

ABSTRACT

KEY, TIFFANY, NICOLE. Ceramic Exchange and the Late Roman Army in *Palaestina*: The Evidence from 'Ayn Gharandal (*Arieldela*) (Under the direction of S. Thomas Parker)

Throughout the third and fourth centuries C.E. the Roman military experienced several alterations in both organization and administration. The Emperors Diocletian and Constantine were largely responsible for these changes which shaped the nature of the military along the southeastern frontier of the empire. The presence of several military forts and fortlets in this region of the Roman Empire is a topic that has been studied in great detail to help ascertain the purpose of the *limitanei*, or frontier troops in this area.

The site of 'Ayn Gharandal is one of these smaller military sites, which lies along the modern day border of Israel and Jordan. The harsh and arid climate of Wadi Araba restricts the amount of agricultural sustainability in the region though appears not to have severely limited the military presence, largely centered near desert oases. With these harsh desert conditions, scholarship has focused on the reason so many military installations exist along this frontier and the obligations imposed upon these troops. The ceramic material at 'Ayn Gharandal is utilized as a case study to evaluate the degree of sustainability and to understand how the transit routes along the southeastern frontier connect Wadi Araba to other areas of the Roman Empire. This analysis takes into consideration both the intra- and extra-provincial ceramic material and how the presence of coarse wares, fine wares, and amphorae relate to trade relations and supply of the Roman military. Furthermore, this ceramic information is utilized to evaluate the supply of the *limitanei* along this frontier and how ceramics may reflect the importation of products related to the governmentally supplied *annona militaris*.

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Ceramic Exchange and the Late Roman Army in *Palaestina*: The Evidence from 'Ayn
Gharandal (*Arieldela*)

by
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BIOGRAPHY

Tiffany Key is a native of North Carolina, originally from the small town of Pilot Mountain. Upon the completion of high school, Tiffany was awarded the North Carolina Teaching Fellows scholarship to aid her undergraduate studies. She attended North Carolina State University as an undergraduate from 2006-2011 where she majored in both Agriculture Education, with a concentration in Horticulture, and History. In 2011 she entered the graduate program in History at North Carolina State University, focusing primarily on Ancient History and Classical studies.

From 2011 to the present Tiffany has worked in Jordan, attending several archaeological projects as a trench supervisor and ceramologist. Her tenure with the ‘Ayn Gharandal Archaeological Project (AGAP) inspired the current thesis research, evaluating ceramic vessels and trends as they relate to movement of products along the eastern frontier of the Roman Empire.

Based on this research, Tiffany has presented these findings at many regional and national conferences and has co-published an article on the AGAP material. In 2014, Tiffany began teaching agriculture education at the high school level.

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As I am sure many people know, graduate school is a trying experience with moments of doubt, failure, and frustration, in addition to those moments of success, excitement, and summers full of excavations. In my tenure at NCSU, the one constant has always been the group of friends who experienced each of these things with me. These people have helped make the long lab days shorter, the late library nights more entertaining, the “work weekends” less work-like, and have more importantly, made this process a life changing experience. For the girls: Pam, Sarah, Anna, Cassie, Jayd, Ashley, Kristie, and Amanda- thank you for the shopping trips, the laughs, the parties, the awesome dance music, and the wine nights. To Pam- my partner in crime, I am so eternally grateful we went through this experience together. I wouldn't trade my summers working with you for anything. We've both learned so much and accomplished so much in the last four years it's hard to describe them all. Instead I'll just say thank you- for the lab days, the dig days, the Target trips, the wine nights, the “study” nights, the movie dates, and everything else. To Sarah- thanks for celebrating your birthday with me ☺! You've been the best office partner I could

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took a chance on Pam and me, trusting us with the pottery from this massive and important site in the middle of Petra. I feel it is safe to say that without this opportunity, I would not have experienced nearly as much as that first summer. That summer I also met Jennifer Ramsey, who has helped me work through two previous thesis topics and has “opened my eyes” to see how crazy they each were. It may not seem like a lot, and coming out of this process six years later may be hard to believe, but your advice saved me more trouble and frustration than you can imagine.

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TABLE OF CONTENTS

LIST OF TABLES	viii
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
CHAPTER 1: Introduction	1
CHAPTER 2: The Ceramic Material from ‘Ayn Gharandal	23
CHAPTER 3: The Intra-provincial Trade Connections.....	102
CHAPTER 4: The Extra-provincial Trade Connections	118
CHAPTER 5: Supplying the Southeastern Frontier: An Analysis of Military Sites in <i>Arabia</i> and <i>Palaestina</i>	128
REFERENCES	150

LIST OF TABLES

Table 1.1: Distribution of cultivated plant material from el-Lejjun.	13
Table 2.1: Registered diagnostic sherds from ‘Ayn Gharandal.	25
Table 2.2: Distribution of registered sherds from the fort.	26
Table 2.3: Distribution of the fabric/ware of ceramic material.	27
Table 2.4: Fabric quantification of diagnostic coarse wares.	29
Table 2.5: Percentage comparison of the Aila fabrics.	30
Table 2.6: Fabric quantification of registered fine wares.	32
Table 2.7: Distribution of NPFW sherds.	35
Table 2.8: Classification of amphorae.	38
Table 2.9: Amphorae descriptions.	40
Table 2.10: Registered diagnostic cooking wares.	42
Table 2.11: Registered cooking wares by fabric.	43
Table 2.12: Distribution cooking pot Type 1.	44
Table 2.13: Distribution cooking pot Type 2.	45
Table 2.14: Distribution cooking pot Type 3.	45
Table 2.15: Distribution cooking pot Type 4.	46
Table 2.16: Distribution cooking pot Type 5.	46
Table 2.17: Distribution cooking pot Type 6.	47
Table 2.18: Casserole distribution.	49
Table 2.19: Cooking lid distribution.	51
Table 2.20: Distribution of registered table and storage wares.	53
Table 2.21: Distribution of the major table/storage wares by fabric.	53
Table 2.22: Distribution of the minor table/storage wares by fabric.	54
Table 2.23: Distribution of bowl Type 1.	55
Table 2.24: Distribution of bowl Type 2.	55
Table 2.25: Distribution of bowl Type 3.	56
Table 2.26: Distribution of bowl Type 5.	56
Table 2.27: Distribution of bowl Type 9.	57
Table 2.28: Distribution of cup Type 1.	59
Table 2.29: Distribution of cup Type 2.	59
Table 2.30: Distribution of jar types by fabric.	61
Table 2.31: Distribution of jug types by fabric.	63
Table 2.32: Distribution of unidentified forms.	66
Table 2.33: Diagnostic material for Locus 4106.	71
Table 2.34: Diagnostic material for Locus 4114.	72
Table 2.35: Occupational levels in the Western room of Eastern Ridge.	72
Table 2.36: Distribution of the material in the Western Room on the Eastern Ridge.	73
Table 2.37: Distribution of fabrics in the Western Room on the Eastern Ridge.	73
Table 2.38: Distribution of diagnostic vessel forms from the bathhouse.	76
Table 2.39: Distribution of amphorae in the bathhouse.	76
Table 2.40: Distribution of vessel forms in Square C:1/7.	79

Table 2.41: Distribution of imported material in Square C:1/7.	79
Table 2.42: Amphorae in Square C:1/7.	80
Table 2.43: Diagnostic material from Square A:3-7, Locus 3223.	84
Table 2.44: Diagnostic material from Square A:3-7, Locus 3262.	84
Table 2.45: Distribution of vessel forms from Square A:4-3/7-6.	85
Table 2.46: Amphorae types in Square A:4-3/7-6.	85
Table 2.47: Imported material in Square A:4-3/7-6.	86
Table 2.48: Distribution of diagnostic material from Square A:6-5/4-3.	88
Table 2.49: Distribution of vessel forms from Square A:4-3/7-6.	89
Table 2.50: Amphorae types in Square A:6-5/4-3.	89
Table 2.51: Distribution of vessel forms in Square A:6-5/4-3.	90
Table 2.52: Locus 3322.	91
Table 2.53: Locus 3358.	92
Table 2.54: Locus 3325.	92
Table 2.55: Locus 3361.	93
Table 2.56: Locus 3369.	94
Table 2.57: Locus 3353.	94
Table 2.58: Locus 3356.	95
Table 2.59: Distribution of vessel forms in Square B:2-1/1-1.	97
Table 2.60: Amphorae in Square B:2-1/1-1.	98
Table 2.61: Fabric distribution in Square B:2-1/1-1.	99
Table 4.1: Distribution of central Jordan diagnostic material.	121
Table 5.1: Fabric identification of Yotvata pottery.	136
Table 5.2: Typological comparison between Gharandal and Yotvata.	138
Table 5.3: Typological comparison between ‘Ayn Gharandal and Mezad ‘En Hazeva.	139
Table 5.4: Typological comparison between ‘Ayn Gharandal and LAP excavation sites. ..	141
Table 5.5: Typological comparison between ‘Ayn Gharandal, el-Lejjun, and Da’janiya... ..	144

LIST OF FIGURES

Figure 1.1: Map of the Roman Provinces in the second century	3
Figure 1.2: Map showing the Roman provinces in the late third century	4
Figure 1.3: Principate legionary fortress	6
Figure 1.4: Legionary fortress at el-Lejjun	7
Figure 1.5: Fourth century quadriburgia from around the empire.	8
Figure 1.6: Military garrisons in the fourth century along the eastern frontier.	17
Figure 1.7: Wadi Araba	18
Figure 1.8: Early site plan of ‘Ayn Gharandal	20
Figure 1.9: Military sites along the southeastern frontier	22
Figure 2.1: NPFW dekorphases	33
Figure 2.2: Fine Byzantine Ware (FBW)	35
Figure 2.3: ARS forms at ‘Ayn Gharandal.	37
Figure 2.4: Cooking pot typology	48
Figure 2.5: Casserole typology.	50
Figure 2.6: Cooking Lid typology.	52
Figure 2.7: Bowl typology.	58
Figure 2.8: Cup typology.	60
Figure 2.9: Jar typology.	62
Figure 2.10: Jug typology.	64
Figure 2.11: Byzantine painted coarse ware (BPCW) from RAP.	65
Figure 2.12: Lamp profiles from ‘Ayn Gharandal	67
Figure 2.13: Pipe & Stopper from ‘Ayn Gharandal	69
Figure 2.14: Tabûn from A:6-5/4-3.	69
Figure 2.15: Final excavation photograph for the Eastern Ridge.	71
Figure 2.16: <i>In-situ</i> tubuli from the bathhouse.	77
Figure 2.17: Excavation areas at ‘Ayn Gharandal.	77
Figure 2.18: Final excavation photo for C:1/7.	80
Figure 2.19: Final excavation photos for A:4-3/7-6.	82
Figure 2.20: Final excavation photos for A:6-5/4-3.	87
Figure 2.21: Complete vessels from Locus 3329	88
Figure 2.22: Gate arch collapse with inscription stone.	96
Figure 2.23: Ceramic assemblages from B:2-1/1-1	97
Figure 2.24: Final Excavation photo of B:2-1/1-1	99
Figure 3.1: Provincial redistribution of Palaestina	105
Figure 3.2: Road systems in Wadi Araba	106
Figure 3.3: Major cities along the Incense Road.	108
Figure 5.1: Dedicatory inscriptions from ‘Ayn Gharandal and Yotvata.	132

LIST OF ABBREVIATIONS

AGAP- ‘Ayn Gharandal Archaeological Project

ARS- African Red Slip

BPCW- Byzantine Painted Coarse Ware

CASS- Casserole

CL- Cooking Lid

CP- Cooking Pot

CRS- Cypriot Red Slip

CTh- *Codex Theodosianus*

ERS- Egyptian Red Slip

ESA- Eastern Sigillata A

FBW- Fine Byzantine Ware

LAP- *Limes Arabicus* Project

NFW- Nabataean Fine Ware

NPFW- Nabataean Painted Fine Ware

NSFW- Nabataean Semi-Fine Ware

PRS- Phocaeen Red Slip

RAP- Roman Aqaba Project

UD- Unidentified

UDFW- Unidentified Fine Ware

CHAPTER 1: Introduction

This thesis focuses primarily on two areas of research. The first is the analysis of the ceramic material from ‘Ayn Gharandal, a Late Roman auxiliary fort in Wadi Araba, Jordan. The second is the role of the eastern *limitanei*, as it pertains to trade and supply in the region. By combining these two interests, the purpose of this thesis is to evaluate the role of the Roman government in supplying smaller military sites along the eastern frontier of the empire utilizing ceramic evidence. This introduction will first provide a brief history of the Roman military in the fourth century¹ when ‘Ayn Gharandal was occupied. Following will be a review of the relevant primary sources, including documentary and archaeological sources, with a summary of current academic scholarship on the Roman military supply systems in the east. Concluding this chapter is a description of the natural environment surrounding the site of ‘Ayn Gharandal, the military site itself, and an outline of the broader significance of this thesis.

The ability to analyze the intricate details of the Roman military system comes first from an understanding of its historical development. While an exhaustive discussion of the Roman military would fall beyond the constraints of this thesis, an outline of Roman military organization throughout the third and fourth centuries places the current topic in context. It is imperative to begin by describing the empire-wide military changes occurring under both Diocletian and Constantine. Following this, the discussion will focus specifically on the southeastern frontier of the Empire and the debate surrounding the mission of the military.

¹ All dates will be C.E. unless otherwise indicated.

Lastly, the ceramic material at ‘Ayn Gharandal in southern Jordan will be introduced as a case study for understanding questions of military supply and trade on the eastern frontier.

The Roman Emperor Diocletian (r. 284-305) rose to power after a half century of instability in the Empire. During his reign, he reformed many aspects of the Roman state and significantly altered its structure. The provincial reorganization instituted by Diocletian included a reformation of the military forces, strengthening the empire’s frontier defenses. Scholars debate whether the increased security measures were part of a conscious Roman “grand strategy” to build an empire-wide “defense-in-depth” structure, or, rather, an attempt to organize a temporary solution. A “defense-in-depth” system would discourage further penetration beyond the frontiers, adding layers of defensive structures in the “frontier zone.” Skeptics argue that to credit such an organized system to the Romans over-interprets the documentary, epigraphic, and archaeological remains. What is certain through archaeological research is that additional military structures appear in the late third and early fourth centuries, including the eastern frontier. Regardless of the motivations, it is obvious that a significant change occurred throughout the Roman military during this time.²

² Edward Luttwak (Luttwak, E., *The Grand Strategy of the Roman Empire*, London: Weidenfeld Nicolson, 1976) argues for three developmental phases of Roman grand strategy, the last being the “defense-in-depth” model. Other scholars, such as Benjamin Isaac (Isaac, B., *The Limits of Empire: the Roman Army in the East*, Oxford: Clarendon Press, 1990) and C. R. Whittaker (Whittaker, C. R., *Frontiers of the Roman Empire: A Social and Economic Study*, Baltimore: The Johns Hopkins University Press, 1994) disagree with Luttwak’s generalizations of “Roman strategy.” Whittaker argues against the idea of a static frontier, or a demarcated boundary, stating the difficulty in clearly defining the limits of Rome’s territory, envisions the frontiers as “zones,” and sees very little difference in frontier defense from the second to fourth centuries (Whittaker, *Frontiers*, 1994: 68, 199, 206-208.) Isaac cautions against generalizing function based on form, though he is speaking specifically of the Arabian frontier (Isaac, *Limits of Empire*, 1990: 187.)

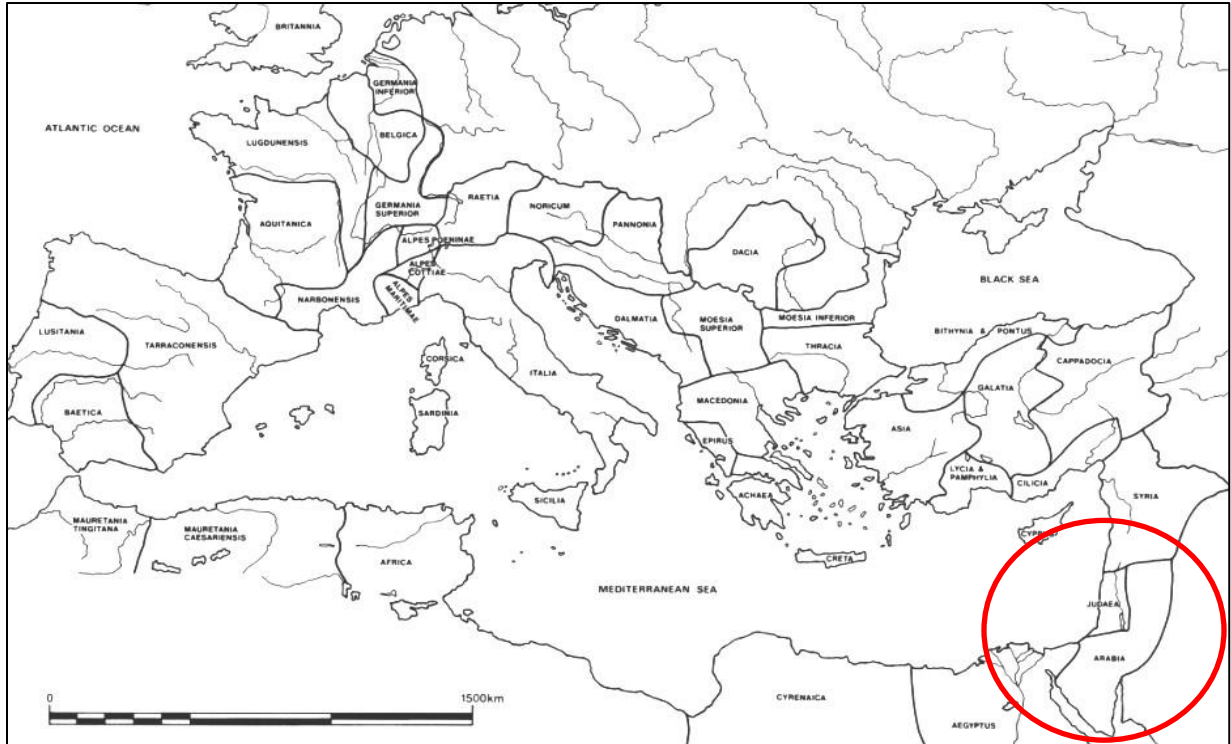


Figure 1.1: Map of the Roman Provinces in the second century, highlighting the eastern province of Arabia (After Southern, P. & K. Dixon, *The Late Roman Army*.)

It was at this time that Diocletian began restructuring the Roman Empire through a reorganization of the Roman provinces. Prior to this period, a single governor in each province wielded both civil and military authority. Each governor directed an immense geopolitical area, which granted them significant power and resulted in many attempted usurpations in the mid-third century. This posed a threat to the central government, forcing Diocletian to limit the power of individual governors.

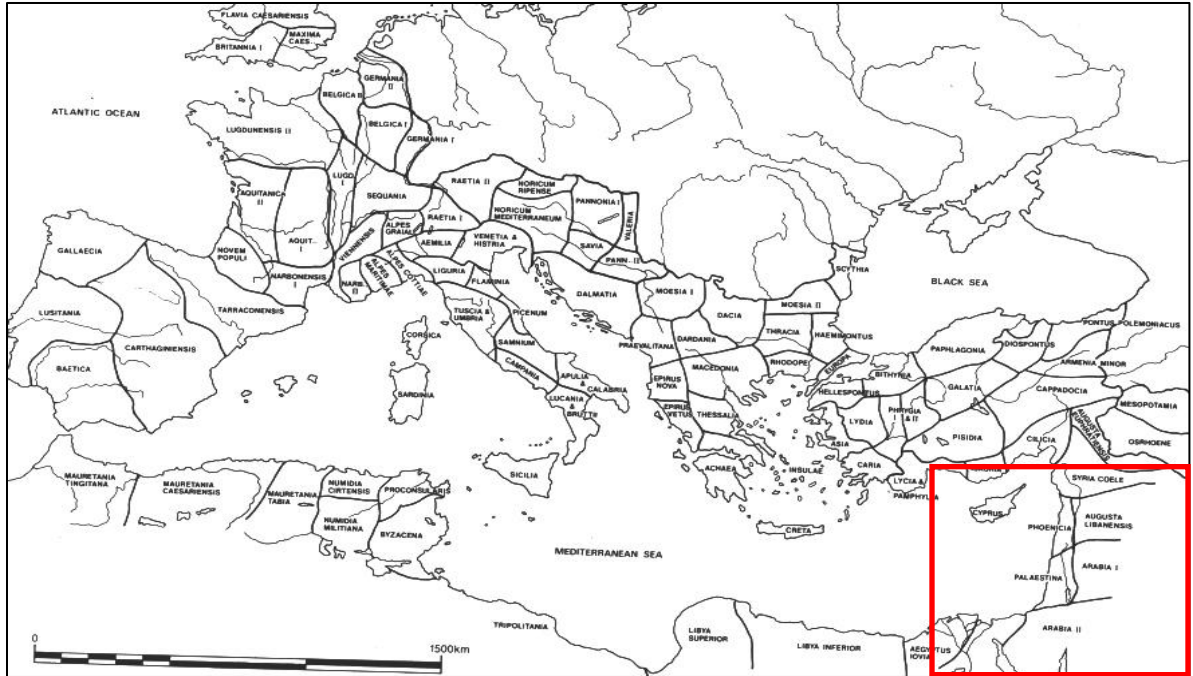


Figure 1.2: Map showing the Roman provinces in the late third century. The changes present in the east are highlighted. (After Southern, P. & K. Dixon, *The Late Roman Army*.)

