomo et al. 2011). Possibly most telling is the

discovery of TSJs on all three known Late Bronze Age shipwrecks: the Uluburun, the Point Iria and the Cape Gelidonya. That Greek olive oil had a high status in the Late Bronze Age Eastern Mediterranean may be best showcased by the presence of TSJs at the Egyptian city of Tel el-Amarna. Kelder (2009) proposes that these jars may have been a diplomatic gift from a ruler in Greece to the Pharaoh of Egypt himself.

When the Mycenaean palaces collapsed around 1200 B.C.E., we are faced with the question of what happened to the agricultural activities that were regulated or aided by the central authorities. Some scholars believe that the technological knowledge needed to produce oil was lost and consequently, Early Iron Age chieftains were “indifferent to agriculture” (Hanson 1999, 32). Others believe that olive oil was not reintroduced to Greece until the 8th century B.C.E. from the Near East, when its production then propelled the chiefdoms into genuine poleis (Hanson 1999, 80-86; Brun 2004, 83-88). In contrast, Lin Foxhall has very recently produced convincing arguments for a contrary situation. According to her, “the olive...almost certainly played a role in virtually all agronomic regimes in the Greek world from early prehistory, and was certainly firmly established among the repertoire of cultigens well before the Archaic period” (Foxhall 2007, 15). This assertion is based on archaeological evidence indicating that after the palaces collapsed, towns, especially those not previously highly integrated with a palace economy, continued to produce the same individual components of the palatial-period agricultural system (Foxhall 1995). Archaeobotanical remains from Nichoria and Methana suggest that virtually the same subsistence crops continued to grow in the Early Iron Age. For olive oil, its importance is further demonstrated by the continued production of small fine and large coarse stirrup jars after the collapse of the Mycenaean palaces. Fine decorated

stirrup jars are one of the most abundant shapes found in Postpalatial cemeteries in Attica, Laconia, and Naxos (Iakovidis 2003; Demakopoulou 2009).

In addition, although political, economic, and social relationships changed, underlying social values and political structures continued (Foxhall 2007, 247). The implication is that social competition and power struggles between leaders and family-groups continued immediately in the LHIIIIC period as well as into the Geometric period. With this in mind, we may recall Hamilakis' (1999) assertion that olive oil and wine production are indicators of instability within a society, so it should be no surprise that these two commodities continued to be produced well after the fall of the palaces, even if the scale decreased. One very good indication of this continued production is the discovery of many similarly-styled ceramic large liquid transport containers dated as early as the Protogeometric period, to which we shall return in Chapter Four.

Wine as a Cultural Commodity: Documentary Evidence in Context

Based on archaeological evidence discussed above, we know that in the Late Minoan period on Crete the number of ceramic presses increased dramatically, which suggests that wine production became more frequent. Written evidence, in the form of Linear A tablets, corroborates this hypothesis. The sign for wine appears even earlier in Cretan Hieroglyphic texts (as sign E116) and may relate to the Egyptian sign for wine (*irp*). Whether the Egyptian sign was derived from the Aegean, as Emmett Bennett believed, or the other way around, both appear to be a pictographic sketch of a trellis and its vine (Bennett 2002, 84). In Linear A archives, the wine ideogram (AB 131) appears on a high proportion of texts at the sites of Agia Triada, Khania, Zakros, Phaistos, Pyrgos and Arkhanes. For example, wine is listed with other commodities on three of the seven tablets found at Arkhanes and is the only commodity recorded on one of the

two tablets from Pyrgos. At Agia Triada, 21 of 147 tablets mention wine. Significantly, many Linear A tablets have single commodity sections recording wine. At Agia Triada, three of 19 and at Zakros four of six tablets single out wine, which may suggest that Minoans accorded wine specialized handling (Palmer 2002, 102). To further support this suggestion, Linear A texts regularly provide details about the wine itself using adjunct or ligatured signs. These may indicate quality, flavor, or even vintage.

When the Minoan Neopalatial period ended in LMIB and the Mycenaeans ushered in a new regime on the island, wine production altered, possibly conforming to mainland Greek standards of consumption. In Linear B texts wine is represented by the ideogram *131 VIN along with a less frequent variant, *131b. The sign itself is incredibly consistent tablet-to-tablet (unlike other signs that can differ according to place or scribe), yet there seems to be a contrast between the mainland and Cretan sign for VIN. Wine ideograms found on Crete, including the Linear A signs, have hash-marks going diagonally from bottom left to top right. In contrast, those from the mainland are drawn from top left to bottom right (Bennett 2002, 79). In addition to the sign, the word *wo-no*, (*woinos*, Mycenaean for “wine”) does not appear in the Knossos archives but is known from Pylos, tablet PY Vn 20. The word *wo-na-si* (*woinasi* “grapevines”), however, does occur on Knossos tablet KN Gv 863 (Palmer 2002, 96). Interestingly, a tablet where the ideogram and the word for wine coexist has yet to be discovered (Palmer 1994, 28). The only tablet series at Knossos to record wine in any form is the Fs series (18 tablets). This entire series was found along with the Fp and Gg series, which list offerings to deities in the form of olive oil and honey. There are six other tablets at Knossos listing wine that are not part of a series written by specialized scribes. These collection or inventory tablets list wine along with other commodities suggesting that the palaces did not specialize in wine production, but collected wine

along with other products, possibly as taxes (Palmer 2002, 98). That the palace was at least concerned with some vineyards is made apparent by Knossos tablet Gv 863, which may describe two different methods of raising vines at a location very near to the palace, *qa-ra* in Linear B. The first line has the word *wo-na-si*, a locative plural form of *woinades* “grapevines.” On the second line, vines are called *we-je-we*, *huiwes*, meaning vines that are trained to climb up trees (Palmer 1994, 59-60). Palmer suggests that the ideogram after these words describes the age of the vine. This one tablet implies that palatial central authorities had some influence on decisions pertaining to these two highly sophisticated methods for optimal vine growth.

On the Mycenaean mainland, wine was treated in a similar way, most frequently recorded along with other gathered food offerings. In the case of the palace at Pylos, most of these tablets refer to collections for festivals. In addition, Pylos’ preoccupation with the perfumed oil industry evidently spilled over into wine consumption as one tablet, PY Un 257, records both varieties of wine as ingredients for perfumed oil (Palmer 2002, 99). One of the most interesting discoveries comes from the palace at Thebes where over 50 tablets record wine as the sole commodity offered to gods and religious personnel. This situation recalls the Minoan propensity to treat wine as a specialized commodity during the Neopalatial period. At Thebes, the format of these wine entries resembles the Knossos olive oil offering tablets. According to Palmer (2002, 99), “this implies that wine at Knossos and Pylos was a valued offering to the gods and may have had its own offering series as olive oil did; its presence only on tablets listing a variety of food items is due to the accident of preservation.”

Actual quantities of wine inscribed on Linear B tablets vary widely between palaces and archives. Wine is measured in liquid quantities in reference to a large container (VIN) that is probably the size of an amphora, not a pithos. The second size down from VIN is “S,” which

indicates a third of the large unit, VIN. The middle size, “V,” is an eighteenth part of the liquid volume of a VIN and the smallest, “Z,” is a seventy-second of the volume of a VIN (Bennett 2002, 80). Apparently, Mycenaean palatial administration systems were very concerned with exact quantities as they gathered and disbursed wine to and from people and divinities. The majority of tablets record fewer than 20 units (VIN) of wine, but two tablets record abnormally huge amounts. Pylos tablet PY Vn 20 records 410 units (11,808 liters) assessed or allotted to nine towns in the Hither Province and Knossos tablet KN Gm 840 records an even larger amount of 498 units (14,342.4 liters) or more (Palmer 1994, 60). The most likely explanation, as put forth by Palmer (2002, 103), for these seemingly absurd numbers is that both these tablets probably list amounts collected per district. Another possibility could be an accrual over time, but most Linear B documents do not seem to serve this type of function, as they deal with mainly one-time transactions within a single year, or season.

Having assessed the place of wine in the Linear A and B tablets of the Late Bronze Age, it is necessary to ask the question: how was the palace involved in the production, distribution, and consumption of this commodity? Although we are limited by the nature of the tablets themselves (the short time span they represent, their accidental preservation, and their restriction to palatial concerns), it is nevertheless possible to propose a few conclusions. First, the Mycenaean bureaucrats did not directly control most of the wine production within their provinces. Based on the tablets and their contexts, wine was brought in from the countryside by orchard owners themselves or via collectors as a form of taxation or assessment. This is perhaps best demonstrated by the clay nodules from Pylos’ so-called wine magazine. Here, about 50 nodules were discovered in four groups in and just outside rooms 104 and 105 where at least 25 pithoi were sunken into the ground (Palmer 1994, 146). These nodules each had at least one seal

and some were inscribed with the ideogram for wine. Based on the fact that 33 out of 50 of the nodules had seals that were represented only once, Palmer concluded that farmers themselves brought these nodules (and their attached commodities) to the palace and then “signed-off” on their commitment using their individual sealings (1994, 163). In addition, the other seals that were repeated, along with the inscriptions, suggest that a collector was also present who may have received wine from at least two landholders and therefore acted as intermediary to the palace.⁴ Other tablets, such as MY Ue 611 from the House of the Sphinxes at Mycenae, record a delivery of commodities (in this case two kinds of olives, figs, and wine) made by one person. These types of tablets demonstrate the range of products raised by an individual farmer (Palmer 2002, 99). Ultimately, this suggests that while the palace did not oversee the growth of most vineyards and the production of actual wine, it did have direct access to those who performed these tasks through taxation and obligations paid. According to Palmer (2002, 12), “this lack of systematic monitoring of wine production implies that the administrators at Knossos felt that enough wine was available within the kingdom for palace needs.” In this way, special arrangements for overseeing wine were not necessary.

Using textual evidence alone, it is also possible to conclude that palatial officials then disbursed wine in both a direct and indirect allotment system to various entities including single

⁴ The term “collector” is derived from the Linear B word a-ko-ra /agorā/ “collector” or a-ke-re /agērei/ “he collects.” The definition of “collector” has been debated for many years. Various interpretations of the roles of collectors include: the owners of the type of good described, middle-men, beneficiaries, overseers, members of local elites, tax-farmers, tamkars (Bendall 2008, 79). One of the more convincing interpretations is that of Killen (1979, 177): collectors were “members of the nobility, the royal family, or the like who were allocated part of the productive capacity of the kingdom for their own benefit (hence their appearance as “owners” of flocks, weaving work-groups, etc.), and whose names appear at more than one site because, as members of this class, perhaps as members of the same dynasty, they tended to be given names from a certain limited stock.”

artisans and whole towns. The palaces, however, did not supply wine on the scale and regularity as they did other commodities such as barley and olives. Wine was not rationed out to palace dependents as a food source, but could be given to palatial workers for their craft or as payment. For example, in the Pylos mixed commodity tablets, wine was apportioned as an ingredient in perfume manufacture probably for its alcoholic/acidic nature or fragrant odor (Palmer 1994, 116). Another mixed commodity tablet from the same palace (PY An 35.5-.6) lists wine as one of several commodities exchanged for alum.

Alternatively, the palace could allot wine to groups of people or geographical entities. The Knossos Fs series records the delivery of foodstuffs, including wine, in small fixed amounts to sanctuaries in Crete. These disbursements were probably meant to feed a small group of religious or prosperous officials for up to ten days of regular meals. Alternatively, the disbursements could have been dedicated to the deity directly (Palmer 1994, 125). On the mainland, the palace at Pylos recorded a disbursement of wine to the nine towns in the Hither Province. This tablet, PY Vn 20, is one of only three existing tablets from the mainland that deals solely with wine. On it, the largest amount is sent to *pe-to-no* (2,880 liters) and the smallest to *ri-jo* (576 liters). The amounts of wine listed produce a total of 410 units or 11,808 liters of wine. This may suggest that the palace supplied wine for consumption during festival or ritual celebrations or, if this is an exceptional occurrence, that the palace supplied wine because of crop failure during that particular year. From the occurrences of wine on disbursement tablets it is clear that this particular liquid was considered valuable enough to be restricted to special occasions, to special people, and even to gods.

The Linear A and B texts help us understand the mechanics behind the collection and distribution of wine in the Bronze Age, but what about its consumption? What was the function

of wine in Minoan and Mycenaean society? As far as the evidence will allow, there were four major functions for wine: feasting, ritual, industrial/household, and commercial.

Evidence for feasting that specifically involves wine can only be guessed when looking at the written tablets alone. When combined with archaeology and iconographic evidence, however, it seems clear that drinking and eating festivities were an integral part of Minoan and Mycenaean society in the Late Bronze Age. Tablets from Pylos listing many commodities in relatively large amounts and from multiple people and places have been interpreted as gatherings for feasts that accompany religious festivals or other events, as seen in the Ta series. This type of mixed commodity tablet can normally be separated from standard taxation tablets by the types of foods and items being collected. For example, cattle and items of high value like gold cups and furniture can be good indications that the tablet is not recording a normal transaction (Palaima 2004). Feasting can be directly connected to sanctuaries and deities themselves in the Knossos Fs series where wine plays a prominent role on the listed menu. Large, yet exclusive, feasts would be appropriate for what we know about Mycenaean society and the importance of maintaining social hierarchies. Feasting and drinking parties are effective mechanisms for accumulating material wealth and also transforming material wealth into power. Intertwined with these practices is the fact that food consumption involves the human body and, therefore, if what you put into your body is valuable or inherently special, you yourself will increase in power and prestige (Hamilakis 1999, 39-40).

Archaeological remains in the form of drinking wares and storage areas corroborate the interpretation of Linear B commodity lists. At Pylos, thousands of long-stemmed kylix drinking cups were found in multiple store rooms of the palace and in varying degrees of quality. One cache of high quality kylikes near the main entrance to the palace suggests a sort of welcoming

drink for officials or other dignitaries. Other caches of kylikes near a side court are of larger quantity and lower quality suggesting they were reserved for a group of lesser individuals coming to the palace. These vessels have been interpreted as being reserved for feasts involving the entire male community who came to the palace to celebrate festivals (Whitelaw 2001). Other common ceramic shapes that are specifically connected to wine became popular in the LHIIIA period and continued even after the collapse of the palaces. Shapes like the krater, used for holding and mixing wine, and dippers for doling it out were ubiquitous in the Mycenaean world and even make their way east as a frequent export item (Wright 2004, 50). Furthermore, the Wine Magazine at Pylos held at least 25 pithoi set into the ground with a total capacity of at least 4,682 liters of wine (Palmer 1994, 146). Other archaeological evidence for feasting comes from the main room of the megaron where a fresco depicts couples seated and toasting kylikes, presumably full of wine (Wright 2009, 2004). Similar evidence comes from the palace of Knossos during this same time period. The so-called Campstool Fresco suggests that large feasts were not restricted to the palace of Pylos, but were a culturally widespread phenomenon. As James Wright states (2004, 34), “Feasting in these areas would have functioned not merely for the advancement of political goals, but as an older custom for kin groups and factions within the community to mark occasions of importance, promote solidarity within the feasting group, demonstrate superior economic and social resources, and, only at the level of the chiefdom and state, to offer tribute.”

The ritual significance of wine is ambiguous. While we have references from later Classical authors and depictions of wine used as offerings to the dead or libations to deities, we have no direct evidence for these practices in the Bronze Age. Honey and perfumed oils tend to be the liquid offerings par excellence at this time and are recorded in the Linear B archives as

intended for a specific sanctuary, religious official, or deity (Harissis and Harissis 2009). It is possible to say, however, that wine was definitely *involved* with many ritual activities such as meals and drinking parties. Wine was also sent, along with other goods, to sanctuaries and/or religious officials by the palatial authorities (Bendall 2008). On KN Fs 2 wine is one of six food items including wheat, figs, olive oil, wheat flour, wine and honey, which were systematically distributed to different sanctuaries in small amounts of fixed proportions as ingredients for ritual meals (Palmer 2002, 96). In the Fs tablets the quantity of 1.6 liters of wine must have been intended as the main liquid consumed at the ritual meal, either poured as libation or drunk (Palmer 2002, 97). Evidence other than the written tablets may support the suggestion that wine played a function in ritual or funerary realms. For example, wine-making presses are found in some religious contexts. At Myrtos, a wine press is located next to the structure interpreted as a sanctuary. Other evidence might connect ritual iconography to wine such as the double axes ornamenting a pithos next to a press at Zakros. More speculatively, sanctuaries like Kato Syme on Crete collected thousands of drinking cups left as dedications or by those who visited the shrine. Wine is one of the more likely liquids to have been involved.

Wine making may also have had a funerary context as suggested by a wine press found in the cemetery at Phourni and models of presses found in tombs in the Mesara (Platon and Kopaka 1993, 94). The funerary association should not be surprising when we take into consideration the importance of the funeral feast. Wine seems to have also played a role as a funerary offering. Small, fine, and decorated stirrup jars are prevalent in tombs of the Late Helladic period and continue to be prominent after the palaces collapse. While these may have also contained oils, residue analysis suggests that some of these vessels contained wine, maybe even resinated wine (French 2011). That drinking was an important symbol of status in the afterlife can also be

attested by the predominance of drinking vessels including cups, jugs, kantharoi, and goblets, in mortuary contexts from as early as the Middle Bronze Age (Wright 2004, 18). According to Wright (2004, 50), “many depictions of drinking represent activities that are largely independent of feasting (such as honoring divinities and the dead).”

Beyond elite consumption of wine in the Linear B tablets, there are some hints of more quotidian uses of the liquid in both household and industrial activities. Wine, being acidic and alcoholic, had properties that made it much more useful than a recreational beverage. Ancient Greeks have traditionally mixed wine with water, and much more water than wine, so it is possible that they were adding wine to water instead of the other way around (Lambrou-Phillipson and Phillipson 2002, 69; Morris 2008). The addition of wine may have killed bacteria, making water safer to drink since large rivers were heavily polluted. We know today that wine kills a large number of bacteria including *E coli*, *Salmonella*, and *Staphylococcus*. Also, cholera and typhoid germs are killed within 15 minutes of exposure to red or white wine (Lambrou-Phillipson and Phillipson 2002, 70). Later Greeks knew of this particular property of wine and used it to their advantage. For example, we know that wine was used to wash wounds (Jouanna 1996; Morris 2008, 114), which suggests that wine may have been added to water for antiseptic and antibacterial purposes.

The alcoholic content of wine may also explain the presence of quantities of wine on Linear B tablets referring to perfumed oil manufacturing. Within the Pylos mixed commodity tablets there is a category dealing specifically with perfume manufacture. The amounts of ingredients on these tablets are not in proportion to one another and vary from tablet to tablet. The varied nature of these tablets suggests that these items were requisitioned by the perfume workshop according to need (Palmer 1994, 116). Most interestingly, both forms of the ideogram

for wine are present on these tablets. Palmer (1994) suggests that *131b may represent vinegar since this is a product of the wine making process and may have been useful to perfume manufacturers. However, two kinds of wine may also be present on these tablets for their fragrant odor, even though today we might not have the same tastes.

That wine was used for commercial transactions is best testified by another Pylian mixed commodity tablet, An 35.5-.6. On this tablet, wine is one of several commodities brought together as *o-no* in exchange for alum. Other hints at wine's commercial value come from tablets where wine is given directly to certain workers, such as the bronze smiths, as a form of payment or exchange. Archaeological evidence, however, may be our best indication for wine as a commercially viable commodity. The most popular ceramic shapes exported from Greece to Cyprus, the Levant, and Egypt were wine drinking sets that included painted kraters, jugs, kylikes, and cups. These were in fact so popular that local Near Eastern artisans reproduced copies soon after the originals infiltrated the indigenous ceramic repertoire. That Greek wine was accompanying these drinking sets can only be speculated. This is due to our lack of knowledge concerning exactly what was contained in small and large stirrup jars. It is entirely possible, though, that wine was one of the liquid commodities sent eastward. In particular, we may speculate that resinated wine was a delicacy, as a parallel to perfumed oils, since traces of this substance have been detected in small, decorated stirrup jars, a shape that is found throughout the Near East (**Figure 4**).

The importance of wine in Greek society persisted after the collapse of the Mycenaean palaces. Production, having been already decentralized in the palatial period, must have continued on a smaller, more local scale. Due to the absence of Linear B tablets, the only evidence for this comes from the archaeological record. Wine continued to be a social drink,

directly connected to large households and feasts. For example, a large house in the Lower Citadel of Postpalatial Tiryns preserves an in situ feast with kylikes, kraters and a large transport stirrup jar from Crete (Stockhammer 2011; Maran 2005). There have not been any tests yet to confirm if the stirrup jar held wine or oil, but the pairs of kylikes at each table signify that drinking was clearly involved. In addition, pictorial wine kraters were still produced in quantity and are commonly found in domestic contexts, as opposed to funerary, at least within Greece (Deger-Jalkotzy 2003). Funerary contexts, however, continue to produce small, decorated stirrup jars that are as likely to hold resinated wine or perfumed oil. In fact, this shape is the most common shape of the Postpalatial period (Iakovidis 2003). It is interesting to note, however, that by the end of the Postpalatial period around 1000 B.C.E both the stirrup jar and the kylix go out of use and are replaced by the amphora and cup, respectively.

Chapter Conclusions

Wine and oil were both integral aspects of Late Bronze Age Greek society through their use for social, ritual, and commercial purposes. There is evidence both archaeologically and from the written Linear B tablets that each commodity had a special role in the operations of social hierarchy, which included not only common feasts, but religious festivals and offerings. Based on the above discussion, it is also clear that wine and oil were treated as separate types of substances, each with their own particular attributes that made them suitable (or not) to widespread use or close regulation. The Mycenaean administration monitored wine less closely than other commodities such as grains, sheep or olive oil, which were used in palace industries, because wine was a staple commodity and seems to have been widely produced throughout the various palatial regions (Palmer 2002, 95). At the same time, tablets listing orchards at Knossos

and Pylos indicate that administrators kept some track of who was growing vines, perhaps in connection with specific palace estates (Palmer 2002, 103).

Conversely, olive oil was more closely regulated by the palaces, probably in conjunction with the production of perfumed oil. Based on Linear B tablets and evidence from palatial workshops, it seems that perfumed oil was one of the most documented activities that took place within the realm of palatial control (Shelmerdine 1986). Unlike wine, olives or olive oil were given out as rations or payment by palatial authorities to dependents. In addition, perfumed oil was one of the main dedicatory offerings to deities and was therefore always needed (Bendall 2008, 93-138). We may also note the importance of olive oil in other regulated activities, such as textile making. Linear B tablets from a number of palaces indicate that the palatial administrators were concerned with all stages of the textile process from raising sheep to finishing touches. Olive oil may have been used in the actual production process to treat the wool and scented oils in particular may have been important for this. The later Homeric epics, *Iliad* and *Odyssey*, both refer to scented textiles and their value (e.g., *Od.* 7.105-107).

Domestically, the role of wine and oil in feasting stands out as perhaps the most important and frequent activity in that it brings together multiple aspects of Greek social life.

“For elites, however, the ability to sponsor feasts represented real economic value. The size and importance of a feast denoted the amount of surplus the sponsor can draw on, which is symbolized through particular vessels, such as the bronze tripod kettles displayed in the assemblages of bronze cooking and serving vessels found in so many tombs of the elite. Since the surplus is collected from agricultural activities, its economic dimension is both geographically and demographically broad. Any substantial feast affected directly and indirectly a large and diverse population throughout the territory held by a community...Therefore, the sponsor of a feast demonstrates the ability to bring together large groups (through coalitions and alliances), to mobilize labor, and to command surplus and distribute it. The sponsor gains in prestige through these activities and advances his family, lineage, and allies both within and beyond the community” (Wright 2004, 51).

Because feasting was such an integral part of Greek society at the time, when the palaces collapsed feasting continued to play an important role in social negotiation. Feasting remained one of the main ways of displaying and aggrandizing wealth and power. The position of feasting in the Greek Postpalatial world would make it unlikely for people to stop producing oil and wine entirely. In fact, it is quite clear from the evidence available, that oil and wine continued to be produced in some quantity and for the same purposes as in the palatial period. The main difference seems to be the scale at which oil and wine were produced and the amount of regulation imposed on vineyard and orchard owners. Because both wine making and oil producing require specialized knowledge and old-growth plants, it is again unlikely that the people inhabiting the hinterland would completely abandon their estates. What I would like to demonstrate in the following chapters is how the ceramic evidence, specifically large transport vessels, corroborates and substantiates this claim. By tracing the production, distribution, and consumption of these vessels and their contents from the Bronze Age through the Iron Age, we can gain a better understanding of how political structures within a society affect the life-cycle of two critical commodities.

Chapter 2

Liquid Commodities Trade in the Late Bronze Age: The Transport Stirrup Jar

Introduction

Compared to other areas of the eastern Mediterranean, Greece was rather late in adopting a means of transporting large quantities of olive oil and wine. As outlined in the first chapter, Near Eastern, Levantine, and Egyptian areas had been producing, bottling, and shipping these two liquids for centuries by the time Cretans started making wine and oil on a large scale. The earliest and most comprehensive data for Greek oil and wine production, distribution, and consumption comes from the Middle and Late Bronze Age, first on Crete and later the Mycenaean Greek mainland. Focusing on large coarse ceramic bulk liquid transport containers provides one mechanism for exploring the oil and wine industries within their cultural and economic contexts.

During the Protopalatial period, Cretans used amphoras for storage and intra-regional trade within the island, but rarely for shipment abroad (Poursat and Knappett 2006). In contrast, other areas of the Eastern Mediterranean had been using transport amphoras for hundreds of years. The divergence may stem from a difference in vessel shape. Near Eastern and Egyptian “Canaanite jars” had an angular body, sloping down to a pointed base (Serpico et al. 2003). The reduced surface area at the base and the sloping sides eased the pressure from the weight of the liquid contents, thereby lessening the risk of breakage. According to Moshe and Ora Negbi (1993, 321), “the morphological evolution of storage jars into commercial jars is regarded by many scholars as an important technical innovation that was aimed at providing these large containers with greater stability and, consequently, less risk of damage when being shipped

overseas.” On Crete, instead of altering the body shape of amphoras for shipping, a new vessel was invented: the transport stirrup jar (TSJ; **figure 5**).

The invention of TSJs by Minoans in the Middle Minoan III period implies a certain concern for transporting liquids before the Mycenaean era, which is more commonly associated with commercial transactions (Haskell 1981, 222). Early examples of TSJs are found in contexts with amphoras and, together with their similar build and shape, may indicate they served the same purpose at this time. The first large stirrup jars had one or two extra handles, holes on the upper disk, and small horn-like protrusions from the spout. The exact purpose of these attributes is unknown; however, Haskell (1981) has suggested that the third handle was used to affix a label. The pierced holes near the edge of the discs are not airholes, but may instead be used to thread string and attach a label or reusable stopper. Likewise, the horns on the spouts were most likely used to aid in lashing down the stopper. All of these features suggest that the contents were meant to be carefully controlled. This naturally implies that they were valuable “with the integrity of the contents and the ownership carefully attested” (Haskell 1981, 223).

These early Cretan TSJ examples are found on islands such as Thera and Keos, which might imply that by the MMIII period there existed a type of proto-trade in bulk liquids. Soon after, however, island communities produced their own version of the stirrup jar, demonstrating the need to identify a particular liquid commodity with a recognizable container (Haskell 1985, 225). It is not until the Late Helladic IIA period that stirrup jars appear for the first time on the Greek mainland and islands. These first attestations are of a finer variety, usually decorated in Marine Style, and found at Athens, Keos, Melos, Kythera, Rhodes, and Miletos on the Asia Minor coast. These first Cretan stirrup jar imports were most likely considered to have some inherent (or use) value, in addition to the value of their contents, and were therefore used as

status items and found in tombs. The large domestic version only makes its way over to the mainland in the LHIIIA period. By this time TSJs are shipped in bulk quantities that do not diminish until the fall of the Mycenaean palaces.

In the Late Helladic IIIA/B periods, TSJs lose the three extraneous features of early Cretan versions (the third handle, disc holes, and spout horns). The shape becomes slightly more standardized, but, as will be discussed, remains regionally produced. This Late Bronze Age TSJ corresponds to Furumark Shape FS 164 (big domestic), in contrast to the numerous versions of fine ware stirrup jars. Its height ranges from 40-50 cm, with a maximum diameter of 27.5-35.0 cm (Ben-Shlomo et al. 2011, 334-5). The shape continues to be characterized by a narrow “false neck” onto which two handles are attached from the shoulders. The actual spout is luted onto or inserted into the shoulder. TSJs at Mycenae were measured directly for capacity and yielded an average of 12-14 liters (Shelmerdine 1985), but Ben-Shlomo et al. (2011) suggest a higher capacity of up to 18 liters. The loss of the extraneous details suggests that labeling techniques may have been irrelevant when large amounts of oil and wine were regularly shipped to designated and consistent locations. Yet where were these places and who ordered the shipment? By the Late Bronze Age there is enough archaeological and textual data available to create a broad picture of the purpose of TSJs within Mycenaean society and the relationship the vessel created between potter, farmer, and central palatial authority. In this chapter, therefore, I take a total context approach and examine the production, distribution, and consumption of TSJs.

Transport Stirrup Jar Production

Introduction

The following discussion of TSJ production includes an examination of regional technology and mechanics of the fabrication of the vessel, the social context of its manufacture, and its purpose in the LBA. By the LHIII period, TSJs were produced in multiple regions of Crete, on the Greek mainland, and possibly in areas of Asia Minor. Each sub-region had its own unique method of manufacturing these vessels allowing for a detailed classification of shapes (Haskell et al. 2011). In addition, the coarse clay used to make TSJs helps, through petrography, to match a vessel to its region of production. Iconographic and textual evidence in the form of pot marks, inscriptions on the TSJs themselves, and Linear B tablets may add to a broader context of TSJ production within LBA society and their purpose as a symbol of Mycenaean commercial identity on a larger Mediterranean network.

Sub-regions of Construction

The construction techniques and technology for making TSJs varied according to their region of origin. Halford Haskell et al. (2011) recently published a monograph documenting over 30 years work on the production and distribution of TSJs. Their analysis of the vessels was broken down into three sections: typology, chemical analysis, and petrography. The detailed results suggest three major zones of TSJ production: west Crete, central Crete, and mainland Greece, as well as a number of minor production locations (see below). Within the major zones, smaller areas of production can be generally detected, though the exact location of workshops or clay sources remains unknown. In addition, there are some vessels that do not fit into these three zones and may belong to production centers in other areas around the Aegean including Asia Minor and

Rhodes. Using their work as a foundation, this section provides a discussion of TSJ production organized by the geographical areas of Crete, mainland Greece, and other regions of the Aegean.

Cretan TSJ Production

Perhaps we should not be surprised to learn that Crete was the largest producer of TSJs in the Mediterranean. After all, archaeological and botanical evidence points to Crete as a major producer of olives and grapes from an early period. Moreover, Bronze Age oil and wine installations have only been found on Crete (Platon and Kopaka 1993, 83). We also know that the TSJ was invented on the island and only later adopted by other regions. It may be this early association that allowed Cretan potters to excel in the manufacture of the vessel. Potters developed a rather complicated but ingenious method of constructing large TSJs that provided stability and resilience. Although its chronological and geographical origin is unclear, the most common method for creating a TSJ involved making the bottom third of the vessel, then the top 2/3 separately and joining the two parts of the body together. Many vessels thus preserve a distinctive bulge at the joining point. The false neck was either produced with the upper half or joined separately to the body, but was always left hollow. The handles were then added and the true spout was grafted or luted into the shoulder of the vessel. Although this is the basic Cretan method for constructing TSJs, each production region of Crete had different styles and decoration that can be separated out into type-groups. Haskell and his collaborators then matched these typegroups together into larger, regional groups coinciding geographically with west Crete and central Crete.

Based on the chemical makeup of clay from west Crete, there seems to have been at least two production areas, one or more located in the Khania Plain. TSJs from west Crete are relatively homogenous with a similar body shape, production technique, and decoration (**Figure**

5). The ovoid shape is most common with maximum diameters high up on the vessel. The bases are almost always plain and they have a tall false neck, flat disc, and round handles (Haskell et al. 2011, 89). West Cretan TSJs are perhaps most unique in their decoration. Haskell et al. (2011) suggest that all TSJs painted with Light-on-Dark originate here, yet the region also produced the more common Dark-on-Light decoration. The designs on west Cretan vessels are very simple, generally consisting of bands around the body with seldom any decoration on the shoulder. A single band connects the handle, false neck, and spout and spirals or crosses were painted on the disc (Haskell et al. 2011, 90). One of the most interesting developments from west Crete is the production of TSJs with painted Linear B signs on the body or shoulder of the vessel (**Figure 5**). These vessels, sometimes called inscribed stirrup jars (ISJs), mostly originate from the west Crete area but are found at palatial sites on both central Crete and the mainland. There may be one, two, or three painted signs drawn hastily or carefully. I will return to these vessels when I discuss the social context of TSJ production as they provide insight into who was involved and how the process functioned.

The large site of Khania is the most prominent settlement in west Crete. Here, archaeologists have found much ceramic and architectural evidence that suggests this town may have been a Mycenaean administrative center in LMIIIA2/B (Hallager 1988; Hallager and Hallager 2003). Khania's prominence in the Late Bronze Age world is also attested by a number of Linear B tablets found in multiple areas of the settlement. The organization and personnel required to use Linear B tablets is normally only attributed to mainland palaces. Because of Khania's high position within Cretan settlement hierarchy and its proximity to the Greek mainland, it has been suggested that commercial products, like oil and wine, were gathered and shipped from this town to palatial destinations on the mainland. Therefore, for west Cretan TSJ

production, Khania may have provided guidance or control, resulting in the uniformity of vessels we detect from the archaeological record.

Central Crete, the second broad area of TSJ production on the island, is easily distinguished by its heterogeneity. While the fabric and chemical compositions suggest a similar area of production, it is clear by the differences in type-groups that there were multiple production locations (Haskell et al. 2011; Day et al. 2011). Central Cretan TSJs have a great range in shape resulting in globular, ovoid, piriform, conical, and even biconical forms. The bodies tend to be somewhat broader with lower maximum diameters than west Crete examples. Bases are also eclectic being plain, torus, thickened, or occasionally disc-shaped. Some central Cretan TSJs are produced with a ceramic neck ring at the base of the false neck, seen also on mainland jars. Many have a prominent deep depression in the disc, deeper than would naturally result during manufacture (Haskell et al. 2011, 89). Decoration of central Cretan TSJs is restricted to Dark-on-Light but there is a great range in decorative motifs and complexity. Shoulder decoration can be elaborate and there may be a single band connecting the handles, spout, and false neck bases or they may be ringed individually (Haskell et al. 2011, 90). However, just as west Crete had a signature Light-on- Dark decoration, central Crete seems to have had a signature decoration of octopus wavy lines (**Figure 5**; Haskell et al. 2011, 90). As with TSJs in west Crete, some central Cretan vessels are marked with Linear B signs, although far fewer in number. The signs from central Crete tend to be smaller with only single words or single signs and the quality of rendering is variable (Haskell et al. 2011, 90).

The production of TSJs with Linear B signs in central Crete should not be surprising since the largest administrative site on the island, Knossos, is located in the north central area and has one of the largest collections of Linear B archives. In fact, it may be more surprising that

this area was not the dominant producer of TSJs (including ISJs) and seems to have had a very deregulated production strategy. Even though Knossos was destroyed during LMIIIA2/B, it is clear that the site was an administrative center for most of the period that TSJs were produced. As might be expected, the TSJs found there mostly come from central Crete with only a few imported from west Crete. This may suggest that the two areas were separate production and shipment centers, even if they were connected by an administrative hierarchy, as the Linear B documents may illustrate.

Yet Knossos was not the only major settlement in central Crete and it is clear from petrographic analysis that another production center existed in the south-central part of the island in the Mesara plain. At Kommos, a large southern coastal settlement, many TSJs were found alongside other transport containers from around the Mediterranean. As a harbor site, Kommos interacted with the external world and may have acted as a major shipper of Cretan oil and wine. In fact, small-scale olive processing in Kommian Middle Minoan households was replaced by a centralized and larger scale production in the LMIII period. Large stone-spouted press beds in the center of the settlement “denote a dramatic social and economic change which took place at Kommos in the LM period” (Blitzer 1993, 167). Contemporary with this change in oil production is a drop in eastern imports and an increase of imports from Khania, Mycenaean Greece, and Italy (as compared to LMII-III A1; Rutter 2006, 630-688). Interestingly, Sardinian imports (51) outnumber other foreign imports in LMIIIB (Rutter 2006, 674-678). Taken together, the increase in oil production, manufacture of TSJs, and connection to Mycenaean Greece all suggest that Kommos played a major role in the olive oil and wine industry of the Late Bronze Age.

Greek Mainland TSJ Production

Even though 85% of TSJs were produced on Crete, the Greek mainland supplied most of the remaining 15% and had its own unique fabrication method in producing these vessels (Haskell et al. 2011, 89). Unlike Cretan, mainland TSJs were formed as a whole vessel, with the addition of handles and the true spout (Ben-Shlomo et al. 2011). The fabric was very fine, giving them the appearance of an oversized fineware stirrup jar (**Figure 6**). In keeping with their fabric, mainland TSJ shapes are highly refined, ranging from conical to ovoid to globular. Peculiar firing holes appear on handles and the handles themselves are flattened oval to strap-style. As with some of the central Cretan TSJs, articulated neck rings appear at the base of false necks. For example, one vessel (KN36) is typologically mainland but macroscopically and chemically the fabric is from central Crete (Haskell et al. 2011, 89-90). Mainland TSJs are usually decorated with simple bands and occasionally floral motifs occur on the shoulder (Haskell et al. 2011, 90). Mainland potters did not label their TSJs with Linear B signs and production seems to have been restricted to certain regions. In fact, mainland TSJs have only been found in the Argolid (Mycenae, Zygouries), Boeotia (Thebes), and Messenia (Pylos).

The Argolid was not only a major Mycenaean administrative area but also a ceramic production location. We know from excavations at Berbati that a large pottery workshop existed there that produced fine ware vessels, sometimes for export (Åkerström 1987; Schallin 1997, 2002). Although no TSJs have been found associated with this workshop, we do have evidence for TSJ production at the nearby site of Zygouries. Here, the first excavator, Carl Blegen, uncovered what he interpreted as a single large mansion “perhaps the residence of the local governor or noble, subject to the king at Mycenae” (Blegen 1928, 221). The house was built in a fashion reminiscent of Cyclopean masonry and decorated with frescoes. In his cellars he, or his

successors, stored a vast quantity of pottery “perhaps for sale or export” (Blegen 1928, 221-22). Blegen interpreted these basement storerooms as a Potter’s Shop based on the large number and impeccable condition of the vessels along with the existence of abundant clay beds in the surrounding area (Blegen 1928, 222). Recent work by Thomas (1992) suggests, however, that these rooms were not part of a potter’s shop, but were instead storerooms for vessels used in the manufacture of perfumed oils belonging to the mansion above. In these storerooms ten mainland TSJs and three enormous TSJs were found in the center of the room. According to fabric analysis by the Fitch Lab of the British School in Athens using Atomic Absorption and Optical Emission Spectroscopy, the clay used to make the TSJs is “unquestionably local to the Argolid, close to that seen at Berbati” (Thomas 1992, 322).⁵ This may indicate, as Thomas (1992, 322) also suggests, that there “seems little doubt, even without considering the decoration, that these jars were made as part of the same batch.” In support of a common manufacturer, the painted decoration of the ten TSJs from Room 13 is “practically identical” (Thomas 1992, 323).

Although there are not many mainland TSJs here, the context is enough to suggest that mainland Greeks considered mainland TSJs part of a normal repertoire of ceramic production. This interpretation is strengthened by the existence of a few mainland TSJs among the many Cretan TSJs recovered from the storage/redistribution area of the House of the Wine Merchant and House of the Oil Merchant, both located outside the walls of Mycenae. The comingling of both TSJ types suggests their common purpose. Additional support comes from repeated seal impressions on clay stoppers from both Cretan and mainland version TSJs at the House of the Oil Merchant (Haskell 1981).

⁵ Thomas 1992, 322 note 117: these analytical results came from Thomas’ personal communication with Dr. Richard E. Jones. In addition, a stirrup jar handle from the site of Tzoungiza is “virtually identical” to the handles of the smaller size TSJs at Zygories.

At Thebes hundreds of TSJs were recovered from the limited excavations around the site. Until recently, however, scholars debated whether this large amount of TSJs were produced in the local region of Boeotia, or were imported from Crete (Day and Haskell 1995). Chemical analyses only confused the debate since the chemical signatures of Boeotian and central Cretan clays are very similar. However, the synthesis of chemical, petrographic, and stylistic analyses by Haskell et al. (2011) ended the debate, with the conclusion that most TSJs recovered from Thebes were in fact produced in central Crete. In retrospect, this should not be entirely unexpected since the same trend is seen at Mycenae. Although the percentage of Cretan vessels is high, a number of vessels were indeed produced locally. Just like the vessels produced at Zygouries, these Theban mainland TSJs are of fine quality with minimal decoration and are found in a context similar to the House of the Wine Merchant and House of the Oil Merchant. Three mainland-version TSJs (TH Z 824, 825, 826; see Raison 1968, figs. 68, 70, 69, 71) have strap handles with pierced holes, a ring foot, and banded decoration, thereby matching the Zygouries TSJs in style and production technique. Petrographic work on these three vases by Day and Haskell (1995, 97) suggests that they were locally manufactured, which corresponds to their chemical signature. At Thebes, however, these locally produced TSJs are in the minority when compared to the number of Cretan imports.

The situation at the Mycenaean palatial site of Pylos is less clear. In contrast with the previously discussed palatial sites, Pylos seems to have used mainly mainland TSJs, though no chemical analyses have been conducted to determine their provenance. Many of the TSJs recovered from the palace at Pylos come from an apparent perfumed-oil workshop, like Zygouries above (Shelmerdine 1985). Interestingly, a group of 17 Pylian TSJs from Room 53 are remarkably similar to the ten found in the “Potter’s Shop” at Zygouries and three from the House

of the Oil Merchant at Mycenae, as noted by Thomas (1992, 285). There may even be at least two mainland workshops represented, demonstrated by the similarities between inv. no. 1613 (mus. Exc. No. B57-807) at Pylos and no. Z-311 from the hillside of Zygouries (Blegen 1952). More research on these vessels may bring to light regional exchange, as seen with, among many other examples, the oval-mouthed amphoras on Crete. Despite Pylos' apparently close connections with Crete in both architectural and artistic styles (Rutter 2005, 20-32; Nelson 2001; Immerwahr 1990, 96-137; Hiller 1996), only two Cretan TSJs were identified (Haskell et al. 2011, nos. PYL02, PYL05). This may indicate that the palace at Pylos acquired its bulk oil locally or from another closer region (Dickinson 2005, 56).

Other TSJ Production: Asia Minor and Rhodes

Most TSJs that have been sampled chemically or petrographically fit into a general range for Crete or mainland Greece. Yet there are a few anomalies that fall outside these ranges and suggest there might be other production centers for TSJs around the Mediterranean. Three of the most prominent geological matches include Troy, Miletos, and Rhodes. At Troy in Phase VIg levels, two stirrup jars were found that seem to have been produced in the local Gray Minyan Ware and one in local Tan Ware whose bodies resemble common Trojan jugs (**Figure 7**). The excavator surmised that these vases might represent a "special Trojan adaptation of the stirrup-vase made by local potters in their own wares," which were found along with at least five other TSJs that seemed to be products of a single workshop (Blegen et al. 1953, 74). Interestingly, on the Uluburun shipwreck there were at least two examples of a similar style stirrup jar made with clay originating from Asia Minor (Haskell et al. 2011, 87). In addition, on the island of Rhodes one TSJ matches the gray ware one from the Uluburun wreck. Although it has not been confirmed by scientific analyses yet, another strange gray ware stirrup jar was found at the

Mycenaean palatial site of Midea (Demakopoulou et al. 1997-8). These four occurrences suggest that Trojan potters may have produced their own version of stirrup jars and subsequently shipped them to destinations in the Aegean. Based on morphology alone they seem to be related to mainland style TSJs rather than Cretan.

Farther south along the coast of Asia Minor, the settlement of Miletos is now considered to be a Minoan and later Mycenaean stronghold. At least eight Minoan and Mycenaean pottery kilns have been found along with locally produced Aegean wares (Gödecken 1988; Niemeier 1997). These wares were accompanied by frescoes, Aegean architecture, and possibly even Minoan/Mycenaean ritual. Cemeteries outside of the city produced a few TSJs and it may be possible to speculate that those too were locally made although no scientific testing has been conducted as of yet.

A more concrete example of TSJ production comes from the Dodecanese island of Rhodes. This large island was a major stopping point for merchants crossing the eastern Mediterranean. It is not surprising, therefore, that the local repertoire of ceramics is a mix of Aegean, Cypriot and Levantine styles. Mycenaean styles dominate the island's ceramic production in LHIIIB, resulting in local copies of Aegean originals. During their study of TSJs around the Mediterranean, Haskell et al. (2011) chemically and petrographically tested TSJs from tombs at the Rhodian cemetery of Ialysos. Stylistically, seven of these TSJs seemed to form their own typegroup and were found to be of local Rhodian clay. This may suggest that Rhodes had its own TSJ production center, although it is uncertain whether they were shipped elsewhere.

Social Context of TSJ Production

After discussing where and how TSJs were produced in the LBA, it is necessary to turn our attention to the actors involved and to recontextualize TSJ production within its cultural and

economic setting. Who were the people responsible for supporting TSJ production and what was their social status? Were the Mycenaean palaces directly associated with TSJ production by regulating the location and volume of their manufacture? A few lines of evidence are available to try and answer these questions. Marks, inscriptions, and written records from the LBA may provide insight into who produced TSJs or who requested their production. Here I will investigate potmarks on TSJs, Linear B inscriptions on stirrup jars (ISJs), and Linear B texts themselves for any information that can help us understand the people behind the pots. Although I focus on the pots themselves as archaeologically visible materials, we must keep in mind that their contents were the actual commodities. Oil and wine were important aspects of LBA Greek society and their containers would have been carefully chosen and attributed meaning and importance. As Hamilakis (1999, 39) suggests, we must “view food processing and preparation not simply as a matter of technical apparatuses, static routine and practices and hardware, but a socially meaningful arena of transformation.”

Markings and Textual Evidence

Markings on the pots themselves and texts related to the oil and wine industry may provide insights into who made TSJs, the producers' association with oil and wine makers, and the type of oversight provided by provincial or palatial officials. Before TSJs were fired they were painted with designs, mostly consisting of linear bands or wavy lines. Occasionally, however, Linear B signs were painted on the belly or shoulder of some TSJs. As mentioned above, these inscribed stirrup jars (ISJs) are found to have been produced almost entirely in west Crete with a few originating from central Crete. The signs are usually large, sometimes hastily painted, sometimes carefully, and may consist of one, two, or three words. The most frequent type of inscription by far is single personal names in the nominative case. Three-word inscriptions

(personal name+toponym+personal name in genitive) are second in frequency. There are also some single toponyms and a single sign *wa* that may be an abbreviation of *wa-na-ka-te-ro*. The three-word formula is similar to those on sheep tablets from Knossos that list the producer, place of production, and collector who answers to the palace (Haskell et al. 2011, 90). Van Alfen (1997, 263) suggests that these signs were meant to be read during the production process. Since it is only the collector formula that appears on ISJs we should take this as the model formula for all of the ISJs: single personal names or toponyms were abbreviations of a longer implied formula. Therefore the personal name is the producer and the scribe recording the TSJs would already know the toponym and second personal name (the collector's name).

However, the first personal name leaves some debate. Is this the name of the potter himself, the producer of the contents of the vessel, or someone else? A logical compromise comes from Van Alfen (1997, 269) who suggests that the personal name is of the manager of the oil bottling process and that he then reports to the collector. The manager's name on the jar indicates that the obligation has been fulfilled. The function of the inscriptions, therefore, is in the process of monitoring production as an administrative tool used to trace and record the fulfillment of an individual's obligation to provide the contents of the jars to a higher authority (Van Alfen 1997, 254; for an alternative view see Duhoux 2010 and Judson 2013). In this way, the low ratio of ISJs to plain TSJs is explained by one marked jar per batch whose meaning is subsequently obsolete once the jars are submitted by the manager (Van Alfen 1997, 272). Other sources, like the seal on the clay stopper of a jar, could convey information that the written words did not. This secondary source of information may have been the most important since we know TSJs and ISJs were both reused.

The function of ISJ inscriptions as fulfillment markers means that when the ISJs were produced there was a region-wide centralized administration process and economic system. It is unlikely that the production of TSJs and their contents could be organized and the jars exported en masse to the mainland without some form of bureaucratic control (Van Alfen 1997, 265). The presence of the adjective *wa-na-ka-te-ro* on some ISJs and its abbreviation (*wa*) necessarily means that the palaces were at least partially involved and at a very high level (TI Z 29, TH Z 839; abbreviated to *wa* on EL Z 1; *wa* incised on disk of KH Z 16). We may even speculate that *wa-na-ka-te-ro* in place of the collector's name means that it was most likely under palatial control or ownership. This does not mean that the wanax himself received the oil, but that he was involved with its manufacture (Haskell 2004). Palatial involvement in ISJ production is also suggested by correspondences between place-names on the ISJs and those recorded at Knossos on Linear B tablets (Haskell 1983, 121). Other bureaucratic means of recording palatial commodities align well with the process of ISJ marking. Nodules were "contractual performance records of individuals" in contrast to the tablets, which were archival. Consequently, nodules were part of an immediate micro-sphere of the economic hierarchy, but affected the macro-sphere in that seals on the nodules suggest a higher authority involved (just as ISJs would have also been marked with a sealing). In this way both nodules and ISJs operated within a closed system where much of the information would be readily understood (Van Alfen 1997, 267). Since there are no words on the ISJs denoting what type of transaction occurred (unlike the nodules) there must have been only one. This one transaction suggests that the manager of oil/wine bottling was probably under contractual obligation to the collector who in turn answered to the palace on a consistent basis.

Interestingly, there is little information in the various palatial Linear B records on oil/wine and TSJ production. Since Linear B texts were used only for archival purposes, and everyday transactions were more suitable for other recording devices such as nodules, we may not expect to find too many records of oil/wine production. Linear B texts record absolutely nothing about TSJ production specifically, and very little on ceramic production in general. However, TSJs may make an appearance on a handful of tablets recording large oil distributions. In Linear B, *ka-ra-re-we* (*khlarewes*. cf. Hesychius, 502: $\chi\lambda\rho\acute{o}\nu \cdot \acute{\epsilon}\lambda\alpha\iota\eta\rho\acute{o}\varsigma \kappa\acute{\omega}\theta\omega\nu$; Shelmerdine 1985, 25) has been interpreted as denoting the large coarseware stirrup jar. Two tablets from Knossos list 1800 “stirrup jars” (K 700) and 180 “stirrup jars” (K 778), and a tablet from Pylos (Fr 1184) lists 38 “stirrup jars” either containing or to be filled with just over 500 liters of oil. At the very least the mention of TSJs confirms that the palaces somehow received large numbers of these containers.

Conclusions for TSJ Production

Based on the information presented here, it seems that Late Bronze Age TSJs were regionally produced and variably involved with central palatial authorities. West Cretan production, probably concentrated around Khania, seems to have been highly regulated with specialized decoration and Linear B inscriptions recording obligation fulfillments to a higher authority. In contrast, central Cretan TSJ production seems to be more deregulated, even though the major palatial site of Knossos was in power for part of the time period. Haskell (1983, 125) suggests that when the palace at Knossos was destroyed (LMIIIA), the towns and regions were “able to reassert their traditional independence,” thereby allowing regionalism to spread. In this situation the Mycenaean ruling elite would have left, but those Cretans who had worked alongside the palace would have retained knowledge of the industries and writing. Central Cretan typology and

petrography supports this assertion. These TSJs are characterized by a great variety and multiple production locations, including one in the southern Mesara plain where the large site of Kommos was simultaneously increasing oil production.

TSJs produced on the Greek mainland underwent an entirely different production process. Here, they seem to have been produced in smaller quantities with a unique style. In the words of Haskell (1997, 102), “Mainland attempts sometimes seem to have resulted in nothing other than overgrown fine ware stirrup jars.” At least three different production centers can be identified. The Potter’s Shop at Zygouries near Mycenae produced ten nearly identical TSJs, as well as at least three locally produced TSJs from the Kadmeion at Thebes. In addition, a TSJ found outside the Potter’s Shop at Zygouries exactly matches another found at Pylos, which suggests a third workshop existed outside of the previous two. It is clear, however, that mainland TSJs were used in the same manner as Cretan versions since both were found comingled at the House of the Oil Merchant, with matching seals on their stoppers. Other TSJ production locations are hinted at by the existence of a few biconical gray ware TSJs found scattered around the Eastern Mediterranean, as well as a possible workshop on the island of Rhodes.

In general, TSJ production seems to have been a restricted activity, available to only a few specialized potters. This is perhaps best illustrated when compared to other regions of the Mediterranean. For example, the Canaanite Jar has many production locations ranging from Cyprus, down the Levantine coast, to Egypt (Serpico et al. 2003). The Aegean TSJ, therefore, was perhaps regulated not only because of the specialty knowledge necessary to create it, but also because of its connection to Mycenaean palatial regimes. As will be discussed in the next section, TSJ distribution appears to corroborate these ideas since the vast majority of these

vessels are distributed and consumed by a limited number of palatial sites on Crete and the Greek mainland.

Transport Stirrup Jar Distribution

Introduction

Following the distribution of an object is complicated. Knowing the places of discovery is not enough information to draw meaningful conclusions about the process of the object's distribution and any socio-economic implications we might draw from it. Including the quantity of objects in each location aids in seeing an overall trend of movements, but still lacks any real significance considering that many volume measurements are affected by excavation methods, site preservation, and chance. Instead, we are perhaps most informed by the pattern generated by comparing production areas to deposition locations. This data, combined with object quantities, can be most useful in reconstructing past economic networks and the socio-political ties that shaped them. For Late Bronze Age transport stirrup jars, plotting the production locations of vessels against their deposition distribution will generate patterns that may represent political ties connecting various regions of the Mediterranean, or trade routes that provided a pathway linking different people and commodities. Again, the chemical, petrographic, and typological work conducted by Halford Haskell et al. (2011) is indispensable and provides the foundation on which we might build new ways of looking at TSJ data, creating new insights into the Mycenaean political economy and its connection to the Mediterranean world. Consequently, this section is designed to integrate the previous discussion of TSJ production regions with their more specific deposition locations. Geographically, TSJs are found throughout the Mediterranean, but are concentrated in the Aegean itself. Of the roughly 240 TSJs found outside the Aegean, about 50%

are from Cyprus, and 25% are from the southern Levant (Ben-Shlomo et al. 2011, 346). I therefore organize the first half of the discussion of TSJ distribution according to the geographical origins of TSJs, discussing where each type was subsequently deposited. The second half of the discussion will focus on the possible actors involved in the shipment, trade, and distribution of TSJs. More specifically, I will concentrate on the evidence for palatial, semi-dependent merchant, and independent or outside merchant involvement in the processes governing how these vessels moved from their production location to their depositional context.

Regional Trade Connections for Oil And Wine

This section seeks to elucidate regional trade connections by discussing specific locations where TSJs from a particular area are found and their comparative volumes. I first present the evidence for west Cretan TSJ distributions, followed by central Cretan TSJ distributions, mainland TSJ distributions, and finally the distributions for any other types of TSJs. Organization in this manner, I believe, will be most useful when drawing conclusions about socio-economic relationships.

West Cretan TSJ Distribution

As suggested in the previous section on production, west Cretan potters generated the largest volume of TSJs in the Aegean and at the same time produced the most standardized vessels. Khania's connection with mainland palatial powers cannot be underestimated and is supported by the generation of over 90% of the ISJs. If production of TSJs in this region seems to be so connected to the Mycenaean palatial system, how did it affect their distribution? Based on the volume of west Cretan TSJs found in mainland palatial contexts, it seems that the connection with their production did in fact transfer to their distribution. The largest numbers of west Cretan

TSJs are found at the most prominent mainland palaces: Thebes, Mycenae, Midea, and Tiryns (Table 1, Map 3). At Thebes, over 120 TSJs were found in the Kadmeion alone, with others located in different excavated areas. Of these TSJs, 92 were analyzed, petrographically and/or chemically, with the result that 57 originated in west Crete. It is necessary, however, to take into consideration the fact that 48 out of 57 were ISJs—objects that were more actively retained by archaeologists, in contrast to regular coarseware TSJs, which may have been unknowingly tossed aside or uncataloged. At Mycenae, a similar picture presents itself with over 92 TSJs recovered from in and around the site. Eighty-four were analyzed with the result that 48 originated from west Crete, again well over half. The Argolid in general seems to have been supplied by liquids from west Cretan TSJs since the nearby palaces of Midea and Tiryns are also recipients of many vessels. Although the exact number of TSJs recovered from Midea is not yet analyzed, it is clear that a good number came from west Crete since they are not only decorated with Light on Dark, but also have Linear B inscriptions (Demakopoulou 2007, 69). The majority of TSJs at Midea were found in LHIII B2 contexts, suggesting that trade in oil or wine between Crete and Midea (or at least the Argolid) continued until the end of the 13th century B.C.E. The numbers at Tiryns may be slightly skewed due the analysis of only 19 ISJs out of about 28 total vessels, but the results are nevertheless telling.

Interestingly, west Cretan TSJs are not uniformly prominent at all mainland palaces. Excavations at Pylos have only produced one or two west Cretan TSJs (Map 3). In contrast, at the Spartan Menelaion around 20 vessels were found, 12 of which were analyzed and all are unquestionably west Cretan in origin. The distribution of west Cretan TSJs on the Mycenaean mainland produces some obvious patterns that cannot be attributed to chance alone. According to Haskell et al. (2011, 126) “the most likely explanation for the pattern of west Cretan jars on the

mainland is directed trade: administrators, possibly under the overall control of bureaucrats at Khania, designated shipments of ISJs and [T]SJs for specific mainland markets.” This suggestion is supported by the numbers of TSJs found at Khania itself: out of 83 TSJs sampled, 71 were locally produced, with the other 18 coming from central Crete. While this split number may be contradictory at first, it may actually support Khania’s status as a staging location for the shipment of other Cretan TSJs to the mainland. In contrast, comparatively few west Cretan TSJs are found in prime central Cretan locations like Knossos and Kommos. Additional support for a direct, controlled link between west Crete and the mainland comes from the surprising lack of west Cretan TSJs from any non-Aegean locations including Cyprus and the Levant.

Central Crete TSJ Distribution

Parallel with their production, central Cretan TSJ distribution networks are much more heterogeneous (Table 1, Maps 2-4). While there is some evidence for a connection to mainland palaces, as with west Cretan producers, the link is weaker. Of the 84 TSJs that were analyzed from Mycenae, 28 were found to be from central Crete, about half as many as west Cretan versions. At Thebes, a similar pattern exists with 23 central Cretan TSJs, compared with 57 west Cretan (out of 92 sampled). Other evidence, however, supports a connection between Knossos and mainland palaces. Inscribed stirrup jars found at Knossos match inscriptions at the palaces of Thebes and Midea. At Midea, a Linear B inscription, *wi-na-jo*, was discovered on a Dark-on-Light double wavy band decorated TSJ (Demakopoulou 2007, 69). As discussed in the production section, decoration of this style is generally restricted to TSJs produced in central Crete. In addition, the inscription itself is matched graphically by two TSJs found at the Knossos Unexplored Mansion and at Armenoi, as well as appearing on several tablets from Knossos (Demakopoulou 1988, 212-13; Demakopoulou 2004, 409). These three TSJs have matching

fabric, suggesting common origin from the same workshop and providing a direct connection between central Crete and the Argolid (Demakopoulou 2004, 409). Other evidence for this connection is suggested, as noted above, by some central Cretan TSJ producers using similar techniques and styles to mainland TSJ producers, including strap handles and ring bases.

Perhaps the most interesting aspect of central Cretan TSJ distribution is the possible connection with areas in the East (Maps 1 and 4). Over 110 Aegean TSJs have been found on the island of Cyprus (Map 4). Examples from the sites of Episkopi Bamboula, Enkomi, Hala Sultan Teke and Kazaphani have been chemically and macroscopically tested with results that show almost all to have a composition matching central Cretan clays. Haskell (2005, 213) suggests there may have been a possible relationship between central Crete and Cyprus with the octopus design serving as a Cretan trademark. On the Levantine coast, most TSJs are found in coastal harbor towns including Minet el-Beida, the port of Ras Shamra/Ugarit, and Tell Abu Hawam (Map 1). Ben-Shlomo et al. (2011, 347) conducted petrographic tests on 24 TSJs (out of a total of 40 vessels) found at Tell Abu Hawam. They found that 17 definitely originated in south-central Crete. The high number of south-central Cretan TSJs concentrated at this one site may suggest some sort of direct connection. A link between the two regions is strengthened by the concentration of Canaanite Jars at the southern Cretan harbor of Kommos. Based on petrographic analysis, it seems that these particular Canaanite jars were made at or near Tell Abu Hawam, providing evidence of a reciprocal trade of specifically bulk liquids between the two port towns of Kommos and Tell Abu Hawam.

In the central Mediterranean, central Cretan TSJs are present at a number of Italian and Sicilian sites (Map 1). One jar from Antigori on Sardinia and two jars from Cannatello on Sicily near Agrigento originate from central Crete (Haskell et al. 2011, 129). Other TSJs found around

the central Mediterranean have inscribed Cypro-Minoan marks on their handles supporting their involvement in a larger Mediterranean economic network (Hirschfeld 2002, 2004, 2011).

Additionally, one site on the north coast of Africa, Zawiyet Umm el-Rakham, produced Cretan TSJs and may have been a stopping point for trade expeditions traveling from Crete to Egypt. TSJs have also been found at other sites around the Egyptian Delta including Qantir, Deir el Medina and Amarna, though their numbers are very small (Map 1).

Additional evidence for the movement of central Cretan TSJs around the Mediterranean comes from three excavated shipwrecks. The shipwreck found off of the southern coast of Turkey at Uluburun had at least 14 TSJs onboard at the time of its sinking. Ten of these TSJs were analyzed by Haskell et al. (2011) with the result that seven are originally from central Crete. These stirrup jars were most likely reused and consequently traveling back to the Aegean. We cannot, therefore, draw conclusions on the high ratio of central Cretan TSJs as it relates to Cretan agency. The Point Iria shipwreck, however, presents a very different case. Found off the coast of the Argolid, the ship seems to have been carrying mainly ceramic transport containers at the time it sank. A group of eight TSJs were onboard and, based on chemical and petrographic analyses, all come from south-central Crete and probably the same workshop. The close typological grouping and the location of the shipwreck might demonstrate directed export between south-central Crete and the Argolid (Haskell 2005, 213). The late date of the Point Iria shipwreck, around 1200 B.C.E., supports the idea that trade connections between central Crete and the mainland continued down to the very last years of the Mycenaean palaces. Around the same time or slightly later, another ship faltered off the southern coast of Turkey. The Cape Gelidonya shipwreck had at least four TSJs onboard. Out of the two that were analyzed, one came from Crete, but it is uncertain where exactly. Two other shipwrecks, found near the island

of Dokos and at Kosta-Hermionid on the Greek mainland (southern Argolid) produced at least one TSJ each, though no chemical or petrographic research has been conducted yet (for Dokos see Lolos 1991, 18; for Kosta, Hermionid see Lolos 1995, 77, 79, fig. 22).

Mainland TSJ Distribution

Until recently, mainland TSJs were thought to remain close to their production locations, never being distributed to other areas of the Aegean or Mediterranean (Haskell et al. 2011). Indeed, it is true that most mainland TSJs are found mixed with Cretan TSJs as at Mycenae and Thebes or found in groups of their own, as at Zygouries and Pylos (Table 1, Map 3). Similarities in vessel style among these groups suggest at least some inter-regional trade within mainland Greece. At Pylos, for example, a TSJ was found that is almost identical to one recovered at Zygouries. It did not, however, match the ten vessels from the Zygouries Potter's Shop group, but rather a single chance vessel found in a house on the hill slope (see above). This may suggest that another regional production center participated in an inter-regional distribution network that connected both the Argolid and Messenia.

According to a recent article by Ben-Shlomo et al. (2011), mainland TSJs were not completely restricted to mainland distribution, but have, in fact, been identified at multiple regions in the Eastern Mediterranean including Cyprus, the Levant, and Egypt (Table 1, Map 1). Based on morphological differences, stylistic idiosyncrasies, and macroscopic inspection they found that eight out of 20 Aegean TSJ imports to Cyprus were mainland examples (Ben-Shlomo et al. 2011, 336). In the northern Levant, at least three mainland TSJs have been identified and in the southern Levant Ben-Shlomo et al. (2011, 336) claim that 10-25% of more than 50 TSJs are originally from the mainland. These include at least one from Ashdod Beach, Beth Shean and Tell Abu Hawam, respectively—each with Cypro-Minoan marks on their handles. One of the

most interesting locations at which Ben-Shlomo et al. have identified mainland TSJs is the coast of North Africa. Four TSJ fragments from Marsa Matruh are supposedly mainland versions based on their ring base and fine fabric (Ben-Shlomo et al. 2011, 336). In addition, one mainland TSJ was identified from the chapels adjacent to the temple within the 13th century B.C.E. Egyptian coastal fortress at Zawiyet Umm el-Rakham (Ben-Shlomo et al. 2011, 336). Although the number of mainland TSJs abroad is very small, it is evident that they were involved with the wider distribution of Aegean TSJs.

