What is for Lunch? A Thin Section Optical Mineralogy Study of Cooking Vessel Fabric during the Hellenistic Period at Ashkelon, Israel.

by

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Abstract

Tel Ashkelon, located off of the southern coast of modern day Israel, was a major port city during the Hellenistic Period, ranging from ca 350 B.C.- ca 68 B.C. Determining how Hellenized, and whether such changes resulted from Greek trade or Greek migration, strengthens the current understanding of the city. Cooking vessels, created to satisfy the participants of the local economic market, act as a proxy to document the cooking culture at the time. The casserole form originates in Greece in the early 5th century B.C. and appears in local fabric at Ashkelon in the early 3rd century B.C. onwards. This study analyzes 30 sherds with thin section optical mineralogy to determine locality of cooking vessel fabric ranging from the early to late Hellenistic. Samples analysis yielded 5 distinct fabric groups. Groups 1-4 represent varying local fabrics surrounding Ashkelon. Boundaries extend north just past Ashdod, east to the start of the Shephelah, south to Gaza, and west through Ashkelon to the coast. Group 5 represents the non-local imported fabric as a point of comparison of foreign vessels. All cooking pots and casseroles come from groups 1-4. The inundation of Greek settlers at Ashkelon in the late Hellenistic elicited the entry of the new casserole form into local fabrics, which the Ashkelon inhabitants adopted into their cooking culture though the rest of the Hellenistic Period. The acceptance of casseroles in local cook culture facilitates the post processual idea that pottery as active as it contributed to the Hellenization of the city.
Introduction

Tel Ashkelon, located on the southern coast of modern day Israel, was a thriving port city with occupation from as early as the Canaanites up to the Crusaders. The site is easily accessible by land and sea, providing a place of converging ideas and people. This study focuses on the Hellenistic Period, ranging at the site from ca 350 B.C. to ca 68 B.C. The Hellenistic Period was a time of great Greek cultural influence across the Mediterranean and Near East. So a question is posed: how did culture at Ashkelon change throughout the Hellenistic Period in terms of adopting Greek practices and adapting them as their own?

Cultural shifts in any society are difficult to understand, especially when dealing with the ancient world. To determine how a group changes over time, possessions are used as a cultural proxy. Items, such as a daily cooking vessel, provide an accurate portrayal and representation of a group. Thus, a petrographic study of clay fabric can help document shifts in daily society. Berlin (1997) explains the importance of cooking pots when describing a population, saying, “Each assemblage can be considered, in a large sense, if not by strict definition, a primary document, since each can be equivocally associated with a strictly delineated, narrowly constituted, short-lived occupational phase. This opens the possibility of defining ceramic corpora that correspond to the habits and circumstances of their users’ lives” (16). Because of their direct relationship to a population, cooking pots are important in studying a group. Cooking vessels do more than provide culinary preparation, “they also serve to highlight the inhabitants’ cultural milieu and perhaps
their ethnicity as well” (Berlin 1997: pg 21). This study will focus on answering the question of Hellenistic cultural change by means of cooking vessel fabric.

Using cooking fabric, I hope to explain what is happening during the Hellenistic Period at Ashkelon. Globular cooking pots originate from the Eastern Mediterranean during the Bronze Age and are well established in the Levant by the Hellenistic Period. The cooking pot, on the other hand, first emerges in Greek in the 5th century B.C., making its way to the Near East in the start of the 3rd Century B.C. The cooking pot maintains a continuous representation in the cook culture throughout the Hellenistic Period at Ashkelon. The casserole, on the other hand, emerges and gains popularity during this time. To understand this cultural shift, the next step is to look at the pottery fabric. Are the mineralogical signatures between the two vessels different at all? Are forms created from local or non-local material? What composition defines a local cooking vessel? Determining an Ashkelon signature will allow us to figure out what pots are made to sell to the population, which in turn describe their cultural preferences. Since the samples include vessels ranging from the early to Late Hellenistic, as well as from one upper class and one lower class neighborhood, I will be able to look at changes in composition throughout time and economic standing within the city. The question remains, using thin section optical mineralogy of cooking vessel fabric, what do cooking vessels imply about culture change and how does this impact Ashkelon culture in the Hellenistic Period?

This thesis will first off, discuss the social and theoretical nature of cooking vessels and how they relate and describe a group. Chapter two provides the site overview of Ashkelon and the context necessary in understanding the setting of the
study. Following this, cooking vessel terminology and form are discussed in chapter 3. After this base overview of theory, site, and material, chapter 4 goes in depth on the petrography of the Levant. Chapters 5, 6, and 7 are the method, data, and results of this thin section optical mineralogy study at Hellenistic Ashkelon. Conclusions are reached in chapter 9 from analysis of these thin sections combined with social theory and history of Ashkelon.

Chapter 1: Archaeological Theory

Habitus as it Pertains to Material Culture

To consider cooking vessels as a descriptor or proxy for describing a people, they must be thought of in a specific way. Cooking vessels hold an intrinsic value, by sharing a daily connection with the owner, describing him/her. Only once there is a complete understanding of these vessels can they be linked to the people using them. More specifically, two questions arise; how do cooking pots describe people and why do cooking pots describe people. The answer lies in Pierre Bourdieu’s notion of habitus, which he defines as, “a system of shared social dispositions and cognitive structures, which generates perceptions, appreciations, and actions,” (Bourdieu 1988: pg 279). Habitus is an internalized cultural habitat in which people behave based on unconscious dispositions to act, think, and feel. Each human acts and behaves based on determined tendencies that are not concretely represented, actively achieved, and consciously emitted. Habitus is innate and, therefore, separates people into categories. Thus, habitus can collectively describe a group, such as the people in Hellenistic Ashkelon.
The house defines a unit family, who can then dictate what part of the house is public and what is private. The public domain of a household is consciously and unconsciously prepared and designed to accommodate an audience. Unconsciously, the family decides what is shown to the public, and what is reserved for the private, without an audience. From this, there are two different spheres of habitus, the dispositions of the public and the dispositions of the private.

Habitus divides a house into two different social frameworks. Different notions drive the unconscious nature of the public and the private. The private realm is not directed to outsiders. It lacks any sort of bystander influence and connection with outside groups of people with different habitus. Meaning, the private habitus stems only from self-recognition, self identify, and felt kinship ties. The private, reserved for just the household has a predetermined system of beliefs not subjected to the ever-changing cultural public realm. Because of this, the private sector of habitus can be linked to ethnicity. The private sphere of habitus lacks this cultural influence of contact, leaving solely the people of the household, and their beliefs, background, and personal histories to influence this sphere. The public realm is subjected to outsider contact and their different ideas and actions. With so much outside influence on the public realm from relations and social influences, culture drives the habitus of the public. Thus, a changing culture and alter the public habitus.

Across all cultures and societies, everyone needs to eat, and therefore, everyone needs cooking vessels. It unconsciously chronicles the daily choices, actions, and beliefs of a person. Habitus links people to their pottery, describing the group using them. Ceramics have a physiological resonance and a social meaning. A
person’s life is the sum of their experiences, so if a specific vessel is part of a
person’s experiences, that object ends up a descriptor of the person’s life. Lawrence
(1987) describes habitus as the values of a person expressed in their habits, practices,
and predispositions (pg 156). The daily cooking vessels expresses said habits,
practices, and predispositions of a person, contributing to and describing the habitus
of a person or group.

Every household hand picks the cooking vessels they use. By nature, a
person’s subconscious will have an impact in choosing the desired vessel. Cultural,
socio-demographic, psychological, political, and economic factors all attribute to
which cooking vessel is bought and used (Lawrence 1987: pg 162). These factors
may be manifest and intentional or latent and unintended (Lawrence 1987: pg 159).
When purchasing a cooking vessel, most people approach the matter in an objective
way. They need a vessel to prepare food, and they will buy the best one for the job.
Because of habitus, however, one cannot go into a scenario with a purely objective
and quantifiable approach. Unconsciously, habitus plays a role. The pot will be
bought in the realm of the public, with an audience present, but will be used in the
realm of the private, reserved just for the household. The cooking pot describes the
people living in the household, but both the internal and external parts of habitus play
a role. Because of this, the purchased vessel tells more about a person than that they
need a cooking implement; it holds information about the culture and ethnicity of that
person.

Habitus allows the formation of groups, which forms from similarities
between people. Theses similarities may be conscious or unconscious. The
unconscious groupings are important for archaeology, for they demonstrate habitus, or the raw cultural undertones of a group. Habitus divides people who use different material goods into different groups. Through these differences in goods, like cooking vessels, archaeologists can begin to describe the people associated to them in terms of the internal and external notions of habitus.

It is natural to form groups. The people of Ashkelon share ideas and values with each other related to daily life. The city has an internal set of beliefs and emotions that favor certain material items over others. Habitus is divided into two sets of unconscious dispositions. The external public realm is designed for an audience, influenced by interactions, and subjected to more change. The internal private realm is meant for the household only and generally remains more rigid.

Potters create vessels they believe will produce the most profit. The forms in highest demand will be the ones they prefer to sell. For this reason, potters create vessels that economically describe a city. The pottery made at the time is the pottery the people use and preferred. Potters, therefore, attempt to create vessels that best represent the desired clientele. The dynamic use of pottery follows the shifting culture of the city, which facilitates the change of public habitus.

Material goods are a tangible way to document habitus, whether it changes or not. Habitus as it relates to ethnicity and culture is not a concrete measurable system. Instead, archaeologists must use material culture as proxies to facilitate this social process. The distribution of material items can relate to both ethnicity and culture. The problem is that there are two separate spheres of habitus. Ceramics are bought in the public, but used in the private. The question arises, which sphere of habitus do
cooking pots describe, the public, the private, or a mix of both? Cooking pots help understand the people in a group, but for the purpose of analysis we need to know if it is a descriptor of the group’s outward public or inward private expression. How we decide to look at cooking pots determines how we think of people in terms of their changing habitus.

**Social Archaeology of Cooking Vessels**

Archaeological theorists all have different beliefs concerning material culture and how it relates to habitus to describe a people. Most archeologists are divided into two separate ways of distinguishing material culture, the processualists and the post processualists. The main argument between the two is the driver of human diversity and change. The processualists believe a product of history, biology, nature, and environmental factors control change (Renfrew and Bahn 2013: pg 100). The post processualists believe it is influenced by social interaction and communications (Renfrew and Bahn 2013: pg 100). Processualists view material culture as a passive medium, meaning that it is a tool that changes with the environment (Renfrew and Bahn 2013: pg 155). It is a secondary response to environmental and biological factors. Material culture is used in terms of explaining changes throughout time. Post processualists, on the other hand, believe that material culture is a meaningfully constituted active presence in the record (Renfrew and Bahn 2013: pg 155). Material culture is useful in direct interpretation of cultural change. Peopling used artifacts, initiating dynamic social life and directly affecting the external notions of habitus. The processualists believe that pottery is explained by the previously determined
environment and history, acting as internal habitus. Post processualists disagree, believing that pottery can actively change a culture through external habitus.

Big names in the archaeological world disagree on this issue concerning material culture. Lewis Binford, Colin Renfrew, Paul Bahn, and Israel Finkelstein all support the processual approach. On the other side, people such as Ian Hodder, David Miller, and Christopher Tilley, lead the post processualists. Binford suggests material finds reflect varying levels of cultural evolution in terms of functional needs, social traditions, ideas, and symbols (Binford 1972: 20-25). Finkelstein, however, slightly disagrees, saying that material culture mirrors environmental background, influence of neighboring cultures, local heritage, traditions, cognitive world, socioeconomic influences, and sociopolitical influences (Finkelstein 1997: 224). Finkelstein and Binford contextualize concrete notions such as environmental background, neighboring cultures, and the cognitive world. From changes in these notions, material goods will shift. Based on this, Finkelstein reaches a conclusion that material culture is not rich enough to allow the drawing of clear ethnic boundaries and that “we cannot assume that the peoples described in the sources correspond to the self conscious identity groups that are essential to the definition of ethnicity” (Finkelstein 1997: 219). Finkelstein comes up with three implications to explain his reasoning; group identity is influenced by complex sociological and physiological factors; processes of assimilation tend to blur ethnic lines; it is difficult to separate expressions of status and manifestations of ethnicity (Finkelstein 1997: 218). He believes that ethnicity is dynamic and that the internal private sphere of habitus is influential, though material culture is not rich enough to use to determine anything.
In one aspect, yes, ethnicity is impressionable, but this processualist approach, however, is to narrow. It does not take into account all of the factors surrounding a group of people. As a species, humans are naturally social creatures, which, therefore, must have dynamic influence on a population. Material culture better displays the outward expression of the material world, applying to the post processualist approach. Material items are created to best represent the economical preferences of a desired group. In an active role, pottery functions as a means of social integration targeted beyond the immediate internal habitus (Hall 1998: pg 131). Interactions between groups produce similarities in material culture. Cultural exchange happens when divisions of ethnic groups interact. Cultures are dynamic and malleable. Social interaction, whether though economic life, social life, political life, military life, or religious life, influence people, causing their culture to shift, redefining the habitus of the group. Culture is extremely influentially and changes with increased contact.

A vessel is created and distributed based on interactions with others, whether that is exclusively within a specific group or traveling across communities. Artifact spread is controlled by person-to-person contact as well as the extent and continuity of that contact (Hodder 1979: pg 446). More extended contact means greater widespread homogeneity. More movement of individuals means the greater the spread of ideas and material artifacts. This increase in cultural diffusion provides an area with increased homogeneity of that artifact of prolonged contact. An area with widespread cultural diffusion will provide that area with a vast heterogeneous mix of material goods. Similarities in material culture are based on the chance to be copied from one community to another (Hodder 1979: pg 446). Though Greece and
Ashkelon are geographically far, Hellenization in Ashkelon is possible because of the opportunity for the spread of ideas. As more non-local people entered the city, making contact and connections (through migration, trade, or politics), so did cultural ideas and artifacts, thus Hellenizing the city and shaping the pottery in the strata. Changes in material goods are not explained by the internal habitus, as processualists believe, rather, changes in material items can shed light on the interpretation of an changing external sphere of influence.

To further analyze pottery’s ability to describe a culture, a few implications are important which Hodder (1979: pg 449-451) takes time to note; artifacts hold information; artifacts are a medium of communication between individuals and groups; artifacts express underlying needs and symbolize and support social relationships; artifacts signal social relations. Artifacts hold valuable information that can be used to interpret the culture of the time. The second implication relates to the public sector of habitus. For a household, the public realm is for an audience, promoting influence though household-to-outside group contact. This influence is demonstrated and displayed through material culture, such as pottery. The external interactions of the public are more important and drive habitus more than the set internal private dispositions.

Artifact patterning reflects group behavior, meaning that cooking vessels group people into varying cultures. Pottery constantly occurring together in the record displays a trait (Renfrew 2000: pg 150). This trait is a piece of that group’s culture, a way of distinguishing them from others. The grouping of pottery is a way to interpret the present cultures in a given area. Social relations, a driver of cultural change, can
shape different ideas about a nation’s economy, social life, economic standings, and political influence all though looking at pottery. Similarities and patterning in cooking vessels can act as proof of cultural diffusion. Pottery is created with the public sphere of habitus and cultural preface in mind. Therefore vessels are tied to the social realm of influence. Ideas, beliefs, and interactions play a vital role in material goods, and they get ignored if pottery is viewed through the internal sphere of habitus.

Case studies in petrographic analysis attempt to correlate pottery in relation to ethnicity, culture, and socioeconomics. In Segvic et al (2012), a study of Hellenistic pottery along the Dalmatian Coast, a conclusion is reached that the cultural meaning of ceramic ware is conditioned by their availability and use. This goes back to the Hodder’s two factors of artifact similarity; efficiency of the person-to-person contact (availability) and the extent and continuity of contact (use). The study goes on to say that as a port city with ties to trade via the sea and land, the community will automatically attract different people, and thus a greater circulation of locally produced foreign influenced pottery. This creates the implication that extensive contact and diffusion with the Mediterranean world combines Hellenistic and local ware part as part of the daily ceramic assemblage.

A study of Iron Age pottery at Megiddo from Harrison and Hancock (2005) notes that the immense diversity from the potsherd record indicates an area of cultural diffusion, possible acting as a center for people from the surrounding hinterlands. The implication is that vast quantities and diversity in the record means an organized center with people from the surrounding area converging in to trade local goods. Megiddo acts as a neutral economic outcrop, resulting in a heterogeneous community
(Harrison and Hancock 2005: pg 719). The case studies promote ethnic and cultural diffusion, creating a vast array of pottery that is constantly evolving based on the current people populating the city.

Greater networking and communication between ethnicities means a higher chance of lasting person-to-person contact. In turn, increased contact promotes an influx of new ideas and artifacts. Diffusion with different cultures would likely translate into a heterogeneous array of pottery influenced by the contact of different groups. As a port city, Ashkelon is subjected to a vast influx of different people from neighboring cultures selling different types of pottery, thus influencing the local potters. As more people begin to migrate to the city during the Hellenistic Period from different areas and ethnicities, the local pottery should begin to transform. Cities see cultural exchange when divisions of ethnicity break down. When ethnic lines fall, cultural exchange reaches the internal private. As more diversity enters and migrates into the city, pottery should transform accordingly with cultural change.

Patterning of these cooking vessels, meaning their dispersal, distribution, mineralogical composition, and area of manufacture can provide insight into the people of Ashkelon. If this study shows one specific local cooking fabric coming directly from the city of Ashkelon, the city would be fairly homogeneous. If there are distinctions in the cooking fabric, then the people of Ashkelon have more contact with hinterland neighbors. In the cookingt fabric record, the greater the diversity in the record, the more cultural exchange there is at the time. Agreeing with Ian Hodder, pottery is an outward expression of interaction in terms of a person’s socioeconomic and cultural standing. Cooking vessel change based on mixing of the habitus of the
public. As people change, and their preferences change, the pottery will follow accordingly. Determining the locality of the cooking pot fabric can aid in understanding the cultural diversity at the port city of Ashkelon.

**Hellenization**

Hellenization is a word tossed around and associated to the ancient Mediterranean. Though it seems haphazardly used, it is simply because hellenization is difficult to articulate in the archaeological record. Martin (2007: pg 2) describes it as a “process of Greek acculturation (culture contact).” Hellenization is the spread of Greek culture outside of Greek boundaries. The difficult part is not in defining the word Hellenization, but in determining what it means to behave and act under this pretense. For archaeologists, the tough part is attempting to define a Hellenized area or culture in terms of just the material record.

Hellenization is the active spread of Greek culture to non-Greek constituents. Martin states, “the Hellenization paradigm assumes that contact with Greece led to culture change in which different local identities and ethnicities became recognizably more Greek” (Martin 2007: pg 33). It is this contact that spreads Greek culture. Hellenization is the assumption that contact with Greece or Greek items leads to assimilation. This contact can come about in three ways: trade, migration, and political happenings (Martin 2007: pg 32). During the later part of Greek rule, 500-0B.C., the world evolved to be significantly smaller. Roads, land routes, sea patterns, and shipping improvements led to better communication and ease of access to adjacent and even distant empires. The greater the trade means the more person-to-
person contact, and thus, the higher the chance of Greek culture to spread. As the world became smaller, and travel became easier, more people migrated to new areas. With them, they took their culture, now engrained in a new location. As political endeavors flourished in the world of increased trade and travel, so did military campaigns, essentially engraining Greek ideas in the local area whether desired or not. In a developing world based on relationships, culture spread rapidly.

Hellenization thrived during and post Alexander’s rule simply because it was a time of mass movement of people, which promotes contact, and thus, the spread of cultural values and ideas.