First, he reduced the size of each province by subdividing them into smaller provinces. The second major modification involved separating civil from military authority in each province. Diocletian accomplished this by creating a second governor, or *dux*, as a military commander who had no civil authority. The *dux* commanded the military units within individual provinces; however, in some cases his authority would reach into neighboring provinces. This subdivision increased not only the number of provinces, but also the number of provincial governors; effectively reducing their power and strengthening their administrative control. This divided leadership limited the power of individual provincial

governors, required cooperation in order for each province to function successfully, and diminished the chances for revolt.³

To complement these administrative changes, Diocletian also restructured Roman military and frontier organization. These reforms included reductions in individual unit size, modifying the configuration of fortifications, and a new defensive frontier strategy. Legions, previously (at least nominally) consisting of ca. 5,000 men, were drastically cut to ca. 1,000-2,000 men. Comparatively, auxiliary units were likely decreased from their original Principate strength of 500 to 100-200 troops depending on the individual units. In contrast to the decreased unit sizes, Diocletian increased the number of legionary and auxiliary units and redistributed them across the empire. One example of these new legions is *legio IV Martia* stationed at the legionary fortress of el-Lejjun, east of the Dead Sea in modern day Jordan. This site documents the disparity between legionary fortresses of the Principate (30 B.C.E – 284) and the Tetrarchy (284-324). Constructed around 300, the fortress of el-Lejjun covers only 4.6 ha. or less than 25% of Principate legionary fortresses which averaged ca. 20 ha. While el-Lejjun could not sustain a legion of 5,000 men, it could easily house the 1,000-2,000 men of the newly reorganized legions.⁴

³ See **Figure 1.1**, (Southern, P. & K. Dixon, *The Late Roman Army*, New Haven: Yale University Press, 1996: 182) for a map of Roman provinces in the mid-second century. **Figure 1.2** (Ibid: 183) shows the provincial divisions of Diocletian in the late third century. Southern and Dixon provide a brief introduction to the administrative division of the provinces under Diocletian (Southern and Dixon, *Late Roman Army*, 1996: 23). The provinces were approximately doubled from 50 to 96 during this time.

Williams, S., *Diocletian and the Roman Recovery*, New York: Methuen, Inc., 1985: 102-9. Williams provides a detailed review of the civil and military innovations for the restructuring of the provinces.

⁴ Kennedy, D., *The Roman Army in Jordan*, London: The Council for British Research in the Levant, 2004: 51-2; Parker, S.T., “History of the Roman Frontier East of the Dead Sea,” in Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project*, Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006: 541-546. Southern, P. & K. Dixon, *The Late Roman Army*, 6. Holder, P. “Auxiliary Deployment in the Reign of Hadrian,” in *Bulletin of the Institute of Classical Studies*, 46:S81, 2003:

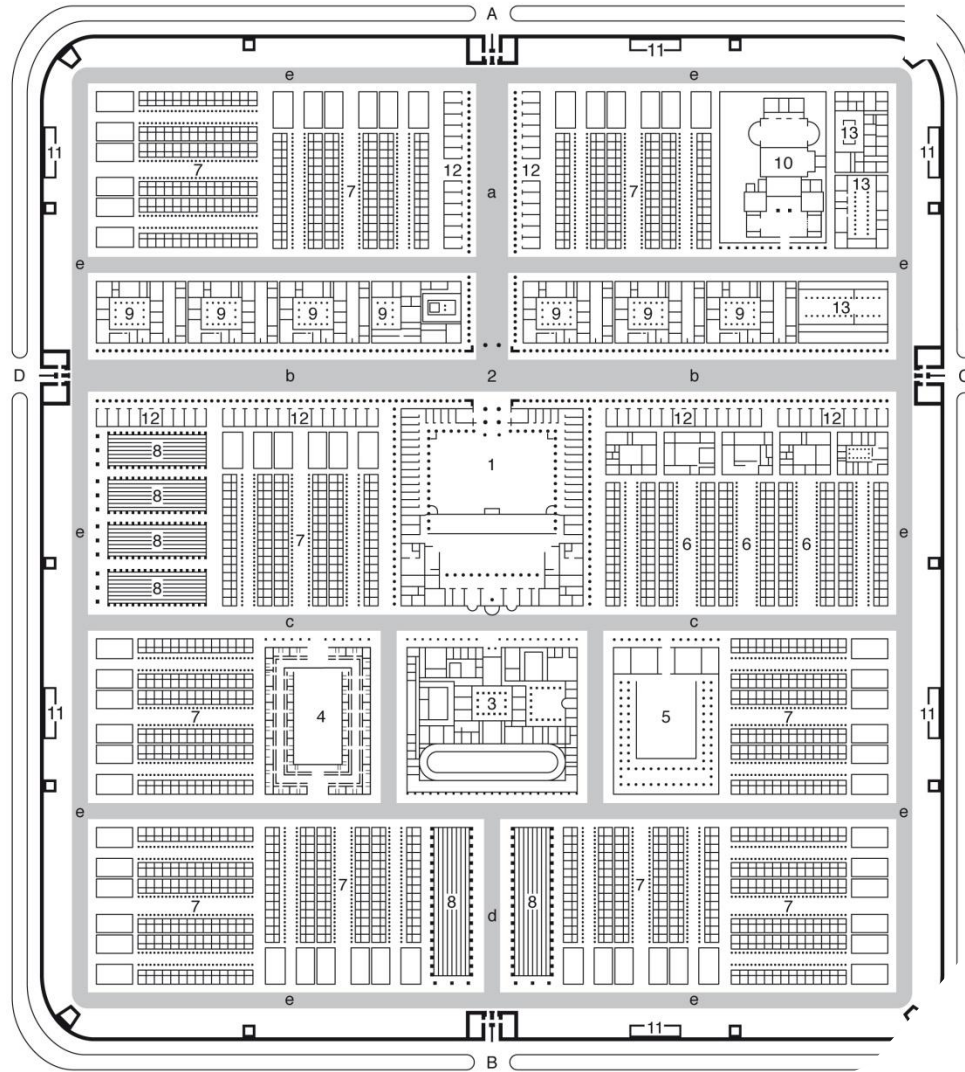


Figure 1.3: General design of a Principate legionary fortress. This image displays the common “playing card design and highlights the large size of the earlier fortresses. (Image courtesy of S. Hoss.)

120. For a detailed examination of the size of the Roman army during the Principate see Webster, G., *Roman Imperial Army of the First and Second Centuries A.D.*, London: Adam and Charles Black, 1969: 113-155.

Webster notes that fortresses of the Principate are typically fifty to sixty acres in area. (*Roman Imperial Army*, 1969: 182) Parker’s excavations at el-Lejjun showed the fortress to cover an area of approximately 4.6 hectares (11.37 acres). As Parker noted this estimates the Tetrarchic fortress at 20% of the size of Principate legionary fortresses. (Parker, “History of the Roman Frontier,” 2006: 546). See **Figure 1.3** (le Bohec, Y., *The Imperial Roman Army*, B.T. Batsford Ltd: London, 1989: Pl. 31.) and **Figure 1.4** (Parker, “History of the Roman Frontier,” 2006: Fig 3.5) for a comparison of the fortresses.

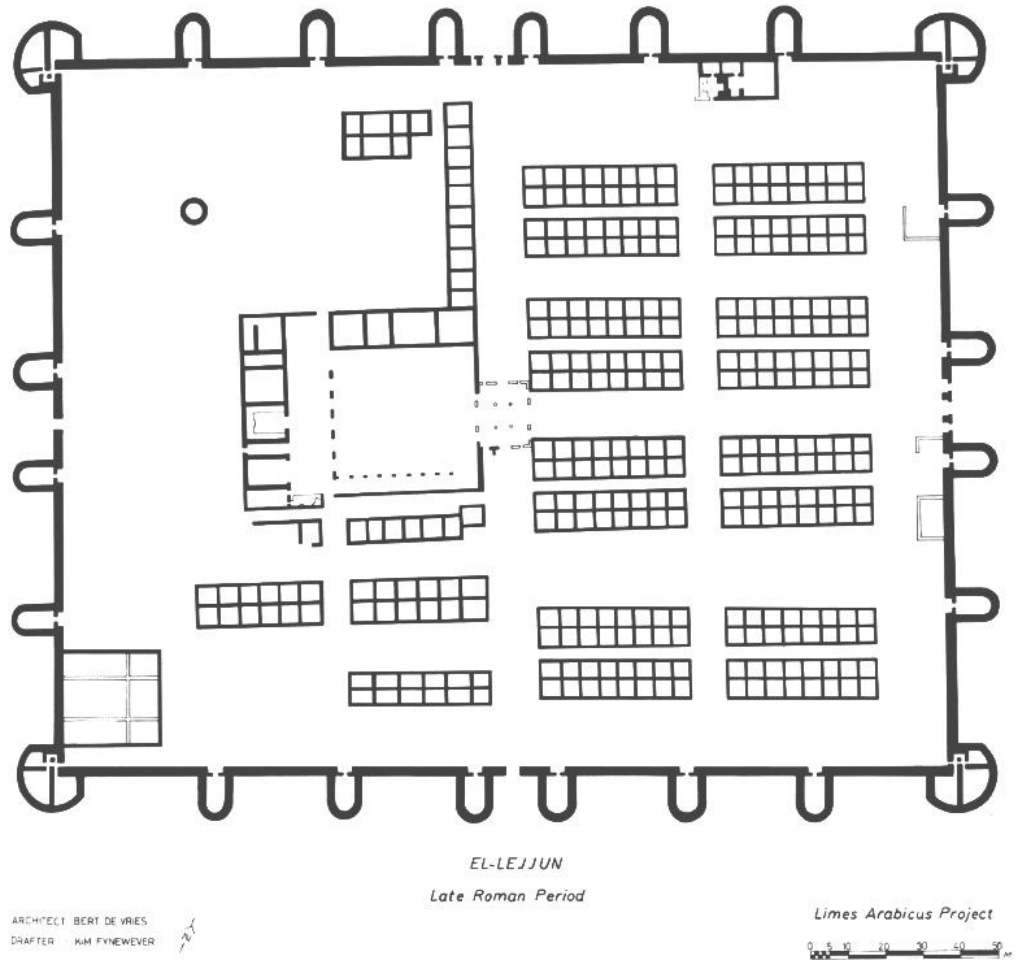


Figure 1.4: Image of the legionary fortress at el-Lejjun. The later fortress design has projecting towers and a much smaller surface area, 4 ha. (Image from Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project*, Fig 3.5)

Abundant archaeological evidence indicates that striking changes to the design of military fortifications were made under Diocletian. From the first to early third centuries, Roman forts were generally characterized by their “playing-card” shape. Their designs commonly featured large interiors, gates which bisected each of the four walls, as well as interval and corner observation towers. Primarily, forts at this time were utilized as secure bases from which the army was deployed for offensive attacks. The construction technique

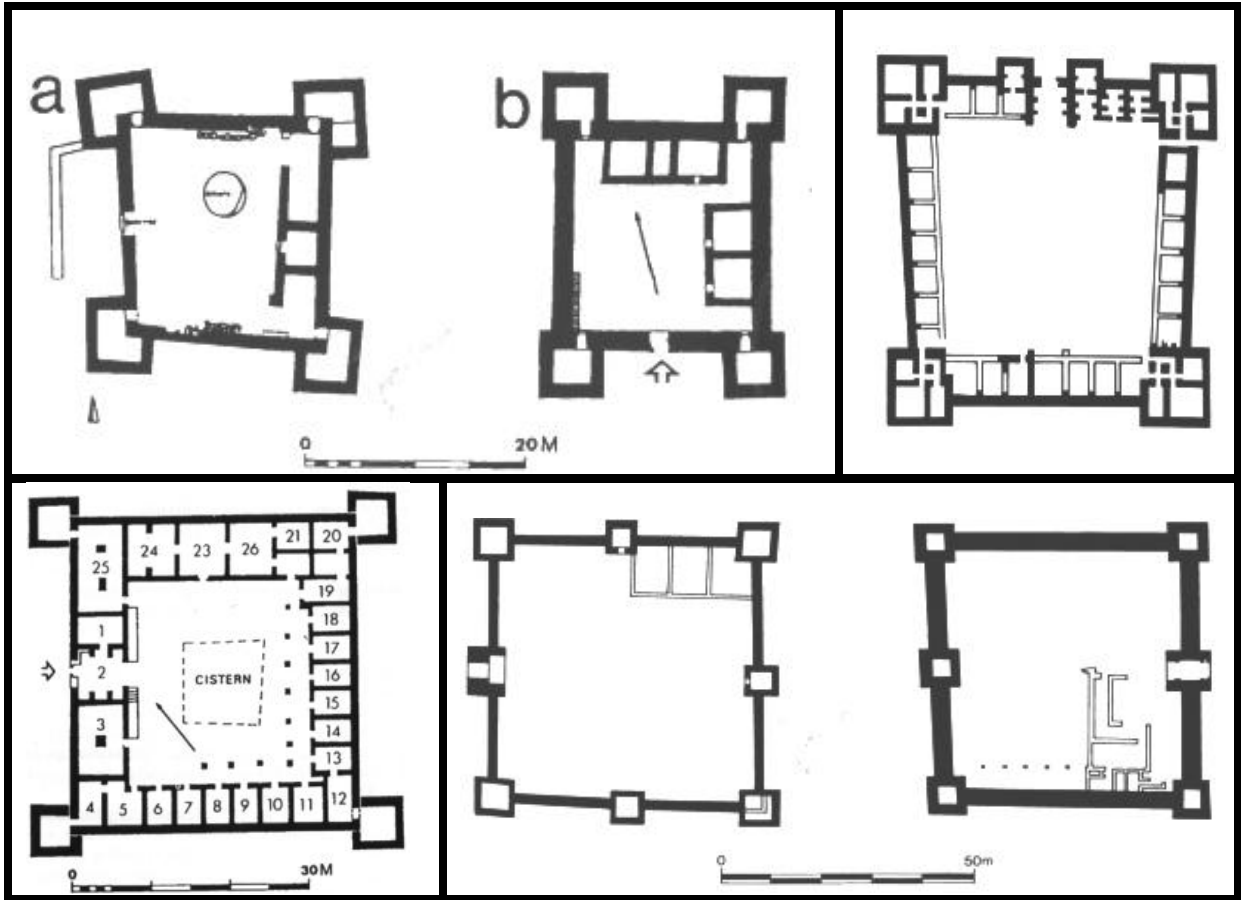


Figure 1.5: Examples of fourth century quadriburgia from around the empire. [Top left: Upper Zohar, Ein Boqeq; Top Right: Qashr Bashir; Bottom Left: Mezar Tamar; Bottom Right: Irgenhausen & S chaan.] (Modified from Kennedy, D., *The Roman Army in Jordan*, 210; and Southern, P. & K. Dixon, *The Late Roman Army*, 136-7.)

allowed the military units inside to be safe against surprise attacks, but was not meant to withstand a long siege. The Roman army of that period mainly met their enemies in the open field. By the late third century this manner of construction was altered in favor of smaller, heavily-defended forts. These later forts had projecting corner towers, more interval towers along the higher and thicker curtain walls, and often only a single gate. In most forts, the interior rooms were also built against the side of the curtain walls, facing a central courtyard. Such changes suggest that at this time, forts were designed as defensive bastions and imply a

significant change in military tactics. Found throughout the empire, this new style of fort was especially common along the eastern frontier as part of a larger defensive system which increased the number of smaller fortifications on the periphery. This system linked legionary bases by roads with smaller auxiliary forts and watchtowers to create a border defense that was further refined under Constantine. It is the shift to smaller more numerous units combined with the development of stronger but smaller but more compact fortified bases and other fortifications, which suggests that Diocletian changed not only military tactics, but also strategy in order to defend the frontiers.⁵

The Constantinian reforms of the early fourth century built heavily upon those of Diocletian. Where Diocletian focused on reforming administrative and defensive structures, Constantine modified the basic organization of the army itself. His actions resulted in a clear division between the mobile field army, *comitatenses*, and the frontier troops, *limitanei*. The mobile forces were generally concentrated in larger strike forces behind the main line of defense to be readily deployed to threatened areas. The *comitatenses* were not permanently stationed, making it difficult for scholars to understand their responsibilities based purely on archaeological remains. Primary sources detail the organization of the *comitatenses* and *limitanei*, both of which included infantry and cavalry units; however they also acknowledge that a higher status was attributed to the *comitatenses* over that of the *limitanei*.⁶

⁵ Southern and Dixon, *Late Roman Army*, 1996: 136-8; Kennedy, *The Roman Army in Jordan*, 2004: 51; Oleson, J. P., "Trajan's Engineers and the Roman Fort at al-Humayma (Ancient Hawara, Jordan)," in *Studies in the History and Archaeology of Jordan*, 10, 2009:535-547. See **Figure 1.5** (Southern, P. & K. Dixon, *The Late Roman Army*, 1996:136-137 and Kennedy, D., *The Roman Army in Jordan*, 2000:210) for image of third/fourth century *quadriburgia*. For more information on Principate auxiliary fort design see Webster, *Roman Imperial Army*, 1969: 204-220.

⁶ Southern and Dixon, *Late Roman Army*, 1996: 33-38; Jones, A.H.M., *The Later Roman Army*, Baltimore: The Johns Hopkins University, 1964: 607-686; van Berchem, D., *L'Armée de Dioclétien et la Réforme*

The *limitanei* are typically defined as troops stationed within a *limes*. To fully understand the role of the *limitanei*, it is necessary to define the meaning of the term *limes* in the fourth century. The most commonly accepted definition of *limes* in this period is a “frontier zone” controlled by a *dux*. Using this definition, the *limitanei* would then be identified as soldiers who are stationed within a designated frontier zone. Though the *limitanei* could be promoted to serve as units of *pseudocomitatenses*, it is suggested throughout the *Codex Theodosianus* that the military service provided by the *limitanei* was less prestigious when compared to that in the *comitatenses*. For example, a law from 443 states that sons of veterans “who are deficient in physical strength or in stature whereby they would be eligible for service in the field troops can be joined to the river patrol troops” (*CTh.* 7.22.8), once again, implying a lower standard placed upon the *limitanei*.⁷

Since the *limitanei* were permanently deployed on the exterior limits of the empire questions arise as to when their obligations expanded to non-military matters beyond defense. Documentary and archaeological evidence both indicate that the *limitanei* at some point began cultivating lands assigned to them outside their forts, though it is unclear when this began.

Constantiniennes, Paris: Imprimerie Nationale, 1952: 87; The *Codex Theodosianus* (7.13.7.3) grants greater exemptions for field troops than frontier troops or “shock troops and auxiliaries in the river patrol.”

⁷ Isaac, *Limits of Empire*, 1990: 161; Isaac, B., “The Meaning of the Terms *Limes* and *Limitanei*,” in *The Journal of Roman Studies*, 78, 1988:125-47; Jones, *Later Roman Empire*, 1964: 651. In his 1988 article, Isaac outlines the history of the term *limes* through ancient sources. With this information, he gives a historical representation of how the term developed from its original connotation as a military road, to a boundary, and even a frontier zone from its first appearance in 10 C.E.

The *limitanei* units who were promoted to the *comitatenses* were called *pseudocomitatenses* in the *Notitia Dignitatum*. The river patrol troops mentioned in the *Codex* are specifically the *riparienses*. These were troops of a slightly higher grade than the *limitanei* who received higher wages, though were essentially the same kind of frontier forces.