Other TSJ Distribution

While west Crete, central Crete, and the Greek mainland are the three major areas from which TSJs were distributed; there are a couple smaller areas of production that deserve mention. The two major projects devoted to chemical and petrographic analysis of TSJs, Haskell et al. (2011) and Ben-Shlomo et al. (2011), both came to the conclusion that a few TSJs did not fit into the typical chemical groups and were consequently labeled “non-Aegean.” In keeping with this conclusion, the morphology of these vessels was not the typical piriform or ovoid shape, but rather biconical and the fabric was a type of gray-ware sometimes burnished or slipped, without painted decoration. In addition to the conclusion by Haskell et al. (2011) that these TSJ are non-Aegean, Ben-Shlomo et al. (2011) speculate that they may have been produced somewhere along the west coast of Asia Minor. Indeed, as mentioned in the production section of this chapter, it seems that a good candidate was the area in and around Troy, where at least two of these vessels have been identified along with a group of traditional Cretan TSJs (Table 1, Map 1). The wide distribution of the gray-ware, biconical TSJs is interesting considering that very few of them have been identified. Their presence on two of the three Late Bronze Age shipwrecks, two on Uluburun and one on the Gelidonya, shows that they must have traveled rather extensively to

multiple regions of the eastern Mediterranean. On land, examples have been identified at Troy in Asia Minor, Ialysos on Rhodes, and Midea on the Greek mainland (Haskell et al. 2011; Demakopoulou 1997, 59 fig. 16 middle; 2009, 248, fig. 4d). In addition, their presence on the Uluburun and Gelidonya shipwrecks may imply that they had first traveled to the Levant before being loaded onboard. This may be corroborated by the non-Aegean TSJ fragments identified by Ben-Shlomo et al. (2011, 340). Although these are not confirmed biconical gray-ware examples they have “no evidence of Cretan provenance.” Based on this evidence, it seems that Crete and the Greek mainland were not the only production areas to leave a visible distribution of TSJs around the Mediterranean. More work on these biconical gray-ware TSJs may show that there was another thriving production area, possibly near Troy, that maintained a trade connection with other regions, distributing their own liquid commodities and competing with Aegean TSJs. Yet the exact ancestral relationship between these anomalous TSJs and the more traditional examples is entirely unknown.

The distribution of TSJs, especially during the LM/LHIIIB period, could be interpreted as mainly directional, from Crete to mainland Greece, with the addition of possibly independent networks of bulk liquid shipment eastward to the Levant from Crete, and westward, on a smaller degree, to Italy. The relatively high-intensity flow of TSJs off Crete to areas throughout the Mediterranean also seems to have spawned secondary networks on which both mainland Greek and other types of TSJs moved, though to a much smaller degree than Cretan TSJs. It is not enough, however, to examine the distribution locations and volumes of bulk liquids shipped in TSJs. It is also necessary to consider the actual means by which these goods reached their destinations from their origin of manufacture. Who were the groups of people involved with their transport? Were they different from the people who managed their distribution? The following

section will consider several possibilities for the actors involved with the distribution of TSJs in the Late Bronze Age Aegean.

Nodes in an Economic Network

Kevin McGeough's (2007) Network-Based-Model (NBM) for the Late Bronze Age economy of Ugarit set a precedent for understanding how nodes in an economic system functioned as internal and external agents. For him, studying individual nodes of economic contact is the best way to untangle the inner-workings of an ever-changing and complex system. Accordingly, each node "should be understood as a situation of economic interaction between discrete groups or individuals" (McGeough 2007, 35). McGeough's results for Ugarit suggest that the palace, elite individuals, merchants, and others existed in multiple exchange relations. Each actor was capable of more than one mode of exchange including reciprocity, redistribution, and market trade. In this case, power (political and economic advantage) was gained not by "control" but by the relative nodal position in the economic network. For example, the palace was not "in control" of the economy, but was an individual economic agent situated at a nodal point for at least 17 different exchange relationships (McGeough 2007). At the same time, numerous other groups participated in exchange relationships without involving the palace. Elite activities were the "dominant mechanisms for circulation of goods and the only group that acted as an intermediary in an exchange relationship" possibly receiving some support from the palace in the form of military service, financial aid, or symbolic capital (McGeough 2007). Other individuals (referred to as *bdlm* and *mkrm* in Ugaritic texts) had the primary occupation of procuring and exchanging goods without the primary goal of accumulating capital. These were elite agents responsible for dispersing certain goods and gaining other goods.

McGeough's conclusions were drawn from an analysis of a rich body of textual and archaeological data from the Levant. Unfortunately, the situation for Late Bronze Age Aegean economic networks is not as well documented. Indeed, even the textual data we do have, the Linear B tablets, are limited in scope, quantity, and topic. One of the glaring lacunas in Linear B tablet archives is any direct information on trade and economic interactions. Palaima (1991) collected all the information regarding "maritime matters" available in the Linear B tablets only to come to the conclusion that, "it is impossible to make any deductions from the tablets about the degree to which such trade would have been either controlled or entrepreneurial" (Palaima 1991, 309). Based on a study of eastern imports to Mycenaean Greece, Burns (2010, 191) suggests that while there was a centralized effort by the Mycenaean palatial power to control foreign symbols and exotic materials, rival elites nevertheless "laid claim to external symbols that represented distant alternatives to local power." When it comes to the oil and wine trade, archaeological evidence in the form of TSJs provides some guidance as to the actors involved. It may, therefore, be beneficial to examine the textual and archaeological evidence outside of TSJ distribution patterns for the involvement of palatial, semi-independent merchants, and independent merchants in the oil and wine trade. Using McGeough's work at Ugarit as a guiding model, we may be able to draw some conclusions on the exchange relationships between these nodal agents in the Aegean.

Palatial involvement

The Late Bronze Age central authorities in Greece, stationed at the palaces, were involved with certain aspects of the Mycenaean economy. The Linear B tablets, mostly found in palace archives and storerooms, are occupied with very specific activities that can mostly be described as added-value/transformational processes. These activities, like perfumed oil manufacture, bronze

working, and textile creation, are in opposition to staple commodity activities such as bulk grain harvesting and fishing for which the tablets are not explicit, although some information about their regulation can be read between the lines (Halstead 2007). In addition, mention of ship building and naval recruitment is relatively common in Linear B tablet records, demonstrating that the palaces did have the capability to move by sea and were concerned with maritime participation (Palaima 1991, 308). Individual ships may even be denoted on the tablets, identified on a set of tablets from Knossos which list two “pilots” in charge of ships from central and western Cretan communities (Palaima 1991, 309). Only one tablet explicitly deals with movement of goods from one place to another. Tablet MY X 508 from Mycenae confirms that the palaces were involved with trade since it describes cloth destined for Thebes (Haskell 2004, 151). According to Haskell (1997, 107), “what matters is that palatial officials at Mycenae somehow directed export.” No other explicit discussions of trade exist in the Linear B tablets, which probably indicates a purposeful lacuna. One important indication of foreign trade, however, is the adjective *ku-pi-ri-jo* modifying textiles at Knossos. Palaima (1991, 308) believes this adjective is meant to denote goods bound for the neighboring island of Cyprus, although others have interpreted this word differently, discussed below. While there is no direct Linear B evidence for trade in oil and wine, there are a few instances of incredibly large totals of wine and oil that must imply some sort of trade or distribution. In the case of tablets K 778 and K 700 from Knossos, direct evidence for TSJ involvement comes from listing *ka-ra-re-we* jars (1800 and 180, respectively), interpreted as large stirrup jars. In addition, Knossos tablet Gm 840 records 498 units (14,342.4 liters) of wine, an immense quantity. At Pylos, tablet Vn 20 records 410 units (11,808 liters) of wine that seems to be (re)distributed to, or collected, from nine towns in the Hither Province (Palmer 1994, 60). In these cases, therefore, the tablets must be recording

surplus agricultural produce that the palace is then consuming, distributing, or trading to local and presumably foreign people.

Indeed, archaeological evidence seems to support the suggestion that Mycenaean palace officials were in some way involved with commercial transactions, both between palaces and with people abroad. The evidence for TSJ distribution around the Mediterranean, discussed above, suggests a type of palatial trade with foreign merchants, but production capacities in the Aegean also suggest a purposeful surplus of commodities. For example, Shelmerdine (1985) estimates that perfumed oil production at Pylos exceeded local demand. When it comes to the nature of the relationship between the mainland and Crete, we may not be dealing with parity between the two trading areas, and should consequently consider the idea of tribute, not trade (Maran 2005). The concentration of TSJs in the Argolid and Boeotia in the palatial period means that these palaces exerted an influence on and may have monopolized the flow of stirrup jars. As suggested by Haskell et al. (2011, 131), the Cretan liquid commodities may have been processed and repackaged on the mainland, then sent eastward. Taking into consideration both the Linear B palatial documents and the archaeological evidence for TSJ distribution, we may be certain that mainland central authorities had some involvement with trade in oil and wine, but possibly from the point of added value (perfume manufacture) onwards. Palaima (1991, 309) goes further by suggesting that, “the specialized inscribed stirrup jar trade must have been managed by Mycenaean ships. It is no great leap of logic then to propose that Mycenaean vessels carried materials and people from one region of the Mycenaean world to another.” While this idea is certainly tempting to accept whole-heartedly, it is also necessary to consider that Mycenaean, if they were transporting their own goods, were doing so alongside many other peoples, including Cypriots, Levantines (Canaanites), and even possibly Egyptians.

Semi-independent Merchants

Another option for the regulation of oil and wine trade in the Late Bronze Age is the existence of semi-independent merchants. This concept is not new and would have many parallels from Near Eastern palaces, such as the *tamkaru*—merchants who ultimately served the king (Killen 1995). For example, the Ugaritic *tamkar* Sinaranu, Son of Siginu, managed trade between Ugarit and Crete and consequently received high status and special benefits (Heltzer 1988). In the Aegean, the Linear B tablets may hint at this class of palatial personnel by the term that we translate as “collector.” These elite people seem to be responsible for organizing a section of the local economy and reporting back to the regional palace. In addition, it seems that collectors manage specific aspects of the palatial economy in part for their own benefit. That collectors are well known by multiple palaces is made apparent by the same collector appearing in Linear B archives from multiple palaces. On Crete, the term *ku-pi-ri-jo* was used as an adjective and as a personal name. In particular, *ku-pi-ri-jo* may refer to a collector whose function was to manage the trade items for the Cypriote market (Killen 1995). *Ku-pi-ri-jo* the collector is associated with receipt of oil, spice, vases, wool, honey, ingredients, and equipment for preparation of perfumed oil. That a particular collector would be associated with the production for a particular market reinforces our archaeological evidence for directed trade discussed above (Haskell 1999, 342).

On the Greek mainland, the initial excavators of structures found outside the walls of Mycenae named them the “House of the Wine Merchant” (HWM) and “House of the Oil Merchant” (HOM) based on their location outside what was thought to be the main area of palatial domain, and because of their contents (Wace 1953). Both buildings had basements filled with storage containers, mostly TSJs and pithoi. At the HOM, a Linear B tablet (MY Fo 101) was discovered that listed oil disbursements to textile workers (Tournavitou 1995). The existence

of Linear B here automatically suggests a connection with the palace. We may therefore be dealing with domains of people who are associated, but technically external to, the palace and its inner-workings. These people could be considered “attached specialists” in the sense that the economic strategy employed was centered on political control by emerging elites (Earle 1987; 2010, 12-13). Alternatively, these two houses may in fact be directly connected to the palace, but situated outside the walls for safety (oil is highly flammable) or space concerns.

Other indications of semi-independent merchants participating in Late Bronze Age Aegean trade come from Crete. A Cretan TSJ found at Bamboula in Cyprus and dated to LMIIIB was inscribed with Cypro-Minoan marks while the vessel was leather-hard, before firing (Palaima et al. 1984). The existence of these marks before firing means that someone on Crete was directly involved with Mediterranean commerce and knew the meaning of these marks (which we still cannot decipher; see Hirschfeld 1993, 2002, 2004). With the addition of Linear B inscriptions on TSJs, we may speculate that the jars were marked with the language appropriate for their destination (Haskell 1986, 85). According to Haskell (1986, 86) only a few people would have had to know these scripts, and these scribes may have worked for independent shippers in various towns.

One of these towns may in fact be Kommos, the largest harbor on the southern coast of Crete. It is hard to say whether the Cretan merchants here were active recipients of palatial authority or had a type of semi-independence. We do know that whether the palaces were directly involved or not, Kommian merchants interacted with foreign merchants on a regular basis. Out of a total of about 75 imported Canaanite jars to the Aegean, 90% come from Kommos. The equivalent number of south-central TSJs found at Tell Abu Hawam may suggest a direct trade connection between merchants at Kommos and merchants from coastal Levant (Ben-

Shlomo et al. 2011, 347-8). While this is an appealing conclusion, Ben-Shlomo et al. (2011, 348) caution that, “the symmetrical importation of bulk transport vessels at the two sites might indicate direct trade and commodity exchange links between them, but it could also result from the two being termini of a large eastern Mediterranean trading system serving not only the Levant and Crete but also Egypt, Cyprus, and the Greek mainland.” Ultimately, we are not able to say whether Aegean trade in oil and wine was clearly affected by the existence of semi-independent merchants. It is tempting, however, to assume a relatively parallel system with Near Eastern economic networks, especially since the palatial Linear B tablets are so silent.

Independent/External Merchants

The distribution of TSJs around the Mediterranean may also be influenced by independent merchants or merchants external to the Greek oil and wine industry. The possibility of directed trade in bulk liquids between Kommos and Tell Abu Hawam has already been mentioned, but the specific actors involved are not certain. Were Cretan merchants moving goods eastward or Levantine merchants westward? Or, is it possible that middlemen acted as transporters, connecting these different areas? Cypriot merchants have already been cited as possible middlemen between the Aegean and Levantine markets (Hirschfeld 2004; Sherratt 1999, 2003). Marks on goods traveling east and west resemble Cypro-Minoan script and were mostly used by Cypriots during a process of exchange and distribution. These marks were inscribed on imported Mycenaean ceramics, both fine and coarse ware, Cypriot locally-made ceramics, and metal ingots. Nicolle Hirschfeld’s work on these marks suggests that there was a pattern to their use, but we are not yet able to understand the connotation of the marks themselves and their placement on the vessels (1993, 2002).

Nevertheless, Cretan TSJs are frequently found with Cypro-Minoan marks incised on one or both handles along the Levantine coast and in the western Mediterranean. One TSJ from Minet el-Beida in Syria has a spiral of Neopalatial date painted in white with a Cypro-Minoan sign. This points to the role of Cypriot merchants in the transportation and trade of TSJs to the east from an early date, the beginning of the 14th century (Kanta 2005, 225). In the west, TSJs have been discovered at Cannatello with incised Cypro-Minoan marks on the handles (Day and Joyner 2005). Related signs have been found on four TSJs from the Uluburun ship, which were most likely in a reuse context (Ben-Shlomo et al. 2011, 338). The contexts of these marked vessels may suggest that Cypriots were in fact the dominant distribution mechanism for TSJs outside of the Aegean. We may imply, therefore, that Cypriots worked alongside semi-dependent merchants and palatial authority. The discovery of Cypriot pithoi at Kommos, indicating direct contact with Cypriot ships or Minoan ships with Cyprus, adds to the interconnection between these three nodes (Haskell 2005, 217). Further evidence for Cypriot merchant involvement is suggested by written evidence from Ugarit where *tamkaru* (merchants) from Cyprus, living in Ugarit, recorded importation of 600 jars of oil (Heltzer 1978, 152-3). Cypriot merchants were therefore not only connected to the wider Mediterranean economic network, but also the trade and distribution of, at least, oil.

Conclusion for TSJ Distribution

The distribution of Late Bronze Age TSJs ultimately allows us to conclude that, “clearly the movement of the commodity or commodities represented by [T]SJs was a large-scale phenomenon” (Haskell et al. 2011, 127). Based on the data presented for each production area, it seems that there was a directed flow of TSJs, resulting from political or trade connections. West Cretan shops and some central Cretan producers shipped most of their goods to mainland

palaces. West Cretan workshops, specializing in Light-on-Dark and ISJ manufacture, dominated the mainland market, sending most of their TSJs to Thebes, Tiryns, and Mycenae. Central Crete, perhaps specializing in octopus-painted jars, exported to Cyprus and the Levant, with a base most likely at Kommos (Haskell 1999, 341). In addition to directed export, we know that these vessels were reused, perhaps on multiple occasions, as attested by the Uluburun shipwreck and TSJ clay stoppers. A jar at Mycenae has a stopper bearing a bovid sealing; according to the analyses the jar comes from central Crete, while the stopper comes from west Crete. A stopper with the same sealing closed another TSJ at Mycenae as well but the jar itself is almost certainly of mainland manufacture (Haskell 1997, 103).

The pattern of reuse apparent at Mycenae along with the context of TSJs in storage areas may suggest that the mainland imported Cretan oil, then redistributed, altered, or rebottled it to be shipped elsewhere. According the Haskell (1999, 342), “It is plausible that at least some of the oil shipped to the mainland was plain olive oil meant to supply the vigorous mainland perfumed oil production and export industry represented by masses of Mycenaean (Argive) fineware closed shapes in eastern contexts.” That direct trade was being organized at Aegean centers is also suggested by a series of medium-sized stirrup jars, which were manufactured in the Argolid and incised before firing with Cypro-Minoan signs then exported to Cyprus and the Levant. Cypro-Minoan signs mean that shippers had a specific overseas market in mind. This scenario may be suggested for Cretan Linear B inscribed jars destined for mainland market since nearly all ISJs are found at mainland palatial sites, the only places where Linear B is common (Haskell 1999, 341).

Palatial authority acting as a node on a Network-Based-Model can be inferred from Linear B tablets listing large quantities of oil and wine and archaeological evidence linking most

of the TSJ distribution to palatial storerooms. Semi-dependent merchants may have acted as intermediaries between the palaces and the producers of TSJs and their contents, making profit on the side. At the same time, external merchants, like Cypriots, seem to have been involved with disbursing Greek oil and wine outside of the Aegean. Whether Cretan or mainland merchants were also involved in this pan-Mediterranean trade is uncertain. Lacking the intricate documentation of the Near East, our view of Aegean palatial and elite interests can only be speculative.

Transport stirrup jar consumption

Introduction

While the distribution of TSJs involves comparing the relationship between production area and the area where they were ultimately deposited, consumption of TSJs requires an investigation of the exact find contexts and quantity of vessels. In this section, I investigate the consumption of transport vessels and their contents by identifying specific local patterns of use and demand (Dietler 2005). Consumption, in this case, is defined as “how people socialize material goods” (Mullins 2011, 134) and can, therefore, contribute to understanding value within both a local and broader cultural context. A theoretical discussion of value includes politics and regimes of value inherent in the production and trade of goods (Appadurai 1986) as well as agency involved with the choice to incorporate a foreign good into an established repertoire (Dobres 2000). The pattern of transport vessel consumption that emerges is one of shifting values, but differentiated between value in the place of origin and value abroad. Within the broader narrative of this dissertation,

detailed analyses of these patterns over time will shed light on Greek production of olive oil and wine and its importance in the wider Mediterranean sphere.

Using the archaeological record as a guide, Dietler (2005) has outlined five parameters for understanding consumption of goods: context of consumption (settlement vs. mortuary vs. ritual); type of sites (palatial vs. elite vs. common); patterns of association (with other objects in certain contexts); relative quantitative representation (within sites and regionally); and spatial distribution (within sites and regionally). Here, I will use these parameters to examine TSJ use over broad geographical regions to compare how different cultures consumed these vessels, incorporating them into their own value systems. Specifically, I will examine consumption patterns of TSJs in Crete, mainland Greece, Cyprus and the Near East, as well as other less well-known areas like the western Mediterranean and Asia Minor.

Cretan TSJ Consumption

Cretan consumption of TSJs (and presumably the liquids they contained) is relatively unique in that, while most vessels are concentrated near palatial sites, the inhabitants of the island frequently deposited them in mortuary settings (Table 2, Map 5). When analyzing these consumption patterns we must keep in mind that this was the main area of TSJ production and their value, therefore, may be viewed differently from areas that were on the receiving end of the distribution/economic network.

The dominant context of TSJ consumption is in settlements. Well over 200 TSJs have been recovered from various habitation areas. This fact should not be surprising since TSJs would have been produced near settlements, then transported there to be shipped off to other destinations. Interestingly, Cretans also deposited TSJs in mortuary contexts. As we will see, this is a relatively uncommon practice in the Mediterranean world. Thirty-one TSJs have been found

in tombs, spread rather evenly around Crete. In west Crete, eight TSJs have been recovered from five cemetery contexts in and around the large settlement of Khania. Near Knossos in central Crete, four TSJs were found in tombs and in East Crete, the town of Palaikastro produced three TSJs from the Beehive tomb. Other, mostly singular, TSJs were found in tombs at Episkopi, Halasmenos, Kalyvia, Klima Pyrgiotissas, Milatos, Rethymnon, Tripiti, Angeliana, and Achladia (Haskell et al. 2011, 153-54). Crete is also the only geographical region that produced TSJs in ritual contexts. One vessel with a central Cretan provenance and an incised mark on one handle was found at the shrine at Amnisos as well as one TSJ on the floor of a shrine (Central Hillside, Room 4) at Kommos.

For all three of these contexts, settlement, mortuary, and ritual, the kind of sites represented tends towards palatial or elite. For the dominant context of settlements, seven are palatial or associated with palaces. The palaces of Khania, Knossos, Malia, and Palaikastro consumed the most TSJs. Other sites, like Kommos, consumed large numbers of TSJs (over 100) and were probably associated with palatial control for at least part of the Late Bronze Age. Other settlements that produced TSJs can be associated with elite groups, such as the villa at Gortyna. However, at least five towns or non-palatial settlements consumed a smaller number of TSJs. Halasmenos, Gouves, Kavousi Kastro and Kastelli Pediada are good examples of the range of sites that had access to TSJs. Tombs that contained TSJs were most likely elite, as a dominant number are chamber tombs associated with rich grave goods. In addition, the shrine at Amnisos seems to have been directly connected with the Knossos palace since Linear B tablets recovered from Knossos frequently refer to a place called *a-mi-ni-so* that was involved with ritual activities (e.g., tablet KN Gg 705).

It seems that on Crete consumption of TSJs was concentrated in regions that also produced them, mostly under palatial domain. However, this did not entirely restrict access to TSJs since they are also found in smaller settlement contexts. The wide distribution of TSJs across the island suggests that they and their contents were highly valued and their placement in tombs only reinforces this idea. It is clear that the main use of TSJs was utilitarian, but they were nevertheless associated with the palaces, which may have given them symbolic value beyond use value. Owning a TSJ may have connected the person to elite ideologies and therefore acted as a status symbol, worthy of taking to the afterlife.

Mainland Greek TSJ Consumption

The pattern of TSJ consumption on mainland Greece is very different from Crete and suggests a distinctive placement within Mycenaean value systems. The vessels are very rarely found in mortuary contexts, and never in ritual contexts (Table 2, Map 6). Perhaps contributing to this difference is the fact that in contrast to largely Cretan production of TSJs, mainland Greece was the dominant area for receiving TSJs. The dominant context of TSJ consumption on the Greek mainland is in settlements. Hundreds of TSJs have been recovered from habitation areas, more than from Crete itself. At Thebes alone more than 120 have so far been identified within palatial storerooms and around 100 were found at Mycenae. In contrast, only eight TSJs have ever been found in mortuary contexts, five from tombs at Prosymna, and only single examples at Tiryns, Mycenae, and Argos. It is possible, therefore, that those vessels recovered from Prosymna are anomalous to the general trend for the rest of Mycenaean Greece.

The kinds of sites represented follow a similar trend as on Crete, with the majority of vessels found at palatial complexes. In fact, on the mainland, this trend is even more exaggerated with only four non-palatial sites consuming any TSJs: Nichoria (3), Tsoungiza (6), Zygouries

(14—but all mainland variety), and Eleon in Boeotia (2). The rather strange site of Gla may be the only elite-based settlement to use TSJs, since over 12 were found in the large double megaron style building found on the citadel. The actual function of Gla is still disputed, so it may well be connected to the nearby palaces of Thebes or Orchomenos. We may conclude then that TSJ consumption was highly restricted on the mainland to the point where not even elite villas or high-ranking settlements could readily participate.

Within palatial sites, TSJs are spatially distributed in a regular pattern, occurring mainly in storage or basement contexts. The patterns of association with other objects may suggest that they were decanted in larger containers, then rebottled in smaller, more easily distributable vessels. The House of the Oil Merchant at Mycenae is just such a case. Consumption, therefore, was controlled by palatial authorities, but not restricted to palatial authorities. Indeed there is a Linear B tablet from the same context that suggests oil was disbursed to textile makers (MY Fo 101). Other patterns of association may suggest that oil from TSJs was involved with perfume and unguent manufacture. At Pylos, though most of the TSJs are of the mainland variety, 80% were found in a palatial context that has been interpreted as a perfumed oil-manufacturing workshop (Shelmerdine 1984, 86-95). The Potter's Shop at Zygouries has also been interpreted as a perfumed oil workshop by Thomas (1992) and again the type of TSJ represented is the mainland variety. It is possible that this pattern of association, mainland TSJs with perfume and Cretan TSJs with disbursement of olive oil, is suggestive of an actual practice; however, without more evidence this is impossible to say for sure. Based on both examples we can say that for most mainland Mycenaean Greeks, TSJs were viewed solely as utilitarian vessels and their contents were not considered valuable enough to be commonly placed in royal or elite tombs (unlike Canaanite jars which are mostly found in mainland tombs). Nevertheless, the contents

were valued enough to be socially restricted to the uppermost level of society, the palaces, and controlled accordingly.

Cypriot and Near Eastern TSJ Consumption

Based on the available archaeological evidence for TSJ distribution, Cyprus seems to have a similar consumption pattern to Crete in that most vessels are found in settlement contexts, yet a large number are also found in tombs (Table 2, Map 7). Unlike Crete, however, none have been recovered from ritual contexts thus far. Over 100 TSJs were found in settlement contexts and 15 from tombs scattered around the island, including Enkomi (6), Akanthou Moulos (3), and Kazaphani (3). This ratio of settlement to mortuary vessels is very close to Crete, but with fewer total vessels. For Cyprus, more than half of the complete or fully restorable pieces were recovered from tomb contexts, “a circumstance peculiar to Cyprus and some sites in the Levant” (Ben-Shlomo et al. 2011, 336). Since the political situation on Cyprus during the Late Bronze Age is not entirely clear, it is impossible to say whether the kinds of sites represented are palatial, elite homes, or common villages. Specifically, it is not clear whether a single king united the island under one rule, or if Cyprus in the LBA was a “decentralized polity comprising a patchwork of variably autonomous territories, loosely affiliated to the state” (Peltenburg 2012, 351). A general pattern suggests that TSJs are mostly found at the largest settlements closest to the coast. For example, the highest numbers of TSJs come from Enkomi (21+), Episkopi (24+), Kouklia (14), Hala Sultan Tekke (10+) and Kition (5; Haskell et al. 2011). Fewer vessels are found at smaller sites around the island. That TSJ consumption is associated with elite activity on Cyprus is suggested by vessels found in the Ashlar Building at Enkomi, one of the largest buildings in the largest settlement. It is clear, however, that the restriction of TSJ consumption is not as regulated as on the Greek mainland, but instead resembles the more widely distributed

pattern on Crete, with some vessels being accessible to lower-ranking sites. In addition, Cypriot consumption patterns suggest that the inhabitants valued the vessels and their contents highly enough to bury them with the dead. It is possible that TSJs were treated as foreign luxury goods imbued with distance-value and a possession of “otherness” that has been argued for other Aegean goods traveling East (Webb 2005).

In the Levant, consumption of Aegean TSJs seems to be divided between the northern and southern coasts, each area approaching these vessels in a unique way (Table 2). In the northern Levant, the types of contexts where TSJs are represented exhibits a rather similar ratio to Cyprus in that most are recovered from large coastal settlements, but a few have been found in mortuary contexts. Twenty-two TSJs have been reported from northern Levantine settlements, with the majority (18) from the central urban center, Ras Shamra/Ugarit and its port, Minet el-Beida. Seven TSJs have thus far been found in cemetery contexts including tombs from the sites of Ras Shamra (3), Minet el-Beida (4), and Beirut (1; Ben-Shlomo et al. 2011, 336). The kind of sites consuming TSJs in the northern Levant are associated with palatial authority (Ras Shamra/Minet el-Beida) or connected with maritime commercial transactions. In the Late Bronze Age, Ras Shamra/Ugarit was the most influential political and economic center in the northern Levant, acting as a commercial crossroads between the major Hittite and Egyptian empires and their Great Kings. It is no surprise then that this city should have control over the consumption of imported commodities. What is most striking is the presence of TSJs in funerary contexts. It is possible that, as on Cyprus, TSJs were associated with foreign products and thereby attributed with inherent value despite their commercial and functional nature.

In contrast, the southern Levant presents a very different pattern from the north. The types of contexts where TSJs are found most resemble the pattern encountered on the Greek

mainland. Over fifty vessels have been identified, and all but one or two recovered from settlement contexts. The kinds of sites consuming TSJs, however, are very different. In the southern Levant, TSJs are mostly confined to coastal commercial settlements, not palatial or high-ranking elite sites. Specifically, around forty TSJs have been identified in settlement contexts at the harbor site of Tell Abu Hawam, as well as four from Akko, and four from Ashkelon. This pattern of TSJ consumption at non-palatial/elite harbor towns continues down the coast to Egypt. The coastal harbor towns of Marsa Matruh and Zawiyet Umm el-Rakham have each produced four TSJs, all in settlement or storage contexts.

The patterns of TSJ consumption produced by examining types of contexts and kinds of sites suggests regional value systems where these vessels are deliberately chosen as valuable imported goods, or treated as purely functional containers. When viewed in association with other objects, it is clear that on Cyprus and the northern Levant TSJs are categorized and valued as Aegean imports first, being placed in tombs with other imported Aegean fineware vessels. Conversely, in the southern Levant and Egypt, TSJs are not associated with imported fineware and are confined to commercial contexts and associated with other commercial vessels like Canaanite jars.

It is also necessary to consider the possibility that the liquid contents of TSJs may have been treated differently from their physical containers. After their comprehensive study on imported TSJs, Ben-Shlomo et al. (2011, 346) suggest that, "...in terms of sheer numbers, those [TSJs] discovered at coastal locales tend to be found in clusters at particular harbor sites...It seems reasonable to infer that the commodities carried in these vessels were decanted at these harbor sites and redistributed to locales farther inland in other types of vessels." If this is the case, then TSJs themselves have a certain use value and symbolic value, which can vary

depending on the value system of the consumers. Their placement in mortuary contexts may have functioned as a signifier that the deceased had direct access to these containers and their contents or that the person was wealthy enough to afford an entire container, instead of a smaller amount of liquid if TSJs were usually decanted. In areas where elites are vying for power and status, TSJs played a role in the symbolic value system. Based on archaeological and textual evidence, elites in Cyprus and the northern Levant were concerned with their status in a constantly evolving social hierarchy centered on mercantile activity, acquisition of status goods and raw materials, and relative relation to palatial authorities. In contrast, the southern Levant was controlled by Egyptian forces throughout most of the Late Bronze Age and would have had a rather fixed social hierarchy based solely on Egyptian desires and necessities. Southern Levantine territory, including harbor towns, would have been under the control of Egyptian governors whose position was dependent on the accumulation of commodities to supply the Egyptian army. It is possible, therefore, that imported Aegean goods were purely functional items not used in the creation of power structures.

Other TSJ Consumption: The Dodecanese, Asia Minor, and Italy

Two islands in the Dodecanese, Rhodes and Karpathos, have produced TSJs. On both islands, the majority of TSJs are found in mortuary contexts, though this may be due to a bias in archaeological excavation (Table 2). On Rhodes, sixteen TSJs have been recovered from tomb contexts at the site of Ialysos. The association of these vessels with other Aegean imported ceramics suggests that these tombs probably belonged to elites. On Karpathos, three TSJs have been found at the site of Pigadia. Although most of the TSJs on Rhodes are of local origin, it is still possible to draw some basic conclusions about the inhabitants' consumption of these vessels and their place within a local value system. It is not out of the ordinary for locally made TSJs to

be placed in mortuary contexts since this is the case on Crete itself where most of this vessel type is produced. On Rhodes, along with the locally produced TSJs were found one west Cretan, three central Cretan, and one non-Aegean (possibly Trojan) TSJ, all in funerary contexts. In the Late Bronze Age, ceramicists on Rhodes were commonly producing vessels with Mycenaean and Minoan styles and shapes, some approaching exact copies, while other vessels maintained a distinct Rhodian character. The presence of imported TSJs alongside locally made versions may suggest a ranking of values used in the constructing and preserving of social hierarchies. In this case, a parallel may be seen with Late Bronze Age Cypriot imitations of Mycenaean kraters where imported vessels were actively consumed alongside a more common “pastoral” style that was locally produced. Jennifer Webb (2005) argues that these vessels might have been available to lower class individuals who were seeking to increase their social standing. If this is also true on Rhodes, we might be able to say that TSJs were viewed as status items despite their utilitarian nature.

Although a few TSJs have been recovered from a selection of tombs along the coast of Asia Minor, the majority of these vessels were found in settlement contexts at Troy. A group of five imported TSJs were recovered from the floor of House VIF along with similar fragments of large TSJs from phase VIg (Blegen et al. 1953, 282, 306). Blegen et al. (1953, 301) suggest that these may be the product of a single workshop based on their consistent shape. In addition, two Gray Minyan Ware examples and one Tan Ware example may represent a “special Trojan adaptation of the stirrup-vase made by local potters in their own wares” since their bodies resemble many Trojan jugs (Blegen et al. 1953, 74). The five whole TSJs were found along with remains of 23 or more imported Mycenaean vases suggesting that this was the house of an elite person, or that it was possibly a storage area associated with the palace (as at Mycenae). At Troy,

based on the evidence, it seems that consumption of both imported and possible local examples was restricted to palatial or elite settlement contexts, similar to mainland Greece. However, more research is needed to have an extensive view of Trojan consumption patterns of TSJs.

Although most TSJ consumption occurred in the Eastern Mediterranean, a number of TSJs made their way to central Mediterranean sites (Table 2). Interestingly, all of them have been recovered from settlement contexts except for one that was found in the sea near Filicudi in the Aeolian Islands. The kinds of sites represented are all coastal port towns including Antigori (2), Cannatello (2), Leporano (1), Roca Vecchia, and Scoglio del Tonno (2; Haskell et al. 2011, 129). The dispersed pattern of contexts on Sardinia, Sicily, and southern Italy may suggest that these few TSJs were part of a larger trade network that included other Aegean wares and Cypriot material, which are more commonly found. Locally made Mycenaean-style ceramics (Jones, Levi and Bettelli 2005) and, at Cannatello, imported Mycenaean pottery, lead Haskell et al. (2011, 129) to suggest that these TSJs may have brought Cretan oil to Aegean artisans in residence at these central Mediterranean sites (on Mycenaean living in Italy see Vagnetti 1999, 194). Conversely, Ben Shlomo et al. (2011, 346) categorize these central Mediterranean coastal sites with coastal harbor sites in the eastern Mediterranean and suggest that they may have been points at which the contents of TSJs would have been decanted into smaller vessels and subsequently shipped inland. This strategy would fit well with suggestion that Mycenaean made infrequent trading ventures to Italy, without establishing any kind of influential presence (Blake 2008). Because of the limited available evidence, it is impossible to draw conclusions for the exact TSJ consumption strategy in the central Mediterranean. It is interesting, however, that none of these vessels have been recovered from tombs in these areas even though they have some distance-value as imported items. This may be a sign that the consumers of TSJs and their

contents were indeed Mycenaean immigrants since it is very rare to find TSJs in mortuary contexts on the Mycenaean mainland.

Conclusions for Consumption

Consumption of TSJs in the Mediterranean Late Bronze Age clearly depicts regional patterns that are reflective of local values. The intrinsic value placed on TSJ vessels in Crete, as evidenced by their placement in tombs and sanctuaries, is probably a result of their local manufacture in large numbers and the association of their production with palatial authority. The wide array of types of contexts and kinds of sites where TSJs are consumed suggests that these vessels were not strictly regulated, but were available as status markers that actively participated in the construction of power and identity.

A similar pattern is seen on Cyprus, in the northern Levant, and even on Rhodes, where TSJs acquire a different type of distance-value as imported objects, but are nevertheless consumed as a means of social differentiation, falling into the same category as other imported Mycenaean ceramics. The various types of contexts—settlement and mortuary—and kinds of sites—palatial, elite, and common—suggest that a wider section of the population consumed these vessels and attributed them symbolic value as grave goods as well as use value. One reason behind this consumption pattern may be that these societies were in the process of negotiating power relations and building hierarchical social structures, which necessitated the conspicuous consumption of high-value imported or elite goods that were technologically restricted in their production. This negotiation of power relations and vying for political or economic success may not have existed, at least to such a degree, in locations where the social hierarchy was static or monolithic. In these cases the consumption of TSJs would produce a different pattern.

Mainland Greece, the southern Levant, Egypt, and maybe the central Mediterranean and Troy all produced consumption patterns with restricted context types and kinds of sites. On mainland Greece and possibly at Troy, the majority of TSJs are confined to palatial settlements. This restriction, especially on the mainland, suggests that central authorities governed the use and consumption of TSJs and their liquid contents, possibly redistributing or rebottling for trade. In these situations, TSJs were not available to be used as objects of value in the creation of power relations. Instead, they were solely a means of maintaining power and control by the ruling elite.

In the southern Levant, Egypt, and the central Mediterranean, TSJs are confined to coastal settlement sites. In the Late Bronze Age, the southern Levant seems to have been under the control of the Egyptian pharaoh and used as a staging point for Egyptian armies traveling to other regions of conflict. Governors appointed by the Egyptian court were stationed at key southern Levantine towns, and Egyptian garrisons were erected in some strategic locations. It has been suggested that the southern Levant was heavily taxed by the Egyptian government and was solely used as a means of supplying foodstuffs to Egypt and its army (Burke and Lords 2010). If this is indeed the historical situation, it should not be surprising that imported TSJs are not distributed equally throughout the population or used as status markers in graves since the social hierarchy was predetermined and static. Alternatively, it is possible that Aegean liquid commodities were decanted from TSJs and rebottled into local wares to be dispersed more freely among the population.

Chapter Conclusions

The sudden movement of Cretan TSJs off the island in large quantities during the LMIIIB period presents a significant change from the previous 200 years of their existence. What caused this

shift from a relatively limited use of TSJs to their increased production and intra-Aegean distribution? The answer may lie in the type of economy within which these vessels functioned. During the Monopalatial (LMII-III A1) and especially during the Final Palatial period (LMIII A2-B), Cretan centers may have been involved in a “political” economy, in opposition to a sacred or commercial economy. In a political economy, goods would be demanded by political authorities as part of unequal power transactions, such as tribute (Poursat and Knappett 2006, 156-157; see also Renfrew 2001). In contrast, a sacred economy would imply that goods are brought to a central religious place as offerings or contributions. Likewise, in a commercial economy, consumers acquire local and imported staple goods independently of any political or sacred obligation, simply as part of commercial transactions (Poursat and Knappett 2006, 158). While it is possible for all three types of economies to be functioning at the same time, it is nevertheless possible to determine one mode that is more prominent than the others. In the LMIII B period, TSJs functioning within a political economy may have been directly tied into the new administrative arrangement, signaled by the preeminence of Mycenaean cultural norms including the use of Linear B. In this political economy it is speculated that commodities would have moved according to the demands of a regulating administrative body, possibly connected to the Mycenaean palatial administration on the mainland. That Cretan TSJs functioned within a political economy during the LMIII B period can be supported by their centralized mode of production, their distribution in palatial or administrative centers, their standardization, and their association with Linear B writing. In addition, Mark Lawall (2011, 30) has suggested that there are a few features that may point to the production of specialized amphoras for a particular commodity, which include 1) evidence for relatively greater specialization in a particular crop, 2) modification of the amphora form, 3) greater standardization of form and capacity as well as

markings that facilitate transactions, 4) large scale exports and indications of a local interest in promoting their success. Although these parameters were developed in reference to later amphoras, these features seem to work for TSJs at this time on Crete from Linear B records of large-scale production of both oil and wine, as well as the archaeological material presented in this paper.

During the LMIIIB period, it has been demonstrated that TSJs were produced at a few workshops in the west and center of the island, including at least one in the south-central region. These patterns may indicate that TSJs were produced within a centralized production system, where a fewer number of producers provided the majority of vessels to the other regions. Each production center would have served a relatively large geographical area encompassing multiple communities. The characteristics of vessels produced in this mode would have consistent fabric sources across large areas served by the few centers. In addition, the manufacturing techniques of the shape would be consistent over large regions, as would their form and decoration. This seems to match LMIIIB production of TSJs rather well. West Cretan producers made mostly Light-on-Dark decorated TSJs using very similar manufacturing techniques. In fact, these vessels have a high degree of standardization in size and capacity, which may also support a regulated production mode. Although their manufacturing techniques are not as consistent, central Cretan producers made mostly Dark-on-Light decorated TSJs, with a particular emphasis on octopus designs. Centralized production can normally be associated with an overarching administration system that governs this process (Keswani 2009, 112-113).

Cretan TSJ distribution also supports their function within a political economy. The majority of these vessels are found in palaces on the mainland or administrative centers on Crete. On the mainland, their distribution is largely confined to palatial storerooms, manufacturing

areas, and basements at specific palaces in the Argolid and Boeotia. Large numbers of Cretan TSJs have also been found at Khania and Knossos, two regional centers that seem to have had close connections to the mainland. Both of these centers, but especially Khania, have produced TSJs that are marked with painted Linear B signs. Linear B tablets were used as administrative tools by both Knossos and Khania, though possibly at different times. This administrative use of Linear B seems to have been transferred to the management of Cretan TSJs and possibly their contents. Linear B inscribed Cretan TSJs are also found at palaces on the mainland, including large caches at Thebes, Mycenae, and Tiryns. Hallager (2011, 380) concludes that “the contents of west Cretan [transport] stirrup jars were coveted in the Mycenaean palatial centres in LMIIIB and inscriptions on these stirrup jars reveal the presence of a *wanax* on the island.”

For the LM/LHIIIB period, some scholars have speculated that Cretan TSJs represent tribute sent to certain Mycenaean palaces by Cretan elites, who were based at regional centers on the island (Maran 2005, 427-29; Stockhammer 2008, 277-78). Stockhammer suggests the possibility of Khania acting as a funnel through which all of the Cretan TSJs made their way to the mainland centers, thereby explaining the presence of both central and western types of TSJs at Mycenaean palaces (Stockhammer 2008, 267). This idea is corroborated by the discovery of both regional varieties of TSJs at Khania, as well as the highest numbers of Mycenaean imported pottery from LHIIIA2 and LHIIIB1, indicating a particularly close relationship. In addition, two central Cretan TSJs were sealed at Khania prior to being shipped to, and subsequently found at, Mycenae (Stockhammer 2008, 276-77; for the seals see Tomlinson and Day 1995, 317, table 32). The status of Khania as a regional administrative center with connections to the Mycenaean

mainland is clear from the use of Linear B and the presence of Mycenaean cultural practices and ceramic styles.⁶

What the Mycenaean palaces did with this Cretan liquid produce can only be speculated. It may be possible, however, to postulate that it had something to do with the use of Cretan olive oil as a base for perfumed oil manufacture. Archaeological and Linear B evidence makes clear the importance of perfume manufacture to the Mycenaean palaces (Shelmerdine 1986; Thomas 1992; Rutter 2005). Perfume manufacturing installations have been tentatively identified at Pylos, Mycenae and possibly somewhere in the vicinity of Zygyouries. It is also clear that mainland palaces did not hoard the perfume for themselves, but rather shipped it, in small, highly decorated containers, to other regions of the Mediterranean, including high numbers to Cyprus and the Levant. Rutter (2005, 39) suggests that the destruction of Knossos on Crete marked the beginning of a major perfumed oil industry on the mainland and simultaneously dispersed “Knossian corps of perfumers among a welcoming set of new patrons concentrated on the Greek Mainland.”⁷ While this is, for the moment, impossible to prove, the presence of great quantities of Cretan TSJs on the Mycenaean mainland in LM/LHIIIB, as well as their shipment further afield, confirms their preferred use as long-distance transport containers. In addition, TSJs may have had a symbolic value in and of themselves. As others have argued, the transport stirrup jar may also have acted as a kind of “brand” representing the source and quality of its contents, thereby simultaneously having an extra-Aegean symbolic value (Bevan 2010). This status may

⁶ In LMIIIB1, 82% of the imported Mycenaean ceramics were dated within this period, and LMIIIA2 90% were dated within the period. This is in contrast to LMIIIB2 and LMIIIC where the Myc imports are older. According to Hallager (2011, 452) “This indicates close contact with the Greek mainland during both periods [LMIIIA:2/LMIIIB:1] that apparently dropped off in the following two periods [LMIIIB:2/LMIIIC].”

⁷ Evidence for a Knossian perfume workshop during the Monopalatial period comes from Linear B texts: Fappas 2010; Speciale 2001; Foster 1977.

be the reason why multiple regions of the eastern Mediterranean began producing their own versions of the TSJ, though only in small quantities and for a short period of time.

It is certain, however, that by the end of the LM/LHIIIB period, socio-political disruptions around the Aegean forced a change in the production, distribution, and consumption of oil and wine. The large-scale production of olive oil at the end of the period might have been a “response to demand and consumption requirements triggered by broader social and political developments” (Hamilakis 1999, 50). These broader social and political developments included large feasts, drinking parties and festivals, all aimed at legitimizing a certain ruler’s power or reasserting his/her control over a given population and region. For this reason Hamilakis (1999, 50) postulates that, “wine and oil, rather than being the indicators of a flourishing civilization as they are usually portrayed, are likely to represent a barometer of the constant and endemic instabilities in Minoan societies.” These instabilities proved too powerful to overcome, resulting in widespread collapse and social change. Yet for all of the social, political, demographic, geographical, and environmental changes that occurred at the end of the Bronze Age, oil and wine continued to be produced as a staple product of Aegean civilization, even into the Postpalatial period and beyond.

Chapter 3

Transitions and Transformations: Postpalatial Transport Stirrup Jars and the Rise of the Amphora

Introduction

In the previous chapter, I explored how transport stirrup jars (TSJs) help us understand the social mechanisms involved with oil and wine production, shipment, and consumption in the palatial Bronze Age. Through the results of petrographic analysis, it seems that production in the LHIIIA2/B1 period was confined to certain, regulated areas of Crete, areas that were also under control by mainland Mycenaean presence. Tracing the distribution of these vessels during this time period corroborated the impression of mainland interference in Cretan production of these vessels and the liquids that would have been shipped within them. However, by the LHIIIB2 period, when Mycenaeans lost some control of Cretan territory (as with the collapse of Knossos for the final time), smaller, local Cretan towns came to prominence and gained independence. These towns, both Agia Triada and Kommos, were concentrated in the south central area of the island and seemed to have direct access to eastern proprietors, shipping their goods to areas on Cyprus, the port of Tell Abu Hawam, and maybe southern Italy (Haskell et al. 2011; Ben-Shlomo et al. 2011). At the same time, Khania in north-west Crete maintained close connections with the mainland, continuing to produce TSJs and ISJs destined for the major Mycenaean citadels in the Peloponnese and Boeotia.

Around 1200 B.C.E., everything that we know about societies in the Late Bronze Age Aegean changed. All of the Mycenaean palaces collapsed due to as yet undiscovered

circumstances. Invaders from the north, earthquakes coupled with fires, disease, and climactic distress are all potential contributors to the loss of Mycenaean states, but scholars cannot pin down the exact sequence of events (Maggidis 2009; Philippa-Touchais 2011; Drake 2012; Middleton 2012; Lloyd 2013). After 1200 B.C.E. in what is called the Postpalatial period, life continued at most of the palatial sites with reduced population, altered town plans, and new social hierarchies. Other, new sites were established, while a few older sites were abandoned. Throughout all of these changes, however, it is remarkable that some social customs remained, and the particular survivors are quite telling. Wine continued to be used at feasts, and valued oils continued to be produced, bottled in small, elaborately decorated unguent containers, and buried with the dead. But what happened to the production of large transport vessels, the very topic of this dissertation, when the palaces collapsed? On the mainland, production of TSJs came to a complete halt. However, it is very significant that on Crete production of TSJs continue for at least a century if not slightly longer. This continuation may be linked to subtle signs of independence from mainland control at the very end of LHIII B. Evidence for continued use of palatial centers comes from Phaistos where a large house produced a full sequence of LMIIC material (Borgna 2007). In addition, pottery styles indicate continued contact with the mainland (D'Agata 2007) and Cretan imports continue to travel to coastal sites in Laconia (Demakopoulou 2009), Tiryns (Maran 2005), and island sites such as Naxos (Vlachopoulos 2003). The exportation of TSJs from Crete in LMIIC may be demonstrated by finds on Cyprus and possibly even Egypt (Maran 2005, 416; Haider 2007). In this chapter I will first discuss the social context of the Postpalatial Greek world, then address the changing role of the Postpalatial TSJ, followed by an account of archaeological evidence in support of the rise of the amphora as the dominant transport container.

Postpalatial Social Context on Crete

Exploring the altered Postpalatial cultural and environmental context can help us understand changes in the production and distribution of TSJs and even some of the further steps taken in Greece to pick up the pieces of the oil and wine trade after the palatial collapse. One of these steps is the adoption of the amphora shape as the most common ceramic container for transporting these critical commodities. For many years scholars have been aware of a certain amount of population movement on the island of Crete during the Postpalatial period, where most of the evidence for previous and continued oil and wine production (and their containers) exists. The juxtaposed interpretations of entire population shift, on the one hand, and restricted population shift, on the other, have been reached at one point or another (Nowicki 2000). Currently, through the renewed interest in the Postpalatial period on Crete in the last 25 years or so, scholars have reached a consensus. The best explanations for the changes we see in the LMIIC period and beyond involve a certain amount of continuity at key major sites along with simultaneous movement of people to smaller sites at higher elevations and defensible positions. The reasons for these differences in settlement distribution included population influx, insecurity related to coastal intrusions, internal competitions, and even climate change.

New people moving onto the island is a hypothesis that was first put forward in conjunction with the “Dorian invasion” where northern people moved south and caused the destruction and abandonment of the Mycenaean palaces as well as introduced the Greek Dorian dialect (Eder 1990). This idea of a foreign movement of people that then pushed Mycenaean Greeks off of the mainland was first put forward, not by modern scholars, but the Classical Greeks themselves (Thucydides 1.12). At that time, over 500 years after the event itself, people sought explanations for their differences and ancestry. For this reason Spartans of the

Peloponnese claimed to be direct descendants of these invading hoards, just as the Athenians claimed to have been spared or overlooked, thereby able to send populations to the contemporary Greek Ionian coast of Asia Minor. In this scenario, Crete was not spared, but invaded as well, thereby pushing the native populations to the mountains. However, the Dorian Invasion has since been questioned and may be more of a myth (Schnapp-Gourbellion 1979, 2002). It could be simply a fabricated story to explain a large cultural dilemma, or the compression of a series of events or long-term process into an imagined single, large-scale event. Either way, it would not suffice to explain the changes on Crete (Papadopoulos forthcoming; Schnapp-Gourbellion 2002; Wallace 2010). The Cretan movement of people to inland and upland settlements in LMIIIC is not just a factor of different people coming into the island since it is possible that Mycenaean and Cypriots had been there for some time (Kanta 2001).

Similarly, these high defensible sites might have been occupied in response to increased coastal raids, no longer kept at bay by a state-run army/navy, similar to that described on the Linear B tablets found at Pylos (Palmer 1956). It seems, however, that some supposedly defensible sites are not actually suited to defending anything. Rather, they may have been for specialized production or for regulating areas for salt extraction or other sea management, for example: Kastri at Palaikastro, Elias to Nisi near Vrokastro and Amnisos. In fact, the typical “defensive” sites that are most cited (Kastrokephala, Orne, Jouktas, Kophinas) may not actually be so suited to populations living there. They may be instead intended to control both sea and land routes connecting northern and southern Crete and access to mountain pastures (Borgna 2003, 157).

Increasingly, scholars have looked to the island itself for an internal impetus behind this population movement and settlement subsistence strategy. Borgna (2003, 156) posits that the

most prevalent cause was “internal competitions and social withdraw.” Demographic increase and growth of defensible settlements in number and size in advanced LMIIC phase might not be the result of persisting troubled conditions but instead could be evidence of the mountain economy’s intensification as an outcome of improvement in sedentary life and population growth (Borgna 2003, 157). In turn, intensification of mountain economy could be due to a changing climate, making these subsistence strategies viable (Drake 2012). Upland settlements then participated in a socio-economic integration process that developed into a pattern of site cluster formation (Haggis 1993). These site clusters were then affected by external exchange networks. And, as we will see by the archaeological evidence available for TSJs, it seems these exchange networks were readily available.

Indeed, this population movement does not seem to be as wide-spread as previously thought. Unlike areas of the mainland (and even this is controversial), there was no widespread collapse at the end of the LMIIIB on Crete. As has always been the case with this large, environmentally disparate island, different areas were affected and reacted differently. The result is that west-central and east-central areas produced different population layouts. In particular, recent work at major sites like Phaistos (Borgna 2011) suggests that whatever crisis existed was in fact overcome. Archaeologists are now finding evidence of settlement and population nucleation around sites like Khania, Phaistos, Knossos and maybe Chamalevri. Each of these then became regional centers in LMIIC (Wallace 2010, 68-70). It is certainly the case, however, that other major palatial-era sites did not fare as well. Agia Triada and Kommos in the southern Mesara plain seem to have been abandoned in favor of these other sites (Borgna 2003, 158).

Contrary to most previous ideas of the Postpalatial era, new foundations of sites like Sybrita (Thronos Kephala) and Gortina show a complex settlement pattern (D’Agata and Boileau

2009). This pattern reflects the shift in agricultural and economic processes mentioned previously. The upland sites managed the animals and the lowland sites processed the animal products and managed internal and external exchange (Borgna 2003, 161). The lowland sites produced pottery, both prestige and utilitarian, including Postpalatial TSJs. In this way, chiefs were vying for control of specific commodities that in turn gave them access to external interaction and more prestige goods. Other evidence besides oil and wine trade using TSJs comes from the distribution of Urnfield bronzes, Handmade Burnished Ware, and Sardinian ceramics on the island. The presence of these luxury import goods from LMIIIB-C indicate that the organization of external contacts was in the hands of elite groups who resided in the major settlements of lowland and coastal west-central Crete (Borgna 2003, 162). According to Borgna (2003, 164), “the main economic resources exploited by the new elites in the lowland settlements would have consisted of the transformation of foodstuffs, such as oil and wine and especially animal products such as wool—i.e. activities based on technological knowledge and a set of practices coming directly from the extensive, specialized industries of the palatial past.” This implies that all of the changes occurring around 1200 B.C.E., for the many reasons that we have for them, did not halt the transmission of knowledge or desire for power and resources attached to this knowledge.

Inhabitants of east-central Crete reacted very differently to these changes, resulting in a much more disruptive situation. There does not seem to have been much reoccupation of the plains or the coast, even at major sites like Malia, a site that was occupied until the very end of LMIIIB. The result is a new, dispersed pattern of small, unstable settlements within an area of continuous human occupation (Nowicki 2000; Borgna 2003, 167; Wallace 2010, 60-67). Some of these new settlements, as mentioned above, were created, not for the purpose of defense as

previously thought, but for specific economic and exploitive purposes. For example, Palaikastro-Kastri and Elias to Nisi seem to be established for the purpose of access to and control of sea routes. By late LMIIC occupation of the uplands in settlement clusters was stable and major sites like Kavousi-Vronda and Karphi emerge. This stability includes increasing social complexity denoted by tholos tombs, freestanding cult installations, and large building complexes. This situation lasts into the Subminoan and Protogeometric period.

One reason why scholars were not as quick to discern this geographic division is due to the fact that it is not very long-lived. In LMIIC Middle/Late balance in metal circulation may have shifted from the lowland and coastal west-central region to the upland and inland sites. Discontinuities in human occupation in the lowlands at this time show that the supply and production of metal weapons and prestige objects were directly controlled by defensible settlements of east-central Crete, such as Karphi, thereby leading to the emergence of chiefs (Wallace 2010, 126; L.P. Day 2011). At the same time, lowland west-central centers went out of use and collapsed. The cause of this second major disruption in LMIIC is most likely due to conflict between the two areas. Indeed the final downfall of the previously wealthy, palatial settlements of the Late Bronze Age might have ultimately been their inability to cope with dangerous situations. As was the case for the palatial period, archaeologists have yet to uncover any strong evidence for fortification walls at these central sites.

This warrior culture, fueled by access to legitimizing knowledge and wealth, is reinforced by funerary evidence (van Wees 1992; Antonaccio 2002; Deger-Jalkotzy 2006; Miller 2011). Burial traditions show re-formation of elites under warrior cultures yet continuation of external contacts, as well as continuation of traditional burial items like TSJs and drinking equipment. In the Postpalatial period on Crete, there is a tradition of small tholos tombs, some with a saddle-

shaped vault, comparable to the Royal Tomb at Isopata, and the tombs of Ugarit (Kanta 1997). According to Kanta (2003, 176), this tomb type may indeed have been directly influenced from the East through Ugarit. This Cretan tradition was then transmitted to Cyprus in the 12th or 11th century B.C.E. In terms of grave goods, the presence of Naue II swords, which were introduced in LMIIIC, is an important indicator of late warrior graves (Kanta 2003). This trend is not restricted to Crete, but can be seen in other areas of the Greek world. Wealthy graves showing social stratification continued into the Subminoan period. At Pantanassa there are iron weapons along with a bronze amphoroid krater as an urn (Tegou 2001). This burial has clear connections with Cyprus and is securely dated to the 11th century B.C.E. (Kanta 2003, 180). The north cemetery at Knossos also dates to this time period and produced aspects of Cypriot burial/contact that have continued into the Iron Age (Kanta 1997). Continuity in social practices, especially in reference to oil and wine consumption, comes from a chamber tomb at Milatos. This tomb dates from the beginning of the 12th century B.C.E. and has a clay amphoroid krater along with drinking vessels and a TSJ. This may also suggest persistence in funeral rites from the LBA to the EIA (Kanta 2003). The presence of TSJs in tombs is not a new phenomenon. The broader economy, within which these Postpalatial TSJs functioned, however, was entirely new, now seemingly independent from palatial or political control. In addition, the vessels themselves underwent significant morphological changes, along with their production strategies.

Postpalatial Transport Stirrup Jars

Morphology and Production

Cretan TSJs continued to be made in the Postpalatial period but were morphologically very different from the majority of their Late Bronze Age predecessors (**Figure 8**). One of the most significant changes is the simplification of its formation technology. Cretan potters no longer

produced TSJs in two joined halves, nor were different pastes used for handles, spouts, and bases. In addition, potters widened the base of the vessel even more, “a feature that suggests a storage function rather than use as a transport vessel. Such stirrup jars have little to do with the sort of vessel exported from Crete in the earlier periods” (L.P. Day 2005, 435). The tall, conical variety that was so popular in LMIIIB disappears from the Cretan LMIIIC repertoire, replaced by rather squat-looking, but still large, TSJs. LMIIIC TSJ spouts tend to be wider and more upright, sometimes touching the false spout behind it. Another distinctive feature of LMIIIC TSJs is the appearance of an airhole pierced into the false spout cap. These holes can sometimes be upwards of one centimeter in diameter (e.g., Karphi no. K36; L.P. Day 2011, 246, fig. 8.3). Linear B is no longer found on TSJs, but many still retain the debased octopus wavy lines on the belly along with bands at the shoulder and base (**Figure 8**). Decoration is predominantly Dark-on-Light, but many are also undecorated or undecorated and burnished.

Examples of Postpalatial TSJs are found mainly at Cretan sites in storage and domestic areas and rarely in tombs. Production sites are no longer on coastal, easily accessible and transportable locations. Rather, they are mostly produced and distributed in the mountainous, central area of the island. Recent work at Thronos Kephala (Classical Sybrita and Linear B *su-ki-ri-ta*) nicely illustrates this shift in the TSJ life-cycle (D’Agata and Boileau 2009). The settlement was founded in LMIIIC Early, just after the collapse of the Mycenaean palace states and was continually occupied until the 7th century B.C.E. when it was destroyed. More than 40 pits filled with mostly ceramic debris, remnants of collective meals, provided the excavators with much data on both fine and coarse domestic wares of the Postpalatial period. One common vessel was the TSJ. Anna Lucia D’Agata and Marie-Claude Boileau (2009) undertook a detailed petrographic analysis of the ceramics. Two TSJs were of local fabric and decorated with octopus

wavy lines (D'Agata and Boileau 2009, 185). Sherds from these vessels were recovered throughout the site and seem to span the entire period from LMIIC Early to the Subminoan. Other TSJs had been imported from intra-regional sites like Knossos and maybe Eleutherna (D'Agata and Boileau 2009, 196).

In the Postpalatial period, although the TSJ still existed, its numbers dwindled. Potters were no longer producing them on the scale of previous output. However, it does seem to be the case that distribution outside of their region of manufacture continued. Production of these vessels may have still been concentrated in geographically distinct areas. Evidence for this comes from the standard decoration of Postpalatial TSJs: a stylized octopus in the form of large wavy bands that span the entire body. This particular design was restricted to central Cretan TSJs during the Palatial period (D'Agata and Boileau 2009, 202). In this way, some workshops of central Crete must have continued to produce coarse stirrup jars in the 12th century. These were then joined by new workshops like those serving Thronos Kephala and other upland settlements (D'Agata and Boileau 2009, 202). Sites that produced TSJs with this decoration span the island and are not confined to higher-tier settlements, but include smaller elevated hamlets.

Halasmenos, a one-period LMIIC Middle site, produced one Postpalatial stirrup jar (92-9) with the canonical wide base and stylized wavy octopus design on its belly (Tsipopoulou 2004, 108). Other smaller sites with similar TSJs include Tyliossos, Khamalevri, Kastrokephala, Karphi, Kavousi Vronda, Praisos Tzani Metochi, Praisos Photoula, Turloutoi, Kritsa, and Mouliana. In addition, TSJs continue to be found in small numbers at larger sites like Khania, Phaestos, Palaikastro Kastri and Knossos (D'Agata and Boileau 2009; Kanta 2005).

One of the most important sites for Palatial-era TSJ production, Khania, remained a prominent consumer of the vessel in its Postpalatial manifestation. Of course, after the fall of the

palaces and drop in demand for TSJs and their contents, the vessels were less prominent but were nevertheless pervasive until the final stages of the LMIIIC period. Excavations at Agia Aikaterini Square by a Swedish team uncovered large pits where a single TSJ was discovered. The pit itself was located in Room I and dated to the latest LMIIIC activities on the site. The vessel, like so many others of this time period, was decorated with high wavy lines on the body. What is most interesting, however, is that this stirrup jar was imported from the Knossos area, just as at the smaller site of Thronos Kephala. Apparently the Khania sample matched fabric from a few stirrup jars at the Stratigraphical Museum at Knossos (Hallager 2000, 163). This fact is rather significant considering that Khania used to be the epicenter of TSJ production in the palatial period. Excavations produced a total of six TSJs, yet none in floor deposits. One of the most surprising discoveries, perhaps, was part of the false neck and handle of a huge coarse stirrup jar more than twice the size of average TSJs (Hallager 2000, 171). This strange vessel recalls those enormous stirrup jars found at Zygouries (mentioned in the first chapter) and dated to the LHIIIB period. The appearance of four TSJs from the LMIIIB:2 construction and leveling deposits at Kastelli suggests that the TSJ continued to be produced without a break between the destruction of the palaces and the beginning of the Postpalatial settlement.

The distribution and continued appearance of these vessels lead D'Agata and Boileau (2009, 202) to conclude that “at the regional level imported coarse stirrup jars at Thronos Kephala shows that, after the collapse of the LBA state system, the circulation of, and trade in oil and wine, associated with the production of these vessels had remained active as much as local economic specialization and a trade network still connected much of the island.” Therefore, the continuation in production of TSJs on Crete suggests a continuation in agricultural strategies, especially fruits for liquid commodities like oil and wine. Based on the distribution of

Postpalatial TSJs on the island, it seems that Crete maintained an inter-island trade network, linking lowland and upland settlements.

Trade and Distribution

Trade using Postpalatial TSJs within the island of Crete seems to be generally well attested through archaeological evidence. Although contacts external to Crete seem to have diminished greatly, it may be possible to see some continued connections. Recent archaeological evidence suggests that indeed there was some continued exchange with people from Cyprus and possibly even Egypt and Italy. That TSJs may have been part of these exchanges is suggested by their presence in LCIIIA or LCIIIB levels on Cyprus and walls paintings in Egypt.

Cypriot Connections

By the end of the Palatial period, Cypriot entrepreneurs were heavily involved with Mediterranean trade and especially metals exchange. Both the Uluburun and the Cape Gelidonya shipwrecks alone would corroborate this, but we also know from other sources like written records at Ugarit that Cypriot merchants were highly active, wealthy, and connected (Pulak 2009, 2006; Bass 1967). As discussed in the previous chapter, Cypriots may have even resided in the Aegean if we can interpret the Linear B name *ku-pi-ri-jo* as such (Palaima 1991, 38). Archaeological evidence may also indicate their presence as conveyors of goods. For example, on the island of Salamis, a Cretan TSJ with Cypro-Minoan marks was found next to a quarter-*ingot* of copper, the canonical commodity of Cyprus. Therefore, more and more we may be inclined to think that it was mainly Cypriot merchants that drove the trade network in the Late Bronze Age (see also Sherratt and Sherratt 1991).