Culture is a fluid system. How then do we distinguish the spread of Hellenistic practices if there are no specific cultural boundaries? In the archaeological record, what distinguishes a Greek immigrant verses a person adopting Greek culture? Essentially, if a person shared preconceived ties to Greece, they were of the Greek ethnicity. The issue is that we cannot determine this through the archaeological record. Instead, proxies such as language, religion, coins, and pottery allow the formation of ethnic or cultural boundaries. The main problem with this however, is that just because someone processes a Greek pot or happens to speak the Greek language, does not mean they are of Greek ethnicity.

Hellenization is often associated to ethnicity when the definition is supposed to be culture. Hall warns that “questions of acculturation, as revealed through the archaeological record, need to be uncoupled from the expression of ethnic identity since they may be governed by a whole series of non ethnic environmental, adaptive, or sociopolitical factors” (Hall 2002: pg 7). Here, he explains that ethnicity cannot be
tied into Hellenization because Hellenization is the product of non-ethnic factors. Hellenization is a diffusion process and must result in first hand contact between separately distinct cultures.

When material culture breaks previous boundaries, Hellenization occurs. The tough part of analyzing the extent of Hellenization, explained by Martin, is that, “culture is a lived experience and unless we have someone writing it all down, we cannot really tell anything about it. Archaeologically, it does not get translated well in the record” (Martin 2007: pg 66). The problem is proving Greek culture existed in these non-Greek settings. Hellenization is the adoption of Greek behavior, but how is that displayed in the archaeological record? If Hellenic objects are used by a different culture, are they simply just using these objects, or adopting the behaviors associated to it? How connected is cultural behavior and objects? Archaeology cannot directly track the movement of culture, or even the movement of people, but it can track the movement of objects. Archaeology can document the spread of cultures through the use of tangible artifacts.

New foreign goods typically are first introduced by the elites. High Greek culture appears as exotic and avant-garde. These material goods then appear in areas the upper class are involved in. Hellenistic materials would manifest in writing, art, public buildings, and luxury goods (Martin 2007: pg 31). Soon, these practices begin to infuse themselves with the socio-political setting of the city. As Hellenistic items slowly spread to everyday life, so to does Hellenistic actions and thought.

Different material items change as different parts of life slowly Hellenize. Political-economic life, social life, civic life, and religious life are all subjected to
change (Martin 2007: pg 31). Material culture documents these changes. The transition to Greek weights and measures is a good indicator for Hellenization in terms of economic life. Coins are a valuable indicator if they show Greek figures such as Zeus and Poseidon. If sites have these coins it means they traded with Greece. If sites make these coins, however, it means they are attempting to mimic and assimilate into the Greek gods and economic system. A change in city name to a one of more Greek origins marks political acculturation, such as the shift of Tel Dor to Doros/Dora (Martin 2007: pg 12). The city is attempting to be recognized as Greek. Civic life changes to follow the Greeks as nations adopt the orthogonal city plan (Martin 2007: pg 8). Emulations and reproductions of Greek pottery forms demonstrate that Greek ideas are part of the daily activities of cooking, socializing, eating, and drinking.

The more the area replicated these once foreign objects the more Hellenized an area became. The replication of Greek artifacts in local material signifies the cultural adaption. Changes such as this in the material culture suggests Hellenization because the society actively decides to use, create, and make material that is Greek influenced. Since Ashkelon is a port city it is difficult to determine what is Ashkelon material culture, what is influenced material culture, what is local, and what is foreign (Martin 2007: pg 8). Port cities are very heterogeneous, making material goods difficult to group, isolate, and track through the city. What can be analyzed is the pottery fabric origin in attempts to determine how Ashkelon became Hellenized.

Looking at the political history of Ashkelon, there was no forceful Hellenistic take over or abrupt changes in the stratigraphic record. Hellenization was gradual.
After the Persian period, Alexander went through the near east on his campaign.

Though he did travel through the area, he never let his army loose on Ashkelon.

Because of this, political control shifted hands for the next 200 years as the Seleucids and Ptolomies fought for power. This political strife promoted the spread of Hellenization. The constant change in political power allowed a constant stream of new people, ideas, alliances, and interactions to take place in a short span of 200 years. The inconsistent control of Ashkelon promoted constant cultural influx.

Hellenization seeped into the city through feuding powers allowing this time to be one of intense cultural change.

Political and military strife causes increased acculturation. During the 5th and 4th centuries, Greece and Persia experienced mass acculturation from each other (Balcer 1983: pg 257). Heightened political tension correlated to the spread of their respective cultures. Greeks held important positions in the Achaemenid Empire such as Telephanes the artist, Mandrokles the engineer, as well as doctors, mercenaries, political agents, and athletes (Balcer 1983 pg: 261). The campaign facilitated first hand person-to-person contact between the two cultures adding to Balcer’s notion that acculturation “results when groups or individuals with different cultures come into continuous first hand contact” (Balcer 1983: pg 257). If political conflict resulted in acculturation in the 5th century, then cultural exchange should happen at Ashkelon during the Hellenistic Period from the ever-shifting rule of the Ptolemy’s and the Seleucids. The city of Ashkelon was a product of a vast influx of social relations facilitated by feuding rulers and nearby trading powers, and, thus, a cultural hotspot.
An important distinction, often forgotten, is that Hellenization replaces previous cultural practices with Greek ones (Martin 2007: pg 41). Hellenization is not orientalism. The greater the Hellenization, the less of what it was before (Martin 2007: pg 41). Often over looked, the acculturation of Greek practices leads to the destruction of the local ones. (Martin 2007: pg 46). Contact between Greeks and others promote the spread of material culture and beliefs. In the ceramic record Hellenization should show not a higher number of Greek forms, but a greater ratio of Greek to non-Greek styled vessels.

Hellenization, or the process of Greek acculturation, is induced by contact of Greek identifying cultures and non-Greek cultures. Hellenization is a fluid process as Greek influences transform the local culture. Archaeology cannot trace Hellenization directly, but it can track material items. These changes in artifacts mark the adoption of new customs, ultimately leading to cultural assimilation. This study uses the material culture of pottery fabric to help understand Hellenization at Tel Ashkelon.

Chapter 2: Ashkelon in the Hellenistic Period

Site Overview

Ashkelon is an ancient Mediterranean port city off the southern coast of present day Israel. The site is located 63km south of Tel Aviv, and 16km north of the Gaza border (Stager et al 2008: pg 3). The port city sits on a tel, or man made earthen mound of occupation, of 150 acres in area overlooking the shore (figure 1). Shaped like a semi circle, the city sits flush with the seashore on its western side, and ringed by a walled fortification. Its location on the coast provided Ashkelon with a bustling
maritime economy. With the coastal port cities of Ashdod just north and Gaza just south, local naval economy would be strong. Ashkelon also is a prime location for larger trading vessels on the way from Greece, Syria, and Egypt to stop and

Figure 1: Arial view of Tel Ashkelon looking north. Photo from Stager et al 2008: pg 5.

resupply. In addition to a strong maritime economy, land trade was also a large part of the city. Ashkelon sits just west of one of the major land highways of the Levant, the Tel Aviv- Gaza highway (Stager et al 2008: pg 37). Ashkelon had a robust economy, both at sea and by land. Wine and olive oil production of the Southern Levant tempted travelers and merchants to use the city as a resupply and rest stop

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while passing through the area (Master 2003: pg 47). A vast amount of commercial storage jars in the strata suggests the city thrived on trade. Large amounts of people and resources entered the city daily. Because of its ideal location and plentiful resources, Ashkelon has a rich history.

Occupied from the Canaanites up through the Crusaders, Ashkelon proved a well sought out destination. The focus of this study is the Hellenistic Period, typically ranging from Alexander’s death in 323BC to the Roman conquest in 31 BC. The Hellenistic Period, called such due to an increased Greek presence abroad in migration, politics, military, and commerce, is consequently a time of cultural diffusion. At Ashkelon, the Hellenistic Period spans from ca 350- ca 68BC. Breaking the period down further, the early Hellenistic ranges ca 350- ca 290/280 BC, middle Hellenistic ranges ca 260- ca 150 BC, and late Hellenistic ranges ca 150- ca 68 BC. The transition from Late Hellenistic to early Roman happened from ca 68 BC to ca 1 AD.

Leading up to the Hellenistic Period, the Persians rule Ashkelon from the late 6th century to the collapse of the Achaemenid Empire by Alexander the Great. During this time, the city was the headquarters for a Tyrian Governor, ruling a Phoenician population at Ashkelon. The population provided intense maritime trade and commerce in exchange for peace with their Persian rulers (Stager et al 2008: pg 9). After the Persian Empire collapsed, the Ptolemies of Egypt ruled Ashkelon until ca 198 BC. After, the Seleucids of Syria seized the city. During the Maccabean period, Ashkelon remained autonomous. Ashkelon minted a coin in the 1st century BC with the Greek inscription “Of the people of Askalon, holy, city of asylum, autonomous”
(Stager et al 2008: pg 9). Not only did the coin confirm the city was of its own governance, but the inscription was in Greek, demonstrating a Hellenized economy.

The Levant in the Hellenistic Period was left in a power vacuum of sorts. Alexander the Great came through the Southern Levant with the intension to get to and conquer Egypt, not to bring wrath on the Southern Levantine coast. Yes, the Levant was conquered by Alexander and left in control by the Ptolemies, but in a loose sense. Life at Ashkelon appeared unchanged, or at least unaffected in the stratigraphic record. No sudden changes or destruction layers of an abrupt power shift emerged in excavation. Ashkelon simply went on living.

Though the Seleucids did not take over until later in the middle Hellenistic, the Seleucids and Ptolemies constantly vied for power in the area. With the Ptolemies strongest in Egypt and the Seleucids from Syria, Ashkelon would have had intense interaction with the north, as the south, as well as Ptolemaic ties in the Aegean. The city of Ashkelon saw a vast influx of wealth and foreign culture at this time resulting from the power struggle of various empires in the Levant.
In 1985, the Leon Levy Expedition to Ashkelon formed. For the past 30 years, seasonal excavation uncovered a vast chronology of history. The excavation devised a grid system, covering the expanse of the city, of 100 by 100 meter units dubbed ‘grids’ (figure 2). Starting in the Northwest corner and ending in the Southeast corner, the grids are in horizontal rows 7 grids wide numbering a total of 84 grids (Stager et
al 2008: pg 186). The grids are parallel to the Mediterranean ocean and are therefore not orientated to true north, but slightly to the east 30 degrees. Further subdividing, a grid contains 100 ‘squares’ that encompass a 10 by 10 meter area. The squares are numbered in horizontal rows starting with square one in the northwest corner and ending with square 100 in the southeast corner. Each square contains 100 ‘fine-grids’, 1 by 1 meter areas, following the same orientation and numbering scheme as the grids and squares. Fine grids, not always necessary, are reserved only for primary living surfaces. Within the context of excavation, every distinguishable stratigraphic entity of a distinct deposition is assigned a unit number in sequential order. Unit numbers are unique to squares, meaning that unit 1 in one square is different than unit 1 in another square. Every distinct difference in the strata is documented and given a unit number. Unit numbers are assigned the next available number within the specific square regardless of excavation season or proximity to associated units. This grid system allows for the recordable location of any material in the site. Meaning a cooking pot labeled 38.73.FG66.U290 is from grid 38, square 73, fine grid 66, and unit 290.

This petrologic study focuses on two distinct grids, grid 38 and grid 51 (figure 2). The two both represent a different sector of the Hellenistic city. Grid 38, located along the northern slope of the southern Tel, is divided up by phase to signify similar occupational stretches. Phase 10 correlates to the early Hellenistic Period (ca 350- ca 290/280 BC), phase 9 correlates to the middle Hellenistic Period (ca 260- ca 150 BC), phase 8 correlates to the late Hellenistic Period (ca 150- ca 68 BC), and phase 7 correlates to the transition from late Hellenistic to early Roman period (68 BC – 1
AD). Grid 51, located along the southern slope of the southern tell, is also broken up into phasing, but different than grid 38. Phase 5 correlates to the early Hellenistic, phase 4 correlates to the middle Hellenistic, and phase 3 correlates to the late Hellenistic. For simplicity’s sake, references to phase number for the remainder of this study will follow Grid 38 phasing. Both domestic settings, grids 38 and 51 are neighborhoods containing insulae.

These two specific areas in Hellenistic Ashkelon both show the lives of the people living there. Both sites turned out artifacts; Grid 38 uncovering fine and well-crafted valuables and Grid 51 producing everyday items related to the domestic industry. Though Alexander the Great conquered the Levant, Ashkelon does not produce any signs of the campaign in the stratigraphic record.

The transition is smooth from the Persian Period to into the Hellenistic Period. In fact this transitional period indicated nothing but a thriving city. There was no interface, but rather a fluid transition of a city on the rise. Something happened in Ashkelon between the early Hellenistic and middle Hellenistic, whether destruction, abandonment, or a combination of both. The city, however, bounced back with incredible verve in the middle Hellenistic. The middle Hellenistic yielded a booming domestic industry. The late Hellenistic continued the upward rise of the middle Hellenistic. The transition into the Roman Period shows new projects and a highly functioning level of society.
Grid 38 Layout and History

Grid 38 phase 10 marks the beginning of an orthogonal city plan with paved streets and insula neighborhoods (Stager et al 2008: pg 287). The grid consists of 3 distinct insulae all oriented NE/SW parallel to the coast. A N/S street borders the western side of these buildings and an irregular E/W street separates the first two insulae (figure 3). Though phase 10 marks the start of a new city plan, there is some reuse, especially of walls for foundation. This reuse resulted in slightly skewed foundation and construction. Such lack of artistic construction compared to the earlier city plans of the Phoenicians during the Persian Period suggests that architects are either less skilled or held to a lesser quality of standard by the overseer of power. Though architecture is noticeably more haphazard then earlier construction, artifacts are ‘richer’, meaning better quality, worth more, and more diverse. Such examples are faience amulets, well-crafted scale weights, finely worked bone, seals, coins, and a high amount of imported pottery, all generally regarded as luxury or expensive items (Stager et al 2008: pg 287). The occupants of grid 38 are generally regarded as slightly wealthier than the average population at Ashkelon.

Phase 10 contained 2 distinct occupations made clear by rebuilding of partition walls and reconstructing ones built with earlier Persian foundation. Ending phase 10 is a destruction layer of heavily burned floors, loose ash, fallen mudbrick, and roof collapse (Stager et al 2008: pg 287). From this, the early Hellenistic met an abrupt, violent, and destructive end. From coins found in the same destruction layer in grid 57, Ashkelon fell around 290BC (Stager et al 2008: pg 287). It’s during this time that the Ptolemies established power in the Southern Levant.
After the destruction from the military campaign, Ashkelon went into a brief 20-30 year period of inoccupation between the early and middle Hellenistic. In phase 9, correlation from room to room and floor to floor is difficult to connect. Many rooms contained plaster and a large cistern dominates the grid (Stager et al 2008: pg 290). Phase 9 ended with mudbrick collapse, but no significant destruction.
Figure 3: Phase 9 block plan of Hellenistic-period architecture in grid 38 Phase 9 (Stager 2008 pg 289).
A new building complex on top of and following orientation of walls and streets distinguishes phase 8. Rooms contained painted plaster walls and some beaten earth floors had white lime plaster on top (Stager et al 2008: pg 290). Typical artifacts from the phase include bronze pins, basalt bowls, stone weights, bone scapula, and bone spindle whorls (Stager et al 2008: pg 287). These small but well crafted finds indicate domestic assemblages. Phase 8 ended not with destruction, but with clay leveling fill for the rise of a new ashlar complex in phase 7 with continuing orientation from phase 10.

**Grid 51 Layout and History**

Grid 51, though also housing a domestic setting, catered to a different socioeconomic group compared to grid 38. The housing complex is tightly packed, indicating a higher concentration of people. Vast amounts of artifacts litter the strata. Unlike grid 38, however, these artifacts are less glamorous. This domestic production center created and housed artifacts of lower quality than grid 38. Grid 51 during the Hellenistic Period housed the majority of an insula with a street, running NW-SE parallel to the shore, along the eastern side of the building complex. The eastern side of the street marks the beginning of a second insula continuing into the eastern baulk. An exterior courtyard functions adjacent and immediately south of the main insula (figure 4).
The Late Hellenistic in grid 51 (phase 5 equivalent to grid 38 phase 10) reuses and follows the previous Persian insula layout. The housing unit of small rectangular rooms remains relatively consistent throughout the Hellenistic Period. Reoccupation of the mudbrick floors from the earlier Persian insula characterizes the Late Hellenistic (Birney 2012: pg 5). Hellenistic pottery appears for the first time, but occupation is poorly preserved. Phase 5, therefore, probably housed a short, but culturally aware occupation. Excavation yielded an agate Persian stamp seal, but other than that was home to more domestic and generic finds such as a tabun and phytolith accumulation (Birney 2012: pg 6). Other finds include grinding stones, mortars, hammerstones, and worked blades, all contributing to processing food.
The insula, and associated courtyard focused on food preparation and industrial domestic production. Abandonment marks the end of phase 5, congruent to destruction at the end of phase 10 in grid 38. Grid 51 shows no sign of destruction other than an ash layer and pot splat in the courtyard, which can simply be explained by haste abandonment (Birney 2012: pg 8).

Phase 4 (equivalent to grid 38 phase 9) marks a time of change (figure 5). Substantial leveling fills and new walls give rise to restoration and rehabilitation of the previous phase 5 deteriorating insula (Birney 2012: pg 10). The rooms, occupational debris, and vast quantity of domestic industrial finds suggest a dense occupation. Plaster now lines the courtyard surface, suggesting a more industrial space rather than cooking and food preparation area.
Figure 5: Grid 51 Middle Hellenistic top plan from the 2011 Leon Levy Expedition to Ashkelon season

(Birney 2011: pg 21).
Phase 3, the end of the Hellenistic Period in grid 51 (equivalent to grid 38 phase 8), yielded pottery rich leveling fills. A large stone drain cuts into the middle of the street at this time and lasts into the Roman period (Birney 2010: pg 18). Phase 3 was subjected to large scale remodeling and public works, showing signs of transition into the Roman period.

Chapter 3: Cooking Vessels of the Hellenistic Levant

Terms: Talking about Ceramics

Describing ceramics is a complicated matter. Classification systems change throughout time and different words subsequently get multiple or altered meanings. Type, form, and ware are subjected to such confusion and turmoil. Ware associates to any decoration resulting in a distinct amalgam, such as slip, paint, glaze, inscribed patterns, or burnishing (Berlin 1997: 6). This classification divides most ceramics into plain ware and fine ware. The names are self explanatory, plain ware lacks distinguishing decoration, if decoration exists at all. Fine ware is highly recognizable with different ornamentations. Further classification is type, in which is a combination between function and shape (Berlin 1997: 4). The plainwares can then by subdivided into type, such as cooking vessels, table vessels, storage vessels, and kitchen vessels. Form then distinguishes a specific type of vessel from the way the vessel looks, its shapes, and how it was made. A few examples are the neckless triangle rim cooking pot and the angled rim casserole (plates 1, 2, 7, and 8). This study focuses on the fabric of cooking vessels, of which will be described in depth later in this chapter.
Plain ware vessels are often gritty and lack decoration. They represent the bulk of pottery in the household, used for storage, transport, cooking, and eating. Because of the high use of these objects, the demand for these vessels is consistently high. The vessels, therefore, are produced in large quantities. Resulting from high demand and high supply, plain ware pottery varies in shape, size, form, and fabric. Given the factors of quantity and variety each site should favor a different selection for plain ware. Representative and unique to the site, local pottery used becomes a descriptor of the people using them. The favored pottery assemblage to a site reflects the general population at the time. Andrea Berlin states “because (plain ware) is such a responsive representation of daily life, careful study of a plain ware corpus can characterize the people who use it” (Berlin 1997: pg 1).