Documentary sources, such as the *Theodosian Code*, granted the territory surrounding border forts to soldiers as early as 423. In 423, a law stated,

“[i]f any person should hold possession of the lands of the border fortresses...he shall withdraw and abandon such property, because it is lawful that the territories of the fortresses be possessed only by those persons to whom they have been assigned and about whom antiquity has decided.” (7.15.2)⁸

A Novel of Theodosius II, added to the *Theodosian Code* in 443, granted land rights to the frontier soldiers. This *novella* reads, “It is our will that the fields of the borders.... which according to the ancient regulation the border militia themselves were accustomed to care for and to cultivate for their own profit... shall be held by them [the border militia]... if such fields are being cultivated by them at the present time.” (Th. *Nov.* 24.1.4) This confirms that *limitanei* were farming this land outside their forts—significantly supplementing the government supplied *annona*—yet also intimates this practice began prior to the installation of the law as it was in accordance to “ancient regulations.” A sixth century reference from the *Codex Justinianus* further illustrates the connection between the *limitanei* and the land, stating the frontier troops not only “...defend the camps and cities of the border, [but] cultivate the fields...” (1.27.2.7), implying a tradition of land use, which persisted throughout the fifth and sixth centuries.⁹

⁸ The full text from the *Codex Theodosianus* reads: “*Idem aa. asclepiodoto praefecto praetorio et consuli ordinario. quicumque castellorum loca quocumque titulo possident, cedant ac deserant, quia ab his tantum fas est possideri castellorum territoria, quibus adscripta sunt et de quibus iudicavit antiquitas. quod si ulterius vel privatae condicionis quispiam in his locis vel non castellanus miles fuerit detentator inventus, capitali sententia cum bonorum publicatione plectatur. dat. non. mart. constantinopoli asclepiodoto et mariniano cons.*”

⁹ Isaac, who argues specifically for a mid-fifth century beginning of direct land cultivation by the *limitanei*, notes that the law of 443 marks the “first [literary] reference of lands worked by soldiers for their own use and profit.” Though, as he claims, this does not indicate this process is hereditary or a detriment to the effectiveness of the forces. (Isaac, “*Limes and Limitanei*,” 1988:145).

In an effort to address this issue, the *Limes Arabicus* Project conducted field research along the Arabian frontier from 1980 to 1989. A principal goal was to determine when the *limitanei* began farming. To accomplish this, the project excavated five military sites and surveyed 530 sites along the frontier east of the Dead Sea, focusing especially on the legionary fortress of el-Lejjun. The project conducted extensive excavations at el-Lejjun and limited soundings at four smaller yet contemporary military sites, which lie on the Kerak plateau. The fortress at el-Lejjun, likely occupied by the *legio IV Martia*, was constructed around 300 and remained occupied until an earthquake in 551 heavily damaged the structure. This legion likely occupied the fortress until Justinian's apparent demobilization of the eastern *limitanei* in the early sixth century. The primary focus of the project was sites east of the *via nova Traiana*, a major North-South road built though the Kerak plateau under the emperor Trajan from 111 to 114. The Kerak plateau receives ca. 200mm of rainfall annually, sufficient for dry farming. Analysis of botanical and faunal material collected from the el-Lejjun fortress and several other sites strongly suggests that these *limitanei* began agricultural cultivation and animal breeding much earlier than the fifth century.¹⁰

Excavators concluded that the residents of el-Lejjun practiced local cultivation from the foundation of the fortress ca. 300. This analysis was based largely on the presence of

An amendment dated to 398 states, "Your Distinguished Authority shall command that the animals of soldiers shall be excluded from the public meadows of Apamea...decurions shall provide, without damage to the provincials, an arrangement by which pasturage may be supplied for the animals of the military." (*CTh.* 7.7.3) Both pieces of legislation show progress towards relinquishing complete governmental control over local military supply.

¹⁰ Parker, S. T., "Introduction," in Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project 1980-1989*, Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006: 6; Parker, S. T., "The Legionary Fortress of el-Lejjun," in Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project 1980-1989*, Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006:114-121.

carbonized botanical remains discovered in numerous anthropic features across the site—such as hearths, ash layers, pits, and middens. Patricia Crawford, the project’s archaeobotanist,

Table 1.1: Distribution of cultivated plant material from el-Lejjun during the Late Roman (106-324) and Early Byzantine (324-491) periods. (Based off data provided in Crawford, P., “The Plant Remains,” in Parker, *The Roman Frontier in Central Jordan*.)

Plant Material	Late Roman Percentage	Early Byzantine Percentage
Wheat	5	5
Wheat rachis	57	32
Barley	67	79
Barley rachis	86	58
Lentil	29	42
Vetch/Pea	24	26
Date	14	19
Grape	14	37
Olive	24	21
Peach	N/A	11
Fig	86	42
Total # of Samples/period	21	19

identified various types of cereals and fruits in every occupational level. Of special importance were the remains of crop by-products, such as rachis and internode fragments, from barley and wheat plants. These products are generally separated from the grains prior to shipment and their presence in the archaeological record suggests local production and processing. This analysis is corroborated by the presence of several weed species commonly associated with cultivated fields. Such weed seeds were represented in all Late Roman and Byzantine phases of occupation, likely a result from livestock foraging near the fortress. The dung of such animals was collected to be burned as fuel, a process which carbonized and preserved the seeds. Charred remains of olive wood were also found in many stratified

deposits. These were small fragments from the pruning of local olive trees. This evidence combined with the crop by-products of both wheat and barley, implies local cultivation of crops as early as the beginning of the fourth century.¹¹

Analysis of the faunal remains by Michael Toplyn also strongly suggested that the area surrounding the fortress supported significant herds of sheep and goats, which limited reliance on imported animals. Mortality profiles of sheep and goat remains, which comprised about 80% of the faunal assemblage, showed that most of these livestock were over three years of age. As this is later than the prime “marketable age,” these were presumably exploited locally as breeding stock and for their production of secondary resources, such as milk and wool.¹²

The evidence from the *Limes Arabicus* Project suggests limited self-sufficiency from the early fourth until the mid-sixth centuries. From the archaeological remains it is difficult to establish the intensity of this activity or the degree to which the garrison remained dependent on external supply. Additionally, while informative, this analysis relates only to a single archaeological, albeit major site on the eastern frontier; therefore it is not necessarily indicative of the eastern *limitanei* as a whole, let alone of the whole Roman army. Rather, the evidence from el-Lejjun and the other sites in the Kerak plateau simply offers an earlier date than the available documentary sources for *limitanei* as farmers. On the other hand, this

¹¹ Crawford, P., “The Plant Remains,” in Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project 1980-1989*, Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006:453-461. **Table 1.1** displays the percentage of identifiable cultivated crops at el-Lejjun by occupational periods. (Crawford, “The Plant Remains,” 2006: Table 21.1)

¹² Toplyn, M., “Livestock and *Limitanei*: The Zoological Evidence” in Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project 1980-1989*, Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006:463-507. The “marketable age” for sheep and goats is typically around two years of age. This is the age when the animals are at their prime for muscle mass and definition.

example demonstrates the adaptability of the Roman army to local circumstances and their concern for the adequate supply of their units.¹³

While the eastern *limitanei* engaged in agriculture, their chief obligation remained military service. Most fourth century military installations in Arabia and Palestine were located along major transit routes which frequently bordered desert regions. Scholars have yet to reach a consensus about the military's primary mission on the eastern frontier. The two conflicting interpretations are: 1) that there was an internal civilian threat and the *limitanei* were charged with policing the movement of supplies, guarding trade routes, and settling internal unrest or 2) that there was an external nomadic threat and the *limitanei* were utilized as a border-defense troop, shielding the province from these external attacks. A military site located in Wadi Araba, 'Ayn Gharandal, is used as a case study to test each of these theories,

¹³ Parker, S. T., "Supplying the Roman Army on the Arabian Frontier," in *Limes XIX: Proceedings of the XIXth International Congress of Roman Frontier Studies, Pécs, Hungary, September 2003*. Z. Visy, ed. Pécs: University of Pécs, 2005:415-25; Ramsay, J. and S. Thomas Parker, "A Diachronic Look at the Agricultural Economy at the Red Sea Port of Aila: An Archaeobotanical Case for Hinterland Production in Arid Environments," in *Bulletin of the American Schools of Oriental Research* 376, 2016; Lowrey, J. and Grantham B., "Tel Aila: The Faunal Remains of Roman Aqaba," Unpublished report, 2012.

In the fourth and fifth centuries, Aila, modern day Aqaba, was the location of another garrison of the eastern *limitanei* the *legio X Fretensis*. Though excavations were conducted throughout the city, due to modern period structures, the location of the garrison was never discovered. Standing in stark contrast to the sites in the Kerak plateau, Aila receives minimal rainfall (40mm annually.) While examination of the botanical and faunal remains is ongoing, results from the preliminary analysis differ from those of the *Limes Arabicus* Project. Cereal grains, cereal by-products, and weed species were still frequent in the archaeological record during the Late Roman and Byzantine periods of occupation, similarly suggesting local cultivation. The increase in imported amphorae during this time, not present in the *Limes Arabicus* material, would alternatively indicate an increased reliance on imported agricultural goods.

The faunal material from Aila was dominated by "domestic consumables." Analysis showed both a lack of these animals past market age and evidence of importation of meat, the presence of imported cattle which was rare, was likely partially processed prior to importation. This evidence is fairly uniform in suggesting primarily external supply. This evidence is used to show the disparity which was present in the eastern *limitanei* forces.

attempting to elucidate the relationship of the Roman military to their civilian and nomadic neighbors.¹⁴

‘Ayn Gharandal lies along the modern day border of Israel and Jordan, ca. 100km north of Aqaba and 40km southwest of Petra. It is situated on the eastern edge of Wadi Araba, a narrow depression surrounded by high mountain ranges forming part of the Great Rift Valley. This area extends ca. 165km from the northern tip of the Red Sea at Aqaba to just south of the Dead Sea. It is characterized by harsh desert conditions, with hot dry summers and cool dry winters. The region’s limited precipitation falls during the winter months, although the amount varies throughout the valley. The southern regions, near Aqaba, are more arid with less than 50mm of precipitation annually, while the northern regions are less arid with near 100mm in areas south of the Dead Sea.¹⁵

¹⁴ Isaac, *Limits of Empire*, 1990. Graf, D., “The *Via Militaris* and the *Limes Arabicus*,” in Groenman-van Waateringe, W., B. L. van Beek, W. J. H. Willems, and S. L. Wynia, *Roman Frontier Studies 1995: Proceedings of the XVIth International Congress of Roman Frontier Studies*, Oxford: Oxbow Books, 1997:123-133; Parker, “History of the Roman Frontier,” 2006; Nicasie, M. J., “The Borders of the Roman Empire in the Fourth Century,” in Groenman-van Waateringe, W., B. L. van Beek, W. J. H. Willems, and S. L. Wynia, *Roman Frontier Studies 1995: Proceedings of the XVIth International Congress of Roman Frontier Studies*, Oxford: Oxbow Books, 1997:455-460; Scholars such as Isaac and Graf argue the military stationed in the eastern provinces were used as an internal security force. Isaac maintains that nomadism and transhumance were only a minor problem, one which did not pose a significant threat to the provinces (Isaac, *Limits of Empire*, 1990:99). He also argues that many fourth century forts were independent structures positioned as ancient police stations guarding roads and resources (Isaac, *Limits of Empire*, 1990:191). Graf refutes the connectedness of the forts on the *limes Arabicus* claiming they do not pose a restrictive boundary against exterior attacks (Graf, “*Via Militaris*”, 1997:127-129).

Contrary to this view, Parker contends the eastern *limitanei* were strategically positioned to defend against an external threat. Parker states that the lack of evidence supporting wide-spread internal unrest coupled with the fact that most military units were deployed on the edge of the desert are evidence of an external focus (Parker, “History of the Roman Frontier,” 2006:536). Nicasie diplomatically states that the *limitanei* “served to monitor influence and control the flow of goods and people across imperial frontiers (Nicasie, “Borders,” 1997:458.)” See **Figure 1.6** (Parker, S., “Projecting Power on the Periphery: Rome’s Arabian Frontier East of the Dead Sea,” in *Crossing Jordan: North American Contributions to the Archaeology of Jordan*, eds. T.E. Levy, P.M.M. Daviau, R.W. Younker, and M. Shaer, 2007:349-357, Fig.3) for the distribution of eastern military garrisons in the fourth century.

¹⁵ For geography and climate in the Wadi Araba see: Henry, D. O. et. al., “Survey of Prehistoric Sites, Wadi Arabah, Southern Jordan” *Bulletin of the American Schools of Oriental Research*, 323, 2001; Raikes, T. D.,

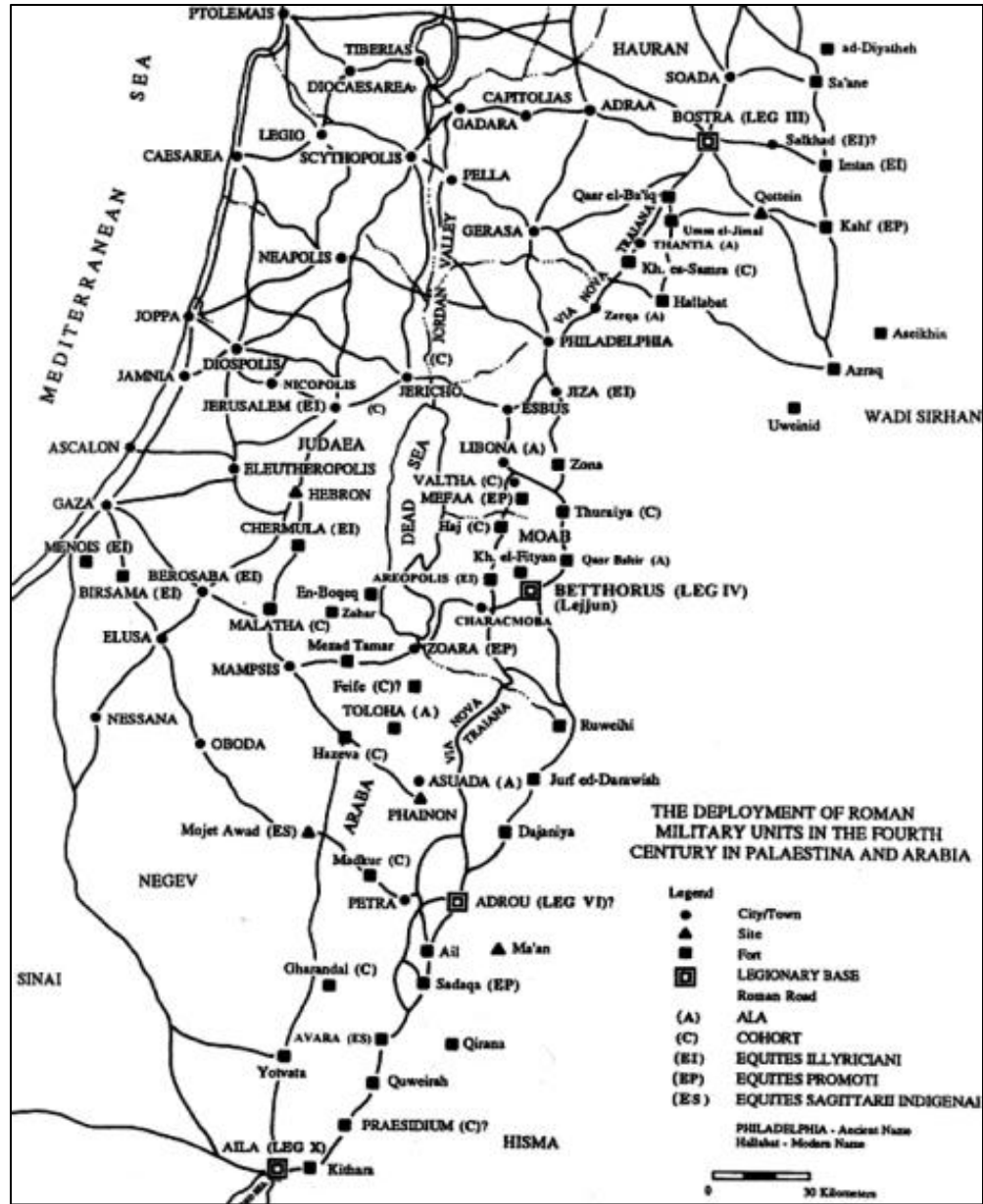


Figure 1.6: The deployment of the military garrisons in the fourth century along the eastern Roman frontier. (Image from Parker, “Projecting Power on the Periphery: Rome’s Arabian Frontier East of the Dead Sea.”)

“The Character of the Wadi Araba,” in *Studies in the History and Archaeology of Jordan* 2, 1985; Parker, S., “Introduction,” in Parker *The Roman Aqaba Project: Final Report, 1*, 2013; Niemi, T., “The Regional Environment,” in Parker *The Roman Aqaba Project: Final Report, 1*, 2013; Smith, A., *Wadi Araba in Classical and Late Antiquity: An Historical Geography*, Oxford: Archaeopress, 2010; Bienkowski, P., “The Wadi Arabah: Meanings in a Contested Landscape,” in Bienkowski, P. and Galor, K. *Crossing the Rift*, 2005; **Figure 1.7** (Niemi, T., “Tom Asunder: Earthquakes at Qasr at-Tilah,” in *Crossing Jordan: North American Contributions to the Archaeology of Jordan*, eds. T.E. Levy, P.M.M. Daviau, R.W. Younker, and M. Shaer, 2007: 409-416, Figure 1A) identifies the location of ‘Ayn Gharandal.



Figure 1.7: Map of Wadi Araba, displaying ‘Ayn Gharandal’s location in proximity to other Roman sites. (Modified after Niemi, “Torn Asunder: Earthquakes at Qasr at-Tilah.”)

Due to the harsh climate and aridity in this region, water and food sources are scarce and highly concentrated. Most of these sources are located near springs or oases formed from rainfall draining off the high mountain ridges and where most archaeological sites are located. ‘Ayn Gharandal proves to be no exception, perched on the outskirts of a desert oasis with access to an underground spring.

Beginning in the early 20th century many explorers and archaeologists visited the ruins at ‘Ayn Gharandal. Alois Musil was the first Western explorer to record the remains, published in 1907. By his account this ancient site was located ca. 250m from the mouth of

the nearby wadi. He could see the remains of a square fortification with corner towers and an eastern facing gate; however, later visitors to the site were unable to see the remains to the same degree. Recently, work conducted by the ‘Ayn Gharandal Archaeological Project (AGAP) has confirmed the basic accuracy of Musil’s description, locating a fourth century fort, bathhouse, and aqueduct through excavations. Until recently it had only been postulated that ‘Ayn Gharandal was the site *Arieldela* from the *Notitia Dignatatum* (Or. 34.44). This hypothesis was confirmed in 2013 when excavations uncovered an inscription identifying both the ancient name of the site as well as the garrison stationed there.¹⁶

¹⁶ Musil, A., *Arabia Petraea II Edom*, Vienna, 1907:193-197. **Figure 1.8** (Musil, A., *Arabia Petraea*, 196) displays the site plan composed by Musil. Other modern explorers and archaeologists who recorded the site: Woolley, C. and Lawrence, T. E., *The Wilderness of Zin*, Indiana: Eisenbrauns, 2003; Frank, F., “Aus der Araba,” in *Zeitschrift des Deutschen Palaestina-Vereins*, 57, 1934; Glueck, N., “Explorations in Eastern Palestine II”, in *Annual of the American Schools of Oriental Research*, XV, 1935; Raikes, “The Character of the Wadi Araba,” 1985:101; King, G.R.D., et. al., “Survey of Byzantine and Islamic Sites in Jordan,” in *Studies in the History and Archaeology of Jordan*, 2, 1989; Smith, A., et. al., “The South-east Araba Archaeological Survey: A preliminary report on the 1994 Season,” in *Bulletin of the American Schools of Oriental Research*, 305, 1997; and Henry, D.O., “Survey of Prehistoric Sites,” 2001.

The current ‘Ayn Gharandal excavations are directed by Robert and Erin Darby, supported by the University of Tennessee, Knoxville and University of Missouri, Columbia. (Darby, R., et. al., “The ‘Ayn Gharandal Archaeological Project: A Preliminary Report on the 2010 and 2011 Seasons,” in *Annual of the Department of the Antiquities of Jordan*, 56, 2012)

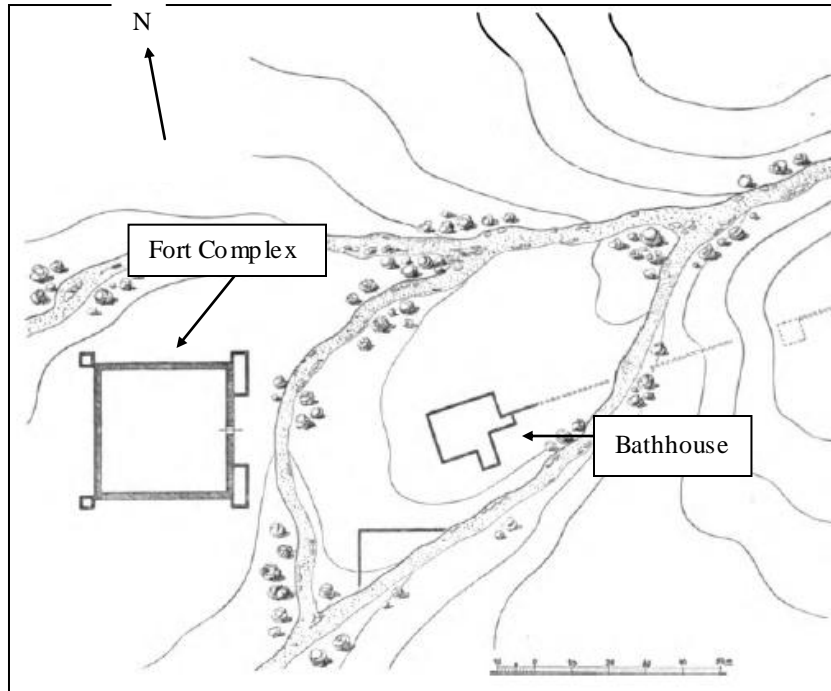


Figure 1.8: The earliest known site plan of the site of 'Ayn Gharandal. (Modified from Musil, *Arabia Petraea*.)