When the Mycenaean palaces collapsed, Cypriots were also affected and were dealing with upheavals of their own.⁸ However, unlike the Mycenaean mainland and the Levant, the major cities of the island did not go out of use and its economy did not collapse. Instead the Cypriot inhabitants and entrepreneurs altered their strategies to accommodate a changing eastern Mediterranean economy. This fact may support a hypothesis that Cypriots continued a curtailed version of the trade networks in use before the collapse. If this is the case, we should not be surprised to find LMIIC TSJs on the island. And this is indeed the case. Multiple sites on the island have produced both fragments and whole vessels that are Postpalatial in style and archaeological context. Enkomi, Hala Sultan Tekke, and Maa Palaikastro each have fragments of Cretan TSJs. They are all in LCIIIA or IIIB levels (post 1200 B.C.E.). Some scholars, like Hal Haskell (1981), have dismissed these as earlier vessels being reused or somehow infiltrating later strata. However, more evidence has come to light since then, especially on Crete itself, to suggest that TSJs on Cyprus may not be out of the question. Catling (1997) interpreted the Postpalatial Cypriot TSJs differently. He noticed that the frequency of Minoan TSJs rises markedly in Enkomi and Hala Sultan Tekke from LCII to LCIIIA. This distribution would suggest that more vessels were coming in after the collapse as there would not be enough of them before hand to produce the distribution evident after 1200 B.C.E. Therefore they must be coming directly from Crete (Maran 2005, 416).

Egyptian Connections

Contact between Egypt and the Aegean world, and more specifically Crete, has been assumed or supposed for most of the Bronze Age. In the palatial period, as discussed above, it is clear that

⁸ This is not the place to discuss the historicity of the Sea Peoples. For recent discussions see Oren 2000; Barako 2003; Mountjoy 2005; Yasur-Landau 2010; Cline and O'Connor 2012.

some trade existed between the two regions since significant amounts of TSJs have been found at Amarna as well as cities on the North African coast. Trade in luxury goods has also been studied extensively for the LBA (Burns 2010; Cline 1994) with the almost unanimous conclusion that Egyptian goods regularly made their way to Crete and the mainland just as Aegean goods, both luxury and staple, made their way to the elites of Egypt and eventually into their tombs in the form of wall paintings or actual objects. After the collapse of many cities around 1200 B.C.E., Egypt was left relatively unscathed and appears to have recovered rather quickly. Ramesses III not only had a navy (as we know from the Medinet Habu reliefs, for example) but his navy seems to have made forays into the eastern Mediterranean Sea. In relation to our particular discussion of Crete in the Postpalatial period, it seems that indeed Egyptian merchants may have had direct or indirect contact with the newly arisen elite in LMIIIC Crete. Most intriguing for this study is the evidence for continued commodities trade. Specifically, Haider's (2007) work on the iconography of the tomb of Ramesses III suggests that Egyptian pharaohs were still receiving or acquiring TSJs during this time period. The four vessels pictured on the walls of Ramesses' III tomb match our understanding of Cretan Postpalatial TSJ morphology: wide, flat base and belly decorated in simple bands or designs (**Figure 9**). Haider (2007) draws attention to correspondingly decorated TSJs found at Tourloti, Episkopi, and Karphi and suggests that the elites at these three settlements might have been in direct or indirect contact with the Egyptian merchants and elites. As we have already discussed, however, Postpalatial stirrup jars were relatively widespread across the island with their production sites at different locations. Therefore, at this point it is impossible to say exactly which settlements were in contact with foreign merchants. That there definitely was contact, and with an area as far away as Egypt so soon after the collapse of the palaces, is the most important aspect of this discovery.

Greek Mainland Connections

If these vessels were making their way to Cyprus and beyond, can we expect to see continued import of Cretan TSJs to the Greek mainland? The answer to this question is, as always, complicated but recent evidence from the Postpalatial town of Tiryns suggests some sort of continuity in contact with specific emphasis on the oil/wine trade using TSJs (Maran 2005). At the end of the palatial period, Tiryns was a wealthy citadel, being either second in command to Mycenae or its own independent state (Maran 2005; Dickinson 2006). Either way it guarded the Argive port and therefore had ready access to intra- and inter-regional exchange and the benefits of commodities trade. The citadel of Tiryns was divided into an upper and lower portion. Strata from the last phase of the palatial period, LHIIIB2, on the Lower Citadel produced Cretan TSJs with Dark-on-Light and Light-on-Dark decoration. Indeed they were found in several buildings destroyed at the end of LHIIIB. The distribution of TSJs throughout LHIIIB2 shows a conspicuous concentration in certain areas of the Lower Citadel. This concentration of such vessels is not unknown from other citadels and is in fact common (for example, the House of the Oil Merchant at Mycenae and the House of Kadmos at Thebes; see previous chapter). At Tiryns in the final palatial period, in the northern tip of the Lower Citadel, the floor of a LHIIIB2 building (Bau XV) had a large fragment of a medium sized piriform coarse ware stirrup jar. Its fabrication using the typical Cretan joining technique as well as its ceramic fabric leaves no room for questioning its origin (Maran 2005, 417). But this jar was not alone. The consistency of appearance of Minoan TSJs in LHIIIB2 destruction contexts of the Argolid points to a continuity of importation of the vessels until the very end of the Palatial period (Maran 2005, 417).

In the very early Postpalatial contexts of Tiryns' Lower Citadel, Kilian's excavation produced TSJ fragments in LHIIC contexts. The excavators noticed that until LHIIC Early they

appeared frequently and that only after LHIIC Developed did a marked decrease in their frequency occur (Maran 2005, 419). But, for the sake of argument, these fragments could all be earlier cast-ups as first suggested for Cyprus. Thankfully, there is more evidence located in the Lower Town of Tiryns. In the Lower Town the LHIIB and LHIIC levels are not right on top of each other as in the Lower Citadel, rather, they are separated by thick stream deposits (Maran 2005, 419). This means that the percentage of earlier cast-ups in the LHIIC levels is extremely low. In fact, the Postpalatial deposits are actually new living quarters built in LHIIC Early on top of the stream deposit. The northeastern Lower Town produced five building phases from earliest LHIIC and LHIIC Middle. One of the best-preserved rooms, Raum 8/00, was destroyed by fire during the latest part of LHIIC Early, apparently in the middle of a feast (Stockhammer 2008). At the entrance of this building stood a large Minoan TSJ with ovoid-piriform body and decoration with deep wavy line (Maran 2005, 421-422). The decoration is typical with a loop linking the bases of the two handles, but not the spout, and on top of the disc there is a spiral. The surface of the vessel is pale brown to pale yellow, and was made by the joining technique. Other pieces of stirrup jars appeared in excavation: one fragment of smaller stirrup jar with the same fabric and decoration from another context of LHIIC Early, one fragment of similar jar, made in parts, from a later deposit, and three fragments of stirrup jars belonging to different fabrics from an earlier phase. In addition, excavators found a fragment of the false neck of a medium-sized SJ with traces of dark brown paint (Maran 2005, 422). All of this evidence suggests that Minoan transport vessels appear at Tiryns until the end of LHIIC Early, while in the course of LHIIC Middle they seem to disappear (Maran 2005, 424).

Again, as on Cyprus, it is necessary to consider whether these vessels are remnants from a previous period or imported during the time period of its final deposition. By close examination

of the ceramic fabric, Maran (2005) believes that the TSJs at Postpalatial Tiryns are indeed Cretan exports. He bases this decision on the fact that neither light-on-dark painted Minoan TSJs nor Canaanite jars and large stirrup jars of fine mainland fabric are ever found in closed LHIIC deposits. However, many of the fabrics of the TSJ fragments in LHIIC contexts show similar fabric use and construction method. If we accept them as imports of the period, we must then ask whether they are part of a continuing connection between Cretans and mainland Greeks or if they were part of the commodities trade taken up by Cypriots after 1200 B.C.E., perhaps reaching Tiryns via the Cyclades. Indeed, on the island of Naxos, at Plateia Mitropoleos in the Chora of Naxos, a TSJ decorated in the canonical LMIIC octopus wavy lines was found in LHIIC Middle contexts (Maran 2005, 424). All the same, Maran asserts that the majority of Postpalatial TSJs arrived on the mainland (and even Cyclades) via direct trade with Cretans. If Cypriots were involved, he posits, then one would expect to find Cypriot transport pottery along with the Cretan TSJs. He goes on to suggest that the appearance of Cretan TSJs would show that certain families in Tiryns managed to re-establish a special relationship with certain regions of Crete, which they held for about two generations (Maran 2005, 429).

Rise of the Amphora in Postpalatial Greece

In all of its attestations, the TSJ was a relatively short-lived phenomenon. Invented in the Middle Minoan III period, it reached its peak use by the Late Minoan IIIB period, and thus was in use for only about 250 years total (Haskell 1985). The survival of the TSJ after the Mycenaean palatial collapse is a testament to its strong roots in Late Bronze Age Greek society, entrenched as a staple symbol of the power conveyed by access to wine and oil. But as a technological entity it could not survive the changing needs of a new social order. By the end of the LM/LHIIC period, it died out. The question, then, is what came next and why? By virtue of our ability to see

historical trajectories, the answer to the first part is simple: the amphora came next as transport vessel par excellence. Current research suggests that by the 10th century B.C.E. the amphora had already become the dominant vessel for bulk liquids, which is perhaps best displayed by the North Aegean amphora and its wide distribution from Lefkandi in the south to Troy in the north (see Chapter Four; Catling 1998, 1996; Gimatzidis 2010, 2011). Necessarily, then, the transition from one shape to the other must have occurred between the 12th and 10th centuries B.C.E. But the answer to the second half of the question, why, has yet to be fully addressed. The second half of this chapter, therefore, explores the mechanisms behind the adoption of the amphora as a bulk liquid transport container in the Postpalatial period. I suggest that this shift in vessel use is the result of technological change brought about by the Mycenaean palatial collapse. In general, technologies, like ceramic transport containers, tend toward stability but are changed as people solve problems presented by altered societal and environmental factors such as differences in peer competitions and new social groups. In particular, the appearance of new social ‘needs’ can be a major driver of technological change (Schiffer 2011). The Postpalatial period created just such a situation where shifting social dynamics may have led to the adoption of a different ceramic vessel technology. To understand why *the amphora* was adopted it is necessary to look at the relationship between TSJs and amphoras in the previous palatial period and how this relationship changed after the collapse of the palaces prompted a new commercial economy in the Postpalatial period. In addition, some curious “hybrid” shapes may provide clues to the changing attitudes towards these two vessels and how potters responded to this new environment and new social needs. Ultimately, this transition in transport vessel technology is an important step in understanding the long-term trajectory of the Greek oil and wine industry, including its continuation into the Early Iron Age.

Relationship in the Palatial period

Amphoras Before the Transport Stirrup Jar

Before the TSJ was invented in the Minoan Neopalatial period, the amphora was used as a transport container for regional economic exchange networks in Protopalatial and Neopalatial Crete. At Malia, a large Minoan palace site on the north coast of Crete, amphoras carrying substantial quantities of liquid commodities were imported from regions such as the Mirabello Bay, south coast, and Mesara plain. These commodity movements were transactions directly connected to a commercial economy (as opposed to a sacred or political economy). Accordingly, the shape of the vessels was relatively standardized in form and decoration suggesting that their purpose and contents could be identified outwardly (Poursat and Knappett 2006).

Generally, Protopalatial use of amphoras as commercial vessels was confined to areas within the island of Crete, and appears to have been excluded from a larger Mediterranean commercial network (Pratt forthcoming). In the Neopalatial period, however, the first TSJs appeared and filled the needs of a growing economy. Soon after its invention, examples of TSJs are found on multiple Aegean islands, suggesting its immediate use as an intra-Aegean liquid transport vessel. One could argue that the TSJ should have replaced the amphora, having been rendered an obsolete transport technology. It is interesting to note, however, that all contemporary neighboring cultures, such as the Canaanites and Egyptians, maintained the use of amphoras for their transport needs (Negbi and Negbi 1993; Leonard 1995; Sugerman 2000; Serpico et al 2003). This juxtaposition displays a deliberate choice to retain amphoras for an inter-regional role on Crete, and eventually, elevate the newly created TSJ to a commercial standard, regulated by a palatial economy. On Crete, therefore, the continued presence of amphoras in a commercial economy, during a time when TSJs were widely used as an intra-

Aegean transport container, might suggest that these separate uses were only prescribed after a strong central authority came into power in the Minoan Monopalatial and Final Palatial periods. By LMIIIA2, the Final palatial authority on Crete and the mainland Mycenaean palatial regime had fully adopted the TSJ, consequently maintaining a large-scale production of TSJs in favor of amphoras, as well as shipment of TSJs to distant locations like Cyprus, Tell Abu Hawam, Ugarit, Miletos and even Troy (Haskell et al. 2011; Ben-Shlomo et al. 2011; Blegen, Caskey and Rawson 1953, Figs. 330-331, 388:4, 403:19, 408-409). As a result, TSJs would be the dominant bulk liquid transport container until the collapse of the Mycenaean palaces.

Regional Amphoras in the Late Bronze Age

The asymmetrical relationship between the transport role of amphoras and TSJs is best seen with the anomalous invention of the Kommian short-necked amphora during the height of TSJ popularity, possibly used as a means of commodity branding in a region that was no longer directly under Mycenaean control (**Figure 10**). Its limited distribution, however, attests to its passivity on a palace-driven market: it has only ever been found at Kommos. As production and transport of TSJs reached a peak in the LMIII period, Mycenaean palatial power began to sway in central Crete, culminating in the destruction and abandonment of Knossos, an important Mycenaean stronghold. The resultant power vacuum allowed smaller Cretan settlements to adopt their own commercial methods and, as a result, the amphora is briefly resurrected to fill a commercial role once again, but with restricted geographical and temporal boundaries. Consequently, the Kommian short-necked amphora is a phenomenon of a single settlement, Kommos, and a single time period, LMIIIB (1375/1350-1200) (Watrous 1992; Rutter 2000; Day et al. 2011). Their shape is unique with bodies that taper down to a small base with a short neck and wide mouth. Two small handles protrude from the shoulders and the vases are almost always

undecorated. These features of the Kommian short-necked amphora draw inspiration from three vessels: the Canaanite jar, the Minoan oval-mouthed jar, and the contemporary TSJ (Day et al. 2011, 516; Watrous 1992).

The peculiar heritage of the short-necked amphora may hint at the future resurgence of amphora production after the palatial collapse. Just like contemporary Cretan TSJs, short-necked amphoras were manufactured in a two-step process. The potter would construct the base and conical flaring lower body separately from the ellipsoidal upper body, thereby creating a join marked by an abrupt thickening. The neck and rim, also resembling a TSJ, are thrown as one piece with the body. In addition, petrographic and chemical analyses by Peter Day et al. (2011) demonstrate that TSJs and short-necked amphoras were both produced at the same locations around the local Mesara plain. These potters had clearly produced TSJs for a century or more before they started producing the local Kommian amphoras (Day et al. 2011, 546-7). This production strategy indicates that the same potters were capable of and accustomed to making amphoras by the palatial period's closure. Although the Kommian amphora disappears after the abandonment of Kommos, it had set the stage for potters to once again produce amphoras after palatial demand for TSJs subsided entirely. In other words, when social pressure forced a technological transition, potters were already able to comply with new demands.

The appearance of Kommian short-necked amphoras, as Jeremy Rutter (2000) proposes, is due to their production by and for the merchants and tradesmen inhabiting this coastal settlement as a means of "commodity branding." Since these amphoras only came about after the fall of Knossos as a major economic player in LMIIIA2, the rising elite at Agia Triada created a new vessel to distinguish themselves and their products, most likely olive oil, in the Aegean world (Rutter 2000, 183 n. 13, 186; Day et al. 2011). In addition, the context and great numbers

of these vessels in the LMIIIA2 ship-sheds (Building P) would imply a commercial nature if not for the short-necked amphora's geographical confinement. This is supported by the quantities of short-necked amphoras in Building P.: 20-30% of the pottery by sherd counts and over 50% by weight. Based on this and the size of the excavated area, there were between 100 and 200 of these vessels (Rutter 2000, 180). Based on the limited one-site distribution of the short-necked amphora, it is possible that the Mycenaean world was unprepared to use amphoras as intra-Aegean liquid transport containers just yet. The vessel is unattested at sites such as Khania, Knossos, Malia, and even Agia Triada, the closest large settlement (Day et al 2011, 517). Nor has it been found at locations off the island, as one might expect, if the short-necked amphora had a trade and transport purpose (Day et al 2011, 517). It seems that while the Komman short-necked amphora was contemporary to and physically related to the TSJ, it was still unable to compete on a rigged market where palatial authorities held the majority demand. When Kommos is abandoned during LMIIIB2, the short-necked amphora disappears forever. Yet soon after, there is evidence that the weakened central powers allowed amphoras to transition to commercial usage.

Amphoras in the Transitional Period

The first time that TSJs and amphoras take on the same role, as intra-Aegean transport vessels, is seen on the Point Iria shipwreck, dated to the period of the Mycenaean palatial collapse, around 1200 B.C.E. The context of these amphoras is perhaps the most exciting aspect of their discovery. On board the small ship excavators found only coarse ware bulk transport containers of Mycenaean, Cretan, and Cypriot origin (Lolos 1999). As would be expected, four typical Cypriot pithoi were found alongside eight Cretan LMIIIB2 TSJs (Hirschfeld 2011). The presence

of three Mycenaean rim-handled coarse ware amphoras (inv. A99), also dated to LHIIIB2, was unexpected amongst these staple transport containers (**Figure 11**).

The most surprising and informative aspect of these amphoras was the existence of incised marks carved on the handles, confirming their place as containers for commodities, as opposed to, for example, domestic water holders for crew members (Lolos 1999, 45-7; 2003). These marks have close parallels on pots from Minet el-Beida in Syria and Cypriot copper ingots from the large Uluburun shipwreck dated to ca. 1300 B.C.E. (Hirschfeld 2004; Pulak 2005). In general, potmarks are not unusual in the Bronze Age Mediterranean. Nicolle Hirschfeld's work on Cypriot potmarks suggests that merchants on this island seemed to be middlemen (Hirschfeld 2002, 2004). Cypriot merchants received goods from the Mycenaean world, processed them using these marks, and forwarded the goods to areas along the Levantine coast and Egypt. In addition, some evidence from the Greek mainland and Crete may imply that Cypriots were stationed in the Aegean or that some Greeks were literate in these symbols (Hirschfeld 1999; Pulak 2005). Whatever the specific situation, the existence of Cypriot marks on the Mycenaean amphoras from the Point Iria wreck means that these vessels had already passed through an established Eastern Mediterranean trade network. The evidence available suggests that these amphoras had "transitioned" in the realm of intra-Aegean transport containers, and were consequently marked for a process of distribution. It is tempting to think that unlike the Komman short-necked amphora that never left the port, these Mycenaean amphoras were sanctioned by the existing ruling elite. And, because this was a time of change, the elite perhaps accepted new methods of transporting their liquid commodities. Precise socio-political decisions aside, the Point Iria wreck nevertheless represents in situ evidence for the incipient adoption of amphoras as bulk liquid transport containers, showing parity to TSJs.

Relationship in the Postpalatial Period

Changing Roles of Amphoras and TSJs

The relationship between TSJs and amphoras aligns in the Postpalatial period when both shapes undergo transformations, transitioning TSJs from an intra-Aegean transport to a storage and inter-regional trade function, while new amphora shapes continue along an inter-regional commercial economy. This relationship is solidified by the consistent discovery of TSJs and amphoras in the same settlement contexts. As discussed above, Postpalatial TSJs were morphologically different from their palatial predecessors. When potters widened the vessel's base, it became more stable, but less suitable to transport. While these altered TSJs still functioned in a limited capacity as transport containers, it was mostly confined to inter-island exchange with minimal external involvement, though, as mentioned, Cypriots and possibly Egyptians still seem to have played a role in these interactions. Based on the distribution and production centers of Postpalatial TSJs, we may conclude that the island still maintained aspects of its former internal trade network, but used both TSJs and amphoras to convey liquid commodities. Desiring a more economical and readily accessible vessel, people may have shifted to amphora use, which had never held the symbolic value of being restricted to elite production and consumption. In addition, the amphora is a technically simpler vessel, which most potters could presumably make.⁹ This transition in desire is physically manifested by the increased use of amphoras alongside Postpalatial TSJs until the latter became entirely discontinued.

Archaeological evidence from recently excavated Postpalatial Cretan sites suggest that there is a marked increase in amphora use as transport containers alongside a simultaneous

⁹ Haskell notes that LBA TSJs were complicated vessels that probably required a high level of expertise. He suggests that mainland potters were not quite successful at their attempts to reproduce Cretan-style TSJs. For construction of fine-ware stirrup jars more generally see Leonard et al. 1993.

decrease in TSJ use. Halasmenos, a one-period LMIIIC Middle site, has produced a handful of Postpalatial TSJs, but these are by no means the largest percentage of ceramic shapes.

Amphoras, however, constitute five percent of the site's pottery. Of these, a number appear to be related to previous TSJ shapes (**Figure 12**; Tsipopoulou 2004, 108). Consequently, at a smaller site like Halasmenos, Cretans may have already preferred to make amphoras in place of TSJs. In addition, by the time Karphi and Kavousi Vronda were abandoned, the number of large coarse amphoras increased, demonstrating their growing popularity (L.P. Day 2005, 436). At other sites, like Thronos Kephala, amphoras constitute a large percentage of coarse ware vessels at the same time that TSJ numbers decrease. Here, petrographic grouping shows that the largest locally produced ceramic group is made up mostly of amphoras (about 80 vessels). In contrast, only 22 fragments of TSJs were recovered. Amphoras also appear to have been imported to the site, along with a healthy local production (D'Agata and Boileau 2009, 195). These petrographic results demonstrate that amphoras are already being shipped to multiple locations on Crete at this early stage.

Alteration: Stirrup Jar to Amphora

In addition, transport stirrup jars start being treated in strange ways that show their direct relationship to amphoras at this time. At Khania, a large settlement in western Crete, excavators found two partially preserved TSJs that had been modified to act as amphoras (**Figure 13**). After the vessel had been in use, a large hole had been cut out of the disk, once capping the false neck, to allow liquid to be poured directly from the top, not the side (Hallager 2000, 70-P 1156, Pl. 68c:1 (analyzed and local) and 70-P 0538, Pl. 68:f:1). Thus, as Birgitta Hallager (2000, 144) points out, "they seem to have continued to be used as a kind of amphora." The modification here contrasts with mending broken vessels or reusing vessels for a different purpose. In the

cases presented, the vessel is modified to retain its original function as a liquid transport and storage container.

Based on these alterations, whoever owned the Khaniot TSJs decided to use these vessels in a different way. In this case, it was more suitable for the user to transform the TSJ into an amphora. The reason for this change is only speculative. Maybe the spout fell off and they needed to pour out of a different orifice. Or, perhaps the person had seen an amphora used for oil and wine and decided this was a good option. We will never know because the rest of the vessel is missing. We can, however, interpret these technological modifications as an instance of the search for technological innovations in the Postpalatial period. In this case, at least some Cretans considered an amphora to be suitable for the same job that the TSJ had previously fulfilled. It may safely be said, therefore, that in the Postpalatial period, the amphora was now directly associated with the TSJ and in time the simpler vessel of the two prevailed on a consumer-driven, rather than palace-driven, market.

“Missing Links”: Hybrid Vessels

Other strange shapes, including hybrid vessels, support the suggestion that TSJs and amphoras are morphologically associated in the Postpalatial period. Hybrid TSJ/amphoras demonstrate the early use of amphoras as inter-regional transport containers in the Postpalatial period and suggest that Postpalatial TSJ potters were transitioning over to amphoras production.

Palatial Innovations

A few interesting vessels have come to light that suggest potters experimented with the relationship between TSJs and amphoras. Some vessels could even be deemed “missing links” in the evolution from stirrup jar to amphora. These hybrid shapes have features of both vessels and might be made by experienced TSJ potters. An example of individual potters experimenting with

transport technology, thereby producing a hybrid TSJ/amphora, comes from an unexpected time and place: the Mycenaean (LHIII B) site of Zygouries. This smaller, though wealthy, settlement is located at the crossroads between the Corinthian gulf and the Argolid palaces. In Room 13 of the “Potter’s Shop” or storeroom there were more than 500 unpainted deep bowls, 75 small saucers, 20 small jars, 3 enormous stirrup vases, 10 smaller transport stirrup vases, water jars, basins, ladles, cups, and the list goes on. The original arrangement in the room was clear. The cooking pots at the south end had been packed one inside another; near the center of the room were several basins and 10 transport stirrup jars. Three enormous stirrup jars were against the east and west walls (Blegen 1928, 33). There are two important aspects of the transport stirrup jars recovered in the Potter’s Shop. They are all of mainland variety (and therefore not imported from Crete), and made by the same potter, thereby contrasting with typical Late Bronze Age storerooms where the majority of stirrup jars are from a mixed Cretan provenance (Tournavitou 1995).

The ten Zygouries stirrup jars, along with the three enormous ones, are all currently located in the Corinth Museum storage rooms where I was able to examine them first hand. Indeed, they all have a particular similarity in potting and painting that suggests a common manufacturer and painter. However, one of the Zygouries stirrup jars was oddly undecorated with the upper part broken. After lifting it up, I noticed that the broken upper section had been placed inside the body of the vessel. As I picked out the pieces I realized that this was no stirrup jar: it was in fact a two-handled amphora. The only one of its kind in the workshop, Z-375 seems to have been an experiment, obviously made by the same potter as the transport stirrup jars (**Figure 14**; Blegen 1928, 163, fig. 158). While thick, clumsy, and heavy handles most likely caused the breakage, the vessel has a neck and body of a mainland transport stirrup jar. This

early hybrid is one-of-a-kind as far as I am aware. Later, after the collapse of the palaces, we start to find such “missing links” once again when transport stirrup jar potters produce amphoras. At the existence of this vessel in a storeroom alongside TSJs suggests that potters often produced both vessels, as the Kommian short-necked amphora also supports. We may infer from the incredible similarity between the two shapes, however, that this vessel was an uncharacteristic Mycenaean amphora (FS 69). This early experimentation in hybrid technology suggests that even potters associated with the palatial elite related the simpler amphora to the more complicated TSJ. Perhaps potters during this unstable stage in Mycenaean history sought to make simpler, less time consuming, shapes that still served the same basic function. It may also be the case that Mycenaean potters found it easier to make a more familiar form, the amphora, than try to reproduce the more complicated Cretan TSJ.

Postpalatial Hybrids

By the Postpalatial period, potters were free to create experimental hybrid amphoras from the basic TSJ model. An example of just such a phenomenon comes from the Postpalatial settlement of Tiryns on the Greek mainland. The initial collapse of palatial society at Tiryns created a power vacuum that elite families exploited soon after (Dickinson 2006, Maran 2011). The new social order tried to assert itself by commissioning new building projects that legitimized the new aristocracy while maintaining a distinct connection to their palatial past. The Upper Citadel was cleared of debris and a new building was erected directly over the site of the old Mycenaean megaron. In addition, the Lower Town was significantly expanded to make room for an increasing population. In addition, elites looked towards symbols of the past to resurrect some form of social power and one of these symbols was the transport stirrup jar. For example, Joseph Maran’s excavations in the Lower Citadel uncovered a TSJ standing in the threshold of a large

house, which had collapsed in the midst of an apparent feast, suggesting that this stirrup jar had been a status item (Maran 2005; Stockhammer 2011). Its placement above ground in a conspicuous location, in contrast to the more common palatial basement storerooms, corroborates this hypothesis. The existence of this TSJ, along with other fragments recovered from the site, provides evidence that some TSJs made their way into Postpalatial levels of the citadel.

In the three building horizons of Kilian's excavation in the LHIIC northwestern Lower Town large, however, TSJs were non-existent. Instead, excavators found an oddly shaped neck-handled amphora dated to late LHIIC early (**Figure 15**; Maran 2005, 422). The vessel's fabric was identified as non-local and instead matched Cretan-style coarse oatmeal fabric. Yet the element that allows us to identify the vessel as a "hybrid" is its body, which recalls the shape of a TSJ. Based on the fabric alone, the vessel had a Cretan origin and, therefore, must have been imported. Its discovery in a Postpalatial Mycenaean citadel indicates that Cretans may have used this vessel as a transport container for oil or wine alongside the contemporary Postpalatial TSJ. Maran (2005, 429) goes as far to suggest that a local elite at Tiryns maintained a trade partnership with producers on Crete as the previous palaces had done. Whatever the case, the position of this amphora should not be surprising since, as discussed above, the TSJ was moving away from a transport role and towards a domestic, storage function.

Conclusions: Palatial Regulation, Social Need, and Technological Change

The research presented here was inspired by the question: why did Greeks adopt the amphora as a transport vessel? Based on the evidence presented above, the amphora may have been adopted as a transport container in the Postpalatial period as a result of technological change brought about by the collapse of the Mycenaean palaces. More specifically, changing socio-economic

conditions led to new social needs that prompted the adoption of a morphologically simpler and readily accessible product over a complicated, and socially restricted vessel. The amphora was preferred over the transport stirrup jar. In addition, the evidence here may suggest that amphoras were actually the consistent popular choice for a transport container throughout the LBA. In other words, from the perspective of ease of use and manufacture, people may have preferred the amphora all along while palaces imposed a new but shorter-lived vessel type.

After the collapse of the Mycenaean states, I suggest that TSJs no longer functioned within a political economy, but evolved to function within the same type of commercial economy as amphoras. This change can be demonstrated by the localized mode of production of TSJs, as well as its wide distribution at both low and higher-ranking sites. The data presented in this chapter suggests that many regions produced TSJs in the LMIIC period including, but certainly not limited to, Khania, the Mesara, Knossos, Thronos Kephala, and Karphi. These local workshops produced some TSJs that were used locally and some that were also shipped to other sites on the island. In addition, Cretan Postpalatial TSJs are found at many different types of sites, including reoccupation of former palatial or administrative sites such as Khania and Palaikastro Kastri, refuge settlements such as Karphi and Kavousi Kastro, as well as new LMIIC foundations such as Thronos Kephala, Halasmenos, and Kavousi Vronda. Within these settlements, TSJs are now found scattered throughout the settlement at ordinary houses, larger buildings, communal spaces, storage areas, and even ritual sites. These characteristics of LMIIC TSJs are very similar to the manner in which amphoras were contemporaneously used. However, there does seem to be one major difference. As Jeremy Rutter suggests for the reason behind the invention of SNAs in the LMIIIA2 period at Kommos, “it is the amphora’s wider mouth, which can easily accommodate the insertion of a hand, that distinguishes the amphora from the stirrup

jar: while stirrup jars seem designed principally for the transport of liquid produce, short-necked amphoras would appear to have been more flexible in the range of produce that they could have contained” (Rutter 2000, 184). Therefore, from a “purely functional point of view,” amphoras were ultimately the better choice, thereby sealing the fate of TSJs within a Postpalatial Aegean socio-economic context (Rutter 2000, 184).

It can also be suggested that the amphora may have been adopted as the primary transport container in the Postpalatial period as a result of changing socio-economic conditions after the collapse of LM/LHIII B social structures. Newly established hierarchies and population patterns led to new social needs that prompted the preference for a morphologically simpler and more flexible product, the amphora, over a complicated, and possibly restricted vessel, the transport stirrup jar. This hypothesis is supported by the quantitative data presented in this chapter where amphora production and variability increases throughout the LMIIC period. Additionally, the aftermath of the destructions at the end of the LM/LHIII B period also seem to have brought about technological changes directed towards the simplification of the TSJ shape, which had previously required an even higher level of skill and effort to produce.¹⁰ These changes include formation of the body in one piece instead of two and the use of a single type of paste for the entire vessel. Schiffer suggests that, “technologies tend towards stability but are changed as people solve problems presented by altered societal and environmental factors” (Schiffer 2011, 52). If this is the case, then we must assume that the appearance of new social needs prompted these two technological changes. The social processes underlying these changes were new peer competitions and new social groups created after the Mycenaean palatial collapse. Stockhammer

¹⁰ Indeed it seems that the TSJ manufacturing group in the Mesara plain continued making TSJs with octopus decoration in the LMIIC period, but simplified the morphology, following other TSJ production areas.

(2008, 283) suggests that a change in the significance of the TSJ in Postpalatial Tiryns is linked to a change in the Postpalatial social system. These same connections can be seen on Crete, where during the LMIIC period social change prompted TSJs and amphoras to be regarded and used differently (Schiffer 2011, 43-49; Maran 2005).

These findings also suggest that the Cretan economy continued into LMIIC, immediately after the palatial collapse. The distribution of TSJs lead D'Agata and Boileau to conclude that, "at the regional level imported coarse stirrup jars at Thronos Kephala show that, after the collapse of the LBA state system, the circulation of, and trade in, oil and wine associated with the production of these vessels had remained active as much as local economic specialization and a trade network still connected much of the island" (D'Agata and Boileau 2009, 202). Coupled with a deliberate and consistent change in vessel morphology across the island, the trade pattern suggests that while the main palatial centers on the mainland had ceased their high demand for Cretan TSJs, local centers on Crete may have retained enough authority to continue reduced production of a modified version. More specifically, emerging Cretan elites in the LMIIC period relied on controlling special resources and technological knowledge, which could have been manifested in the production of TSJs and their contents (Borgna 2003, 164). The LMIIC Cretan elite may have sought to align themselves with the previous LMIIB regional administrative authorities by maintaining the same ceramic shape to ship their commodities.¹¹ As the power of these new elites waned by the middle of the LMIIC period, however, people may have viewed TSJs in a new light. People may have shifted to amphora use desiring a simpler and more flexible vessel. TSJs were rather complicated vessels and difficult to make, thereby requiring a

¹¹ For Postpalatial elite referencing the Palatial past see Dickinson 2009, 2006; Maran 2011. For the importance of controlling oil and wine in the LBA see Dietler 1990; Hamilakis 1996, 1999; Wright 1996; Sherratt 2004, and discussion in Chapter Two. In relation to maintaining TSJ production, this is perhaps best seen with the production of LMIIC TSJs with wavy line in the Mesara.

high level of expertise. For example, Haskell suggests that LHIII B mainland potters were not quite successful at their attempts to reproduce Cretan-style TSJs. In his own words: “They are just awful” (Haskell 2005, 241).

Basically, it seems that TSJs were difficult vessels to make, whether one was good at it or not. It is logical that if there were an opportunity to make an easier vessel that performed the same function, one would take it. Otherwise, it would be necessary, for whatever reason, to continue producing the more complicated and specialized vessel. Therefore, the disappearance of the TSJ means that A) another vessel was able to perform the same task and B) there was no other reason, political or commercial, to continue producing TSJs. In LM/LHIII C, amphoras seem to have been deemed reasonably capable of performing the same roles that TSJs had previously occupied. This certainly appears to be the case concerning the LMIIC modified TSJs found at Khania.

Although the insights presented here are promising, there are some caveats to our knowledge. The most significant is the scope of the dataset. The few sites and vessels described here are by no means exhaustive examples of this technological change from TSJ to amphora. It is probable, however, that the transition may become clearer as more sites are carefully excavated on Crete and more examples of altered TSJs, or hybrid shapes come to light. As it is, what little data we do have is nevertheless very important to our interpretations of how people involved in the oil and wine industry, especially potters, coped with the changing social and economic environment of the Postpalatial period. By studying transport vessels we gain a window onto aspects of social interactions such as the relationships between potter, palatial authority, and collective demand.

The archaeological evidence presented here supports the argument that changes in Postpalatial social need provided the impetus behind the permanent adoption of transport amphoras after LBA palatial regulation of TSJ production. Indeed, the answer to why people adopted transport amphoras also sheds light on other questions of socio-economic interactions between Crete and mainland palatial authorities. The nature of palatial control over liquid commodity production and distribution, including the containers in which the commodities were shipped, provides an important insight into the continuation of agricultural practices after palatial collapse. To this end, the next chapter continues to trace the use of transport amphoras after the Postpalatial period in order to understand to what degree people still produced oil and wine in the Protogeometric period. The evolution of this production and the distribution and consumption of liquid commodities intensifies throughout the Greek Early Iron Age, culminating in the Archaic economic revival. This progression is best understood by tracing the adoption of amphoras as transport vessels and the gradual shift to their systematic, regularized use.

Chapter 4

Liquid Commodities in the Early Iron Age: The North Aegean Amphora

Chapter Introduction

The previous chapter discussed the evidence for continuity in oil and wine trade after the collapse of the Mycenaean palaces around 1200 B.C.E. Continued production of TSJs and the gradual adoption of the amphora as the dominant transport container suggest that these two commodities continued to be produced, distributed, and consumed. This chapter seeks to understand what happened to the oil and wine industry in the Early Iron Age (ca. 1050-700 B.C.E.), after a second major disturbance in Greek history at the end of LH/LMIIIC. Did some areas of the Greek world continue to produce and trade oil and/or wine despite changing social, economic, and environmental factors or did the production of a surplus in these goods cease altogether along with the necessary external contacts? In a transitional period, we may also ask: did the production of oil and wine in the Early Iron Age contribute to later large-scale production in the Archaic and Classical periods? To attempt to answer these questions I will focus on a single type of transport amphora, the North Aegean amphora (NAA), which is used throughout the entire period as a method for transporting larger quantities of bulk liquids, most likely oil and wine, although not limited to these commodities.

Unlike the rather static economic landscape of the Late Bronze Age, the Early Iron Age was a period of considerable change and dynamic movement with regard to both population and economic enterprise. Consequently, this chapter is organized chronologically, as opposed to regionally. The Bronze Age TSJ seemed to have relatively stable production locations and distribution networks over the entire period. Conversely, based on the available information it

seems that NAA production locations and distribution networks may have changed significantly over time. The organization of this chapter, therefore, follows the three diachronic variations of the NAA shape as outlined by Catling (1998) in his seminal work on this very distinctive vessel type: NAA Type I, NAA Transitional, and NAA Type II. The chronology of the NAAs is, however, far from clear as none of the examples found within central Greece come from tightly sealed stratified contexts. Instead, much of Catling's chronology is based on style, ultimately reliant on the Attic and Euboean styles. Consequently, there is probably much more overlap between these three types of NAAs than the current evidence suggests. It is nevertheless the case that the shape remains remarkably consistent/traditional over a long period of time, a fact that also hinders a neat classification. Lack of stratified archaeological material, however, currently necessitates the retention of these three divisions, despite their many problems. This dissertation will therefore maintain the use of Catling's Type I, Transitional, and Type II divisions with the acknowledgement that future research may prove this typology inadequate.

The production, distribution, and consumption of each variation will be examined in relation to each other in order to gain a better picture of how the treatment of this vessel and its contents evolved over the course of three centuries. To do this it is necessary to examine first the Early Iron Age social and geographic context, especially in light of information from recent archaeological pursuits in the areas of population mobility, land management, settlement structure, and social organization. To be able to discuss oil and wine trade in the Early Iron Age, it is necessary to first establish that Greeks did in fact continue to have contact with the wider Mediterranean world. It must then be shown that people continued to maintain vineyards and olive groves in settled communities and that the social organization promoted and produced a surplus of these commodities. After establishing the previous stipulations, it will then be possible

to explore the means by which the Iron Age Greeks bottled and shipped olive oil and wine to distant locations; namely, the NAA and, consequently, the emphasis of this chapter.

Early Iron Age Social Context

Continued External Contact

The Early Iron Age was a time of movements, both large and small, both within the Aegean, as well as longer distance overseas travel and trade. The period is marked with the movement of people, commodities and ideas, in part fueled by the foundation of colonies, and smaller trading ventures. Throughout all of these various scales of movement, Greeks maintained settlement continuity and agricultural stability in many mainland regions, though some more than others. The Greek movements westward to Aeolis, Ionia, and Doris are only discussed by much later authors (e.g. Strabo 13.1.3-4) and are consequently skewed necessitating a critical assessment. Indeed various scholars have questioned the historicity of the Ionian (Papadopoulos 2005, 580-588; Crielaard 2008), Aiolian (Rose 2008), and Dorian (Schnapp-Gourbeillon 1979, 1986, 2002) migrations. As Papadopoulos (2005, 580) notes, “migrations, colonizations, and even invasions have dominated modern views of the myth-historical landscape of Early Iron Age Greece.”

Perhaps more historically concrete, though not without its criticisms, is the foundation of colonies in the Early Iron Age. For our purposes here, the most important and possibly earliest colonies were founded in the north Aegean by the Euboeans. While the date of the first large movements to the Chalkidike and Pieria are not clear, it is certain that the areas had contact with Mycenaean Greeks as early as LMI-II at, for example, Torone. Evidence usually cited for this early movement north normally comes in the form of a type of skyphos (cup) with pendant semicircle decoration that came to represent Euboean presence, at least to some scholars

(Snodgrass 1994). This motif, however, does appear in Macedonia at the same time or earlier than Euboea. Only when the decoration becomes standardized do the two regions develop this shape in tandem. As Gimatzidis (2011, 959) pointedly states, “today there is no doubt that all types of the pendant semicircle skyphoi were produced and consumed at the same time both in Euboea and Macedonia.” Additionally, Tiverios (2008, 8) points out that it does not matter if the Euboean-style pottery was imported or made locally because it still means there was Euboean presence in northern Greece. Other authors are more skeptical, calling into question whether the existence of skyphoi necessarily implies the presence of Euboeans themselves or are the result of trade or even indigenous invention (Papadopoulos 1997, 2011).

Other possible forms of evidence for Euboean presence in Macedonia may come from sanctuaries, though this too is questionable. The Sanctuary of Poseidon Pontios near Mende has a large apsidal building with pottery dating to LMIII/SM, PG and Geometric periods. While an apsidal building alone would not signal Euboean presence, construction of four cult buildings, including one dating to the 10th century B.C.E, produced material interpreted as relating to Greek cult practices (Tiverios 2008, 14-15). Tiverios (2008, 124) argues that, “what persuades us that the Greeks probably settled in these parts [the north Aegean] at such an early date [immediately after the Trojan War] is above all the discovery near Mende of a purely Greek sanctuary, the first phase of which dates back to the Late Mycenaean period. It is precisely this find which forces us to break out of the straitjacket of dogmatic views in this discipline of ours and re-adjust our interpretation of the considerable body of evidence outlined above.” Although it is uncertain whether Euboeans settled in the Chalkidike and Pieria at such an early date, by the 8th century B.C.E. a new wave of colonists came from the Euboean cities of Chalcis and Eretria. However,

Euboeans were not the only people moving north, but were part of a larger movement of people involving agents from Andros, Corinth, and Paros, to mention a few.

Whatever the outcome for colonization, it is now clear that Greeks, including Euboeans, took an active role in commercial activities from the beginning of the Early Iron Age. John Boardman perhaps put it best when he said, “A shared Dark Age does not mean that two-way traffic stopped, merely that it ceased to be archaeologically visible or culturally influential” (Boardman 2006, 515). Yet this two-way traffic is becoming more and more visible with each published excavation. Descoedres (2008, 313) now says, “there can be no doubt that by the second quarter of the 10th century B.C. a link between the Levant (Tyre) and Euboea (Lefkandi and probably nearby Chalcis) was established and that the ships sailed via Cyprus, as attested by Phoenician imports.” Even before this solid link was established there seems to have been more sporadic contact between the Greek and Eastern worlds in the 11th century. Two major debates relate to Early Iron Age trade. The first is what exactly was traded, commodities or finished goods. The second is who exactly is doing the trading and moving, Greeks or Phoenicians.

Arguments for what was traded involve archaeological evidence and inference based on what a certain group of people “needed.” For example, if Phoenicians were bringing finished goods to Euboean Lefkandi, what did they get in return? Some scholars posit that Phoenicians would have been seeking silver from the Laurion mines, slaves, or iron (Mazarakis Ainian 2006, 194). Other scholars suggest that agricultural products, including olive oil, were the main objective. Euboea’s incredibly fertile Lelantine Plain was “capable of producing agricultural surpluses in such amounts that it became the cause of one of the most famous and longest-lasting wars in early Greece (whatever its precise chronology), involving a substantial part of the whole country” (Descoedres 2008, 317). In parallel, Phoenicia was suffering from a shortage of

agricultural products. Aubet (1993, 56) states that, “from the tenth century onwards, there are clear allusions to a deficit in foodstuffs in the territory of Tyre, a city that imported huge quantities of oil and cereals from abroad.” Phoenician search for agricultural supplies was not limited to Lefkandi and is even preserved in Homer’s *Odyssey* (402-483) when Eumaeus recalls Phoenician traders coming to Syros for foodstuff in exchange for *keimelia* during his childhood. In support of Greek agricultural products traveling to the Near East, Descoeudres (2008, 319), Courbin (1993, 109), and Boardman (2006, 514) each cite amphora fragments of PG date, now identified as NAAs. Additionally, all three authors designate these amphoras for the transportation of olive oil.

In opposition to trade in commodities is the opinion that Greeks only traded in finished goods, such as fine ware pottery, especially drinking equipment (Tandy 1997; Boardman 2006). Again the pendant semicircle skyphos comes into play as a putative marker of Euboean enterprise. Early Iron Age Greek pottery has been recovered from mostly port towns like Tyre (Coldstream and Bikai 1988), Bassit (Courbin 1993), and Al Mina (Luke 2003, Coldstream 1991), and most recently in Geometric Carthage. Boardman (2006, 514) posits that although there are a few EIA Greek amphoras in the East that they were merely “in the baggage” of early visitors. However, the fact that most shapes imported to the east are for storing, transporting, mixing, and drinking wine may imply a demand for the actual liquid to accompany the equipment.

Who actually sailed from port to port trading these goods is up for debate. Some scholars argue that since Phoenicians were active previously and there is early evidence for their colonies we should attribute most Euboean pottery in the east to Phoenician ventures (Papadopoulos 1997, Courbin 1993). Other scholars have no doubt that Euboeans were active (Tiverios 2008).

One argument suggests that since nothing Cretan shows up in the east (indeed there does not seem to be any Cretan pottery outside of Crete in the EIA), even though the island has much orientalizing culture, the Phoenicians were not moving things eastward, only west (Boardman 2006, 516). In conjunction with this is the argument that if Phoenicians had been the carriers we should expect Syrian products to have been taken farther west, with other Phoenician goods, and they are not. Consequently “The strong Syrian character of Greek orientalising culture can only be explained in terms of mainly Greek initiative in the 8th century, probably building on earlier exploration and exchanges” (Boardman 2006, 516). Boardman (2006, 516) continues by arguing that “the Euboeans had a longer record of exploration of foreign shores in the Early Iron Age than any other Greeks or even than the Phoenicians; witness their exploration of and settling in Macedonia from the 11th century on.” In reality this debate is far from settled, but what is certain is that these two cultures were definitely trading with one another already in the PG period, each exhibiting varying degrees of agency in the transactions.

This discussion of EIA Greek mobility suggests that contacts with other Mediterranean cultures never ceased after the end of the Bronze Age. Greeks moved northward to Macedonia most likely as part of commercial enterprises and, eventually, founded colonies on the Chalkidike and Pieria. Additionally, a consistent flow of traded goods, both commodities and finished products, connected Greeks to the outside world and provided an outlet for surplus and wealth accumulation. It can be said beyond a doubt that between the 10th and 8th centuries B.C.E. the “only thing reliable on firm data is the re-establishment of the external contacts; not the development of the polis, wars, etc.” (Descoedres 2008, 298). Most important for our question of continuity and connectivity to later periods is that “the major economic accomplishment of the

EIA seems to have been creating new structures that sustained what was, by ancient standards, major archaic-classical economic growth” (I. Morris 2007, 231).

Stability and Agricultural Communities

Having established that EIA Greeks maintained external contacts in the form of mobility and trade, we must consider more fully the commodities that were traded, and in particular oil and wine. It is therefore necessary to discuss the evidence for settled communities maintaining long-term vineyards and olive groves. This will include a discussion of evidence for olive oil and wine manufacture and settlement distribution, longevity, and size. In general, discussions of agricultural practice in the Early Iron Age are split into two basic ideas. The first suggests that after the collapse of the palaces the agronomic regime changed entirely to a pastoral focus with an almost complete loss of arboreal practices (Snodgrass 2006, Hanson 1999). The second posits that agricultural practices remained relatively unchanged in relation to maintaining similar ratios of arboreal, cereal, and pastoral management, but changed only in scale (Palmer 2001, Foxhall 2007). More evidence is now in support of the latter, although there is some speculation that “pastoral politics” existed with herd management playing an important role in power hierarchies and wealth display (Howe 2008). Ruth Palmer (2001, 66) suggests that “the fall of the palaces probably had little effect on the actual agricultural tradition” and that “the cultivation of grains was certainly not forgotten during the Dark Age” (Palmer 2001, 75). Later emphasized by Howe (2008), Palmer (2001, 71) asserts that “the main differences between Mycenaean and Dark Age land use lay in the Dark Age emphasis on herds as wealth, and the extensive use of land for grazing, which was possibly due to the low population, and lack of competition for land between crop cultivation and herding,” though faunal evidence supporting this assertion has yet to be convincingly documented. We must keep in mind that the EIA is characterized by regionalism,

with some areas reacting to the new environment differently and therefore implementing differing agronomic strategies based on population density, hierarchical institutions, and external contacts. For example, the settlement of Nichoria in western Messenia lasted around 200 years and raised sheep and goats for meat, but probably used cattle mainly for draft animals rather than meat though their numbers rose between 30-40% from the Bronze Age. In addition, seed remains as well as pollen cores found during excavation shows that grains, grapes, olives, figs and peas were exploited (Shay and Shay 1978). This is further supported by charcoal from pruned branches of olive, fig, and grape (Palmer 2001, 69). Nichoria would have been a stable settlement, only disrupted at the end by human action of a nefarious manner (Mazarakis Ainian 2006, 187; in contrast see Whitley 1991, 347). Similar evidence has been found in other regions of Greece including PG and Geometric Iolkos, which produced cereal remains (Jones 1987; Foxhall 2007, 16).

Beyond archaeobotanical remains like grape seeds, olive pips, and olive and grape branches there are indirect indications that olive oil and wine were still consumed on a relatively broad scale. The high number of ceramic shapes used for drinking, mixing, and storing wine are strong support for the ubiquity of the liquid. The common Euboean skyphos was a wine drinking vessel and kraters used to mix wine and water have been recovered from a number of EIA Greek settlement sites. In addition, a specific type of applied-relief pithos from the Geometric site of Zagora on the island of Andros seems to have been specifically fabricated to hold wine (McLoughlin 2011).¹² Interestingly, vessels associated with wine have been recovered from every excavated area of this settlement suggesting that there had been no restriction to the

¹² These specific pithoi are in opposition to the most common pithoi most likely used to collect rainwater. Excavators noted that many pithoi were positioned in outdoor areas, including courtyards, in order to collect rainwater (see also Ebblinghaus 2005 for other alternatives).

commodity. In particular, McLoughlin (2011, 919) believes that it is possible that “these enigmatic vessels served as containers for aged wines, so lovingly described in Homer’s *Odyssey*, when Telemachos goes to get provisions from his father’s storeroom for his journey to Sparta (*Od.* 2.337-355).” It is therefore possible that the high visibility of the applied-relief decoration served to advertise the high quality of the contents, thereby “promoting the [homeowner’s] personal vintages (and superfluous surplus in years of abundance) to a prospective buyer visiting the settlement” (McLoughlin 2011, 920). McLoughlin goes on to conclude that “if Zagora was, in a small way, an exporter of its surplus wine, traders might well stop there, and incidentally provide passage for the Tenian-Boiotian applied-relief pithos makers. It may be no coincidence that the two islands with well-documented separate and thriving local traditions of applied-relief pithos makers were Naxos and Rhodes, both famous in later antiquity of their wine” (McLoughlin 2011, 920). Other pithoi found in Crete and Boeotia (the Tenian-Boeotian group) seem to mimick certain traits typically reserved for amphoras, such as two handles extending from shoulder to neck (Ebbinghaus 2005, 53). These handles were purely decoration since a jar this size would not have been easily lifted, especially when full. The pithoi found on Zagora may, therefore, be part of a much broader trend where pithoi became status markers as a form of “conspicuous storage” (Ebbinghaus 2005, 69).

Other evidence suggests the production and consumption of olive oil in surplus quantities. As mentioned above, most scholars studying EIA trade assume that the large Greek coarseware amphoras recovered from settlements in the Levant (e.g. Al Mina) may have conveyed olive oil. In addition, smaller shapes were not only used for wine consumption, but also used as oil and perfume containers (Descoedres 2008, 334). Particularly common shapes that had been continuously popular for export since the Bronze Age include flasks, aryballoi, and

lekythoi. In fact the most common shape in the Postpalatial period, the small decorated stirrup jar, evolved into the lekythos and continued to be used for perfumed oils particularly associated with funerary ritual and burials (Mountjoy 1986, 199; Stubbings 1947, 24). On the availability of olive oil, Lin Foxhall (2007, 17) states that, “in this period olive oil is likely to have been a ‘semi-luxury’ commodity, that is, something desirable that was sometimes within reach of people from a fairly wide band of the socio-economic spectrum, at least on special occasions, but not necessarily a staple to be taken for granted in everyday use.” If this is indeed the case, then the situation seems to have been reversed from the Late Bronze Age where wine was possibly restricted but olive oil was disbursed by the palace in large quantities. An EIA restriction for olive oil may be due to limited access to an oil press, whereas wine production could be undertaken in one’s own backyard (as may be the case at Zagora).

Within this discussion of whether olive oil and wine were capable of being produced in surplus quantities during the EIA we must consider the longevity and stability of Greek settlements. As we have seen, olive trees can take up to ten years to produce fruit capable of being pressed for good-quality oil. Grape vines do not take as long but certainly require active tending almost year-round. This implies that either EIA Greeks continued to use previous Bronze Age plants and/or the population was static enough to grow and produce their own commodities. Certainly this type of situation would have varied according to region. In fact, the Early Iron Age may be characterized by regionalism, with some areas flourishing while others that had been most prosperous in the LBA nearly went into extinction. Indeed in the north Aegean, in areas that did not have Mycenaean palaces, nothing collapsed and instead produced clear continuity in agronomic regimes and consumption practices (Papadopoulos 2005). We can now say for certain that regional central places continued to be important and maintained their associated socio-

political identities. For the main focus of this chapter, the regions of Boeotia, Phokis, Lokris, Euboea, Thessaly and Macedonia, what is now termed “north-west Aegean,” are most important (Gimatidis 2011, 959). Particularly, these regions continued to be important and maybe even flourished at a time when other areas, like the Argolid, were reduced to hamlets. Morphological similarities in pottery styles existed in these regions from the earlier phases of the EIA until the end of the period and have therefore been called the “Euboean koine” or “Thessalo-Cycladic Protogeometric and Subprotogeometric” (Gimatidis 2011, 959).

Based on archaeological remains, we know that the north-west Aegean region retained its population and settlements were stable for long periods of time. For example, the area of East Phokis continuously used most chamber tomb cemeteries throughout the LHIIC and into the SM period. At Elateia tombs were found with some heirlooms reused as burial gifts, signs for continuity in settlement distribution and social structure (Livieratou 2011, 152). In addition, continuous cult activity at the site of Kalapodi suggests that the region was occupied from the LBA into the EIA and Geometric periods. Despite dynamic power shifts in the Middle PG period Kalapodi continued to be a meeting place for local populations into the Sub-PG period (Livieratou 2011, 153). Livieratou (2011, 152) concludes that “the collapse itself does not appear to have had a huge impact on the life of the local populations, and the settlement patterns and socio-political structure of the communities seem to have overall been preserved throughout LHIIC.” It seems that some settlements, especially those in the north-west Aegean with access to coastal trade and fertile land, maintained a high level of stability despite changing social situations. The consistent use of family tombs over multiple generations suggests that land was continuously occupied by the same group of people long enough to be able to produce long-term investment products like olive oil and wine. Coupled with access to external trade and the

discovery of finished goods from the east in Greek tombs, we may confidently say that some people had access to surplus with which they could barter.

Social Organization, Leadership, and Religion

The capability to produce an agricultural surplus does not necessarily mean that people did. In addition to land, time, and stability, a surplus might only have been achieved if there was a strong enough social organization to provide the labor necessary to harvest and produce large amounts of olive oil and wine. Foxhall (2007, 17) surmises that “indeed the main problem for farmers in Late Geometric and Archaic Greece appears to have been the problem of commandeering sufficient labour to work the land available.” Labor may have been organized in two likely scenarios. The first is that someone was able to force or coerce people into working to produce surplus, such as a leader. The second involves the organization of a labor force under the auspices of an overarching and powerful entity such as religion. In this case people would labor for the deity or for those who communicate with the deity.

Evidence for the existence of a central authority in the form of a leader comes from a number of sources including linguistic terms, architectural layouts, and burials. While literary evidence for EIA kingship is indirect, it has undergone the most complete examination. Recently, however, archaeological evidence has come to the fore with the excavation of EIA and Archaic settlements and cemeteries. These new data shed light on social stratification during the periods following the Late Bronze Age palatial system. Combining both direct and indirect evidence for leaders in the Early Iron Age provides a rather compelling picture for the ability to mobilize labor necessary for both surplus production and its dissemination via trade.

In the Mycenaean period the wanax was considered the head of state or what we may call ‘king’. Below him existed the *qa-si-re-u* (basileus), a type of local or ‘village’ authority who was

called upon selectively for labor and other forms of economic mobilization by the palace and wanax (see Carlier 2006 and Deger-Jalkotzy 2002). After the collapse of the Mycenaean palatial system, the wanax essentially disappeared, leaving the basileis to continue as local authorities. Therefore, “the essential features of wanax ideology (concerns with ‘birth’ and ‘lineage’ and ‘fertility’)... were then transferred to the basileis, who on the local level might have legitimized their authority, even in the Mycenaean period, with a similar ideology” (Palaima 2006, 68-69).

This same term, *basileus*, is used in Homeric epics for king or prince. Carla Antonaccio (2006, 381) suggests a translation of “chieftain” may be appropriate at this point (see Wright 1995). Whether these basileis actually existed and ruled over settlements in the Early Iron Age or are a product of the Homeric tradition is debated. Based on written evidence for Archaic basileis, Drews (1983) argues that there is no conclusive evidence that during the Geometric period Greek poleis were ruled by kings. Instead he argues that a small circle of hereditary leaders, identified as basileis, ruled (Drews 1983, 129-30). Carlier (2006), after studying the use of the term *basileus/eis* in the Homeric epics, determined that the term was used for both a single person and a group of elders, once termed the *qa-si-re-u*. This group was considered to share the honor and power of the basileus so they eventually received the collective title of basileis. Similarly, using the Homeric poems, Carlier draws the historical conclusion that the Assembly and the Council were already familiar to the poet’s audience in the eighth century and considered traditional institutions (Carlier 2006, 107-8). He therefore comes to the conclusion that “Assembly, Council and kings probably existed in most Greek communities of the early archaic period—villages, ethne and many emerging poleis; they probably worked more or less as the poems describe them. As this type of government is considered traditional by the poets and their audience, it probably already existed in the late Dark Age” (Carlier 2006, 108).

The archaeological evidence for leadership in the Early Iron Age is growing rapidly. Mazarakis Ainian (2006) divides the material evidence for identifying an individual of high status, who could have been a *basileus*, into direct and indirect. Direct evidence includes houses in settlements with extraordinary features including association with metal working, tombs with prestige goods and status symbols (bronze urn cremations) (Morris 1999; Crielaard 1998), “Homeric” burials, warriors (Whitley 2002), and the identification of hero cults (Antonaccio, 2002; Deoudi 1999; Hägg 1999; Boehringer 2001). Indirect evidence can take the form of prestige goods, antiques, status symbols and ritual meals at sanctuaries, perhaps pointing to visiting elite (Morgan 1999; Fagerström 1993) as well as narrative art possibly used for underlining the ruler’s status or heroic descent (Hurwit 1985, 124).

As settings for daily activities, settlements can be most informative for distinguishing social hierarchy. The beginning of the EIA brought a transformation in building techniques including the (re)introduction of curvilinear buildings and cist tombs, which had been preserved in the periphery of the previous palatial world (Crielaard 2006, 285). Most settlements would have been scattered and small, between 30 and 50 people, while some others were larger such as Athens, Lefkandi, Knossos, and Old Smyrna. The smaller ones with 100 or less would have had open access to arable land and pasture (Palmer 2001, 67). In the PG period settlements shared a number of features yet the most interesting is that there was usually one house that stood out from the others because of its size, location, or other features. This structure is always labeled as for a ruler or cultic functions (Mazarakis Ainian 1997; Descoeudres 2008, 355). The houses were simple but wealthier buildings had multiple rooms, such as Unit IV-i at Nichoria in Messenia. At this point there is no positive evidence for a public space serving civic activities. This has led scholars to suggest that the areas for communal gatherings and cult activities were related to the

dwellings of the elite (Mazarakis Ainian 2007, 167). During the Early Iron Age it seems that the success of the leaders depended in part upon control of land and labor, and the use of animals as sign of wealth. The greater the population the more unequal would be access to land and the ability to achieve self-sufficiency through diversification (Palmer 2001, 67).

By the 8th century B.C.E. sites were characterized by complexes of enclosure walls with at least two oval or apsidal buildings as well as round ancillary buildings for storage or workshops. This pattern is seen at Skala Oropos, Eretria, Xeropolis/Lefkandi and Viglatouri (Mazarakis Ainian 2007, 160). The compounds observed here may represent the limits of individual oikoi with the periboloi acting as divisions as well as protection. At Skala Oropos, each household had a significant degree of economic autonomy, in some instances going beyond self-sufficiency (Mazarakis Ainian 2007, 166). However, excavations at Skala Oropos have only covered a small fraction of the settlement, making it impossible to determine if one house or enclosure stood out from the others.

A common feature among the large houses mentioned above is the association with metallurgy. Mazarakis Ainian (2006, 206) proposes that “The basileis of Early Iron Age Greece derived much of their power not only from their bravery and skills as warriors or their possession of arable land, but also from their abilities to offer feasts and their connection with metals and trade.” He argues that the introduction of iron, the supervision of the metals industry in general, as well as the maintenance of contacts with areas rich in metals and the trade of costly goods, especially metallic, go in tandem with the formation of a new elite in the beginning of the EIA (Mazarakis Ainian 2006, 206). As overseas trade and contacts intensified, communities stabilized and grew in number, land ownership gained importance and craft specialization started to become a necessity. Accordingly, the members belonging to this elite group gradually grew in

numbers and by the later 8th century were no longer strongly differentiated from the main body of the community. This would explain the gradual shift in the archaeological record from an obviously differentiated house to relatively even groups of wealthy households.

Burials provide perhaps a more direct avenue for viewing social hierarchy. Tombs distinguished by physical separation, deferential treatment, rich grave goods, exotic materials, and geographic focus most likely belonged to elite individuals. When juxtaposed with graves in the neighboring area they can be labelled as exceptional and therefore having belonged to a leader or chieftain. If this tomb is then associated with others it can be possible to distinguish a lineage or oikos. This concept is not new to the EIA but was practiced since the Early Mycenaean period when elites vied for control of resources and territory, placing monumental tholos tombs in prominent locations. While this particular form of funerary display disappeared with the collapse of the palaces, distinguished burials continued in the form of what we term “warrior tombs”. These tombs are prominent in the century immediately following the palatial collapse and are found from Crete to the north-east Aegean. After considering all the evidence of LM/LHIIIC warrior tombs Deger-Jalkotzy (2006, 175-6) comes to the conclusion that,

“it may be suggested that the warrior tombs of the post-palatial Mycenaean period demonstrate that the ostentation of military prowess and elite status was not only an issue of rulers and leading social ranks of the Early Mycenaean and the Mycenaean palace periods. This feature of social behaviour outlasted the fall of the palaces and survived right into the EIA of Greece. Moreover LH IIIC warrior tombs may be viewed as the funerary monuments of individuals who either held, or were entitled to hold the title of basileus and to obtain the position of a political leader, if not a petty king or prince. It was their prerogative to be buried together with their swords and spears, even if we may assume that military prowess was a quality which was generally expected from all members of the social elites of the period. Under these premises the political function of the men buried in the warrior tombs of LH IIIC may well be viewed as a step along the line of development from Mycenaean *qa-si-re-we* to the Homeric basileis.”

At Lefkandi on Euboea tombs in the Skoubris plot show inheritable status differences. During the MPG inhabitants of the area constructed a monumental apsidal building at Toumba. Labeled

the “Heroon” by its excavators, the building showed connections to banqueting and feasting and was the resting place of two individuals: a cremated male and inhumed female, both buried with antique exotic goods and four horses. The grave goods displayed here along with other tombs in the region suggest that imports played an important role in elite identity. After the building was destroyed and a mound put over it more burials and cemeteries were created around it. The Heroon at Toumba remained the most lavish. Interestingly, child tombs were large and rich suggesting that the people buried here acquired wealth through inheritance and lineage, not deeds in life. The burials at Lefkandi demonstrate that in the MPG period, an increase in social differentiation and social competition and an increase in and intensification of external communications were interrelated. From late MPG on it became a matter of prestige to participate in networks that included a growing variety of increasingly distant regions (Crielaard 2006, 290). This correlation culminated in SPG II and III periods when individuals had a tendency to bury ‘collections’ of goods from a variety of regions. Elite burials in the Early Iron Age, therefore, correlate with status-enhancing and legitimizing activities that they participated in during their life. If chieftains gained and maintained power through the control of external trade connections and internal metallurgy as well as agricultural surplus, then these values should be reflected in the ruler’s burial.