For this study, the focus lies on cooking ware, for its consistent daily use and representation of a household. It has a specific function and place in the household, eliminating unknown variables. For instance, a storage vessel can be used to house material other than food, be in use for inconsistent number of days, and is subjected to unknown trade between people. A cooking vessel, once purchased, will be stored in a household until broken and used solely for the daily activity of cooking. Cooking pottery represents a function of daily life and thus can be used as a consistent proxy for understanding the general population of a city in the ancient world.

Vessels are exposed to local and regional exchange and influence. A way to document such trends lies in the vessel fabric. Cooking vessels define local materials. For the common people for the common occasion, vessels will not be imported in, but rather consist of a local matrix. Master (2003) states, “Ancient transportation
systems… were too inefficient to engage in substantial movement of baulk commodities. The increased price resulting from moving bulk goods few weeks’ journey down the road rarely compensated for the effort of the journey” (48). For acquiring cooking pots, any area other than local would be a burden on the economy. Sea trade is enormously more efficient in terms of cost and quantity and allowed for a greater geographic area of exploitation. This exploitation however, would include materials of greater value than cooking pots, such as Greek attic ware and other fine wares. The simple truth is that cooking vessels are more economically efficient if produced in the local region.

Cooking vessels not only describe the people using them, but also the local fabric in use. The assemblage of cooking vessels at a time period determines what the people thought of as local material. The cooking fabrics gathered at Ashkelon determine the distribution of the local economy. The question arises, according to Ashkelon, what is local fabric in terms of cooking fabric and how far does “local” extend in the areas surrounding Ashkelon?

Cooking vessels are made of hearty fabric designed to withstand the wear and tear of hard daily use, and extreme heat. The vessels are not pretty, and don’t need to be. They are functional and formed based on the food being consumed. Cooking pots cook soups, stews, and gruels suited for slow cooking without water loss, hence the small opening (Berlin 1997: pg 21). Casseroles have wide open mouths with large round bodies meant to cook chunks of meat, fish, or vegetables too large to fit in the cooking pots (Berlin 1997: pg 21). Baking trays have open tops with flat bottoms and angles sides meant to bake food instead of boiling or stewing (Berlin 1997: pg 21).
Cooking pots are the most common in the Levant confirming that stew, soup, and gruel was the easiest as well as most common meal cooked (Berlin 1997: pg 84). Casseroles, originating from Greece, migrated to the Near East with Greek settlers (Berlin 1997: pg 84). As cultural exchange increased, so did exchange of culinary practices, therefore adding variety of shapes and forms of Near Eastern cooking vessels.

Form: The Cooking Pot

During the Hellenistic and Roman Periods, the high-necked globular cook pot was the leading cooking vessel of the time. Described by Berlin, this shape has a long sack-like body with a short vertical or angled neck and two opposing handles on either side from rim to shoulder (Berlin 1997: pg 84). There are some variations to the pot, mostly having to do with the rim. Such variations include a high rim, low rim, angled, flattened, pointed, grooved, ledged, beveled, triangular, thickened, and thinned. Such differences are used to pinpoint time and area of origin. At Anafa, 3,755 cook pot rims have been found and categorized into thirteen forms throughout the Roman and Hellenistic Periods, 7 of which exclusively attributed to the Hellenistic Period (Berlin 1997: pg 84). In the early Hellenistic, only two forms exist, the neckless triangle rim and the neckless plain rim (Berlin 1997: pg 85). Both were constructed in one piece, meaning that the neck is not a separate attachment, but brought up excess clay as an extension of the body. All other Hellenistic cooking pot forms have a vertical short neck attached as a second piece to the body (Berlin 1997: pg 85). Necked cook pots appear in 198B.C. at Tel Anafa, a Northern Levantine site
Berlin proposes the idea that necked cook pots began in the 4th century B.C. in Southern Israel, eventually migrating up to Tel Anafa at the beginning of the 2nd century (Berlin 1997: pg 85). Globular cooking pots are the dominant cooking vessel throughout the entirety of the Hellenistic Period in the Southern Levant (Plates 1 and 7).

**Form: The Casserole**

Casseroles are wide open cooking vessels with sloping angular sides into a rounded bottom (Berlin 1997: pg 94). A casserole lid can rest on the lip of the vessel. The dish originated in Greece during the third quarter of the fifth century B.C. and dominated the cooking vessel industry well into the Hellenistic Period (Berlin 1997: pg 94-95). The excavation of a late fifth century well located in the Athenian Agora yielded casseroles as the dominant cooking vessel (Talcott 1935: pg 495). Talcott (1935) goes on to say that casseroles were the favorite cooking vessel of classical Athens (495). In the last third of the fourth century B.C., at the Tholos in Athens, the only cooking vessels were casseroles, braziers, and saucers (Thompson 1940: 134-135). The Greek casserole was a standard and often the most prevalent cooking vessel for Greek domestic assemblages starting in the late fifth and lasting into the Hellenistic Period.

This original form had a wide round belly and a steeply angled rim with an interior flange (Berlin 1997: pg 94). Casseroles first appear in the Levant as early as the early 3rd century B.C., and show up in number in the Levant during the second century B.C. Sites in Israel confirming this are Akko, Anafa, Ashdod, Ashkelon,
Caesarea, Jerusalem, and Samaria (Berlin 1997: pg 95). Other large sites (with published data by 1997) including Bethel, Beth Zur, En Gedi, Gezer, Qumran, Ramat Rachel, and Shechem, did not have any casseroles in 2nd century strata (Berlin 1997: pg 95). As the casserole gained ground at these mentioned sites, Greek cuisine must have been a common daily meal.

At Anafa, second century Hellenistic casseroles occur in four different forms, grooved rim casseroles, angled rim casseroles, beveled lip casseroles, and squared lip casseroles (Berlin 1997: pg 95). The angled rim casserole is by far the most popular casserole form at Ashkelon (Plates 2 and 8). The form is so dominant that, all of the casserole samples in this study are angled rim. The form, with a shallow body and upward angled rim, has a smoothed surface and near straight walls (Berlin 1997: pg 97-98). Two ribbed handles emerge from the rim to mid body (Berlin 1997: pg 97-98). The form curves into a rounded bottom (Berlin 1997: pg 97-98). Known parallels of this form in the Levant are at Ashdod, Banias, Sanctuary of Pan, Jerusalem, and Samaria (Berlin 1997: pg 97-98).

Form: The Casserole lid

Casseroles have a flanged rim to accommodate a lid. Lids however, were not made for a specific vessel. Unless a lid is in situ covering a vessel, it cannot be directly associated to it. Lids appear at Anafa the same time casseroles entered the site (Plate 2) (Berlin 1997: pg 115-116). The lids, straight walled flat/shallow domes with plain rounded rims, generally appear in 2 sizes, one for angled rim and grooved rim casseroles, and a large one for beveled lip casseroles (Berlin 1997: pg 115-116).
Form: The Baking Tray

Baking dishes are not numerous in Ashkelon’s Hellenistic record and only one is part of this study (plates 6 and 8). They are low open vessels with thick angled walls lacking handles. (Berlin 1997: 110). Important to note, the outsides of the tray are unburnt, while the inside have sooty residue. These dishes, therefore, would not be set on a cooking fire, but rather used solely as baking food items on the inside. Only 67 baking dishes were found at Anafa, all in the Late Hellenistic (Berlin 1997: pg 110). The vessel fabric is rather distinguishable with inclusions of mica, igneous rock, feldspar, and quartz (Berlin 1997: pg 110). This micaceous baking dish is the uniform form and fabric across the Eastern Mediterranean, reaching Anafa, Ashdod, Samaria, Tel Michal, Akko, and Dan to name a few (Berlin 1997: pg 110). The vessels do not appear at Ashkelon until the Late Hellenistic, carrying over onto the Roman Period.

Cooking Vessels in the Hellenistic Period at Ashkelon

In terms of cooking pots, the Hellenistic Period produced an impressive corpus. The transition from Persian Period to early Hellenistic yields almost solely globular cooking pots. The cooking and domestic culture of Ashkelon revolved around the globular cooking pot. Fabric is thick and forms remained the same as in the Persian Period. The early Hellenistic-middle Hellenistic interface brought a rapid change, described as the Hellenization of Ashkelon. New cooking forms emerged en
masse in the record. As explained earlier, for such vessels to have a significant impact on the assemblage heavy foreign trade and/or intense immigration need to happen for acceptance into daily food culture. This transition point is when the casserole first appears at Ashkelon. This Greek originated vessel normally does not appear in the Levant until the later half of the second century B.C. The casserole appears earlier than usual at Ashkelon, similar to Tel Anafa. More specifically, the angled rim casserole represents the vast majority of casseroles at Ashkelon. By the Late Hellenistic, cooking vessels become thinner and well crafted. The most notable change in cooking vessels at Ashkelon in the Hellenistic Period is the introduction and establishment of the Greek casserole form in the cooking assemblage.

Chapter 4: Geology and Petrography

Geologic Background of the Mediterranean

The geology of the Eastern Mediterranean has not changed drastically over the past thousands of years. Thus, the material formed millennia ago can be found and described today. Below is a breakdown of the geology of the Eastern Mediterranean based on work by Daniel Master (2001). In depth descriptions of all the geological features of this massive expanse of area is unnecessary. Cooking fabric in general is made from local material so places other than Israel and the Southern Levant are beyond the scope of this study.

Greece is part of the northern extension of the African plate that has drifted north towards the Aegean and Eurasian Plate. This collision resulted in mountain ranges, ultimately caused by the subduction of the African plate below the Eurasian
plate. The collision created a series of parallel folds across Greece as well as an abundance of igneous and metamorphic rock from the intense heat and pressure caused by the collision (Master 2001: 28). Acid-intermediate igneous rocks, as well as schists and marbles are distinctive to Greece (Master 2001: 28). The parallel folds of Greece extend into Western Turkey. The southern coast of Anatolia was subjected to uplift of ocean sediments onto continental margins in the Paleozoic and Mesozoic, creating limestones and ophiolites (Master 2001: 29).

Northern Coastal Lebanon and Syria are part of the same Troodos complex as Cyprus (Master 2001: 30). In southern coastal Lebanon, Cretaceous limestones and marls form a high range of hills (Master 2001: 30). A wide range of sandstones, chalks, mudstones, limestones, chalks, and basalts compose Egypt. Marl clays turn up from the hills along the Nile and alluvial clays appear from the floodwaters (Master 2001: 30).

**Geologic Background of the Levant**

Israel is home to distinct geologic regions: the coast plain, the foothills, the central hills, the Jordan valley, and the Negev (figure 6). Silt from the Nile River created the southern coastal region south of the Carmel (Master 2001: 31). The result is a gritty sandy matrix with spherical quartz inclusions. The sand north of the Carmel is from the weathering of limestone hills to the east with a high amount of micrite and shell inclusions (Master 2001: 31). The inland foothills are Senonian to middle Eocene calcite deposits appearing in forms of chalks, marls, clays, and limestones. This formation extends from the Negev in the south, through the foothills of the
Shephelah, and through the Carmel range (Master 2001: 31). The hills of Galilee, encompassing the highest points of the Carmel range and the central highlands, are all made of middle cretaceous limestones, dolostones, and chalks (Master 2001: 32). These formations, east of the coastal plain, include the foothills and the central hills, forming the highlands. East of the highlands is the alluvium of the Jordan Valley. Lastly, the Negev, a desert located from the southern tip of the dead sea south to the southern tip of the country, is a mass of wind deposited sand dunes from exposed Jurassic sandstones (Master 2001: 33). The majority of Israel is composed of limestone and calcite formations with quartz inclusions, not promoting an easily identifiable clay signature.
Pottery Fabric

Fabric, or the material composing the vessel, is the most direct way of determining vessel origin. Ceramic vessel fabric consists of two distinct components. The first is the clay itself, a plastic component. The clay composing vessels is typically a composition of hydrous aluminum silicates, often amphiboles (Goren et al 2004: 4). To retain its form while wet, a vessel needs to be at least 50% clay (Goren

Figure 6: Map of the geologic regions of Israel from The Levantine Ceramic Project
(http://www.levantineceramics.org/maps#israel)
et al 2004: 4). Over plasticity, however, causes cracking and dehydration, thus a temper is necessary.

Temper is purposely added aplastic coarse inclusions, allowing the vessel to be more easily worked. Any solid gritty inclusions act as a viable temper, such as sand, crushed stone, brick, straw, slag, hair, and even crushed bone (Goren et al 2004: 4). Ashkelon, residing on sandy coastal dunes and calcitic sandstone (kurkar) bedrock, is the perfect location for local accessible temper. Temper essentially increases the strength of the vessel by limiting cracking and dehydration, effects of direct contact with heat. Since cooking vessels are subjected to daily contact with heat, temper is crucial in providing lasting cooking fabric. Temper provides an addition of grain sizes to the matrix. Vessels with too much clay lack structure and strong bonds. The addition of temper allows the various grains to mesh together and intertwine, creating a sturdy foundation.

Temper can get distorted based on different physical processes. Upon deposition of the base material, certain features and minerals can degrade and weather over time, resulting in voids. Such voids allow the material to increase in porosity, making water percolation easier. Sinter, or mineral precipitates of such water can fill or line the porous spaces. Thus minerals, carried by flowing water, can enter a sample. Weathering and flowing water can cause rounding of grains. If the outcrop formation of base material was formed through increased heat and pressure, grains can be reshaped and undulatory. These grains are not distorted by any part of vessel manufacturing, but of the geologic events of the landscape.
Production, firing, and constant use also cause alteration. Such undulatory metamorphosis can also happen due to the increased temperature in the kiln. Firing can also burn off natural material such as straw, grass, and even shell. Burning can leave voids, which gives a porous appearance resulting in mineral precipitation in the pores. Clay cannot be overly moist prior to firing. If so, the pot will crack in the kiln from rapid compression (overly saturated clay causes expansion). Water that intrudes post firing has the potential to cause expansion, cracking the pot as well.

Temper helps to strengthen the material by providing structural support. Grains of rock forming minerals are stronger and have a greater tensile strength than clay/silt. In addition, temper of various sizes allows voids to be filled, negating weak points within the vessel. Temper adds durability and longevity to a pot. Over tempering, however, hinders the structural integrate of the vessel. The Levantine ceramics project states “sections [that] are overtly cracked… is a result of over tempered paste” (Levantine ceramics project; Akko sandy cooking ware). Over tempering increases microscopic thermal shock, meaning added pressure on the pot caused by an imbalanced thermal gradient, causing some parts to expand. Such expansion increases stress and strain on the grains, causing them to either undulate or crack. Thermal shock also occurs on the macroscopic level where excessive heating and cooling causes the pot to fracture. On the other hand, temper must be provided in order for a pot’s longevity, especially a cooking vessel that is subjected to intense daily usage. By far the most common reason for temper in cooking fabrics is to avoid thermal shock (Berlin 1997; pg 14). Generally, the greater the amount temper there is and the more heterogeneous grain size there is, the greater the resistance to thermal
shock. This explains why cooking fabrics tend to contain high percentages of temper of a large range of sizes. Thermal shock results in cracking of the weak points in vessels due to heat. If the vessels contain more temper of varying sizes, the grains weave into the clay matrix and fill in and strengthen areas of loose clay.

To help understand the fabric of cooking vessels, it is important to understand how potters selected or thought about their base fabric. A few assumptions are presumed. First, skilled potters are more selective in their clay and temper choices than unskilled potters. Going off of this, finer or nicer vessels probably had more thought put in in terms of fabric quality. Potters producing en masse would also have to be selective over their material considering they would need a fabric to cover all necessary domains of required durability and function. Potters must consciously alter their choice in temper based on the desired vessel. Fine ware should be pleasing to the eye as well as smooth in texture. To get this result, potters are forced to be selective of temper and careful to not use too much. Cooking fabric, on the other hand, has to hold up to be fire resistant, thermal shock absorbent, and impermeable. Because of this, cooking fabric must have large course inclusions that don’t need to be as selective, but must be specifically added with some deeper understanding of vessel production. Cooking vessel inclusions are deliberate and purposeful. Thus, local potters have the knowledgeable of local surrounding materials for their pottery. Temper is readily available at Ashkelon, located in the southern coastal plain, in the form of gritty coarse sand. Because of the geologic location of the site, local potters can take advantage of these resources without being too selective.
Clay and temper act as proxies to reconstruct a geologic setting from which cooking pots originate. Petrography defines the mineralogical components of an object. In which case, fabric composition can fingerprint a geologic provenance. In this study, pottery fabric is analyzed using thin section optical mineralogy. A thin (several millimeters) section is cut from the potsherd. One side is flattened and fixed to a glass slide. The other side is then shaved down with a diamond lap or abrasive powder to .035 mm (or 30 microns) thick (Ben-Shlomo 2011: 225). This ‘thin section’ is then ready to be examined through a polarizing microscope. The microscope shines a polarized light through the slide containing the fabric, which is so thin that most of the minerals become transparent. Because of different mineralogical properties, the light behaves differently when passing through different minerals, allowing identification. These minerals and signatures identified in thin section analysis can, often times, represent a specific geographical region.

In thin section, clay and temper are easily distinguishable. The clay gives off a background color for the slide, while temper appears as specific individual grains. Clay matrix is typically too fine grained to identify specific minerals under a microscope (Peacock 1970: pg 379). Additionally, clay mineral grains are destroyed at and above 500 degrees Celsius, a very low firing temperature for pottery (Peacock 1970: pg 380). Very rarely are specific clay signatures preserved in their unaltered state. Therefore, temper is the main distinguishing component of a vessel. After identifying the minerals in a thin section and other key characteristics of the slide such as weathering, size, orientation, voids, frequency of inclusions, and cracks, this
knowledge is used in attempts to meaningfully classify the pottery fabric into groups of similar material.

The unfortunate truth is that quartz makes up the majority of rock on the crust. Because of this, most pottery inclusions consist of mainly quartz, making provenience determination rather difficult (Peacock 1970: pg 379). Therefore, small fractions of accessory minerals, such as feldspars, amphiboles, and pyroxenes and their concentrations are important to note. These unique additions to the matrix can often times describe a fabric or provenience.

Fabrics are matched to provenance using geologic maps, soil maps, and previous petrographic studies of the area. Hopefully, the fabric of the pot can be pinpointed to a specific clay bed or regional area. In this study, the final resting place of the sherd is Ashkelon Israel, but petrographic analysis determines its original area of manufacture. This petrographic analysis is an attempt to categorize local cooking fabric by determining the location of origin during Hellenistic Ashkelon in a way that reflects the different geological background of the components of the vessel. Petrography provides a good control for origin by mitigating other factors such as vessel style, shape, stratigraphic sequence, and chronology that can skew thoughts on origin of material. By assigning provenance to Ashkelon’s cooking vessels, patterns should appear, ultimately describing the people occupying Hellenistic Ashkelon.