This thesis will use 'Ayn Gharandal as a case study to examine the system of military supply and study local and regional trade structures, mainly for ceramic products. The fort at 'Ayn Gharandal, set in the desert of Wadi Araba, lay west of a major military road the *via nova Traiana*. The *via nova* was a fortified North-South route along the southeastern edge of the Roman Empire. Additional garrisons in Wadi Araba likely performed the role of a secondary support system, guarding either against internal or external threats. Combined with the North-South roads paralleling the *via nova Traiana*, several East-West roads crossed the Araba. The Incense Road, a well-known route linking Petra to Gaza, ran through Wadi Araba moving luxury goods to the Mediterranean. Through such road systems, the port city of Aila (modern day Aqaba) was linked to major trade posts in Petra and Gaza. 'Ayn Gharandal,

strategically placed in the southern portion of Wadi Araba, was likely involved in policing and facilitating traffic between Aila and sites in the north.

The role this garrison played in military defense is difficult to determine through archaeological evidence alone; however, it is the principal aim of this thesis to illuminate the interconnectedness of the region, which incorporated several trade and military supply routes, by understanding and analyzing available ceramic evidence. Subsequent chapters will first examine the types of ceramic material rediscovered through surface survey and recent excavations. Following this, an analysis of the intra-provincial and extra-provincial trade relationships will elucidate ‘Ayn Gharandal’s relationship with other sites along the southeastern frontier. Finally, the ceramic material from ‘Ayn Gharandal will be compared to other military sites in the region, noting the similarities and differences between sites in *Palaestina* and southern *Arabia*. While focused, this ceramic analysis from ‘Ayn Gharandal will work to understand the supply of the Roman army and to better understand the role and purpose of the *limitanei* along the southeastern frontier of the Empire.¹⁷

¹⁷ **Figure 1.9** displays the forts located along the *via nova Traiana* and in Wadi Araba (Parker, S.T., *Romans and Saracens*, 140, Figure 53.) The *Notitia Dignitatum* is thought to generally represent the state of the Roman military around 400, though the eastern lists are likely out of date. The Beer Sheva Edict references the site of *Ariddela* (fragment V, line 5).

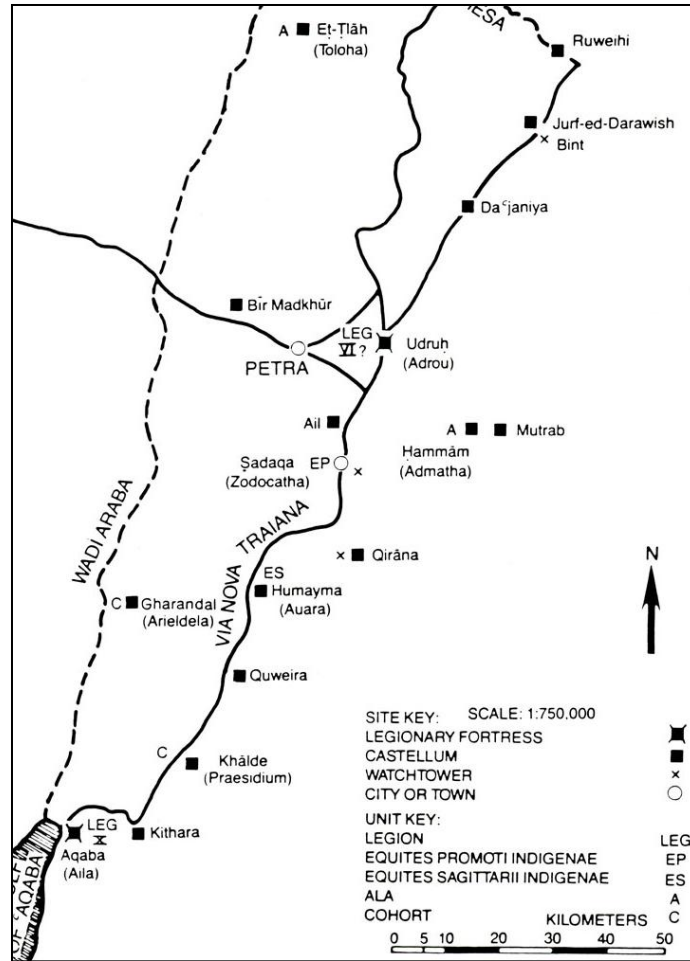


Figure 1.9: Military sites along the southeastern frontier of the Roman Empire. (Image Parker, S. T., *Romans and Saracens*, Fig. 53.)

CHAPTER 2: The Ceramic Material from ‘Ayn Gharandal

This chapter offers an in depth analysis of the ceramic material recovered from the excavations of the ‘Ayn Gharandal Archaeological Project (AGAP). Unsurprisingly, ceramics were the most ubiquitous finds throughout the excavations and, with the exception of the inscription discovered in the 2013 season, provided the best tool for dating the structures. This project began in 2009 as the ‘Ayn Gharandal Survey and Preservation Project. The ‘Ayn Gharandal Survey and Preservation Project was initiated to better understand the purpose of the Roman military along the southeastern frontier through analysis of architectural features and visible ceramic materials. Following this initial investigation the project, now identified as AGAP, was expanded to include a detailed exploration of the partially visible structures. AGAP conducted extensive excavations on the site from 2010 to 2014 and has partially uncovered a Late Roman *castellum*, bathhouse, and an earlier military watch-post. To understand how ‘Ayn Gharandal was supplied in antiquity, this chapter aims to provide an understanding of the site’s ceramic material-including the quantity, fabric, form, function, and date of the ceramics. The second part is a preliminary typological report of the Gharandal ceramics, which assesses the material by functionality rather than chronologically. The final section provides an analysis of the fort’s occupational history through stratigraphic deposition of the ceramic material.¹⁸

At the conclusion of each field season, a preliminary ceramic evaluation summarized the quantity, function, and the source of the ceramics collected. The material was then

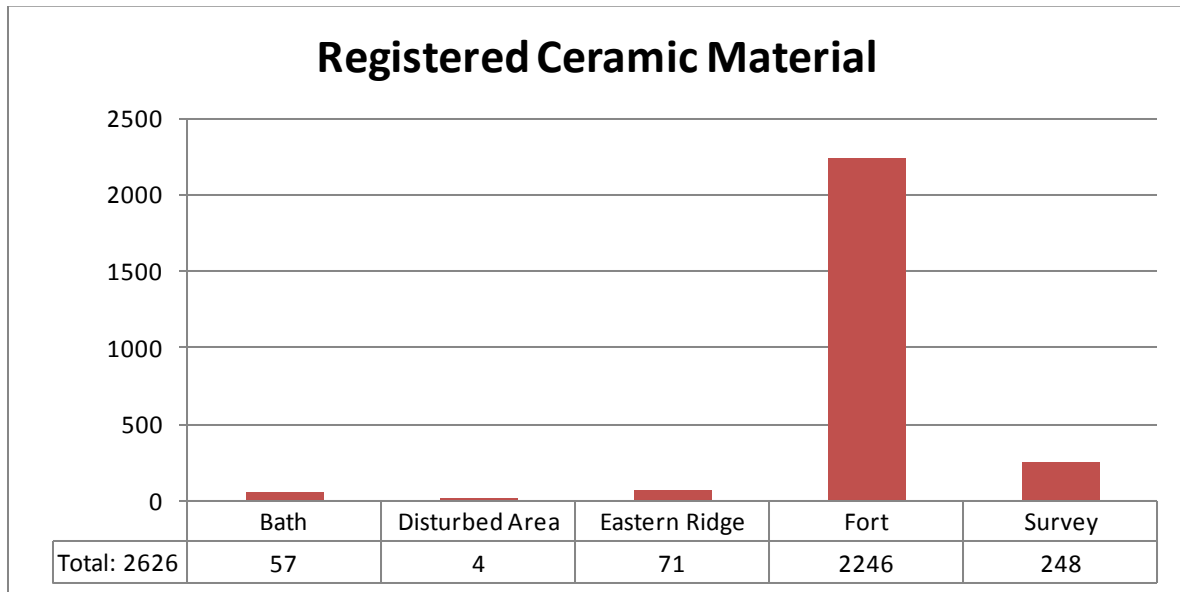
¹⁸ Darby, R., et. al., “The 2009 ‘Ayn Gharandal Survey and Preservation Project,” in *Annual of the Department of Antiquities of Jordan*, 54, 2010.

analyzed to determine its place of manufacture and to isolate major phases of occupation in each structure. This discussion is largely modeled after ceramic analyses conducted on materials from el-Lejjun and Aila where coarse ware materials are integral to the overall analysis of the site. In many other studies on ceramics, the focus is typically on the imported fine ware and amphorae as tools for understanding connections between Roman provinces. For this particular region the quantification, identification, and typological classification of the coarse ware materials has provided greater insight into the movement of goods throughout the East and the relationships among major commercial centers. Recent and ongoing research on sites such as en-Hazeva, el-Lejjun, Yotvata, and Aila provide a larger corpus of coarse ware materials to better understand regional trade and supply.

For an area to sustain a ceramic production, a steady supply of water, clay and firing material are necessary. 'Ayn Gharandal's location in Wadi Araba is devoid of significant clay beds and the entire site is supplied by a small spring east of the site. The spring was likely capable of sustaining the military garrison, their family, and perhaps a small agricultural area, but was hardly substantial enough to sustain ceramic production. The absence of ceramic waste and the paucity of resources near 'Ayn Gharandal suggest that all ceramic material was imported to the site for garrison supplies or accessed through trade networks. An examination of the ceramics confirmed that several production sites, both within and outside of the province, exported ceramics to the site. Additionally, the pottery has proved beneficial in dating various occupational phases. A description of the excavation areas will be provided later in the discussion when examining the stratigraphic depositions. It is important, however, to note that the ceramic material recovered derives from the three

primary areas of excavation (the Eastern Ridge, the bathhouse, and the Roman *castellum*) and the surveys around the site. The vast majority of registered material derived from excavations of the fort, as seen in **Tables 2.1** and **2.2**.¹⁹

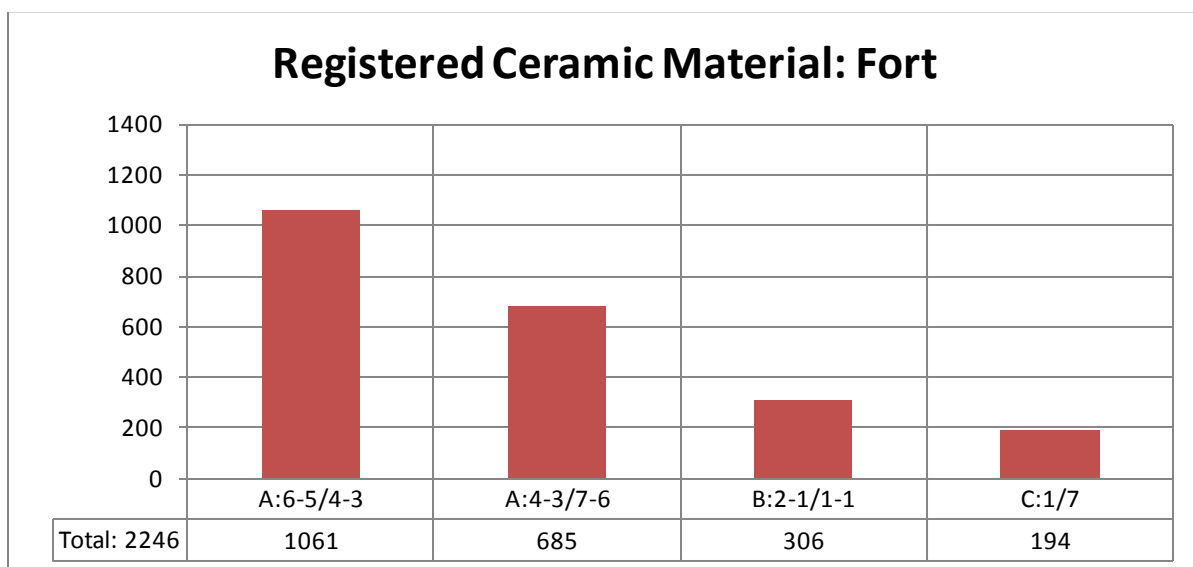
Table 2.1: Registered diagnostic sherds from ‘Ayn Gharandal divided by areas.²⁰



¹⁹ In the 2009 survey season under the ‘Ayn Gharandal Survey and Preservation Project 1,344 sherds were collected (including pottery, lamps, *tubuli*, and bricks). From the 2010 excavation, approximately a two week season, 1,117 sherds (of the same types) were collected. The 2009 and 2010 material was initially examined by Andi Shelton and later by Tiffany Key and Pamela Koulianos. The 2011 excavation season, approximately four weeks, uncovered 4,101 sherds (again this included pottery, lamps, *tubuli*, and bricks). The material from 2013, a four week season, recovered 8,598 sherds (of the same types). Finally, the 2014 season, a ten day excavation focused on the *principia* (A:4-3/7-6) collected 1,302 sherds. The 2011 and 2013 material was analyzed by Tiffany Key and Pamela Koulianos; the 2014 pottery was analyzed by Tiffany Key. For a preliminary analysis of the 2009-2011 materials see: Darby, R., et. al., “The 2009 ‘Ayn Gharandal Survey and Preservation Project,” 2010 and Darby, R., et. al., “The ‘Ayn Gharandal Archaeological Project: A Preliminary Report on the 2010 and 2011 Seasons,” in *Annual of the Department of the Antiquities of Jordan*, 56, 2012. Darby, R. and E. Darby, “The Late Roman fort at ‘Ayn Gharandal, Jordan: interim report on the 2009-2014 field seasons,” in *Journal of Roman Archaeology* 28: 2015.

²⁰The bath, disturbed area (previously thought to be the “domestic structure”), Eastern Ridge and fort all represent material from the 2010 to 2014 excavations while the survey category includes the 2009 survey of the fort, domestic structure and bath as well as the 2011 survey of the Eastern Ridge.

Table 2.2: Distribution of registered sherds from the fort.²¹

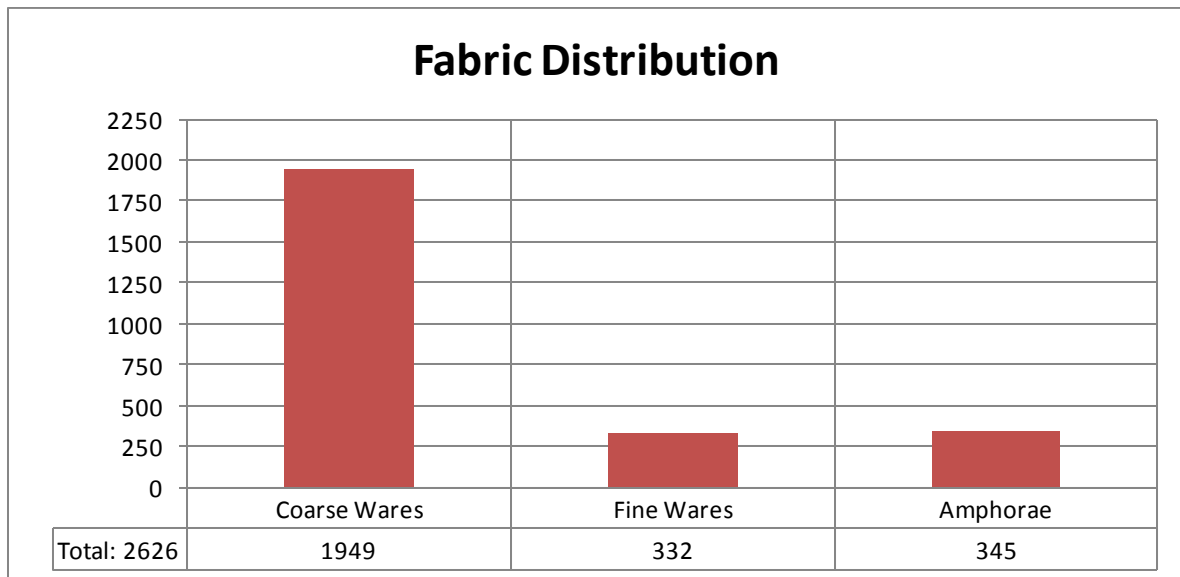


Throughout the course of the project, a total of 16,462 ceramic sherds were collected, processed and analyzed. Of this total, 3,030 sherds were registered as diagnostics (rims, handles, and/or bases), imported fine wares such as Eastern Sigillata (ESA), African Red Slip (ARS), and Nabataean Painted fine ware (NPFW), or imported amphorae. The fabric or ware of the ceramics can broadly be divided into three main categories: coarse wares, fine wares, and amphorae. Coarse wares from various production areas are functional, roughly made and/or fired, and generally have larger mineral or organic inclusions. Fine wares are imported luxury wares of highly levigated clay, more evenly fired, and usually decorated with a burnished slip and/or paint. Some fine wares derive from outside the province but most at AGAP are from nearby Petra (known here as Nabataean fine ware [NFW], Nabataean semi-fine ware [NSFW], and Nabataean painted fine ware [NPFW].) Due to its limited presence in

²¹ From 2010 to 2011 A:6-5/4-3 was also excavated as A:6-4 and A:4-3/7-6 was excavated as A:4/7 and A:3/7. The areas were expanded in the 2013 season. Area C:1/7 was only excavated in 2010 and 2011.

the ceramic corpus, despite the vast imports of Petra coarse ware pottery, this has been included as an imported fine ware in the ‘Ayn Gharandal material. The final category is imported transport vessels or amphorae. While a few amphorae are indigenous to Palestine and Arabia, it must once again be stressed that all material is imported to ‘Ayn Gharandal-eliminating the difference between local and imported amphorae.²²

Table 2.3: Distribution of the fabric/ware of all registered ceramic material from ‘Ayn Gharandal.²³



Coarse ware makes up ca. 74% of the ceramics from ‘Ayn Gharandal (**Table 2.3**).

The fabric of the coarse ware was analyzed to differentiate among the major production

²² Note that all distributive sherd counts in this report will reflect only on the registered ceramic material. The total number of registered sherds included material from the 2009 survey, a smaller survey of the Eastern Ridge in 2011, as well as material from the 2010 to 2014 excavations. For an analysis of the complete ceramic collection from 2009-2011 see the ADAJ reports listed above.

²³ The coarse ware classification includes material identified as the following: Aila (including sub-types AILA-1a, AILA-1b, AILA-2, AILA-3), Petra, central Jordan (Kerak Plateau region), coarse Gaza ware, Axumite, and unidentified imported coarse wares. The fine wares include: Nabataean fine ware (NFW), Nabataean semi-fine ware (NSFW), Nabataean painted fine ware (NPFW), Fine Byzantine Ware (FBW), African Red Slip (ARS), Eastern Sigillata A (ESA), and unidentified fine ware (UDFW). The amphorae category includes 9 Aila-1a body sherds which may or may not be an Aila amphora.

centers in *Palaestina* and *Arabia*. The goal in identifying various fabrics was to comprehend the supply lines feeding into 'Ayn Gharandal. From this study, Aila and Petra proved to be the primary ceramic contributors, though a significant amount of material originated from the Kerak Plateau of central Jordan.