The amount of labor required to maintain olive groves and grape vines and produce a surplus in their respective products may have also been achieved via organized religion. One of the major developments of the EIA is the emergence of regional and settlement-specific sanctuaries. There were fewer than 40 sanctuaries and cult palaces in the 9th century, which rose to almost 60 in the MG period and 120 in the second half of the 8th century (Descoedres 2008, 322). A particular advancement was the creation of a building strictly used for cultic activity, the

temple. But this development was gradual and at the beginning of the EIA local cultic activities still seem to have been performed under the auspices of the ruler in his house (Mazarakis Ainian 1997, 2007). At the same time regional sanctuaries were created or continued from the LBA at, for example, Kalapodi where “the uninterrupted cult activities...throughout the transition from the LBA to the EIA correspond to the continuous use of most of the sites in the vicinity and in the wider area of the plain of Atalante to the East and the valley of Kephissos to the west” (Livieratou 2011, 152). Material culture of the area also finds parallels in the offerings deposited at Kalapodi throughout the transition from LBA to EIA. It is clear from organic and ceramic evidence that at this point in time sanctuaries were general meeting places as well as religious institutions. Feasts were regularly held at these locations as demonstrated by large amounts of refuse. In addition, sanctuaries were important centers of manufacture and major economic centers with the ability to command resources and craftsmen on a large scale. In fact, these institutions were so deeply embedded in most regional economies that “often no meaningful distinction can be drawn between the sacred and the secular” (Morgan 2009, 50). One industry frequently associated with sanctuaries is metal-working. Descoedres (2008, 337-8) explains this association by the fact that “much of their output was destined to be offered as votives to the gods,” however, for him, “more importantly, it indicates that sanctuaries, probably in the wake of Phoenician models, have become the centers of commercial activity, assuming the role once played by the palaces” (Descoedres 2008, 337-38). But metals were probably not the only products offered as commercial transactions. Agricultural surplus would have been available for trade, possibly by the farmers themselves (Descoedres 2008, 338). Alternatively, surplus may have been organized by the regional sanctuary, which possibly acted as a type of middleman.

Chieftains and sanctuaries are not entirely separate entities, there probably would have been interaction between the two, either on a personal or social level. What the specific types of interactions were is entirely unknown. If it is correct to say that the chieftain acted as a religious leader in his community then it is possible that he would have interacted closely with regional sanctuaries, including their commercial affairs. In any of these scenarios, there seems to have been an adequate infrastructure to handle producing a surplus of liquid commodities. When coupled with the evidence for mobility, there seems to have been a reasonable level of connections continuing in the Aegean to allow for commercial interaction between various groups of Greeks as well as other people living around them. All we need is a way to see and perhaps put into perspective the commercial activity of the EIA, including various networks of people and resources. Fortunately, large amphoras, what are generally called North Aegean amphoras (NAAs), were still the preferred method for transporting large quantities of liquid commodities. These ceramic containers can therefore be used as a means of tracing cultural interaction, as well as the initial production of these critical commodities and their final consumption. NAAs were produced, and evidently transported long-distance, as early as the 11th century B.C.E. and continued to be used as bulk liquid transport containers for the following 400 years. Chemical analyses conducted on five Type II NAAs from Methone produced traces of beeswax and plant-based fatty acids, which are generally interpreted as sealing agents (Kiriati et al. 2013). These results seem to support the assumption that the contents of NAAs were liquid-based. Most scholars agree that the specific contents would most likely have been olive oil and/or wine (Kotsonas 2012, Gimatzidis 2010, Catling 1998). Either way, the most important aspect of NAAs is their existence as relatively standardized vessels that are produced over a long period of time and used to ship some sort of surplus liquid to very distant places.

North Aegean Amphora: Shifting Production Locations

Introduction

The very existence of a “class” of ceramic vessels, now called North Aegean amphoras (NAAs), was unknown until Richard Catling published a large collection of these amphoras from excavations at Troy (Catling 1998, Lenz et al. 1998). While these vessels had been mentioned previously, they had never received the type of attention that generates greater awareness, and subsequent publication, of other examples around the Aegean (Hertel 2011). Over the past fifteen years or so a sufficient number of NAAs have come to light such that we have the ability at least to begin to discuss their production, distribution, and consumption (Kotsonas 2012, Gimatzidis 2010, Papadopoulos 2005). As mentioned in the introduction to this chapter, NAAs have been divided into “Groups/Types” because of their use over the course of about 400 years (Catling 1998). Type I seems to have spanned the EPG through LPG periods, the Transitional NAA extended from LPG through EG, and Type II lasted from the MG period to the beginning of the Archaic period, around 670 B.C.E. It is necessary to realize, however, that these divisions are now 15 years old and the majority of information published since then focuses mainly on the last, and most prevalent Type II NAA (Gimatzides 2010; Kotsonas 2012). In addition, excavation data published within the past 15 years problematizes the chronology of the NAA including the date of its inception, how long Type I overlaps with Transitional NAAs, and the longevity of Type II NAAs. Keeping these issues in mind, the following discussion presents the evidence, as we currently have it, for NAA production locations from their inception to their disuse in an attempt to understand the connections between the production of NAAs, oil/wine manufacture/surplus, and economic connections maintained during the Early Iron Age.

NAA Type I Characteristics

Type I NAAs have been designated as such by Catling (1998) based on their presence at Troy during Phase VIIb2, immediately following a level with LHIIIC imported wares (**Figure 16**). Yet Type I NAAs are by no means restricted to Troy and are found in central Greece, Thessaly, and Macedonia. Based on the supposed earliest NAA thus far recovered from a grave at Elateia in Lokris, it seems that NAAs began to be manufactured in the Early Protogeometric period, corresponding to roughly the turn of the 11th or early 10th century B.C.E. (Gimatidis 2011, 253; Catling 1998, 155). The exact date of this and other early examples is, however, based mainly on funerary assemblages, which are notoriously difficult to date, relying mainly on typological characteristics and association. Type I NAAs are wheelmade, but there is paring on the vessel walls, which is uncommon for large pots at this time (Catling 1998, 154). The bodies of NAAs are formed as one whole piece with the neck added while the vessel was on the wheel and the handles added separately. Their base is relatively flat, without a foot or ring, though sometimes a slight hollowing of the bottom can be perceived. The NAA body is oval or biconical and reaches heights around 50cm and a width around 40cm creating a capacity of 15-16 liters (Catling 1998, 153). A representative example comes from Troy where a complete profile is 48.6 cm high and 38.7 cm wide at the belly, with a rim diameter of 15.6 cm and only slightly thickened with a rounded exterior, and a flat 13.1 cm wide base (**Figure 16**). It is well-proportioned with its center of gravity exactly at mid height. Though most of the other NAAs found at Troy are only fragmentary, the rest of the sherds have basically the same characteristics (Catling 1998, 154).

Type I NAAs established a few specific features that can be used to identify the shape throughout their existence. First, there is a ridge or “swelling with a pointed crest” at the junction of the neck and shoulder, created by the manner in which the neck was thrown (Catling 1998,

152). Second, the strap handles are ribbed, with two depressions running parallel along the length of the handle, causing a small of hump in the middle. Third, the basic elements of NAA decoration remain consistent. The depressions of the ribbed handles are painted, creating two stripes down each handle that then extend onto the shoulders, cross, then continue and terminate somewhere on the body, creating a type of “tail” effect. They are also light-ground with ornament primarily on the shoulder, with some bands below. The dominant motif is always sets of concentric circles drawn with a multiple brush, sometimes with lines separating the circles. One variation on this design is the use of concentric semi-circles, also drawn with a multiple brush. Interestingly, the NAA provides some of the earliest evidence for the use of a multiple brush and suggests that this technique was not restricted to fine Euboean wares, as once thought (Jacob-Felsch 1988; Catling 1996; for the multiple-brush technique see Papadopoulos et al. 1998). Type I NAAs are generally characterized by a lack of technical expertise in both potting and painting, resulting in uneven firing, poor surface finish, drab lusterless paint, clumsy application of the painted decoration, and defective or careless potting. The banding is also irregular, as a product of their slow wheel manufacture. Catling even suggests that NAA potters “were not fully conversant with the techniques used by contemporary craftsmen at places such as Athens or Lefkandi” (Catling 1998, 153). This observation may, in fact, be connected to the location of their production, yet the specific location(s) is completely unknown.

NAA Type I Production Location(s)

Because a detailed and extensive petrographic or chemical analysis has never been undertaken for Type I NAAs, it is impossible to say with any certainty where exactly they were produced. There are, however, a number of suggestions that place their production either in central Greece (East Lokris), Thessaly, Troy, Pergamon, or Clazomenai. The high number of possibilities may,

in fact, suggest that there were multiple NAA production locations, and that oil or wine was being shipped around the Aegean from multiple regions. Catling (1998, 162) first suggested that the Type I NAAs recovered from Troy were products of the area north of central Euboea and Boeotia. Based on their fabric he posited that the area of coastal Lokris might have been a suitable place. The chemical analysis (Atomic Absorption Spectrometry) performed on three NAA sherds from the sanctuary of Kalapodi produced inconclusive results because of the broad concentration ranges of certain elements, which overlap with ranges characteristic of most of central Greece. Because of this homogeneity, Jones (1996, 119) does not eliminate the possibility that these NAA examples could be local products. Additionally, some of the earliest examples of NAAs are found in Phokis, East Lokris, and Euboea. At Kalapodi, one vessel may date to the transition from Mycenaean to PG and could be a precursor of Group I, but this is based solely on its decoration. According to Catling (1998, 157), its decoration appears to be experimental with an LHIIC tassel and compass drawn concentric circles. In addition, both the cemeteries of Elateia and Agnanti produced NAAs in tombs that had been used since the latest phase of the Mycenaean period. In opposition to the suggestion that the first NAAs were produced in Phokis, Sigrid Deger-Jalkotzy agrees with Jacob-Felsch when she says, “like Dr. Jacob-Felsch, I do not believe that the amphoras bearing compass-drawn concentric circles were actually produced in Phocis” (1999, 201). She does not, however, give evidence for his rejection.

Alternatively, it has been suggested that Type I NAAs were produced farther north, in Thessaly, though this has yet to be greatly substantiated. The major EIA site of Iolkos has produced many examples of these containers and although the fabrics do not match local Iolkian fabrics, their number may suggest that the production location was nearby, possibly in the Pagasitic Gulf (Catling 1998, 159, 162). Jones (1996, 119-120) states that “a case can be

advanced for an origin in northern Thessaly on the basis of similarities with the characteristic compositions at such sites as Marmariani...; for [two sherds tested] an origin of this part of Thessaly would also be consistent on the basis of the (micaceous) fabric.” While she believes the clay of the NAA sherds found at Kalapodi differ from local ceramics, Jacob-Felsch (1988, 198) suggests that they had been containers for merchandise exported from Thessaly “into the adjoining areas of Macedonia and Phokis.”

While a single location of production may be very convenient, it is also possible that NAAs were produced in multiple locations around the Aegean, as already noted. Hertel (2003, 128) believes that NAAs were designed in central Greece, but then imitated after they were exported to other places. He suggests that reproductions were created at Mende, Kastanas, and Troy based on the fabric of the pots. Hammond (1995) suggests that Greek movements east began by the end of the 12th century with Thrace as their first station, then moving on to Troy and down the coast of Asia Minor. Hertel (2003, 129) posits that “This might link up when thinking of the distribution pattern of the Group I pottery [Type I NAAs] from Troy. The northern station of the emigrants must be the main track of the migration that followed the shores of the northern Aegean.” If this is the case, then we should expect to find NAAs in local Trojan clays. The only step in that direction was a single Neutron Activation Analysis on a single sherd by H. Mommsen that did seem to match Trojan clays (Hertel 2003, 129). A single sherd, however, is certainly not enough evidence when dealing with the variability of chemical analyses. Against a Trojan producer is also the fact that later studies have shown that NAAs made up only 3% of the ceramic assemblage in Protogeometric levels. Interestingly, however, at least three fabric types have been discerned among the Type I amphoras from Troy (Lenz et al. 1998). This may suggest that NAAs were arriving at Troy from multiple production locations.

More recently, Aslan considers Type I NAAs as imports and states that, “Scholars have tended to focus on the imported amphoras as an indication of activity during this time period, but the evidence from D9 indicates that Troia had a flourishing local pottery tradition with only a small number of imports” (Aslan 2002, 84).

Other sites on the coast of Asia Minor have claimed NAA production as their own. NAAs found at Pergamon have been subjected to the only major chemical analysis undertaken thus far. Once the chemical fingerprint of local Pergamon clays and clays from its port, Elaia, were securely established, two NAA fragments were tested with the result that one seems to match clays from Elaia exactly, while the other only partially coincides (Hertel 2011, 81; Mommsen and Japp 2009; Schneider and Japp 2009; Japp 2009). Hertel (2011, 82) therefore comes to the conclusion that because the amphoras at Pergamon correspond in both typological characteristics and quality to PG amphoras from Euboea and central Greece, the workshop that produced them had a potter(s) and a painter(s) that was intimately familiar with the wares of those Greek regions. He explains this phenomenon by suggesting that the Pergamon potters were either Greek immigrants or descendants of Greek immigrants. However, Hertel does not completely exclude the possibility that the Pergamon NAAs were decorated by a non-Greek, which implies that this painter was not only talented, but also by Greek standards, a skilled craftsman (Hertel 2011, 82). Hertel’s conclusions, however, are far from concrete and require much more archaeological data to confirm the presence of Greek potters or even the presence of a workshop producing NAAs.

At Clazomenai a large PG curvilinear building, measuring 6.25m wide and at least 8.5m long, had seven large storage vessels on the floor at one end of the structure, three of which were NAAs. Three more were found in a pit at the outer east end. Additionally, another curvilinear building nearby produced an NAA on its floor. The main evidence for NAA production at or

near Clazomenai is the presence of other ceramic shapes, including a hydria and oinochoe, produced in the same style, with similar features, and the same clay (Aytaçlar 2004, 24).

Aytaçlar (2004, 26) suggests that “these three individual pieces all share common features and add a new shape to the repertoire of vessels classified under Group I at Troy.” One must note, however, that some of these examples are handmade, are made in separate pieces, and had a ring foot. Additionally, the designs on the shoulders are different and the handles do not appear to be ribbed. Consequently, the evidence for the relationship between canonical NAAs and these other vessels is minimal, especially since no chemical or petrographic analyses have been conducted.

Aytaçlar (2004, 29) explains these differences by saying that, “these features should be considered as local features rather than later innovations associated with the group. “

Interestingly, it seems that ceramic production akin to Group I pottery continued until the end of MPG period without transitioning to Group II (Aytaçlar 2004, 29). In tandem with the explanation provided by Hertel (2003) for the appearance of NAAs at Troy and a possible local production, Aytaçlar (2004, 30) states that “the close relationship of the recent PG material from Klazomenai with the finds from northern Phokis and Lokris may suggest that a significant role was played by Boeotia, very close to these centres geographically, in the colonization of North Ionia.” This suggestion may, however, show that NAAs were in fact imported from those Greek regions, thereby essentially creating a lasting trade connection, explaining the presence of canonical NAAs. One should note that either this connection did not last or the Clazomenian ceramic tradition overtook the Boeotian, because by the beginning of the LPG period Clazomenian material displays different stylistic features from the NAA at Troy or in Greece (Aytaçlar 2004, 30).

Based on the evidence collected thus far on the origins of Type I NAAs, it is not possible to come to any solid conclusions about their production locations. Despite a number of (limited) chemical analyses since Catling's (1998) study, no clear geographical region stands out as the producer of Type I NAAs. Instead, it seems that Type I NAAs are defined by their heterogeneity of production. It is very possible, however, that future excavations will produce larger sample sets with which it will be possible to conduct large-scale chemical and petrographic analyses.

Transitional NAA Characteristics and Production Location(s)

According to Catling (1998), following Type I NAA production there is a period of about one hundred years when the shape seems to undergo a gradual transition to its final state as a "Type II" NAA. He suggests that these amphoras are part of a continual evolution as evidenced by the appearance of all typological characteristics that subsequently become the identifying features of Type II NAAs. For the transitional types, these typological features never occur together on the same vessel (Gimatidis 2010, 254). More recently, Gimatidis (2010, 254), following Catling, states that the Transitional NAA is a "direct predecessor of the Type II amphora." One must remember, however, that many of the examples of Transitional NAAs, like Type I NAAs, come from unclear archaeological contexts or contexts that make accurate dating difficult (e.g., cemeteries). Indeed, recent archaeological evidence from sites such as Torone, provide evidence that suggests those vessels characterized as "Transitional" may, in fact, overlap more significantly with Type I NAAs (Papadopoulos 2005). Additionally, the production locations of Transitional NAAs are just as uncertain as their predecessors. Like the previous Type I NAAs, Transitional NAAs seem to have different manufacture groups with slightly different characteristics (**Figure 17**). Their size is around the same as Type I only slightly larger, perhaps gradually increasing (Gimatidis 2010, 254). The Transitional NAAs identified up to this point

present us with a rather incomplete view of their evolution. Catling (1998) suggests that the first manifestation of Transitional NAAs can be represented by an almost perfectly preserved example from a funeral pyre at Lefkandi and the upper part of an NAA from Kastanas, both of which he dates to the Protogeometric or LPG period. Examples from the sites of Torone on the Chalkidike, Kastanas, and Lefkandi provide the next transformation when the shape becomes taller and slimmer, but retains its flat base, narrow neck and handle shape of Type I. At this point the decoration may have changed with three concentric circle groups and a group of three bands (one wide and two thin) instead of two broad bands as on Type I NAAs.¹³ However, on many Transitional NAAs the number and type of bands are not yet uniform (Gimatidis 2010, 257). Catling (1998) suggests that the next stage in evolution is again witnessed at Torone when in the LPG period the flat base gives way to a low ring foot. The neck becomes wider, but retains its height. At the same time, the decorative features that will become the hallmark of Type II appear: handle stripes intersect at the end and run in opposite directions to the back of the vessel; under the concentric circles is a band group; at the base of the neck are usually two narrow horizontal bands rather than one (as was for type I) (Gimatidis 2010, 257). Finally, it is argued that the last vessels of the Transitional type increase the number of concentric circles and the neck gets shorter and wider, such as a vessel from Tholos of Pherai (Chloe). This stylistic evolution, however, is far from straight forward. Indeed, many examples from Torone may, in fact, date much earlier than suggested, overlapping with Type I NAA chronology (Papadopoulos 2005). This site alone suggests that much work is needed to understand the classification of this shape during this period of the Early Iron Age. Specifically, Torone has produced many

¹³ Interestingly this pattern of banding is very similar to standard Athenian Protogeometric table amphoras. The NAA examples found at Torone possibly served this type of function, not a commercial function (Papadopoulos 2005).

examples of belly-handled NAAs, suggesting that there was more variation in the production of NAAs than previously assumed. What the significance of this variation was is still quite obscure, but it may suggest that these amphoras were not produced exclusively for commercial purposes.

The production location(s) of these Transitional NAAs is even more obscure than their predecessors. Many of the possible production locations for Type I NAAs are no longer valid for Transitional NAAs. Troy appears to be minimally occupied at this time, though this is currently debated (Aslan 2002; Catling 1998). Ceramic production at Clazomenai, if it had produced Type I NAAs, no longer produces the shape in its Transitional form (see above, Aytaçlar 2004). In addition, evidence currently suggests that NAA numbers slowly decrease in Boeotia and Euboea, possibly suggesting that Lokris is no longer a contender for their production. However, Catling (1998, 177) briefly mentions a “Type III” NAA found at Troy that has fabric and paint “clearly separating” them from Types I and II NAA. While only shoulder fragments have been recovered, Catling suggests that they may be from the Thessalo-Euboean region and date to the 10th/early 9th century, thereby belonging to the Transitional types. If this is truly the case, which is highly speculative, then these imported NAAs may represent a continued tradition of production in central Greece.

The only areas where NAA finds increase are Thessaly and Macedonia, including the Chalkidike. Catling (1998, 171) suggests that Thessaly was the prime source for Transitional NAAs with simultaneous local production beginning at Mende and Torone. At Torone, however, a large number of seemingly Transitional NAAs have been chemically and petrographically analyzed. The results suggest that these are indeed locally produced (Papadopoulos 2005; Gimatzidis 2010, 263). Until other chemical or petrographic analyses have been conducted for Transitional NAAs, it will be nearly impossible to say where else they were produced. Currently,

however, sites in the Chalkidike present us with the most conclusive evidence since excavators have macroscopically (Mende), chemically, and petrographically identified the ceramic fabric as local. The presence of NAA producers in the Chalkidike would not be surprising since this region of Greece was relatively unaffected by the Mycenaean palatial collapse occurring in the south. Indeed, it seems that northern Greek regions flourished during the Early Iron Age and maintained a high level of agricultural production and trade (Papadopoulos 2005; Tiverious 2008; Mazarakis Ainian 2011, 2012).

Type II NAA Characteristics

At some point in the Middle Geometric II period (mid 9th century B.C.E.), the Transitional NAA acquired all of the characteristics of a Type II NAA and remained a relatively static shape for more than a century, until NAAs disappeared entirely at the end of the Late Geometric period or the second quarter of the 7th century (though this date is still uncertain; Catling 1998, 170). The peak of their production and period of their widest distribution was reached in the second half of the 8th century B.C.E. The main novel features of Type II NAAs include a projecting, nearly flat lip with everted rim, and a short and wide neck that has a “distinctive bulge immediately below the rim at the level of the handle attachment” (**Figure 18**; Catling 1998, 166). Other features are generally the same as Transitional NAAs: biconical or oval body; lower foot ring; strap handle with a broad central ridge between shallow grooves; a ridge on the neck. It has been postulated, however, that some Type II NAAs may not have been wheelmade but rather by the coil technique (Kotsonas 2012, 158). Type II NAA decoration retains the same basic components of the past types. Two bands run along the neck ridge, the shoulder continues to have a group of bands (one wide and three narrow) as well as two band groups around the lower part of the body (three bands each). The painted lines on the handles extend at the join to the neck in a curve and

at the joint to the shoulder in a loop. One major innovation for Type II NAAs is their manufacture in two sizes: a larger and a smaller version. The larger Type II is far more common with a height of about 60 cm and a capacity of about 50 liters. The smaller version has a height that varies between 35 and 40 cm. The choice of motif in the shoulder zone seems to be related to the size of the vessel. Smaller amphoras are decorated with cross-hatched triangles, whereas larger amphoras continue to be decorated with concentric circles or semi-circles (circuits fluctuate between 7 and 11, but usually 8 or 9), normally in sets of three (Gimatidis 2010, 259). The specific reason for two versions of Type II NAAs is unknown, yet there may be some distinction in their consumption and deposition practices, which will be discussed below (i.e. funerary vs. commercial). This distinction may have already existed before the Type II manifestation, as demonstrated by the belly-handled versions recovered from Torone and discussed above.

Type II NAA Production Location(s)

The production location(s) for Type II NAAs has received much more attention than the previous versions of the shape, probably due to their presence in many recently excavated sites in Macedonia and the Chalkidike. One site in particular, Sindos, has been extensively published in a recent volume that includes a long discussion of petrographic and chemical analyses conducted on these and other ceramics. Unlike Type I and Transitional types, most examples of Type II, both large and small, can be assigned to one big production group with very specific technological features, what Gimatidis (2010, 260) has termed group K 19. Ceramics from Sindos were analyzed using a X40 stereoscopic microscope with the result that 30 large fabric categories of wheelmade pottery existed at the site (Gimatidis 2011, 98). The core feature of K 19 is coarse clay with a high proportion of quartz, often with large grains, used by potters to

control the formability. The fabric (K 19) for these NAAs was already known since the SubPGIIB/MGII period, possibly originating from Mende or Toumba Thessaloniki (Gimatidis 2010, 261). Yet the first time it was used for NAAs with consistent shape, decoration and, under certain circumstances, capacity, was in the 8th century B.C.E. (Gimatidis 2011, 101). This implies that the region producing pots with this clay fabric only started producing NAAs in the 8th century, thereby implying the movement of NAA production regions over time.

The fact that two types of Type II NAAs were produced with the exact same technology with the same pattern for a very long time “testifies to a kind of specialization of ceramic workshops that produced these products en masse with the aim of meeting a large demand” (Gimatidis 2010, 267). Based on high concentrations of Type II group K 19 vessels, these ceramic workshops may have been located somewhere in the north Aegean Sea, especially in the area of the Thermaic Gulf (Gimatidis 2010, 262). This suggested production zone is supported by additional chemical and petrographic analyses by Kiriatzi et al. (2013). Tests conducted on nine NAAs from Methone suggest the presence of four clearly distinct ceramic fabric groups, all deriving from the region around the Thermaic Gulf (Kiriatzi et al. 2013). The presence of related Type II NAAs at sites that had previously produced Transitional NAAs (Mende and Torone) suggests the continued local production of these vessels alongside imports from farther north on the Thermaic Gulf, which Gimatidis (2010, 264) believes would have originally come as commercial vessels. At Sindos the highest number of Type II fragments has been recovered, including a belly-handled version with two vertical handles on the shoulder (also recovered much earlier from Torone in the EPG) and a few fragments from other forms using K 19 fabric (open vessels; Gimatidis 2010, 263). In support of a Thermaic Gulf area of production, Kotsonas (2012, 159) reports that petrographic analyses at Methone show that most but not all

NAAAs at Methone have fabric that could derive from the east coast of the Thermaic Gulf, though probably not from Methone itself. Contrary to, or in conjunction with, the Thermaic Gulf production location is the suggestion that Type II NAAAs were also produced in or around Troy. Hertel (2003, 129) does not believe the existence of calcareous clay enough to prove Type II NAAAs originate in Macedonia. He suggests that this clay is also presents on Lesbos and areas of Asia Minor. He surmises that “The amphoras belonging to Group II on Thasos could otherwise come from Troy, and in them there would have been Trojan products and transported from the Troad. This is supported by the characteristics of the Thasian pieces, but also two details of the *Iliad*, which assume for the time around 750 or even earlier a lively (wine) trade between Lemnos and Thrace and the Troad” (Hertel 2003, 131).

Die zur Gruppe II gehörenden Amphoren auf Thasos könnten im übrigen durchaus aus Troia gekommen sein und in ihnen hätte man troianische Produkte dorthin und thasische in die Troas transportiert. Dafür sprechen nicht nur die Merkmale der thasischen Stücke, sondern auch zwei Angaben der Ilias, die für die Zeit um 750 oder auch schon früher einen regen (Wein) Handel zwischen Lemnos bzw. Thrakien und der Troas voraussetzen.

While this hypothesis is interesting, more research and scientific testing is needed to determine the origin of the Type II NAA sherds from Troy. It is certain, however, that NAAAs from Karabournaki, Thasos, and Troy all differ in fabric, alluding to at least three production locations for Type II NAAAs (Kotsonas 2012, 159). At this point, the analyses conducted on examples from the excavations of Sindos and Methone are the most reliable and should therefore be used as a starting point for the production locations of Type II NAAAs, specifically the Thermaic Gulf.

Much work is still needed to clearly delineate the production locations for all three types of NAAAs. As it stands, the archaeological evidence does not support any one location for Type I or Transitional NAAAs. Petrographic and chemical analyses have confirmed local variations at Torone and Mende, but it is entirely possible that other production locations existed. Type II

NAAAs are on more solid ground, as they have been the focus of multiple analytical projects. The confirmation that Type II NAAAs were most likely produced at multiple locations around the Thermaic Gulf does not come as a surprise. Indeed, it may eventually be confirmed that this region was the production location for NAAAs throughout their entire existence. In general, the agency of North Aegean actors has tended to be overlooked in favor of their neighbors farther south, when in reality settlements in the North Aegean seem to have prospered throughout the Early Iron Age, completely unaffected by the Late Bronze Age “collapse.” Alternatively, it is possible that production locations for NAAAs will be shown to have shifted throughout the Early Iron Age. In this case, as the NAAAs and their products spread around the Aegean, the technological qualities of these containers might have been subsumed into preexisting ceramic traditions that then adopted the shape to store/ship local products.

North Aegean Amphora: Shifting Distribution Networks

Introduction

To understand better the role of North Aegean amphoras within the Early Iron Age economy and their relationship to changing social factors, we must try to distinguish the networks along which they traveled and the patterns they created over time. This section provides an in-depth look at the data available for NAA distribution networks and how these interactions changed between Type I, Transitional, and Type II production styles, as they are currently defined. It is fully acknowledged, however, that as this typology is refined, vessels belonging to a particular group may be shown to overlap with another.

Networks, whether social and/or commercial, are the best indicator of object-people interactions, and in this case, oil and wine distributions (Knappett 2012; Malkin 2011).

Production centers for Late Bronze Age TSJs are much better studied and data on their locations were easily accessible from published excavation reports. These data made the patterns of TSJ distribution networks much easier to distinguish vis-à-vis producer-consumer interactions and the commercial connections between geographic locations. Unfortunately, for the Early Iron Age NAA, the little information available from provenance studies, including chemical and petrographic analyses (as outlined above), provides little help when trying to view distribution patterns. It is necessary, therefore, to take a slightly different approach in this chapter and examine the evidence for NAA distribution networks from a diachronic perspective, rather than a geographic perspective. This approach is, however, not without its own pitfalls, especially when approaching the so-called “Transitional” NAAs, since much work remains to be done regarding their chronology.

Additionally, because NAA production centers are not well known, and consequently cannot be compared to find contexts, it must first be determined that NAAs were used for the trade of liquid commodities at all. It could be possible, for example, that they were made locally and used locally (as has been shown for some examples at Torone). I will therefore first examine the evidence for their use as specifically transport containers through the presence of commercially oriented potmarks, applied both before firing and after firing. I then discuss some possible patterns in distribution of Type I, Transitional, and Type II NAAs and how these patterns change overtime, possibly reflecting economic or social decisions within the contexts of the broader Aegean and Mediterranean region. Finally, I examine the evidence for the specific agents involved with the movement of Type I, Transitional, and Type II containers and their contents.

Evidence for Trade: Markings on North Aegean Amphoras

Marks placed on pots, both before firing and after, can signal a number of meanings, none of which can ever be absolutely certain. As discussed above, pot marks can signal the involvement of particular actors in the transport of goods, lending a commercial connotation to otherwise unmarked pots. Early Iron Age pot marks are more enigmatic due to their fewer numbers and inconsistency in both location and symbol. The most comprehensive examination of pot marks in the Early Iron Age came to the conclusion that they may have been used by the potters themselves to distinguish particular orders (Papadopoulos forthcoming; 1994). Evidence gathered over the last fifteen years has added to the number of pot marks, as well as the repertoire of marked pots. Pertinent to this discussion is the discovery that examples from all three types of NAAs were marked either before or after firing, demonstrating a degree of organization to the patterns and nature of commercial activity in oil and wine (Catling 1996, 130). Pot marks on Type I NAAs have been found at the Toumba cemetery at Lefkandi and at Troy. The best preserved amphora from Troy has two marks incised after firing on the belly (Catling 1998, 151). The marks themselves do not conform to the marking system present on local Trojan vessels and may therefore represent an import. The amphora found on pyre 11/12 at Toumba cemetery at Lefkandi is dated to ca. 950 B.C.E. and also has two post-firing incised marks, one on each handle (Catling 1996, 128). These marks do not conform to local Euboean-style marks. Since both the Trojan and Lefkandian amphoras are considered imports and both have incised signs, they could plausibly be treated as commercial marks (Catling 1998, 165). In addition, the presence of two sets of marks and the differences in their execution may indicate that the amphora had been involved in more than a single episode of exchange (Papadopoulos

1994; Catling 1996, 128). The gap of 50-100 years between the Trojan and Lefkandi examples further demonstrates the long-term use of pot marks for commercial means or identification.

Pot marks are also present on so-called Transitional NAAs. Unlike Type I examples, the Transitional marks are painted before the vessel was fired. Published examples include a cross painted on the neck of an NAA from Kastanas, another from Kastanas with rows of dots next to the handle, a cross painted on an NAA from Chloe, and a vertical row of dots painted on an NAA from Iolkos (Gimatidis 2010, 265; Papadopoulos 1994, 446 A38, pl. 113.f). Support for these marks having a commercial meaning comes from their find contexts in settlements, as opposed to cemeteries, however it is impossible to distinguish their exact meanings (Papadopoulos 1994, 463). The application of the marks before firing might suggest that the purpose of the pot (or its contents) was already decided as the pot was created. This is in contrast to incised post-firing marks that have the impression of being an added piece of information to an already existing communication code. Based on current data, it seems that pot marks were not the rule for transitional types of NAAs. Gimatidis (2010, 267) speculates that this is because there was a general lack of uniformity in shape, size and decoration of the pots themselves so that, although they were probably used as commercial vessels, the market did not require the application of pot marks to distinguish between different varieties or production location (as they did for Type II, see below).

Pot marks, both pre- and post-firing, are by far most prevalent on Type II NAAs. As the vessel became more standardized in size, shape, and decoration, pot marks seem to have been more common. Indeed, pot marks exist on nearly every preserved Type II NAA. Gimatidis (2010, 264) posits that the pre-firing marks must have been made by the potters and have to do with the use of the vessels, essentially standing for a communication code since all the other

features of Type II NAAs were standardized. There is a wide repertoire of pre-firing painted marks positioned on the neck, body and handles. The signs on the neck are generally larger than those painted on the body. The most common painted marks are sets of dots (similar to the Transitional example from Kastanas).

Post-firing marks were probably intended for some stage within the process of the sale of the vessels since they are found on sherds from different locations in the north and north-western Aegean. They are mostly located on handles and include simple symbols or lines. A unique mark found on a number of NAAs is a small, drilled pit(s) on the handles (Gimatidis 2010, 266). The standardized nature of NAAs may have made pot marks necessary for the dealer to distinguish particular shipments, customers, or production regions. The marks do not seem to designate capacity, since there is no correlation between size and the marks themselves, nor do they seem to show contents as the repertoire of marks is too large (Papadopoulos 1994; Gimatidis 2010, 267). Just as pot marks on Type I NAAs, in cases where more than one post-firing mark is present, it is likely that the vessel has changed its contents or owner at least once (Gimatidis 2010, 268; Kotsonas 2012, 162). The presence of pot marks on all versions of NAAs, spanning over 300 years, shows that these liquid containers were continually designated as transport containers involved in a multi-tiered commercial network. Based on the current available evidence it seems that over time, as the vessel itself became more standardized, pot marks became more prevalent. These may both be indications of an increase in the complexity of the oil and wine industry and the various actors involved.

Regional Trade Connections for Oil and Wine

This section explores the possibility of discerning the networks along which NAAs of each type traveled. Particular attention is given to the volume of NAAs found in various locations in

conjunction with the distance from possible production locations. Because specific production locations have yet to be unquestionably identified, it is necessary to pay attention to patterns or similarities in specific decorative or formative features of the vessels. This especially pertinent during the circulation of Type I and Transitional Type NAAs, when their specific morphology seems to be rather unique and not as standardized as in the following Type II period. The presence, therefore, of the same details on vessels found at different locations could perhaps signify some sort of relationship within a shared ceramic tradition.

Type I NAA

Before delving into Type I NAA distribution, it is important to recognize first the basic implications for the social history of Greece in the Early Iron Age. The presence of these containers in both Greek and coastal Asia Minor settlements, whether produced in one or the other location (or both), proves the existence of a network of social interaction across the Aegean as early as the Early Protogeometric period. Consequently, we must come to the conclusion that either these networks continued from the Bronze Age, or that they were re-established by people during this period. Either way, we are left with the important realization that Early Iron Age Greeks were active agents in an Aegean-wide network of agricultural commodities (probably wine or oil), not just finished objects.

Just how intricate this network of interaction was at this early time can be illustrated by the distribution of Type I NAAs. Based on the available published data, it seems that there were three major areas involved with Type I distribution. The first is a cluster of sites in central Greece, but specifically the coastal region connecting Lokris, Boeotia, and the island of Euboea (Map 8). While the (identified) numbers are not large since most examples of these containers are very fragmentary, the number of sites involved is perhaps more significant (Table 3) and

includes the cemetery at Elateia (10), the large site of Kynos (1+), the sanctuary of Kalapodi (1+), Atalanti (1), Mitrou (2+), Agnanti (1), and Lefkandi (4+ in Toumba and fragments from Xeropolis; Catling 1998). The second region includes coastal sites to the north of this region in Thessaly also produced low numbers of Type I NAAs during this time period (Table 3, Map 8) including Iolkos, Volos/Kapakli, as well as sites in Macedonia and the Chalkidike, such as Sindos, Thessaloniki Toumba, Kastanas, Assiros, Sane, and Mende (Catling 1998).

The third major area to receive Type I NAAs is the north-west coast of Asia Minor, specifically the site of Troy, with smaller numbers at Clazomenai and possibly Pergamon and Ephesos (Table 3, Map 8). Over the course of a century of excavation at Troy, Type I NAA fragments have been discovered in almost every part of the citadel. At least 68 fragments of Type I NAAs have been recovered and recorded (likely many more lost). At Clazomenai, more than seven examples have been recovered in recent excavations on the floors of houses and in pits outside. As mentioned with reference to their production, these pots are argued to be locally made. In addition, the two pots recovered from Pergamon have also tested as locally made, but on close inspection there are significant morphological differences from the typical Type I NAA, suggesting a local variant (**Figure 19**). In addition, the island of Lemnos produced high numbers of Type I NAAs, possibly as many as 30 or more (Cultraro 2004; Danile 2009, 323, fig. 27). The high number of fragments from Troy may be explained by the size of the site and the volume of excavations undertaken there. It is true, however, that NAAs are by the far largest group of imported PG/Sub-PG vessels found in the settlement. It is possible that many sites in Greece and elsewhere have only been partially excavated with the result that the volume of material recovered is much less and the identification of a mostly plain coarseware container very difficult to detect. Nevertheless, these three clusters of Type I NAA distribution, in coastal

central Greece, northern Greece, and the area around the Troad, suggest a general distribution pattern moving between east and west across the Aegean Sea. Based on the high number of vessels found, Lemnos may have acted as a way station or stopping point along the way (Map 8). This movement ultimately may have lead to settlements producing their own versions (such as Pergamon and Troy itself) if the chemical analyses are accurate.

While it could be argued that these three regions were merely part of the same stylistic koine focused on concentric circles and amphoras, there are a few instances of similarities between specific vessels that should be further examined. Three vessels, one from Troy, one from Clazomenai, and one from Elateia, have a nearly identical body shape, decoration, and formation technique, thereby suggesting that they were perhaps produced in the same workshop or derive from the same tradition (**Figure 20**). Specifically, each have two sets of double banding and concentric circles with straight lines between. The only difference is that the Elateia example has five concentric circles (if copied accurately) and the other two have four. Rim shape is also exactly parallel and so is the style and size of the base. These identical features are all the more striking when we take into consideration the general lack of conformity for Type I NAAs (unlike the following Type II).

A few other groups of vessels have stylistic similarities that could possibly suggest their production within a common ceramic tradition or perhaps more speculatively within workshops familiar with each other's work. The most identifiable aspect of a NAA is its shoulder decoration, which is consequently the area most commonly saved and recognized. This type of pattern may be seen by an example from Lefkandi Xeropolis, three from Troy, fragments from Clazomenai, and possibly a whole pot from Elateia. Each demonstrates a very similar artistic approach including four concentric circles, very nicely executed, with dots in the center. The

lines between the two circles are four in number with tight waves (**Figure 21**). Since there is no standardized decoration for Type I NAAs, these stylistic similarities may act to highlight particular nodes of a network for these vessels. In this case, these nodes are complementary to the three identical vessels discussed above, namely, central Greece/Euboea, Troy, and Clazomenai.

Transitional NAA

The distribution of Transitional NAAs is much more difficult to discern since examples are few in number and their attribution as Transitional is mainly based on style. Using currently available evidence, it can perhaps be said, however, that the distribution network during this interim time period is very different from the previous Type I NAA (Map 9). Sites on the coast of Asia Minor, including Troy, no longer seem to be connected to the NAA trade network, although this may be due to a lack of excavation data for this time period or published examples of Transitional NAAs. At the same time, it seems that NAA distribution in Greece shifts northward. Transitional NAAs are not found in the coastal areas of Lokris and Boeotia, though there does seem to be one example at the cemetery of Lefkandi. At this point, the same pattern observed for Type I NAAs (a large cluster of many sites, but few number of vessels) is seen in Thessaly (Table 3).

Specifically the sites of Pyrasos, Pherai/Chloe, Marmariani, Skyros, and Iolkos each have produced at least one Transitional NAA (Catling 1998; Gimatzidis 2010). In addition, sites in Macedonia and the Chalkidike increase in Transitional NAA volume. Sindos has at least six examples and the cemetery of Torone has at least six as well (though many more belly-handled examples). These vessels are smaller than the following Type II and do not have regularized features. Yet their presence in the Torone cemetery may lead us to question whether these particular examples are part of the same NAA tradition as elsewhere.

In general, Transitional NAAs do not produce an obvious network of trade and interaction. It is difficult to understand what trends are occurring since their production locations are so obscure. A possible pattern, based on current typological considerations, suggests that Transitional NAAs moved in a more south-north trajectory than the previous Type I and are more or less confined to trade or movement within Greece (Map 9). Based on published data, it also seems that the network has decreased in intensity since only a few examples of Transitional NAAs have been recovered from each site. As Transitional NAAs start to adopt the characteristics that become regularized under Type II NAA manufacture, their distribution seems to consolidate around the Thermaic Gulf and northern Thessaly. This concentration may be the first step towards standardization and regulated networks of exchange, whereas Type I NAAs may have traveled along more informal networks. Of course, this shift from west-east network movement during Type I production to south-north network movement with Transitional NAAs happened over a very long period of time (around 100 years) and may therefore only represent the spread of NAA ceramic technologies and stylistic attributes.

Type II NAA

The distribution patterns associated with Type II NAAs are much easier to discern through the archaeological record. This accessibility has to do with an increase in the number of pots produced during the LG period, an increase in their identification within the archaeological record, and an increase in their rate of publication. Unlike Type I and Transitional NAAs, Type II NAAs are highly standardized in both size and decoration. Coupled with the dramatic increase in numbers of pots and sites at which they have been discovered, as well as the common use of pot marks, it is clear that Type II NAAs were part of a large and complex distribution network, especially when compared to other north Aegean products or any transport closed shape of the

same period (Gimatzidis 2010, 262). This distribution network involved, once again, settlements in coastal Asia Minor, but also extended the NAA boundary into the western Mediterranean (Maps 10 and 11). Since Type II NAAs were most likely produced at one or more locations near the Thermaic Gulf, the renewed connection with Asia Minor suggests a healthy commercial network moving west to east (Table 3). Thasos, an island located approximately halfway between the two regions, has produced a “large number” of Type II NAA fragments in the port/settlement context (Gimatzidis 2004). Moving east from that location, at least 30 fragments of Type II NAAs have been recovered in multiple settlement contexts within the citadel of Troy (Lenz et al. 1998). Additionally, one pot has been identified on Lesbos (Pyrrha) and Type II NAAs have been recovered from Samos (Gimatzidis 2010, 262 n. 1603). A new node in the NAA network was created in the western Mediterranean by the addition of Pithekoussai to the distribution list (Table 3, Map 10). Here, two NAAs have been recovered from the cemetery, and one from the acropolis (Gimatzidis 2010, 262 n. 1603). Since only a very small percentage of the colony has been excavated, we may expect to find many more Type II NAAs, which would add to the strength of the complex distribution network of the Late Geometric/Early Archaic period.

Type II NAAs were once again included in a network moving from Macedonia down a southern route and are found in larger numbers at Eretria and Lefkandi on Euboea (Map 11). This suggests an intensified connection, at least in the oil and wine trade, with cities in the southern part of central Greece, an area that was perhaps disconnected from Transitional NAAs. The distribution networks of Type II NAAs, therefore, comprised an extended west-east trajectory as well as a north-south trajectory. This may provide evidence for the use of trade networks that had previously been established or maintained by Type I and Transitional NAA networks.

While Type II NAAs had a very wide range in their distribution, it is also clear that they were distributed locally in the areas of central Macedonia, Thessaly, and the Chalkidike (Map 11). Because of the high standardization of these vessels, it is difficult to determine which locations might have been connected by way of vessel similarities (as with Type I NAAs). However, there may be two slight variations in Type II NAA production that could signal either different production locations, or, possibly, a change over time. The one variation has more of a biconical body and a taller neck, while the other is more oval (egg-like) with a shorter neck (**Figure 22**). Both are found at the large settlements of Kastanas and Sindos, but it is possible that one variation was a product of one site, and the other produced at the other site, suggesting an inter-site commercial network. In support of this smaller, but intense network in the north Aegean, the site of Iolkos has produced at least 900 fragments of “clearly imported” Type II NAAs, though Sindos is supposedly has the highest number of these vessels (Catling 1998, Gimatzidis 2010). The list of sites in the Thessaly/Macedonia region with a few examples of NAAs (both published and unpublished) is very long (Table 3) but includes Volos, Assiros, Marmariani, Thebes, Leivithra, Halos, Thessaloniki Toumba, Polichni, Methone, Acanthos, Archontiko, Nea Philadelphia, Aspros, Sariomer, Gona, Agrosykia, Perivolaki, Aphytis, Kochei at Neos Marmaras, Eion/Amphipolis, Kavala, Leukopetra, Neochori, Sfindami, Kranie at Platamon, Nea Nikomideia, Gallikos, Axiochori, Argilos, Edessa, Lebet Table, Kritsana, Therme, Nea Kallikrateia, Olynthos, Perivolaki Lagada, Sane Pallinis, Aphytis, and Mende (Map 11; Gimatzidis 2010, 375; Kotsonas 2012, 154 ff). Where the sherds have been published, however, there are normally fewer than three listed. One site that should be promising in future publications is Karabournaki, where at least two Type II NAAs are published (but probably many found), one in front of an oven (Tiverios 2009; Manakidou 2010). The site has also

produced a large number of pottery workshops. Most interesting is the identification of large wine making installations throughout the site and large quantities of archaeobotanical evidence for grape pressing (Tiverios, Manakidou, and Tsiafaki 2003, 193). It is possible that this site was a bottling location for the wine shipped in Type II NAAs, which “serve for the overseas promotion and marketing of “Thermae” wine” , “...να χρησίμευαν για την υπερπόντια προώθηση και την εμπορία του "θερμαίου" οίνου” (Tiverios, Manakidou, and Tsiafaki 2003, 193).

Nodes in an Economic Network

The distribution networks outlined above detail the location and volume of NAAs over time, displaying patterns of connections between different areas. Distribution networks do not, however, automatically convey the nodes, or actors, within an economic network. Basically, we must still address, to the extent that we are able, the question of who the agents were that physically moved these amphoras from their place of production to their place of deposition. The social context of NAA production and distribution, outlined at the beginning of the chapter, will aid in reconstructing the various people involved in the transportation of bulk liquids during the Early Iron Age. Over the course of NAA production, from the 11th to the 7th century B.C.E., different agents would have been involved in the shifting distribution networks, thereby acting on various levels of exchange, from simple reciprocal gift exchange to commercial enterprise. Based on the information available at this time, it is impossible to reconstruct in detail the modes of exchange involved with NAA distribution networks. However, in the following discussion, I would like to attempt a few hypotheses about the agents who were actively involved with Type I, Transitional, and Type II NAA distribution.

Type I NAA

During the Postpalatial period, major shifts in population density and settlement occupation led to the virtual abandonment of the Argolid as a center of commercial and social development in favor of coastal Lokris, coastal Boeotia, and Euboea. This concentration of wealth and organization is most apparent at the sites of Lefkandi, Kynos, and the sanctuary of Kalapodi. Perhaps not coincidentally, this same area has the highest concentration of Type I NAAs during the Early Protogeometric period. This may suggest that Type I NAAs were fabricated to store and transport oil or wine made by these regions. If this is the case, then it is possible that local elites, who are trying to consolidate power and legitimize their rule, established or maintained trade connections left over from the Bronze Age. It is well known that elites of this time period associated themselves with ventures overseas, contact with eastern people, and the control of metals (Crielaard 2006; Mazarakis Ainian 2006). Added to this list may be the control of agricultural surplus, and specifically, high-status and expensive agricultural surplus like oil and wine. Both of these commodities require an organized labor force and constant attention during the growing season, suggesting that people capable of organizing these activities were ultimately involved with their trade and distribution.

Whether these elite people actually moved NAAs from one location to another is impossible to determine. An alternative would be that NAAs moved along networks that were connected by trade patterns eastward to Asia Minor. Another possibility is that Type I NAAs, while controlled and produced under the auspices of Greek nascent elites, were shipped by outside merchants, such as Phoenicians or Cypriots. The debate over whether Euboeans or Phoenicians were the major carriers of goods during the Protogeometric period is well known and will not be recounted here (Papadopoulos 1997, Ridgway 2007, Lemos 2005). It is probably

safe to say, however, that Type I distribution was intimately associated with the continued social connections between Greece and the coast of Asia Minor where emerging Greek elites perhaps wanted access to settlements like Troy, which operated as a center for the exchange of goods and commodities from the Black Sea, north-west Anatolia and eastern Balkans (Catling 1998, 163; Cultraro 2004, 224). This suggestion is hindered, however, by the dearth of other ceramics at Troy imported from these regions of Greece.

Transitional NAA

During the transitional phase of NAAs, the distribution network shrank considerably and was basically limited to relatively local movements within central and northern Greece. The actors involved with their distribution are consequently very hard to discern. Since the network is so curtailed, elite overseas entrepreneurs may not have had such a major role as in the distribution of Type I NAAs. Only very few Transitional NAAs have been found off the Greek mainland, suggesting that trade of oil and wine overseas, at least using NAAs, was halted for a few years, or at least greatly diminished. Alternatively, we may now be dealing with more localized gift-exchange or commercial transactions on a smaller scale. This is perhaps supported by the presence of locally made NAAs used within the cemetery of Torone on the Chalkidike. It is also possible that these amphoras did not have a commercial nature at all during this period. Instead, the Torone examples may suggest their use within the domestic (and later funerary) realm, paralleling the use of neck-handled and belly-handled amphoras in funerary contexts of other regions, such as Attica (Papadopoulos 2005).

Type II NAA

Type II NAAs probably moved along multiple networks with different driving factors. First, the agency of north Aegean people cannot be ruled out for the intricate distribution network within the Northern Aegean itself. Specifically, the North Aegean acted as a middle ground involving numerous actors from multiple regions. Indeed, this region is the single common denominator between all three types of NAAs. The vast amount of Type II NAAs discovered on Thasos and at Troy may imply a separate network that connected the west and east sides of the North Aegean Sea. A developed Type II NAA found in the sea off the coast of Thessaly hints at a larger sea-born trade of oil and wine using these containers. In addition, the presence of pot marks on most Type II NAAs suggests an organized system of commercial connections with middlemen acting as intermediary nodes within an established network. Another possibility, therefore, is that independent merchants were major factors in the distribution of Type II NAAs. Kotsonas (2012, 161-2) believes that these actors were most likely Macedonians themselves, and not Euboeans, because the graffiti on the vessels do not conform to Euboean graffiti on contemporary vessels. Specifically, the graffiti on NAAs are not alphabetical at all, and instead seem to match some graffiti on Samian amphoras from Methone.

Second, Type II NAAs might have traveled along colonial or commercial networks. Gimatzidis (2010, 962) suggests that the lowest common denominator between the northern Aegean and Italy was Euboean commercial activities. In support of Euboean involvement with Type II NAA production and distribution is the fact that when Euboean commercial enterprise dramatically declined at the beginning of the 7th century (possibly because of their civil war) the NAA disappears entirely. Alternatively, NAAs may have been carried along commercial networks by outside agents, perhaps the Phoenicians. As will be discussed below, Phoenicians

had a long tradition of commercial activity around the Mediterranean, not least in the North Aegean and certainly at Pithekoussai. It is most likely, however, that NAAs moved along multiple commercial networks that involved traders from different origins, including indigenous. Based on the evidence from the site of Karabournaki, it seems that large-scale wine production was already a major industry for Macedonia and the Chalkidike, an industry that would only grow in the next centuries, even after the abandonment of NAAs.

North Aegean Amphora: Consumption Patterns

Examining the consumption of North Aegean amphoras, or, “how people socialized” these containers, is integral to our understanding of the oil and wine industry in the Early Iron Age and how these consumption patterns are different from those in the previous Bronze Age. This section, therefore, attempts to consider the specific contexts within which NAAs have been found and what that means for the perceived value of oil and wine (and these containers) at this time. Specifically, I investigate the consumption of Type I, Transitional, and Type II NAAs and their contents by identifying specific local patterns of use and demand (Dietler 2005). As with TSJ consumption, I will use Dietler’s (2005) five parameters for understanding consumption of goods: context of consumption (settlement vs. mortuary vs. ritual); kind of sites (elite vs. common); patterns of association (with other objects in certain contexts); relative quantitative representation (within sites and regionally); and spatial distribution (within sites and regionally). Here, I will use these parameters to examine NAA use diachronically to compare how the treatment and value of these vessels and their contents changed over time, as related to their three morphological divisions as we currently know them. The contextual data used and the relative quantitative representation of NAAs is based solely on published material, thereby presenting the archaeological record as we currently know it. Hopefully as more sites are

published and NAAs are recognized in the archaeological record, these consumption patterns will be elaborated upon. The pattern of transport vessel consumption that emerges is of a constant dual nature. While NAAs are continually treated as valuable objects (both in settlements and cemeteries), their utilitarian aspect as a commercial container fluctuates over time. The analysis of NAA consumption, when compared to TSJ consumption, presents an interesting picture of continued traditions that are variously accessible to different people over time.

Type I NAA Consumption

The context of consumption for Type I NAAs is mostly divided between settlements and cemeteries (Table 4, Map 8). Specifically, five settlements have produced over 75 pots, and four cemeteries produced over 15 pots. In addition, Type I NAAs have been recovered from one sanctuary, though it is unclear exactly how many have been found. In terms of kinds of sites, it seems that the settlements where Type I NAAs are found are generally large centers, at least for the Early Iron Age, and include Lefkandi, Kynos, Mitrou, Troy and Clazomenai. Each of these settlements has produced evidence for large, apsidal buildings or continuation of LBA citadel occupation (as at Troy). Additionally, these sites have been associated with metalworking and interregional trade networks, suggesting a high level of connectivity, even in the early stages of the Protogeometric period (Lemos 2002). This may suggest that during the first phase of NAA production, the vessels and their contents, were restricted to elite consumption, or at least elite regulation, similar to the Palatial LBA TSJ. Of course, the scale at which these jars were consumed is much smaller and the size and complexity of settlements at this time had changed considerably.

In addition to settlements, Type I NAAs are also found in cemeteries as grave gifts (not urns). The cemeteries where these pots are found, like the settlements, seem to have been large

and characterized by a generally high amount of relative wealth. In particular, we may highlight the cemetery of Elateia where chamber tombs had been used for multiple generations, extending into the LBA (Deger-Jalkotzy 1999). Many of those interred were buried with precious metal objects and heirloom pieces, including imports (Deger-Jalkotzy 1999). Type I NAAs have also been recovered from the cemetery at Lefkandi, including inside the fill for the Heroon/Toumba building and Pyre 11/12 (Catling 1996). The other cemeteries where NAAs were found only produced one or two vessels and the relative wealth of the graves is hard to discern. Only one ritual site produced evidence for the consumption of NAAs, and that is the sanctuary of Kalapodi. This sanctuary seems to have been a regional place of worship that received offerings from multiple areas in central Greece. Therefore, it may be characterized by a high amount of wealth at this time and connections to regional elites. Following the pattern produced by consumption of NAAs within settlements, it seems that Type I vessels were relatively confined to the graves of elite or wealthy individuals as well as high-ranking sanctuaries.

In terms of patterns of association, Type I NAAs are recovered from buildings that stand out for their size and elaborate burials. For example, multiple Type I NAAs were recovered from the floor of a large apsidal building at Clazomenai, similar to that at Nichoria in Messenia. Associated with the amphoras were many spools for weaving, as well as other drinking vessels (Aytaçlar 2004, 19). This suggests that Type I NAAs and their contents, within a settlement context, were highly valued and used in elite activities like feasting and possibly even weaving (as argued for LBA oil/wine as per the Linear B tablets). For NAAs recovered from burial contexts, they are either associated with important burials, such as the Toumba building and Pyre 11/12, or are used as a valued grave good. The latter seems to be the case for a burial in the Elateia cemetery where Tomb LXXXVII's last interment was only buried with a single NAA

(Deger Jalkotzy 1999, 199). The very early date of this burial (Submycenaean/EPG) may suggest that the first versions of NAAs were highly prized and therefore chosen as a burial gift. The contexts of these associations suggest activities such as feasting and weaving, but also probably storage. Many of these vessels found on the citadel at Troy were located in large groups within rooms of houses, suggesting a more domestic consumption.

The relative quantitative representation of Type I NAAs and their spatial distribution illustrate the prevalence of this object and its widespread or restricted use. At Troy, Type I NAAs were originally thought to make up 90% of the recovered PG pottery (Catling 1998, Lenz et al. 1998). However, recent evidence suggests that in fact there was a healthy local PG pottery production (Aslan 2002). If this is indeed the case, then Type I NAAs are generally a very small percentage of the PG pottery recovered from settlement and sanctuary sites. But certainly, Troy seems to have consumed a much larger number of Type I NAAs and their contents than all the other sites where these containers have been found. Spatially, Type I NAAs are clustered at wealthy households or tombs within sites. Regionally, they seem to be associated with coastal settlements, possibly indicating further their nature as a transport vessel. The patterns displayed here, using Dietler's (2005) parameters of consumption, may suggest that while the production and distribution of these amphoras display continued manufacture of oil and wine on a larger scale than subsistence, as well as its trade to other regions of the Aegean, the consumption of Type I NAAs demonstrates a restricted availability as a high-value item. The high-value placed on Type I NAAs during the EPG/MPG period is further demonstrated by an example found at Toumba Lefkandi, pyre 11/12. The pot, already demarcated as a status item by its association with this tomb, was actually an antique at the time of its deposition and had been repaired using lead clamps. Coupled with signs of wear on the interior surface, it is clear that this pot had been

used and its contents consumed prior to its reuse as a burial object (Catling 1996, 126). Its importance as an object in itself (and not just the contents) is demonstrated by its repair (and therefore not suitable for storing liquids) and subsequent reuse and deposition. It seems, therefore, that Type I NAAs had a dual nature that lead to two types of consumption. The first was a high-value utilitarian vessel that was restricted to upper class and used during feasts for the consumption of oil or wine. The second was its value as an item in itself and consequently consumed as a status object within the realm of burial goods.

Transitional NAA Consumption

Based on the evidence available, the contexts of Transitional NAA consumption are relatively equivalent to the previous Type I, except that pots are fewer in number and more spread out (Table 4, Map 9). Specifically, six settlements have produced more than 10 pots, seven cemeteries have produced more than 15 pots, and one sanctuary has evidence for the presence of Transitional NAAs. These contexts may be the result of a lack of published data for the Late PG period/Early Geometric period, as well as a concentration in excavations on tomb finds. As it stands, however, it seems that there was a decrease in the use of NAAs in settlement contexts, even though the number of sites that had access to them increased. In contrast, the use of these pots in cemeteries increased as well as their numbers. In term of the kinds of sites represented, Transitional NAAs are found at a mix of larger (Kastanas, Sindos) and smaller settlements (Troy, Neokaisaria Kastro, Phthiotic Thebes). The same pattern is seen for cemeteries. Some are large and wealthy (Torone, Marmariani), while others are smaller. This pattern may suggest that Transitional NAAs were not as restricted to wealthy elite, at the same time that their general consumption decreases. The one sanctuary that has produced Transitional NAAs is Poseidi at Mende on the Chalkidike.

The pattern of association with other objects and their contexts is very unclear for Transitional NAAs. It is certain, however, that they started being used as cremation urns in cemeteries, whereas the trend previously was only as a valued grave good. This may signal a shift in the perceived value of the vessels themselves during their reuse within the funerary realm. At the same time, their presence within larger settlements may suggest retention of some of their former value as elite goods, although this is currently unclear since many vessels are very fragmentary and their contexts unspecified. Again, as with Type I NAAs, their relative quantitative representation both within sites and regionally is very minimal when compared to local ceramic traditions. Towards the developed stages of Transitional NAAs, however, it is possible that their numbers were increasing, especially farther north in Macedonia and the Chalkidike. Ultimately this increase in their percentage of the ceramic repertoire culminated in the standardization and mass production of Type II NAAs. The consumption of Transitional NAAs is probably the least well known and documented. Based on the information available, however, it seems that there was a shift towards a funerary consumption and deposition where the pots themselves continued to be valued as status items, but on a broader scale. Additionally, their presence at more sites, though fewer in number at each site, may suggest a weakening of their restricted use.

Type II NAA Consumption

When Transitional NAAs developed all the characteristics of Type II NAAs they were subsequently standardized and distributed along multiple intricate networks that connect Asia Minor, northern Greece, southern Greece and even the central Mediterranean. Consequently, the consumption of Type II NAAs is better understood due to the increase in evidence available. The contexts of Type II consumption shift from relatively equal ratios between settlement and

cemetery, to heavy concentrations in many settlements (Table 4, Map 10 and 11). Specifically, Type II NAAs have been found at more than 20 settlements with 80+ pots published, but hundreds have been cited (e.g. Catling 1998 says 900 for Iolkos). In contrast, Type II NAAs have only been recovered from six cemeteries with only about eight pots published. Additionally, the only possible ritual context comes from the later sanctuary of Athena at Troy, but it is unclear whether it had acquired this status during the Late Geometric period.

Because of the vast number of sites that consumed Type II NAAs, there is a range of kinds of sites present. Just as the consumption of Type I NAAs, Type II are found in large numbers at large, wealthy, and industrial settlements, such as Eretria, Iolkos, Sindos, Troy, and Karabournaki. During this time period, a new class of settlement, the colony, starts consuming NAAs as well (Pithekoussai, Thasos). In addition, Type II NAAs are consumed at a very large number of smaller settlement sites where only a few examples have been published. The few cemeteries where large Type II NAAs have been found are mostly large, such as Marmariani, Mende, and Pithekoussai. It seems, however, that the smaller version of Type II NAAs are mostly found in cemeteries, which implies that they may have been made for a specific mortuary purpose (Catling 1998, 153). This may be the reason why large Type II NAAs are seldom found in burial contexts.

The patterns of association for Type II NAAs is rather unclear, but their predominant location in settlements, and in large numbers, may indicate that at this point NAAs were mainly viewed from a utilitarian perspective and consumed within a domestic sphere where the pots were valued mainly as containers of the liquids inside. That hundreds of fragments have been recovered from specifically coastal and island settlements, such as Iolkos and Thasos, may indicate their use as trade/transport vessels, more so than long-term storage. If they were used for

long-term storage we would expect to find them in the basements of houses or large buildings, possibly inland (as we do for LBA TSJs).

The relative quantitative representation of Type II NAAs within sites suggests that at this time, NAAs made up a large percentage of the coarse ware vessels at sites that seem to have specialized in the shape or in transporting the shape (e.g. Sindos and Thasos). But most sites have produced a few examples that constitute a very small percentage of the pottery, not unlike the previous two versions of NAAs. Regionally, Type II NAAs make up a large percentage of the coarse ware amphoras in the north Aegean, specifically central Macedonia and Pieria, as well as parts of Thessaly (Iolkos). Interestingly, however, there is a stark contrast between those sites that have hundreds and those that have only a few. This division may suggest that once again NAAs are restricted or regulated in some way.

It should be noted that outside the main region of Type II NAA production, these vessels seem to have been valued as objects in themselves, not just utilitarian containers. At Pithekoussai, two large Type II NAAs have been recovered in the cemetery, used as urns. One of these, no. 621, has been mended in antiquity by drilling holes down the breaks and tying the pieces together (**Figure 23**; Rotroff 2011). This type of mending would make the vessel unsuitable for liquid storage. Therefore, the vessel was valued for its own sake and used to bury the dead. It is possible, however, that this merely shows its utilitarian value, as a vessel large enough to hold the remains. Either way, it is clear that the Type II NAA had been subsumed into local categories of consumption as both a utilitarian transport vessel for large amounts of oil and wine, and as a burial container. The fact that Type II NAAs and their contents are consumed in such large amounts would suggest that by the Late Geometric period, surplus liquid commodities were also produced in large amounts and desired by many areas of the Mediterranean. One might

argue that by the time Type II NAAs were mass-produced, they certainly held wine, since this region was known for its variation of wine by the Archaic period.¹⁴ Additionally, after the Type II NAA stopped being produced, north Aegean wine continued to be very popular, especially Mendaian wine, but was transported in many different amphoras (Papadopoulos and Paspalas 1999). The Type II NAA, therefore, represents the solidification of northern Greek production and the entrance of Macedonia as a force on the market for bulk liquids.

Chapter Conclusions: NAAs and the Economies of the Early Iron Age

Although evidence for the production, distribution, and consumption of NAAs and their contents over their long period of manufacture is difficult to interpret, it is nevertheless important to try and discern the socio-political and economic conditions under which these containers flourished. It seems clear, moreover, that these economic conditions changed over time, from the Protogeometric to the early Archaic period. It is therefore impossible to say with any certainty by what means these goods travelled: were they traded within a commercial economy, or presented as gifts or tribute within a political economy? Or, is it possible that they could have functioned as offerings within some sort of sacred economy? Most likely, it was a combination of all three with the ratios between these modes of circulation changing over time.