**Petrography and Fabrics of the Levant**

Israel has two main soil types that make up the clay bed for fabric manufacture, the forest soils of the highlands and the loess soil of the coastal and
southern regions (Master 2001: 33). Both soils contain calcite and quartz, but the distribution is different. The dark brown to red ferruginous soil of the highlands is called Terra Rossa. It forms from the deterioration of limestone, but is calcite-poor (Master 2001: 34). The other soil is windblown loess characterized by fine sand-sized particles including hornblende, clinopyroxene, olivine, and feldspars (Master 2001: 34). Local trade around Ashkelon (figure 7) rarely extends into the highland region. Ashkelon and neighboring sites sit on loess soil (figure 7). Such soil forms from windblown fine-grained silt and sand particles. The nature of windblown formations suggests loose soft material that can build up into stronger structures, such as dunes and kurkar. Alluvial soil, also appearing near Ashkelon, results from clay silt and sand deposited by streams and larger bodies of water. Such alluvial soil near Ashkelon often contains iron oxide, tinting the soil deep brown/red.
Figure 7: Clay and soil regions with Master’s understanding of the limits of local trade at Ashkelon during the Iron Age (Master 2003: pg 58)

Resting on the Northern coastal plain, Tel Dor is located off the Mediterranean Coast roughly 30km south of Haifa. Often compared to Ashkelon, Tel Dor was a major port city with similar occupation. The site sits on a bed of alluvium and kurkar. The Southern Carmel Mountain, located 3km away, weathers into the
alluvial plain Tel Dor rests on (Ben-Shlomo 2011: 226). Local matrix should contain sand and coastal quartz from weathered kurkar, as well as highland inclusions from the Carmel. Tel Dor sits just east of the terra rossa soils of the Carmel foothills. David Ben-Shlomo (2011) conducted a thin section petrographic analysis on 59 vessels from Tel Dor ranging from the late Persian to late Hellenistic in order to examine imported and local produced pottery (Ben-Shlomo 2011: 225-246). Results yielded 6 groups, with three from the Levant, the Alluvial group, the Marl group, and the Dolomitic group.

Group A is an alluvial soil. Subgroup A1a contains a reddish clay matrix with inclusions and 15-20% voids (Ben-Shlomo 2011: 229). The inclusions consist of 25-35% well sorted sub rounded quartz (Ben-Shlomo 2011: 229). Small quantities of fine sand sized chalk, limestone, chert, and feldspar also appear. Subgroup A1b is the same as A1a, but with small amounts of coarse beach rock temper inclusions (Ben-Shlomo 2011: 229). A1c fabric has a dark clay matrix with 10-20% voids, and 20-25% bimodal quartz (Ben-Shlomo 2011: 229). Group A2 is the same as the A1 group, but with amphiroa algae. This algae is a marker for the Neogene formation, often associated to the northern strip just north of Akko (Ben-Shlomo 2011: 229). Due to beach sand quartz and alluvial coastal clay, Group A is local clay off the coast of Tel Dor. This northern coastal clay is subject to limestone, chert, and chalk inclusions unlike the southern coastal fabrics.

The Marl Group, dubbed MR, is calcareous silty clay. Subgroup MR1 has the calcareous silty matrix with 10-15% voids, 20-30% foram inclusions, and minor percentages of chalk and limestone (Ben-Shlomo 2011: 229). Quartz is lower than
10% and mica, along with ferruginous minerals occasionally appears (Ben-Shlomo 2011: 229). Such a low percentage of quartz and presence of mica confirms this fabric to be from the northern Terra Rosa and rendzina soils of the Southern Carmel.

The Dolomite group has a dark matrix with only 5% voids (Ben-Shlomo 2011: 229). Dolomite, the most frequent inclusion composed 30% of the matrix, while quartz only takes up 5-15% (Ben-Shlomo 2011: 229). The high amount of Dolomite, with the presence of quartz, suggests the Carmel region as the source of Fabric.

These three fabrics are all from the Northern coastal plain and help distinguish the northern coastal plain from the southern coastal plain. Because Ashkelon is located in the southern coastal plain, the northern coastal plain is not represented in this study. It is important, however, to recognize that the two areas are not just separate in name, but in fabric as well.

The Southern Levant is composed of very similar, often indistinguishable fabrics. In fact, Goren et al (2004) states, “the southern coastal plain and the western Negev are particularly monotonous in their geology, consisting mostly of Aeolian silt (loess) and coastal sediment that are dominate by sands and their derived calcitic sandstones (kurkar)” (Goren et al 2004: 18). Because of this, it is difficult to distinguish between provenance in the southern coastal plain, the southern portion of the central coastal plain, the Shephelah, and the northern Negev. Using the petrographic study of the Armana tablets conducted by Goren et al (2004), this geologic area can be more accurately defined. The tablets are a correspondence of administrations around the near east. More specifically, it’s a dialogue between the
Egyptian government and its near eastern ties. Found at Amarna, Egypt, the tablets total 382 and date to a range between 1402-1334 BC. Along with the petrographic fabric analyses, these tablets have written texts that provides context to the region. Using the context of the tablets and political history of the area, these fabrics can be assigned a more specific location within the Southern Levant, such as tablets originating from Gezer, Gath, Ashdod, Lachish, and Ashkelon (figure 8). These cities all fall into the range of local trade at Ashkelon during the Iron Age as understood by Master (figure 7).

![Figure 8: Map of Ashkelon and surrounding sites. (Picture taken from Master 2003: pg 48 courtesy of James Monson, Biblical Backgrounds)](image)

Tel Gezer, located in the northern portion of the Shephelah, situates on Eocene chalk of the Adulam Formation (Goren et al 2004: 270). This is capped by
Nari crust and bordered by Paleocene marl and shales by the Taqiye formation (Goren et al 2004: 270). What provides the clay, however, is the rendzina soil that form on the Eocene chalk. Other sources include the shale and marl, as well as the red sandy loan and alluvial soils from the coastal plain hamra blown in from the west (Goren et al 2004: 270). This cite borders the northwestern Shephelah, contributing terra rossa soil as well as the alluvial loess of the coastal plain. Common inclusions, therefore, consist of a combination of chert, chalk, limestone, and coastal inclusions.

Gath, lying directly in between Gezer and Lachish in the Shephelah (see picture), sits on exposures of middle Eocene globigerinal chalk of the Maresha Member of the Zorah Formation capped by Nari crust (Goren et al 2004: 280). The common soils are all brown grumosolic loess and brown rendzina with chalk, nari, and some chert and fine sand quartz inclusions (Goren et al 2004: 280).

Lachish soils are also dark brown grumusolic soils and brown rendzina. Lachish sits in the only area the Oligocene Lachish Formation is exposed (Goren et al 2004: 287). The Lower Ramle member is a conglomerate of chalk boulders set in a marly-chalky matrix with abundant large foraminifera and mollusks (Goren et al 2004: 287). The upper member is a hard biosparitic and biomicritic limestone (Goren et al 2004: 287). Common incisions consist of chalk, chert, limestone, forams and accessory minerals including mica.

Ashkelon sits on quaternary aeolian and marine coastal sediments, which provides shifting sands and alluvial clay. Part of the Pleshet Formation, the Calcareous sandstone, forming Kurkar, is deposited above the Jaffa formation (Goren et al 2004: 294). Fabric often includes this sand component of sub angular to rounded
quartz. This loess contains a carbonatic clay matrix with a large fraction of quartz silt (10-20%) and an abundant array of heavy mineral inclusions such as hornblende, augite, zircon, plagioclase, microcline, biotite, muscovite, epidote and even tourmaline, rutile, and garnets (Goren et al 2004: 112, 294). Gritty sand and shell fragments provide the perfect temper for local potters. An example of Ashkelon fabric, tablet EA 168 (VAT 1659), from Aziru to the King of Egypt, is a gritty light tan silty and carbonatic fragment (Goren et al 2004: 112-113). The large fraction, as stated above, contains well-rounded sand sized quartz grain while the small fraction consists of an array of heavy minerals, shell, and kurkar. This matrix is characteristic to the southern coastal plain, the Northern Negev, and Western Shephelah (Goren et al 2004: 112-113). Unlike the inclusions from the other major cities, Ashkelon inclusions are specifically coastal, composed of beach sand and accessory minerals.

Daniel Master, with the help of Lawrence Stager and the Leon Levy Expedition to Ashkelon, composed a petrographic study on a 7th century B.C. pottery assemblage of Ashkelon (Master 2001, Master 2003, Stager et al 2011). The material comes from both a 7th century market and a 7th century winery. In his work, he created a basic catalog of petrographic samples built on geologic, soil, and slide observations. Master’s study of Ashkelon pottery was conducted with location of origin driving the classifications and groupings. Vessel type and style was not considered during grouping. These categories help flesh out specific mineralogical signatures for the region surrounding Ashkelon.

From the study, provenience breakdown is as follows; 77% of the fabric is local, originating from the vicinity surrounding Ashkelon and Ashdod, 13% from the
Shephelah, 5% from Phoenicia, 3% from the Negev, 1% from the Aegean, 1% from Cyprus and Northern Syria, and a fraction of a percent from the Nile (Master 2003: 52).

Master found his assemblage fit into 19 groups to best aid him in discerning pottery provenance. Categories 6 and 8-18 represent maritime trade, considering the fabric is of origin not accessible from Ashkelon by land (Master 2001: 158). Category 5 represents Egyptian vessels, which could travel up to Ashkelon either by sea or caravan (Master 2001: 158). Categories 2 and 4 suggest trade from Ashkelon to the Shephelah. Ashkelon shows no record of vessels coming from the north from areas such as Meggido, the Jezreel Valley, or Jerusalem in the 7th century (Master 2001: 158, Master 2003: pg 56). Category 1 represents the local vessels where a hearty trade from Ashkelon to Ashdod and Ashkelon to Hinterlands is presumed. Category 3 is exclusively cooking vessel fabric.

Petrographic breakdown of the total assemblage confirms 53% of samples are from brown/red alluvial soil, 21% coastal loess, 9% Shephelah Loess, 5% Phoenician, 4% lowland terra rossa, 3% Negev Loess, 3% cooking Fabric, 1% Cyprus and North Syrian, 1% Greek, and a fraction Egyptian (Mater 2003: pg 52). The cooking vessels, made from local fabric, are not made with the same treatment as other local vessels. The difference suggests local specialization within the cooking vessel category (Master 2001: 220).

Of the ceramic assemblage, 50% are storage jars, 30% are bowls, chalices, and kraters, 17% are jars, juglets, bottles, and lamps, and 3% are cooking pots. The percentage of cooking pots in the corpus correlates directly to the percentage of
Master’s cooking pot fabric. This confirms that cooking pots are exclusively made from local materials. Though these pots are local, they carry a slightly different, yet noticeable petrographic fabric than other local vessels. The following goes through the breakdown and comparison of the local fabrics.

Though most of the local pottery comes from the southern coast of Israel (figure 9), the signatures are very similar enough that they are difficult to differentiate. This local fabric ranges across the coastal plain and the westernmost part of the Shephelah (Stager et al 2011: pg 55). This area is bounded by and includes Ashdod to the north, Lachish to the east, and Gaza to the south (Stager et al 2011: pg 71). The fabric of this area has gritty loess made up of well-rounded course sand sized quartz particles.
Figure 9: Local fabrics in thin section found at Ashkelon in Master’s Iron Age petrography study (Master 2003: pg 53).
Out of the local clays, brown/red alluvial soil with coastal inclusions characterizes Ashkelon pottery (figure 10). The fabric is isotropic, non-carbonatic clay with a brown to black core and black to red fabric (Master 2003; pg 54). This category is dominated by monocrystalline quartz in a bimodal distribution. Course beach sand, meaning rounded quartz fragments, compose a large fraction of the temper. Smaller angular quartz and accessory birefringent minerals also appear in trace quantities (Master 2003; pg 54). More specifically, the small fraction consists of a mix of hornblende, clinopyroxene, olivine, and plagioclase feldspar (Master 2001: 119). The clay component, also appearing at Ashdod, originates from a local dark brown grumusol. This is the dominant southern coast fabric ranging from slightly farther south than Ashkelon up to Ashdod.
Loess soil, including coastal loess, Shephelah loess and Negev loess, comprises 33% of the assemblage (figure 11). Coastal loess, the most prevalent loess at Ashkelon, expectantly contains coastal inclusions of beach sand and heavy minerals (Master 2003; pg 55). This local fabric should originate from the southern coast, running from Gaza up to Ashdod. The Shephelah loess differs in that chalk and chert are inclusions to the loess soil rather than coastal minerals (Master 2003; pg 55).
The Negev Loess category contains inclusions of angular quartz and argillaceous rock (Master 2003; pg 55).

Cooking pot fabric, or category 3 in Master’s 2001 study, contains only local cooking pots, and 90% of all cooking pots found in the assemblage fall into this category (Master 2001: 125). This fabric is a subset of the dominant local brown/red alluvial category found at Ashkelon (figure 12). The inclusions are a mixture of coastal quartz grains as well as accessory minerals such as hornblende and clinopyroxenes (Master 2003; pg 55). Characterized by its orange hue and large

Figure 11: Fabric of loess with coastal inclusions (left) and fabric of loess with inland inclusions (right) at Ashkelon, Israel in Master’s Iron Age petrographic study (Stager et al 2011: pg 56).
number of parallel cracks, the fabric no doubt suffered degradation due to exposure of constant heating and use from cooking.

![Cooking pot fabric at Ashkelon, Israel in Master’s Iron Age petrographic study (Stager et al 2011: pg 57)](image)

Though the fabric is clearly local, it is different from the brown and red alluvium with coastal inclusions category. This suggests that potters are doing something different to their local clay to create their cooking pots. A different selection of clay from a different local bed, or a different mix and ratio of temper for cooking fabric indicates a specialization of a functional decision in manufacture of
the cooking pot that does not coincide with other local forms. Determined earlier, cooking vessels need higher percentages of temper and courser grains to adequately preform its intended function. This could account for the variability.

Master (2003) describes an example of a typical cooking vessel fabric of the southern coastal plain (figure 13). This vessel, found in the warehouse district of 7th century Ashkelon characterizes the subset of cooking pot fabric of the local pottery at Ashkelon. As seen below, the fabric is a dirty orange-brown with beach sand and quartz inclusions all surrounded by parallel linear cracks. This gritty sandy matrix is typical of the southern coastal cooking vessels and is virtually indistinguishable around the region. The fabric, though local, seems to be specialized and used solely for cooking vessels. The pot is designed to absorb thermal shock as seen by the parallel cracks and gritty inclusions.

Figure 13: Cooking Pot (inventory number: 72/92 50.58.L262.B83) and associated thin section from Ashkelon, Israel. (Stager et al 2011: pg 86)
The 7th century thrived under its local economy, with the majority of fabrics centering in the southern coastal plain and eastern Shephelah. Local, however, is a broad term. Since fabric is petrographically indistinguishable in this region, fabrics from Gaza, Ashkelon, Ashdod, and nearby vicinity are all considered in this local category. Ashkelon did appear to trade east with the Shephelah and the Northwest Negev, as well as Phoenician sites in the Mediterranean region (Master 2003; pg 57).

Because of the wide area of similar fabrics, inclusions are extremely important to help identify a more specific provenance. Though loess surrounds the general area around Ashkelon, different inclusions suggest a different area of origin. The study conducted by Goren et al (2004) identifies some key inclusions to make note of. Loess with limestone as the dominant inclusion is prevalent northeast of Beersheba valley (Goren et al 2004: 112-113). The Southern Shephelah, however, contains a large fraction of heavy sand (Goren et al 2004: 112-113). The Northwest Negev contains high amounts of quartz, which appears with the heavy accessory minerals (Goren et al 2004: 112-113). The southern coast contains not only this quartz and small fractions of heavy minerals, but also shell and calcitic sandstone. The further inland a fabric originates from, the less shell inclusions it should have. Only one tablet is concretely associated to Ashdod, so differentiation between the neighboring cities is not confirmed, but it is possible that local Ashdod fabric uses slightly more hamra rather than the Ashkelon fabric (Goren et al 2004: 292).

Ashdod, located 20km north of Ashkelon, was a coastal port city located in the same geological and geographical region as Ashkelon. The site is an important comparison considering that the two cities are close enough that both would have
similar goods, pottery, economy, and politics. Cohen-Weinberger and כהן-וינברגר (2013) conducted a study on nine Late Bronze Age vessels using thin section optical mineralogy with the goal to identify fabric origins. Of the nine, three are local fabrics. One vessel, a krater, is composed of loess soil with coastal inclusions (Cohen-Weinberger and כהן-וינברגר 2013: pg 123). The clay matrix is silty and calcareous. Rounded quartz dominates the temper with a small fraction of foraminifera and accessory minerals, including oxihornblende and feldspar (Cohen-Weinberger and כהן-וינברגר 2013: pg 123). The second vessel, a bowl, is made from aeolian soil, possibly loess, with coastal sand inclusions (Cohen-Weinberger and כהן-וינברגר 2013: pg). These inclusions are coarse rounded quartz and feldspar. Silty ferruginous soil composes the clay matrix. These two vessels categorize loess soil, which is dominant along the coast spanning from Ashdod south to Gaza. A third vessel, a jar, contains terra rossa soil, meaning ferruginous silty quartz and carbonate (Cohen-Weinberger and כהן-וינברגר 2013: pg 123). Temper includes coarse quartz with chalk fragments. Such fabric occurs in the Shephelah (Cohen-Weinberger and כהן-וינברגר 2013: pg 123). These three local vessels confirm a tight knit local economy within the confines of Ashdod in the north, south through Ashkelon to Gaza, and east to Lachish in the Shephelah.

Temper and clay for cooking vessels are abundant in the southern coastal plain, which Ashkelon is built on. Unfortunately local cooking ware of the Southern Levantine coast falls into a sandy gritty non descript category. Unique local Ashkelon clay will consist of coastal loess of sand sized rounded quartz accompanied by silt sized quartz grains and a small fraction of heavy minerals. Vessel just north towards
Ashdod will contain more hamra. Vessel further inland will contain more chalk and limestone. With a petrographic analysis of cooking vessels at Ashkelon, a unique local signature can be pinpointed and fleshed out.

Chapter 5: Methods

Sample Selection

My data set contains 30 samples of vessel fabric (Table 1). The vessels are identified by sample number, numbered 1-30. Each is from a specific location represented by the following: grid.square.unit or layer/feature number. Sample 1 coming from 51.84.U119 is congruent to grid 51.square 84.unit 119. The assemblage consists of a broad range of samples spanning 7 cooking pots, 8 casseroles, a baking tray, a brazier, 4 plain ware vessels, and 9 various fine wares (see plates 1-8 for images of vessel forms).

<table>
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<tr>
<th>Sample Number</th>
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<th>Phase</th>
<th>Grid</th>
<th>square</th>
<th>Unit</th>
<th>group</th>
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<td>51</td>
<td>84</td>
<td>U119</td>
<td>1</td>
</tr>
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<td>phase 10</td>
<td>51</td>
<td>84</td>
<td>U119</td>
<td>1</td>
</tr>
<tr>
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<td>Plainware jar</td>
<td>phase 10</td>
<td>51</td>
<td>84</td>
<td>U119</td>
<td>4</td>
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<td>51</td>
<td>83</td>
<td>U118</td>
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</tr>
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<td>Cooking pot</td>
<td>phase 10</td>
<td>51</td>
<td>84</td>
<td>U119</td>
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<td>Plainware jar</td>
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<td>84</td>
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<td>84</td>
<td>U119</td>
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<td>U119</td>
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<td>73</td>
<td>LS7 F62</td>
<td>4</td>
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<tr>
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<td>38</td>
<td>73</td>
<td>LS7 F62</td>
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<tr>
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<td>38</td>
<td>73</td>
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<td>5</td>
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<td>75</td>
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Table 1: Samples 1-30 with their associated form, phase, grid, square, unit, and fabric group.
The cooking pots and casserole dishes were discussed earlier (plates 1, 2, 7, and 8). Cooking pots maintain a prominent and consistently used vessel throughout the Hellenistic Period. The casserole, a Greek form, entered the Levant in the early 3rd century B.C. and soon flourished in the Hellenistic cookware economy. Form dictates that these two cooking vessels are distinct. The question remains whether this distinction applies to the fabric as well and what does the distinction in fabric, if any, mean in terms of the people residing in Ashkelon.