Aila and Petra were identified as large ceramic production centers near 'Ayn Gharandal from the first to the fourth/fifth centuries. The ceramic finds from AGAP were identified based on macroscopic identifications of inclusions in the fabric composition. A study from the Roman Aqaba Project (RAP) classified ceramic material from Aila based on its sandy fabric and the high concentration of biotite mica in the matrix. Also characteristic of the pottery is the occasional presence of organic temper, quartz, and red and black diabase. RAP distinguished between four fabric variations in the Aila pottery-identified at AGAP as AILA-1a, AILA-1b, AILA-2, and AILA-3.²⁴

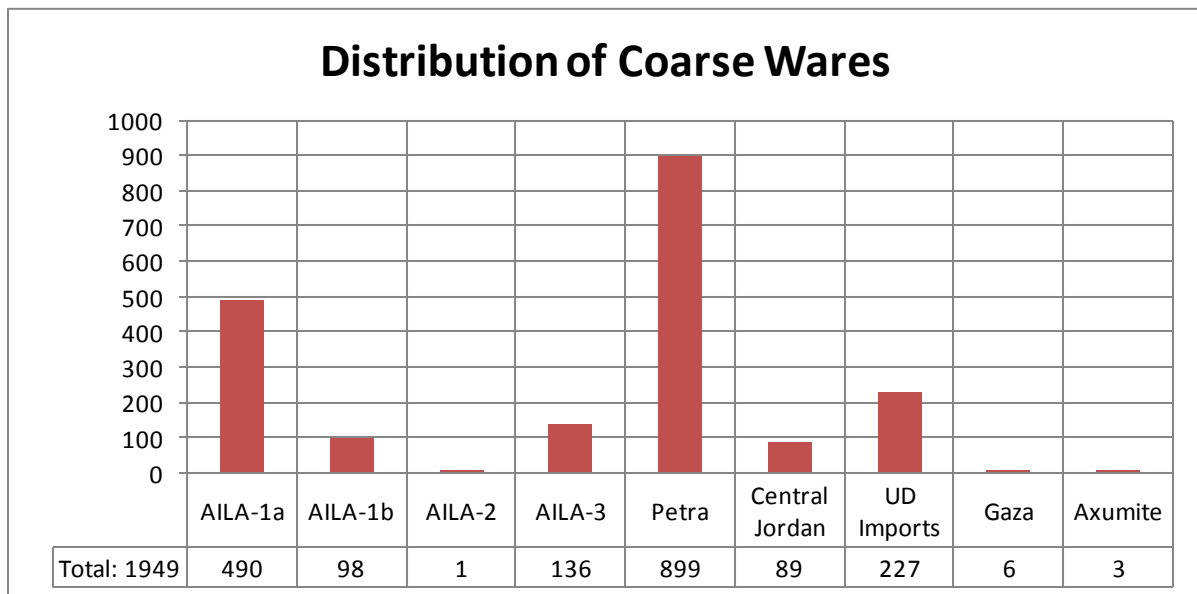
AILA-2 is the rarest of the Aila fabrics present at AGAP. Vessel forms made of this ware are very thin-walled with a fabric color varying from light red or pink to buff. Unlike the other Aila fabrics, this ware corresponds primarily to forms of the first and second centuries and is exceptionally rare at 'Ayn Gharandal. AILA-1 is divided into two subtypes because of the similarity in fabric composition. Typically AILA-1a and AILA-1b fabrics correspond to thick-walled vessels, such as bowls and jars. Both are sandy with a significant quantity of inclusions, which are quite larger than those present in the AILA-2 fabric. The difference between AILA-1a and AILA-1b is largely a color distinction, where AILA-1a varies from pink to reddish in color and AILA-1b has buff or brown hues. The color

²⁴ Dolinka, B., *Nabataean Aila (Aqaba, Jordan) from a Ceramic Perspective*, BAR International Series, 2003.

variations are likely a result of different firing techniques and temperatures, which supports a subtype classification. The final fabric at Aila is known as AILA-3, a thin-walled, brick red fabric commonly associated with cooking vessels.²⁵

The Petra coarse wares lack the abundant biotite inclusions of the Aila fabrics, are darker in color, and are hard-fired, enhancing the diversity of the material. Together the pottery from Aila and Petra comprises 83.3% of the total coarse wares from AGAP, with the majority originating from Petra (46.1%).²⁶

Table 2.4: Fabric quantification of all diagnostic coarse wares from ‘Ayn Gharandal.



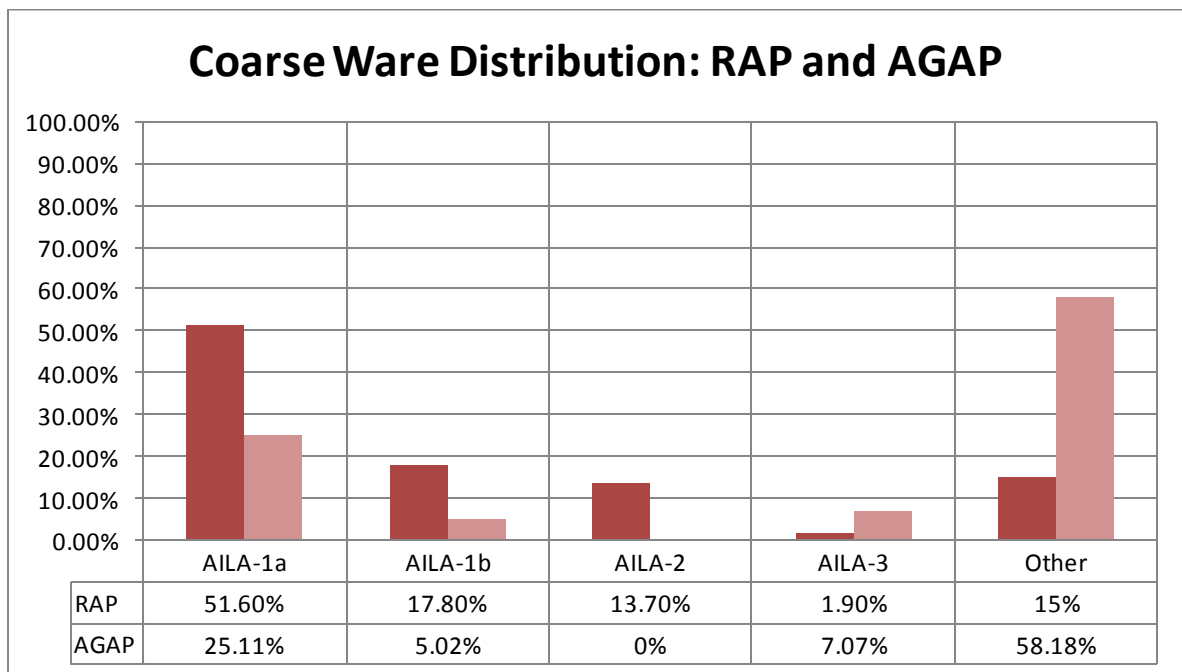
Presented in **Table 2.4** is a quantifiable breakdown of the diagnostic coarse ware material at AGAP. The coarse ware materials originating from the Kerak Plateau region

²⁵ The ceramic material from the Roman Aqaba Project (RAP) is currently being studied at North Carolina State University under the direction of S. Thomas Parker. A sample of the material has been added to a collaborative ceramic database known as the Levantine Ceramics Project.

²⁶ Dolinka, B., Towards a Socio-Economic History of Nabataean Aila (Aqaba, Jordan) from the 1st century BC through the Early 2nd century AD: Ceramic Evidence from the Roman Aqaba Project, Raleigh, NC: Department of History, 1999: 100-105. Dolinka, B., *Nabataean Aila*, 2003.

made up only a minor portion of the coarse wares, accounting for ca. 5% of this material. The quantified evidence shows that Aila and Petra were major suppliers to ‘Ayn Gharandal. Since a significant portion of the material originates from Aila, a distribution analysis was drawn between the coarse ware materials at AGAP to those from the RAP excavations. **Table 2.5** analyzes all coarse ware fabrics present at both RAP and AGAP by percentage.²⁷

Table 2.5: Percentage comparison of the Aila fabrics at the Roman Aqaba Project (RAP) and the ‘Ayn Gharandal Archaeological Project (AGAP).²⁸



The final three coarse ware categories, which are listed in **Table 2.4**, are UD (undetermined) imports, Gaza, and Axumite. Axumite is a coarse ware import from the site

²⁷ This quantified evidence is based upon unfinished and unpublished catalogued data from the Roman Aqaba Project. The data entry for this project is ongoing and final percentage results may vary from what is presented here.

²⁸ The RAP data is based on the 24,977 coarse ware sherds (out of 35,863 total diagnostic sherds - 69.6%). The AGAP data is based on the 1,951 coarse ware sherds (out of 2,628 total diagnostic sherds - 74%). The “Other” category includes all other coarse wares except Aila.

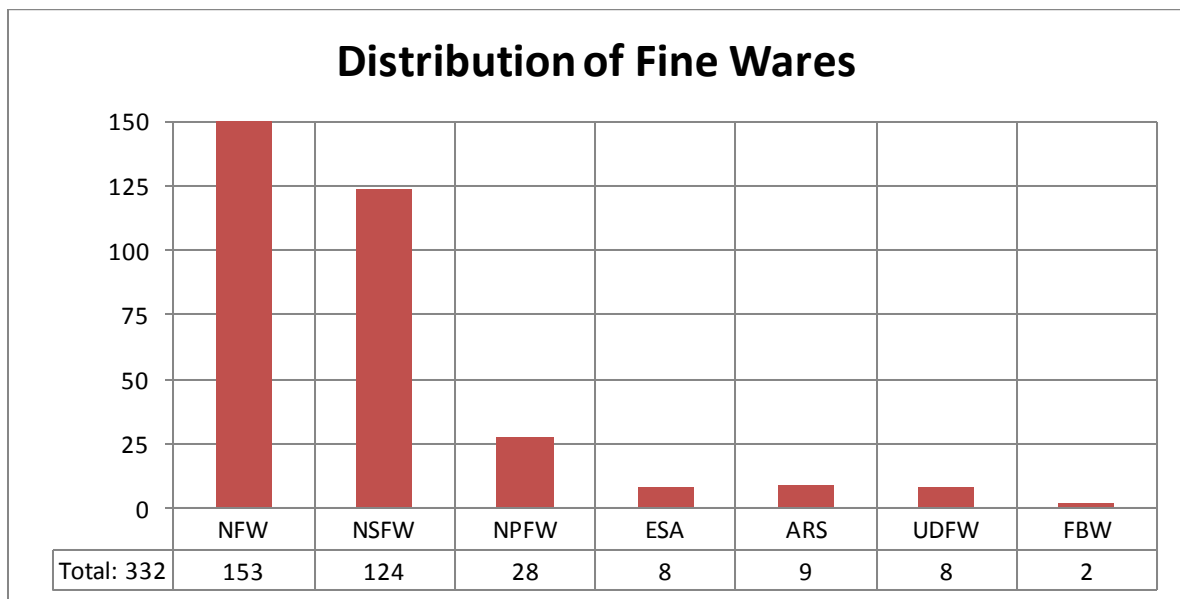
of Axum in modern Ethiopia and a rare import to *Palaestina*. These vessels are handmade, typically with a smooth burnish on one or both sides, and mostly derive from fourth century contexts. Very few poorly preserved Axumite sherds were recovered from AGAP and as a result the vessel forms cannot be determined.

The Gaza coarse wares at AGAP present an interesting anomaly. Most, as expected, are amphorae but six sherds at AGAP represent assorted bowls and jugs. Finally, the UD Imports comprise various fabrics which cannot be associated with a particular production site, limiting their utility in a comprehensive study. Based on proximity, it is possible many of the UD imports originate from the Negev. Very little work has been conducted on potential production sites in the Negev, limiting the comparative data.

A few broad generalizations can be drawn from this analysis of the coarse wares. First, it is obvious from the distribution in **Table 2.4** that the majority of the pottery recovered at AGAP was produced in either Aila or Petra. Aila was the southern terminus of the *via nova Traiana*, and as a major port city served as a transfer point for many trade routes. The pottery produced in the city would likely accompany shipments of goods and supplies headed north, explaining the significant quantities present at the fort. Petra, another major production center, was known for its trade in luxury items such as aromatics and painted fine wares. The Petra-Gaza road was an East-West route which linked Petra to the Mediterranean; both the *via nova Traiana* and a north-south road through the Araba linked Petra to the port of Aila, expanding the distribution of these luxury items. While Petra coarse wares were of lesser value, it would have been sensible to ship them with other cargo, increasing their trade distribution and their presence in the south. Second, the large number

of unidentified coarse wares suggests that some of these may not represent direct imports to the site. The *cohors II Galatarum*, stationed at ‘Ayn Gharandal around ca. 300, likely originated in the area of Palestine north-west of Wadi Araba. It is feasible that some materials may have arrived as the personal belongings of the original garrison.²⁹

Table 2.6: Fabric quantification of all registered fine wares from ‘Ayn Gharandal.



The fine wares from AGAP make up 12.6% of the total fabric distribution, as can be seen in **Table 2.3**. As previously mentioned, this distribution is a combination of both the intra-provincial fine wares (the Nabataean fine wares and Fine Byzantine Ware [FBW]-92.5%) and the extra-provincial fine wares (Eastern Sigillata A [ESA], African Red Slip [ARS], and Unidentified Fine Ware [UDFW]-7.5% **Table 2.6**.) The Nabataean fine wares- NFW, NSFW, and NPFW- were produced in Petra and were a major export from the first to

²⁹ Darby, R., “Aufidius Priscus, the *cohors Secunda Galatarum*, and Diocletian’s re-organization of *Arabia* and *Palaestina*: the new tetrarchic inscription from ‘Ayn Gharandal,” in *Journal of Roman Archaeology* 28: 2015.

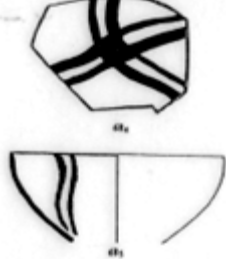







DEKORPHASE	IMAGE		
<p>1 (150- 50 B.C.E.)</p>			
<p>2 (50 B.C.E.- 20 C.E.)</p>	 <p>2a (50- 30/20 B.C.E.)</p>	 <p>2b (30/20- 1 B.C.E.)</p>	 <p>2c (1- 20 C.E.)</p>
<p>3 (20- midsecond century C.E.)</p>	 <p>3a (20- 70 C.E.)</p>	 <p>3b (70- 100 C.E.)</p>	 <p>3c (100- mid second C.E.)</p>
<p>4 (Second- fourth century C.E.)</p>			

Figure 2.1: NPFW dekorphases (Adapted from Schmid, S.G. and B. Kolb, *Petra- Ez Zantur II*, 2000.)

third centuries. There is little distinction between the NFW and NSFW as they are both thin walled, finely levigated fabrics. The presence of visible inclusions is traditionally used as an indicator of fabric quality. NPFW sherds are generally shallow carinated bowl forms with a painted interior; however it is not uncommon to find cups with the same motifs. This painted tradition began in the mid-second century B.C.E and continued throughout the third and into the fourth centuries C.E. The chronological divisions of the painted fine wares are based primarily on the painted designs designated as “Dekorphases.” Only two of the four Dekorphases are present at ‘Ayn Gharandal: Dekorphase 3-sub-divided into 3a, 3b, and 3c- which begins in the early first century (ca. 20) and extends through the early second century, and Dekorphase 4, which dates from the mid-second through fourth centuries.

Approximately half of the NPFW sherds from AGAP are Dekorphase 4 (**Table 2.7.**)³⁰

The other intra-provincial fine ware from AGAP was identified as FBW. This pottery form was produced near Jerusalem beginning in the sixth century. The FBW tradition continued throughout the Islamic period and the style evolved from incised and nicked designs to fine painted motifs. One sherd found at AGAP is hemispherical in form with a red and black painted design. This sherd has been identified as a later Early Islamic variety, dating to the eighth or ninth century.³¹

³⁰ Schmid, S.G. and B. Kolb, *Petra- Ez Zantur II: Ergebnisse der Schweizerisch- Liechtensteinischen Ausgrabungen*, Germany: Philipp von Zabern, 2000. The Dekorphase tradition for Nabataean Painted Fine Ware pottery was put forth by Stefan Schmid based on the excavations at ez-Zantur in Petra, Jordan. Schmid’s full Dekorphase chronology for NPFW can be seen in **Figure 2.1**.

³¹ Magness, J., *Jerusalem Ceramic Chronology, circa 200-800 CE*, England:Sheffield Academic Press, 1993. **Figure 2.2** shows an image of the FBW sherd from AGAP. This particular sherd is the “Variant E” identified by Magness.

Table 2.7: Distribution of NPFW sherds at AGAP, based on Dekorphase..³²

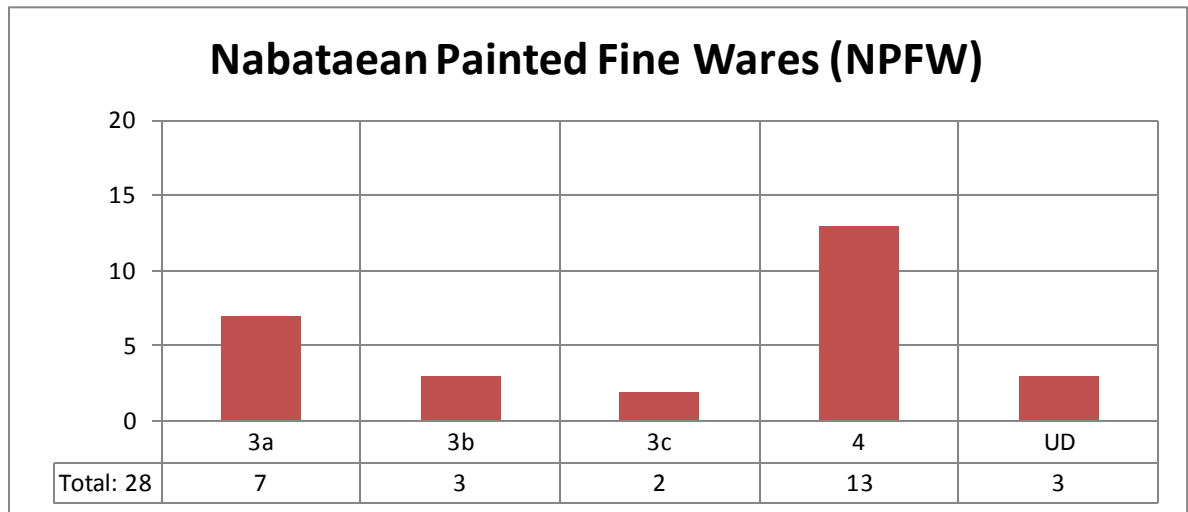


Figure 2.2: Fine Byzantine Ware (FBW).

ESA forms began to appear in the mid-second century B.C.E. and likely originated from the north, in modern Syria. These vessels have a glossy red slip on the surface with a buff or light pink fabric color. Though several rims and bases have been recovered, none are

³² The UD category includes 2 sherds which could not be categorized by their painted designs and 1 painted cup

sufficient for classification. As ESA ceased production by the end of the second century, all AGAP finds are residual. About a century after the disappearance of ESA, there was a rise in the importation of ARS to the Roman East. ARS appears at AGAP as early as the fourth century. ARS, imported from Tunisia, is easily identified by its orange-red to brick-red fabric color and thick, dark red slip coating the vessels. Forms are typically classified based on vessel form, thickness, and occasionally distinctive marks such as stamps. Using a chronological typology developed by John Hayes in 1972, four of the nine sherds from AGAP have been identified. The earliest is the later variety of the ARS Form 50A dated ca. 300-360; a very shallow bowl with a relatively thin sidewall. Form 57, a thicker bowl with a grooved, flanged rim, is dated from ca. 325-400. The base of a Form 59 dating from ca. 320-380/420 was unique, bearing a large stamped design on the interior of the base. The latest identifiable ARS is a Form 61A. This form dates to ca. 325-400 and has a smooth inverted triangular rim. Combined, the ESA and the ARS are the chief extra-provincial imports to ‘Ayn Gharandal as evidenced in **Table 2.6**.³³

There is a clear correlation between the dated fine wares and the site’s primary period of occupation. The paucity of NPFW and ESA from the first and second centuries suggests minimal occupation in the excavated and surveyed areas during this time. The arrival of the *cohors II Galatarum* ca. 300 corresponds with the increase in the later fine wares, such as NPFW Dekorphase 4 and ARS. Since this material constitutes only a minor fraction of the

³³ Hayes, J., *Handbook of Mediterranean Roman Pottery*, Norman: University of Oklahoma Press, 1997:54-59; Hayes, J., “Sigillate Orientali,” in *Enciclopedia dell’Arte Antica Classica e Orientale: Atlante delle Forme Ceramiche II, Ceramica Fine Romana nel Bacino Mediterraneo (Tardo Ellenismo e Primo Impero)*, Rome: Istituto della Enciclopedia Italiana, 1985; Hayes, J., *Late Roman Pottery*, London: The British School at Rome, 1972; Malfitana, D. et. al., “Eastern Sigillata A in Italy: A Socio-Economic Evaluation,” in *Bulletin Antieke Beschaving*, 80, 2005:200. **Figure 2.3** shows the ARS forms present at AGAP.