The evidence presented here may suggest that at times, and especially in the Type II manifestation, NAAs functioned within a commercial economy. In a commercial economy, consumers acquired local and imported staple goods independently of any political or sacred obligation, simply as part of commercial transactions (Poursat and Knappett 2006, 158). That NAAs may have functioned within a commercial economy, at least partially, can be

¹⁴ Olive oil, however, was certainly produced in this region (Margaritis and Jones 2008).

demonstrated by their localized production strategy, secular distribution, standardization, as well as the continuation of these patterns from the Protogeometric to early Archaic period. In a localized mode of production, fabric sources of a particular type of vessel are variable between regions as the producers probably resided in many different communities, “serving the needs of their own villages and towns and perhaps a few close neighbors” (Keswani 2009, 112-113). Based on the data for all types of NAAs, they appear to have been produced at a number of locations throughout their existence, but especially in the Type I version. Type I NAAs may have been produced in the area of Lokris/Phokis, the Thermaic Gulf, Clazomenai, Pergamon, or even Troy. During the later Type II period of production, NAAs seem to have been produced in a more geographically restricted area, most likely the Thermaic Gulf, but based on fabric compositions, there were at least four different producers. A localized mode of production for NAAs coupled with their complicated distribution patterns, suggests that many regions produced local vessels, filled them with local produce, and shipped them to various other sites around the Aegean. In addition, NAAs had standardized decoration that remained consistent suggesting it formed some sort of “label” or identification method, most likely for their contents. Since the vessels were produced in various locations, the decoration could not have signaled where the NAAs had come from.

This commercial network must have fluxuated in intensity over time and was driven by various actors. By the time Type II NAAs were mass-produced, the commercial network had expanded and integrated into the early Archaic Greek colonial world, which itself was expanding. The concentrated region of production and standardization of shape and decoration of type II NAAs might suggest a more regulated commercial network. NAAs were still functioning as containers of surplus destined for trade and commercial interactions; however, their localized

production may in fact signal a change in the “branding.” During Type I and Transitional NAA production, the decoration may have been a sign of the type of commodity. At this later phase of production, it could be the case that the decoration signaled not only the type of commodity but also the region of production, like later Archaic and Classical amphoras.

NAAAs seem to have functioned along some sort of commercial economy throughout the time of their existence, except *how* they were consumed, their commercial value, changed. Type I NAAAs and their contents seem to have been consumed as prestige goods in that they are consistently found within large buildings in settlements. Also, they are found as *grave goods* within wealthy graves. Their use as an object to be placed within a tomb is significantly different from their later use as burial containers—an exploitation of their functionality as large vessels. That Type I NAAAs were nevertheless considered ultimately utilitarian (i.e. for holding large quantities of liquid) can be deduced from their association with feasting and drinking equipment within both a domestic and funerary realm. It is also possible that Type I NAAAs partially functioned as part of a political economy, in that they were given as high-status tribute to powerful people or political entities. While this may be the case, the localized production of Type I NAAAs, coupled with their consistent decoration, seems to suggest otherwise. In addition, there is some speculation that Type I NAAAs may have initially functioned as a type of tribute from Lokris to Troy, following the myth of the “Locrian Maidens” (Catling 1998, 164; S.P. Morris 2007, 60-62). Even if this were true, it does not explain the presence of Type I NAAAs at other locations. In contrast, Type II NAAAs were consumed in a more utilitarian manner. Their treatment as prestige objects is no longer clearly evident. What comes to the fore is their strictly utilitarian use as large containers suitable for transportation of liquids overseas. When Type II

NAAAs are found in funerary contexts, they are usually used as burial containers, not as grave goods. Again, this type of usage emphasizes the utility of these vessels more than anything else.

Type II NAAAs seem to have been the initiators of a trend in Greek amphoras production where the characteristics of the vessels themselves act as identifying markers of the region from which the contents originated. Later Archaic and Classical transport amphoras continued this trend as they were labeled by specific regions (e.g. Chian or Samian). It has become increasingly clear, however, that these different amphoras actually represented a much broader region. For example, Papadopoulos and Paspalas (1999, 165) suggest that “the ancient fame of Mendaian wine, the importance of viticulture in the Chalkidike, and the ceramic and numismatic evidence from Torone in particular, as well as the archaeological and literary evidence from elsewhere, all suggest that “Mendaian” may have been used in antiquity to refer to the wine of a much larger area of the Chalkidike.” This realization can also be applied to Type II NAAAs. We know that multiple production regions manufactured Type II NAAAs based on fabric composition. It is also clear that the vessels were highly standardized in size, shape, and decoration. This suggests that like later amphoras from the same region, Type II NAAAs represented a large area of production in liquid commodities and did not signal one particular origin. Type II NAAAs may have been the ancestor that affected later homogeneity in shapes of north Aegean amphoras, especially Thasian, Akanthian, and Mendaian. Each of these vessels share morphological traits and even used similar marking systems (Papadopoulos and Paspalas 1999, 179; Lawall 1995, 156). Indeed, North Aegean agency may have been the defining characteristic of NAAAs throughout their existence. As suggested above, the only common denominator between all three types of NAA is, in fact, the North Aegean, and specifically the region around the Thermaic Gulf and Chalkidike. In this way, the North Aegean acted as a veritable “middle ground” where multiple

actors interacted with each other; actors that included southern Greeks, Phoenicians, and Trojans, just to name a few. In this sense the North Aegean functioned as a chronological bridge, essentially connected the end of the Bronze Age with the beginning of the Archaic period through the continued maintenance of commercial ties with regions outside Greece. During the 8th century, the north Aegean formation of a homogeneous system of amphora production, starting with the Type II NAA, may have prompted a southerly response in the region of Attica and Euboea. By the time of the NAA's abandonment in the north, the south had initiated a large-scale production of its own amphora, the so-called "SOS."

Chapter 5

Expanding Economic Networks in the Archaic Period: The “SOS” Amphora

Introduction

At the same time that Type II NAAs were being mass-produced in northern Greece/Macedonia, filled with oil or wine, and widely distributed throughout the north Aegean and Tyrrhenian seas, certain areas of southern Greece began to produce their own versions of liquid transport containers. In particular, Corinth produced a handmade transport amphora, while Attica and Euboea started to produce and export the so-called “SOS” amphora during the middle of the 8th century. The amphoras produced at Corinth were quite prominent in Archaic Mediterranean markets, especially in the west, and have been thoroughly studied (Koehler 1981; Whitebread 1995; Strack 2007). This dissertation, therefore, will focus on the production, distribution, and consumption of the SOS amphora. The reasons for this renewed desire to bottle and export surplus agricultural product are not known. There are, however, a few social and economic trends happening at this time in Greek history that may have been factors contributing to the desire and ability to produce, bottle, and ship surplus in distinctive transport containers. In this chapter, an initial cultural-history section is first provided as an attempt to place the production, distribution, and consumption of Greek large liquid transport containers of the early Archaic period into their social context. The following section addresses the evidence available for SOS amphora production in Attica, Euboea, and possible colonial contexts in the central Mediterranean. Distribution of SOS amphoras is then discussed according to the origin of the amphora, thereby tracing the distributions of both Euboean and Attic versions of the vessel. The section concludes with a look at the various actors most likely involved with the SOS amphora’s distribution. The final section of this chapter deals with the evidence for SOS amphora

consumption trends in the various regions where the pots are found. Accordingly, SOS amphora consumption is addressed within the regions of mainland Greece, Italy, Sicily, and the western Mediterranean, focusing on Iberia. This holistic approach provides the best way to view patterns in the material record that may correspond to patterns produced by specific economic or socio-political situations.

Social Context

This section addresses key aspects of the Archaic Greek socio-cultural world that may have influenced the production, distribution, and consumption of SOS amphoras. First, the formation of the classical Greek city, or *polis* (*pl. poleis*), gained steady momentum in the 8th century B.C.E., eventually providing a formalized social structure through which production of amphoras and their contents was most likely solidified. Second, though chronologically simultaneous, population movements, especially widespread colonization of regions in the central and western Mediterranean, led to a strengthening of social and economic networks. Third, the Archaic Greek economy, while still based primarily on agricultural products, expanded the formality of its constituents including agents of distribution, such as different classes of merchants. This section concludes by concentrating on the specific areas of Attica and Euboea in the 8th and 7th centuries and the social-historical context (including a discussion of Solon) that may have contributed to the life-cycle of the SOS amphora.

Colonization and the Polis

Intricately linked to Archaic oil and wine trade is the phenomenon of colonization. Indeed, “It seems likely that trade and exchange and the relationships that undergirded them blazed the trail for the permanent settlements that colonization brought” (Antonaccio 2007, 210). Beginning in

the second half of the 8th century B.C.E., Greeks set sail from the mainland and established residences, first in the central Mediterranean, then west to Iberia, and East to the Black Sea. These new settlements could be characterized as either *emporía* or *apoikiai*. Emporia were sometimes joint ventures with other cultures, such as the Phoenicians, and were mainly used for trading connections. Apoikiai were more traditional colonies where groups of Greeks would establish new settlements in previously occupied land.

The exact timing and explanation for this sudden desire to establish new enclaves is unknown. Exactly who was responsible for these ventures and their relationship to the metropolis is also not well understood. Indeed, the formality of connections between the metropolis and its colonies are highly debated. The traditional view has been to understand colonial ventures as organized by the polis and within its aristocratic framework, thereby providing the necessary means (ships and crew) and a charismatic leader (*oikist*; Greco 2006, 170). However, these idealist views may be too tightly bound to later traditions, such as those found in the work of Herodotos. Carla Antonaccio (2007, 211) suggests that, “despite much ink spilled to demonstrate the contrary, colonies are not very tightly bound to their mother cities by religion, military alliance, or other ties.” In support of this idea, Descoeudres (2008, 361) argues that there is no evidence that the colonies in Sicily or southern Italy provided their mother cities with any goods at all, “and even less to suggest that the motherland’s prosperity or survival depended on supplies.” Indeed, one could argue that since the colonial communities of the central Mediterranean were established at the same time as poleis on Greece, “the colonies may have led the way toward the integration and urbanization of the metropolitan communities” (Antonaccio 2009, 315).

It can be said with some certainty that the motivations for establishing colonies varied considerably. The specific motivations for creating colonies probably ranged from the desire for advantageous trade points, to the search for specific metals, severe drought, over population, and, as mentioned above, the desire by wealthy sons to make their own place in the expanding world (Descoeudres 2008, 361-2). It is much more probable that individual apoikiai were established by entrepreneurs over a long period of time by groups of emigrants who were not necessarily all originating from the same place. Whatever the reasons, it is clear that the last generation of the 8th century B.C.E. was responsible for establishing a new settlement in Sicily and south Italy about every two years (Osborne 2007; Antonaccio 2007, 202).

Our sources of knowledge on the process and historical trajectory of founding colonies are literary-historical, mythological-ethnographic, and archaeological. The literary-historical texts provide chronological frameworks, including the order of foundations, the names of founders and their original communities, and absolute dates. These authors include Homer, Thucydides, and Herodotus, as well as the Archaic poet Archilochus, the geographer Strabo, and the chronographer Eusebius (4th century C.E.). Mythological-ethnographic sources such as epinician poetry (Pindar) include myths and narratives about indigenous groups, (Antonaccio 2007, 209). Archaeological data, our third source of knowledge on Greek colonial enterprises, while at time contradictory, is perhaps the most interesting as it has the capability to bring to life the foundation stories and myths we can only read about in the other sources. In addition, for our purposes here, archaeology has the ability to connect material remains of the physical trade in oil and wine with its historical context.

Before discussing actual colonial ventures of the Greek Archaic period, it is first necessary to mention briefly the existence of cultural interconnections within the broader

Mediterranean world and the relationships that were created from them. While the phenomenon of Greek colonization in the 8th century is truly incredible, it is also a little late. Phoenician colonial ventures had been occurring since the 9th century at the latest, having established their first colony on Iberia, Huelva, around 850 B.C.E. Phoenician establishments on Sicily, Sardinia, and the north coast of Africa pre-date Greek colonization by at least a century. It is clear, moreover, that when Greeks started colonizing these areas in the 8th and 7th centuries, they had to interact with not only pre-existing Phoenician colonies, but also indigenous populations, some of which were highly advanced and already intricately connected to established trade networks (e.g. Etruscans). The specific types of interactions between these groups of people varied by region and time period, but during the beginning of the Archaic period it seems that, in contrast to older views, “mutual intelligibility seems to have played a large role in the Greek experience in the west, even if hostility, warfare, and cultural assimilation were also present” (Antonaccio 2009, 320). This “mutual intelligibility” led to multiple types of interactions including “transfers of artistic styles, mythological narratives..., elite ideologies (like sympotic practices and burial customs), to say nothing of commodities and finished goods in trade and exchange” (Antonaccio 2009, 320). Antonaccio (2007, 201-2) goes on to say that “...the colonial world was a productive “middle ground” between Greeks and non-Greeks in which the mode of interaction was accommodative, rather than conflictive.” It seems, therefore, that while conflict between groups is inevitable, it does not seem to have been the norm. Indeed, evidence from early colonial establishments, such as Pithekoussai, suggests that Greeks lived next to Phoenicians and indigenous people who each performed their own economic tasks, trading and producing goods related to their own desires and needs. However, it is also clear that as Greek colonial ventures progressed during the Archaic period, this mutual intelligibility gave way to a Greek-dominant

way of conducting oneself, especially in relation to indigenous people. Thus, Antonaccio (2007, 215) suggests that although the term “hellenization” has been rightly criticized, “the facts remain that everywhere, Greek replaced local languages, Greek material culture came to dominate, and local groups were caught up in, and overtaken by, the Greeks in their territories.” Understanding how different groups interacted with one another in a new realm of colonial and economic enterprise is essential to our view of oil and wine trade within this intricate web of customs, desires, and necessary tools of social interaction.

A detailed discussion of every Greek colonial venture during the 8th and 7th centuries B.C.E. is out of the scope of this dissertation. However, a brief overview of the main regions of colonial enterprise is necessary for later discussions of transport container production, distribution, and consumption. In the Archaic period, so much of the oil and wine life-cycle is tied up in the economic and social networks of colonies, metropoleis, and inter-regional merchants.

Overlapping with the discussion of Type II NAA distribution in the previous chapter, the site of Pithekoussai plays a major role in the early Archaic oil and wine trade. As a colonial “middle ground” Pithekoussai seems to have been a meeting point for Greeks, including Euboeans, Phoenicians, Etruscans and native Campanians (Malkin 2010). Located on the small island of Ischia opposite the Italian coast, was neither an emporion nor an apoikia. The best description of this site is an “enoikismos” or “cohabitation” where Greeks lived with Phoenicians and other people from diverse regions. It seems that the number of people from different origins was very high and included Greeks from other areas as well as “families whose original individual members came from Campania, Etruria, Latium vetus, north Africa, Sardinia and doubtless more besides as well as from Euboea, Corinth, north Syria, and Phoenicia” (Ridgway

2000, 30). Here these people lived, intermarried, traded, manufactured, and farmed together (Antonaccio 2009, 321). The strong Phoenician presence, possibly a colony of merchants, is represented by Phoenician red-slip ware in both the cemeteries and inhabited areas (D'Agostino 2006, 222). Social differentiation is harder to discern, though it seems that there were a number of wealthy graves. The most obvious social division at the site seems to indicate a division of at least two classes of people: those that were cremated and those that were inhumated with no burial gifts.

The colony of Cumae was founded soon after Pithekoussai or around the same time. In contrast to Pithekoussai's status as an *enoikismos*, Cumae was a formally founded city with a structured social hierarchy and an *oikist* cult (D'Agostino 2006, 225). Naxos was the first Euboean *apoikia* on Sicily, founded around 734 B.C.E. according to Thucydides (6.3-5), and supported by archaeological data. According to recent interpretations, Naxos arose as a point within a network of establishments created by the Euboeans during the second half of the 8th century to secure trading routes in the direction of Tyrrhenian Italy (Domingues 2006). Zancle, another Euboean *apoikia*, was founded around the same time as Naxos.

Greeks from other regions of the mainland started to move westward, at least more visibly, around the same time or just after the Euboeans established Naxos. Among the most prominent were the Corinthians whose goods had already been prominent in trading networks, but who established their first *apoikia* at Syrakoussai after 733 B.C.E. (Thucydides 6.3-5; Strabo 6.2). After this time there seems to have been a chain-reaction where, as mentioned, a new colony was founded every two years. Among them the Megarians founded Megara Hyblaea around 728 B.C.E. The Akhaians founded their first *apoikia*, Sybaris, in the last quarter of the 8th century B.C.E, after which they established a number of other settlements, including Kroton,

Kaulonia, Metapontion, and Poseidonia (Papadopoulos 2001, 377; Morgan and Hall 1996, 199-215).¹⁵

Greek presence in the western Mediterranean, and specifically Iberia, took place much later than their Italian and Sicilian expeditions. On the basis of literary sources and archaeological data, it seems that Phoenicians were much more active on the Iberian Peninsula than Greeks and had established many colonies even by the 8th century. For example, the site of Toscanos was founded in the mid-8th century as a “commercial enclave” and has evidence for a large market building. Material remains excavated suggest connections to Pithekoussai, Cyprus, and the eastern Mediterranean (Antonaccio 2009, 317). The first Greeks to actually set sail to Iberia and the west seem to have been individuals interested in tapping into the thriving metals trade that the Phoenicians had been exploiting. One of the first Greeks to do this, at least according to tradition, was the Samian Kolaïos who sailed to Tartessos (Iberia) in the second half of the 7th century (Herodotus, *Hist.* 4.152). The first clear evidence for Greek presence on Iberia was not until the establishment of Emporio around 575 B.C.E. by Phocaeans.

While there are no contemporary accounts of Greek colonization in the early Archaic period, and indeed we rely mostly on later Classical authors, one can nevertheless detect a sense that colonization was very prominent in the minds of Greek authors during that time period. Our most important Archaic literary works, both the Homeric and Hesiodic traditions, give some insight into how Greeks viewed the foundation movements and how these movements affected daily consciousness. That these two very different or traditions each present evidence for knowledge of not only colonial activities but also the intricacies of intercultural contact, displays the pervasiveness of these activities. Homer, whom other sources claim to have Ionian roots,

¹⁵ Indeed, it seems that western Greece, and specifically the region of Akhaia, may have had long-lasting ties with Italy and Sicily, extending as far back as the Late Bronze Age (Papadopoulos 2001).

reveals a type of “colonizing consciousness,” especially through episodes of the *Odyssey* (Antonaccio 2009, 319; see also Dougherty 2001; Hartog 2001). From foundation stories of the Phaeacians and Trojans (*Od.* 6.4-10) to descriptions of ideal geographic locations for new settlement (*Od.* 9.130-42), these episodes are “permeated with an awareness of mobility as much as colonization” (Antonaccio 2009, 319).

The Hesiodic tradition, claiming to have some connection to Ascra in Boeotia (*Works and Days* 630), reveals some knowledge of Italic people and their connections with Greek mythology. In the closing lines of Hesiod’s *Theogony*, there is an explanation of the relationship between Odysseus, Circe, and her two sons Latinos and Agrios who “ruled the Tyrsenoi far off in the recess of the holy islands” (*Theog.* 1019-1024). Irad Malkin (1998) has accepted these lines as original to the poem and suggests that the Tyrsenoi represented the “Italic” peoples, possibly the Etruscans, and that “Living a short distance from Euboeia, home of the two major colonizing Greek states of the eighth century, Hesiod could have been well informed also by his neighbors. Even if only a persona, the “poet” would have belonged to a world in which Euboian information concerning maritime affairs and distant lands would have been proverbial” (Malkin 1998, 182). This ultimately means that Hesiod was familiar with the sea (though he claims not to be an expert, *Works and Days* 638-640), the implications of seamanship (*Works and Days* 610-625, 652-682), and “must have heard of Pithekoussai and Kyme and of the various local elites with whom their colonists came into contact, especially the Etruscans” (Malkin 1998, 183).

The Archaic Greek Economy

Understanding why SOS amphoras were produced in Greece and distributed throughout the Mediterranean necessitates a discussion of the contemporary economic conditions within which these vessels existed. The contents of these amphoras were, after all, the primary commodities

that were demanded and consumed by others. It is therefore important to address the oil and wine industries in place in Greece at the time of the production of SOS amphoras and how these commodities fit within a broader market. Additionally, addressing the possible agents involved with the production of these commodities, as well as their shipment abroad is a critical step in understanding how these goods functioned within the economic networks established in the early Archaic period. As Archaic Greek poleis gradually coalesced into the concrete forms of political and ideological expression, manifested in a centralized polis temple cult, a hierarchical bureaucracy, and population explosion, economic enterprise became an increasingly important aspect of Greek life. Coupled with constant colonizing expeditions, interactions between Greeks and other Mediterranean cultures increased dramatically. This interaction spawned a heightened level of desire for foreign goods, which in turn increased imports. An increase in the desire for imports necessitated the simultaneous increase in exports from Greece. Based on archaeological and literary evidence, we know that exports from Greece at this time in the Archaic period consisted mainly of agricultural surplus. Our main literary sources for this knowledge include Hesiod, the Homeric epics, and Archilochos. In addition, based on archaeobotanic studies and regional archaeological surveys, it is clear that the main crops produced were cereals, olives, and grapes. For example, we know that in the early 6th century B.C.E., agricultural production constituted by far the most important, if not the only pillar of the Athenian economy.

Agricultural production was the main tenant of the Greek economy during the Archaic period, but what was the motivation behind producing these goods? In general the debate has been divided between the desire to attain self-sufficiency and the “acquisitive drive,” the desire to attain things for the sake of prestige or want. Based on recent work, however, it seems that “Archaic poetry leaves no doubt that a powerful acquisitive drive, rather than a struggle for mere

self-sufficiency, shaped the archaic economy” (Van Wees 2009, 450). This acquisitive drive was fueled by two major activities: the creation of surplus and its subsequent trade, and competition for wealth. In the Greek Archaic period, surplus agricultural product was generated by farmers, or more accurately, wealthy estate owners. These estate owners can be manifested as “princes” in the case of Homeric poetry (such as Odysseus himself) or as “farmers” in the case of Hesiod’s *Works and Days*. In *Works and Days*, Hesiod’s brother Perses has at least six full time staff including three slaves and hired men. Although Hesiod uses terms such as “poverty” and “hunger,” these expressions must be understood in light of the quite high standard of living that he expected. In later Classical Greece everyone who could not afford to live off the labor of others was deemed to live in “poverty” (Van Wees 2009, 445). Farmers, in this sense of the word, seem to have been able to trade their own surplus for desirable goods, even without the involvement of middlemen (Descoedres 2008, 338). For example, in *Works and Days*, Hesiod clearly states that he can export (631) and that he enjoys wine imported from Byblos (589). Archaeological material supports this acquisitive drive since “grave goods...show that at least some farmers produced surpluses with which they could acquire non-essential goods” (Descoedres 2008, 330).

One of the major impetuses for acquiring such non-essential goods was competition for wealth and prestige. Indeed, Van Wees (2009) argues that from the very beginning the Archaic economy was far more complex than the usual picture suggests. Intense and escalating competition for wealth characterized economic life and was a driving force behind many major historical developments and crises. This competition was no longer restricted to the top eschelon of social hierarchy, but was permeating levels below, including the “farmers” just discussed. For an instructional piece of literature geared towards farmers, the *Works and Days* begs the

question: “why a hymn to the virtues of toil was meaningful and important to a landowner at this economic level. The answer is that he faced a competing ideology of leisure, as well as intense rivalry for wealth” (Van Wees 2009, 446). In the case of nascent Archaic polis politics, land was the major sign of one’s prestige so that the landowner competitively pursues wealth with the aim of becoming richer than others in his community. Consequently, surplus agricultural product was not simply stored or given away, but invested in expansion of the farm: exchanged for livestock or for land. Farmers did not merely compete to preserve their holdings but engaged in a rivalry to expand and excel so fierce that it often spilled over into litigation and violence (Van Wees 2009, 449). In addition, exotic or precious goods were acquired to enhance the person’s status. The type of goods was dictated not by need but by desire to increase one’s cultural capital and prestige. Therefore, it seems that “we have the attributes of something analogous to the modern notion of ‘fashion’, in the absence of the gigantic scale of modern, post-industrial mass consumption” (Foxhall 2005, 241). Fashion here meaning the widespread, relatively large-scale consumption of standardized goods with rapidly changing styles. Stylistic change in itself contributes to the cultural value of the item and is thus partially driven by the desires of the consumers. This cyclical interplay between desire, production, and consumption was fueled by an increase in the complexities of trade networks and the growing access to new and exotic materials made possible by the establishment of colonies connected with one’s polis.

As mentioned, olives and grapes were two of the most prominent agricultural products of the Archaic period in Greece. Olive production in particular seems to have enjoyed a major increase, coinciding with the 8th century population increase and polis creation (Foxhall 2007). However, olive tree maintenance, expense, and seasonality (fruit produced every two years), as well as the labor and equipment necessary to produce oil, limited olive oil’s availability,

categorizing it as a “semi-luxury” commodity. In this sense, olive oil was “something desirable that was sometimes within reach of people from a fairly wide band of the socio-economic spectrum, at least on special occasions, but not necessarily a staple to be taken for granted in everyday use” (Foxhall 2007, 17). This special status for olive oil, and especially scented or treated olive oil, can be seen archaeologically in the form of specialized ceramics that were exported (and imported) around the Mediterranean. These special ceramics include aryballois, juglets, and other small unguent containers, usually decorated and finely made. The desire for specialized olive oils as a semi-luxury good can be seen by the wide, pan-Mediterranean distribution of not only Greek, but Near Eastern and other regional versions of small oil containers. This distribution presents a “coals to Newcastle” effect where areas that produced their own oil and containers, such as Corinth, nevertheless imported oils and containers from other regions (Foxhall 1998).

The importance of olive oil during the early Archaic period can also be seen by the desire to control its production. At this point in the development of the polis, oil installations were still kept inside the polis, not in the surrounding country. This practice is analogous to the control of other valuable technologies such as metal-working. The best example of an Archaic olive press is found in Asia Minor at the Greek city of Clazomenae where it was located on the south slope of the Acropolis (Koparal and Iplikçi 2004). In addition, the production of olive oil depended on very large amounts of labor, but little investment in the type of equipment needed (Foxhall 2007, 217). In other words, oil presses were relatively cheap to make, but if you controlled the use of an oil press and the labor then you could create a type of monopoly. Unfortunately, because of the ephemeral quality of Archaic period oil pressing installations (other than the stone bed itself), relatively low numbers have been recovered archaeologically (Foxhall 2007, 217). It is difficult,

therefore, to see which regions in Greece actually produced olive oil on a large scale. However, “the distribution of Attic SOS amphoras suggests a local Athenian advantage in oil or wine, and Corinth held another local dominance in ceramics until about 550 B.C.E., when Athenian wares displaced Corinthian” (Morris 2002, 31-2).

Wine was another major commodity that was produced regionally around the Mediterranean and extensively traded. Just like olive oil, viticulture is inherently labor-intensive, “especially when it relies on artificial irrigation, as according to Homer it did” (Van Wees 2009, 451). As one of the other major activities discussed by Hesiod in *Works and Days*, viticulture seems to have played a large role in the economy of Greece. However, it is also clear that imported wines were valued as specialties or for particular flavors and other qualities (as they are today; see Papadopoulos and Paspalas 1999). Hesiod mentions his wine from Byblos (589), but we also have information from Homer regarding valuable imported wines and vintages. For example, Euneos from Lemnos, ‘prince’ and farmer like Odysseus, obtains from Menelaus, Agamemnon and other Achaeans a whole range of goods for his large delivery of wine: bronze, iron, hides, cattle and slaves (*Iliad* 7.467-475). In addition, Odysseus obtains Ismarian wine from Maroneia, a wine which is known for being particularly strong, powerful enough to intoxicate a Cyclops (*Od.* 9.196-215). Indeed, there is some evidence that wine might have been shipped in various concentrations. Vintages are known that were diluted with 20 parts of water to one of wine (*Od.* 9.209-10). This may serve a practical function as more concentrated wines may have survived transport more readily (Koehler 1996, 330). Yet still other wines were valued for their age: in the *Odyssey* (2.340) wine was recognized as “old” and Nestor had the seal breeched on wine that was ten years old in his palace (*Od.* 3.391).

In addition to literary references for the desire to acquire and consume special wines, archaeological remains provide evidence for transporting drinking paraphernalia, which may have been accompanied by Greek drinking customs related to, first and foremost, the symposium. As early as 800 B.C.E. Greek fine ware ceramics reached and perhaps surpassed the technical and aesthetic quality of the Bronze Age and the potter's repertoire of shapes was already complete. What is most interesting is that "most shapes are designed to store and transport wine, to mix it with water and other ingredients, and finally to consume it, others serve as oil and perfume containers" (Descœudres 2008, 334; shapes see Coldstream 1991, 39-40). Indeed, the first Greek ceramics present in Italy are associated with drinking wine. It is possible that "the acquisition of such exotic customs allowed the Tyrrhenian elites to place themselves on an equal footing with the Greek aristocracies" (D'Agostino 2006, 212).

Other ceramics for transporting wine, such as amphoras, became incredibly prevalent and regionally distinct, making the identification of trade networks much easier than ever before. The distribution of the Type II NAA is met with much competition by the early Archaic period. As the NAA died out before ca 700 B.C.E., many more and varied amphora types flooded the market carrying wines from all regions of the Aegean and beyond. By the middle of the Archaic period it seems that almost every region was equipped with a type of amphora to export surplus product, "aimed mostly to purchase products lacking in the city itself" (Baccarin 1990, 29). The existence of a regional amphora type necessarily means that the region produced surplus, since other types of containers would have been sufficient for daily use. The particular shape of amphoras is uniquely conducive to long-distance maritime travel. Indeed the production of amphoras themselves is connected to the production of surplus liquid commodity: "L'exportation est liée à l'existence d'un surplus que la communauté politique constate, et donc

la fabrication massive d'amphores est le resultat d'une volonté politique" (Gras 2010, 111-112). Different city-states in the Greek world seem to have initially, at least, produced their own distinctive shapes so that presumably a jar from a particular city would have been recognizable in the marketplace (Koehler 1996, 325). Successful transmission of information by the amphora depended on the specificity with which its shape or associated markings can be identified with a particular producing region. Lawall (1995) uses the term "regionalism" to express this relationship. Regionalism of a given amphora is defined both by the degree to which that amphora's shape is unique to one geographical region and by the physical extent of that region (Lawall 1995, 14). A specific reference to one city and its territory by a given amphora type cannot be assumed (see also Papadopoulos and Paspalas 1999). It has been further conjectured that each community had one type of jar for oil and one for wine in the Archaic period (Gras 1987, 41). As will be discussed further below, in the last years of the 8th century, the city of Chalcis on Euboea produced both a type of oil amphora (the SOS Chalcidian) and a type of wine amphora (these are called "Euboean"), each of which are imitated at Pithekoussai (Gras 1987, 42).

Bulk trade in amphoras and the liquids within them is best illustrated by the numerous Archaic-era shipwrecks. Among these ships, it is clear that there were multiple scales of trade networks functioning at the same time. Large-scale inter-regional trade is represented by ships such as the Tanit and Elissa, discovered in the southeast Mediterranean off the coast of Egypt. These Phoenician ships each contained a massive cargo of standardized and specialized wine amphoras. The existence of these ships demonstrates that "ces échanges entre la Phénicie et l'Égypte, qui ne s'apparentent en rien à du 'cabotage', (contra Herodotus *Histories* 3.6) connaissent un essor dès le VIII^e siècle au plus tard" (Drakides et al. 2010, 99). Yet the

Phoenicians were not the only exporters of large amounts of wine. An Egyptian customs register from 475 B.C.E. confirms and amplifies this pattern. From mid-February to mid-December three or four Greek ships per month passed through the port with a peak of five at the end of summer. This number can be compared to a total of six Phoenician ships for the year. The register records that all Greek ships brought wine, olive oil (possibly scented) and “empty” pottery, and the return freight carried wheat (Van Wees 2009, 459). In addition to these large-scale exchanges, other shipwrecks display a smaller-scale regional trade using smaller ships and more local cargoes. The shipwreck at Pabuç Burnu, Turkey is dated to the first half of 6th century (570-60 B.C.E.) and seems to have circulated agricultural products in a moderate-sized merchant vessel, 17-18 m long, carrying under ten tons of goods. The cargo seems to have been made up of mostly amphoras, over 260 (although they are now fragmentary), ones related to Miletian and Samian types but with fabric similar to that of Halikarnassos and Knidos (Greene et al. 2008). The amphoras aboard the ship had an average capacity of 19 liters, which estimates the ship’s liquid cargo at more than 5 metric tons. The discovery of grape seeds and lees inside the amphoras, along with pitch lining in some jars, suggests that at least a portion of the liquid cargo included wine, although oil may have been carried in some of the unlined amphoras (Greene et al. 2008, 704). This ship represents a “local scale of agricultural exchange conducted by sailors” (Greene, Lawall, and Polzer 2008, 700). The existence of both types of ships, large inter-regional and small intra-regional, dated to around the same time suggests that “These small-scale regional interactions seem to have taken place alongside more consistent regional and perhaps international exchanges of the sort for which Hesiod (*Op.* 643-45) advises farmers to fill large ships rather than small ones, since larger cargoes bring greater profit” (Greene et al. 2008, 702-3).

Oil, Wine, and Colonization

All of the topics discussed thus far, colonization, the polis, and agricultural trade, come together from the point of view of the oil and wine economy. A surplus of oil and wine was produced in the context of the Greek polis, then exported via local merchants or a third party (or both), for two reasons: to aid a newly founded colony, or to acquire goods that local elite desired as status symbols in a system of changing fashions. According to Gras (1988, 293-4), the large amount of imported oil and wine amphoras discovered at Archaic Greek colonies seems “s’inscrire dans une politique d’assistance: il s’agit plus de ravitaillement que de commerce” (to enroll in an assistance policy: it is more supply than trade). That the metropolis needed to supply its nascent colony with these liquids may prove reasonable since, 1) we know that Italy and Sicily did not have an indigenous production of olives before colonization. Olives and oil only went west after colonization by Phoenicians and Greeks (Hadjisavvas 2003, 118). Therefore, 2) when new colonies were founded, colonists brought the plant, but were unable to make oil (or wine) for many years because olive trees needed at least ten years to mature fully and produce good quality olives (which are then only produced every two years) and grape vines are not immediately productive either (Gras 2010, 112). For example, olive cultivation did not begin at Metapontion until around 500 B.C.E., one century after the first Greek settlers (Antonaccio 2007, 212-213). To illustrate this fact archaeologically, most colonies did not seem to have their own production of amphoras except Corcyra, Marseille, and Pithekoussai (Gras 1988, 293). A city acquired a type of amphora when it had an agricultural surplus to export and if most of the Greek colonies did not have amphoras, it is because they did not have anything to export in such a package (Gras 1988, 295). This means that 3) the new colonies (1 every two years) needed an imported supply of oil (probably also wine), thus making trade networks for oil and wine necessary for the

establishment of colonies and their (initial) functioning. This type of trade is not what we may typically expect: “Il s’agissait finalement de ‘commerce’ au sens ou nous l’entendons habituellement mais l’existence d’échanges quantitativement importants était le signe d’un besoin particulier de la communauté” (Gras 2010, 112). It seems, therefore, that the existence of oil and wine containers from the mother-regions within a colony adds another dimension to this relationship. The connection was not only religious and institutional with oikists, but also commercial and economic.

It is clear, moreover, that oil and wine were traded in a more traditional sense at the same time during which this “assistance policy” existed. Indeed, the export of oil and wine surplus was used as a means for acquiring other desirable goods, which, as we have discussed, was a fundamental tenant of the economic drive of the Archaic period. To this end, another view of colonization suggests that it acted as a state-sponsored enterprise aimed at “securing lucrative resources (grain, metals, timber, fish) or trade with native populations (as seen especially in ceramic exports, which include transport amphorae and so indicate the trade of commodities and possibly cultural practices that come with these)” (Antonaccio 2009, 321). It seems that local indigenous elites wanted Greek wine and drinking paraphernalia as a status symbol. As mentioned, the first Greek ceramics present in Italy are associated with drinking wine, which may have facilitated the interaction between Tyrrhenian elites and Greek aristocracies (D’Agostino 2006, 212).

The production, distribution, and consumption of oil and wine were inextricably linked to the major developments of the Greek Archaic period. The formation of Greek poleis facilitated the organization of labor and the accretion of wealth to produce oil and wine on a large scale, resulting in enough surplus to not only export to newly founded colonies in the form of

assistance, but to export in exchange for other desired goods. These goods then fueled the generation of wealth and status that, in turn, concentrated wealth even more, consequently maintaining the cycle. In addition, oil and wine facilitated cultural interactions with new, indigenous populations as Greek people moved into previously remote areas and tapped into desired resources and even larger trade networks. The SOS amphora played a major role in this increasingly complicated and cyclical web of economic and political interactions. The SOS may have built upon networks that had previously been established by trade using NAA amphoras, as well as others. SOS amphora trade expanded these networks in both distance and scale, thereby essentially paving the way for later large-scale movements of oil and wine from many other regions of the Mediterranean.

Attica and Euboea in the Archaic Period

The first production locations of SOS amphoras in the early Archaic period were in Attica and Euboea. It is therefore necessary to explore in more depth the social context of these geographic regions during this time period in order to answer questions about why these containers and their contents were produced and exported, and the social mechanisms that supported this accomplishment. A discussion of the social context of Attica and Euboea in the Archaic period should include their geographic relationship and attributes, the specific social trends occurring at both locations, and historical perspectives on politics governing these regions. For Attica, this necessarily includes a discussion of Solon and his possible impact on and reactions to agricultural trade and the SOS amphora.

Boundaries on maps dividing separate states or political entities were most likely not constant over time, but rather fluid ideas. The Classical territory of Attica and the island of Euboea are generally thought of as entirely distinct, yet they are only separated by a thin strip of

water called the Euripos Strait (Map 13). While the polis of Athens and the polis of Eretria formed individual characteristics during the Archaic period, it is unclear whether there were boundaries between the two regions or if interactions happened more seamlessly. This is especially difficult when one examines the material culture from “border” settlements on the Euripos Strait, such as Skala Oropos, a site that displays characteristics akin to both Euboean and Attic material culture trends. Indeed, settlements in the Bronze and Iron Ages were often situated “in pairs” on either side of the water, “forming socio-cultural sub-regions which makes a separation of south Boeotian, Attic and Euboean culture both arbitrary and difficult” (Houby-Nielsen 2009, 193). Chalcis and Eretria on the Euboean side faced Aulis and the important settlement at Skala Oropos on the south Boeotian coast. It seems that “All four communities no doubt stimulated each other, as they developed at an even pace and all experienced a flourish in the eighth and seventh centuries, as shown by the abundant layers of late Geometric-early archaic material and by complex cultic activity and metal industry at Eretria and Skala Oropos” (Houby-Nielsen 2009, 193).

The Euripos Strait itself also acted as a vital point of interaction and control since the Bronze Age (Knodell 2012). After 750 B.C.E., increasing seaborne communication made the “straits” even more important, as demonstrated by the extensive development on the Chalcis peninsula (Houby-Nielsen 2009, 195). Indeed, the issue of controlling this watery boarder is best seen by the strife between Athens, Boeotia, and Euboea over the community of Oropos and sanctuary of Amphiaraos (Houby-Nielsen 2009, 190). Geographical entities other than the strait, such as an agricultural plain, became hotly contested regions. In the Archaic period, the Lelantine plain between Chalcis and Lefkandi on Euboea was known as an *oinopedon* (good for

vines), control of which was probably the cause of the so-called Lelantine War (D'Agostino 2006, 225).

Euboea in the Early Archaic Period

During the early Archaic period, Euboea played a major role as a forerunner in the most salient trends of this era. Euboeans were the first to settle colonies in the central Mediterranean, they were at the forefront of settlement expansion and the formation of poleis, and seem to have even had a major role in the adoption of the Greek alphabet (Mazarakis Ainian and Levanti 2009, 214). Archaeological evidence for Euboean participation in the transmission of the alphabet comes in the form of a Semitic graffito, dated to the late 9th or early 8th century, and scratched on a local MG I cup from the sanctuary of Apollo at Eretria, “alongside significant numbers of Orientalia encountered in both sacred and funerary contexts all over the Aegean during the Geometric period” (Mazarakis Ainian and Levanti 2009, 215).

Euboean material remains from the early Archaic period display aspects of the early formation of characteristics inherently necessary for the formation of poleis. Clearly demarcated social stratification is seen in almost all categories the material record: “in the architectural organization of settlements, the layout of cemeteries, the funerary rituals and offerings, one observes a social stratification into classes” (Mazarakis Ainian and Levanti 2009, 217). On Euboea the power of the dominant clans was founded upon agricultural wealth through mainly cereal cultivation. Only the first-born son was guaranteed a substantial political role, so the other siblings must have searched for new economic activity. Consequently, “Viticulture and the cultivation of the olive now assumed a considerable importance since they were the vehicles for producing the surplus to engage in trade” (D'Agostino 2006, 219). Other important aspects of polis formation happened early on Euboea, such as nascent forms of agoras and the construction

of public monuments and works. To the south of the presumed ruler's dwelling in Zagora, an open area in the center of the settlement, which includes an open air sanctuary and altar, may have functioned as a primitive agora (Mazarakis Ainian and Levanti 2009, 218). In addition, the construction of monumental temples (Eretria, Zarakes, Yria, Delos), fortification walls (Louyot 2005) and drainage works (Eretria, Oropos) point towards a communal organization that was well established by 700 B.C.E. (Mazarakis Ainian and Levanti 2009, 219). One of the best examples of early temple architecture is the monumental hekatompedon temples built at Eretria and Zarakes already by the end of the 8th century (Mazarakis Ainian and Levanti 2009, 224). All of these achievements, adoption of the alphabet, social restructuring due to wealth via agriculture and trade, and monumental works, were facilitated by increased contacts with the east, west, and north. The Euboeans' previous contact with the east and north in the Early Iron Age created lasting networks that only grew more lucrative as they expanded westward during the colonial period.

Athens in the Early Archaic Period

During the early Archaic period, Attica was not a densely populated region. Evidence for settlements is concentrated in coastal zones, in Athens and its immediate vicinity and the Mesogeia plain. Before the 6th century, "nothing much goes on inland" (Houby-Nielsen 2009, 192). It seems that the main reason for this concentration is a necessity to be in proximity to the sea and have access to trade. Since Athens was not a colonizing city, it relied mainly on trade with others to acquire necessary and desired goods. It seems that, "...even though Athens was never a colonizing power much of social life in Attica responded to the colonial world, no doubt due to Attica's central geographical position in the Mediterranean" (Houby-Nielsen 2009, 192). Athens at this point in time was well supplied by its own hinterland. Because of this, the city

seems to have imported mostly wheat, at least in terms of agricultural produce. For Athens the critical feature of imported grain is that it is wheat, not barley. High quality wheat, imported to a barley-growing region, is a delicacy on par with good quality wine, perfumed oil or pickled fish (Foxhall 1998, 303). This supports the suggestion that exchange for Athens was based on an “acquisitive drive.”

To pay for these imports, it seems that Athens relied mainly on export of oil (at least during this early period, before the discovery of the Laurion silver mines; Kakavoyannis 2001). The SOS amphora, which developed in the LG I period and continued until the first half of the 6th century, “...is one of the more obvious manifestations of the Athenian export trade in the Mediterranean during the Archaic period” (Jones 1986, 706). During the 8th -6th centuries, these Attic transport amphoras were widely exported and are well known in archaeological contexts from the Black Sea to Iberia (Lawall 1995). In addition, the abundance of exported Attic oil, demonstrated from archaeological sources, shows a significant capacity in the industry, which is confirmed by an examination of the specific geo-climatic region and its ability to sustain thriving olive trees (Baccarin 1990, 29). The production, distribution, and consumption of the Attic SOS amphora will be discussed in more detail below.

Political History: Solon, Agricultural Trade, and the SOS

The Archaic period is unlike the Bronze Age and Early Iron Age in that later literary sources have preserved some information on the historical political situation during the 7th and 6th centuries. For the majority of the life-span of the SOS amphora, we have names of rulers, their institutions, and even some political actions that may have affected the Athenian wine and oil trade. The history of Athenian state formation follows a chain of powerful individuals: beginnings (Draco), brilliant design (Solon), tyranny (Peisistratus), revolution (508 B.C.E.), and

institutional consolidation (Cleisthenes) (Gehrke 2009, 139). For our purposes here, the sources we have for Solon and his reforms are the most important, even though the SOS amphora was being produced and exported during the archonship of Draco and the attempted coup by Kylon before him. Because Solon's reforms focused partially on agricultural regulations they may have had a direct influence on or have been in reaction to oil and wine trade and the production of SOS amphora.

Solon is a persona whose characteristics we derive from later literary sources (e.g., Plutarch's *Solon*). Indeed there is some speculation as to whether he actually existed at all (Blok and Lardinois 2006). However, it is most likely that he did exist and that some of the reforms attributed to him were actually his and other were not. Based on the available data, Solon was Archon in Athens in 549/3 B.C.E. (Diog. Laert. 1.62), so he may have been born between 630 and 620 B.C.E. According to tradition, he was summoned to fix a crisis in Athens, possibly due to rising population, overuse and subsequent exhaustion and erosion of soil, and division of land by inheritance. Credit was also a problem as more people fell into debt. It seems that, "the agrarian society of Attica was in danger of becoming dependent and feudal through the establishment of structures of clientele" (Stahl and Walter 2009, 145). To correct these issues, Solon created a number of reforms including land divisions, restrictions to agricultural production, new measures, and restrictions on trade.

One of Solon's major reforms was cancelling all the debts for Athenian citizens and redrew the political boundaries. Just before Solon, around 600 B.C.E., the wealthy citizens owned much of the land and used cheap labor to maintain it: *hektemoroi* (sixth-sharers), *pelatai* (laborers), chattel slaves, or real slaves. Solon then enacted a *seisachtheia* 'shaking-off of burdens' and cancelled all existing debts and forbid loans secured on the borrower's person. It is

even possible that Solon gave the land to the *hektemoroi* (Morris 2002, 40). He did, however, let the wealthy land owners keep their slaves from overseas, thereby providing enough labor to continue producing agricultural products on a larger scale. Solon then redrew the political, hierarchical boundaries by dividing the citizenry into echelons based on annual grain yield. In this system, the wealthiest and highest level of citizen was the *pentakosiomedimnoi* (500-bushel men), followed by the *hippeis* (horsemen; 300 bushel), then the *zeugitai* (farmers with a team of oxen; 200 bushels), and finally the *thetes* with little or no landed property.

With the land and people thus divided, Solon enacted a number of agricultural reforms. Here I will focus mainly on those reforms that pertain directly to olive cultivation. Possibly in reaction to overuse of the land, Solon required that a determined distance between trees be kept, in particular of figs and olives, as well as a distance from the border of the neighboring field. In addition, some have attributed to Solon the law, handed down by Demosthenes, that one was prohibited from cutting down more than two olive trees per year (Baccarin 1990, 30). These laws seem to have been in place to encourage the olive production to thrive, possible under constrained circumstances.

When it came to export and trade, Solon, if the sources are accurate (Plutarch *Solon* 24.1), made a number of radical changes. By far the most radical was the ban on the export of all agricultural products from Attica, with the exception of olive oil (Baccarin 1990, 30). This Solonian legislation (whether it is really Solonian or not does not matter) “need not mean that there was a permanent surplus of oil, but it does suggest that other foodstuffs, not necessarily just grain though perhaps including it, might regularly have been the objects of trade” (Foxhall 1998, 302). In addition to only allowing the export of olive oil, Solon also regulated who, including foreign merchants, could import and export certain items. Based on the language of the law,

Descat (1993, 153) thinks that Solon means people cannot sell to “foreigners” or those outside the chora. Therefore Athenians are obligated to sell their products within Attica only. This idea is strengthened by a Solonian law that prohibits strangers from working in the agora. This law is known only from a passage of Demosthenes (*C. Euboul.* 30) and concerns foreigners who have the function of *ergazesthai* who exchange: sell and buy (Descat 1993, 153). At the same time, however, it seems that foreigners can sell Athenian products: “Avant Solon les Athéniens pouvaient faire sortir les produits comme ils l’entendaient, maintenant ce sont les étrangers qui sont invités à venir en Attique (ils le faisaient déjà bien entendu, mais le mouvement ne peut qu’être amplifié)” (Descat 1993, 158). But the question remains, why make an exception for oil and allow direct sales to foreigners and overseas? According to Descat (1993, 159), it is because oil followed the common lot of Attic products and was prohibited for export in the same conditions. This took place a generation before the reorganization of the Panathenaic Festival of 566 B.C.E. and the establishment of the competition. At that point, Panathenaic Prize amphoras would supplant SOS amphoras entirely (Valavanis 1986; Descat 1993, 159; Bentz 1998).

The SOS Amphora and Its Relation to Solon

The production and distribution of the Athenian SOS amphora may provide clues to the true nature of these Solonian regulations, the reasons for their adoption, and their effects. Indeed, it seems that there is a connection between the Solonian measures and the abandonment of the SOS. The SOS disappears around 580 B.C.E. (date of the last SOS at Camarina). At the same time, or just before, a new amphora, called the “à la brosse” type was produced and seems to have replaced the SOS amphora (Lawall 1995, 36 n. 21: see Gras 1987, 46-7; Baccarin 1990 30-33; and Docter 1991, 46-7 for the historical ramifications of the change). Not only is this change in amphoras a qualitative change, it is a quantitative change in that “à la brosse” amphoras found

in Etruscan tombs and in the Greek colonies of the west are far fewer in proportion to the previous number of SOS amphoras (Baccarin 1990, 30). It is possible, therefore, that Solon's intervention is somehow related to or a reaction to not only the change in amphora type, but also a decrease in the export (or production) of Attic oil (Baccarin 1990, 32-33).

The evidence from exported oil amphoras suggests that before the era of Solon we should not assume there was a crisis of oil production since SOS amphoras are exported in large numbers. At the same time, if there were an oil crisis, Solon would not have granted its free trade and banned the felling of olive trees (Baccarin 1990, 33). For Descat (1993, 160), the SOS amphora is a sign of the freedom to export. When Solon's rules were enacted, Athens decided to use a new form of transport container (the *à la brosse*) to mark the difference and the suppression of the former privilege. Given the importance of amphora types to an ancient city, this change did not consist of a simple alteration of container, but rather a more general alteration of oil production, which would have affected the amount of product exported (Baccarin 1990, 30). Alternatively, Gras (1987, 13) suggests that the decrease in oil exports may have been caused by an actual agrarian crisis to which Solon was responding. Additionally, around the same time the introduction of olive trees to Etruria and the production of some Etrurian amphoras may suggest a competing market. However, Gras (1987) denies the effect of this new market since these Etruscan amphoras were only used in local transactions and for indigenous needs (Baccarin 1990, 30). As it stands, therefore, it seems currently impossible to establish a clear link between cause and effect of these two phenomena, the Solonian laws and the change from SOS to *à la brosse* amphoras (Baccarin 1990, 32).

*SOS Amphora Production*¹⁶

Introduction

The so-called “SOS” amphora derives its name from the markings on the neck of the vessel resembling the Greek letters sigma, omicron, sigma, though these markings, as will be discussed, were not always consistent (**Figure 24**). The production of SOS amphoras occurred in multiple regions. This should not be surprising since the existence of multiple production regions has been a pattern for bulk liquid containers since the Bronze Age. The location of the initial production of SOS amphoras is currently up for debate, though it had been assumed to be Athens until rather recently. Excavations at Chalkis and Eretria on Euboea have produced early LGI contexts with SOS amphoras, possibly even in pits representing potters’ waste (Descoedres 1976, 38 note 49). Indeed the evidence for an initial production in Euboea has generated heavy support by some scholars: “Malgré la prudence des collègues anglais, je pense que c’est Chalcis qui a créé le type “SOS”, lequel a été rapidement imité par Athènes” (Gras 1988, 293).¹⁷ By LGIa, SOS amphoras were definitely being produced in Athenian potters’ quarters and most likely at multiple Euboean sites.

Compared to the amphoras discussed above, the SOS amphora represents a major shift in technological attributes. The addition of a noticeably large foot, an increase in size and capacity, as well as a sense of regularity in decoration and possibly size suggests that people were

¹⁶ The most comprehensive account of SOS amphoras remains Johnston and Jones 1978, though an update is desirable considering the large amount of archaeological data generated over the last 35 years. In general the account in this chapter tries to focus on such recent data, though its analyses are in no way entirely thorough.

¹⁷ The heritage of the SOS amphora, though vexing at the time of Johnston and Jones 1978, may in fact derive from a combination of local atticing amphora production and the influence of North Aegean amphora decoration and morphology.

responding to specific stimuli, resulting in a change of ceramic repertoire. One stimulus may have been an increasing awareness of trade networks for profitable agricultural surplus, such as oil and wine, including the burgeoning trade in the north Aegean using NAA amphoras. In addition, new markets, generated by, for example, colonizing activities, for the products of the Attic and Euboean countryside may have prompted an increase in production and a desire to market the products as distinctly from these regions by way of a recognizable and durable container.

In general, the dimensions of SOS amphoras vary substantially with little perceivable chronological pattern, except that the lip and foot gradually widen. Over the course of 200 years, vessel height varies between 58 cm and 75 cm, but an average of 68 cm for most of its existence seems reasonable. Maximum diameter is more stable over time and ranges between 43cm and 49cm with an average at 44.4 cm. The height of the foot remains 3 or 4 cm, but neck plus lip height varies between 9 and 16 cm—though most stay within the 11 to 14 cm range (Johnston and Jones 1978, 133). Because of the great variety in size, capacity is not consistent. Only one has been tested and it holds 61.75 liters up to the base of the neck. However, this particular vessel is one of the larger examples and should not necessarily be taken as the norm (Johnston and Jones 1978, 134). Contrary to this picture, Johnston postulates a loose standardization by potters based on simple dimensions including maximum diameter (44cm/22 Attic fingers), height (64cm/2 Attic feet), and neck diameter (14cm/7 Attic fingers), as well as the body and neck diameters being related by the factor π (Jones 1986, 706-707). This gives a capacity of 144.4 Attic *kotylai* or just over one Attic *metretes* (Johnston and Jones 1978, 135).

The following section focuses on the evidence for SOS production and the multiple regions involved in their manufacture. It seems, based on current published evidence, that the

majority were made at Athens, but many must also have been potted at Chalkis and Eretria at least in the late 8th and early 7th century, though it is unclear whether they were exported in any large numbers from this location (see next section; Johnston and Jones 1978, 140). In addition, it seems likely that imitations of the Attic type were made at Pithkoussai, while less immediate copies appear sporadically elsewhere.

Athenian Production

Formation Technique

The Athenian SOS amphora shape seems to have developed out of the standard decorated amphora of the time, adopting the symmetrical balloon body and tall, straight foot (**Figure 24a**; Johnston and Jones 1978, 132). However, significant differences separate it from these others, including handles that are circular in section and a flaring neck. Johnston and Jones (1978, 132) suggest these differences can be “explained on practical grounds,” but such handles are not necessarily chosen for most transport amphoras (e.g., the NAA). The characteristic neck profile incorporates a sharp molding under a simple vertical lip. Johnston and Jones suggest that, “this feature is best explained as a drip-ring to catch the contents that might dribble over the end of the lip” (Johnston and Jones 1978, 132-3). However, this suggestion could be contested since the ring would not necessarily save any liquids and this ridge disappears over time in place of a more cup-shaped mouth. Indeed, it seems that “a very similar progression is seen in the shape of the mouth of the sixth-century Attic lekythos and encourages the view that the SOS was primarily an oil container” (Johnston and Jones 1978, 133). In addition the neck becomes more concave with a taller and more flaring lip, which eventually becomes echinus- or calyx-mouthed on the latest

vases (e.g., numbers 58, 59 in Johnston and Jones 1978, 133). Other morphological characteristics include a tendency to a higher, broader greatest diameter and a flatter shoulder.

Decoration

The basic Attic SOS amphora decoration included various configurations of S, O, or sometimes a triangle or wheel on a reserved-ground neck, with bounding lines above and below (the number vary: normally none, one or two not infrequent, and three attested). The inside of the neck is almost always reserved on Attic versions. The body is glazed in dark stripes, some more sloppy than others. Decoration on early examples of Attic SOS amphoras included a triangle motif between two S motifs, which in the beginning were more like squiggly lines. Over time the squiggles became more like sigmas leading to a three-barred version in the later 7th century. Common Attic varieties of circles include a dot with two rings, two rings and no dot, four rings, three rings with four spokes, and two rings with four spokes. The origin of both hatched triangles and concentric circles appears to be autochthonous and based on Attic pottery of earlier Geometric periods; however, the S motif is not common in Attica (Johnston and Jones 1978, 139). Johnston (1978) attributes the S motif to a stylization of a dribble of oil, but I think a more likely explanation is that the motif is borrowed from previous and contemporaneous transport containers including the NAA (**Figure 25**). In support of this suggestion, early Attic and Euboean SOS amphoras also had striped handles (found in quantity at Pithekoussai as well: Buchner Ridgway 1993; Johnston and Jones 1978, 139). In addition, Johnston asserts that Chalkis adopted the circular motif on the neck before Athens, possibly from Cyprus, but again the motif may have been borrowed from North Aegean amphoras, which we know reached Lefkandi around the same time (Catling 1998).

Other decoration specific to Attic SOS amphoras includes irregularly applied paint on the outside of the handles (Johnston and Jones 1978, 138). For example, a handle from the old Kerameikos (later Agora), above a kiln, has irregular paint on the handle arch and prominent irregular brush wipings on the inner face, as well as the fingerprints of the maker (Papadopoulos 2003, 131, note 63).

Fabric

Amphoras produced in Attica can also be distinguished by their petrographic and chemical compositions. Analyses conducted by Jones (1978, 1986) have clearly proven the existence of a distinct Attic group with the distinguishing features of high Mg, Cr, and Ni contents (Johnston and Jones 1978, 123). Jones analyzed 99 samples of SOS amphoras including seven “à la brosse” (later in date, streaky wheel-painted body, cylindrical neck and rolled rim), using 23 samples from Athens as a control (Jones 1986, 708). Amphoras of certain origin from Athenian Agora and Kerameikos are made of fine clay with white and red inclusions of widely ranging size and are very hard and well fired. These chemical tests concluded that “the majority of amphorae from outside Attica which have been taken to be Attic by reason of their fabric and decoration fall within the Attic limits” (Johnston and Jones 1978, 123), thereby positively correlating appearance with composition and consequently making the identification of Attic SOS amphoras easier. Jones states that, “The most successful outcome of the four sets of analyses has been the independent corroboration of an Attic origin for the majority of SOS amphorae” (Jones 1986, 711).

Euboean Production

It is clear, based on both archaeological and chemical analyses, that SOS amphoras were also produced on the island of Euboea, as early, if not earlier, than in Athens (**Figure 24b**). However,

the exact production locations on the island are indistinguishable because the ceramic fabric is too similar. Nevertheless, it may be possible to assume that the majority of Euboean ceramics in Eretrian cemeteries came from local producers, as the majority of Geometric ceramics from Chalcis, as well, were produced by artisans at that site (Blandin 2007, 77). Additionally, there is some archaeological evidence to support the existence of pottery workshops at both Chalcis and Eretria.

In 1976, excavations in Chalcis uncovered a large pottery deposit 11.5 meters deep. Mostly decorated, fine wheelmade pottery was found and belongs to the local workshop, dated to the end of the 11th to the end of the 8th century (Andreiomenou 1996, 111). In addition to fine pottery, four SOS amphoras were found and were deemed local (although one seems to have been imported from Attica). Other excavations at Chalcis have unearthed three deposits on the Gyphtika hill. The third pit, excavated in 1969 was dated to the first half of the 7th century and contained the waste of a potter's workshop (Descœudres 2006/2007, 4-5, note 10; see also Choremis 1971 [B1], 252 pl. 227a-b). In this pit, drinking vessels predominate but there are also fragments of a large number of locally made SOS amphoras, about 200 (Johnston and Jones 1978, 111).

Evidence for local Eretrian SOS production comes from excavations in the West Quarter.¹⁸ Verdan et al (2008, 101) suggest that an Eretrian origin for two SOS amphoras recovered should not be excluded based on the Euboean quality of the pieces (Verdan et al 2008, 101 note 678). In addition, some other SOS amphora fragments have been reported from excavations at Eretria, but no final publications can confirm this (Andreiomenou 1975, 224 and

¹⁸ More information will be known about production of SOS amphoras in Eretria and their morphology when the ceramics are published (Descœudres, Forthcoming).

pl. 64c; Andreiomenou 1983 pl. 53, 26-28 and pl. 64, 217-220, 222).¹⁹ During their seminal study of SOS amphoras, Johnston and Jones (1978, 140) also posit the possibility of an Eretrian workshop producing SOS amphoras, but qualify this hypothesis with a statement regarding material from the Greek and Swiss excavations: “there is nothing in the description of these pieces to indicate an origin other than Attic; the clay analyses published in *Archaeometry* support such an attribution and the description of the clay and the decoration of the others in no way opposes it” (Johnston and Jones 1978, 112).

Based on the available evidence, it is currently accepted that SOS production definitely existed at Chalcis, and may have existed at Eretria (or possibly other locations as well). Regarding the distinct morphology of Chalcidian SOS amphoras, this version differed from the Athenian type in a few ways. The foot is lower and more flared, the body has a higher center of gravity, the handles are flattened, the lip is thicker, and the neck is slightly convex with a groove instead of a ridge (Johnston and Jones 1978, 133). In particular, the lip is low, at most 4 cm. and of varying profile with a notch rather than a ridge separating the lip from the neck (Johnston and Jones 1978, 111). Chalcidian SOS feet tend to be more flaring with a rounded inner contour and vary from 14.3 to 18.7 cm in diameter, usually under 17 and from 2.5 to 3.75 cm in height (Johnston and Jones 1978, 111).

Additionally, Chalcidian SOS amphoras differ slightly from SOS versions in regard to decoration. One of the most recognizable features is that the neck is usually slipped cream and glazed on the inside (unlike Attic versions which are left reserved). The glaze tends to be dull,

¹⁹ Andreiomenou (1996, 120) concludes that Eretrian SOS amphoras decorated with triangular motifs are products of the Euboean workshop (Andreiomenou 1975, pl. 64c, a-c) and date to an early stage of the production of these idiosyncratically decorated vases. However, Johnston and Jones (1978, 112) consider them Attic.

and often fired chestnut (Johnston and Jones 1978, 112). For the Chalcidian SOS, its distinctive variety of decoration on the neck consists of long double zig-zags enclosing a circle with a large triple set of rings around two very small central rings (**Figure 24b**).²⁰ The early use of the concentric circle on Euboean SOS amphoras may suggest that Chalkis adopted the circular motif on the neck of its storage amphoras before Athens, where in the early period the triangular central motif was more common and the type of circle used was simpler and drawn from LG stock ornamentation (Johnston and Jones 1978, 136). Alternatively, Chalcidian SOS necks can be solidly glazed on the outside. Another distinctive feature is the common decoration of three stripes running down the outside of the handles, which can have a slipped or reserved ground. In addition, Chalcidian SOS amphoras normally have a broader band with more lines, slipped or reserved, or exceptionally in added white (Johnston and Jones 1978, 139).

Euboean SOS amphoras are also distinct in their fabric. The large red inclusions that are the hallmark of Attic ceramics are conspicuous by their absence in the Chalcidian SOS series, which has a richer red colored fabric than Attic (Jones 1986, 708). Like Attic SOS amphoras, Chalcidian versions are well fired and are noticeably hard (Jones 1986, 708). The program of chemical analyses by Johnston and Jones (1978), mentioned above, resulted in the recognition of a very distinct group of amphoras with a Euboean signature. In particular, the Chalkis samples (48-54, 56-7) formed a distinct group, and one that is “satisfactorily consistent” within itself. The diagnostics for this Chalcidian/Euboean group are low Mg, Cr, and Ni (Johnston and Jones 1978, 123). While this distinction of fabric is very useful when comparing samples to Attic compositions, Euboean fabric compositions do not separate as well from central Italian samples, as will be discussed below.

²⁰ Johnston and Jones (1978, 139) suggest that the more complicated Chalcidian five-ring circle would have been borrowed from Cyprus, though other explanations are possible.

Pithekoussai and Other Locations

Based on chemical analyses by Jones (1986), it is clear that production locations other than Euboea and Attica existed for SOS amphoras. Out of 99 samples, 15 were non-Attic. Of these 15, six were found at Pithekoussai, one at Megara Hyblaea, one at Huelva and one at Cypriot Salamis (Jones 1986, 711). Unfortunately, all bore some resemblance to Chalcis-type composition but only four fell within the concentration ranges mentioned above (Jones 1986, 708). Therefore, it is hard to tell where these particular vessels came from, especially because Pithekoussaian locally made pottery is similar to Euboean in chemical composition (Jones 1986, 711). Nevertheless, the fundamental connection between Euboean cities and Pithekoussai opens the possibility for relatively easy movement of ideas, technology, and people between these two areas. Therefore, it is possible that Euboean, or even specifically Eretrian, potters came to Pithekoussai or the environs and made pots in local clay. David Ridgway (2004, 25-6) cites the existence of two Eretrian-style chevron skyphoi found in graves at Etruscan Veii, but made of Veientine clay (Ridgway 2004, 25-6). Indeed, Ridgway believes that immigrant Euboean potters are the most plausible explanation for the fact that although locally-made pottery outnumbers imported Euboean by 81% to 3% in the acropolis assemblage (or rather in a sample of around 10,000 pieces in it), a substantial proportion of the local pottery is of Euboean type. In addition, imported Euboean, locally-made Euboeanizing, locally-made Corinthianizing and other local wares at Pithekoussai share a firing temperature that is higher by 50 degrees Celsius than that estimated for the imported Corinthian samples analyzed (Ridgway 2004, 26; Deriu, Buchner, and Ridgway 1986, 113). It seems, therefore, that the similarity in technological features of ceramic production between Euboea and Pithekoussai suggests a shared potting tradition. Ridgway

(2004, 26) states that “I therefore (still) feel that resident Euboean potters, presumably with locally-recruited pupils, can reasonably be postulated at both Veii and Pithekoussai.”