The baking tray and brazier are both non-dominant forms in the cooking assemblage at Hellenistic Ashkelon (plates 4, 6, and 8). The brazier acts as an original barbeque, meaning a ceramic vessel meant to contain a fire for dishes to be cooked on top of (Talcott 1935: pg 495). These forms serve a purpose as too represent the remaining dining options used at Ashkelon. The 4 plain ware vessels include 2 plain ware bowls and 2 plain ware jars (plate 3). Including these vessels in analysis serves as a point of comparison to cooking vessels.

Fine ware help provide a non-local counter point to the local ware. These vessels distinguish non-local fabric. The fine ware vessels from this corpus include an Eastern Sigillata A (ESA), 2 carinated cups, 4 incurved rim bowls (IRBs), a fishplate, and a lekythos (plates 4 and 5). The ESA is a Hellenistic form known for its fine fabric and red slip. The carinated cup evolved in the 4th century B.C. in Greece and made it’s way over to Ashkelon by the middle Hellenistic (Coldstream 1999: pg 335). The IRB and fishplate form also originates from Greece and usually contains black or red slip. The lekythos was first established in Greece as a burial vessel to hold libations. However, as time progressed, the lekythos began to appear in wealthy
households as a beautiful vessel holding oils and perfumes. All of these vessels, though expensive, are found in the household and hold prestigious value.

Location of deposition within the city is also useful to describe the people of Ashkelon. 16 vessels come from grid 51 and 14 vessels come from grid 38. The distinction is necessary considering the two grids describe two separate socio-economic peoples within the city. Grid 51 characterizes a lower class neighborhood with a prevalent domestic industry. Grid 38 was wealthier, indicated by better quality and more expensive artifacts upon excavation.

The vessels are all from different times throughout the Hellenistic Period. One vessel comes from the pre Hellenistic in the 5th century. Ten vessels originate from the early Hellenistic (phase 10), 11 vessels are from the middle Hellenistic (most from the phase 9/8 transition), and 8 were in use at the end of the Hellenistic Period/early Roman boundary (phase 8/7). The comparison is valuable to characterize changes in fabric throughout time.

**Context**

The samples for this study come from the two grids described above, grids 38 and 51. The strata in which they were found provide a context necessary to document the people who used them. Where these sample are from, when they were used, and in what context they were found help further understand of the city. Each sample comes from a specific area and time period within the city and is labeled as such. Every sample comes from a specific, grid, square, and layer. The layer should help to provide context to the associated sample. Below is a description of all relevant layers
in order based off of chart 1. The labeling system follows the order of grid. square. unit (or layer/feature) number.

51.84.U119 marks 20cm of late phase 10 occupational debris on the exterior courtyard surface (figure 14). The surface houses a tabun and a large flat basalt stone lay just outside the tabun entrance, possibly acting as a workbench or surface. The occupational debris yielded a plethora of small finds such as a grinding stone and mortar, a hammerstone, flint and stone blades, a cows head and swaths of phytoliths, most likely all a result from a prominent food preparation industry.

Figure 14: Grid 51 square 84 Late phase 10 courtyard surface looking north. Photo # 22751. Leon Levy Expedition to Ashkelon. (Birney 2012: pg 8)

51.83.U68 is late phase 10 exterior courtyard destruction debris resting on occupational debris 51.84.U119 (see above for details). Notable finds include a 3 tiered limestone stand (possible used as a mortar for food preparation), a bronze pin, a hammerstone, a basalt mortar, a limestone tile, a bone game piece, and 2 nails.
Domestic industry is present, but not prominent in this layer, which is associated to rushed abandonment, ending the late Hellenistic occupation.

38.73. L57/L56 F62 is a late phase 9/ early phase 8 deposit of back fill material in anticipation of phase 8 occupation. The layer contains roughly 400 pieces of painted plaster, now believed to be some sort of mosaic, settled at the earliest portion of the fill (Birney, forthcoming). The mosaic, which would have mounted the walls of this building, contains Greek masonry style painted plaster, meaning the pieces are in geometric square panels and molded edges (Birney, forthcoming). The primary deposition layers immediately preceding layers 57 and 56 take responsibility of this mosaic. Along with this decoration a partition wall separates this mosaic from what originally was thought of as a cistern, but now thought of as an individual bath (Birney, forthcoming). This type of bath, where the user stands as water is pored over, is Phoenician (Birney, forthcoming). The bath and adjacent mosaic go hand in hand with each other in the sense that this private housing setting is elite and wealthy in nature. Other than the painted plaster, artifacts found include, an iron strigil, mosaic tessera, 6 copper coins, a Antiochus IV 169BC copper coin, baked mudbrick, an iron ring, a Rhodian stamped amphora, a Brindisi amphora, a African red slip vessel, a few fish plates, a jug with a stamped inscription, red slipped jugs, 2 Lagynos, a few megarian bowls with reliefs, 3 cooking pans, and cooking pot fragments. Though the painted plaster is by far the most prominent discovery in the room, this area also contains an unusually large amount of imported fine ware. Other than a few cooking pot fragments, the rest of the assemblage in the room would probably be expensive. This area was home to an affluent household.
38.74. L222 marks a late phase 8/7 disturbance layer of bricky gravely reddish brown soil with gravel bits, small pebbles and cobbles, and bits of plaster. This room does not contain any registered pottery, but many other unique finds such as yellow and black painted plaster, a copper fibula, a stone spindle whorl, worked bone, vitreous glass, a bone button, a Ptolemaic copper coin, a glass bead, turquoise glass faience, a glass inlay, a basalt bowl, and a basalt pestle. All of the artifacts found indicate a living surface. No specific industry seems to dominate the room, but the finds are rich and have a daily use in a home.

38.63.U530 is a phase 8/7 thin bright red clay surface, possibly ornamental. The room holds many notable artifacts such as worked bone, pieces of gypsum, an iron blade, 5 copper coins, a Antiochus III ca 200 BC copper coin, a Antiochus IV mint of Akko (175-164BC) copper coin, 359 pieces of plaster, vitreous glass, a lead weight, 2 cooking pans, red and black slipped Hellenistic bowls, plain bowls and jugs, a casserole, and cooking pot fragments. Clearly a wealthy domestic room, this surface contained fine imported vessels and basic cooking ware.

51.75.U529 is an early Persian 5th century shelly pit cut into a floor in the northeast corner of the insula. A large quantity of small metal pieces was found in the fill. More wealthy finds include a quartz bead, a jasper scarab, an iron blade, a cube weight, and a small piece of yellow glass. The pit was in heavy use, holding valuables and providing an area for metal production.

51.85.U77 is late phase 10 Hellenistic street material. The center of the street caves in, forming a loose sandy gully. The eastern and western sides are hard compact and pottery rich. Along the eastern side resides a dog burial (Vander Vorst 2013 pg
5). Valuables such as an alabaster vessel, metal vessel, ivory handle, and a surprisingly large amount of black attic ware appear as discarded or lost items mixed into the course street material.

51.75.U42 is a late phase 8/early phase 7 build up of material along and running the length of the eastern side of drain 51.75.U16. This layer probably resulted from spillage, detritus, or sinter from the drain itself. The layer is light green, caused by organic material, with high amounts of sand and pottery. The drain, 51.75.U16 cuts N/S through the center of the street (Burrus 2010: pg 4). Rough fieldstones of heterogeneous sizes line the drain on either side while the bottom of the drain lacks this fieldstone outline (Burrus 2010: pg 5). Due to the size of the drain and vast exercise of power necessary to excavate, stratigraphic control was difficult to maintain and all recovered material was recorded as U16. Material marked as U16 can, consequently, be from any part of the drain as a whole, the fill, or the lining. The drain acted essentially as a widely used waste deposit for organic material, both for human waste and food disposal.

**Thin Section Optical Mineralogy**

To conduct this study on pottery fabric, methods included thin section optical mineralogy techniques. The process started by taking a slice of fabric a few millimeters thick from a pottery sherd and fastening it to a microscope slide. The sample was then ground down to .035 millimeters (or 35 microns) thick. After which, the sample is ready to study. Each sample was looked at under a polarized microscope with and without the analyzer. Using microscopy techniques, I identified
all mineralogical components to the best of my abilities. Each sample was looked at under a 4X lens for an overall representation of the fabric. Further identification of individual grains was conducted under a 10X lens and, if needed, a 63X lens. In order to compare fabric, a picture of each sample was taken under the 4X lens. These pictures are labeled in the data section below as ‘classifying picture’ considering that they were used to classify each sample into fabric groups. For consistency, all classifying pictures are all from a 4X lens. Pictures of individual grains of interest were taken with the 10X lens. The labeling system of sample pictures is as follows: sample number (SX), microscope lens (MX), picture number (PX). Thus, S1M4P1 represents the classifying picture of sample one under a 4X lens.

Under a polarized microscope, the clay matrix and temper are distinguishable. Descriptors of the clay fabric and temper are noted. Quartz is the most common rock-forming mineral on the surface of the earth; therefore, this mineral commonly dominates temper inclusions. The quartz is described in depth in thin section. Any accessory minerals, typically feldspars, clinopyroxenes, or amphiboles, then get mentioned and explained. Additional items of note get recorded and then the sample is assigned a group. Sample descriptions contain clay matrix, temper (quartz description and additional mineral description), notes, fabric group, and pictures, respectively.

After observation of samples, groups are formed based on the observations of the thin sections under the 4X lens (classifying picture). Groups are formed based on best fit of like thin section. The number of groups from this study are not
predetermined but created based on the number needed to best classify all thin section samples.

Chapter 6: Data

The following chapter consists of individual thin section descriptions and results of observation. Each sample description starts with sample number, vessel form, identification number (grid. square. unit/layer), and phase. Next, the description goes into clay matrix observations and temper observations, which is broken down further into large ovoid quartz observations, medium sub angular quartz observations, small angular quartz observations, and other small fraction mineral observations. Then, any additional notes, such as a unique mineral, are mentioned, if applicable. The description ends in the samples assigned group fabric number. Each sample contains a picture of the sample in thin section under a polarized microscope using the 4X lens. Additional pictures with varying lens magnification are included if there are additional features of note. Sample descriptions are in order from 1-30.

Sample 1: Plain ware bowl, 85.84 U119, Phase 10

Clay Matrix: Muddy brown

Temper: Quartz dominant. Two distinguishing quartz shapes. Dense. High temper to clay ratio.

Large Ovoid Quartz: Small amount of large ovoid quartz. Some are undulatory.

Medium angular Quartz: No medium angular grains.

Small Angular Quartz: Dominates the sample. High amount of small grains.
Other small fraction minerals: A few big rounded pockets of carbonate. The occasional small feldspar (meaning a mineral with laminar extinctions that act like feldspar). A few highly birefringent orange minerals that are the same size, if not smaller than the small quartz.

Notes: Identified a singular biotite grain.

Group: 1

Sample 1 in thin section under a polarized microscope: S1M4P1 (Left) Classifying picture. Mineral of note is large ovoid tan carbonate slightly off center to the southwest. S1M63P2 (Right) Picture of biotite grain.

**Sample 2**: Plain ware bowl, 85.84 U119, Phase 10

Clay Matrix: Light brown

Temper: Quartz dominant.

Large Ovoid Quartz: A couple larger ovoid quartz grains.

Medium angular Quartz: Some medium angular quartz. Not enough to distinguish the fabric.

Small Angular Quartz: The majority of the temper. Large amount.
Other small fraction minerals: Small amount of feldspar. A few red birefringent minerals.

Notes: One very small birefringent mineral. One large feature with long grains forming stripes all in the same direction. Possibly a shell or foraminifera.

Group: 1

Sample 2 in thin section under a polarized microscope: S2M4P4 (Left) Classifying picture. S2M10P3 (Right) Picture of a small birefringent mineral.

**Sample 3**: Plain ware jar, 85.84 U119, Phase 10

Clay matrix: deep tan/drown with a hint of red.

Temper: Quartz dominant. Wide range of sizes, no one size more pronounced than the other. Not a high temper to clay ratio.

Large Ovoid Quartz: A few large ovoid quartz grains with fractures. Present but not plentiful.

Medium angular Quartz: Some medium sized angular quartz. They are presence, but are not plentiful.

Small Angular Quartz: Small angular quartz but less pronounce.
Other small fraction minerals: A few very small red birefringent minerals

Notes: N/A

Group: 4

Sample 3 in thin section under a polarized microscope. S3M4P5. Classifying Picture.

**Sample 4**: Cooking pot, 51.83 U68, Phase 10

Clay Matrix: noticeably red (iron oxide) fabric

Temper: Quartz dominant.

Large Ovoid Quartz: a small amount of large ovoid quartz all highly fractured. Present but not abundant.

Medium angular Quartz: a small amount of medium grains. Present but not abundant.

Small Angular Quartz: high amount of small angular quartz grains. Abundant.

Other small fraction minerals: A few very small red birefringent minerals.

Carbonate lined vestibules
Notes: One mineral with a bright blue interference color. It has oblique extinction and does not have a color of its own, suggesting that it is a clinopyroxene. Singular grain of microcline as well.

Group: 1

Sample 4 in thin section under a polarized microscope. S4M4P8 (Upper left) Classifying picture. S4M10P6 (Upper right) Picture of bright blue grain located slightly south west of center. S4M10P7 (Bottom center) Picture of microcline grain in the shape of an upside down triangle just west of center.

**Sample 5:** Cooking pot, 51.84 U119, Phase 10


Temper: Quartz dominant. Uniform grain size. High temper to clay ratio. Grains are fractured.
Large Ovoid Quartz: No large ovoid grains.

Medium angular Quartz: Sample dominated by medium angular grains

Small Angular Quartz: Very few small grains.

Other small fraction minerals: No (or nearly no) mafic/birefringent red minerals.

Notes: One medium sized rounded egg shaped grain that is highly birefringent with some color of its own.

Group: 2

Sample 5 in thin section under a polarized microscope. S5M4P10 (Left) classifying picture. S5M10P9 (Right) Picture of highly birefringent rounded mineral located just left of center.

**Sample 6**: Plain ware jar, 51.84 U119, Phase 10

Clay matrix: Deep red fabric. Looks porous but could be due to poor thin section.

Temper: Quartz dominant. Wide range of sizes, no one size more pronounced than the other. No pronounced temper to clay ratio.

Large Ovoid Quartz: Some large ovoid quartz grains. All cracked.
Medium angular Quartz: Some medium sized angular quartz grains. Some undulatory.

Small Angular Quartz: Some small angular quartz grains.

Other small fraction minerals: A few birefringent red minerals.

Notes: One yellow/brown mineral with higher birefringence. Not much of a grain shape.

Group: 4

Sample 6 in thin section under a polarized microscope. S6M4P12 (Left) classifying picture.
S6M10P11 (Right) Picture of yellow/brown grain located at center.

**Sample 7:** Cooking pot, 51.84 U119, Phase 10

Clay matrix: Deep red

Temper: Quartz dominant. Wide range of sizes, no one size more pronounced than the other. No pronounced temper to clay ratio.

- Large Ovoid Quartz: Contains some large ovoid grains
- Medium angular Quartz: Contains some medium angular grains
- Small Angular Quartz: Contains some small angular grains.
Other small fraction minerals: Not a lot of birefringent minerals observed.

Notes: A single grain of what appears to be biotite.

Group: 4

Sample 7 in thin section under a polarized microscope. S7M4P14 (Left) classifying picture.
S7M63P13 (Right) picture of biotite grain.

**Sample 8**: Cooking pot, 51.84 U119, Phase 10


Temper: Medium angular quartz dominant. High temper to clay ratio. Uniform grain size.

Large Ovoid Quartz: No large ovoid grains.

Medium angular Quartz: High amount of medium sized angular quartz grains.

Small Angular Quartz: Very small amount of small angular grains.

Other small fraction minerals: Not a lot of birefringent minerals observed.

Notes: N/A

Group: 2
Sample 8 in thin section under a polarized microscope. S8M4P15 classifying picture.

Sample 9: Globular cooking pot, 51.84 U119, Phase 10


Temper: Quartz dominant. Mainly small fine grained angular quartz. High temper to clay ratio.

  Large Ovoid Quartz: A few large grain quartz. Most are undulatory quartz grains

  Medium angular Quartz: A small amount of medium angular quartz. Most are undulatory quartz grains

  Small Angular Quartz: Large amount of small grained angular quartz

  Other small fraction minerals: Some grains of twinned feldspar.

Notes: Some grains of what look like brown hornblende. A quartz grain with mafic mineral in it.

Group: 1
Sample 9 in thin section under a polarized microscope. S9M4P18 (Upper left) Classifying picture. S9M10P16 (Upper right) Picture of twinning feldspar in the center. S9M10P19 (Lower left) Picture of quartz grain with mafic grain embedded in it at center S9M10P17 (Lower right) Picture of 3 potential hornblende grains identified by the arrows.

**Sample 10:** Brazier, 38.73 L57 F62, Late Phase 9/Early Phase 8


Temper: Quartz dominant but no dominant size.

- Large Ovoid Quartz: contains larger ovoid grains. Not a noticeably large or small amount.
- Medium angular Quartz: Contains medium angular grains. Most are undulatory. Not a noticeably large or small amount.
Small Angular Quartz: contains small angular grains. Not a noticeably large or small amount.

Other small fraction minerals: A few cross hatched feldspar grains. Not a lot of highly birefringent minerals observed.

Notes: N/A

Group: 4

Sample 10 in thin section under a polarized microscope. S11M4P20 Classifying picture.

Sample 11: ESA, 38.73 L56 F62, Late Phase 9/ Early Phase 8


Temper: Very low temper to clay ratio. Hardly any temper.

   Large Ovoid Quartz: No Large quartz
   Medium angular Quartz: No medium quartz
   Small Angular Quartz: contains a negligible amount of small angular quartz grains.
   Other small fraction minerals: Occasional grain of biotite. A number (more than quartz grains) of what at first looks like red birefringent minerals, but are
iron oxide coating of another mineral such as quartz. Considerable amount of these red coated grains when looking at the small amount of temper in this vessel.

Notes: One small blue birefringent mineral with no color of its own, no good cleavage, and monoclinic. Identified a small globular inclusion of 3 ovoid chambers connected to each other. This could be some sort of fossilized foraminifera or a later fill in of carbonate due to water percolation.

Group: 5c

Sample 11 in thin section under a polarized microscope. S11M4P21 (Left) Classifying picture. Note the blue birefringent mineral in the upper right hand corner. S11M63P22 (Right) Picture of potential foraminifera or carbonate.

Sample 12: Casserole, 38.73 L57 F62, Late Phase 9/ Early Phase 8


Temper: High temper to clay ratio. Quartz dominant. Grains are cracked.

Large Ovoid Quartz: Contains large ovoid quartz but few in abundance.
Medium angular Quartz: Contains medium angular quartz but few in abundance.

Small Angular Quartz: Higher amount of small angular quartz than the other sizes.

Other small fraction minerals: No feldspar or cross hatched grains observed.
Few birefringent minerals. Some patches of red iron oxide, possibly covering quartz grains.

Notes: Suggestion of a few hornblende grains, but not definite.

Groups: 1


**Sample 13**: Casserole, 38.73 L57 F62, Late Phase 9/ Early Phase 8


Temper: Fairly high temper to clay ratio. Large ovoid quartz dominant. Grains are not cracked.
Large Ovoid Quartz: A high presence of large ovoid grains. Some
crosshatched and undulatory grains. Grains are very rounded an ovoid.
Medium angular Quartz: Small amount of medium angular sized grains.
Small Angular Quartz: Abundant small angular grains.
Other small fraction minerals: A small but noticeable amount of carbonate
patches.