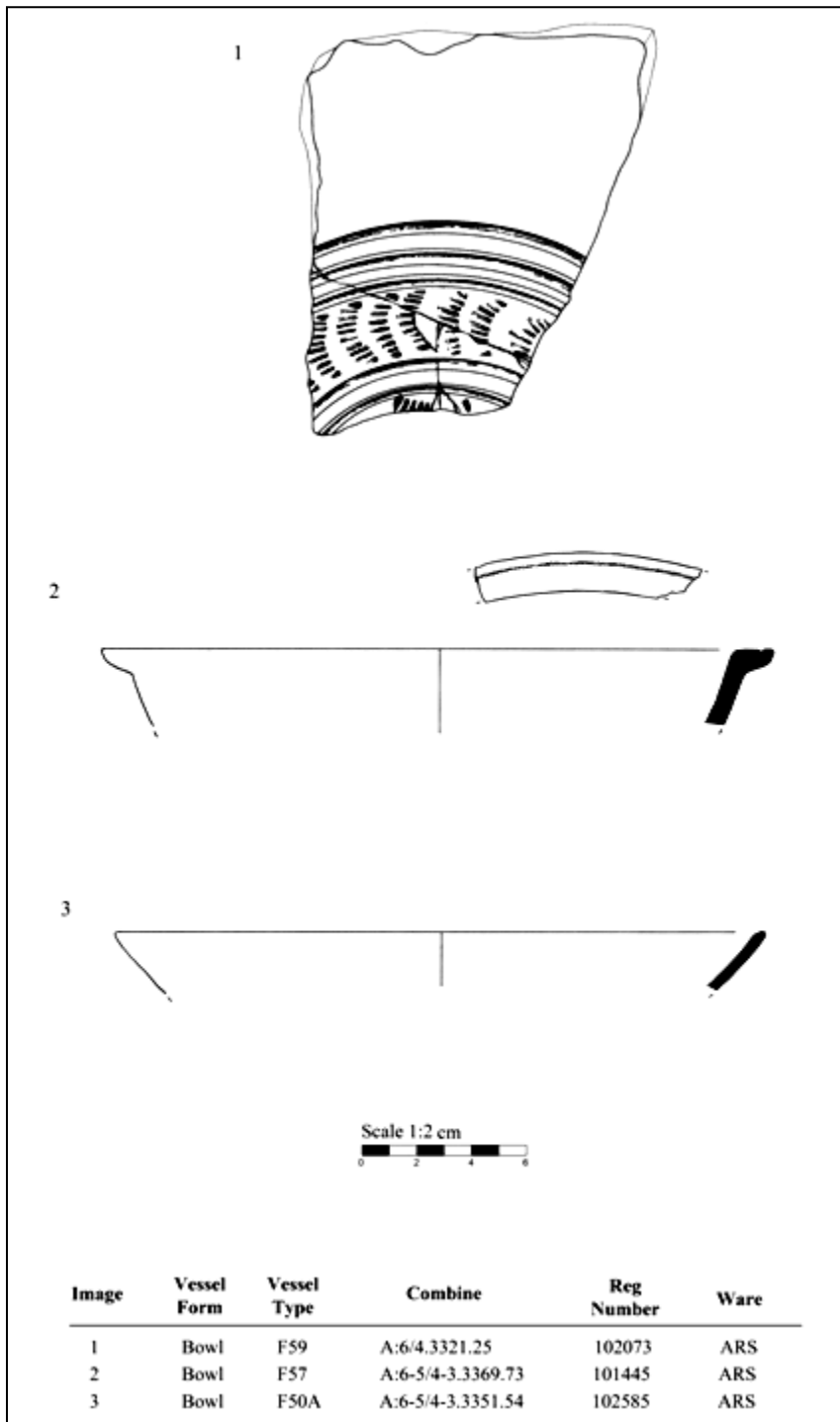
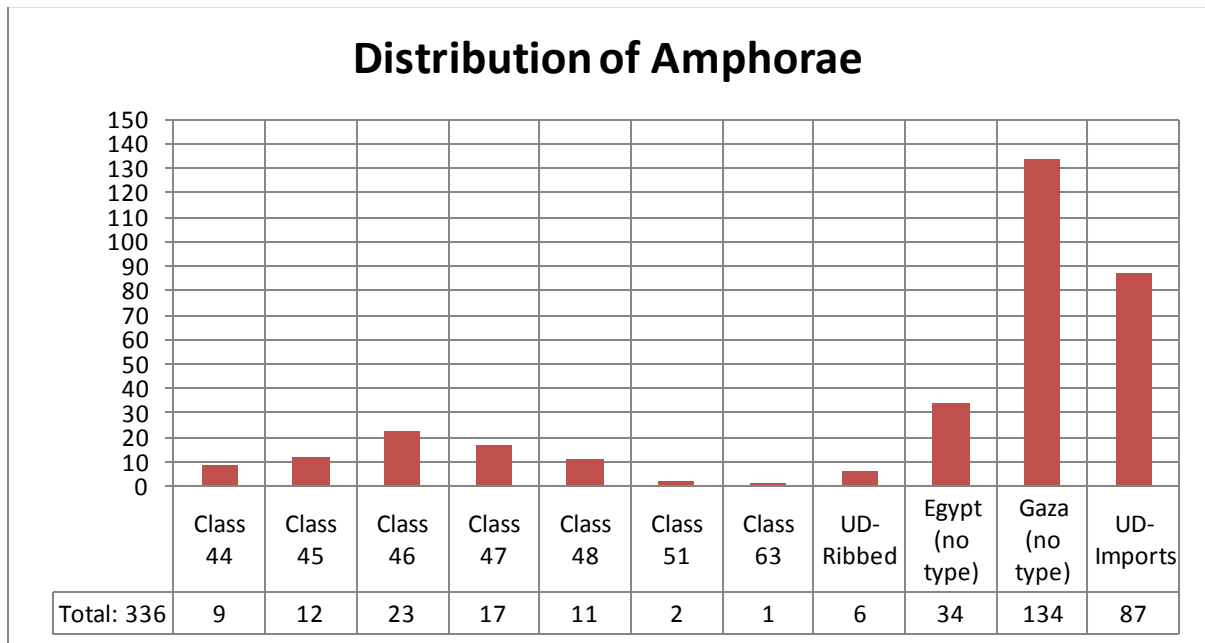


Figure 2.3: ARS forms at 'Ayn Gharandal.(Drawing courtesy of Eric Steigmaier)

ceramic assemblage, it is important to examine them in conjunction with other aspects of the pottery.

The last major division of ceramic fabric is transport jars, or amphorae. These vessels usually contained liquid, staples such as oil and wine. Interpreting amphorae in the archaeological record is complicated by several factors. Initially, there is the question of trade versus supply. The hyper-arid climate suggests a continuing need to supply the garrison externally. Another issue is determining the contents of the amphorae. The source and probable contents have been surmised for common amphorae forms- although it is always possible that a vessel was subsequently reused for other products.

Table 2.8: Classification of the various amphorae recovered AGAP.³⁴



³⁴ The categories for Egypt and Gaza have been identified based on fabric composition though could not be associated with a specification “Class” type. The UD-Imports could not be identified based either by form or fabric. Not included in this are 9 body sherds from the same Aila -1a vessel as the identification is unclear.

Most amphorae at AGAP are small body fragments, with a few diagnostic sherds to aid in identification. Despite this, 74.2% of the amphorae have been identified as to either a source, such as Egypt or Gaza, or by a specific vessel form (**Table 2.8.**) The remaining 25.8% of the amphora sherds were not recognized by either fabric or diagnostic features so are simply classified as “UD-Imports” (**Table 2.8.**) Identified amphorae provide several useful pieces of information; they illuminate possible networks of trade, offer an approximate date range, and suggest various commodities possibly provided as supplies. Unfortunately, these results are largely speculative. There are eight classified amphorae types from AGAP, most dating from the third or fourth century through the fifth or sixth century. The chart in **Table 2.9** gives a brief discussion of each as well as its date range.

Egyptian and Gazan wares, quantified in **Table 2.8**, were broadly categorized based on a combination of fabric, color and form. Due to a lack of well-preserved forms, or the limited examples published elsewhere, these sherds did not fit into the typological sequence developed by Peacock and Williams. This same problem also arose with the UD-Imports. For this collection of amphorae, a variety of fabric forms, lack of *comparanda*, and dearth of diagnostics (only 12.6% of the total sherds in this category) prevented identification of a production area or other classification. Notably, there is a complete lack of the 5th century Aila amphora from the material at ‘Ayn Gharandal. Based on the prevalence of other Aila material at the site, this lack would strongly suggest a *terminus ante quem* for the occupation of the fortlet.³⁵

³⁵ Peacock, D.P.S. and D.F. Williams, *Amphorae and the Roman Economy: An Introductory Guide*, New York: Longman, 1986.

Table 2.9: Description of the classified amphorae present at ‘Ayn Gharandal. Information based on analysis of amphorae by Peacock and Williams. (Peacock, D.P.S. and D.F. Williams, *Amphorae and the Roman Economy: An Introductory Guide*, New York: Longman, 1986.)

<u>CLASSIFICATION</u>	<u>DATE</u>	<u>DESCRIPTION OF VESSEL</u>	<u>POSSIBLE CONTENTS</u>
CLASS 44 ³⁶	4 th -mid 7 th	This is a relatively thin-walled vessel, hard fired with wide spaced ribbing and a sandy fabric. Color is usually a pinkish cream.	Unknown
CLASS 45	1 st -5 th	A highly micaceous fabric, red-brown in color. Thin-walled with a long neck and a tapering hollow foot. There is an early 1-handled version and a later 2-handled version- the Gharandal material likely reflects the 2-handled amphorae.	Unknown
CLASS 46	4 th -6 th	The Palestinian bag jar. This amphora has a vertical rim large angular ribbing. Color ranges from orange in the south to gray in the north.	Palestinian white wine?
CLASS 47	3 rd -4 th	Known as the Hollow Foot amphora. This has a bright orange-red fabric with large black inclusions in the matrix. Thick vertical handles with a tall hollow foot.	Wine?
CLASS 48	3 rd -4 th /5 th	This is a Gaza amphora. Neckless with a thickened rim and a bag shape. There is ribbing between the handles and the brown fabric frequently includes small bits of seashells in the matrix.	Wine?
CLASS 51	Late 4 th -5 th	Spatheion . This has a narrow body and a long solid foot. The fabric is hard and ranges in color from light red to light buff with a greenish cream slip on the exterior.	Unknown
CLASS 63	5 th -8 th	This is a later variant of the Palestinian Bag Jar (Class 46). Reddish brown fabric with mica and limestone inclusions	Unknown
UD-Ribbed	4 th -?	This type of amphorae is currently only known from Aila. It has a very hard, clean matrix with minimal inclusions. A smooth outer surface with wide spaced ribbing.	Unknown

³⁶ Archaeology Data Service, archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005- Revised dating of Peacock and Williams to appearance in the fourth century.

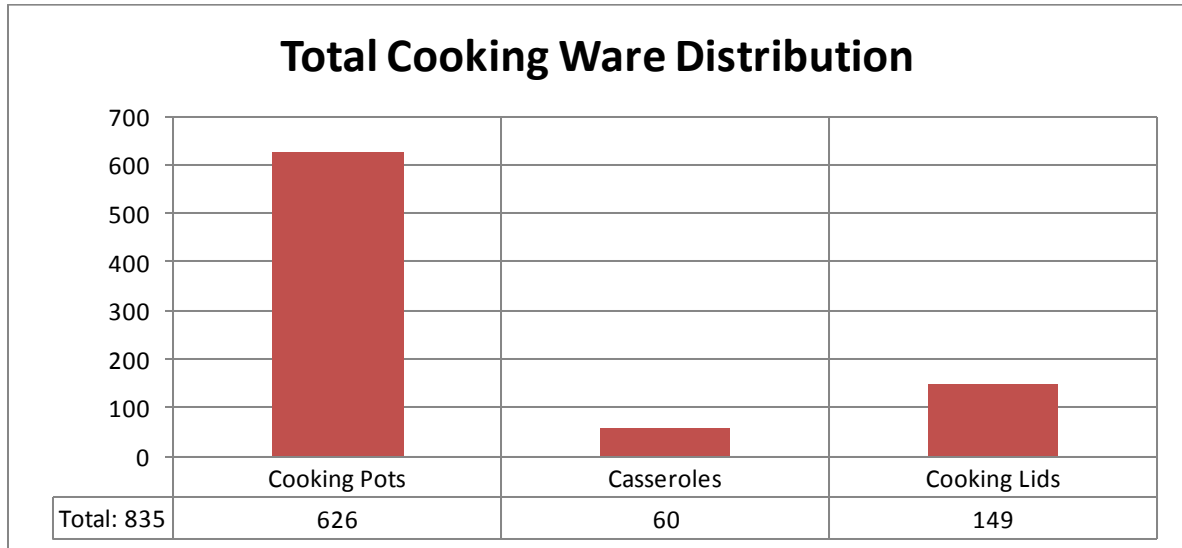
A comprehensive analysis of the ceramic fabrics, as above, is necessary to further contextualize the types of vessel forms. In most cases, the fabric of a vessel is a reflection of its specific form; for instance, wine cups are not commonly made from coarse ware fabrics, just as cooking vessels are not commonly made with fine ware fabrics. A ceramic typology has been created to help contextualize the material from 'Ayn Gharandal. This typology is largely representative of the coarse ware material at the site, though many interprovincial fine ware forms mirror their coarse ware counterparts. This typology is a reflection of the most prominent vessel forms found throughout the AGAP excavations and is divided by broad categories. The broad designation is used because of the probable multi-purpose use of many vessels. It is important to note that this information is not organized chronologically due to the preliminary data uncovered. Also, as excavations are ongoing this information will likely change with an increased body of material from future excavations.

In the AGAP typology, the major ceramic types are divided into cooking wares and table/storage wares. Within this classification system the cooking wares are further separated into cooking pots, casseroles, and cooking lids while the table/storage wares can be divided into bowls/cups (table) and jars/jugs (storage.) Each vessel category has a distinctive basic shape with slight variations in form. Due to the sites proximity to Aila and the large quantities of Aila ceramic materials, the AGAP typology shows many parallels with the

ceramic analysis completed for the RAP corpus. When possible, parallels have been drawn between the two typologies.³⁷

COOKING WARES³⁸

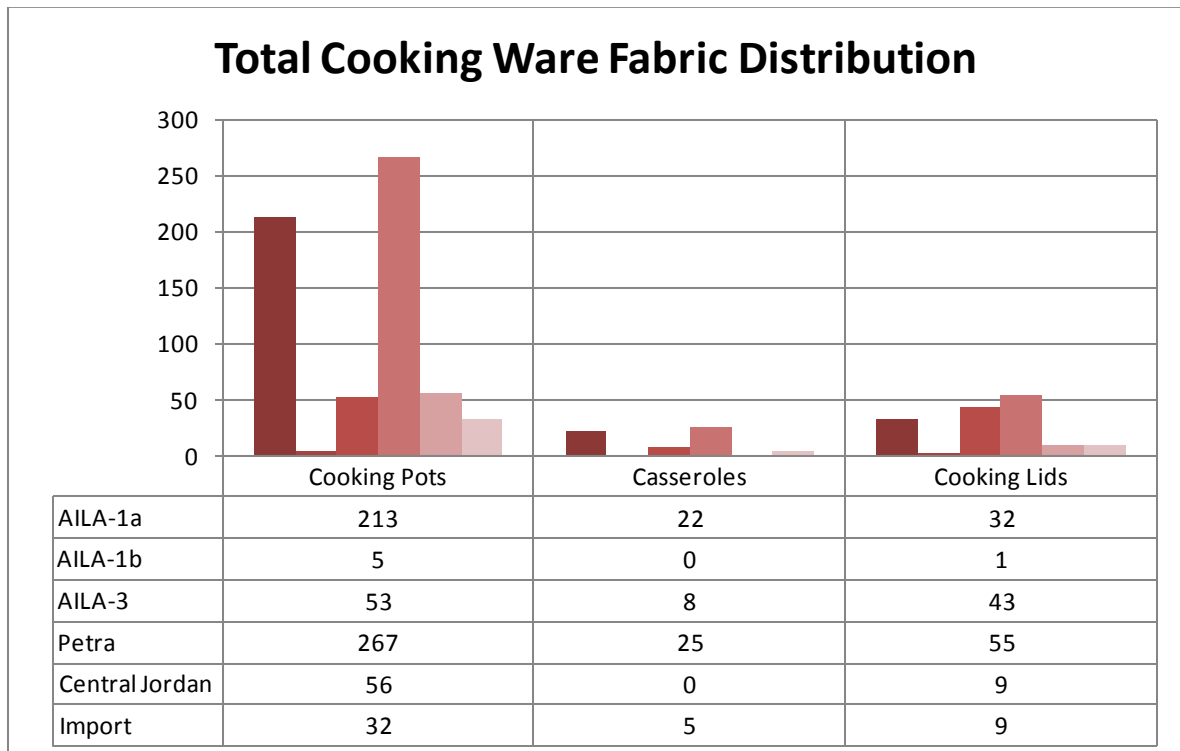
Table 2.10: Distribution of all registered diagnostic cooking wares from ‘Ayn Gharandal.



³⁷ Parker, S. T., “The Pottery,” in *The Roman Aqaba Project Final Report: Volume II*. In preparation. The ceramic analysis for the RAP excavations is still under examination. The comparisons are based on preliminary results and with further analysis and publication the paralleled types may differ.

³⁸ **Table 2.10** shows the distribution of all the cooking wares; **Table 2.11** highlights the distribution by fabric.

Table 2.11: Distribution of registered cooking wares by fabric from ‘Ayn Gharandal.



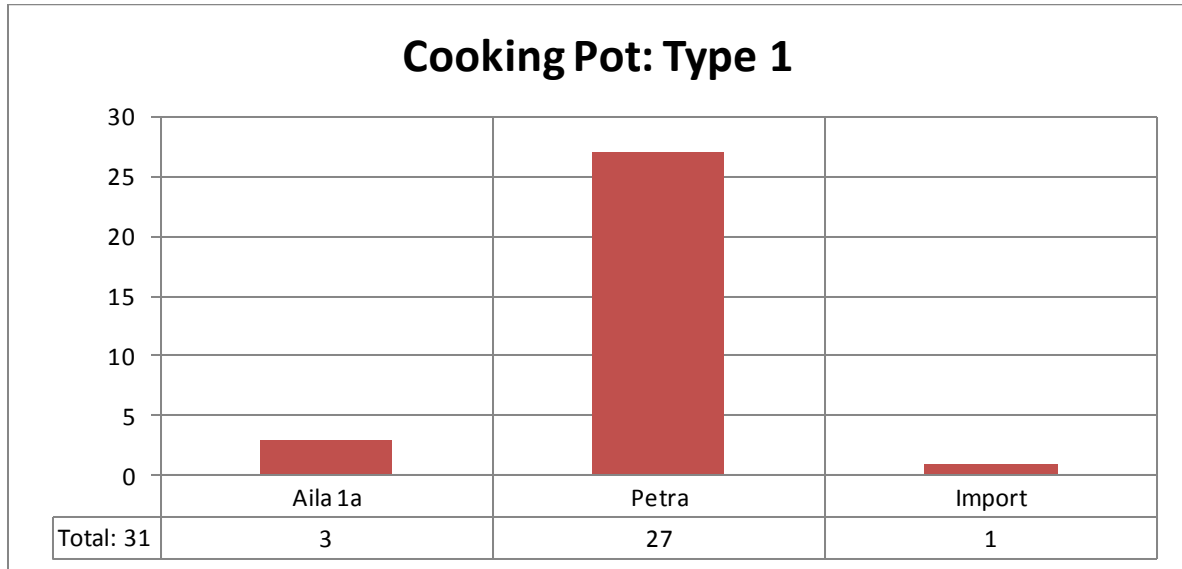
Cooking Pots: Cooking pots are closed vessels identified by their short necks and globular bodies. These vessels are two handled, frequently with ribbing on the body of the vessel.

Frequent evidence of charring on their exterior surfaces confirms their use for cooking.³⁹

Type 1- Dates from the first to the late second or early third centuries. It has a triangular rim, which thickens in later periods. Most fragments discovered at AGAP appear to be residual finds. Corresponds to RAP CP Type 1.

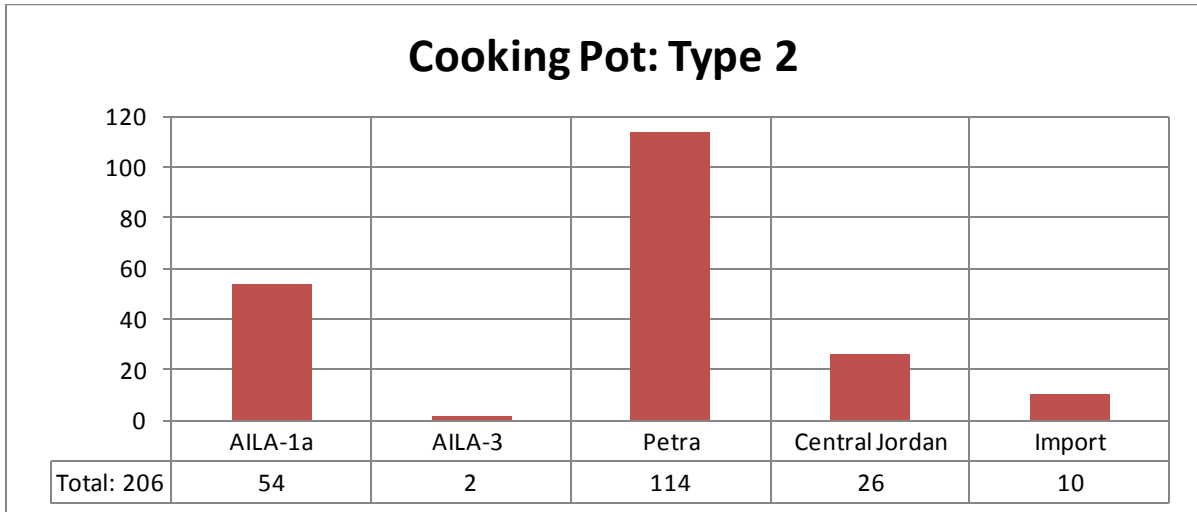
³⁹ **Figure 2.4** is a collection of the CP types from ‘Ayn Gharandal. **Tables 2.12-2.17** give a quantitative distribution of cooking pot type based on fabric.