There are some features of SOS amphoras from Pithekoussai that might distinguish them from Chalcidian versions (**Figure 26**). Based on available evidence, it seems that the clay and slip are similar but the wall of Pithekoussian versions is thicker, the glaze a brighter chestnut red and the slightly concave profile contrasts with the convex neck profile found at Chalkis (Johnston and Jones 1978, 114). In addition, the decoration, as far as preserved, does not include the typical Chalcidian wheel and zig-zag motifs (Johnston and Jones 1978, 114). Potters from Pithekoussai also seem to have imitated Attic SOS amphoras (Ridgway 1992, 64). Hundreds of fragments of amphoras characterized mainly by simply swollen lip and neck flared up with markedly concave walls were found in the habitation areas of Pithekoussai (Di Sandro 1986, 15). The neck is decorated with hasty horizontal wavy lines and the shoulder and belly are banded. The clay is fine but dull and tends towards orange, pink or beige, and the paint is also dull and opaque. Di Sandro (1986, 15) admits that identifying SOS amphoras with certainty in this mass of fragments of large vessels is often difficult, especially when dealing with small body pieces. Nevertheless, Di Sandro (1986, 15) suggests that there are definitely local imitations of SOS amphoras, which can be identified by their non-canonical decorative syntax. A typical example is an amphora (inv. no. 476) from a tomb in the necropolis of San Montano (Buchner and Ridgway 1993, 478, no. 476.1). In addition, a locally-produced SOS amphora from the Scarico Gossetti area of Pithekoussai (fragment SG14), combines elements drawn at random from the SOS motif repertoire, and is “obviously misinterpreted in its syntax” (Di Sandro 1986, 15). Although currently few in number, locally produced SOS amphoras definitely existed at

Pithekoussai, though probably on a smaller scale. These amphoras seem to have continued the Euboean tradition, but with their own peculiar traits (Jones 1986, 707).

In addition to Pithekoussai, there is some evidence to suggest that SOS amphoras were produced at other colonial locations in the central Mediterranean. Based on his work on the distribution of Euboean pottery outside of the island, Descoedres (2006, 12) suggests that Euboean potters worked at a number of sites in Italy and Sicily. In accordance with Ridgway, Descoedres includes Pithekoussai and Veiï as locations with an Euboean potter, but adds Vulci, Pontecagnano, Locri, Sicilian Naxos, and even Zagora on the Aegean island of Andros.²¹ Local production of SOS amphoras may have also occurred at Policoro where an SOS amphora was found in tomb 26 that resembled the Chalkis group in composition, but not in physical characteristics. Since south Italian clays show this type of “Chalcidizing” results, Johnston and Jones (1978, 122 note 24) suggest that, “it was presumably made near Policoro.”²² There is some evidence (mostly single pots) for local production of SOS amphoras at other sites, such as Metapontion (Johnston and Jones 1978, 117), Sybaris (Johnston and Jones 1978, 127, note 24, vessel number 32), and Megara Hyblaea. The high number of SOS amphoras found at Megara Hyblaea (over 250) is relatively unique and includes at least one local version.²³ Jones (1986, 711) states that, “evidence in favor of local production at Megara Hyblaea is equivocal, but these amphoras could have been made elsewhere in Sicily.” Based on this evidence, it seems that if

²¹ Descoedres has yet to publish definitive proof of these identifications. This list is drawn from a distribution map that included hypothetical locations of Euboean potters (Descoedres 2006, 12).

²² Additionally, local imitation SOS amphoras were alluded to in *Rend. Linc.*, 1971, 646.

²³ Johnston and Jones 1978, 118, note 12: we may note the local imitation of seventh-century date with well-spaced SI,O,SI,O,SI on the neck, MEFR lxxvii (1955) pl. iia. The Attic vase mentioned in AJA lxx (1966) 361 is not yet published.

multiple colonial Greek cities were producing SOS amphoras, it would have been on a small scale. More chemical analyses of local clays are needed to establish control groups against which we can safely compare the compositions of these non-Attic amphoras.

Outside of the central Mediterranean, few locally-produced non-Attic SOS amphoras have been identified. At Salamis on Cyprus, however, two non-Attic SOS amphoras have been published. According to Jones (1986, 712) these amphoras “open up the prospect of examining sites in East Greece as potential production centres of these and related amphoras” (Jones 1986, 712). It is now clear that Ionian sites were producing their own versions of transport containers, though currently none have been identified as producing specifically SOS amphoras. There is, however, some evidence for later Ionian production of “à la brosse” amphoras found at the Phocaeen colony of Massalia in southern France. These amphoras were originally said by the excavator to be from Ionia, based on the fabric, and might show that Ionians were imitating Attic shapes later in the Archaic period (Gras 1988).

Distribution of SOS Amphoras

Introduction

Since SOS amphoras were produced at multiple locations, their distribution across the Mediterranean produces interesting patterns that also change over time. These patterns in amphora distribution may correspond with multiple facets of Greek historical occurrences, but the waves of colonization movements played particularly large roles. SOS amphoras have been found at over 140 sites throughout the Mediterranean and this number continues to grow as more excavations publish their findings.

As discussed above, it is generally accepted that there were two major production locations for SOS amphoras in the Archaic period: Athens and Euboea. The ability to distinguish

between pots produced in one region versus another provides the basis for reconstructing separate distribution networks. Consequently, this section uses SOS typologies, contexts, and scientific analyses to understand where and in what quantities Athenian, Euboean, and other SOS amphoras were transported. Of course, this methodology is not without caveats. Chemical and petrographic analyses, as outlined in the previous section, can overlap in certain geographic locations making it impossible to determine with any certainty where exactly a pot was produced. Regarding the present study, the chemical overlap between Euboean and Pithekoussan ceramic chemical signatures prevents a concrete deliniation between Euboean SOS imports to Pithekoussai and locally made versions. Hence, our reconstruction of the Euboean SOS trade network is slightly hindered. This hindrance is somewhat mitigated by the generally distinctive Euboean decorative scheme applied to their own SOS amphoras, making their identification feasible. In the same vein, chemical analyses of SOS amphoras tend to provide only an “Attic” or “non-Attic” designation. Athenian SOS amphora trade networks are, therefore, much more robust and concrete as will be demonstrated below. The change in morphology and design of SOS amphoras over time aids in reconstructing how trade networks might have shifted, since early versions are found in more limited locations. The general ability to date SOS amphoras as Early, Middle or Late, based on morphological characteristics (primarily the foot and rim shapes), provides some evidence for tracking when these vessels were transported to certain areas, and for how long they continued to do so.

In addition to the painted decoration, graffito inscriptions have been found on the shoulder and neck of at least 50 vessels. As with the other vessel types in this study, potmarks continue to be an important asset when examining the role and scope of oil and wine movements, including the various hands through which the pots moved. The graffiti on SOS amphoras were

summarized in some depth by Johnston and Jones (1978) who suggested that there are multiple categories of graffito marks: owner's names in the genitive scratched post-firing, single letters that may convey content or capacity, and single letters or marks as standing for a name.

Names scratched on the vases tend to be relatively uncommon (Johnston and Jones 1979, 129). An SOS amphora found in a tomb from Kamarina has a name written in Attic script. However, the name, Smordon, is generally confined to the northern Aegean area. Two other inscriptions on a late SOS and an *à la brosse*, one found in Egypt the other at Cerveteri, read "PET" and may be an Egyptian name, but certainly written by the same hand (Johnston 2000). It is also possible that these are traders' names written by Attic producers as a way of reserving the contents (Johnston and Jones 1978, 129). An additional SOS amphora found at Methone has an alphabetic inscription that could be a name, but this remains uncertain (Bessios et al. 2012, 349-350, no. 6). This same difficulty in distinguishing between owners' marks and sellers' marks is a recurring problem that is even encountered in the much more fully studied realm of 5th century Athenian potmarks (Lawall 2000).

For the purposes of distinguishing trade networks, graffiti on SOS amphoras can give some possible indication of the routes these pots took or the people involved. SOS amphoras made in Attica have been found with Cypriot, Cycladic, and even Phoenician writing in geographical locations distant from both the origin of the pot and the region of the script. For example, there are graffiti on SOS amphoras found at Almuñecar in the south of Spain that seem to show ties with Pithekoussai (Cebeillac-Gervasoni 1982, 205). The graffito mentioned above, "PET", may have been written by the same hand with the amphoras found in Egypt and Italy. In addition, an Attic SOS amphora found at Mende in the northern Aegean has a Cypriot inscription that is identical to an inscription from the Policoro cemetery on Cyprus (**Figure 27**;

Vokotopoulou and Christidis 1995, 7-8). In both cases the graffito consists of a name (of trader or owner) followed by an abbreviated patronymic (*te-mi*) and an abbreviated ethnic (*Se*=Salamis). In addition, three incised horizontal lines on one handle form a common Cypriot capacity pot-mark (Masson 1983, 80). Salamis has the highest concentration (ca. 20 examples) of SOS amphoras on Cyprus, one of which was inscribed (Karageorghis and Masson 1965, 146). Does this mean that Attic SOS amphoras were moving through Cyprus or that the trader himself was Cypriot?

This section outlines the data available for reconstructing the distribution of SOS amphoras in the Archaic period from the time of their invention (ca. 750 B.C.E.) to their disappearance (ca. 575 B.C.E.). The distribution of Attic SOS amphoras throughout the Mediterranean, including their volumes and evolution over time will be discussed first. Then, the distribution data for Euboean SOS amphoras will be presented. The remainder of this section is devoted to addressing the various actors involved with the transport of SOS amphoras during the Archaic period and the evidence for participation by Greeks, Phoenicians, and possibly other cultures and their roles within these distribution networks.

Attic SOS Amphora Distribution Network

Attic SOS amphoras are found throughout the Mediterranean from the middle of the 8th century B.C.E. to the beginning of the 6th century B.C.E. (Table 5; Map 12). Currently, there are over 100 sites published that report at least one SOS amphora, though many publications do not provide the exact find context, date, or ceramic provenance. The distribution of Attic SOS amphoras presented here will be divided chronologically, since many published examples can be identified as “Early” or “Late” versions. In this case, “Early” is defined as mid-8th century B.C.E. to mid 7th-century B.C.E., and “Late” is defined as mid-7th century B.C.E. and later. The related

“à la brosse” amphora is not treated in full as it is out of the scope of this study. However, when appropriate, their existence at a site is noted since there is some overlap between these amphoras and late SOS amphoras.

In central Greece and the Peloponnese examples are found at a total of 16 sites (Map 13). Of these, eight sites have produced examples of the early version (64%). Perhaps to be expected, the largest group of early and late Attic SOS amphoras come from areas in and around Athens, including the Athenian Agora (34) and the Kerameikos (13). Closer to the port, at Phaleron, 17 examples, some of which are early, have been published. Additionally, nine Attic SOS amphoras have been found on the island of Aegina, in the Saronic Gulf (Johnston and Jones 1978).

Interestingly, the highest concentrations of Attic SOS amphoras are not found in central Greece, but in Sicily. A total of 21 sites have produced evidence for at least one Attic SOS amphora (Map 14). Of these 21 sites, six have produced early versions of the shape (29%). Sites with the highest concentrations of these vessels include Megara Hyblaea (over 160), Kamarina (35, late), and Syrakoussai (over 10), though most have more than a single example (Johnston and Jones 1978, 115-121; Procelli 1997; De Angelis 2003; Birzescu 2012, 175-180).

Similarly, 24 sites in Italy have produced at least one example of an Attic SOS amphora, nine of which have identified early versions (38%; Map 15). However, unlike Sicily, there is only one site that stands out as having a high concentration of these vessels. Pithekoussai has produced over 55 examples of SOS amphoras, 15 of which are certainly identified as Attic, with many others unidentified (Di Sandro 1986). Most of the other published sites in Italy only report the existence of one or two examples, though some hint at the possibility of more.

The distribution of Attic SOS amphoras in the far west, including Iberia and the northwest coast of Africa, is very similar to Italy, in that a total of 24 sites have reported Attic

SOS amphoras, though most have very few, and only five sites report early examples (21%; Map 16; Johnston and Jones 1978, 115-121; Birzescu 2012, 175-180; Domínguez and Sánchez 2001). Two sites stand out as having relatively high concentrations for the region: Toscanos (over 11) and Mogador (over 12).

Our information for the northern Aegean region, including ancient Macedonia and the Chalkidike, has increased dramatically in the last 30 years with the full publication of many sites with Archaic occupations (Johnston and Jones 1978, 115-121; Kotsonas 2012, 188-194). Because of this, the number of sites with Attic SOS amphoras has also increased. A total of 16 sites have thus far reported finding at least one SOS amphora (Map 17). Of these sites three of them have identified early versions (19%). Some sites have produced relatively high concentrations of these vessels, including Methone (over 14) and Karabournaki (over 10, though probably many more when fully published). Most other sites have reported only a handful of SOS amphoras, many of which are relatively late.

The number of Attic SOS amphoras in Asia Minor and the Black Sea region remains relatively scarce (Birzescu 2012, 175-180). A total of 11 sites have produced any evidence for the existence of SOS amphoras, none of which are early versions (Map 18). Miletos has produced the most evidence for any SOS amphoras (12), followed by Smyrna (6). The remaining sites can only identify one example at most, though there is some question as to whether the sherds belong to early “à la brosse” amphoras instead since the body sherds are virtually identical.

Only four Aegean islands have thus far reported Attic SOS amphoras present: Crete, Rhodes, Keos and Thera (Map 12). However, most of these examples are late, and none can be

securely dated to an earlier period of production. Interestingly, Euboean SOS amphoras are more predominant on the Greek Aegean islands, which will be discussed further below.

On the large island of Cyprus, six sites have published SOS amphoras, only two of which have early examples (Map 19). Salamis has produced at least 20 examples, some of which can be identified as early versions. Amathus too has produced 15 fragments, though it is uncertain whether they are certainly of Attic derivation and could be rather late (Johnston and Jones 1978, 115-121).

Sites in the Levant, Egypt, and the north-central coast of Africa have also produced examples of Attic SOS amphoras (Map 19). A total of 19 sites have reported finding at least one vessel, with four sites identifying early versions. Cyrene (35), Carthage (16) and Al Mina (14) stand out as producing the most examples. Many sites in Egypt have only recorded one or two SOS amphoras, all of which are later than the middle of the 7th century B.C.E.

Euboean SOS Amphora Distribution Network

Although it is clear that regions of Euboea were producing their own versions of SOS amphoras, as discussed above, it is unclear where or in what quantity they were shipped abroad. Based on the evidence currently available, it seems that Euboean SOS amphoras remained primarily on the island, but did have a limited distribution to most of the same regions where Attic versions traveled (Table 5; Map 12). At Chalcis on Euboea over 200 SOS amphoras have reportedly been found in a potter's dump providing direct evidence for their large-scale local production (Johnston and Jones 1978, 111). Unfortunately, this deposit has yet to be fully published, making the date unclear, as well as whether these pots are consistent with other Euboean SOS amphoras found abroad.

Because of the difficulties surrounding the identification of Euboean SOS amphoras through chemical or petrographic means, only a handful of vessels have been positively identified in the western Mediterranean as specifically Euboean (Map 12). Two SOS amphoras at Pithekoussai have been determined as deriving from Euboea, one from Metapontion, and a late version from Policoro. On Sicily, five sites have recovered at least one Euboean SOS including, Naxos, Syrakoussai, Kamarina, Morgantina, and Zancle. Only one site in Iberia, Guadalhorce, has thus far produced positive evidence for Euboean SOS amphoras in the far west.

Within the Aegean, single Euboean SOS amphoras have been identified at three sites in northern Greece: Sindos, Methone, and Torone (Map 12). The Aegean islands, while they do produce evidence for Archaic Euboean pottery of other types (Descoedres 2006), have yet to produce a securely identified SOS amphora. The only possibility is an SOS from Knossos, which does not seem to fit the typical Athenian standard, nor does it appear to be local. In the Levant and Egypt, a few amphoras have been labeled as Euboean SOS at Ras Al Bassit, Tyre, and even one at Marsa Matruh.

Based on this limited distribution, it seems likely that Euboean SOS amphoras were never intended to transport goods off the island in large quantities, but perhaps were caught up in the export of Attic SOS amphoras abroad. The fact that all the sites where Euboean SOS amphoras are found have also produced many Attic versions supports this idea. Additionally, many of the sites where Euboean SOS amphoras are found are also those with a long tradition of importing Attic versions, as most of them have produced early versions of the latter.

Observations

It was originally thought that there were chronological trends where the earlier SOS amphoras were confined to specific regions, namely the Near East (Cyprus and Al Mina) and the central Mediterranean, with many at Pithekoussai (Shefton 1982, 341). Thirty years ago this certainly seemed to be the case. However, with the publication of many more sites, especially in Sicily, Iberia, and the North Aegean, it is clear that this chronological division is not quite so obviously demarcated. The only region that has continued to fail to produce early Attic SOS amphoras is Asia Minor and the Black Sea. Instead, the presence and quantity of early SOS amphoras in the west, at least, seems to coincide with the distance of the site from their production location (mainly Attica and Euboea). For example, the regions of Iberia, Sicily and Italy have around the same number of sites producing any SOS amphoras (24, 21, 24 respectively). However, the number of sites with *early* SOS amphoras decreases as we move west. Italy has nine sites (38%), Sicily has six sites (29%) and Iberia has five sites (21%). The Levant, Egypt, and the north Coast of Africa follow a similar pattern with four out of nineteen sites (21%) producing early versions of SOS amphoras. Interestingly, this pattern does not seem to depend upon the presence of many Greek colonies in the region (i.e. Iberia, Levant, Egypt).

Other chronological patterns are visible as well. In the central and western Mediterranean, SOS amphoras seem to be the forerunners of other Attic ceramic exports and tend to be counted as the earliest Attic imports to many sites. It is only decades later that the typical Attic fineware exports start to be seen in some numbers at these sites. For example, at Morgantina fragments of Attic SOS amphoras found in the settlement area of the Cittadella date from the late 7th century and are the earliest imports identified. Other Attic pottery is rare until the third quarter of the 6th century B.C.E. (Lyons 1996, 29; Antonaccio 2004). In addition, the

earliest Greek objects found in some quantity in the Far west (Iberia) are Attic SOS amphoras and Corinthian ceramic material, mostly kotylai (Shefton 1982, 338). Many of the Attic SOS amphoras date to the late 8th and early 7th century and can also be found with other imports, such as Cypriot bichrome IV (Shefton 1982, 339).

These chronological trends may be the result of a number of factors, most likely concurrent. One explanation is that export of Athenian and Chalcidian SOS amphoras may correspond to specific colonial exploits. These amphoras may have contained provisions for nascent colonies during the first few decades when olive trees and even vineyards were not yet capable of producing the requisite amounts of olive oil and wine. The early SOS amphora locations roughly correspond to the earliest Greek (primary) colonies on both Sicily and Italy, which also happen to be on the coast. It is only the later SOS amphoras that are found inland in later colonies. This might explain the relative absence of SOS amphoras at, for example, Catane, since it was a secondary settlement. Alternatively, SOS amphora distribution patterns may be connected to Phoenician trading ventures as containers of valuable and desirable liquids. Additionally, early SOS amphora locations also correspond to Phoenician colonies or direct trade connections. For example, the sites of Motya and Carthage, both very prominent Phoenician colonies, produced SOS amphoras. SOS amphoras are also found at sites which seem to have had intimate connections to Phoenician trading ventures, including Cerveteri on the Italian Peninsula and Methone in northern Greece. Phoenician amphoras dating to the 8th century have also been found at Methone (Adam-Veleni and Stefani 2012, 161-162, nos. 109-111; Kasserli 2012). In fact, Phoenician “torpedo” amphora distribution corresponds almost exactly to the locations of SOS amphoras, including many sites in Iberia (Kasserli 2012).

One final consideration for the distribution of SOS amphoras is the long span of time over which they were imported to various sites. Although the absolute numbers of vessels recorded at many sites in the Mediterranean are not large (e.g., one to five counted), it is significant that many sites have different versions. In other words, even if only three SOS amphoras were found at a site, but they span a century based on morphology, then it is most likely that this site had been receiving these commodities for a long period of time, even taking into consideration reuse. This suggests that the presence of SOS amphoras at a site does not represent a single importation event. Rather, these amphoras were accumulated over time in a series of interactions, most likely incorporated into different economic networks and maintained by various actors. Megara Hyblaea is a unique example in that the site has produced one of the highest volumes of SOS amphoras (159 examples). Indeed, SOS amphoras comprise about 90% (159 out of 166) of the amphoras up until 580 when the SOS stopped being produced. The Attic amphoras imported after this time (e.g., *à la brosse*) are both less numerous and more varied in types (85 total including one Panathenaic; De Angelis 2003, 93). This large quantity provides the opportunity to see patterns of SOS amphora importation over time. Instead of all amphoras appearing during a single time-span, the distribution of SOS amphoras at the site takes place over almost 200 years. Within that 200-year period, however, there is certainly an era of increased volume. Specifically, five SOS amphoras imported from 750-700 B.C.E., 154 from 650-600 B.C.E., and only two from 600-575 B.C.E. This example demonstrates not only the long duration of SOS amphora distribution from its place(s) of origin, but also the wave-like pattern of the volume of SOS amphoras at any given time.

Actors and Their Roles Along the Archaic SOS Amphora Network

Categories of Actors

Contemporary and later sources make reference to different categories of personnel involved in moving goods from one location to another and participating in their sale. Based on the work by Reed (2003), there are three main actors who would have probably been involved along the SOS network. The first is “emporoi” or “traders” who always carried on interstate trade, traveled by sea using someone else’s ship, but owned the goods they traded in, though did not produce the goods themselves (Reed 2003, 7). A second category, “naukleroi,” refers to people who actually owned a seagoing merchantman. While these are two of the most prominent actors involved in maritime trade in ancient sources, there were certainly others who participated, though maybe not in a conventional way. For example, there were people who imported goods for their domestic or business use, those who financed a trip abroad by taking a shipload of goods to sell, soldiers who engaged in emporia on military expeditions, and pirates who unconventionally participated in emporia by transporting and selling the goods or people they had captured. In addition, there were farmers or craftsmen who engaged in emporia by traveling in order to sell elsewhere the goods they themselves grew or made, which is precisely the case encountered in Hesiod’s *Works and Days* (652-682; Van Wees 2009, 460; Descoedres 2008, 338).

Reed (2003, 65), however, provides another term that is perhaps most useful: “maritime trader.” These are free or unfree men who derive most of their livelihood from traveling by sea to buy and resell goods either for their own profit or for the profit of their owner. This category of independent maritime traders and agent traders were most likely involved in much of the early Archaic trade and derived from a number of different ethnic regions. In particular, Phoenician maritime traders come to mind as one of the dominant actors during this time period. Indeed

even in the Homeric tradition, long-distance trade is dominated by foreigners, especially the Phoenicians.²⁴ According to Reed (2003, 68), “we can reasonably doubt that all exchanges with places such as Al Mina and Pithekoussai were in the hands of Greek landowners or Phoenicians; some if not many such exchanges very likely were carried on by Greek *prekteres*—agent or independent—whom we may legitimately call “maritime traders.” These were most likely poor people, not aristocrats since, “the ideological divide between aristocrat and maritime trader loomed wide throughout the archaic period” (Reed 2003, 67). These seem to be the same group of actors mentioned in the *Odyssey* (8.162), though probably as independent merchants: the Phaiakian noble Euryalos taunts Odysseus by saying “you don’t strike me as a man of games, but as one who travels in a many-benched ship, a master (*archos*) of *prekteres*—a man who oversees the cargo, in charge of the merchandise and of greedily-sought profits.” These *prekteres* are in contrast to both Greek aristocrats sailing on their own (Reed 2003, 64) and the coastal voyages of farmers. Traveling overseas for long distances was a risky business. It is highly doubtful that Attic farmers with surplus produce, such as olive oil or wine, would want to take the risk, personal and monetary, to travel as far as Italy and Sicily to sell their goods in SOS amphoras. Therefore, one might suppose that either these amphoras traveled with people who were already going abroad for one reason or another (e.g., to set up or populate a colony), or SOS amphoras moved with people who were constantly traveling as a profession

²⁴ The Homeric tradition also makes clear, however, that elites also took part in trade as a means of deriving profit (Ulf 2009, 87; e.g. *Od.* 3.70-4; *Il.* 7.467-75; von Reden 1995, 61-68; Winter 1998; Wagner-Hasel 2000, 246-60).

Actors Participating in SOS Amphora Distribution

The data presented here on the distribution of SOS amphoras throughout the Mediterranean presents numerous inconsistencies in quality and quantity (e.g. some sites have been excavated for much longer than others, or published more thoroughly). Nevertheless, the sheer volume of data permits an attempt to discern some trends in the distribution that can be placed within an historical Archaic context and subsequently interpreted. It is first necessary, however, to try to understand the actors involved with the shipment and distribution of SOS amphoras throughout the Mediterranean. Without having at least an idea of the origins and categories of individuals participating in this network of bulk liquids, it will be impossible to come to any conclusion about the inter-connections and value system generated by this network of commodities.

Immediately, we are faced with a few conundrums that must be addressed. First, based on chemical and petrographic analyses (Jones 1986, Johnston and Jones 1978) we know that the majority of SOS amphoras found abroad were produced in Attica. It is also relatively clear, however, that Athenians did not send out colonies of their own to the western Mediterranean until the 5th century. This discrepancy brings to light a major issue: how involved were Athenians in the movement of SOS amphoras out of Attica?

The evidence for direct Athenian participation in SOS amphora movement abroad is relatively scarce. Unfortunately, most arguments for the direct participation of Athenians in the shipment of bulk goods rely on SOS amphoras as evidence. For example, Alexandridou (2011, 116) says, "...more importantly, the distribution of the SOS transport amphoras positively points to some participation by the Athenians in the mechanisms of promoting and distributing [later] fine-decorated Attic pottery." The effect here is a circular reasoning since it is not necessarily the case that Athenians would have transported their own goods abroad, especially since they do not

seem to have any direct link to contemporary colonies (e.g. Houby-Nielsen 2009, 198). Against the direct participation of Athenians in the distribution of Attic SOS amphoras is the fact that other Attic pottery is rarely found in contemporary contexts abroad. Even at Pithekoussai, a site that produced many early versions of Attic SOS amphoras, there is a complete absence of other contemporary Attic pottery in the cemetery or settlement (Ridgway 1992, 64). At the very least, this suggests that demand for prestigious olive oil, which is what these amphoras most probably carried, was not sufficient to create a market for fine pottery from the same origin. Although the evidence is bleak, I do not believe that it would have been impossible for Athenians to participate in what was probably a very lucrative and rapidly growing colonial market, thereby tapping into the existing need for an initial supply, at least, of necessary liquid commodities.

The second conundrum presented by the SOS amphora distribution is essentially the opposite of the first. We know that Euboeans, mainly from Chalkis and Eretria, were actively sending out movements of people westward from the very beginning of the Archaic period. Excavations of these early colonies have all produced Attic SOS amphoras, some producing many early examples (e.g. Pithekoussai). However, it is also clear that Euboeans produced their own versions of SOS amphoras. Surprisingly, these are rarely found off the island, though many that have been identified as Euboean are often located at Euboean colonies: Methone, Zancle, Naxos. This certainly raises the question: if Euboeans were moving amphoras abroad, why not move their own SOS amphoras instead of Athenian versions?

The question of Euboean participation in the shipment of SOS amphoras is in some ways harder to address than the Athenian question. At first, it may seem obvious that since Euboeans actually were establishing colonies, unlike the Athenians, then they would have an immediate need for a supply of liquid commodities. This may indeed be the case since there is evidence for

early (9th century) colonies of Euboea, such as Mende (Mazarakis Ainian and Levanti 2009, 235), or places of Euboean interest, such as Pithekoussai, producing many SOS amphoras. In these cases, Euboeans could have transported the vessels themselves to their own colonies or to places where they had some interest (e.g. Al Mina). But this straightforward answer to the Euboean participation ignores the fact that almost all of these SOS amphoras found in Euboean colonies are in fact Attic in origin. Indeed, even late Attic SOS amphoras continue to arrive at Euboean colonies throughout their period of manufacture, suggesting continued supply of Attic products and not their own.

A third issue concerns Corinthian pottery, including a high percentage of bulk liquid transport containers, found at just about every colonial archaic site in Italy and Sicily. However, there is only one primary Corinthian colony: Syrakoussai. Syrakoussai did spawn secondary and even tertiary colonies (Heloros, Kamarina, Maestro, Modica), but it is unclear how much involvement Corinth would have had in their establishment and provision. Most interesting for our discussion is that all of these colonies have produced Attic SOS amphoras. It is possible that Corinthians were making relatively regular trips abroad with both their own ceramics and goods as well as goods from the surrounding region, like Attica. But why would there be any need for Attic oil if Corinthian B amphoras also supposedly contained oil? An explanation for this pattern is harder to provide. Geography may also play a factor, but to a lesser extent. The Corinthian ismthus problem would affect the choice of amphoras one was able to take to western areas. Certainly Corinthians would have capitalized on this by providing a ready supply of liquid produce for anyone traveling overseas from that departure point. This provides an answer for the supposed predilection for Corinthian oil and wine in the west, as reflected by a number of Corinthian A and B amphoras at most sites, not to mention arryballoi and other finewares. Attic

SOS amphoras may have been thrown in the mix when supplies were low or to accommodate specific preferences. Support for Corinthian actors moving Attic SOS amphoras comes from a later context in the Black Sea region. Here at Istria a late Attic SOS amphora was found with Corinthian-Megarian writing on it, possibly suggesting the origin of the merchants (Dupont 1995-6, 87).

A final conundrum presented by the distribution of SOS amphoras must be addressed. Many sites in Iberia received Greek SOS amphoras before any direct Greek activity had reached that part of the western Mediterranean. In 1982, Brian Shefton convincingly demonstrated a connection between the find-spots of early Attic SOS amphoras, early Corinthian aryballoi, and Phoenician enterprise, particularly in Iberia. Based on these distributions, he suggested that Phoenicians were the primary movers of Attic SOS amphoras, along with most other Greek goods, at least in the early part of the Archaic period. He went on to suggest that perhaps Pithekoussai, as a settlement with both Greek and Phoenician traits, acted as a transshipment point (Shefton 1982, 342). The expanded SOS distribution provided here continues to support this idea. More Phoenician colonies can now be added to the distribution, including Carthage and Motya, as well as in Etrurian assemblages rife with Phoenician merchandise and iconographies (i.e. Cerveteri [Gill 1988, 8], Veii, Vulci). A greater number of Iberian sites with SOS amphoras have also been added that seem to be restricted to Phoenician contacts in the early Archaic period (Gonzales de Canales et al. 2006, 15). Additionally Phoenician presence at Ischia has been elaborated since Shefton's publication. Evidence now strongly suggests that the island was populated by both Greeks and Phoenicians. A particularly striking piece of evidence is an SOS amphora with both Aramaic and Greek graffiti (Garbini 1978) and an *enchytrismos* burial using a Greek amphora that had been inscribed with Phoenician writing. Finally, a recent review

demonstrates that the distribution of Phoenician 8th century torpedo amphoras seems to align very well with the distribution of early SOS amphoras, showing a clear connection between SOS distribution and Phoenician enterprise (Map 20; Kasser 2012, 307).

It is certainly possible for other, less easily visible groups to have participated in the distribution of SOS amphoras. For example, Aeginetans were known for their skill as seafarers and quite a few SOS amphoras have been found on the island (Hesiod fr. 205 Merkelbach-West; Houbby-Nielsen 2009, 198). In addition, Samians are alluded to in later sources as being some of the first seafarers to reach the far western Mediterranean. Herodotus includes the story of the Samian named Kolaïos who was the first Greek to reach Tartessos (Herodotus, *Hist.* 4.152). However, if this person existed, he did not perform his deeds earlier than about 640 B.C.E. (Shefton 1982, 344). Certainly, these suggestions from later literary sources attest to the varied nature of the merchants and seafarers traveling the western Mediterranean at this time.

Archaeological evidence may also point to Cypriot involvement in SOS amphora distribution. It seems relatively clear that over the course of the Early Iron Age, a prominent Greek presence evolved on the island (Iacovou 2006). In 673 B.C.E. more than half of the ten Cypriote states were ruled by kings with Greek proper names (as recorded by Essarhaddon's royal scribes; Iacovou 2006, 261). Iacovou (2006, 269) asserts that, "it seems reasonable to propose that those Cypriote kingdoms where state administration was conducted in the Arcado-Cypriot dialect—written exclusively in the syllabary until late in the 5th century B.C... claimed for themselves a Greek identity." This historical background may provide some clues to the presence of Cypriot graffiti on an Attic SOS amphora recovered at Mende in the North Aegean (Vokotopoulou and Christidis 1995). The graffito was inscribed in Cypriot script with the: name (of trader or owner) followed by abbreviated patronymic (*te-mi*) and an abbreviated ethnic

(Se=Salamis) (Vokotopoulou and Christidis 1005, 7-8). Interestingly, there is an identical graffito from the Policoro cemetery, suggesting that the same person was involved with the manufacture or sale of these vessels. Other evidence for the Cypriot connection comes from the same jar at Mende, which has three incised horizontal lines on one handle, a pot mark common on Cypriot pottery representing capacity (Masson 1983). Since Salamis has the heaviest concentration of SOS amphoras on Cyprus, and the person's graffito identified himself as from Salamis, it is possible that Cypriot merchants acted as some sort of node along the economic network of Attic SOS amphoras.

The many actors involved with the distribution of SOS amphoras provide multiple nodes within the greater economic network of the Archaic period. These patterns of trade might be a result of either sporadic contact or a result of a high level of knowledge and high frequency of contact. Robin Osborne (2007) suggests that the latter is more likely since it requires a discriminating demand and would result in non-random patterning, which seems to be the case. The demand for Attic oil/wine inside the SOS amphoras may have been either need-based or desire-based. In this way, Attic SOS amphoras acted as both provisioning goods for nascent colonies as well as prestige items for consumption within indigenous communities in Italy, Sicily, and Iberia. Consumption patterns help elucidate the variations in demand for SOS amphoras throughout the Mediterranean. It is therefore necessary to examine these consumption patterns more closely.

Consumption of SOS Amphoras

Introduction

Consumption of bulk liquid commodities during the Archaic period seems to be quite different from previous periods. As discussed above, the Archaic period presents an evolving social environment in transition from a system of chieftains and big-men to the nascent Greek polis. Although there are no palaces to speak of, a hierarchy certainly still existed with an upper echelon of elites, men who governed and owned large amounts of land (Duplouy 2006). In addition, consumption in the Archaic period was affected by the growing awareness of “otherness.” The world of the “Greeks” was widening to include people and places as far west as modern Spain and as far east as the Black Sea. This expansion of boundaries created new opportunities to experience foreign products as well as exploit the newness of their own commodities to these distant people (Broodbank 2013, 506-592). Indeed, it seems that throughout this period there was a growing awareness of a “shared elite lifestyle” among different cultures around the Mediterranean basin that included not only wine-drinking and its associated paraphernalia, but also luxury finished goods made of exotic materials (Broodbank 2013, 517).

A discussion of consumption must therefore move away from invoking demand as a response to “need.” Instead, we now have a situation where demand can be driven by desire as well (Foxhall 1998, 297; Graeber 2001; Papadopoulos and Urton 2012). Desire as impetus for consumption patterns visible in the archaeological record can be easily seen in the case of bulk liquids like oil and wine. For example, why would north Syrian and Phoenician cities, like Al Mina and Byblos, import Greek oil or wine when there is a healthy production of the same products in their own regions? Indeed, we even see the reverse situation when Hesiod drinks

wine from Byblos at his summer holiday barbecue (*Works and Days* 589), though there is no lack of wine production in Boeotia (including at his own estate). When examining the consumption patterns of Greek SOS amphoras throughout the Mediterranean regions, it is therefore necessary to ask whether the vessels were consumed as a reaction to necessity (or shortage, need) or whether their contents (and the containers themselves?) were consumed as prestige items, valuable in and of themselves and in relation to the culture's regime of value (Appadurai 1986). That being said we must also be cautious about the depositional patterns of SOS amphora consumption. We can safely assume, I believe, that most of the SOS amphoras were first shipped and consumed for their contents. Only then, when empty, were they re-used again (multiple times?), then deposited as we find them, sometimes assuming an entirely new purpose (e.g., as a burial container, see below).

The following discussion of Greek SOS amphora consumption in the Archaic Mediterranean will focus on a number of overarching questions specific to the time period. First, what are the differences, if any, between how these vessels are consumed in Greece or in Greek colonies compared to indigenous Italic, Sicilian, or Iberian regions? Do the consumption patterns show a difference in use-value between Greek colonizers and local inhabitants of the differing regions, especially within the realms of mortuary and ritual contexts? Are there differences between how indigenous people consume these vessels in various regions, for example, Sicily compared to Italy or Iberia? Along the same lines, are there differences between SOS consumption in their place of origin (mainland Greece) and the Greek colonies? Does this tell us anything about how the colonies were using the commodities and the vessels: were they provisions or were they prestige? Or did the commodities gain an entirely new use-value within a new colonial environment?

These questions will necessarily involve the detailed analysis of the contexts of consumption of SOS amphoras throughout the Mediterranean. Here, I will only focus on the regions of the Mediterranean for which we have the most data and largest sample size; namely: central Greece, Italy, Sicily, and Iberia. As in past chapters, this section will focus on the five parameters outlined by Dietler (2005): context of consumption (settlement, mortuary, ritual), kind of site (elite/common, colonial/indigenous), patterns of association (with objects, with contexts), relative quantitative distribution (within site, within region), and spatial distribution (within site, within region). Comparing these variables between regions and between sites within regions will lead to a better understanding of how people integrated SOS amphoras and their contents within their own cultural value system and consequently why these pots were deposited in the way that we find them today. It is this tension between colonial and indigenous value systems that can bring to light the cultural mechanisms involved with the consumption of bulk liquid commodities and how their trade over a long period of time can reflect and possibly even affect changes in social dynamics.

SOS Consumption in Mainland Greece

The primary location of SOS production is in the region of Attica, as described above (Table 6, Map 13). In addition, we know there was a second production region in the vicinity of Chalcis on the island of Euboea, just off the coast of Attica. It is important to first examine the consumption patterns of SOS amphoras here, at their production locations, as a kind of “constant” against which we can later compare patterns in other geographical regions. Six sites have produced evidence for consumption of SOS amphoras within settlement contexts. Mortuary contexts come from seven sites, and potential ritual contexts at only two sites. Settlement contexts tend to be public areas (e.g. the Athenian Agora) or production areas (e.g. Chalcis). Within all mortuary

contexts in this region, SOS amphoras appear to be used as the burial container itself, not as a grave good. SOS amphoras have been mentioned as existing at the Poseidon sanctuary at Isthmia (Alexandridou 2011), in addition to one found in floor fill of the sanctuary to Poseidon at Kalaureia (Wells et al. 2003, 71 no. 89).

The kinds of sites at which SOS amphoras are found tend to be towns of considerable size, but not necessarily considered hierarchically superior to others. Within sites, quantitative distribution produces an interesting pattern. It seems relatively common for SOS amphoras to be used both within settlement contexts and within mortuary contexts of the same site (e.g., Athens, Halieis, Eretria). However, the ratio tends to be in favor of settlement use, with at least three times as many SOS amphoras recovered from settlement contexts as compared to mortuary contexts. Phaleron currently has an unusually high number of SOS amphoras used within a mortuary context (17), recovered from graves spanning the entire Archaic period (Pelekidis 1916, 27-9). However, without publication of the associated settlement, it is currently impossible to know whether the ratio is maintained. Additionally, many of the burials with which SOS amphoras are associated are child/infant burials, including all 17 amphoras from Phaleron (Young 1942, 24), many from the Agora, Kerameikos, and Acropolis South Slope cemeteries (Papadopoulos and Smithson 2002, 184-185). In terms of relative quantitative distribution within the region, SOS amphoras seem to be concentrated at larger coastal or trading sites. Spatial distribution within the region shows that SOS amphoras have yet to be found at inland sites. These vessels are only recovered along or near the coasts of Attica, Euboea, northern Peloponnese, and the western Ionic coast. As of yet, there do not seem to be any patterns of association with specific objects or within specific contexts. These parameters for SOS

consumption convey the general trends by which these vessels were used within the culture that initially created the ceramic shape as well as the liquid commodities that were carried within.

SOS Consumption on the Italian Peninsula

The Italian peninsula was one of the first areas to import Greek SOS amphoras (Table 6, Map 15). Based on current analyses, it seems that a mixed community of Greek settlers, including Euboeans from Chalkis and Eretria, founded one of the earliest (if not the earliest) central Mediterranean colonies on the small off-shore island of Ischia opposite the Italian Campanian coast. Here, these Greeks interacted, on a daily inter-personal scale, with Phoenicians who also lived on the island (as demonstrated by burial practices, writing, ceramics, and weight systems, among other things). Among the earliest imported ceramic containers are large quantities of Attic (and some Euboean) SOS amphoras in the settlement (46+). It seems relatively clear that these vessels reached Ischia as containers of oil or wine for use first within the settlements. Subsequently, some were reused in the cemeteries, notably at Pithekoussai, for burial containers, mostly for infants (9). Early SOS amphoras are also found at the Euboean colony of Cumae, located on the coast opposite Pithekoussai, where one SOS amphora has been reported from a settlement context and two from mortuary contexts. Other Greek colonies followed suite in their consumption of SOS amphoras, though not to the extent we find at Pithekoussai. SOS amphoras are found within settlement contexts at Sybaris (3), Metaponto (5+), Policoro/Syris (2), Metauros (2), Kaulonia (6+), Reggio (2), Medma (2), and Taranto (1). Colonial mortuary contexts with SOS amphoras include Metaponto (2), Policoro/Syris (11), and Hipponion (1). The only colonial site to produce evidence for SOS amphora consumption within a ritual context is Metaponto with only two vessels reported.

Italy presents the first opportunity for a glimpse into how indigenous peoples consumed Greek SOS amphoras and their contents (Procelli 1997). Compared to colonial sites, a similar number of indigenous sites have produced evidence for SOS consumption within settlement contexts. These include Veii (1), Basento (8), Incoronata (4), Cavallino (1), Pisa (1+), Paestum (2), Calatia (1), and Ficana. Only three indigenous sites have produced SOS amphoras in mortuary contexts, though the numbers are rather striking: Veii (4), Vulci (11), Cerveteri (32). These three Etruscan sites are clustered in the north-west peninsula and present an important difference in consumption habits. Here, many of the SOS amphoras were found within tombs as grave goods, not used solely as burial containers. This difference in consumption patterns is a departure from both the Greek mainland and colonial practices of SOS amphora use and re-use, suggesting a different value attribution to these vessels. Yet interestingly, no SOS amphoras have been found in indigenous ritual contexts thus far. This may, however, be due to lack of archaeological excavations of such sites.

Patterns of association between Greek SOS amphoras and other objects at both colonial and indigenous sites are unclear. It is possible to say, however, what patterns do not exist. For example, at both the settlement and cemetery of Pithekoussai (and indeed the entire island), no other Attic pottery is found contemporary with the Attic SOS amphoras (Ridgway 1992, 64). The only pattern of association that might be meaningful at this particular site concerns the similar use of Corinthian A amphoras in mortuary contexts, where two examples have been found alongside the nine SOS amphoras. In settlement contexts, Corinthian A amphoras are also present, again less than half the number of Attic SOS. Relative quantitative distribution within sites presents different patterns between colonial and indigenous sites. Greek colonial sites seem to follow a similar pattern as the mainland. More SOS amphoras are found in the settlement than

in mortuary contexts. For example, at the necropolis of Pithekoussai, there are nine Greek SOS amphoras compared to 46 within the settlement (Di Sandro 1986, 130). However, at indigenous settlements, the numbers of SOS amphoras found in mortuary contexts seem to outnumber those recovered from settlement contexts. For example, at Veii, four SOS amphoras were found in mortuary contexts compared to one within the settlement. Though we do not have much settlement information for Vucli and Cerveteri, the numbers of SOS amphoras found in mortuary contexts are rather large, 11 and 28, respectively. It is hard to imagine, though not impossible, that we would eventually find three times those numbers within the respective settlements. The relative quantitative distribution within the region produces an interesting pattern. It seems that in general SOS amphoras are evenly spread between the sites. Only Pithekoussai stands out with over 46 recovered from settlement contexts. However, this high number is partially due to the extensive excavations carried out at the site over many years and its excellent state of preservation. Spatial distribution of SOS consumption suggests that clusters of sites, mainly located along the western and southern coasts of the Italian peninsula, acquired these vessels. Both indigenous and colonial sites are represented in these clusters. To the northwest, there is a cluster of indigenous Etruscan settlements with SOS amphoras. In the central-west, Campania has produced another cluster made up of both colonial and indigenous settlements. The same can be said about the middle southern coast where colonial and indigenous sites have clustered around the region of Metaponto, as well as the southern tip of the peninsula where Locri and its secondary colonies have also produced SOS amphoras. This spatial pattern is somewhat similar to the Greek mainland in that SOS amphoras are consumed primarily at coastal locations, rarely penetrating indigenous sites further inland.

SOS Consumption in Sicily

Consumption of Greek SOS amphoras at Sicilian sites has attracted the most attention of all the Mediterranean regions (Table 6, Map 14). Not only have many excavations provided detailed quantitative data, but independent studies have sought to examine Greek material at both colonial and indigenous sites throughout the island. Therefore, it is perhaps not surprising that Greek SOS amphoras appear to have been used in many more numbers and at more contexts on Sicily than other regions. Settlements categorized as “indigenous” here refer mainly to those sites which remained outside of the colonial sphere, generally located in the mountainous center of the island or on the outskirts of large colonial centers. Greek SOS amphoras have been recovered in small numbers from seven indigenous settlement sites, if one includes pre-colonial levels of Himera. In addition, a survey of the chora surrounding the Rhodian/Cretan colony of Gela found 130 fragments of SOS amphoras at 35 different settlement sites (Klug 2012). This number is rather striking and may suggest that future survey projects will present similar results. Only two indigenous sites have produced evidence for SOS amphoras in mortuary contexts: Monte S. Mauro (8) and perhaps Pre-colonial Himera (3+). The relatively high number of amphoras found at Monte S. Mauro deep in the mountains may provide evidence suggesting future excavations in indigenous cemeteries will produce similar results, especially in light of the Gela Survey findings. Ritual contexts of SOS consumption at indigenous sites are also surprisingly common. In the Gela chora survey, SOS amphoras were identified at nine ritual sites. In addition, one SOS amphora was also recovered from a ritual context in Himera. Again, the Gela chora survey presents a tantalizing glimpse into the wealth of information still waiting to be discovered about the consumption of Greek SOS amphoras within indigenous contexts on Sicily.

Colonial sites on Sicily present a somewhat different pattern. Settlements remain the most common context of consumption, with 13 sites producing SOS amphoras. Most of these sites have fewer than five examples of the vessels. Megara Hyblaea, however, has produced over 159 examples of SOS amphoras within the settlement contexts alone. This great number cannot be the result of archaeological site formation, excavation techniques, or the vagaries of survival/preservation. This is a real concentration of SOS amphoras. The reason behind this concentration is entirely unknown, though Megara Hyblaea was one of the first Greek colonies, founded by Megara around 728 B.C.E. One of the first questions is why a colony of Megara would have such a concentration of Attic SOS amphoras; a question which is impossible to answer at the moment. Another colonial settlement context that stands out from the rest on Sicily is at the site of Motya (De Angelis 2000-2001, 196). It is at first surprising to find early Attic SOS amphoras at a Phoenician colony. However, based on the wider distribution of these amphoras throughout the Mediterranean, discussed above, it is clear that the Phoenicians would have had access to SOS amphoras and their consumption. Greek SOS amphoras are also found in colonial mortuary contexts. Based on the available data, six colonial sites have produced evidence for the use of these vessels as burial containers. All of these sites have five examples or under, except for Kamarina, which stands out with 37 examples (Sourisseau 2006, 132). All of these examples are, however, late in date since Kamarina was not founded by Syrakoussai until around 600 B.C.E. It is nevertheless interesting that the people would embrace the pots' re-use as burial containers so readily. In addition, five SOS amphoras were used at Megara Hyblaea for inhumation burials. Three colonial sites have produced evidence for use of Greek SOS amphoras within ritual contexts: Lentini (2), Syrakoussai (2) and Gela (1).

SOS amphoras have yet to produce many concrete patterns of association with objects or contexts at Sicilian sites. Within mortuary contexts, Greek SOS amphoras can be found alongside Corinthian amphoras, also used as burial containers. This association may be practical, in that both of these types of vessels are large enough to contain human remains. However, the association may also suggest that both of these amphoras were consumed as items of prestige, perhaps based on distance-value or value as a limited/restricted commodity. The relative quantitative distribution of Greek SOS amphoras on Sicily is somewhat different from what we see on mainland Greece. Within sites, it does not seem to be the case that vessels in settlement contexts outnumber those found in mortuary contexts. This pattern may be due to archaeological priorities or recording strategies. It is also possible, however, that this pattern displays a particular consumption practice where the vessels themselves were more highly valued as objects of prestige. In this case, they could have been re-used more consistently as burial containers, reflecting the individual's status as having owned one of these amphoras. Within the region, relative quantitative distribution seems to suggest concentration at single sites, then distribution and subsequent consumption from that point. For example, at Megara Hyblaea, SOS amphoras comprise 90% (159 out of 166 items) of the amphoras up until 580 B.C.E., when SOS amphoras stopped being produced (De Angelis 2003, 93). This certainly might suggest that this particular site specialized in importing or controlling the consumption of Greek oil or wine shipped in SOS amphoras. These numbers also support the suggestion that SOS amphoras were shipped continually from Attica over a period of at least one hundred and fifty years.

Spatial distribution of SOS amphoras within Sicily is also quite different from the Greek mainland. While coastal sites, both indigenous and colonial, consumed SOS amphoras in some numbers, these vessels also make their way inland to mountainous indigenous sites including

Monte Balchino, Ramacca, Monte S. Mauro, Grammichelle-Terravecchia, and Morgantina, all concentrated in the south-eastern area of the island. This spatial pattern of consumption may further support the idea that SOS amphoras are being moved from a more centralized location to other coastal sites, then inland to indigenous settlements. This is certainly not the case on mainland Greece where SOS amphoras are not found outside coastal or commercially important cities. The insistence on consuming Greek oil/wine from SOS amphoras themselves, and not re-bottling the commodities at their coastal place of initial unloading, may also support the idea that on Sicily, at least, these vessels were considered important in and of themselves as markers of distinction or objects of value within a colonial, but especially an indigenous, sphere.

SOS Consumption in the Western Mediterranean (Iberia)

SOS amphora consumption in Iberia produces a strikingly different pattern from the rest of Mediterranean (Table 6, Map 16). All of the vessels recovered from the 24 sites come from settlement contexts. An SOS amphora has yet to be found used as a burial container or used within ritual contexts. While this pattern may be a function of the vicissitudes of the archaeological record, at least partially, it nevertheless seems to reflect an important difference in consumption practices. In Iberia, eight indigenous settlements have produced evidence for SOS consumption, roughly parallel to the seven Phoenician colonies reporting the same vessels. These Greek amphoras were found roughly associated with other imports, including Phoenician amphoras, Cypriot bichrome IV wares and Corinthian kotylai (Shefton 1982). The relative quantitative distribution of SOS amphoras within the region of Iberia is difficult to determine with certainty based on the published data. Gadir was the largest and highest hierarchically of all the Phoenician colonies, but it is unclear how many SOS amphoras have been recovered there; we only know of their presence (Domínguez and Sánchez 2001). However, Toscanos has

produced at least 11 examples (Shefton 1982; others report 50: Birzescu 2012, 179 note 1404 citing Docter 1997, 239). The rest of the sites have reported six amphoras or fewer. Indigenous settlements display a similar pattern, with one site standing out in relative quantity, in this case Mogador (12+), compared to less than five vessels present at the other sites. It is unclear whether this regional quantitative distribution is a result of archaeological practices and chance or a genuine reflection of consumption practices. Spatial distribution of Greek SOS amphoras on Iberia seems to follow a pattern favoring coastal sites, both colonial and indigenous). However, some SOS amphoras did find their way to some inland indigenous sites.

The underlying factors behind these consumption patterns are not easily pinpointed, though it is possible to speculate when placed within a social context. In Iberia, one fact that may affect these consumption trends though not necessarily explain them is the fact that the colonies here are not Greek, but Phoenician. It is possible that when Phoenicians brought Greek SOS amphoras and their contents to the Iberian peninsula the population consumed the contents of the vessels and valued the vessels themselves as part of their own value system, which apparently did not consider the pots suitable for reuse within a mortuary context. Specifically, Greek SOS amphoras may have acquired a prestige value based on desire for Greek liquid commodities. Shefton (1982, 341) observed, "If Attic oil was known and appreciated in the Eastern Mediterranean (Al Mina!), one can well imagine that it was thought a worth while cargo for the Phoenician sites on the southern Coastal Strip (Toscanos, Guadalhorce; Aljaraque) and also to the Tartessian native settlements (Huelva)." This idea may be supported by archaeological settlement patterns suggesting that the earliest dwellings within Phoenician colonies were of a large size within a carefully planned town. Aubet (2006, 99) believes these characteristics may indicate the presence of rich merchants from the very beginning of colonization. The value of the

contents of SOS amphoras as prestige commodities may have then been conveyed and consumed within indigenous value systems. On the other hand, one should not rule out the possibility that the commodities within SOS amphoras were acting as a supply for nascent colonies as part of general Phoenician needs abroad. For example, Cerro del Villar, one of the earliest Phoenician colonies, seems to have relied on consuming agricultural resources and stock raised by others since the colony's focus was on metals, industry, and trade (Aubert 2006, 96). The presence of SOS amphoras may have been part of this town's supply of oil or wine purely out of need for those products. It must be acknowledged, however, that the small number of examples published from the site indicates that Greek SOS amphoras were certainly not a major percentage of that colony's supply.

Consumption Conclusion

Throughout all this focus on imported SOS amphoras in the various regions of the Mediterranean, it is necessary to keep in mind that SOS amphoras are nevertheless a very small percentage of a much larger group of amphoras, mostly local, at each of the sites discussed. The best example is perhaps Pithekoussai. Even though this site has the largest number of SOS amphoras, they are nevertheless the minority. Within the first period at the site (LGI-MPC), imported amphoras from the necropolis represent only 25% of the total number of amphoras. Of the imported amphoras, SOS amphoras number nine (about 40%), along with two Corinthian A amphoras, five Phoenician and seven Ogiva (Di Sandro 1986, 130). Greek amphoras are dominant at Scarico Gosetti with ca 46 SOS and 24 Corinthian A, while the eastern amphoras are limited to 19 Phoenician and only 5 Ogival jars (Di Sandro 1986, 130).

Despite these (relatively) small numbers, it seems clear that each region consumed SOS amphoras and their contents according to differing sets of values. While each region consumed

these amphoras within settlement contexts, the volume of amphoras and method of consumption within mortuary contexts varied greatly between regions. This is perhaps best discernible when comparing the Greek mainland's patterns of consuming SOS amphoras with the patterns produced by indigenous Italians. Mainland Greeks often used SOS amphoras for burial containers, though the volume of amphoras found in mortuary contexts is generally significantly lower than settlement contexts. In contrast, indigenous Italians consumed SOS amphoras within mortuary contexts, but as grave goods. This difference may be due to the respective value of SOS amphoras and their contents. Within regions of SOS amphora production, they were not considered valuable enough for use as anything other than conveniently large containers for burials (Papadopoulos and Smithson 2002, 185). In regions distant from production, however, SOS amphoras probably assumed a certain distance-value, and were subsumed into existing notions of value within a non-Greek repertoire (Dietler 2005). That Attic SOS amphoras have been recovered from multiple indigenous ritual sites suggests that these vessels and their contents may have been valued beyond the utilitarian in cultic activities.

Chapter Conclusions

The Archaic period was the first time that bulk oil/wine shipped in large ceramic amphoras consistently moved along established networks, especially towards the west. The previous Early Iron Age saw the maintenance of some commercial economy in oil/wine, but certainly limited in scope and volume. Likewise, the Late Bronze Age trade in TSJs focused mainly on local transactions, only venturing sporadically to Eastern markets (and even more rarely western ones). Based on the data presented in this chapter, it seems relatively clear that by the middle of the Archaic period, a solid commercial economy was well underway for the oil/wine industry. The socio-political background of the Archaic period, including the formation of poleis and

establishment of colonies, provides a broad network with many solid nodes that liquid commodities could be moved to and from. The distribution of SOS amphoras during the Archaic period suggests that they were not part of a political or sacred obligation, as was evident during the LBA, for example. SOS amphoras are widely dispersed throughout the Mediterranean, demonstrating that they were not used as a means of tribute or obligatory payment to a central authority. Rather, the bulk of SOS amphoras are produced in two locations, but shipped to over 100 sites from the Black Sea to Iberia. In addition, their standardized decoration, shape, and perhaps volume all point towards their functioning within trade transactions as easily recognized commodities.

It is peculiar, however, that SOS amphoras do not, for the most part, have a localized production strategy, which was one criterion for a commercial economy. In fact, the production of SOS amphoras is similar to the LBA TSJs within a political economy: two major regions of production, with much smaller production areas outside of the “home region.” It seems to be the case that politics infiltrated the commercial enterprises of poleis, as demonstrated by Solon’s regulations in Athens. We could say, therefore, that while the Greek oil/wine economy was commercial as a whole (many regions of Greece producing their own oil/wine and amphoras), each individual type of amphora (and its contents) functioned on a political level as well. By the late Archaic period, many regions of Greece produced their own amphora with its own semiotic code: the style, decoration, and individual features all pointed to a specific meaning. This is wholly unlike the LBA, where each region on Crete produced its own amphoras, but they were all uniform, following the same semiotic codes. In the case of SOS amphoras, they were a product (mainly) of Attica and Euboea and perhaps subject to the political decisions of each respective polis. That this may have been the case can be seen by the apparent decision to export

Attic SOS amphoras in large numbers, but restrict the export of Euboean SOS amphoras, for whatever reason. Of course this is impossible to determine in any concrete way, and it could be just as plausible that the restriction of Euboean exported SOS amphoras was a purely economic decision.

It seems possible, moreover, that this type of commercial economy in the Archaic period had roots in the Early Iron Age. As discussed in the last chapter, Type II NAAs also seem to have been produced in the one general region (Pieria, Thermaic Gulf) with a consistent semiotic code, but shipped to various regions of the Aegean (and a few to Pithekoussai). At the end of the EIA, therefore, a smaller-scale version of the later Archaic commercial network existed for bulk liquids trade using amphoras. The network of NAAs was certainly the largest at the time, especially by the time that they Type II version was standardized. It is precisely at this point that the first SOS amphoras were produced in Attica/Euboea. Where the NAA stopped, however, the SOS continued and pushed the boundaries of Greek presence in the western Mediterranean. That SOS amphoras are some of the first Greek pots found in Sicily and Iberia suggests that although Greeks themselves were probably not transporting the vessels, the amphoras were nevertheless forerunners for future large-scale consumption of Greek products and the establishment of Greek colonies in these regions. Although the SOS amphora disappeared by the end of the Archaic period, it had expanded upon patterns of recognizable production, widespread distribution, and localized consumption that would be continued by other regions of Greece into the Classical period and beyond.

Conclusions

The broad historical trajectory covered here provides the ability to trace the transitions and transformations of the Greek oil and wine economy across multiple chronological divides. These divides represent both large-scale disruptions in economic and political situations, as well as significant expansion in socio-economic networks brought about by the increased mobility of people in the Mediterranean basin. The results of this dissertation suggest that despite these political and economic transitions, various regions in Greece maintained a level of surplus olive oil and wine, which was continually bottled and exported. Such continuity allows us to question what types of interaction between farmer, potter, and politics needed to exist, on a local scale, to facilitate this level of commercial sophistication. Additionally, the maintenance of long-distance cultural and commercial contacts through trade throughout the Early Iron Age suggests a level of network continuity from the Bronze Age. Indeed, it is necessary to consider the agency of less centralized entrepreneurs in the EIA and how this category of actor may have descended from a Bronze Age counterpart who perhaps participated alongside a palatial economy. Having analyzed the production, distribution, and consumption of ceramic containers used to ship bulk liquids, we can examine critically the social mechanisms in place during the LBA and EIA that allowed for this commercial continuity during a period of dramatic political change.

Multiple regions of Greece produce evidence for continuity in oil and wine production from the LBA to the EIA that includes not only the transport containers addressed above, but also increased storage capacity at major sites. Despite the change in socio-political conditions at the end of the Bronze Age, production of TSJs continued into the Postpalatial period on Crete. In addition, amphoras continued to be produced alongside TSJs and eventually assumed a dominant role for transporting bulk liquids. That the amphora continued to be the favored shape is then

demonstrated by the production of NAAs in the Early Protogeometric period. Although it is unclear exactly where Type I NAAs were produced, the most likely candidates remain within Greece, perhaps the region of Lokris or farther to the north. It is also interesting to note a continuation in the general size, volume, shape, and linear decoration of transport containers across this chronological divide. It is hard to draw any definitive conclusions from these observations, but it is nevertheless important for understanding ceramic traditions and the technical/mechanical properties of the vessels themselves.

The continued production of significant quantities of transport containers from the LBA to the EIA may also support the idea that the potters themselves were not closely regulated by a central authority. Oka and Kusimba (2008, 362), focusing on the nature of political control, contend that it was neither efficient nor desirable for states or political elite to control every aspect of production, distribution, and consumption or even long-distance trade. Instead, it is suggested that the centralization of craft production should be seen as a locational phenomenon and not a political control mechanism. It is necessary to note, however, that a change in technological attributes of TSJs and a move towards a simpler shape (amphora) may indicate a change in preference brought about in some way by the collapse of the Mycenaean palaces. In contrast, this continuity in production of amphoras does not imply anything about the authority needed to produce a surplus of the liquid products themselves, which may have required a different level of organization and cooperation.

Other hints of continuity in olive oil and wine production, or at least the ability to produce a surplus of bulk commodities, come from an increase in storage capacity represented by a dramatic increase in pithos sherds in LHIIIC Late, the Submycenaean period and the Protogeometric period in the areas of Lokris and Phokis (Lis and Ruckl 2011; Caroline Belz,

pers. comm., notices an increase in incised pithos sherds during survey of the area around Mitrou). In a study of pithoi with impressed decoration, Lis and Rückl (2011, 162) suggest that the real flourish of this shape occurred during the Middle and Late Geometric period at sites such as Lefkandi, Corinth, Tiryns, and Argos. In addition, many of these pithoi recovered from Mitrou seem to have been produced at nearby Kalapodi, and another workshop may be located near the coastal site of Kynos (Lis and Rückl 2011, 162). The time-consuming decoration suggests that “they were not treated as purely utilitarian containers, but rather as important objects of display, embodying or manifesting owners’ ideas and intentions in reaction to the goods stored in them...it is obvious that there had to be something more than a sole desire to store surplus; the surplus must have been manipulated for certain social or political goals” (Lis and Rückl 2011, 162). While it is not always necessary to have an elite-based hierarchy for the production of surplus, evidence nevertheless exists for the presence of an elite class (e.g., the Toumba building at Lefkandi, evidence for feasting at Kalapodi, and elite tombs at Elateia). There may also be evidence for a priest-class or some form of religious personnel with the capability to manipulate the production and distribution of surplus agricultural material, as evidenced by the large number of pithoi found at the sanctuary of Kalapodi and their production nearby. The desire to continue producing labor-intensive surplus commodities may have been triggered by competition in the form of conspicuous consumption and control over resources, an aspect of social life that had clearly continued from the Palatial period. As suggested by Hamilakis (1999, 50), rather than signaling stability, olive oil and wine production likely represent a barometer of the “constant and endemic instabilities” within a society, of which the EIA seems to have had its fair share.

While the observations above apply to central Greece, it is also clear that agricultural activities continued in northern Greece. Indeed, there were no palaces in northern Greece that

could have succumbed to collapse, nor were there dramatic shifts in settlement occupation. It seems that the regions around the Thermaic Gulf and the Chalkidike maintained the same levels of production as in the LBA. Archaeobotanical remains suggest that the same types of produce continued to be grown, including the vine and olive tree. A case exists, therefore, for the ability to produce olive oil and wine in both regions where NAAs may have first existed. Indeed, future research should be directed toward elucidating the chronology and exact production locations for NAAs, especially the early versions (Type I and Transitional), so that we might understand more fully the socio-cultural mechanisms underpinning their existence along a broad trade network.