Notes: N/A

Group: 3

Sample 13 in thin section under a polarized microscope. S13M4P24 Classifying picture.

**Sample 14:** Casserole, 38.73 L57 F62, Late Phase 9/ Early Phase 8

Clay matrix: Dark brown fabric. Too dark to distinguish if red or not. Fairly dense.
Temper: Large ovoid quartz dominant.

Large Ovoid Quartz: Dominant large ovoid grains.
Medium angular Quartz: medium angular quartz are prevalent, but not as
much as the ovoid bodies.
Small Angular Quartz: Small angular quartz are prevalent, but not as much as the ovoid bodies.

Other small fraction minerals: Some cross hatched grains. A few carbonate patches. Few birefringent minerals.

Notes: One second order green mineral.

Group: 3

Sample 14 in thin section under a polarized microscope. S14M4P25 Classifying picture.

**Sample 15**: Casserole, 38.73 L57 F62, Late Phase 9/ Early Phase 8


Temper: Quartz dominant. No clear dominant size. A few cracked grains. Not a noticeably large or small temper to clay ratio.

Large Ovoid Quartz: A few large ovoid quartz grains.

Medium angular Quartz: Slightly more medium angular quartz grains.

Small Angular Quartz: Some fine grained small angular quartz.

Other small fraction minerals: The occasional small birefringent mineral.

Notes: N/A
Sample 15 in thin section under a polarized microscope. S15M4P26 Classifying picture.

**Sample 16**: Carinated cup, 38.73 L56 F62, Late Phase 9/ Early Phase 8


Temper: Low temper to clay ratio.

- Large Ovoid Quartz: No large quartz
- Medium angular Quartz: No medium quartz
- Small Angular Quartz: Temper that does exist contains a low amount of small angular quartz grains
- Other small fraction minerals: Temper that does exist contains a low amount of small angular red birefringent minerals, possibly patches of iron oxide.

Notes: N/A

Group: 5c
Sample 16 in thin section under a polarized microscope. S16M4P29

**Sample 17**: Carinated cup, 38.73 L56 F62, Late Phase 9/ Early Phase 8


Temper: Very low temper to clay ratio. Nearly no temper.

- Large Ovoid Quartz: No large grains
- Medium angular Quartz: No medium grains.
- Small Angular Quartz: A very small amount of small grains.
- Other small fraction minerals: The temper that does exist is mainly carbonate patches and carbonate lined vestibules. A few small red patches of iron oxide.

Notes: N/A

Group: 5c
Sample 17 in thin section under a polarized microscope. S17M4P28 Classifying picture.

Sample 18: cooking pot, 38.73 L57 F62, Late Phase 9/ Early Phase 8

Clay matrix: Deep red fabric. Porous

Temper: High temper to clay ratio. Medium angular quartz dominant. Some grains are cross hatched.

   Large Ovoid Quartz: No large ovoid quartz.

   Medium angular Quartz: High amount of angular quartz grains

   Small Angular Quartz: Few small angular quartz grains.

   Other small fraction minerals: Not a lot of birefringent minerals observed.

Notes: Vertical beveled rim.

Group: 2
Sample 18 in thin section under a polarized microscope. S18M4P29 Classifying picture.

**Sample 19**: Incurved rim bowl (IRB), 38.74 L222, Late Phase 8/ Early Phase 7


Temper: Very low temper to clay ratio. Nearly no temper.

Large Ovoid Quartz: No large ovoid quartz

Medium angular Quartz: No medium angular quartz.

Small Angular Quartz: there is the occasional small angular quartz grain. Not a significant amount.

Other small fraction minerals: Not enough temper to distinguish other small minerals. A few red birefringent minerals observed.

Notes: One large red colored mineral, possibly a coating of iron oxide on a larger quartz or feldspar grain.

Group: 5c

**Sample 20**: Incurved rim bowl (IRB), 38.73 L57 F62, Late Phase 9/ Early Phase 8

Clay matrix: light brown/tan fabric. Clay dominant. Dense but appears slightly porous as a result of mineral degradation due to water infiltration post deposition.


- Large Ovoid Quartz: No large quartz
- Medium angular Quartz: No medium quartz
- Small Angular Quartz: Very rare appearance of small angular quartz grains.
- Other small fraction minerals: the temper that does exist is mainly carbonate lined vestibules. Very few red iron oxide patches. Very rare red birefringent minerals.

Notes: N/A

Group: 5c
Sample 20 in thin section under a polarized microscope. S20M4P31 Classifying picture.

**Sample 21**: Incurved rim bowl (IRB), 38.63 U530, Late Phase 8/ Early Phase 7


Temper: Temper is not abundant, almost negligible. Low temper to clay ratio.

Carbonate dominant.

- Large Ovoid Quartz: No large quartz.
- Medium angular Quartz: No medium quartz.
- Small Angular Quartz: Very rare appearance of small angular quartz grains.
- Other small fraction minerals: the temper that does exist is mainly carbonate lined vestibules and fillings. Very few red iron oxide patches. Very rare red birefringent minerals.

Notes: N/A

Group: 5c
Sample 21 in thin section under a polarized microscope. S21M4P32 Classifying picture.

**Sample 22**: Incurved rim bowl (IRB), 38.63 U530, Late Phase 8/ Early Phase 7


- Large Ovoid Quartz: No large quartz.
- Medium angular Quartz: No medium quartz.
- Small Angular Quartz: Very rare appearance of small angular quartz grains.
- Other small fraction minerals: Characterizing feature of the temper that does exist is a large percentage of small globular vestibules with a carbonate lining around the edge. Temper nearly all fine grained carbonate sediment. There is the occasional feldspar grain, but negligible.

Notes: N/A

Group: 5c
Sample 22 in thin section under a polarized microscope. S22M4P33 Classifying picture.

Sample 23: Fishplate with curved rim, 38.73 L57 F62, Late Phase 9/ Early Phase 8


Temper: Very low temper to clay ratio. Quartz grains present, but negligible.

- **Large Ovoid Quartz**: No large grains
- **Medium angular Quartz**: No medium grain
- **Small Angular Quartz**: The occasional small quartz grain.
- **Other small fraction minerals**: Lots of small biotite fiber like grains. Just as small if not smaller than the small angular quartz.

Notes: One green hued mineral, probably an amphibole.

Group: 5a

**Sample 24:** Lekythos, 51.75 U529, Early Persian (5th century)


Temper: Very little temper. Very low temper to clay ratio. Quartz grains exist, but are few in number.

  - Large Ovoid Quartz: No large quartz grains
  - Medium angular Quartz: A small amount of medium sized grains numbering less than ten total.
  - Small Angular Quartz: the occasional small quartz grains.
  - Other small fraction minerals: The temper that does exist mainly consists of first order blue and green birefringent medium and small minerals (See picture below).

Notes: N/A

Group: 5a
Sample 24 in thin section under a polarized microscope. S25M4P39 Classifying picture. Picture contains first order blue and green birefringent minerals.

**Sample 25**: Casserole, 51.85. U77, Late Phase 10


Temper: Small angular quartz dominant.

- Large Ovoid Quartz: large ovoid grains exist, but are not abundant.
- Medium angular Quartz: Medium angular but are not abundant.
- Small Angular Quartz: Abundant small angular quartz.
- Other small fraction minerals: A few small red birefringent minerals.

Notes: Rectangular horizontal handle. Poor thin section. Should not have much individual analytical or diagnostic contribution, but rather support the presented data.

Group: 1
Sample 26: Casserole lid, 51.75 U42, Late Phase 8/ Early Phase 7

Temper: Medium angular quartz dominant. Slightly higher temper to clay ratio.
Uniform sized medium grain temper.

Large Ovoid Quartz: No large grains.
Medium angular Quartz: A large abundance of medium angular grains.
Quartz grains are not cracked, but undulatory.
Small Angular Quartz: Small fine grained quartz is present but not abundant.
Other small fraction minerals: Not a lot of birefringent minerals observed. No feldspar. No carbonates.

Notes: N/A

Group: 2
Sample 26 in thin section under a polarized microscope. S26M4P38 Classifying picture.

Sample 27: Cooking pot, 51.75 U42, Late Phase 8 /Early Phase 7


Temper: High temper to clay ratio. Medium quartz dominant. Range of quartz sizes from small to medium.

- Large Ovoid Quartz: No large ovoid quartz grains
- Medium angular Quartz: High amount of medium angular quartz grains. These grains however, are slightly smaller than other medium quartz grains in samples. Majority of temper is medium/small grains. Quartz is undulatory and not cracked.
- Small Angular Quartz: Present but not abundant.
- Other small fraction minerals: No carbonates or feldspar. Outlier due to wide variety and high concentration of mafic minerals. Non quartz an feldspar grains are approximately 10% of the sample.

Notes: concave rim. Identified one potential biotite grain.

Group: 2
Sample 27 in thin section under a polarized microscope. S27M4P40 (Left) Classifying Picture.
S27M10P39 (Right) Picture of a potential biotite grain located at center.

**Sample 28**: Angled rim casserole, 51.75 U42, Late phase 8/ Early Phase 7

Clay matrix: rich red fabric. Slightly porous.

Temper: Medium angular quartz dominant. Homogeneous grain size.

  - Large Ovoid Quartz: No large quartz grains.
  - Medium angular Quartz: High amount of medium grains. Abundant. A small amount of the grains are cracked, but most are in tact.
  - Small Angular Quartz: Small quartz grains exist, but not in abundance.
  - Other small fraction minerals: No feldspar or carbonate. Not a lot of birefringent minerals observed.

Notes: N/A

Group: 2
Sample 28 in thin section under a polarized microscope. S28M4P41. Classifying picture.

Sample 29: Baking tray, 51.75 U42, Late Phase 8 / Early Phase 7

Clay matrix: dirty tan fabric. Very little clay. Porous, but could be due to poor thin section.
Temper: Large temper to clay ratio. Very little clay. Feldspar dominant.

Quartz: Quartz exist but not in abundance. Mix of angular small and medium grains.

Other minerals: Big feldspar grains with twinning. Large ovoid Carbonate patches. Large amount of rope like fibers in congruent and similarly orientated patterns (see picture below). This type of texture is common in lava flows. Likely a K feldspar and if volcanic, Sanidine. Lots of grains with complex morphology within the grain, suggesting it was recrystallized.

Notes: Found a small biotite grain. Found a green hues mineral likely to be Hornblende.

Group: 5b
Sample 29 in thin section under a polarized microscope. S29M4P42 (Upper left) classifying picture. S29M4P43 (Upper right) Picture of twinning feldspar flush with rope like metamorphic inclusion located at center. S29M10P44 (Lower left) Picture of a few biotite grains around center. S29M4P45 (Lower right) Picture of possible hornblende grain just right of center.

**Sample 30:** Angled rim casserole, 51.75 U42, Late Phase 8 / Early Phase 7

Clay matrix: Light brown/tan


- **Large Ovoid Quartz:** No large quartz
- **Medium angular Quartz:** Medium grains are rare but exist
- **Small Angular Quartz:** Very few quartz grains other than the uniform small angular quartz grains.
Other small fraction minerals: The occasional yellow/red first order mafic mineral.

Notes: One greenish hued mafic mineral.

Group: 1


Chapter 7: Results and Analysis

After studying the samples, 5 distinct groups emerged, taking solely observations from thin section optical mineralogy into account. Vessel form, grid, and time within the Hellenistic Period were not taken into account when assembling the groups. These are groups of best fit, and, thus, samples do not strictly follow the characteristics of the group. Groups 1-4 are local fabrics, meaning they derive from the southern coastal plain near Ashkelon. Group 5 represents the entirety of the non-local imported fabrics.
Description of Groups

Group 1: Local (Coastal loess fabric)

Contains: 7/30 samples

Sample 1-plainware bowl 51.84.U119 phase 10
Sample 2-plainware bowl 51.84.U119 phase 10
Sample 4-cooking pot 51.83.U68 phase 10
Sample 9-cooking pot 51.84.U119 phase 10
Sample 30- Angled rim casserole 51.75.U42 late 8/early 7
Sample 12-casserole 38.73.L57 F62 late phase 9/8
Sample 25-casserole 51.85.U77 late phase 10

In terms of clay matrix, group 1 ranges between tan/light brown to brown.

This group, lacking a red tinge, does not contain much iron oxide. The fabric is dense and the temper to clay ratio is high. Quartz dominates the temper, and though the occasional large ovoid and medium angular quartz grain appears, they are not abundant. Rather, small fine-grained angular quartz characterizes group 1’s matrix. In each sample, there are a few grains of red birefingent minerals, feldspars, carbonate patch, or hornblende that do not have a significant presence or fraction within the sample.

A few samples, however, do not strictly follow or exemplify all of group 1’s characteristics. Sample 4’s clay matrix contains more iron oxide than others in the group. Neglecting its coloration, the sample still fits well into group. Sample 12 contains a few medium sized quartz grains that appear coated in iron oxide. Sample
25 came from a small soft sherd that was difficult to cut into thin section, making it too thin and difficult to assess. Sample 30 is extremely dense and contains a higher temper to clay ratio of small angular quartz than the others in this category.

**Group 2: Local (Red alluvial soil based with well sorted coastal inclusions)**

Contains: 6/30 samples

Sample 5-cooking pot 51.84.U119 phase 10

Sample 8-cooking pot 51.84.U119 phase 10

Sample 27-cooking pot 51.75.U42 late 8/early 7

Sample 26-casserole lid 51.75.U42 late 8/early 7

Sample 28-Angled rim casserole 51.75.U42 late 8/early 7

The characterizing clay matrix is a deep red, resulting from higher amounts of iron oxide, and the fabric is slightly porous. In terms of temper, the matrix consists of sub-angular quartz all of uniform medium size. Large ovoid quartz grains do not have a representation in this fabric. Small angular grains exist, but not notably abundant as in group 1. The defining medium angular quartz grains can be undulatory, meaning a bent crystal lattice giving a melted or wave like appearance caused by heat and pressure, or fractured, also caused by increased heat and pressure. Group 2 temper contains nearly exclusive quartz. No feldspars or calcite were observed under the microscope. The samples contain a very small amount of birefringent red mafic minerals.
The above samples all fit nicely into group 2 except for sample 27. Grain size for this sample is not as uniform as the others, meaning it ranges from medium to small grains. It also contains a wide variety and high concentration of mafic minerals. Sample 26 contains less iron oxide in the clay matrix as the others in the group, but fits all the other defining characteristic of group 2.

**Group 3: Local (Brown alluvial based with poorly sorted coastal inclusions)**

Contains: 2/30 samples

Sample 13-casserole 38.73.L57 F62 Late phase 9/8
Sample 14-casserole 38.73.L57 F62 Late phase 9/8

Group three contains a darker brown clay matrix with little iron oxide. The fabric is dense and inclusions are quartz dominated. The defining characteristic of this group is the large ovoid quartz grains making up the temper. The ovoid grains do not amount to a large number, but they are large enough and numerous enough to distinguish the fabric. Some of the grains are undulatory and crosshatched. Medium angular quartz grains also appear, but in a smaller amount. Small angular grains are plentiful, but not so much that it is defining. There is a small but noticeable amount of carbonate patches and few birefringent minerals.

**Group 4: Local (Red alluvial soil based with poorly sorted coastal inclusions)**

Contains: 5/30 samples

Sample 3-Plainware Jar 51.84.U119 phase 10
Sample 6-Plainware Jar 51.84.U119 phase 10
Sample 7-Cooking pot 51.84.U119 phase 10
Sample 15-Casserole 38.73.L57 F62 Late 9/8
Sample 10-Brazier 38.73.L57 F62 Late 9/8

Group 4 has a deep red/brown clay matrix that ranges from dense to slightly porous. The quartz dominated temper contains a mix of sizes with no one noticeably more abundant than the other. Large ovoid grains, medium sub-angular grains, and small angular grains all exist in roughly the same amount. Most of the medium grains are undulatory and some of them are cracked. The fabric contains a few very small angular birefringent minerals. It should be noted that these samples correlate well to group 2. The reasoning behind creating a separate category for these samples is that they do not contain the same concentration and uniformity of medium quartz grains as in group 2.

Group 5: Non-Local Imported

Group 5a: Sample 23-Fish plate 38.73.L57 F62 Late 9/8
    Sample 24-Lekythos 51.75.U529 early Persian (5th century)
Group 5b: Sample 29-Baking tray 51.75.U42 Late 8/Early 7
Group 5c: Sample 11-ESA 38.73.L56 F62 Late 9/8
    Sample 16-Carinated cup 38.73.L56 F62 Late 9/8
    Sample 17-Carinated cup 38.73.L56 F62 Late 9/8
    Sample 19-IRB 38.74.L222 Phase 8/7
Sample 20-IRB 38.73.L57 F62 Late 9/8
Sample 21-IRB 38.63.U530 Phase 8/7
Sample 22-IRB 38.63.U530 Phase 8/7

This group does not contain any cooking vessels. Group 5 represents imported non-local fabric. Because this group is not characterized by certain traits, but defined by a lack of similarity from groups 1-4, this group contains a variety of thin sections that do not appear congruent to one another. For this reason, group 5 is broken into 3 separate sub groups based on appearance.

Group 5a represents samples 23 and 24. Both are extremely dense and clay dominate, containing little temper. Sample 24 contains a tan clay matrix and does not contain temper other than a few medium angular blue birefringent minerals. Sample 23 does not contain quartz temper, but rather small biotite like fibers in large quantity.

Group 5b represents sample 29, which is temper dominant with a brown clay matrix. The sample contains a high temper to clay ratio of feldspar and rope like fibers. The fiber bundles originate from rapidly cooled lava flows, which is likely K feldspar. If volcanic, this mineral is most likely sanidine. The sample also contains large ovoid carbonate patches as well as a small number of biotite and hornblende grains.

Group 5c contains samples 11, 16, 17, 19, 20, 21, and 22. The clay fabric is tan and extremely dense. There is a very low temper to clay ratio. The temper contains the occasional small quartz grain, a handful of small birefringent minerals, and what appears to be a coating of iron oxide on a few larger quartz grains. The
samples contain a fairly high amount of carbonate lined vestibules, compared to the total amount of temper, as a result of either mineral degradation due to water infiltration post deposition or as high firing temperatures burning off debris combined with later carbonate precipitation in the pores. Though the samples are extremely dense, the vestibules make the samples look porous. The lack of temper is notable in this group.

**Sample Breakdown**

1) Vessel form: Four forms, the cooking pot, the casserole, the brazier, and the baking tray exist among the cooking vessels in this assemblage. The plain ware in this study contains plain ware bowls and plain ware jars. The imported fabric generally equate to imported vessel forms. Imported vessels include ESA, carinated cups, a fishplate, a lekythos, and IRBs. Though a cooking vessel, the baking tray is made of non-local fabric, and, thus, considered an import. The classification is as follows:

Cooking vessels:

Out of 7 cooking pots: 2 are group 1, 4 are group 2, and 1 is group 4

Out of 8 casseroles: 3 are group 1, 2 are group 2, 2 are group 3, and 1 is group 4.