Table 2.12: CP Type 1 organized by fabric.



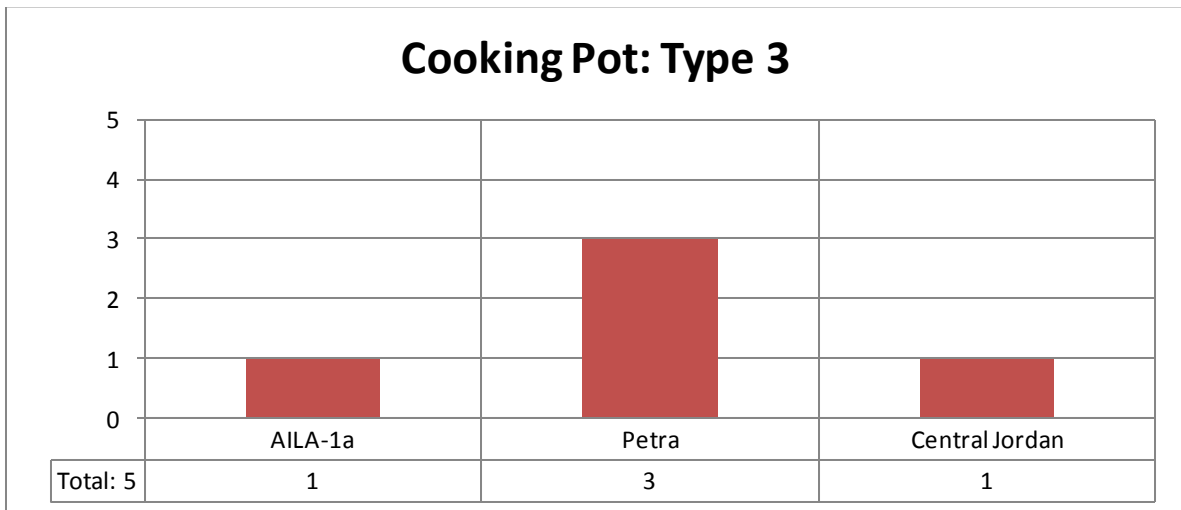
Type 2- This type appears to be a transition from the triangular rim cooking pot and displays a groove both above and below the exterior rim profile. It has been identified as early as the late second century at other sites in southern Jordan, though appears to date primarily to the third to fourth centuries. Characteristic of this later date is the pinched handle. It is by far the most prominent cooking pot type at AGAP. Corresponds to RAP CP Type 11.

Table 2.13: CP Type 2 organized by fabric.



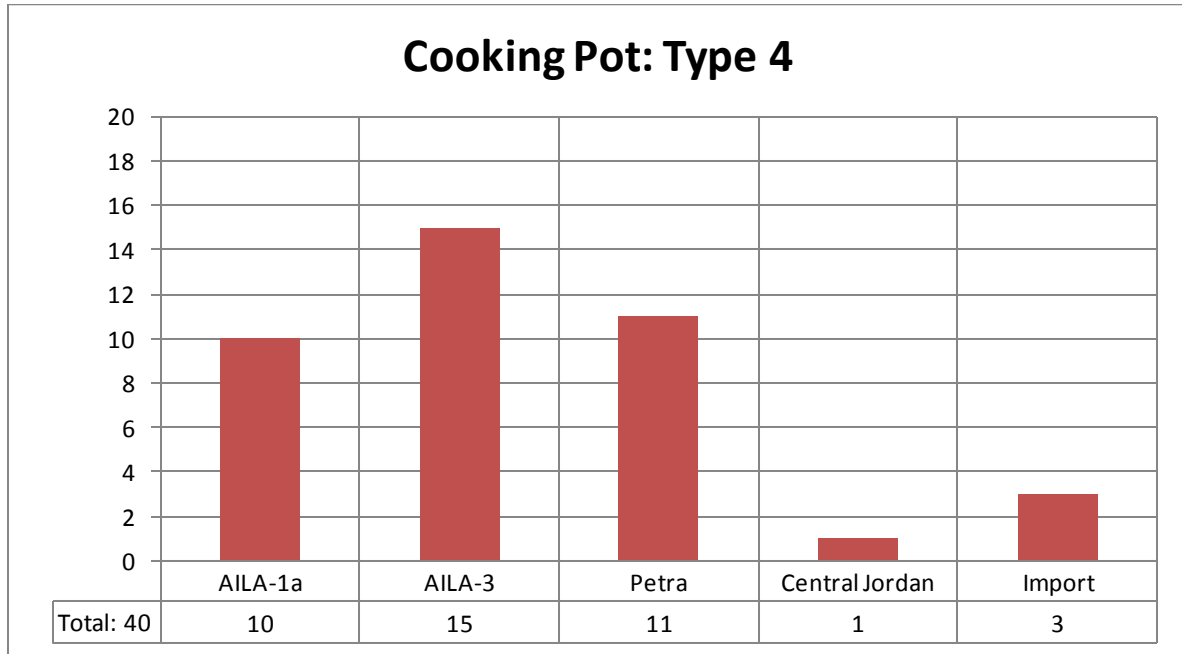
Type 3- The Type 3 has a wide squared rim, sometimes with a noticeable groove on the top of the rim profile. Typically appears in first and second century contexts and is extremely rare at AGAP. Corresponds to RAP CP Type 3.

Table 2.14: CP Type 3 organized by fabric.



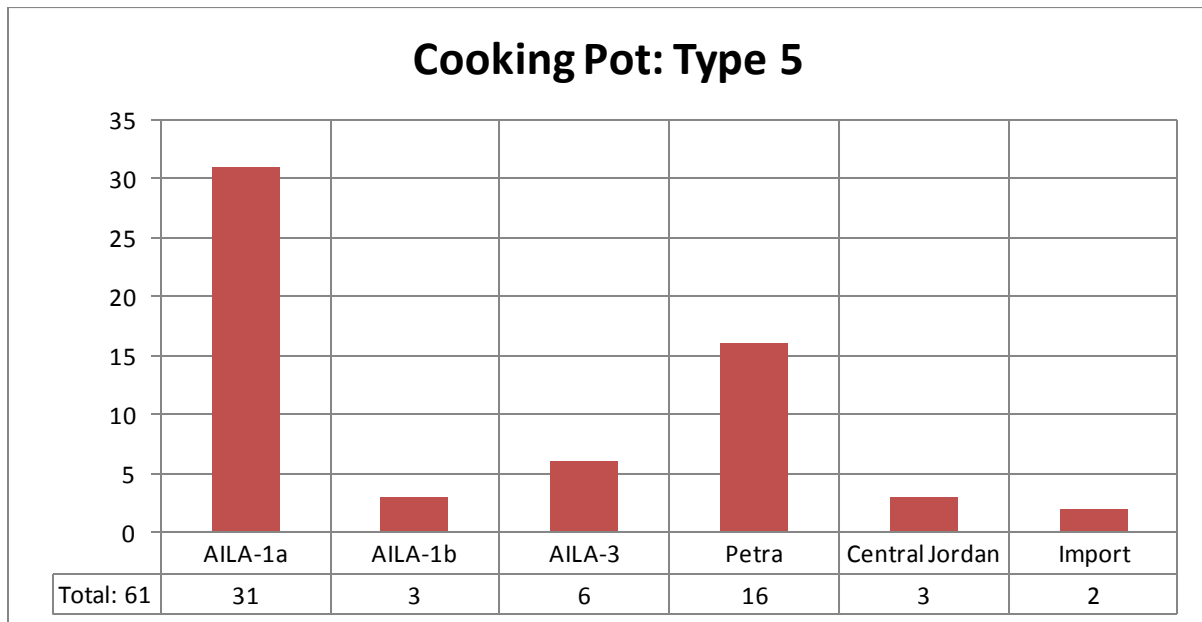
Type 4- This type is characterized by a deep groove on the rim and a pinched handle. Typically dates to the late second and third centuries. Interestingly, most of the finds are in the AILA-3 ware, and are very thin-walled vessels. Corresponds to RAP CP Type 7.

Table 2.15: CP Type 4 organized by fabric.



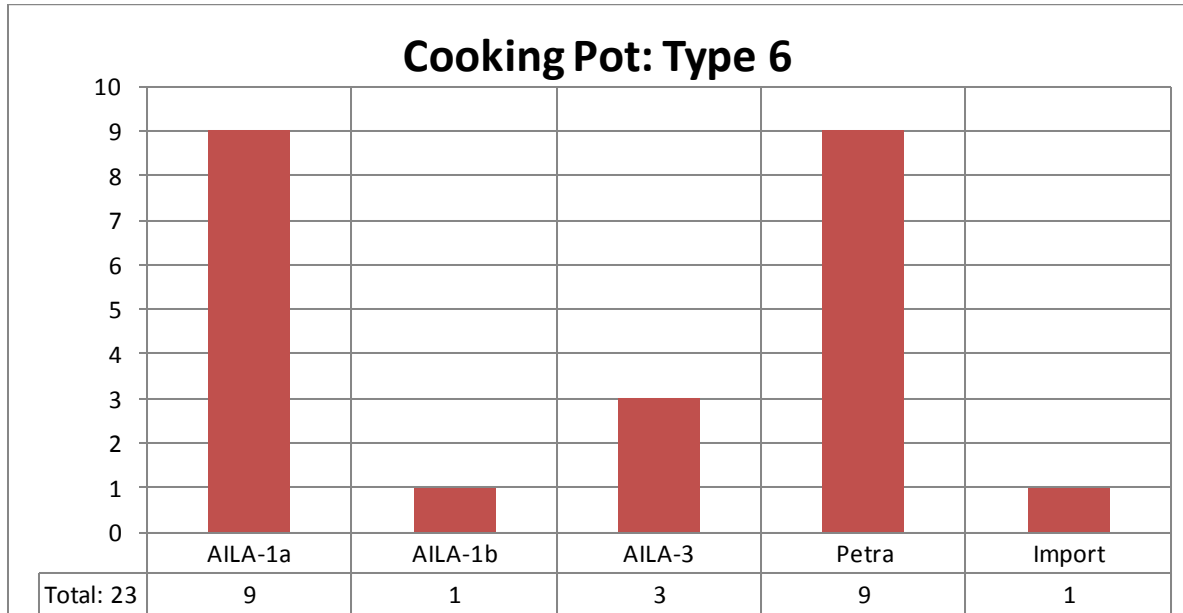
Type 5- This is a later cooking pot dating to the mid-late fourth century. It has a rounded rim and the handle has either a large ridge or groove in its center, which is characteristic of the period. Corresponds to RAP CP Type 10.

Table 2.16: CP Type 5 organized by fabric



Type 6- This type has a slightly hooked rim and possibly dates earlier than the Type 5, to either the early or mid-fourth century. Corresponds to RAP CP Type 9.

Table 2.17: CP Type 6 organized by fabric.



Type 7- This is the latest identified cooking pot at AGAP. It is similar in profile to the Type 5, with a rounded rim, though this has a noticeably everted rim. Based on comparanda from RAP, this form may date to the late fourth century. Corresponds to RAP CP Type 12.⁴⁰

⁴⁰ There is no chart displaying the quantitative distribution for the Type 7 CP because only four vessels of this type have been recorded. Three of the four are in the AILA-1a ware, the other is in AILA-3.

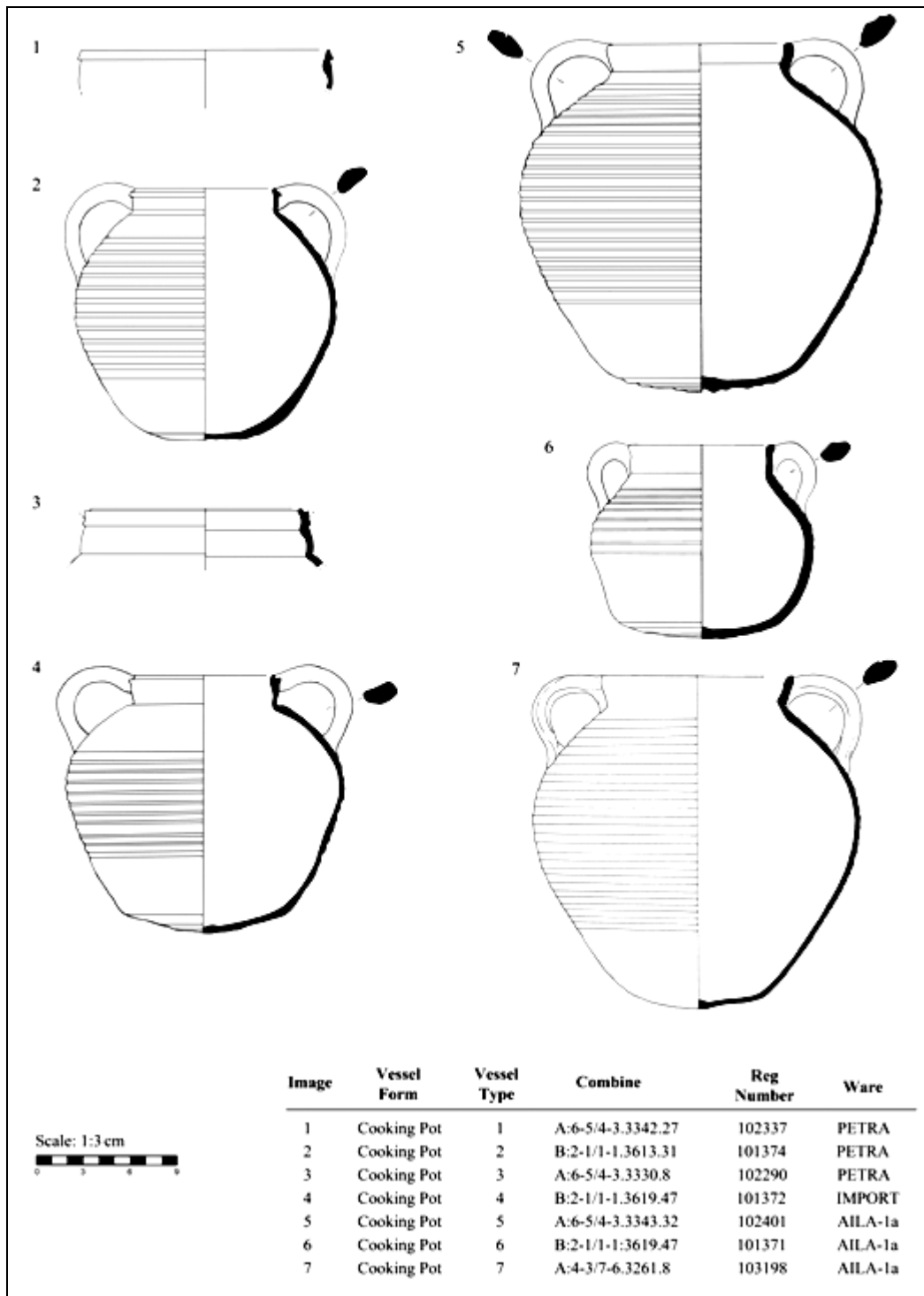


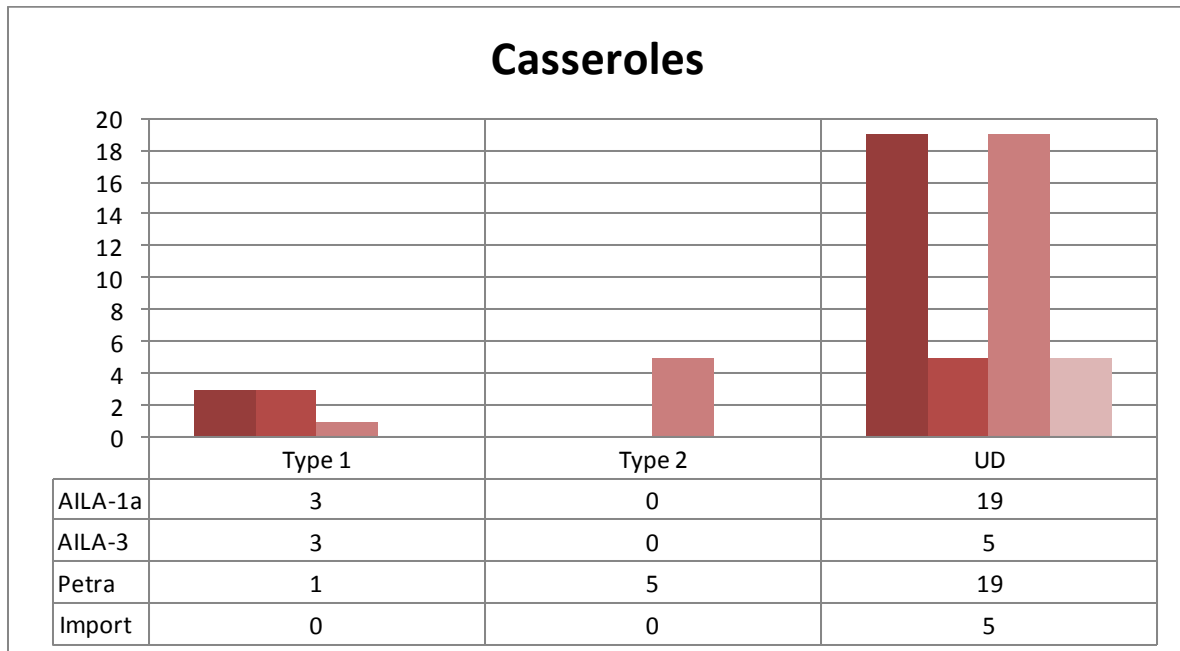
Figure 2.4: Cooking pot typology. (Drawing courtesy of Eric Steigmaier)

Casseroles: Casseroles are shallow, open vessels, with 2-4 handles. While rim profiles vary, casseroles generally have an inward beveled rim with a vertical sidewall. As with cooking pots, frequent charring on the exterior surfaces confirms their use for cooking. Due to the limited number of casseroles at AGAP this form is classified only by handle variations.⁴¹

Type 1: This is the most prominent casserole type and displays a horizontal loop handle. This type of handle may or may not rise above the rim. It dates to the late third and fourth centuries. Corresponds to RAP CASS Types 5 and 6.

Type 2: The second type is earlier in date, likely to the second and early third centuries. This has a vertical loop handle, often pinched near the bottom. Corresponds to RAP CASS Type 4.

Table 2.18: Distribution of casseroles by both type and fabric.



⁴¹ **Table 2.18** gives the correlation of casserole types - including the number which could not be classified based on lack of handle profile. **Figure 2.5** presents an image of the AGAP casserole types.