Following production, one might ask if Bronze Age trade routes were forgotten and replaced by completely new ones in the Iron Age, resulting in an entirely new distribution. Based on evidence presented in this dissertation, the collapse of the palaces toward the end of the Bronze Age did not mean the collapse of oil/wine production or trade. Instead, these socio-political changes seem to have initiated a shift in the focus of distribution networks away from the Levant, towards coastal Anatolia and the North Aegean. The impetus behind the existence of trade routes was likely to change as well. Specifically, in addition to trade as a means of acquiring luxury commodities, trade may have also been a function of mobility and maintenance of inter-personal connections. The collapse of the Bronze Age palaces might have allowed for the creation of a larger class of entrepreneurial agents, capable of continuing commercial networks that had been in place since the Palatial period. As demonstrated by the distribution of Type I NAAs, there was a clear connection between Greece and important sites like Troy, as well as other settlements in Asia Minor, soon after the Mycenaean palatial collapse. It would be hard to imagine that these connections were entirely new, devoid of any continuity from the

previous Palatial period. The social and commercial connections formed in the Bronze Age were likely to have remained, at least in some form, into the Early Iron Age.

Comparing the patterns produced through consumption of transport containers during the LBA and EIA may also shed some light on the continuities or discontinuities in the Greek oil and wine economy across this divide. The most obvious difference is that during the EIA, oil and wine seem to have been consumed, or at least deposited, by a different level of society. Whereas in the Palatial period vast amounts of TSJs were recovered from Mycenaean mainland palace storerooms (and very rarely in mainland tombs) NAAs are widely, and rather sparsely, distributed. Unfortunately, very little evidence exists that speaks clearly to the identity of those who used these objects during their period of circulation. But it does seem to be the case that NAAs were used in elite contexts, including mortuary (Toumba cemetery at Lefkandi), settlement (Clazomenai apsidal houses), and even ritual depositions (Kalapodi). The contexts and singularity of these NAAs may suggest that the pots and their contents had a prestigious connotation, producing a desire to display them instead of store them in basement rooms (Flad 2012). In terms of continuity in olive oil and wine production and distribution, these patterns may suggest that these liquids were less plentiful than in the previous Palatial period. Alternatively, it is possible that the trade networks in place to distribute NAAs in the EIA were not as regular or dependable.

The observable differences and continuities in production, distribution, and consumption of bulk liquid transport containers and their contents contribute to understanding shifts in political aspects of society during the period after the collapse of the Mycenaean palaces. Maintained long-distance exchange, surplus production and organization, and even consistency in transport containers themselves all allude to a level of complexity in social institutions and

economic networks that otherwise seemed to disappear at the end of the Postpalatial period along with other classes of evidence (lack of writing, monumental architecture, etc.). One might posit that the production of surplus oil/wine was a response to the threat of crop failure. If this were the case, however, one would not expect to see elaborate decoration on storage pithoi, nor would one expect to see any sort of exportation of these commodities to outside regions. The distribution pattern of NAAs indicates that at least some regions were very capable of exporting surplus products.

Instead, it is possible that a type of “market” economy was in place where the appearance of new economic opportunities stimulated the intensification of agricultural production. In addition, political decentralization seems to correspond to market expansion and increased interregional competition (Braswell 2011). As Lis and Rückl (2011, 164) have observed, “it is obvious that during LHIIC there emerged new opportunities for both producers and merchants to capitalize on luxury crops such as olives and vines, if only the demand was strong enough.” The presence of NAAs in disparate locations certainly seems to suggest that demand for surplus products was in place in multiple regions of the Aegean. This idea could also be supported by the transition to amphoras from TSJs, as observed and traced in Chapter Three. The simpler form of amphoras suggests a more wide-spread production of the shape. At the same time, these pots continued to travel within regional trade networks with occasional long-distance exchange. The collapse of the Mycenaean palaces may have paved the way for these new market opportunities and provided the necessary freedom for a new class of entrepreneur.

It is important to note, however, that a form of this “market” economy was most likely in place during the Palatial period. Recently, scholars have suggested that a non-palatial economy functioned alongside the traditional redistributive palace economy during the Mycenaean period

(Parkinson et al. 2013; Aprile 2013; Feinman 2013). It may, therefore, be possible to suggest that not only was there a continuity of production in oil and wine from the LBA to the EIA, but that at least some part of the economic networks, and in this case the market or commercial economies, survived this seemingly impenetrable divide.

If the continuities observed for the LBA/EIA transition were in some way influenced by the previous socio-economic situation, is it possible to observe a similar trend for the transition from the EIA to the Archaic period? To answer this question we must first consider the relationship between EIA economic networks and those of the Early Archaic period. Using patterns generated by the production, distribution, and consumption of bulk liquid transport containers, it may be possible to understand trade networks for the commodities contained therein along a continuum that shifts in centrality as production regions change (**Figure 28**). Although causal connections are impossible to reconstruct, one can observe that the north Aegean formation of a homogeneous system of amphora production (and presumably surplus oil/wine), starting with the Type II NAA, seems to have prompted a southerly response with the production of SOS amphoras in the region of Attica and Euboea.

Although the distribution networks of NAAs and SOS amphoras do not perfectly overlap, they form a hypothetical Venn diagram. NAAs are concentrated in the north Aegean and SOS amphoras in the western Mediterranean, but they overlap considerably in northern Greece. This overlap may be the result of similar consumption habits, or shared distributors (e.g., Phoenicians, Euboeans). Either way, northern Greece continued to act as a “middle ground” where multiple actors came together within a shared commercial network. In addition, the characteristics of the trade network for Type II NAAs may have served as a loose baseline for later Archaic networks. Specifically, a more regulated commercial network formed during the tenure of Type II NAAs,

as suggested by their concentrated region of production and standardization of shape and decoration. It seems possible, moreover, that this EIA commercial economy was the root of the commercial economy of the Archaic period. Like Type II NAAs, the bulk of SOS amphoras derive from a concentrated region of production, but the pots were distributed to over 140 sites from the Black Sea to Iberia. The attribution of a commercial economy for SOS amphoras may also be attested by their consumption within standard settlements and use as non-elite burial containers. SOS amphora production may therefore signal a landmark transformation of the EIA system of multiple production/export centers into a system that was dominated by a single container, closely identified with a single product and source.

Moreover, both vessels have standardized decoration, shape, and perhaps volume, all pointing towards their functioning within trade transactions as easily recognized commodities. While NAAs served a basic function as containers of surplus destined for trade and commercial interactions, their localized production may in fact signal a change in their “branding.” At this later phase of production (Type II), it could be the case that their specific decoration signaled not only the type of commodity within the vessel, but also the region of production. It may also be possible to suggest that the SOS amphora followed suit in a more direct manner than previously thought. Evidence for this direct link between NAAs and SOS amphoras may be shown in the similarity of specific decorative motifs. Early SOS amphoras frequently had two stripes running down their handles, like NAAs. In addition, the “squiggly line” present on the necks of early SOS amphoras (as opposed to the later Sigma-style motifs) has no obvious parallels in Attic Geometric motifs, especially on large shapes. It does, however, have a parallel on the NAA, where this motif had been a staple decoration since the inception of the shape in the Protogeometric period (**Figure 25**). Additionally, while compass-drawn concentric circles have a

long history in Attic vase painting, they are also found on NAAs. Moreover, Type I NAAs represent some of the earliest examples of this technique. In this stylistic or semiotic way, the SOS amphora may be seen as continuing and expanding upon a tradition of bulk liquid transport amphoras already present in northern Greece. As such, producers in Attica may have captured the olive oil export industry and along with it the container most familiar in trade from the previous two centuries.

It may also be beneficial to consider the long-term effects of a continued economic network for trade in Greek olive oil and wine from the Bronze Age to the Archaic period. The expanded Archaic distribution network may have built upon not only previous EIA networks, but also some manifestation of LBA networks as a basis for increased connections throughout the Mediterranean. Multiple scholars have already observed that the distribution of LBA Mycenaean pottery resembles the distribution of later Archaic wares. In a detailed study of Akhaian pottery in Italy, Papadopoulos (2001, 443-4) states that “the distribution of Mycenaean pottery in general is a virtual blueprint for the distribution of Greek pottery in the historic period” and that “Where these people [the Mycenaean Greeks] went and what they did, if the archaeological record is of any consequence, correspond closely to the destinations and activities of the later Greeks of the Late Geometric and Early Archaic periods.”

Indeed, this general view continues to hold true for Archaic transport containers. Many of the sites where SOS amphoras have been recovered have LBA counterparts or are located near LBA sites with Mycenaean or Mycenaeanizing pottery (Gras 1985; Vagnetti 1999; van Wijngaarden 1999). It is improbable that the same exact trade routes were consciously used by the Archaic descendants of LBA merchants. It is, however, important for emphasizing the endurance, or memory, of real connections through which it would be possible to instigate the

reinvigoration of sea routes that had been used sporadically, at best, for hundreds of years. The acceleration at which these routes were used from the 8th century on suggests that there must have been some lasting legacy of seafaring out to the west. Of course, Greeks were not the only people traveling these networks. Instead, the EIA and the Archaic period were characterized by heterogeneity of seafarers, including the Phoenicians, who had had at least a century's head start toward the west. There is no doubt that the Greeks, once the wave of westward mobility began, received guidance from others (perhaps even within the North Aegean middle ground) who had already created solid networks and established outposts along the way. One of these outposts might have been the strategically situated Pithekoussai, a place where Greeks, Phoenicians, indigenous groups, and others seem to have coexisted. In addition, these trading connections seem to be corroborated by the evidence provided by the distribution of early SOS amphoras and their alignment with contemporary Phoenician amphoras. It is certainly not a coincidence that some of the earliest examples of Greek (and especially Attic) pottery in the west were SOS amphoras, for example, at Pithekoussai.

So, in some way, the continued production of Greek oil and wine throughout the EIA paved the way for Greeks to penetrate a broad and fruitful western market where consumption of these critical commodities was in strong demand. Soon after, other Greek amphoras, such as Corinthian and Samian types, became increasingly popular in conjunction with the simultaneous expansion and complication of Mediterranean trade networks. By the end of the Archaic period, Greece, a region that was once a very modest presence in a large and disparate market, became the dominant and most valued supplier of olive oil and wine.

Figures

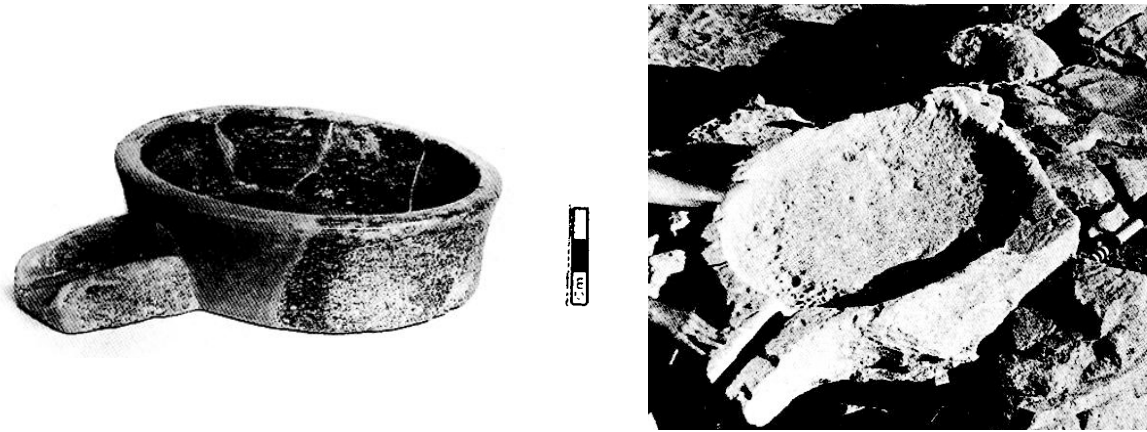


Figure 1. Pressing beds: (left) Type I (grapes), (right) Type III (olives). After Platon and Kopaka 1993, 40, fig. 3, 41, fig. 4.

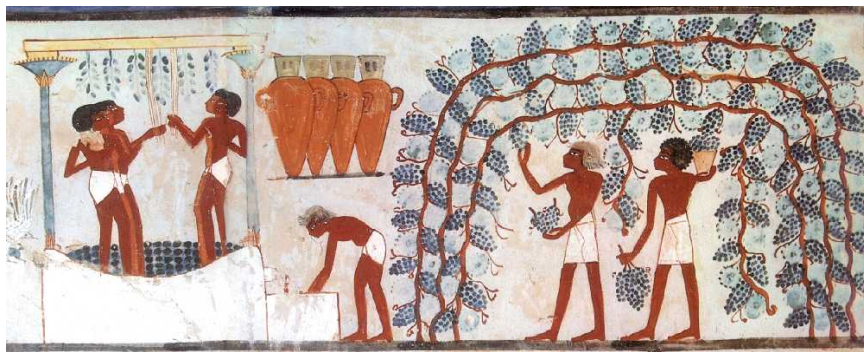


Figure 2. Wine pressing scene from tomb of Nakht at Thebes, 18th Dynasty. After Hallager 2002.

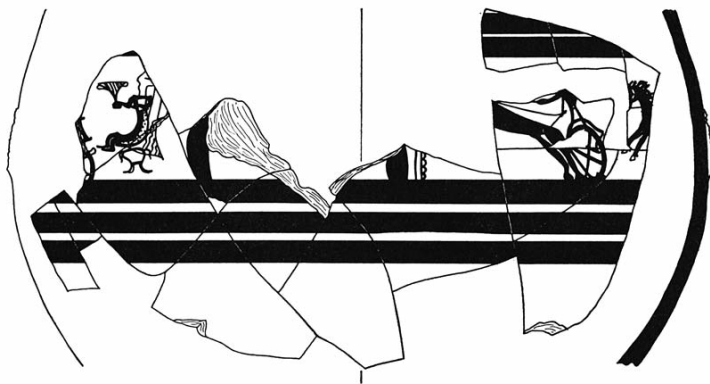


Figure 3. Drinking scene on a pictorial krater found at Tiryns. After Kilian 1980.

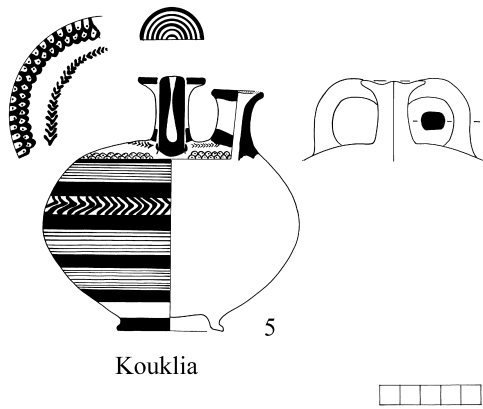


Figure 4: Small decorated stirrup jar from Kouklia, Cyprus. After Maier 1973: TE III.21, 70 fig. 3; reproduced in Mountjoy 2008.

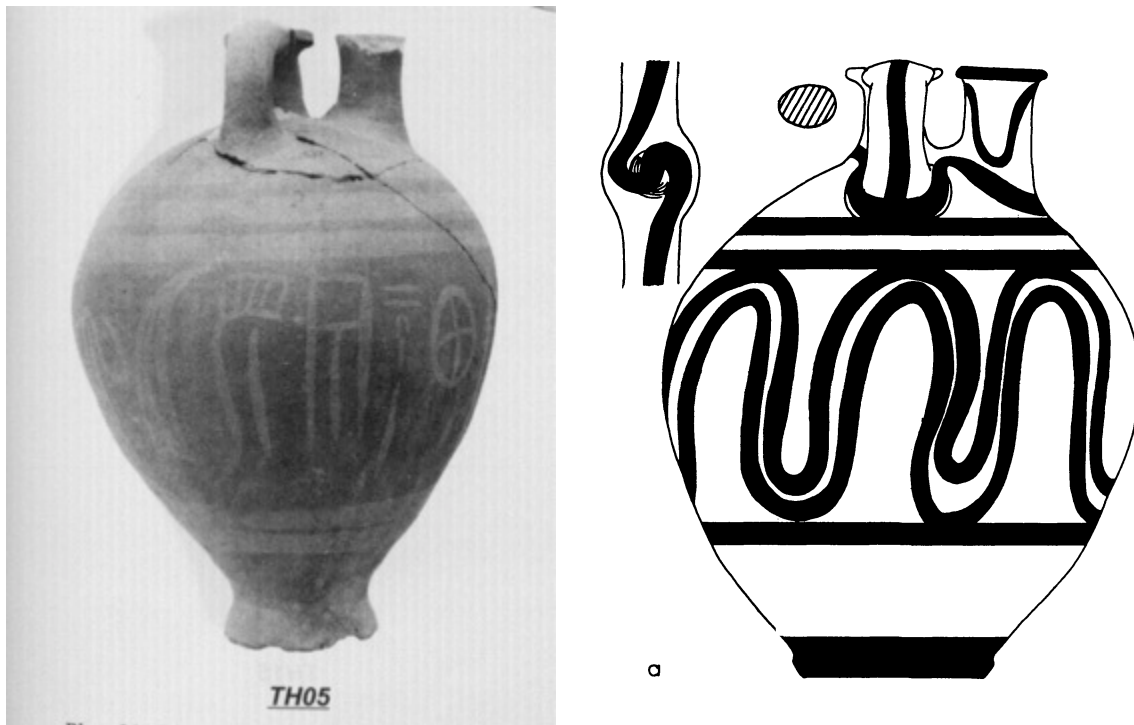


Figure 5. Cretan transport stirrup jars: (left) West Cretan transport stirrup jar from the Kadmeion at Thebes marked with Linear B. After Haskell et al. 2011, Pl. 21, TH05 [source image modified]. (right) Central Cretan transport stirrup jar from the House of the Oil Merchant at Mycenae. After Haskell 1981, 234, fig. 5a. Gp. 4 (5362a).

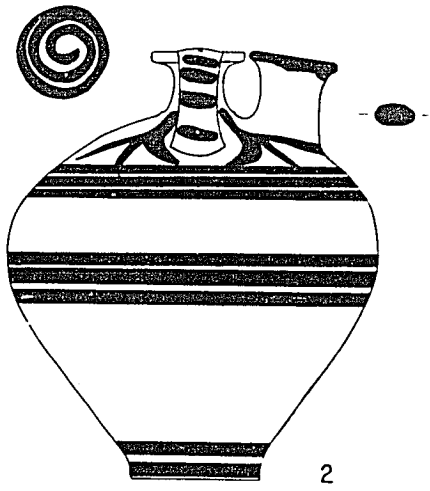


Figure 6. Mainland Greek transport stirrup jar from Zygouries. After Thomas 1992, 576, fig. 42.2.



Figure 7. Trojan Gray Ware transport stirrup jar. After Blegen, Caskey and Rawson 1952, fig. 331(b) 34.320.



Figure 8. Cretan Postpalatial transport stirrup jar with octopus wavy lines from Halasmenos. After Tsipopoulou 2004, 110, fig. 8.5 no. 92-9.

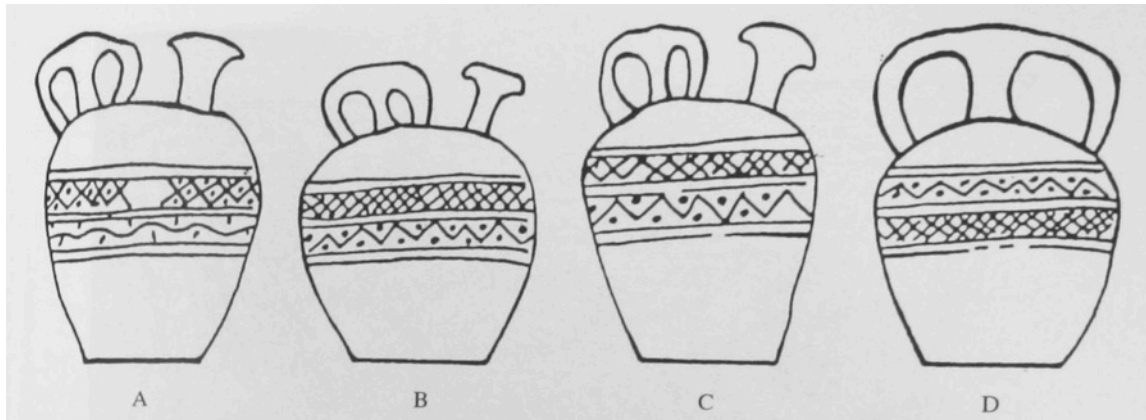


Figure 9. Postpalatial Cretan transport stirrup jars depicted on the walls of Ramesses III's tomb. After Haider 2007, 187, fig. 3 A-D.

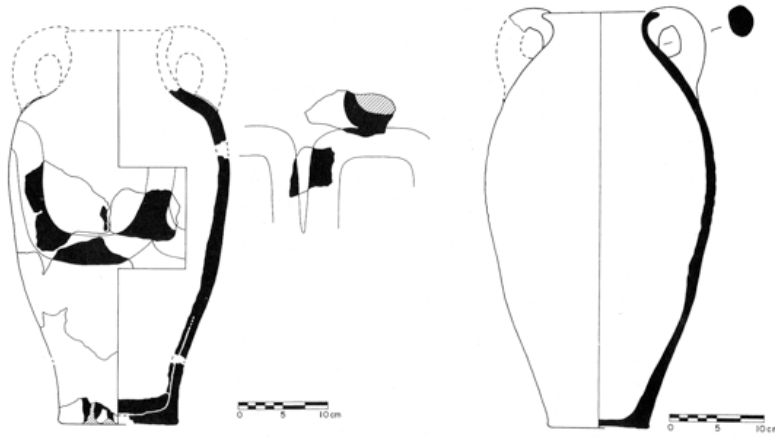


Figure 10. LMIIIA2 decorated short-necked amphora, Kommos C9063 (left); LMIIIB plain short-necked amphora, Kommos C10348 (right). After Rutter 1999, p. 186, fig. 3, 4 [source image modified]



Figure 11. Mycenaean rim-handled amphora, A99, recovered from the Point Iria Shipwreck with potmarks on handles. After Lolos 1999, p. 56, fig. 6 a-b [source image modified]



Figure 12. Postpalatial amphora from Halasmenos. After Tsipopoulou 2004, 110, Fig. 8.4. 96-358.



Figure 13. False neck and handles of a transport stirrup jar from Chania with hole in false neck cap (70-P 11.56). After Hallager 2000, Pl. 68c., fig. 1 [source image modified]



Figure 14. Zygouries amphora Z-375, photo by author.

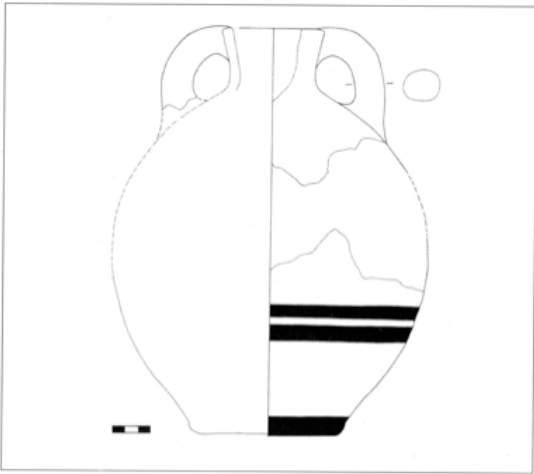


Figure 15. Hybrid amphora/transport stirrup jar from Tiryns Northwest Lower Town. Dated to LHIIC Early (LIV 30/63 IIb). After Maran 2005, p. 423, fig. 3 [source image modified]

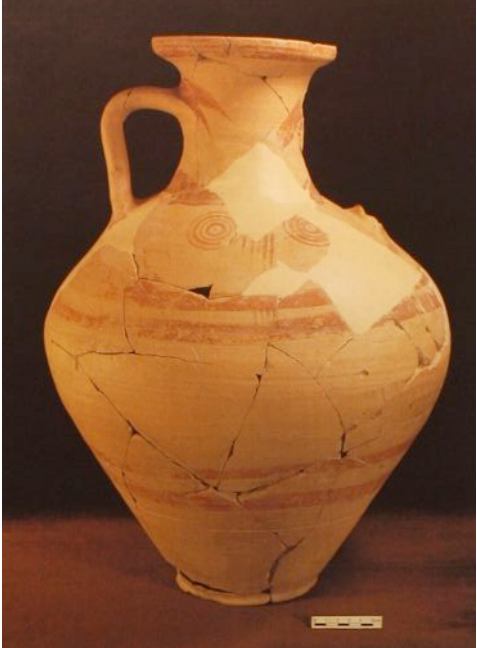


Figure 16. Type I North Aegean amphora recovered at Troy (Cat. IB. I. Dia Troia 23.864). After Catling 1998, pl. 1, fig. 3 [*source image modified*]

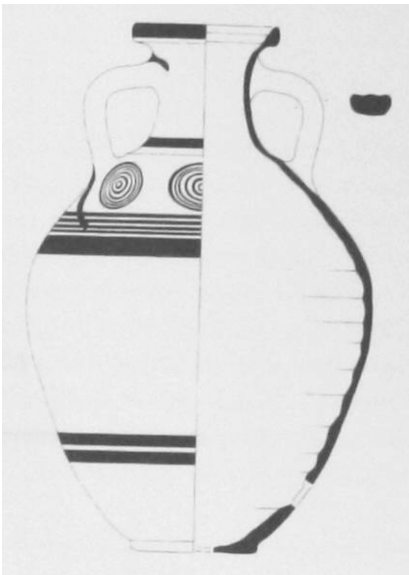


Figure 17. Transitional North Aegean amphora found at Lefkandi. After Lemos 2009, 35, fig. 6.

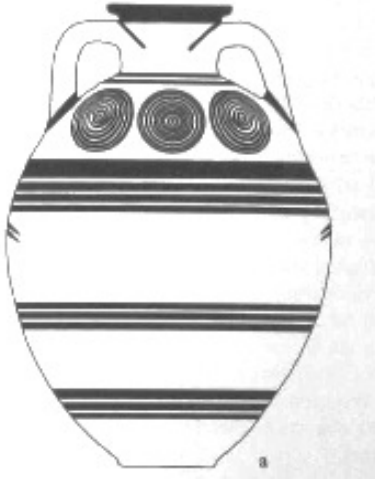


Figure 18. Type II North Aegean amphora from Sindos. After Gimatzidis 2010, 261, fig. 80a.

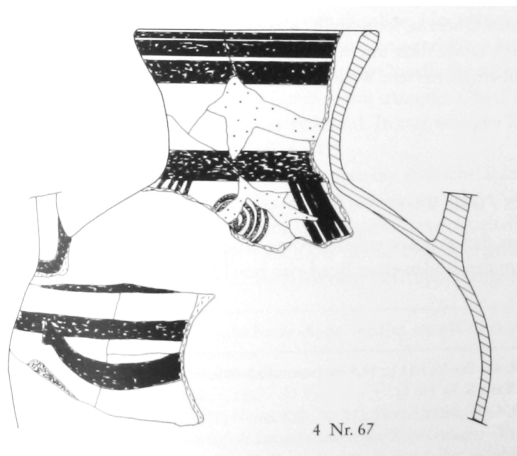


Figure 19. Type I North Aegean amphora from Pergamon said to be locally made, but with morphological differences. After Hertel 2011, 59, fig. 8.

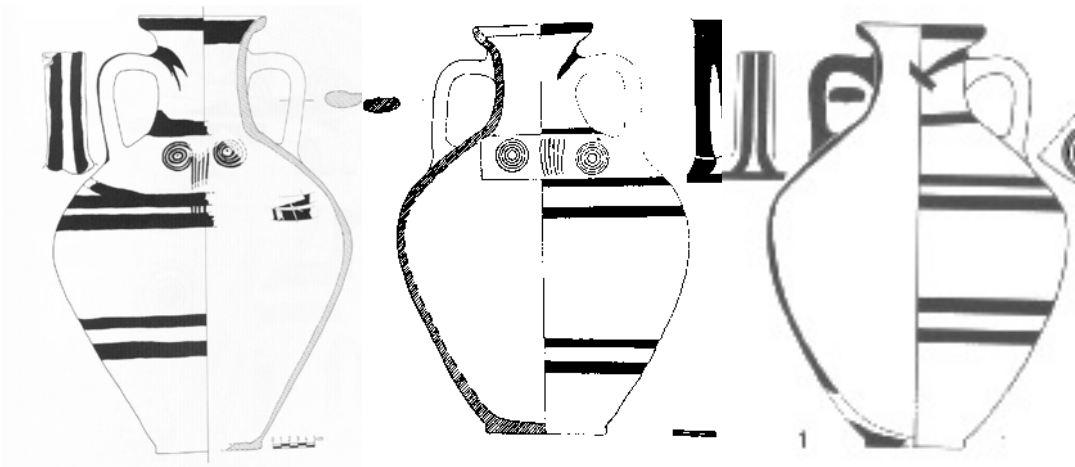


Figure 20. Group of Type I North Aegean amphorae from Troy (left), Elateia (middle), and Clazomenai (right) showing similar morphological and decorative traits.

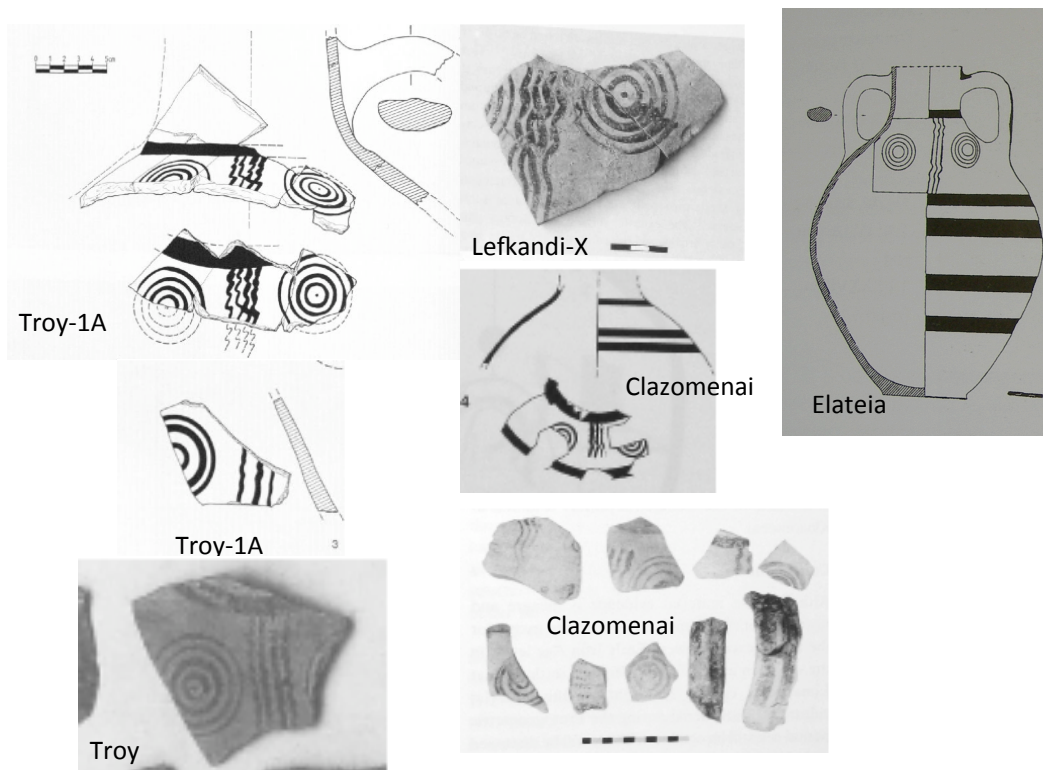


Figure 21. Group of Type I North Aegean amphorae from Lefkandi, Troy, Clazomenai, Elateia, each decorated with four concentric circles with dots in the center and four distinctively wavy lines between.



Figure 22. Type II North Aegean amphora variations: (left) biconical body and taller neck from Kastanas; (right) oval (egg-like) body with shorter neck, found off the coast of Thessaly (after Gimatzidis 2011).

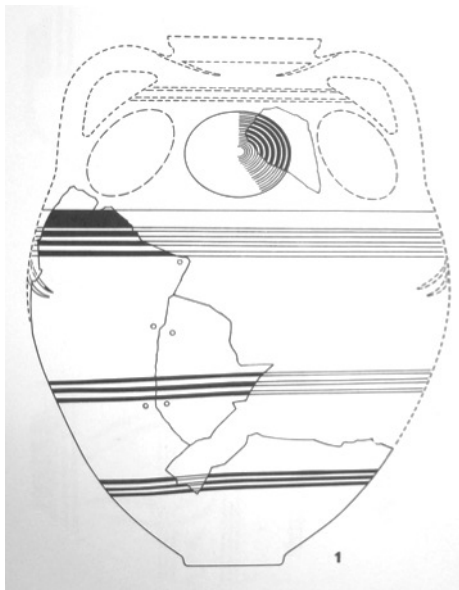


Figure 23. Type II North Aegean amphora from Pithekoussai, no. 621, with mending holes. After Rotroff 2011.

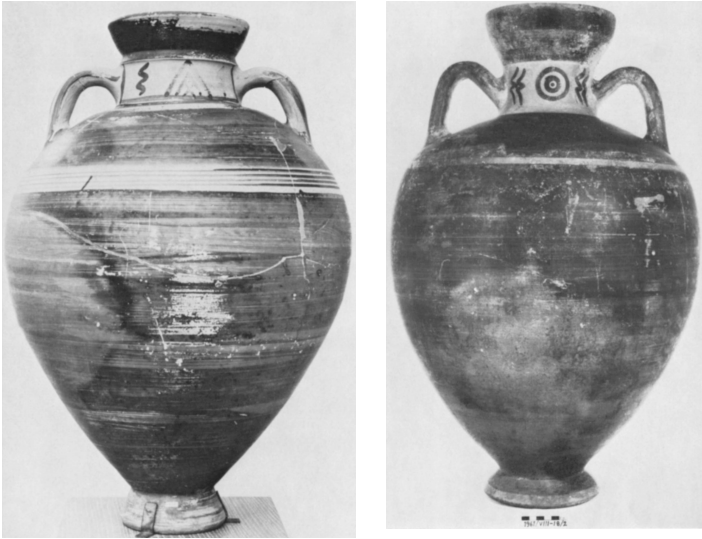


Figure 24. Athenian SOS amphora: (left) early version, (right) late version. After Johnston and Jones 1978, Pl. 18a and b.

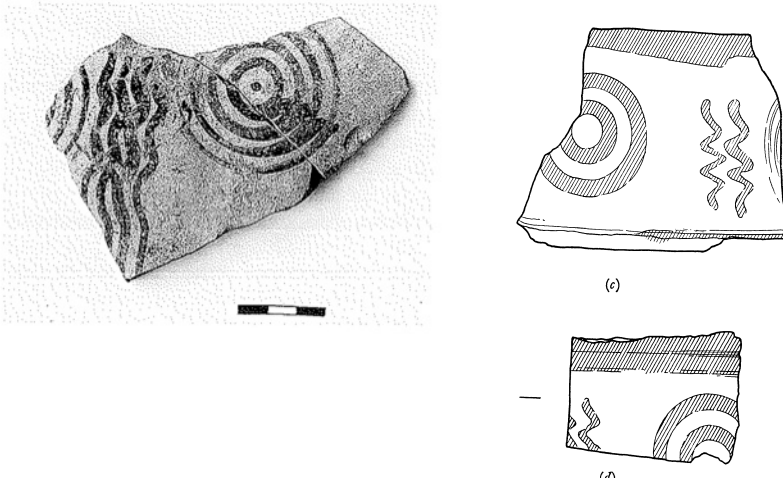


Figure 25. Comparison of the squiggly line motif found on the early versions of SOS amphoras to those found on North Aegean amphoras: (left) North Aegean amphora fragment from Xeropolis, Lefkandi. After Catling 1998, 158, fig. 2; (right) SOS fragment. After Johnston and Jones 1978, 106, fig. 2c,d.



Figure 26. Pithekoussain version SOS. After Pelagatti 2009, 151, fig. 1. Buchner and Ridgway 1993, 478 no. 476.1.



Figure 27. SOS amphora from Mende with Cypriot graffiti. After Vokotopoulou and Christidis 1995, Pl. 1 and Pl. 2.

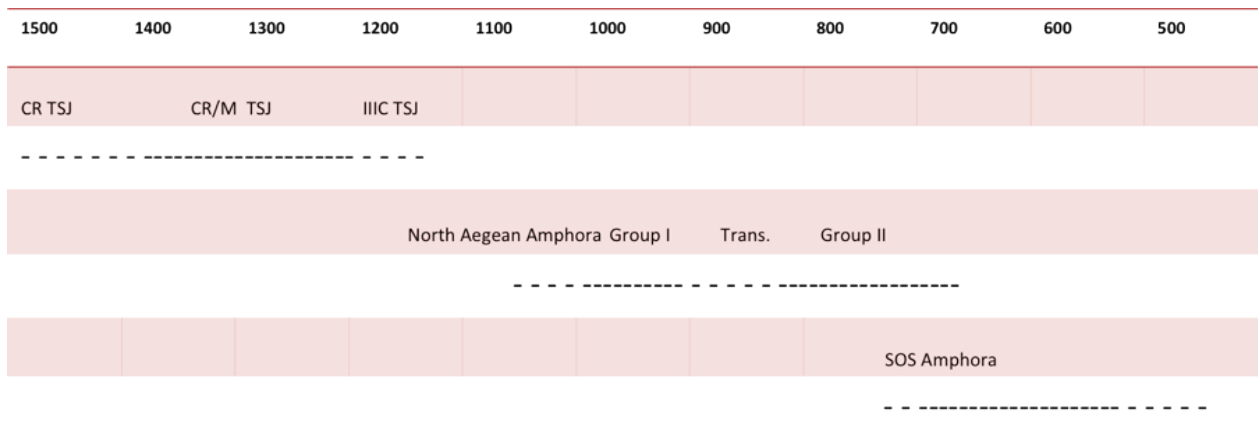


Figure 28. Transport vessel timeline.

Table 1. Late Bronze Age Transport stirrup jar distribution by site.

Map #	Site	Total # TSJs	Total # sampled	# West Crete	# Central Crete	# Mainland	# uncertain
	Cyprus						
1	Akanthou, Moulos	3	3	0	2	0	1
2	Enkomi	21+	13	1	12	0	
3	Dhenia	2	2	0	2	0	
4	Episkopi Bamboula	Ca. 24	2	0	2	0	
5	Hala Sultan Teke	10+	9	1	8	0	
6	Kazaphani	3	3	0	2	0	1
7	Pyla Kokkino	3	1	0	1	0	
8	Athienou	3	NA				
9	Kalopsidha	1	NA				
10	Kition	5	NA				
11	Korovia, Nitovikla	1	NA				
12	Kouklia	14	NA				
13	Stephania	1	NA				
14	Toumba tou Skourou	2	NA				
15	Kourion	1	1	0	1	0	
	Crete						
16	Amnisos	1	1	0	1	0	
17	Angeliana	1	1	0	1	0	
18	Khania	61+	83	71 (35 ISJs)	18	0	
19	Armenoi	3	2	0	0	0	Local= central
20	Sissi	7+			All (octopus)		
21	Knossos	42+	29	4	24	0	1 east crete
22	Kommos	100+-	24	2	22 (10 south- central)	0	
23	Malia	13+	8	2	6	0	
24	Mameloukas Cave	1	1	1	0	0	
25	Palaikastro	19+	5	0	0	0	5 east crete?
26	Achladia	1	NA				
27	Episkopi	1	NA				
28	Archanes	1	NA				
29	Gortyna	1	NA				
30	Gouves	1	NA				
31	Halasmenos	2	NA				
32	Kalyvia	2	NA				
33	Kastelli Pediada	1+	NA				

34	Kavousi, Kastro	2	NA				
35	Klima Pyrghiotissas	2	NA				
36	Milatos	2	NA				
37	Mouliana	1	NA				
38	Phaistos	1	NA				
39	Pseira	1	NA				
40	Rhethymnon	3	NA				
41	Tripiti	1	NA				
	Mainland Greece						
42	Kythera	1	1	0	0	0	1 local
43	Athens	5+	1	0	0	1	
44	Lefkandi	1	1	1	0	0	
45	Midea	17+	NA				
46	Eleusis	1	1	1	0	0	
47	Eleon (Boeotia)	2	0				2
48	Mycenae	92+	84	48	28	7	1
49	Orchomenos	1	1	1	0	0	
50	Iria	8	7	0	7	0	
51	Gla	13+	2	1	0	1	
52	Pylos	7	5	2	1	2	
53	Thebes	120+	92	57 (48 ISJs)	23	7	
54	Sparta Menelaion	Ca. 20	12	12	0	0	
55	Tiryns	28	19	19 (18 ISJs)	0	0	
56	Zygouries	13	11	0	0	11	
57	Tsougiza	6	0	0	0	6	
58	Argos	1	NA				
59	Kreusis	1	NA				
60	Laconia	1	NA				
61	Nichoria	3	NA				
62	Paralimni (Teichos Dymaion)	2	NA				
63	Prosymna	5	NA				
	Dodecanese and Asia Minor						
64	Ialysos (Rhodes)	16	13	1	3	0	1 non-A 7 Rhodes
65	Lardhos (Rhodes)	1	NA				
66	Kalavarda- Kameiros (Rhodes)	1	NA				
67	Apollakia (Rhodes)	2	NA				
68	Karphathos Pigadia	3	3	0	0	0	3 east Crete?
69	Troy	7+		5+			2-local
70	Müskebi	1	NA				
71	Uluburun	12+	10	1	7	0	2 non-

							Aegean
72	Gelidonya	4+	2	1?	0	0	1 non-Aegean
	Levant and Egypt						
73	Minet el-Beida	4	3	1	1	1	
74	Ras Shamra	Ca. 4	1	0	0	0	1 local?
75	Sidmant	1	1	0	0	0	1 dwl
76	Akko	4	4		4		
77	Ashdod	4	3	1	1	1	1
78	Ashkelon	2	2		2		1 loner, 1 not TSJ
79	Beth Shean	2				1	
80	Beirut	1	NA				
81	Deir el-Balah	4	1				1 unknown
82	Gezer	1					
83	Tell Abu Hawam	40	24	0	17	1+?	7
84	Tell Sera	1					
85	Ras Ibn Hani	1	NA				
86	Marsa Matruh	4				4	
87	Zawiyet Umm el-Rakham	4			3	1	
88	Qantir	2			1	1	
89	Deir el Medina	2			2		
90	Amarna	1			1		
91	Amman	1	NA				
	Central Mediterranean						
92	Antigori (Sardinia)	2	2	1	1	0	
93	Cannatello	3	2	0	2	0	
94	Filicudi	1	NA				
95	Leporano	1	NA				
96	Roca Vecchia	3	NA				
97	Scoglio del Tonno	2	NA				

Table 2. Late Bronze Age Transport stirrup jar consumption by region.

	Settlement	Mortuary	Ritual	Other
Crete	Total number of vessels with provenance: 147+ Number of sites: 7 high-ranking sites: Khania, Kommos, Malia, Sissi, Palaikastro, Knossos, Phaistos 1 villa: Gortyna 10 towns: Armenoi, Knossos, Kommos, Kourion, Malia, Gouves, Halasmenos, Kastelli Pediada, Kavousi Kastro, Pseira	Total number of vessels with provenance: 33 Number of sites: 15 Angeliana, Armenoi, Kourion, Palaikastro, Achladia, Khania environs, Episkopi (Ierapetra), Halasmenos, Kalyvia, Klima Pyrgiotissas, Knossos environs, Milatos, Mouliana, Rhethymnon, Tripiti	Total number of vessels with provenance: 2 Number of sites: 2 Amnisos, Kommos	
Mainland	Total number of vessels with provenance: 200+ Number of sites: 6 palaces: Midea, Tiryns, Mycenae, Pylos, Thebes, Menelaion 4 towns: Nichoria, Tsoungiza, Eleon, Zygouries	Total number of vessels with provenance: 9 Number of sites: 4 Mycenae, Tiryns, Prosymna, Argos	Total number of vessels with provenance: 2 Number of sites: 2 Mycenae, Eleusis	Shipwreck: Total number of vessels: 11 Point Iria, Dokos, Kosta Hermionid, Leonidion
Near East/ Egypt	Total number of vessels with provenance: 21 Number of sites: 10 Minet el-Beida, Ras Shamra, Ashdod, Ashkelon, Tell Abu Hawam, Tell Sera, Beth Shan, Qantir, Amarna, Zawiyet Um el- Rakham	Total number of vessels with provenance: 8 Number of sites: 7 Beirut, Deir el-Balah, Minet el-Beida, Ras ibn Hani, Ras Shamra, Sidmant, Beirut	Total number of vessels with provenance: 1 Amman temple area	
Cyprus	Total number of vessels with provenance: 24 Number of sites: 8 Enkomi, Episkopi, Athienou, Kalopsidha, Kition, Korovia, Pyla Kokkinokremos, Toumba tou Skourou	Total number of vessels with provenance: 12 Number of sites: 5 Enkomi, Akanthou Moulos, Kazaphani, Dhenia, Stephanía	0	
Dodecanese/ Asia Minor	Total number of vessels with provenance: 7+ Number of sites: 1 Troy	Total number of vessels with provenance: 19 Number of sites: 3 Ialysos, Pigadia, Müskebi	0	Shipwreck: Total number of vessels: 16+ Uluburun, Gelidonya

Italy	Total number of vessels with provenance: 7+ Number of sites: 5 Antigori, Cannatello, Leporano, Roca Vecchia (?), Scoglio del Tonno	0	0	Underwater: Total number of vessels: 1 Filicudi
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Table 3. North Aegean amphora distribution by site

X=presence noted, but number not specified.

Map #	SITE (regionally)	Type I	Transitional	Type II
	Lokris/Phokis			
1	Elateia	10		
2	Kynos	1+		
3	Kalapodi	1+		
4	Atalanti	1		
5	Mitrou	2+		
6	Agnanti	1		
	Euboea (and environs)			
7	Lefkandi	6+	1	2+
8	Eretria			X (many fragments)
9	Oropos			X
	Thessaly			
10	Volos/Kapakli	1		X
11	Pyrasos		1	
12	Pherai/Chloe		2	
13	Marmariani		3	2
14	Iolkos	4?	1	X (large number-900 sherds?)
15	Phthiotic Thebes		1	
16	Leivithra			X (unpublished)
17	Halos (near Iolkos)			X
18	under water off SE Thessaly			1
19	Bunar Baschi		X	
	Macedonia/Chalkidike			
20	Sindos	1+	6+	36+ (largest amount?)
21	Neokaisaria Kastro		1+	
22	Thessaloniki Toumba	1+		X (unpublished)
23	Polichni			X + (unpublished)

24	Methone			X (unpublished)
26	Palio Gynakokastro		1	
27	Dion		1	
28	Akanthos			1+ (unpublished)
29	Karambournaki			3+ (many?)
30	Archontiko			1+
31	Nea Philadelphia			1
32	Aspros			X
33	Neochori			X
34	Sariomer			X
35	Gona			1+
36	Agrosykia			1?
37	Perivolaki			3?
38	Kochei at Neos Marmaras			X (unpublished)
39	Eion/ Amphipolis			1+
40	Kavala/Neapolis			1+
41	Leukopetra			1+
42	Sfendami			1+
43	Kranie at Platamon			X (unpubl)
44	Nea Nikomideia			X
45	Gallikos			X
46	Axiochori			1
47	Argilos			X (multiple fabrics)
48	Edessa			1
49	Lebet Table			6+
50	Kastanas	X	1+	6+
51	Assiros	1		X
52	Mende	1+	1	4+
53	Torone		7+	
54	Kritsana			X
55	Therme			X
56	Nea Kallikrateia			X
57	Olynthos			X
58	Poseidi			X
59	Sane Pallinis	1+		X
60	Aphytis			X 1+ S
61	Koukos Sykia		X	
	North Aegean Islands			
62	Thasos			X (large number)
63	Lesbos (Pyrrha) Antissa		1	2
64	Lemnos; Hephaistia	30		X
65	Samos		X?	X
66	Skyros		X	
	Asia Minor/Levant			
67	Svilengrad (?)			X
68	Troia	68+	1+	30+
69	Pergamon/Elaia	2+		
70	Ephesos	X?		
71	Clazomenai	7+		

72	Ras el Bassit (Poseidio)		X ?	X
Central Mediterranean				
73	Pithekoussai			3
74	Crete: Kommos		1 (?)	1

Table 4. North Aegean amphora consumption by chronological type

	Settlement	Mortuary	Ritual
Type I	Number of sites: 5 Number of pots with provenance: 75+	Number of sites: 4 Number of pots with provenance: 15+	Number of sites: 2 Number of pots with provenance: 2+
Transitional	Number of sites: 6 Number of pots with provenance: 10+	Number of sites: 7 Number of pots with provenance: 15+	Number of sites: 1 Number of pots with provenance: 1
Type II	Number of sites: 19 Number of pots with provenance: 80+	Number of sites: 8 Number of pots with provenance: 10+	Number of sites: 2 Number of pots with provenance: unknown

Table 5. SOS amphora distribution by site

X=SOS amphora mentioned, but not identified in detail

Num.	SITE	Attic SOS	Euboean SOS	Local SOS	Unknown	Total
<i>Italy</i>						
1	Pithekoussai (Early)	15	2	2	26	45+
2	Cumae (early)				3	3
3	Sybaris	3				3
4	Veii [indigenous]	5				5
5	Vulci [indigenous]	11				11
6	Cerveteri (Early) [indigenous]	28			8	36
7	Metaponto (Early)	7	1		1	9
8	Basento [indigenous]				8	8
9	Policoro/Siris	11	1		1	13

	(Early)					
10	Metauros				2	2
11	Otranto (Early) [indigenous?]				X	X
12	Kaulonia				6+	6+
13	Hipponion	1				1
14	Reggio Calabria	2				2
15	Medma/ Rosarna	2				2
16	Satricum [Indigenous?]				X	X
17	Incoronata (early) [Indigenous]	4				4
18	Taranto				1	1
19	Cavallino [indigenous?]	1				1
20	Mazzola [indigenous?]				X	X
21	Pisa [indigenous]	1		X?		1+
22	Poseidonia/ Paestum [indigenous]	2				2
23	Calatia [indigenous]				1	1
24	Ficana [indigenous]				X	X
<i>Sardinia</i>						
25	Olbia				X	X
<i>Sicily</i>						
26	Megara Hyblaea (early)	164+		2	1	167+
27	Lipari [Indigenous]	X				X
28	Leontini	1			2	3
29	Naxos (Early)	7+	2		5+	14
30	Syrakoussai (Early)	7+	1		5	13+
31	Kamarina	37	1			38
32	Gela Gela chora: [Indigenous]	5 ----- 140+				5 (140+)
33	Selinus	2+				2+
34	Morgantina [Indigenous]	X	1			1+
35	Mylae/Milazzo (Early)	3				3
36	Motya (early)	3				3

	[Phoenician]					
37	Zancle (Messina)	3	1			4
38	Eloro (Early)	2				2
39	Catania	1				1
40	Grammichele- Terravecchia [Indigenous]	1				1
41	Himera [Indigenous]	11			5	16
42	Maestro	1				1
43	Modica	4				4
44	Monte S. Mauro [Indigenous]	9				9
45	Ramacca [indigenous]	4				4
46	Monte Balchino [indigenous]	2				2
<i>Western Mediterranean (Iberia, S. France, N. Africa)</i>						
47	Toscanos (Early) [Phoenician]	50				50
48	Huelva				2	2
49	Guadalhorce (Early) [Phoenician]	2	2		1	5
50	Aljaraque (Early) [Phoenician]	2			4	6
51	Castillo de Doña Blanca / Gadir [Phoenician]				X	X
52	Málaga [Phoenician]	2+				2+
53	Morro de Mezquitilla/ Algarrobo [Phoenician]	1				1
54	Cerro de los Infantes/ Pinos Puente	1				1
55	La Fonteta/ La Rábita (Early)	5+				5+
56	Tos Pelat/ Moncada	1				1
57	Illeta dels Banyets/ El Campello				1?	(1)
58	Cabanyal- Malvarrosa	1				1
59	Burriac/ Cabrera de Mar				1	1
60	Ampurias/ Emporion				7 (late?)	7

	[Greek]					
61	Ibiza (Balearic islands)				1	1
62	Rachgoun				1	1
63	Petit Bois				1 +	1+
64	Cerro del Villar [Phoenician]	1				1
65	Mogador (Early)				12+	12+
66	Massalia				X	X
67	Saint-Blaise				5	5
68	Tamaris (Martigues)				X	X
69	Villevieille (Gard)				1	1
	<i>North Aegean (N. Greece, N. Aegean Islands)</i>					
70	Sindos	6	1			7
71	Methone (Early)	15+	1			16+
72	Mende (Early)	3				3
73	Karabournaki	6				6
74	Akanthos	X				X
75	Abdera				X "small number"	X
76	Archontiko (Early)	1				1
77	Torone		1			1
78	Toumba Thessaloniki				X	X
79	Oisymne				1+	1 +
80	Amphipolis				1	1
81	Mikra Karaburun, Thessalonike	1			1	2
82	Thrace: Palaiopolis N. Cemetery				1	1
83	Samothrace	1				1
	<i>Central Greece</i>					
84	Krania				X	X
85	Athens (Early)	49			1	50
86	Isthmia (Poseidon sanctuary)	X				X
87	Thorikos (early)	1				1
88	Eleusis (early)	3				3
89	Phaleron (early)	17				17
90	Asine	1				1
91	Corinth	2				2
92	Kalaureia				1	1
93	Halieis (Porto Cheli)	5				5
94	Oropos				1	1

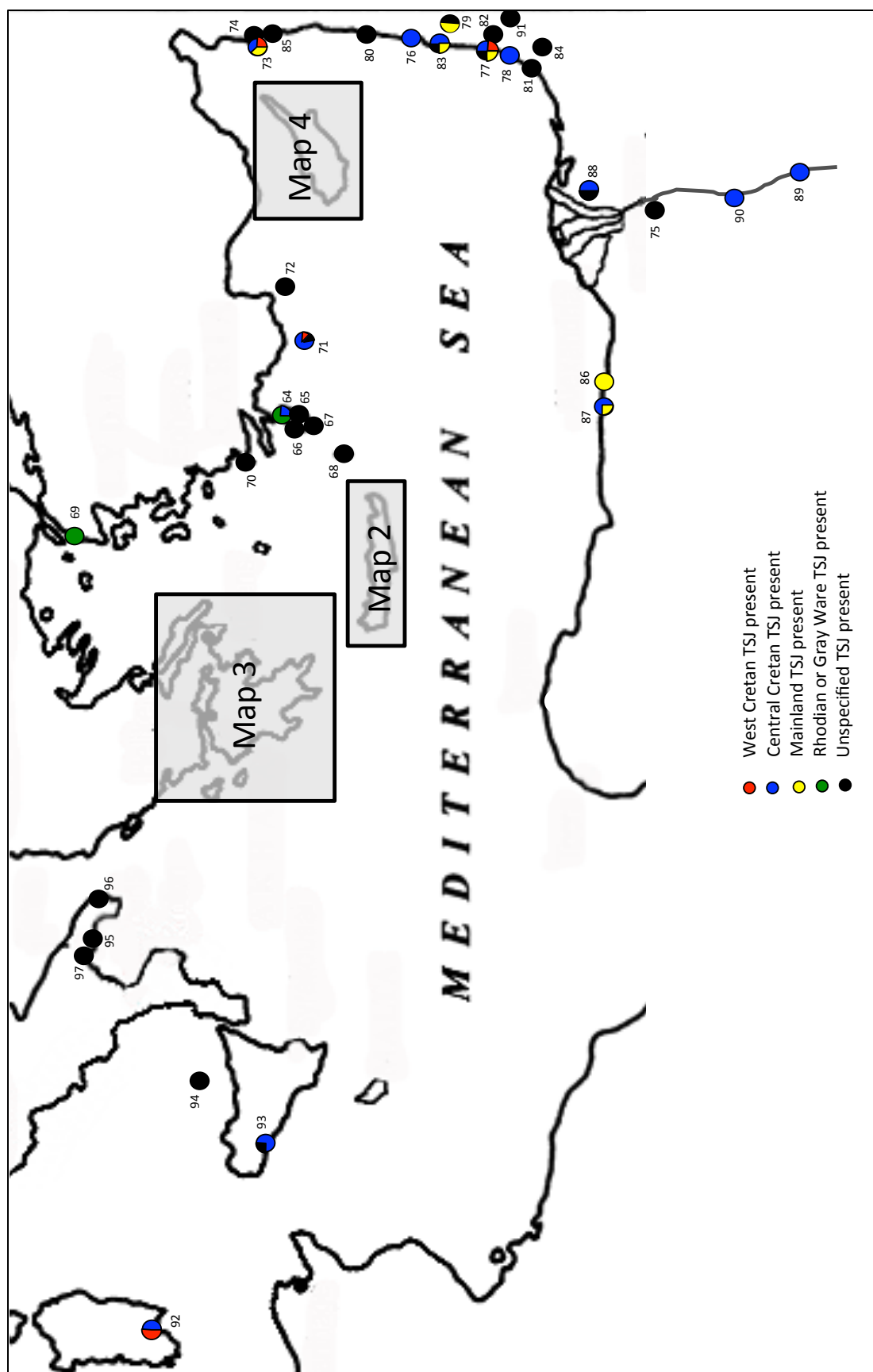
	(early)					
95	Eretria (early)	6		X?	4	19+
96	Chalkis (Early)	1	~200	4		200 +
97	Agina: Kolonna (early)	9				9
98	Bouthroton (Ionian Coast)				16	16
99	Kerkyra (Ionian Coast) (Early)				2	2
100	Droukoulina				X	X
	<i>Aegean islands</i>					
101	Delos				6+	6+
102	Crete Khania		1	1		2
103	Kommos	5		1		6
104	Knossos (early)	1	1			2
105	Rhodes	2				2
106	Kamiroi and Ialysos					
107	Thera	2				2
108	Thasos				X	X
109	Keos: Koressos				1	1
	<i>Cyprus</i>					
110	Marmari	1				1
111	Kition (Early)	2 +				2+
112	Salamis (early)	20				20
113	Idalion	1				1
114	Amathus	1			14	15
115	Deneia				2	2
	<i>Asia Minor/ Black Sea</i>					
116	Black Sea: Istria	1+			2	3+
117	Black sea: Orgame				1	1
118	Black Sea: Posta/Tulcea	1				1
119	Black Sea: Taganrog				4	4
120	Sozopol (Thrace)				1	1
121	Black Sea: Berezan	2				2
122	Gorgippia	1				1
123	Pitane				X	X
124	Smyrna				6	6
125	Miletos	12				12

126	Assesos	2				2
<i>Levant/Egypt</i>						
127	Al Mina (early)				14	14
128	Kinet Hoyuk/Issos	2+				2+
129	Kabri	1				1
130	Ras al Bassit (early)		5			5
131	Tyre (early)		5			5
132	Beirut	1				1
133	Tell Defenneh	1			1	2
134	Naukratis	X “small number”				X
135	Karnak	2				2
136	Thebes	1				1
137	Saqqara	1				1
138	Gurna				1	1
139	Elephantine				1	1
140	Fort Migdol (delta)	1+				1+
141	Marsa Matruh, Bates’ Island	1	1			2
142	Cyrenaica: Cyrene	35				35
143	Cyrenaica: Tocra				1	1
144	Carthage (early)	16				16

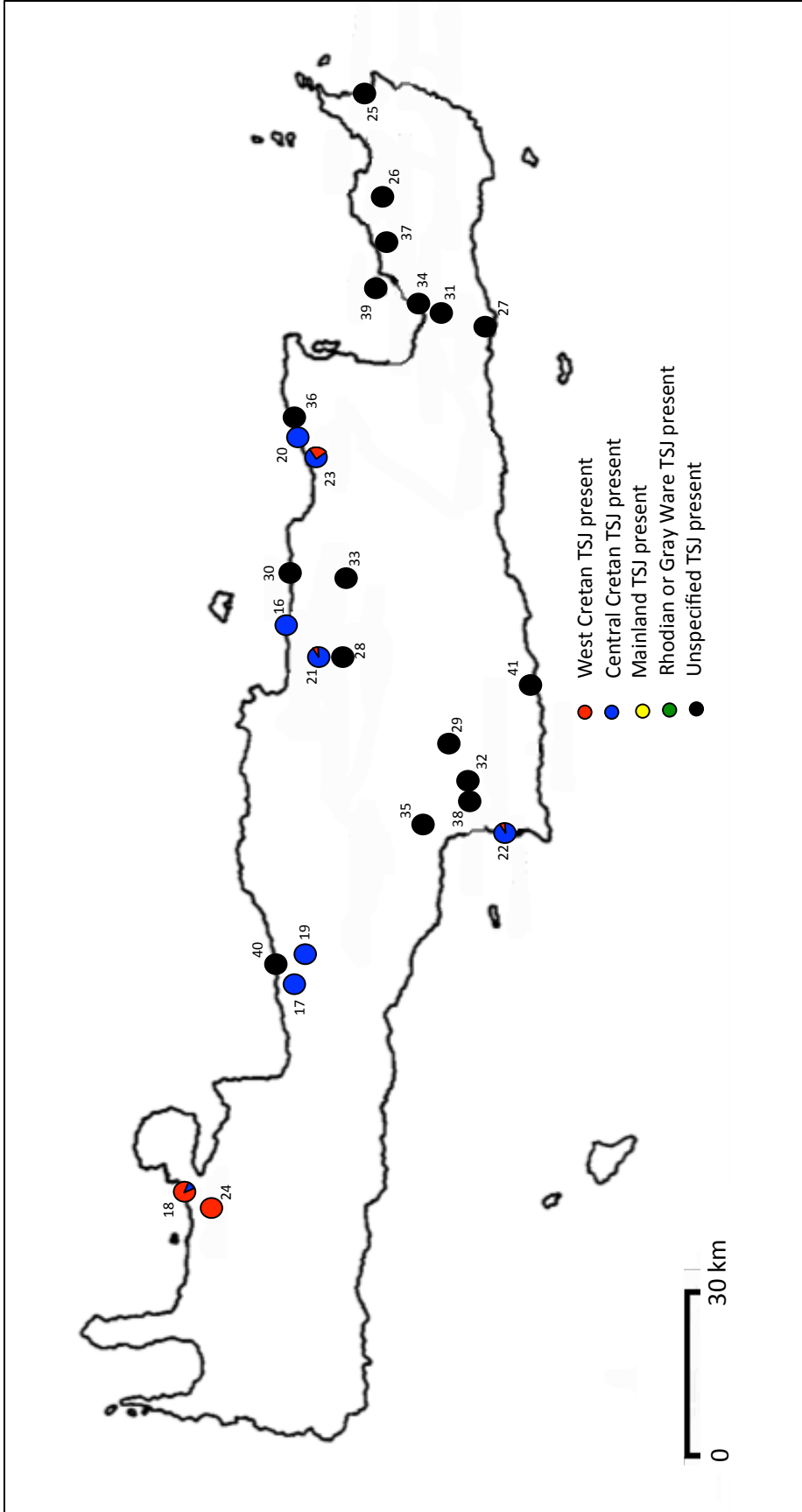
Table 6. SOS amphora consumption by region.