One brazier: group 4

Plain ware:

Out of 2 plain ware bowls: all in group 1

Out of 2 plain ware jars: all in group 4

Out of imported vessels:
Out of 4 IRBs: all 4 in group 5
Out of 2 carinated cups: all 2 in group 5
One ESA: group 5
One Fishplate: group 5
One Lekythos: group 5
One baking tray: group 5

2) Grid: Vessels come from either grid 38 or grid 51. The fabric breakdown is as follows:
14 vessels from Grid 38: 1 is from group 1, 1 is from group 2, 2 are from group 3, 2 are from group 4, 8 are from group 5
16 vessels from Grid 51: 6 are from group 1, 5 are from group 2, 3 are from group 4, 2 are from group 5

3) Time:
1 pre Hellenistic vessel: group 5
10 late Hellenistic vessels: 5 are group 1, 2 are group 2, 3 are group 4
11 middle Hellenistic vessels (phase 9/8 transition): 1 is group 1, 1 is group 2, 2 are group 3, 2 are group 4, 5 are group 5
8 vessels transitioning out of Hellenistic (phase 8/7): 1 is group 1, 3 are group 2, 4 are group 5
Analysis of Groups

Groups 1-4 are all local fabrics coming from the southern coastal plain (figure 15). They all fall into this broad local category of fabric containing coastal inclusions and a clay matrix from regions near Ashkelon. The local groups have different defining characteristics from each other that demonstrate different production centers created from different outcrops in the local area. The 4 groups all appear in Master’s Iron Age study (Stager et al 2011: pg 53-71, Master 2003: pg 47-64, Master 2001). Group 1 is the equivalent of Master’s loess with coastal inclusions, while groups 2, 3, and 4 are all sub categories of the brown or red alluvial soil with coastal inclusions. Areas of group origin overlap (figure 15), considering the local fabrics are all petrographically similar. Group 5 contains the non-local samples. Subgroups include fabric from Greece, Northwest Turkey, and Southern Phoenicia.
Figure 15: Master’s understanding of the limits of local trade at Iron Age Ashkelon and soil regions from (Master 2003: pg 58). Photo is overlain with this study’s best representation of fabric group 1-4 origins.

**Group 1: Local (Coastal loess fabric)**

Sample 1-plainware bowl 51.84.U119 phase 10

Sample 2-plainware bowl 51.84.U119 phase 10

Sample 4-cooking pot 51.83.U68 phase 10

Sample 9-cooking pot 51.84.U119 phase 10

Sample 30- Angled rim casserole 51.75.U42 late 8/early 7
Light brown/tan fabric with a high amount of temper consisting of mainly small angular quartz grains defines group 1. In the temper, the occasional feldspar grain, mafic mineral/ heavy accessory mineral, and carbonate patch/lined vestibule compose the small fraction.

This coastal loess base clay and inland inclusions fits Master’s category of ‘Loess with inland inclusions’ (Stager el al 2011: pg 56-57). He goes on to state that, “coastal loess is the most common loessial soil in the Ashkelon area” (Stager el al 2011: pg 56). Master’s local fabric made of loess with coastal inclusions represents group 1 well (figure 11). Both contain small-grained silt sized angular quartz, an occasional larger quartz grain, as well as small fractions of accessory minerals. Group 1 is from the coastal loess kurkar dunes of the area immediately surrounding Ashkelon, with a northern boundary of Ashdod, western boundary of the beginning of the Shephelah, and a southern boundary of Gaza (figure 15).

The high concentration and amount of quartz grains suggest fine beach sand, indicating a coastal origin. Dan Master defines coastal inclusions a “beach sand and abundant heavy minerals” (Stager et al. 2011: pg 55-56). More specifically, coastal inclusions make a temper “dominated by coarse sand sized, rounded quartz fragments (beach sand), accompanied by smaller angular fragments of silt-sized quartz and a variety of birefringent accessory minerals” (Stager et al. 2011: pg 55). Though group 1 does not have a significant amount of larger rounded quartz, the temper is almost
entirely composed of what Master calls ‘small angular fragments of silt-sized quartz’. A production center with finer sand explains this slight size deviation.

The few carbonate patches and lined vestibules observed in thin section are chalk components. Master’s definition of temper with inland inclusions “is dominated by chalk and chert inclusions typical of the Shephelah” (Stager et al. 2011: pg 56). Though group 1 is not numerous in chalk components, they are present. The accessory minerals are more numerous in abundance than the chalk inclusions. Thus, the base material is still coastal, but might have a small representation within start of the Shephelah. If the group 1 material were strictly from the Shephelah, the carbonate patches would be far greater in number. Therefore, the range of group 1 extends west into the beginning of the Shephelah, but no farther. The group consists of a temper that is mainly coastal with a few inland inclusions.

In fact, the small presence of chalk inclusions might be a result of wind blown debris from the Shephelah, forming the sand and kurkar dunes. Wind blown sand dunes make up the majority of the southern coastal plain surrounding Ashkelon (Stager et al. 2008: pg 13). These dunes are composed of kurkar, aforementioned hard sandstone. This rock is porous which allows water infiltration. Such water will then erode soft deposits, such as carbonate, leaving carbonate lined vestibules and further contributing to the build up of porous loose sandy kurkar.

The base clay for group 1 is a light brown/tan with a low iron oxide concentration. For the local area round Ashkelon, this best describes coastal loess. Loess, as mentioned earlier in the description of soils in Israel, is windblown build up of silt sized sand grains of quartz. Ancient riverbeds that surround Ashkelon (see
and wind coming off of both the Mediterranean Sea and inland from the Shephelah provide Ashkelon with the right conditions for loess material.

Piecing together the components of group 1, the material most likely comes directly from the area immediately surrounding Ashkelon all within a close range. If the range of group 1 extended north to Ashdod, there would be a greater presence of iron oxide and a switch from coastal loess to alluvial soil. If the region extended south to Gaza, the clay would have Negev properties. Any farther west than the start of the western Shephelah, and group 1 should contain a larger presence of chalk inclusions. Group 1 is well confined to the area immediately surrounding Ashkelon, meaning within a circumference of a few miles.

**Group 2: Local (Red alluvial soil based with well sorted coastal inclusions)**

Sample 5-cooking pot 51.84.U119 phase 10
Sample 8-cooking pot 51.84.U119 phase 10
Sample 27-cooking pot 51.75.U42 late 8/early 7
Sample 26-casserole lid 51.75.U42 late 8/early 7
Sample 28-Angled rim casserole 51.75.U42 late 8/early 7

As described, group 2 contains deep red clay with medium sized well-sorted sub angular quartz inclusions. The samples lack any feldspar or carbonate in the small fraction. Only a small number of birefringent minerals (feldspar, hornblende, and
other clinopyroxenes) showed under the microscope. Group 2 does not have any large ovoid grains. Small angular grains are present, but not numerous.

Group 2 matches Master’s (2011) ‘brown or red alluvial soil with coastal inclusions. Group 2 contains well-sorted monocrystalline quartz representing beach sand as the dominant temper. Master describes the fabric as “dominated by course sand-sized, rounded quartz fragments (beach sand), accompanied by smaller angular fragments of silt-sized quartz…” (Stager et al 2011: pg 55). Beach sand does dominate the group 2 matrix, but it is well-sorted medium quartz grains occurring with smaller angular silt size quarts. Group 2 hugs the alluvial plain north just past Ashdod and south to the city of Ashkelon with a western boundary stopping well before the foothills of the Shephelah.

Due to the lack of silt sized quartz grain and the presence of heightened amounts of iron oxide, the clay is not loess, but rather an alluvial soil. In terms of temper, the inclusions are still coastal. Quartz grains dominant the fraction and accessory minerals are rare, but present. However, large rounded beach sand grains do not appear, the silt sized quartz grains are not in abundance, and accessory minerals do not have a large representation in even the small fraction. For this reason, group 2 seems to originate, not from solely the coastal plain, but from the convergence of the alluvial and coastal plains. The matrix still has coastal inclusions, but alluvial base clay.

Group 2 originates from the local region just north west of Ashkelon, the overlapping region of the coastal and alluvial soils (figure 15). Any south of Ashkelon, and the rich red of the alluvium would turn to light brown of loess. Any
farther east out of the coastal plain and there should be a least an existence of inland inclusions, which group 2 lacks. The western boundary does not extend beyond the alluvial plain directly to the confluence of the coast and sea. This is because the temper is not variable enough to fit the poorly sorted deposition of the area immediately coastal. Beaches, even if medium grain dominant, should also have a large or small quartz representation due to the constant sifting of grains to fit all of the finer pores. Group 1 fabric can come from the coast directly off of the Sea because the small angular quartz is the finest grain, and thus fills in all pores created by sand. Group 2 is not because the grains are too uniform.

Petrographically, this fabric can extend north up the length of the central coastal plain, considering coastal and alluvial sediment extends this far north. Master, in his description of ‘brown or red alluvial soil with coastal inclusions states, “this local fabric, in addition to being the most common at Ashkelon, is also found at Ashdod” (Stager et al 2011: pg 55). The presence at Ashdod confirms local trade of this fabric as well as origins extending north at least to this city. Ben-Shlomo (2011) writes about a local alluvial-based clay at Tel Dor, located just south of the Carmel. His study, discussed in chapter 4, confirms a red alluvial fabric with well-sorted sub rounded quartz, His samples, however, all contains fine chalk, limestone, chert, and a few with carbonate inclusions as well. Group 2 clay does not have any representation of carbonate or highland inclusions. Though the clay component does extend north up the central plain, the temper does not. Alluvial loess and extends north to Gezer, but is mixed with the northwestern Shephelah terra rossa soil, as previously discussed in
chapter 4. Ashkelon group 2, fabric solely composed of southern coastal hamra with inland inclusions, probably just reached just north of Ashdod.

**Group 3: Local (Brown alluvial based with poorly sorted coastal inclusions)**

Sample 13-casserole 38.73.L57 F62 Late phase 9/8
Sample 14-casserole 38.73.L57 F62 Late phase 9/8

Dark brown clay with little iron oxide and quartz-dominated temper of large rounded grains and small angular grains characterizes group 3. Small fraction includes a few carbonate patches and a small amount of birefringent accessory minerals.

The dark clay matrix suggests an alluvial origin. While group 2 is red, group 3 is brown, fitting Master’s (2011) ‘Brown and red alluvial soil with coastal inclusions’ category. The quartz inclusions, including the large rounded grains and small angular grains, as well as the mafic heavy minerals, define coastal inclusions. The small patches of carbonate, as discussed in group 1, is from a mix of kurkar water infiltration and Shephelah wind carried inclusions, forming coastal dunes. These inland inclusions are not prevalent enough to be from the interior of the Shephelah, but could be material from its western outskirts. The wide array of sizes and range of non-weathered to weathered shapes of the quartz grains result from the kurkar dunes subjected to the elements and coastal mar. The large ovoid grains are distinct beach sand, confirming coastal ties.
Roughly the same boundaries of group 2, Group 3 fabric comes from the local area just north of Ashkelon (figure 15). The material would not be south past the city, considering alluvial soil does not run that far south. The northern boundary is just past Ashdod. West, the fabric should be from an area no farther than the start of the Shephelah. With such prominent beach sand and coastal inclusions, this temper can originate as far east as directly on the beach. This coastal alluvium fabric encompasses a small range north and northwest of the city.

**Group 4: Local (Red alluvial soil based with poorly sorted coastal inclusions)**

Sample 3-Plainware Jar 51.84.U119 phase 10
Sample 6-Plainware Jar 51.84.U119 phase 10
Sample 7-Cooking pot 51.84.U119 phase 10
Sample 15-Casserole 38.73.L57 F62 Late 9/8
Sample 10-Brazier 38.73.L57 F62 Late 9/9

Observationally, there is a difference between group 2 and group 4. Group 2 is very well sorted medium sub angular quartz. Group 4, however is poorly sorted with a mix of grain sizes and shapes. No quartz type is dominant over another. They both contain a deep red clay matrix with quartz dominated coastal temper and small amounts of accessory minerals. Neither contains any carbonate. Other than group 2 containing well sorted coastal temper and group 4 containing poorly sorted coastal temper, the groups are identical.
Fitting Master’s (2011) ‘brown or red alluvial soil with coastal inclusions’, group 4 has the fabric origin of group 2 (figure 15). The material originates from an area starting south at Ashkelon, hugging the southern coastal alluvial plain north to the central plain. The fabric cannot come from anywhere south of Ashkelon considering the alluvial plain does not extend that far south. The lack of any carbonate suggests this material is strictly coastal and does not extend west to the beginnings of the Shephelah. The one geographical difference from group 2 is that the temper is poorly sorted and can thus be directly from the coast immediately off of the sea.

**Group 5: Imported**

Group 5a: Sample 23-Fish plate 38.73.L57 F62 Late 9/8
Sample 24-Lekythos 51.75.U529 early Persian (5th century)

Group 5b: Sample 29-Baking tray 51.75.U42 Late 8/Early 7

Group 5c: Sample 11-ESA 38.73.L56 F62 Late 9/8
Sample 16-Carinated cup 38.73.L56 F62 Late 9/8
Sample 17-Carinated cup 38.73.L56 F62 Late 9/8
Sample 19-IRB 38.74.L222 Phase 8/7
Sample 20-IRB 38.73.L57 F62 Late 9/8
Sample 21-IRB 38.63.U530 Phase 8/7
Sample 22-IRB 38.63.U530 Phase 8/7
Group 5 distinguishes the non-local imported fabrics. The 10 samples come from a total of 3 different geographic regions. Subgroup 5a represents material from Greece. Subgroup 5b describes the Northwest Ionian Coast. Subgroup 5c portrays Syrian fabric.

Subgroup 5a: Sample 24 and 23, the lekythos and fishplate, respectively, are Greek forms. Alaimo et al (2002), conducts a petrographic study with 3 lekythos ranging from the 6th to the 4th century B.C. All three deemed attic imports, contain yellowish brown and brown clay matrix with non-plastic inclusions of small silt sized monocrystalline quartz with traces of mica and feldspar (Alaimo et al 2002: pg 21). Both the lekythos and fishplate are attic black ware and fit Alaimo’s description. The subgroup 5a vessels probably originate at or near Attica.

Subgroup 5b: Sample 29 is a baking tray from late phase 8/ early phase 7. Though a cooking vessel, thin section determined it is not of local origin. Sample 29 fits Berlin’s description of micaceous baking trays at Anafa where, “the fabric is distinguished by lens-shaped inclusions of gold and silver mica; thin-section analysis of one example from Anafa also includes igneous rock (16% of matrix), feldspar (13%), and quartz (9%). The composition indicates production proximate to a volcanic source; the area around Pergamon has been suggested” (Berlin 1997: pg 110). Sample 29 is identical to this description. The gold and silver mica correlates to muscovite and biotite, respectively. This mica makes up a small portion of the sample, or 3% suggested from Anafa (Berlin 1997: pg 110). The temper, dominated by the rope like volcanic fragments (described as igneous rock by Berlin) and feldspar grains, take up over half of the fabric. Quartz is present, but not in quantities
as great as the volcanic inclusions and feldspar. Berlin suggests Pergamon, a site in modern day Turkey on the northwest coast, as the area of production. Her inclination is based off of Kathleen Slane’s opinion that the distribution of the baking tray is heaviest in this area and related to Tschandarli ware, which is associated to Pergamon as well (Vogeikoff-Brogan 2000; pg 308-311, Berlin 1997; pg 110, Slane 1986: pg 291-292, 312). At Anafa, micaceous baking dishes are found around the same time as sample 29 from this assemblage, the phase 8/7 transition. Based on these parallels, Sample 29 most likely is an import from the region of Northwest Turkey.

Subgroup 5c: The carinated cups (samples 16 and 17), the incurved rim bowls (sample 19, 20, 21, and 22), and the Eastern Sigillata A vessel (ESA) (sample 11) all are composed of similar fabric under thin section. They all contain the light tan well-levigated fabric with a few shimmering grains of what might be quartz or the odd mafic mineral. Under thin section, all 7 of these vessels contain carbonate-lined vestibules that might contribute to the sheen as well. Due to their similarity under thin section and Slane’s (1997) identification of ESA, these fine ware vessels originate from the same general location. As the name suggests, ESA is from the Eastern Mediterranean. The samples all contain quartz grains, albeit rarely, and possess a high amount of carbonate lined vestibules, which is a result of formation and degradation of coastal dunes. Sample 11 contains what appears to be a foraminifera, common along the northern half of the Levantine coast.

To understand fabric origin, the vessel forms must be understood. Eastern Sigillata A appears at Anafa post 125 B.C. and continues on to the early Roman Period (Slane 1997: pg 269). At Ashkelon, sample 11 comes from the late 9/early 8
transition, fitting this window. Well-levigated fabric, deep red slip, and distinct standardized base material characterize ESA (Slane 1997: pg 269). Occasional sparkling inclusions and light tan fabric also describe the vessel (Slane 1997: pg 269). Sample 11 contains this characteristic clay coloration as well as a few small mica grains and larger iron oxide covered quartz grains, which might contribute to the shine. Black Slipped Predecessor, or BSP, is chemically identical to ESA, but as the name suggests, precedes ESA and is covered in black glaze (Slane 1997: pg 270). This form potentially gave rise to the ESA vessels.

In thin section, the samples of IRBs, carinated cups, and ESA are all nearly identical when compared to the rest of the non-local samples. Andrea Berlin explains her current understanding of ESA originating in Southern Phoenicia, and more specifically Tyre (1997: pg 9-10). In her study, Berlin found Phoenician semi fine ware to be from the same fabric as ESA. Her petrographic analysis determined the fabric to be from outside Israel, but near the coast (Berlin 1997: pg 9). In context, her samples came from areas associated to the Phoenician language. Phoenician semi fine ware is found all over Southern Phoenicia, but en masse at Tyre. Therein confirms Tyre as the production center for ESA, BSP, and Phoenician semi fine ware. Slane cautiously believe a North Syrian origin due to distribution patterns, but does not discount Tyre as the source (Slane 1997: pg 272).

The thin section confirms northern coastal clay and the foraminifera, a shell structure, is either from the coast or an older fossil from local marls inland. For our understanding of this study’s samples, Southern Phoenicia, specifically Tyre, is logical. During the Persian period, though the Achaemenids ruled Ashkelon, the
people were of Phoenician decent. Thus, it would make political sense for the Ashkelon people to continue their ties to this northern power.

**Fabric of the Hellenistic Period in Context**

As time passes, there is the inevitability of change. In this study, pottery fabric is a proxy to look at how Ashkelon became Hellenized. Variety and quantity of group type and vessel form throughout time is outlined in chart 2. A synthesis of such groups and forms, as well as context, follows chronologically.

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<td>Plain ware bowl</td>
<td>Sample 1</td>
<td>Sample 2</td>
<td>Sample 18</td>
<td>Sample 17</td>
<td></td>
</tr>
<tr>
<td>Brazier</td>
<td>Sample 3</td>
<td>Sample 10</td>
<td>Sample 24</td>
<td>Sample 24</td>
<td></td>
</tr>
<tr>
<td>Imported Fabric</td>
<td>Sample 24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lekythos</td>
<td>Sample 11</td>
<td>Sample 19</td>
<td>Sample 20</td>
<td>Sample 11</td>
<td></td>
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<td></td>
<td>Sample 16</td>
<td>Sample 19</td>
<td>Sample 20</td>
<td>Sample 11</td>
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<td>Sample 17</td>
<td>Sample 21</td>
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<td></td>
<td>Sample 20</td>
<td>Sample 22</td>
<td>Sample 20</td>
<td>Sample 11</td>
<td></td>
</tr>
<tr>
<td>Fishplate</td>
<td>Sample 23</td>
<td>Sample 22</td>
<td>Sample 21</td>
<td>Sample 22</td>
<td></td>
</tr>
<tr>
<td>Baking Tray</td>
<td>Sample 24</td>
<td></td>
<td>Sample 22</td>
<td>Sample 22</td>
<td></td>
</tr>
</tbody>
</table>

Chart 2: Classification of samples in terms of group (see color key), time, and vessel form.