Region	Settlement	Mortuary	Ritual	Sites with early versions	Total # sites
Iberia/west	# of sites: 13 Sites with highest #: Toscanos: 11+ Mogador: 12+	# of sites: 0	# of sites: 0	# of sites: 5 % of total: 21	24
Sicily	# of sites: 21 Sites with highest #: Megara Hyblaea: 159+	# of sites: 8 Sites with highest #: Megara Hyblaea: 5 Kamarina: 37	# of sites: 4	# of sites: 6 % of total: 29	21
Italy	# of sites: 16+ Sites with highest #: Pithekoussai: 46+	# of sites: 8 Sites with highest #: Pithekoussai: 9 Cerveteri: 26+	# of sites: 1	# of sites: 9 % of total: 38	24
Central Greece	# of sites: 6 Sites with highest #:	# of sites: 7 Sites with highest #:	# of sites: 2	# of sites: 8 % of total: 50	16

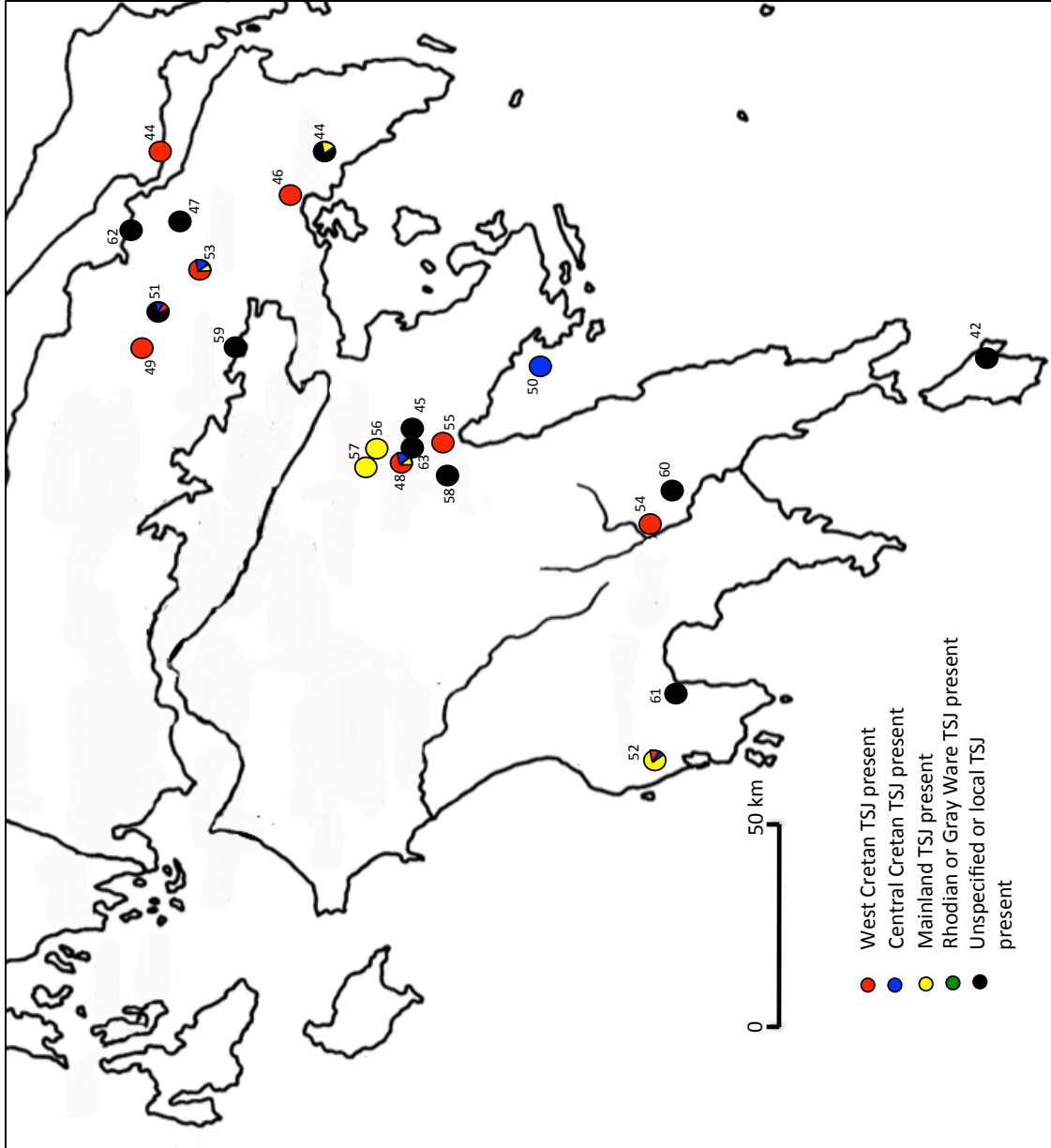
	Athens: 39 Chalcis 200+	Athens 13 Phaleron: 17			
Northern Greece	# of sites: 5 Sites with highest #: Methone: 14+ Karabournaki: 6+	# of sites: 4 Sites with highest #: Mende: 3	# of sites: 0	# of sites: 3 % of total: 19	16
Aegean Islands	# of sites: 4 Sites with highest #: Kommos: 6	# of sites: 1 Sites with highest #: Ialysos: 2	# of sites: 0	# of sites: 1 % of total: 12.5	8
Cyprus	# of sites: 5 Sites with highest #: Amathus: 15 Salamis: 6	# of sites: 2 Sites with highest #: Salamis: 13	# of sites: 1	# of sites: 2 % of total: 33	6
Asia Minor/ Black Sea	# of sites: 4 Sites with highest #: Miletos: 12 Smyrna: 6	# of sites: 2 Sites with highest #: Posta: 1 Gorgippia: 1	# of sites: 1	# of sites: 0 % of total: 0	11
Levant/ Egypt	# of sites: 9 Sites with highest #: Cyrene: 35 Carthage: 16 Al Mina: 14	# of sites: 2 Sites with highest #: Thebes: 1 Saqqara: 1	# of sites: 1	# of sites: 4 % of total: 21	19



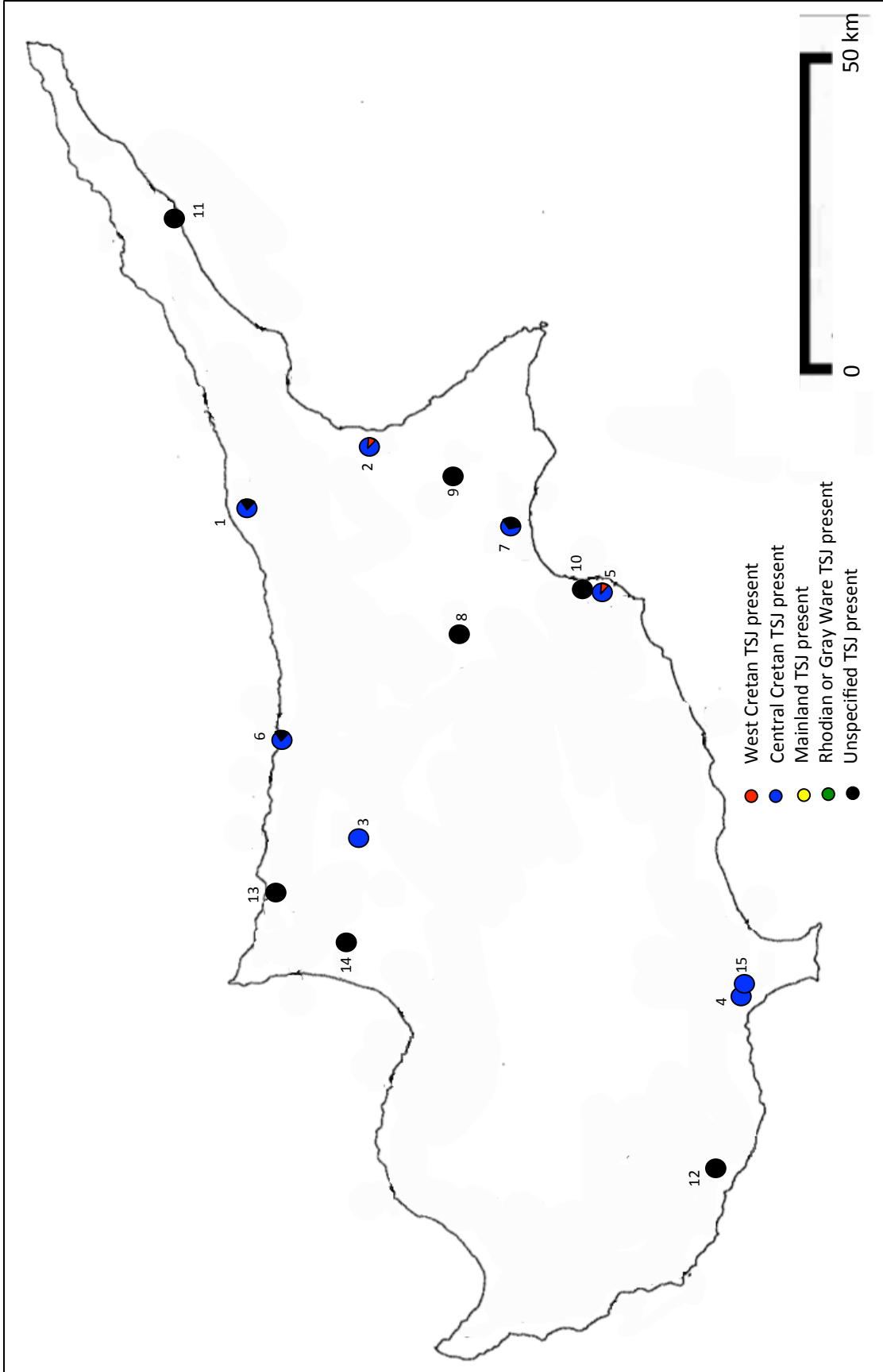
Map 1. Distribution of Late Bronze Age transport stirrup jars in the Central Mediterranean, Egypt, Levant, Dodecanese and Asia Minor color-coded for place of origin.



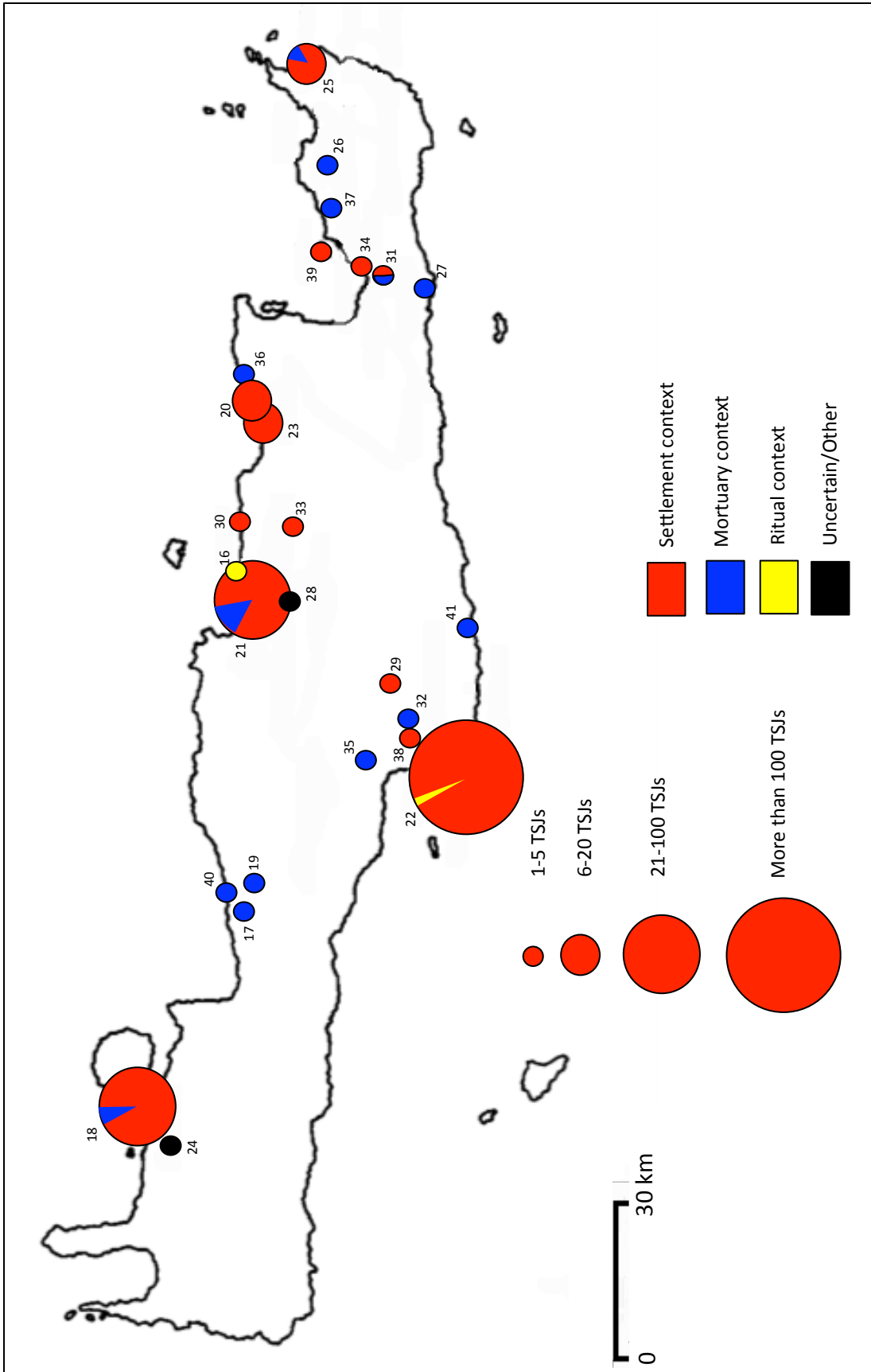
Map 2. Distribution of Late Bronze Age transport stirrup jars on Crete color-coded for place of origin.



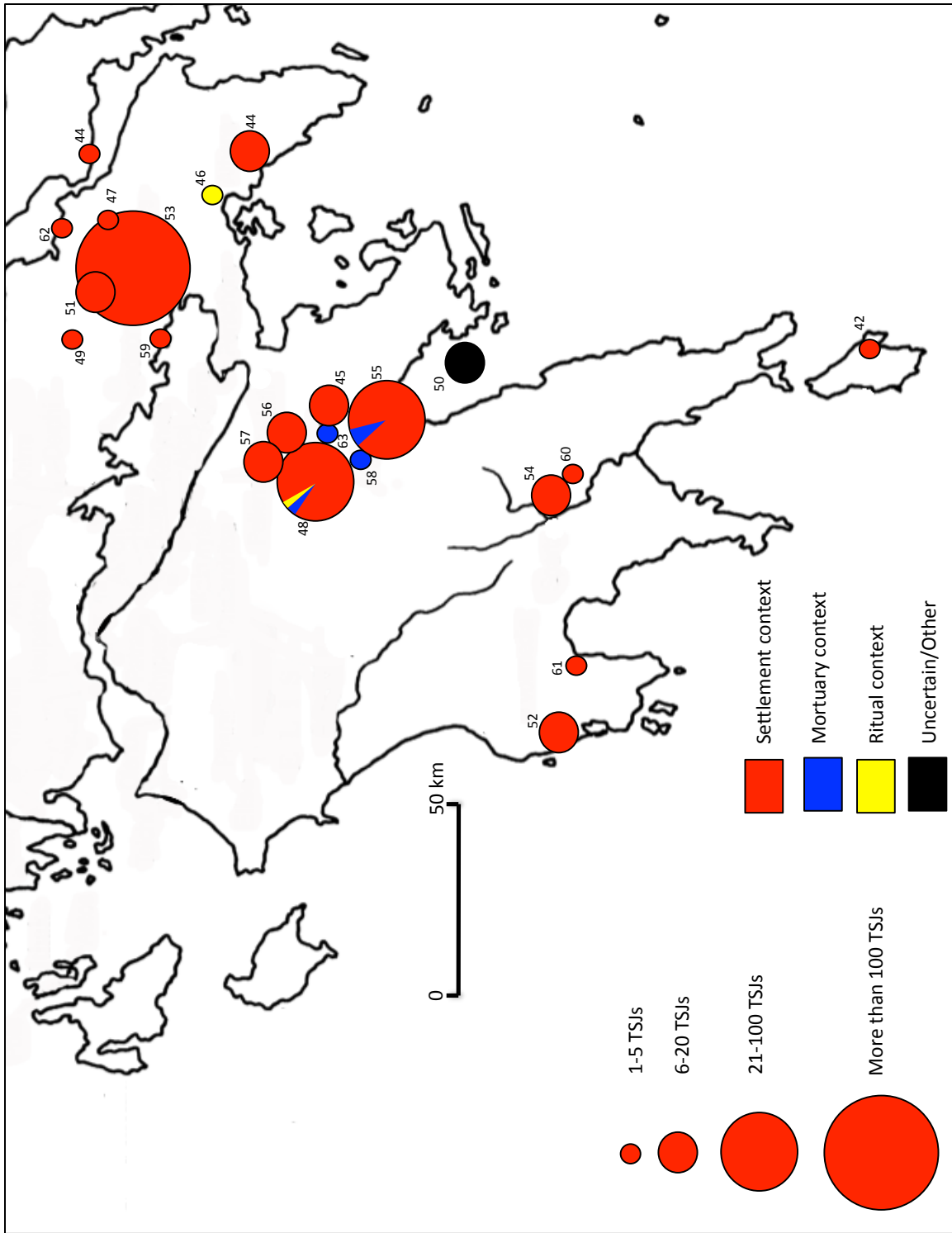
Map 3. Distribution of Late Bronze Age transport stirrup jars on Mainland Greece color-coded for place of origin.



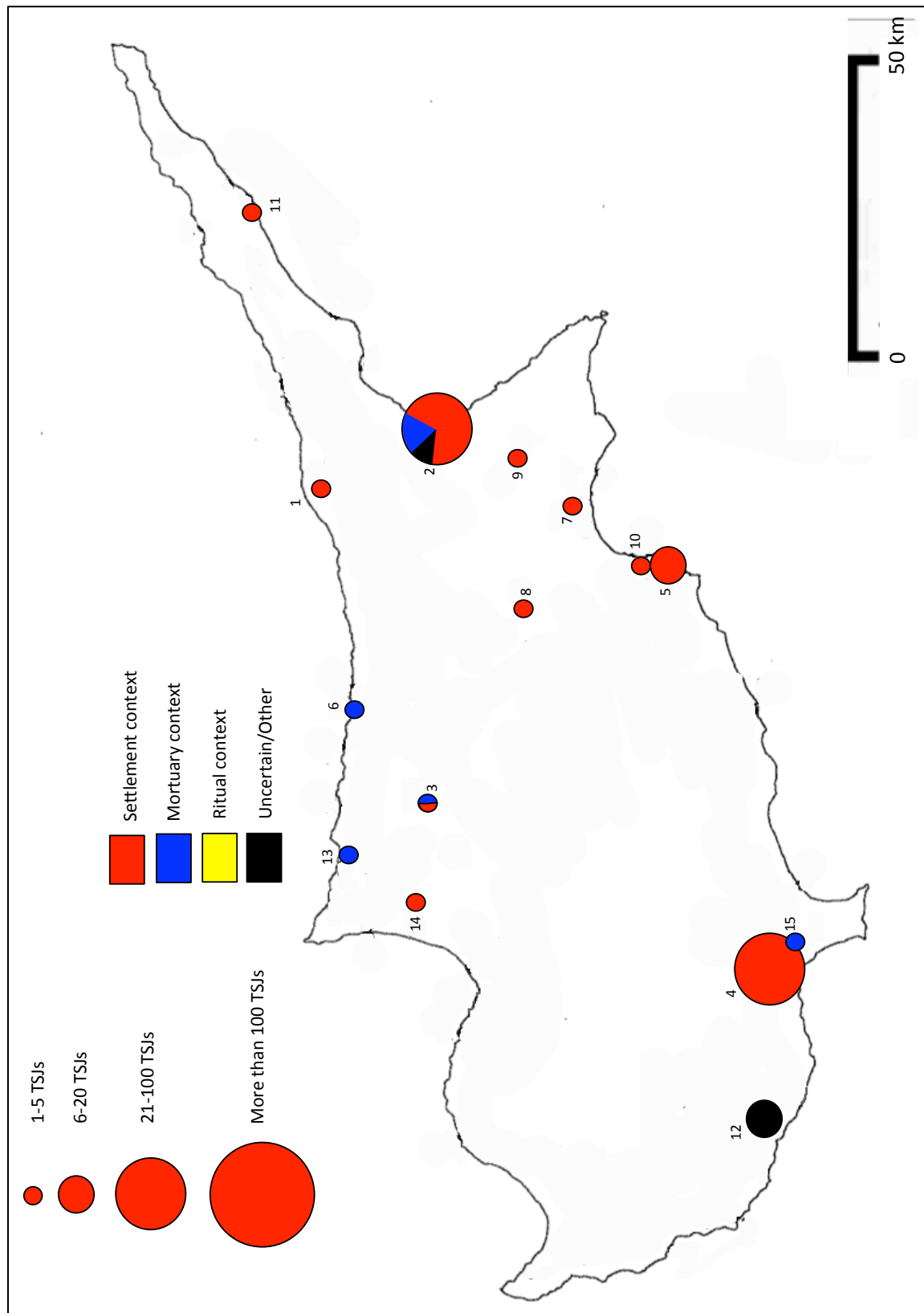
Map 4. Distribution of Late Bronze Age transport stirrup jars on Cyprus color-coded for place of origin.



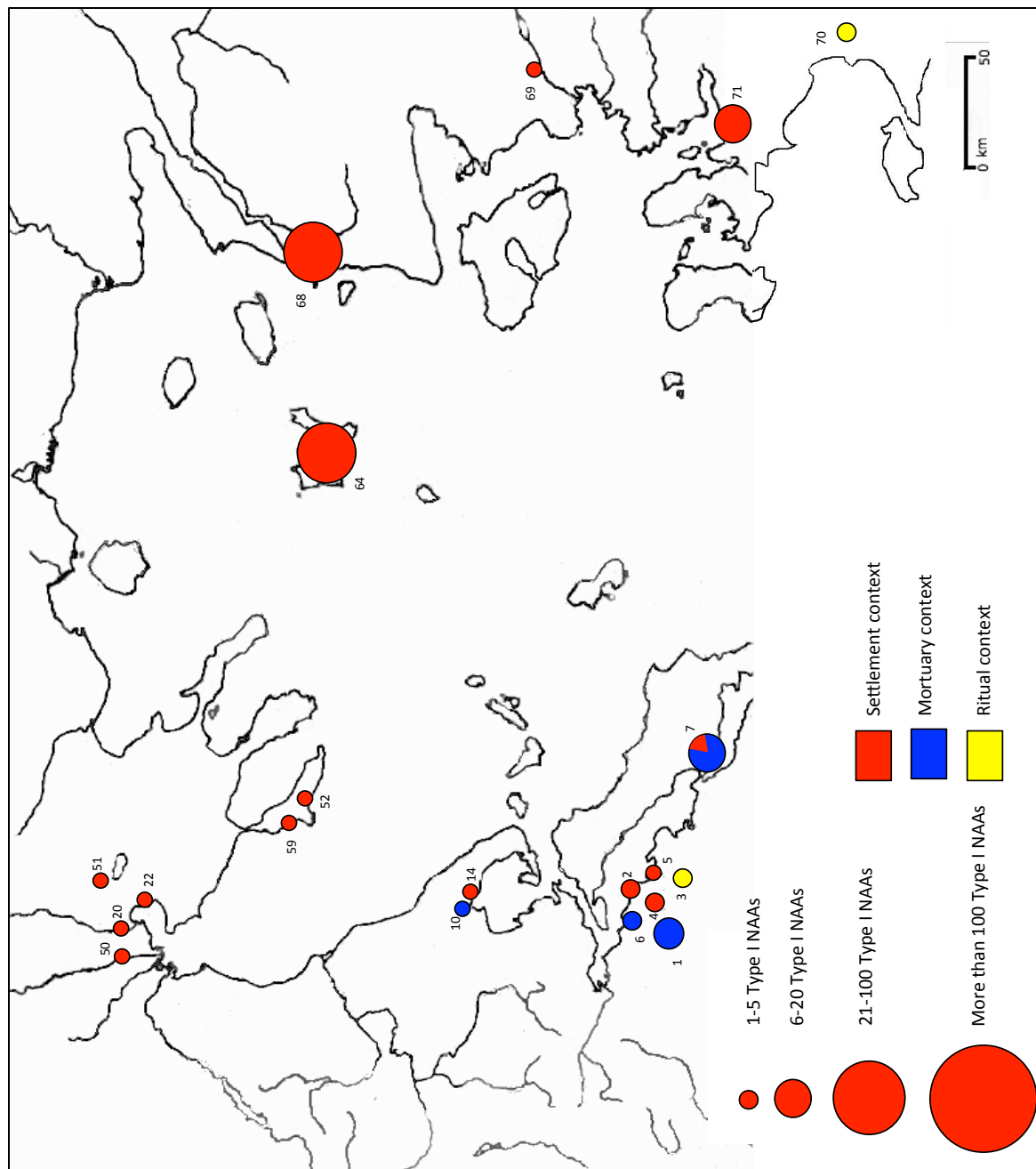
Map 5. Late Bronze Age transport stirrup jar distribution on Crete with volumes accounted for and color-coded for context.



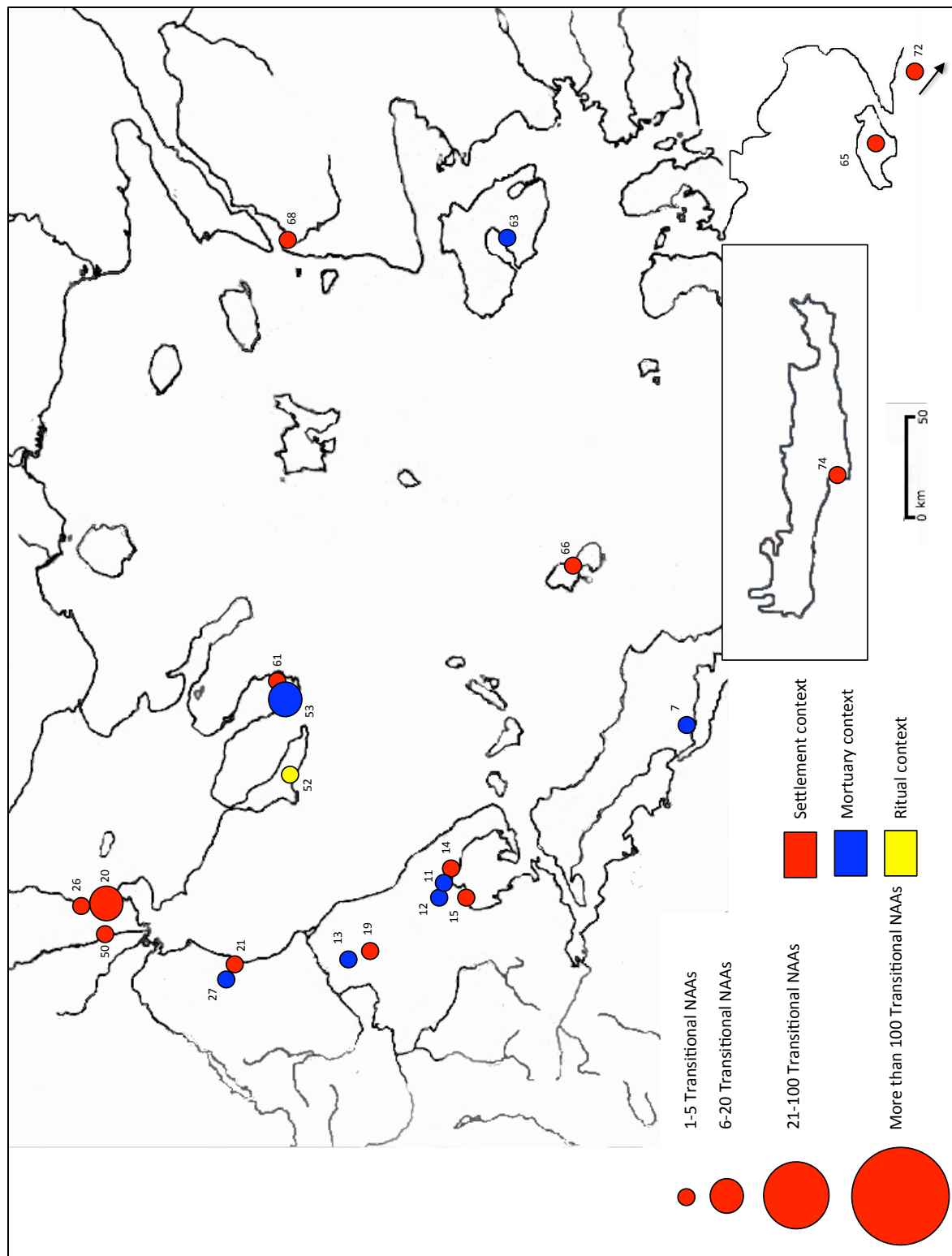
Map 6. Late Bronze Age transport stirrup jar distribution on Mainland Greece with volumes accounted for and color-coded for context.



Map 7. Late Bronze Age transport stirrup jar distribution on Cyprus with volumes accounted for and color-coded for context.



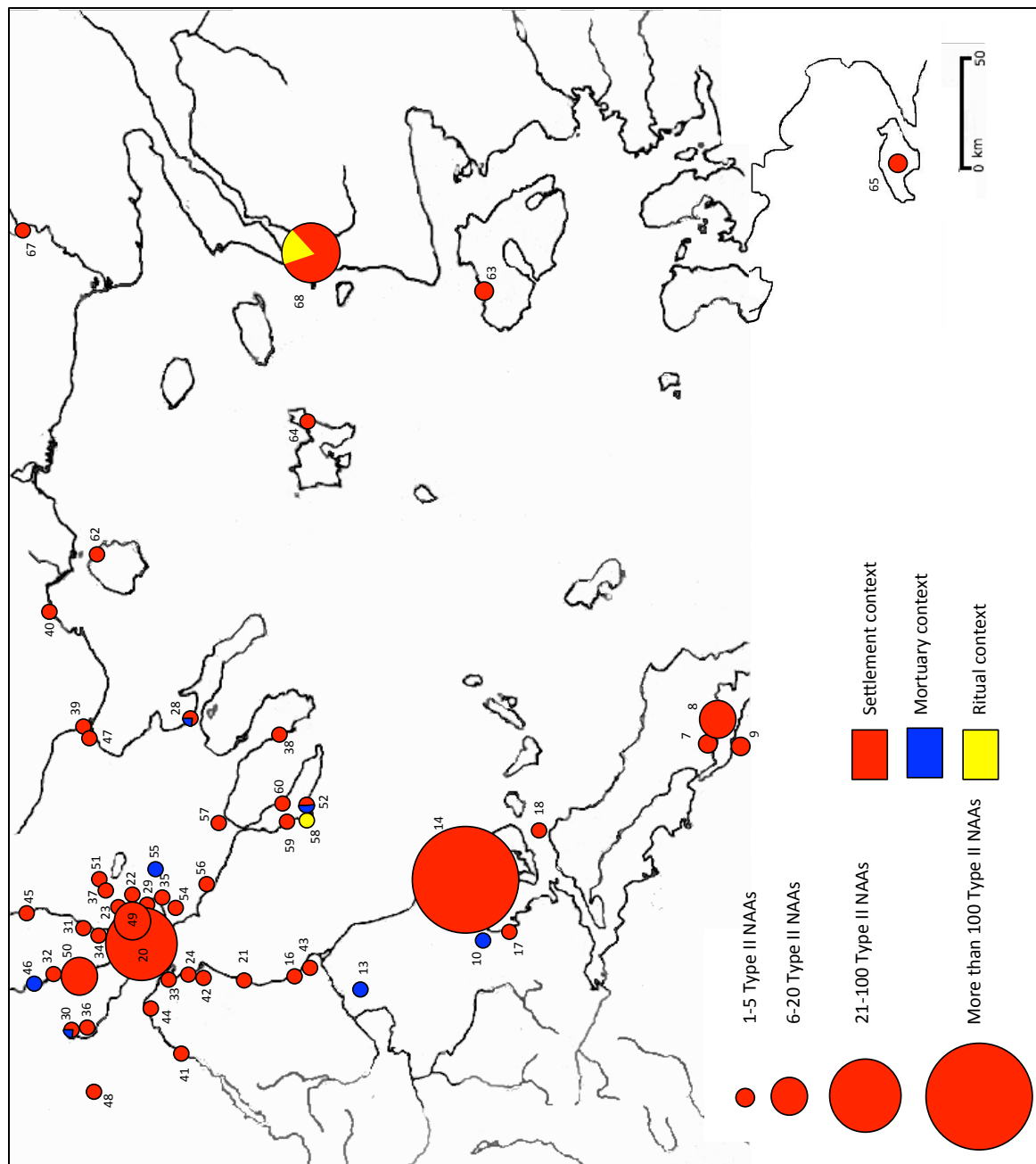
Map 8. Distribution of Type I North Aegean amphorae in the Eastern Mediterranean with volumes accounted for and color-coded for context.



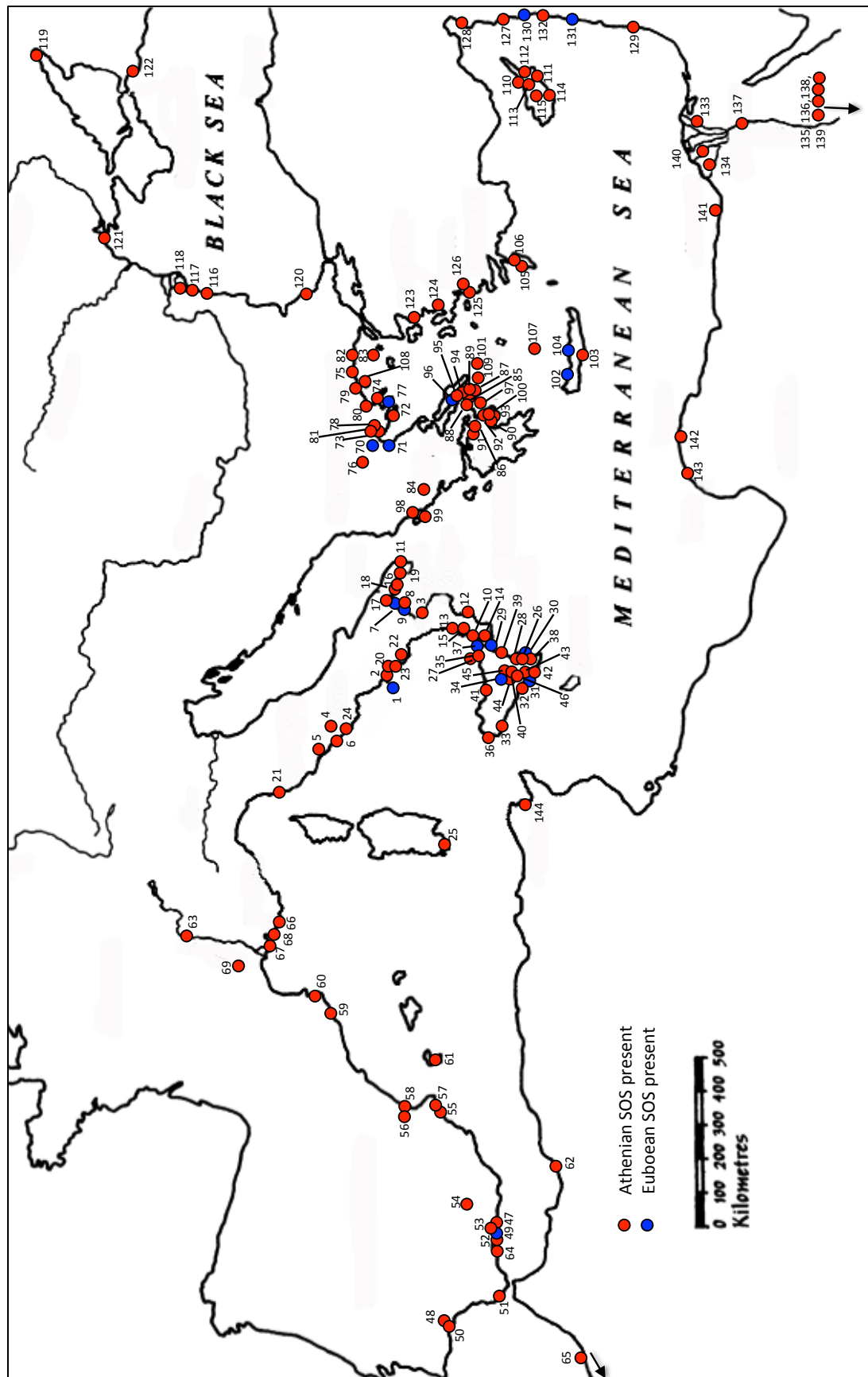
Map 9. Distribution of Transitional North Aegean amphoras in the Eastern Mediterranean with volumes accounted for and color-coded for context.



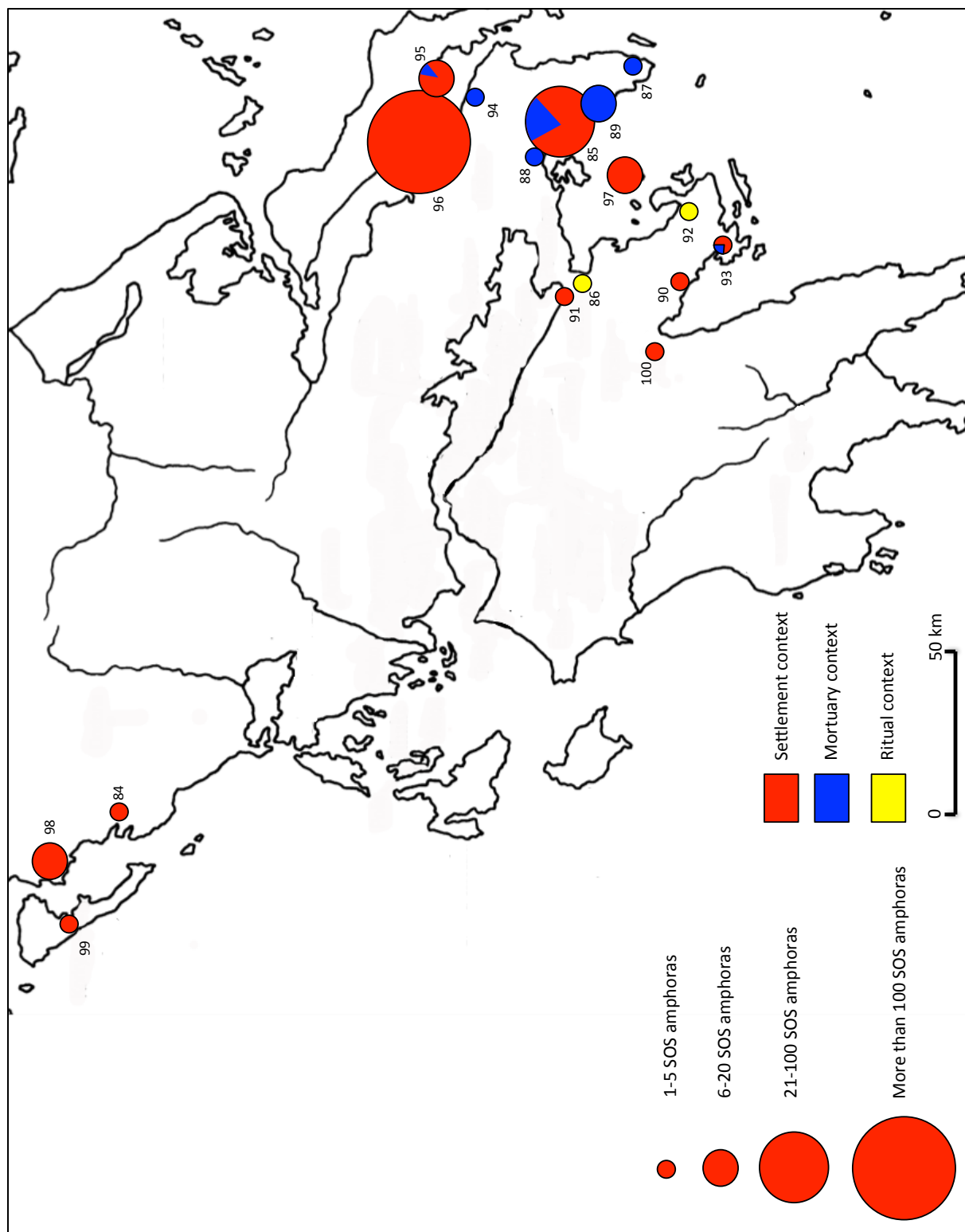
Map 10. Distribution of Type II North Aegean amphoraras within the Mediterranean, color-coded for context.



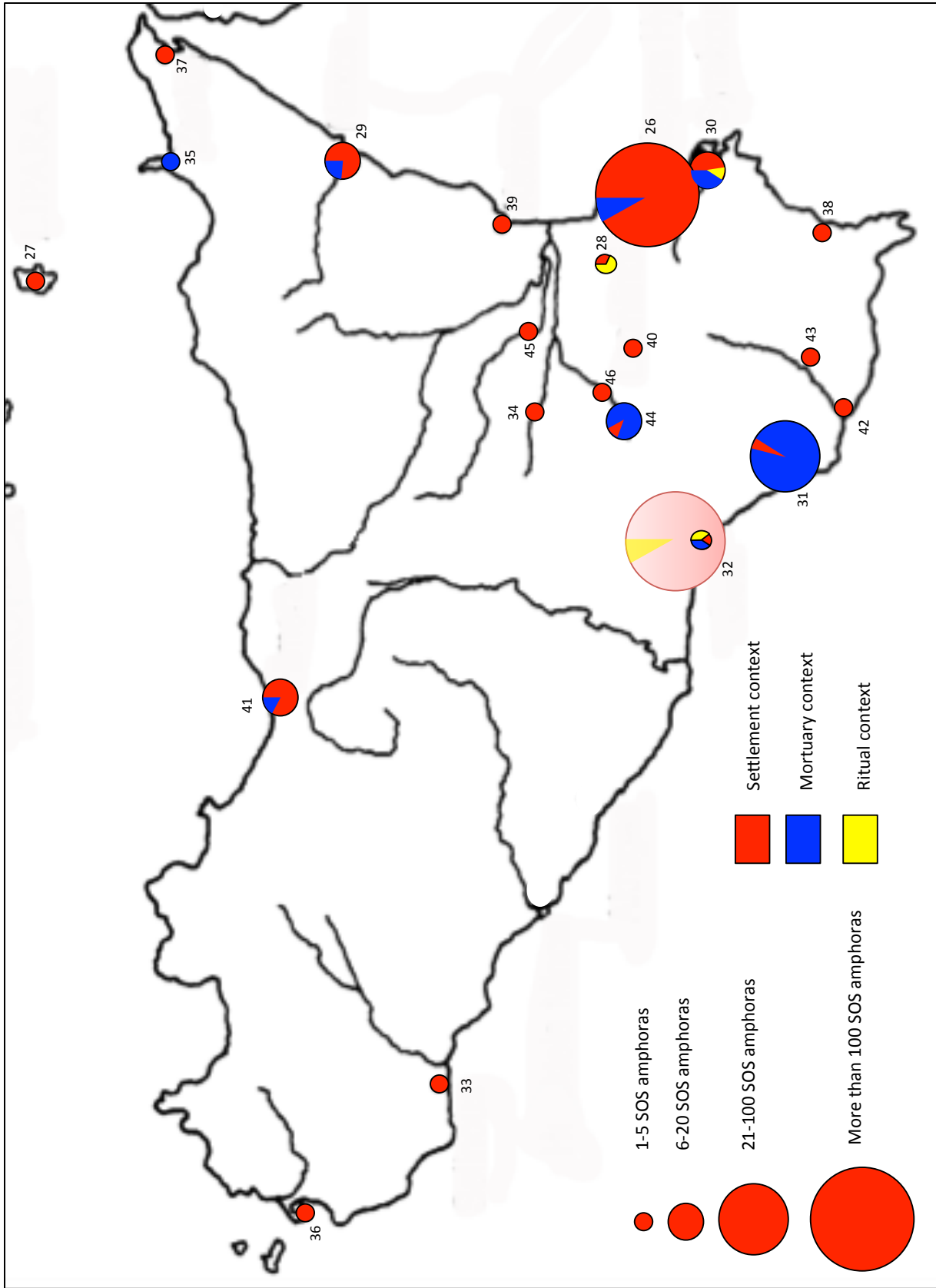
Map 11. Distribution of Type II North Aegean amphorae within the Aegean with volumes accounted for and color-coded for context.



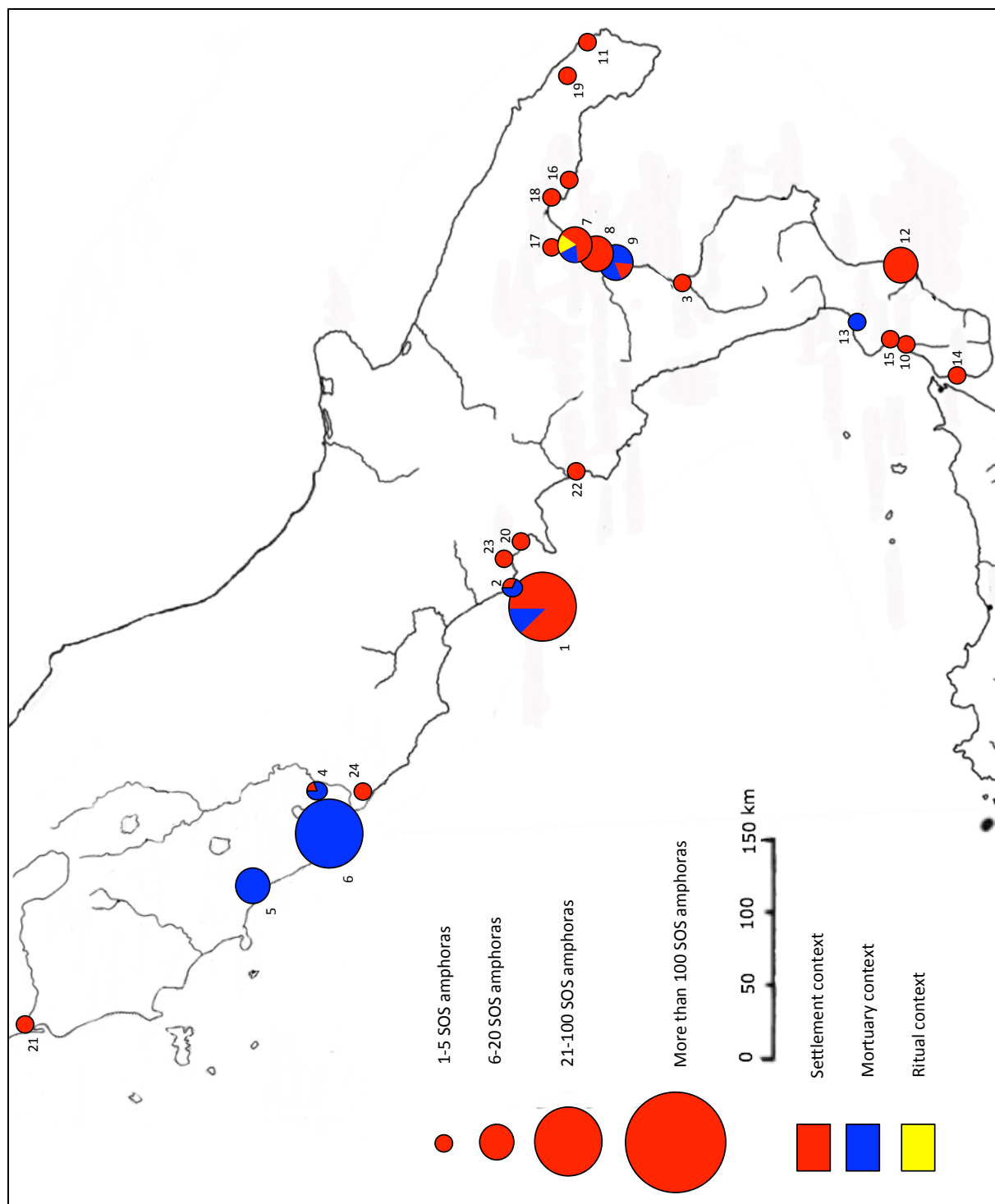
Map 12. SOS amphora distribution within the Mediterranean, color-coded for provenance.



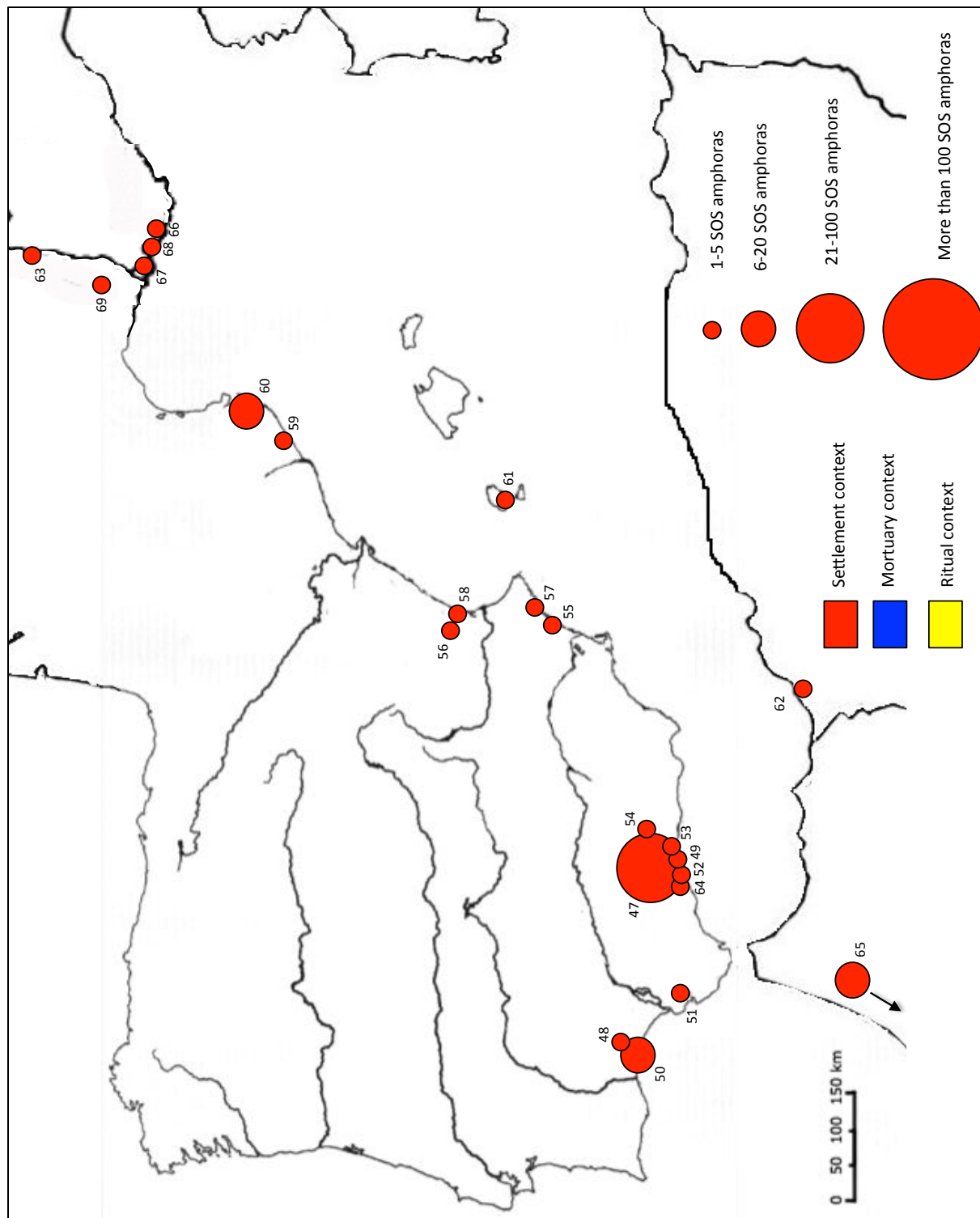
Map 13. SOS amphora distribution in Central Greece and the Peloponnese, with volumes accounted for and color-coded for context.



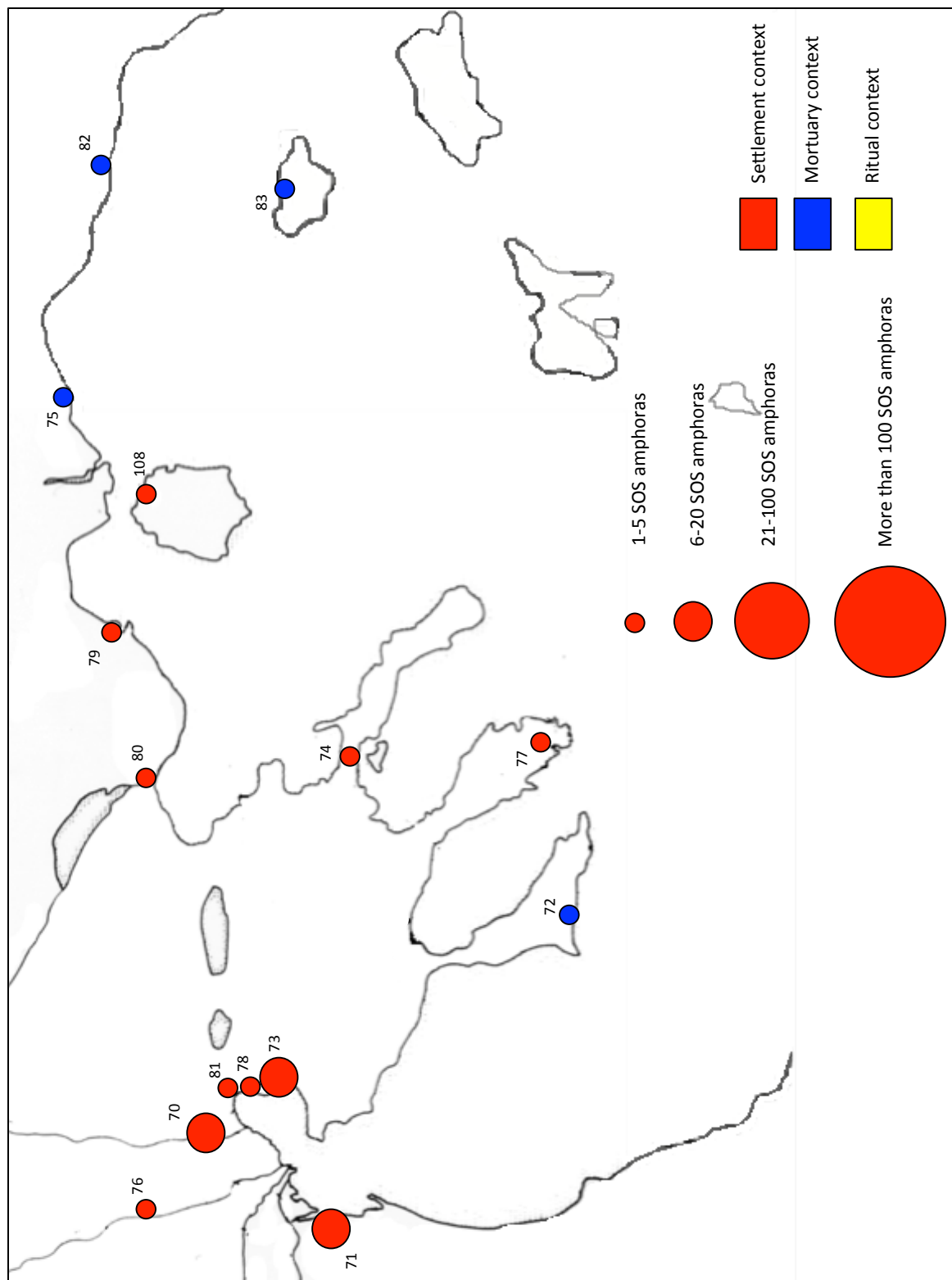
Map 14. SOS amphora distribution in Sicily with volumes accounted for and color-coded for context.

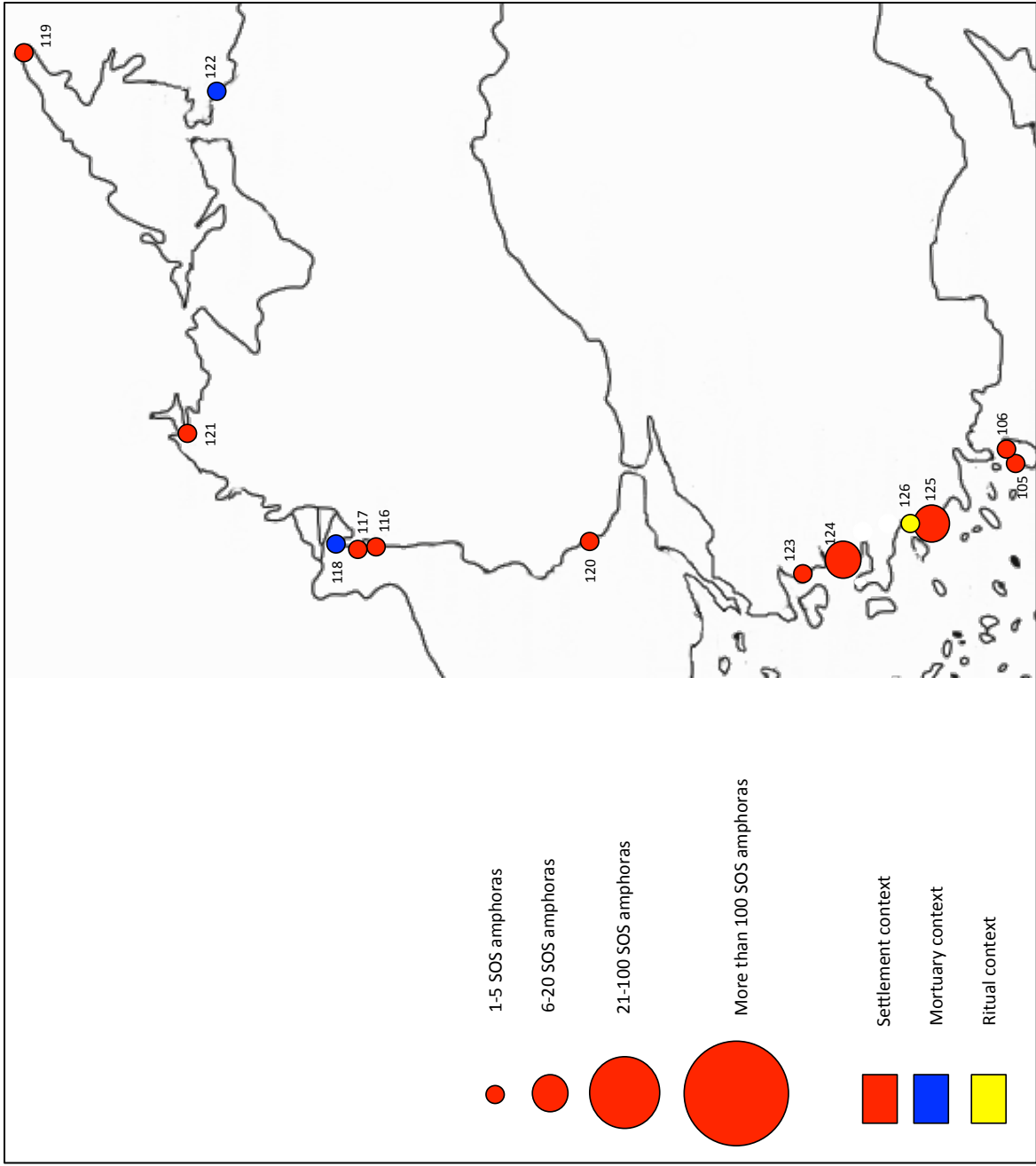


Map 15. SOS amphora distribution in Italy with volumes accounted for and color-coded for context.

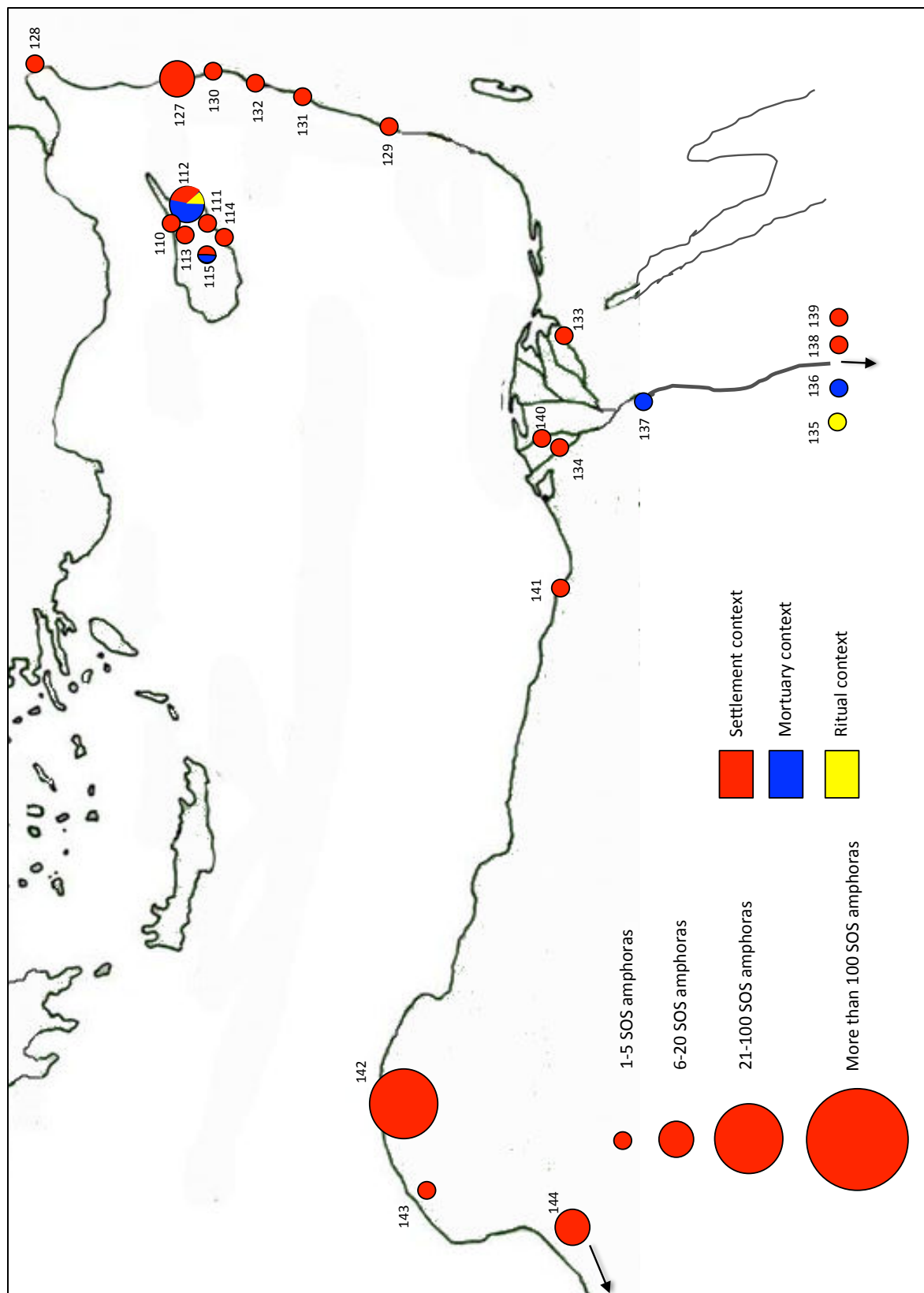


Map 16. SOS amphora distribution in the Western Mediterranean with volumes accounted for and color-coded for context.

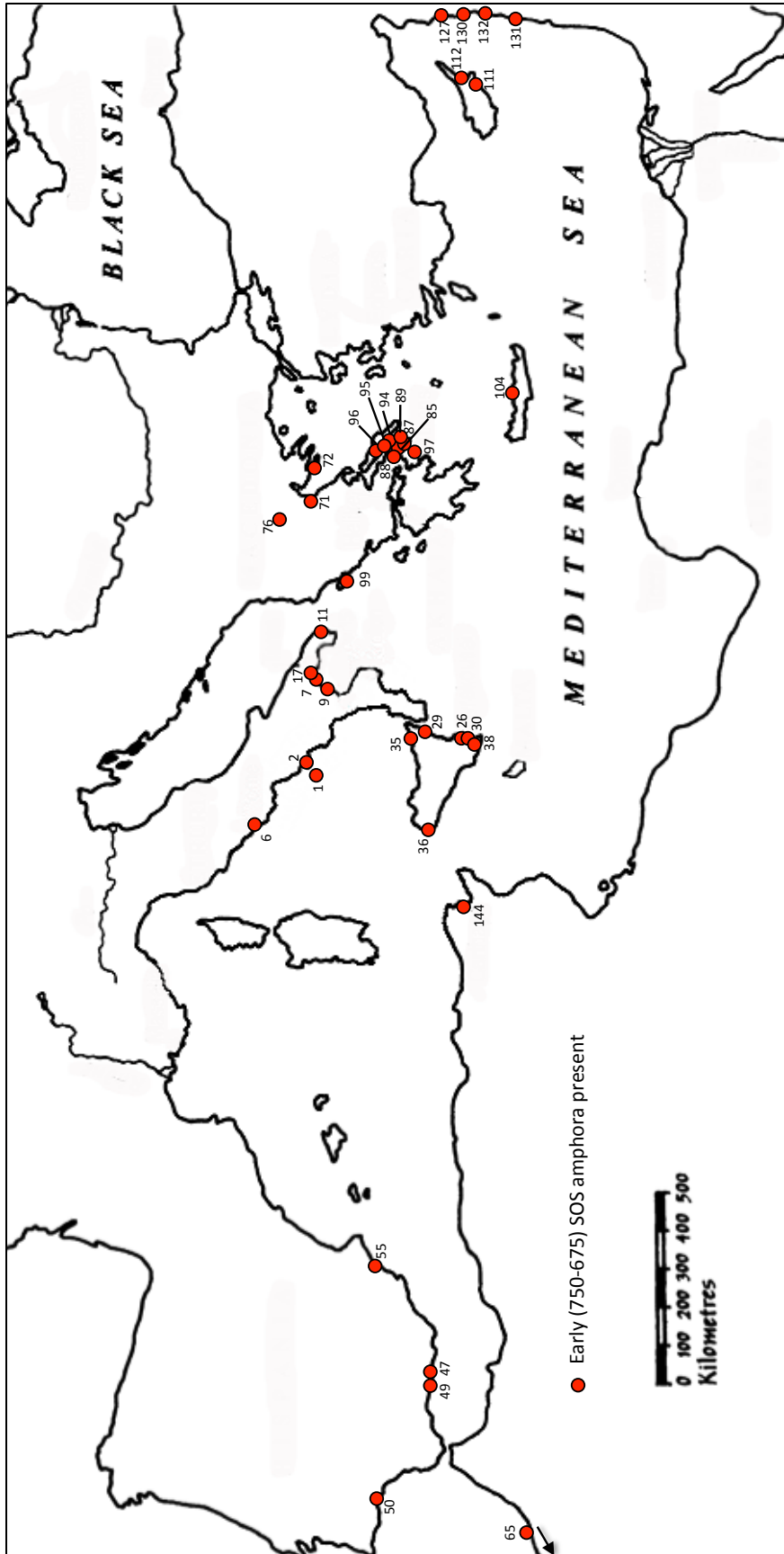




Map 18. SOS amphora distribution in Asia Minor and the Black Sea with volumes accounted for and color-coded for context.



Map 19. SOS amphora distribution in Cyprus, the Levant, and Egypt with volumes accounted for and color-coded for context.



Map 20. Distribution of early SOS amphorae within the Mediterranean.

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