**Pre-Hellenistic: (-350 B.C.)**
This study does not have a representation of local wares for the pre-Hellenistic. The only sample, rather, is a 5th century B.C. Greek lekythos, confirming continuation of Greek interest from the Persian period. The lekythos comes from the Persian period in grid 51, an area representing a lower class neighborhood in Ashkelon. The vessel is coming directly from Greece, so though Greek cooking vessels are not yet localized, there is direct contact with Greek imported luxury goods. This vessel provides an example of non-local fabric as well as a point of comparison of a fine well-levigated luxury vessel to a common cooking vessel.

**Early Hellenistic: (ca 350–ca 290/280 B.C.)**

The samples during this time include 5 cooking pots, 2 from group 1, 2 from group 2, and 1 from group 4. There is one casserole from this time, which is composed of group 1 fabric. The two jars, both of which are from group 4, and two bowls, both from group 1, demonstrate that plain ware are the same locality as cookware.

In terms of context, all of the early Hellenistic samples come from Grid 51. All of the samples were excavated from an exterior late phase courtyard and adjacent street, which function together. The courtyard, based on finds such as grinding stones and a tabun, is a food preparation space. Contributing to this picture, the cooking pots, both jars, and both bowls are from this area. Interestingly, the casserole is from the neighboring street, which yielded a sizable amount of Greek attic ware, immediately east of the courtyard.
Middle Hellenistic: (ca 260-150 B.C.)

The samples in this time range all come from the end of the middle Hellenistic, where phase 8 is essentially a continuation of occupation from phase 9. Among the middle Hellenistic samples, there is one cooking pot of group 2 fabric. Samples include 4 casseroles, of which 1 is in group 1, 2 are group 3, and 1 is group 4. The brazier, made from group 4 fabric, offers a contrast of cooking form among the pot and casserole. In terms of fine ware, the middle Hellenistic holds a fishplate from Greece, and an ESA, 2 carinated cups, and an IRB all from the North in near Tyre.

The samples from this time all come from grid 38, a domestic setting of increased wealth and prosperity. They come from the fill of a lavish insula with a decorated mosaic and a Phoenician personal bath. Though a wealthy setting, cooking pots and casseroles both show up.

Late Hellenistic: (150- ca 68 B.C.)

The late Hellenistic is a time of transition. The Romans are slowly gaining ground across the Mediterranean. At Ashkelon however, life carries on. From 68 B.C. to the 1st century A.D., the late Hellenistic transitions into the early Roman culturally and politically, not stratigraphically. Samples from this study are from late phase 8/early phase 7, falling right at a time of a political power shift from Greece to Italy in the Mediterranean. The local cooking economy at Ashkelon, however, remains relatively unchanged.

From the samples, there is one cooking pot of group 2 fabric. Out of the 2 casseroles and 1 casserole lid, 2 are from group 2 and one is group 1. The end of the
Hellenistic Period is when the imported baking tray appears. The 3 imported IRB’s at this time are from grid 38 wealthy domestic surfaces with no clear industry.

In context, the cooking vessels are all from a large drain where the street previously lay in grid 51. The convergence of casseroles and cooking pots within the same depositional layer show that these combined cooking practices lasted from the early to late Hellenistic.

**Parallels at Tel Anafa**

Andrea Berlin conducted a systematic analysis of the Hellenistic and Roman plain ware corpus of Tel Anafa. Her work is an important point of comparison to Ashkelon in an effort to understand the people of the city through their cooking fabric. Tel Anafa resides in the upper galilee, Israel and her study contains plain ware pottery from the start of the Hellenistic Period (ca 350B.C.) up through the end of the Roman period (7th century C.E.). The Anafa excavation identified 5 distinct cooking fabrics during the Hellenistic Period, the spatter painted ware, gritty cookware, sandy cookware, bricky cooking fabric, and Galilean cookware discussed in Berlin (1997) pages 7-15.

Spatter painted ware is hard coarse gritty fabric and contains a plethora of inclusions and voids of all sizes, giving it a porous appearance. Thin section analysis revealed the lowest percentage of clay matrix, 50-65%, in fabrics tested at Tel Anafa. This means that the potters mixed in more temper than usual for this fabric. Large quartz grains dominate the matrix. Large voids, composing 15-25% of the matrix, suggests high usage of organic temper burned off during firing. Berlin suggests that
spatter vessels only appear within the Hula Valley, encompassing the Upper Galilee and Northern Israel.

Gritty cookware is gritty textured, thin, hard, and gray to grayish brown. Inclusions in the matrix are fine to medium and temper is rarely visible to the naked eye. Thin section analysis concluded that quartz is the main if not only inclusion, ranging from 10-20% of the sample. The fabric does not have any parallels, making the source of fabric difficult to identify.

Sandy cookware is a dense, fine-grained, sandy, red brown, fully fired vessel. White and gray inclusions are visible by eye and the vessels walls are even and fully fired. In thin section, the clay matrix comprises 60%, voids 19%, quartz 10-20%, and a mix of plagioclase and potassium feldspar 1-2%. Similar fabric is found, and most likely produced, in the area around Akko. The fabric at Akko is most prominent in the early 2nd century and last seen before the end of the 2nd century. The vessels at Anafa in this fabric date to 100-80B.C., well after the similar fabric found in Akko. The sandy cookware at Anafa was most likely a successor of Akko. It’s interesting to note that this fabric only shows up in casseroles, a cooking vessel not native to the area.

Bricky cooking fabric is a dense, hard, thick walled fabric with a smooth surface. They range in color from dark grey to warm brown to golden brown. Inclusions are common and are fine to medium sized. Neutron Activation Analysis conducted on the fabric suggests it originates from the Golan, but because of the wide mineralogical variety in this fabric group, specifics remain unknown.

Galilean cookware is hard, smooth, and brownish red with thin walls. The fabric contains white oval inclusions and a few large black iron nodules. The nodules
are strategically included in the temper to prevent thermal shock. Thin section revealed a fine-grained homogeneous clay matrix comprising 60-75%. Voids occupy 9-12%, and temper inclusions are exclusively quartz. Based on Adan-Bayewitz’ work, the samples tested at Anafa originate from material from the Hananya Valley and manufactured in the lower galilee at the site Kfar Hananya (Adan-Bayewitz 1993; pg 61-82, 166-170).

At Anafa, casseroles consist of 26% of the cooking vessels at the time (Berlin 1997: 21). If percentage of casseroles in the cookware assemblage is proportional to Greek settlers in the Anafa population, then a quarter of the population could have been immigrants. Due to cultural exchange, however, the casserole dish mostly likely spread to the local non-Greek inhabitants of the city. Therefore, 26% is an overestimation for Greek settlers. The percentage, however, would still be significant since a large Greek population is needed to integrate the casserole into a quarter of the cooking corpus. As Berlin says, “The inescapable conclusion is that Anafa’s Late Hellenistic population was heavily influenced by Greek culture” (Berlin 1997: 22).

Cooking pots and casseroles are part of the local Hula industry and Akko region. Addition of new shapes, such as the casserole and lid, suggest new cuisine. The influence for such a radical shift in daily cooking practices must have come directly from Greek settlers. To learn how to use these cooking vessels, it’s not enough for the site to simply have increased cultural exchange. New people would have to come into the site to use and subsequently spread their culinary practices. Life at Anafa during the later Hellenistic appears to be one of high society, cultural exchange, and a growing foreign population. Tel Anafa sees the introduction of the
casserole form in the early 3rd century B.C. and its subsequent rise as the Hellenistic Period progresses. Berlin concludes that Greek settlers at Anafa provoked this Hellenization of cooking culture. The local creation of the foreign casserole form at Anafa signifies Greek settlers. This is important to understand Ashkelon in that Anafa is a comparable site to Ashkelon in terms of timeline of casserole introduction and subsequent prosperity within the respective local cooking vessel assemblages.

Chapter 8: Conclusion

With the establishment and prominence of casserole at Ashkelon it is not a question of if the city was Hellenized, but how. From thin section analysis, a few results are clear. Casseroles first appear in local fabric in late phase 10, by 280B.C. Casseroles are made from local material and continue throughout the rest of the Hellenistic Period. From the selected corpus, casseroles do not appear in non-local fabrics. The form is Greek, but the earliest of casseroles at Ashkelon are in local fabric (Sample 25 in group 1 fabric). To promote an understanding of these result, a few questions are posed. What is this foreign shape doing in local Ashkelon fabric? What do cooking vessels imply about culture change? How do these casseroles impact Ashkelon? In the following, I argue that the integration of the casserole into Ashkelon culture indicates Greek immigration to the city. With casseroles changing the cook culture of the time, they taking an active role in changing the habitus of the public into a Hellenized cooking society.

Stager et al (2011) shares, “The geographical origin of a vessel has considerable bearing on our understanding of its function in the broader sense - that is, in terms of
its particular social, economic, and political significance for those who acquired and used it” (pg 54-55). The presence of the casserole shows Greek exposure at Ashkelon. The establishment of this form, from the moment it was introduced to the end of the Hellenistic Period, proves that this Greek cooking practice was not a fad, but a valued way of eating. The continuity and frequency of this form at Ashkelon suggests a prolonged and intense contact with Greek culture. The fact that the casserole originated from Greece, but was used and ingrained in Ashkelon cook culture, is significant. The acquisition tells us that based on Hall (1998), pottery functions as a means of social integration. The adoption of the casserole shows that interactions between Greece and Ashkelon not only existed, but also overlapped in material culture, strictly in terms of form.

Yes, the form is established in Ashkelon’s cooking culture, but more importantly, it shows up exclusively in local fabric. Vessels generally need to be introduced into a society before they are adopted. At Ashkelon in the 7th century B.C., direct imports of Phoenician red slipped fine ware, from Phoenicia, precede the local occupants’ red slipped imitations (Stager et al 2011: pg 9, 97). The Phoenician store jar entered Ashkelon during Phoenician rule as imported fabric coming from the Phoenician coast. Soon after, the form was replicated in local fabrics (Master 2003: pg 57). Naturally, it is assumed that within the strata, there should be cassetoles from Greece before imitations appear. However, at Ashkelon there is currently no evidence for an imported stage of casserole before we see them in local fabrics. The people of Ashkelon jumped straight into localizing and adopting this form. More importantly, they make the form their own instead of acquiring it directly from Greece.
There is no evidence for an imported stage of casseroles before they appear in local clays. This transitional step does not exist. Trade alone, would not have provided an event large enough to produce the production of casseroles in local form. If there were an original casserole trade at Ashkelon from Greece, there would have been imported casseroles in the strata. Trade of a foreign form should also bring in with it foreign fabrics. This is not what is happening at Ashkelon.

Trade is also an unlikely trigger considering the first casseroles appear in both grid 51 and grid 38, a lower class and upper class neighborhood. If the addition of a cooking vessel was a product of trade, the form should initially function as a possession of the wealthy. The immersion of a foreign form, especially in foreign fabric, would not be an affordable commodity of the lower class. Cooking pots already serves the function of food production, so an extra vessel is superfluous spending, not to mention obsolete since it does not fit with the population’s habitus. The local casserole at Ashkelon is not one of luxury, since it is deposited in grid 51 and created in local material. It is reasonable to assume that this vessel functioned as a cooking vessel, and not a luxury acquired by trade.

A new vessel will not last in the strata for as long as it did without a significance social and cultural impact on the Ashkelon population. The casserole was ingrained into the local cooking culture. Trade alone would not have caused this prolonged fascination with Greek cooking. For the vessels to become a dominant form, persistent common use is necessary, outlined by Hodder’s requirements of efficiency of person-to-person contact (availability) and the extent and continuity of contact (use) (Hodder 1979: pg 446). A large Greek population at Ashkelon would
result in such constant and frequent desire for casseroles lasting the Hellenistic Period.

For someone to pick a casserole at the market, two requirements are necessary. First, the vessel must be accessible, monetarily and production-wise. Because the casserole shows up in grid 51 and grid 38, we know that the form was purchased by the wealthy and still cost efficient for the lower class. The local potters deemed the form popular enough to produce a worthwhile profit in the local economy as Ashkelon. The local market is producing this vessel in local material for all socio economic spheres of the city.

Second, the user needs to have prior knowledge how to use this form. If trade triggered casserole production, the local population would not know how to use this form. Greek people arriving at Ashkelon still possess their Greek culture, but live in a new land. Therefore, casseroles will be in use, in local material. Greek immigrants possess the prior knowledge needed to use, produce, and introduce this cooking form and practice into the Ashkelon society. Discussed earlier in chapter 1, Finkelstein (1997) believes the processes of assimilation tend to blur ethnic lines. I believe that the casserole displays this thought. The casserole, originally Greek, was brought over by Greek immigrants. The casserole is seen as a local vessel of the city, not a descriptor of a foreign Greek culture.

The start of the Hellenistic Period contained only globular cook pots then expanded by the start of the third century to accommodate the casserole. Anafa witnesses the same cooking transformation seen at Ashkelon. Berlin (1997) states, “Casseroles, on the other hand, are Greek in origin, and they are found in quantity
only at sites with Greek populations” (21). She agrees that Greek immigrants need to be present to introduce this foreign cook form and culture into the local cook practices. When casseroles appear in such large quantity over a consistent period of time, “[casseroles are] typical only to sites with at least largely Greek populations” (Berlin 1997: pg 23). At Anafa, Berlin concludes that Greek settlers largely influenced the Late Hellenistic (Berlin 1997: pg 21-22). Hellenized culinary habits, brought in with the casseroles, suggest that these sites had more than just Greek cultural exchange. Settlers must have settled at these locations in order to teach and popularize their cooking practices. Drawing from these parallels from Tel Anafa, Ashkelon also must see a large Greek population arriving at the start of the third century. From this point through the Hellenistic Period, the local population adopted Greek practices, becoming Hellenized by means of Greek settlers.

Vessels that represent a society will be the most desired. Because of habitus, what people desire is often how they are described. Thus, potters are selling the present culture, or what they best think a society will want. Potter’s make economic business decisions by producing vessels most profitable for the desired audience. In this case, the potter thinks casseroles will accurately represent the people. They are creating casseroles, meaning people’s cooking culture changed to accommodate the new form. For a potter to make this conscious addition of form into his repertoire, he must believe that the city prefers and is characterized by Greek culture, in terms of cooking vessels. The casserole is no longer for the ethnic Greeks. Instead, Culture shifts to accommodate this localized form, prompting a change in the habitus of the city and how Ashkelon views itself.
Vessels are produced for and bought in the realm of the public, but used in the realm of the private. Thus, for a pot to be introduced and used, ethnically Greek people with Greek internal habitus need to establish themselves at Ashkelon. The casserole is heavily produced in the middle and late Hellenistic at the site. The public, and their associate culture, must have adopted this originally Greek cooking practice as their own. The casserole successfully arrived by means of internal habitus, which resulted in the entry into public cook preference, shifting to a product of Ashkelon’s cultural habits.

A post processual thought, the casserole actively changed the culture of Ashkelon. Greek immigrants brought the form to Ashkelon, where it became a representation of the Ashkelon culture as a whole. These vessels described and facilitated the Hellenization of the city. Mentioned in chapter 1, Hodder (1979) states four implications 1) artifacts hold information 2) artifacts are a medium of communication between individuals and groups 3) artifacts express underlying needs and symbolize and support social relationships 4) artifacts signal social relations. His statements correlate to Ashkelon. The casserole facilitates a change in the way Ashkelon represented itself in terms of cooking culture. The casserole essential acted as a dialogue between the newly arriving Greek immigrants and the city. Agreeing with Hodder, the casserole signals this fluid social interaction and subsequent transformation into Hellenistic Ashkelon.

The acquisition of foreign goods alone does not facilitate a change in Habitus. Rather, the replication of them signifies cultural adaption and a change in outward public display. Trade can thus contribute to the Hellenization of the city, but cannot
easily alter the Habitus. The Hellenistic Period at Ashkelon sees a change in Habitus in terms of cook culture, which immigration, not trade, should facilitate. The infusion of Greek culture and practices in a city promotes Greek acculturation. Immigration produces a local replication of this foreign form. Because the local replication became a part of the daily cook practices, due to the large number of Greek settlers, the city can be described as having demonstrating a Hellenistic habitus.

Military, politics, and demographics supply the interaction needed to promote cultural diffusion and a change in Habitus. Ashkelon does not see large destruction in the stratigraphy, nor is there political strife large enough in the historical record. A large Greek population in the city, however, explains the casserole form and provides the lasting cultural contact needed to successfully alter the city’s cooking habits.

The established localization of casseroles throughout the Hellenistic Period acts as a descriptor for cook culture. Based on this study, Ashkelon was a Hellenized society in which habitus shifted to accommodate the casserole. Berlin (1997) agrees that, “a given assemblage must be considered an artifact in and of itself, reflecting a particular groups specific needs and desires” (1). The samples are an adjective of the constituents of Ashkelon. The local replication and integration of the casserole describes a Hellenized cooking society.

Agreeing with the post processual theorists, local casserole production, introduced by Greek settlers, actively changed the identifying cook culture at Ashkelon during the Hellenistic Period. Mentioned in chapter 1, Hall (1998) explains this thought further saying that pottery functions as a means of social integration beyond the immediate internal habitus. The casserole form entered Ashkelon via
immigration, was produced in local fabric, merged in with the local economic industry and daily cooking life, and, thus, added to the city’s habitus. With diffusing cooking practices, the city morphed and evolved, allowing the form to change the cooking culture and industry. Agreeing with the post processualists, the casserole actively contributed to the habitus of Hellenistic Ashkelon, triggered by means of Greek immigration.
Note: Professional drawings for these sherds as of April 10th 2015 are not yet available. The following plates do not contain all 30 sherds from this study, but rather, a representation of every form and associated variations.

The Cooking Pots
The Casseroles

Sample 13: Late Phase 9/ Early Phase 8 Angled Rim Casserole

Sample 25: Late Phase 10 Angled Rim Casserole Profile

Sample 26: Late Phase 9/ Early Phase 8 Casserole Lid Profile

Sample 12: Late Phase 9/ Early Phase 8 Angled Rim Casserole Profile

Sample 30: Late Phase 8/ Early Phase 7 Angled Rim Casserole with Ridged Body Profile

Sample 14: Late Phase 9/ Early Phase 8 Angled Rim Casserole Profile
Plate 3

The Plain Ware Bowls and Jars

Sample 1: Phase 10 Plain Ware Bowl Profile
Sample 2: Phase 10 Plain Ware Bowl Profile

Sample 6: Phase 10 Plain Ware Jar
Sample 6: Phase 10 Plain Ware Jar Profile
Plate 4

The Brazier

Sample 10: Late Phase 9/Early Phase 8 Brazier Profile 11cm

The Import from Greece

Sample 23: Early Phase 9/Late Phase 8 Fish Plate with Curved Rim 25cm
Plate 5

The Imports from Southern Phoenicia

Sample 11: Early Phase 9/ Late Phase 8
Eastern Sigillata A

Sample 17: Late Phase 9/ Early Phase 8
Carinated Cup Profile

Sample 19: Early Phase 9/ Late Phase 8
Incurved Rim Bowl Profile

Sample 20: Early Phase 9/ Late Phase 8
Incurved Rim Bowl Profile

Sample 21: Late Phase 8/ Early Phase 7 Incurved Rim Bowl

26cm
Plate 6

The Import from Pergamon

Sample 29: Late Phase 8/ Early Phase 7 Baking Tray Profile

5 cm
Plate 7

Whole Form Cooking Pot Drawings

From Berlin 1997: pg 264-265, plate 20 and 21
Plate 8

Whole Form Casserole Drawing

From Berlin 1997: pg 272, plate 28

Whole Form Baking Tray Drawing

From Berlin 1997: pg 278, plate 34
Bibliography


Kate Birney (forthcoming) Final Reports of the Leon Levy Expedition to Ashkelon vol. 10.