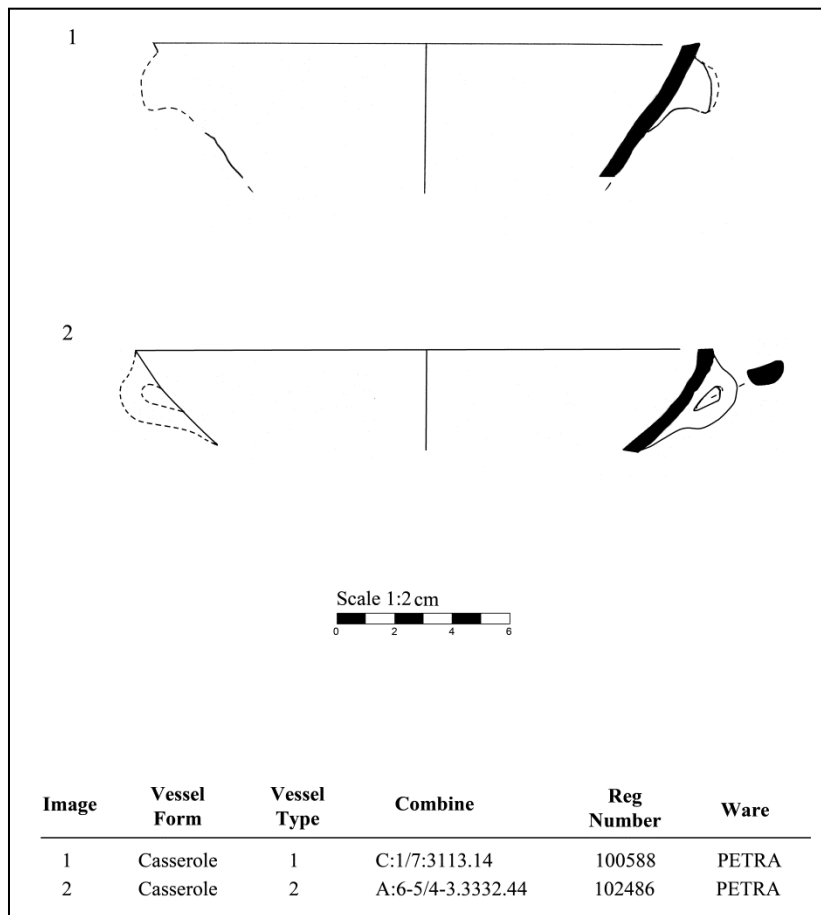


Figure 2.5: Casserole typology. (Drawing courtesy of Eric Steigmaier)

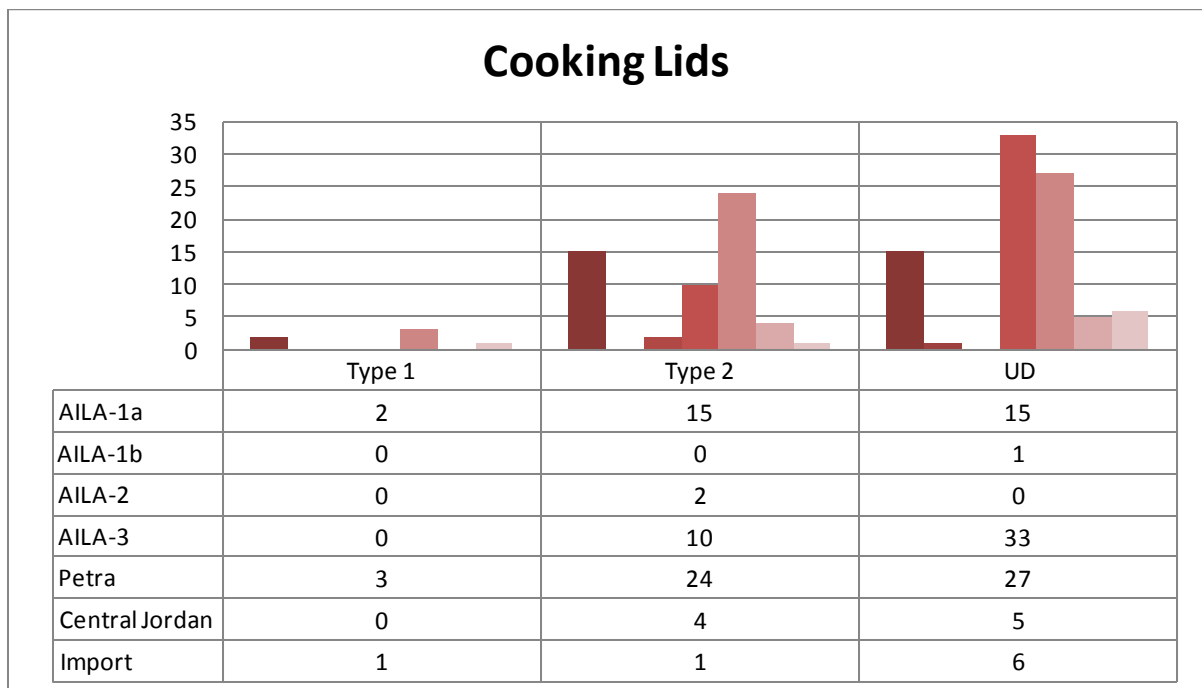
Cooking Lids: Cooking lids are shallow vessels with a single handle and were designed to fit over another cooking vessel. Like casseroles they typically have an inward beveled rim, but have a more angular sidewall. By comparison, cooking lids are also rare at AGAP and usually only a small part of the rim is preserved for identification.⁴²

Type 1: This type of cooking lid is characterized by the small handle with a steam hole in the center. It dates to the first and second centuries. Corresponds to RAP CL Type 1.

⁴² Figure 2.6 presents the AGAP CL types. Table 2.19 shows the breakdown of cooking lids by type and fabric.

Type 2: This cooking lid is identified by the sharp angular rim, which does not lie flush with a flat surface, but rather tilts slightly upward. These lids may also be identified by a central bulbous handle with a steam hole pierced nearby. These appear largely from third to fourth century contexts at AGAP and RAP. Corresponds to RAP CL Type 4.

Table 2.19: Number of cooking lids by type and fabric.



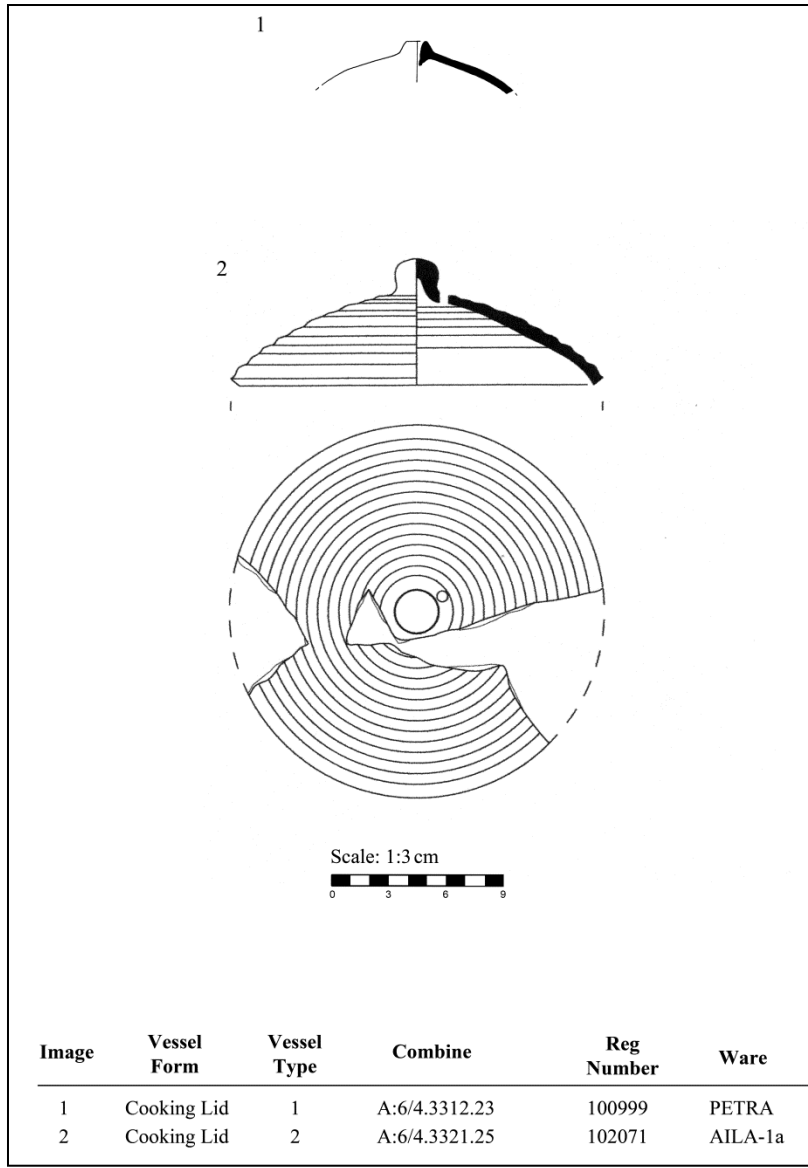


Figure 2.6: Cooking Lid typology. (Drawing courtesy of Eric Steigmaier)

TABLE/STORAGE WARES⁴³

Table 2.20: Distribution of all registered table and storage wares at 'Ayn Gharandal.

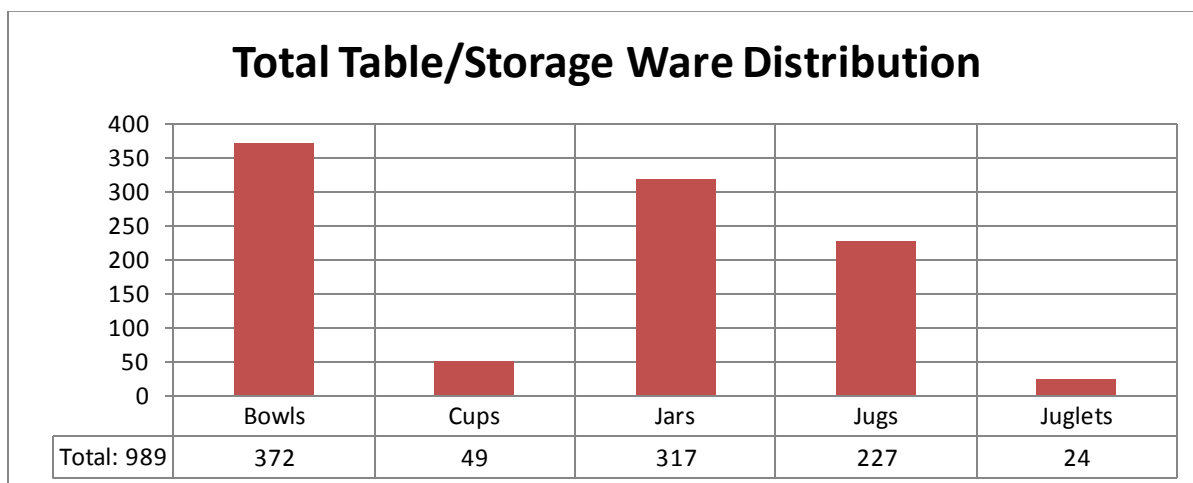
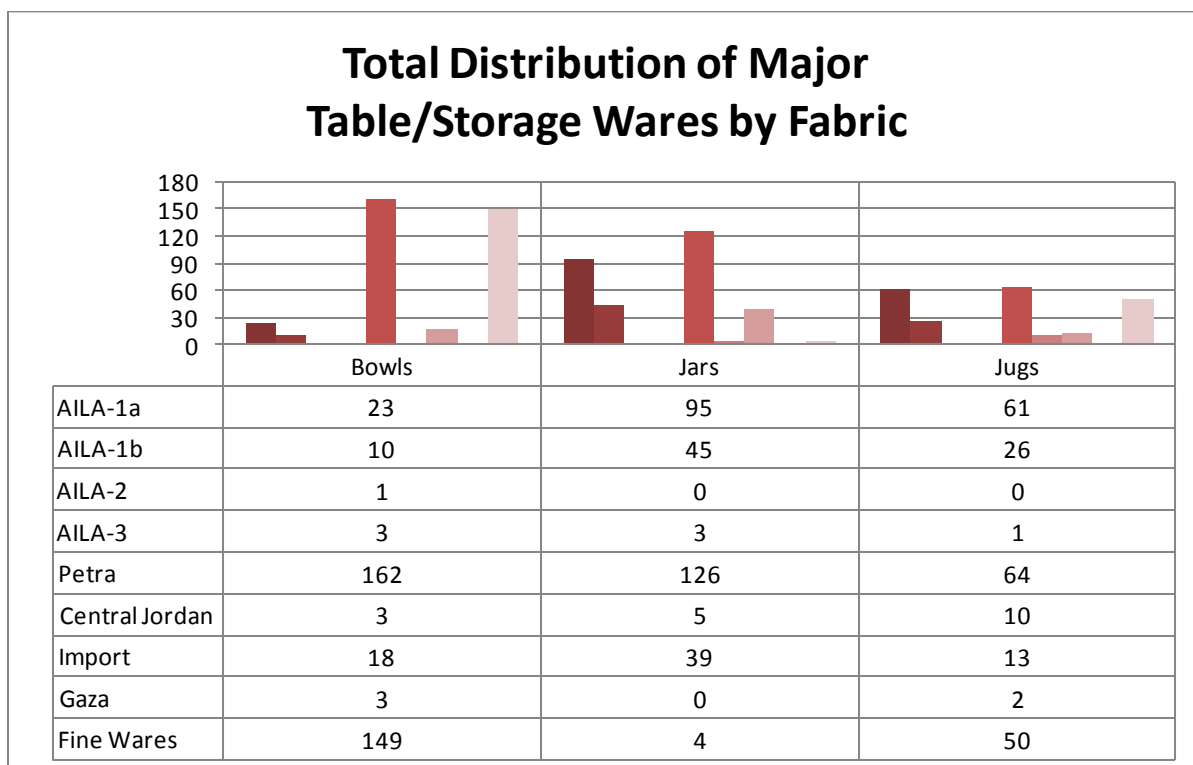


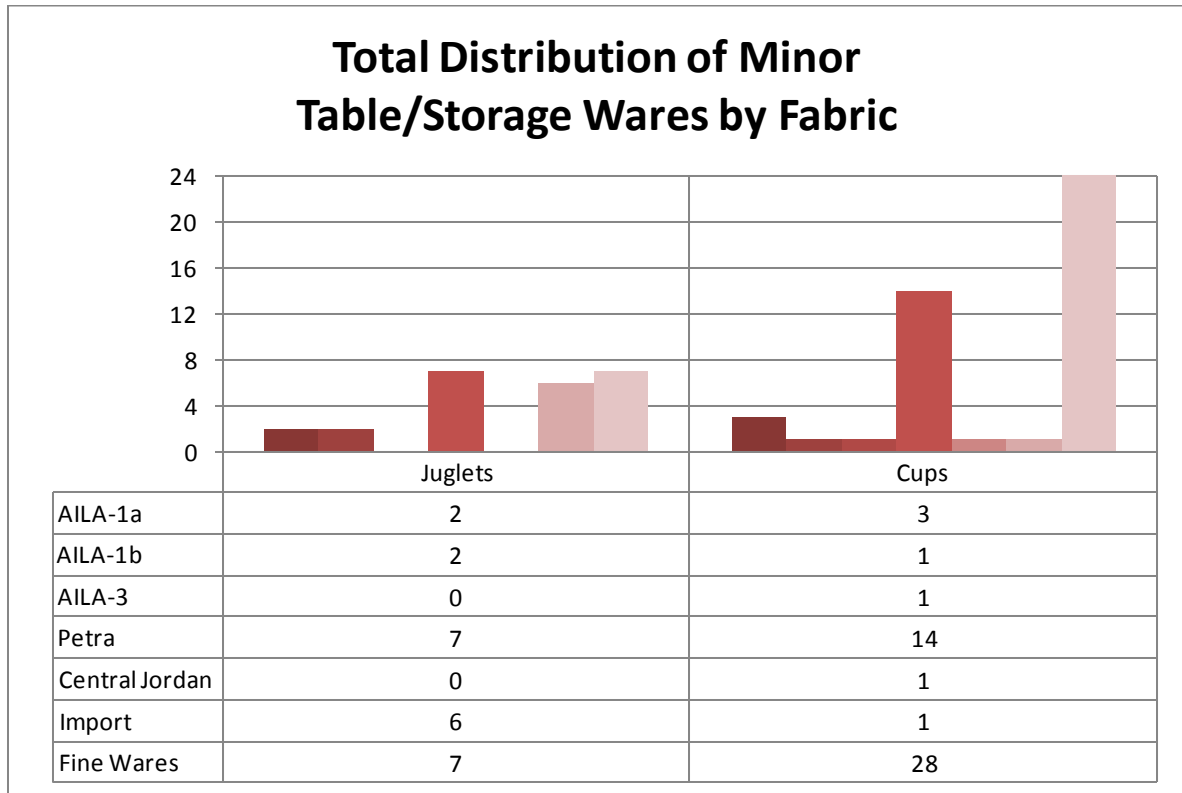
Table 2.21: Distribution of the major table/storage wares at 'Ayn Gharandal by fabric.⁴⁴



⁴³ The distribution of table/storage wares can be seen in **Table 2.20** and the breakdown of table/storage wares by fabric is presented in **Tables 2.21** and **2.22**.

⁴⁴ The Fine Wares category includes NFW, NSFW, and NPFW.

Table 2.22: Distribution of the minor table/storage wares at 'Ayn Gharandal by fabric.

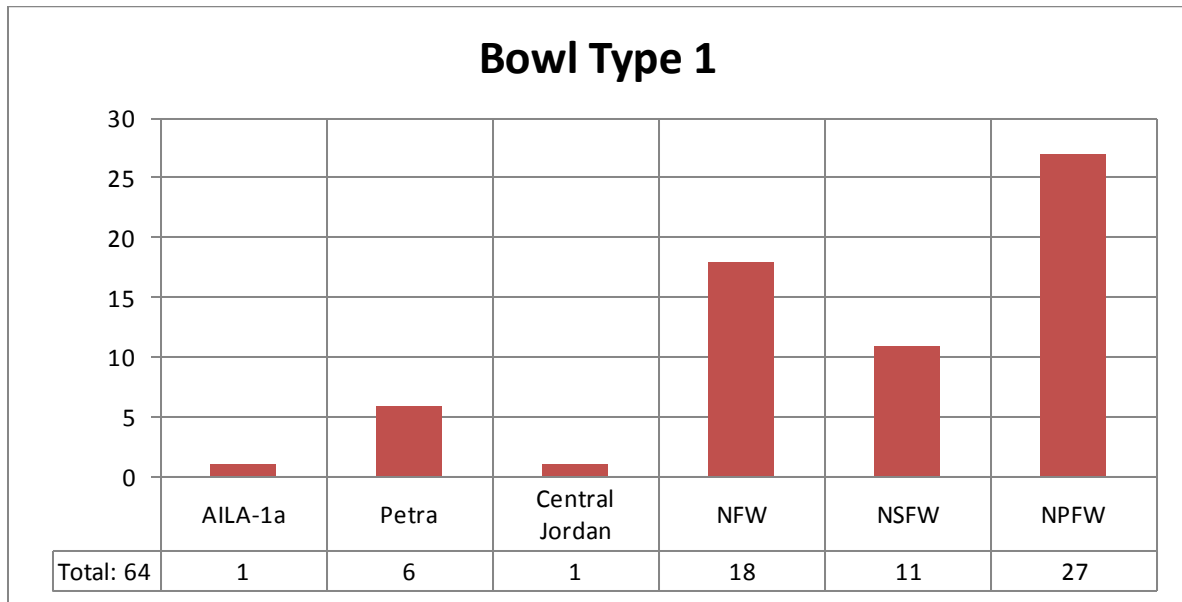


Bowls: Bowls are open formed vessels with a variety of profiles and date ranges. The bowls from AGAP are primarily based on rim profile and comparanda.⁴⁵

Type 1: Typical carinated bowl form, shallow and usually appears in the first and second centuries. This type is also paralleled in the Nabataean fine ware tradition. Corresponds to RAP bowl Type 1.

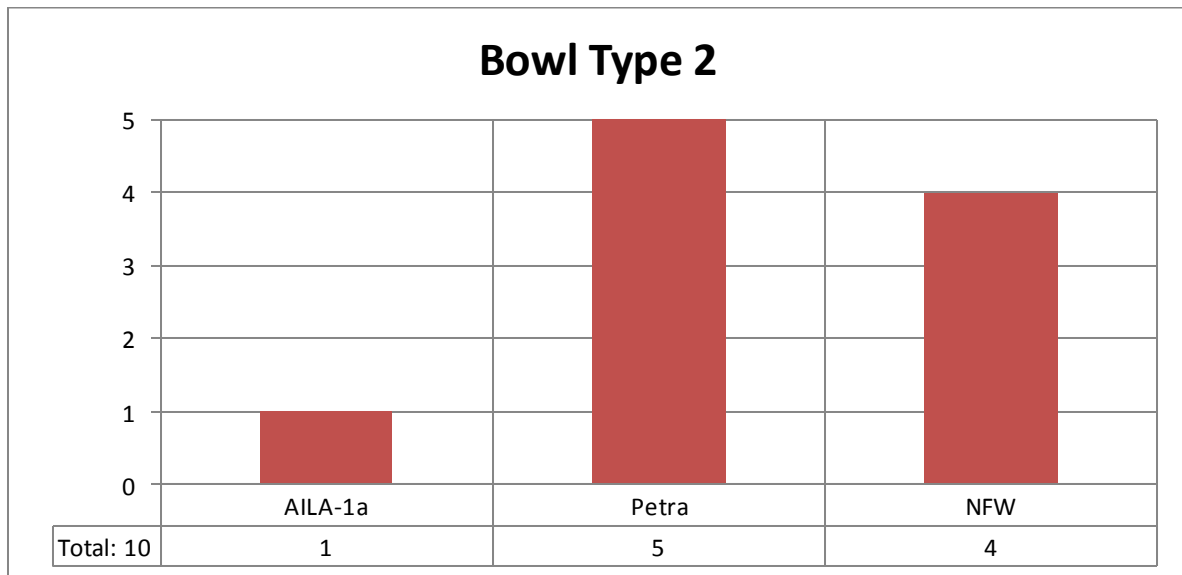
⁴⁵ **Tables 2.23-2.27** give the fabric distribution of bowl types 1-3, 5, and 9. There are only nine examples of the Type 4 bowl, all of which are in Petra ware. For the Type 6 bowls there are only five examples: two in AILA-1a ware and three in AILA-1b ware. The majority of Type 7 bowls are Petra ware (eleven), with only one being an unidentified import ware. Nine sherds have been identified as a Type 8 bowl, two as AILA-1a ware and seven as Petra ware. **Figure 2.7** shows the bowl typology.

Table 2.23: The fabric distribution of Type 1 bowls.



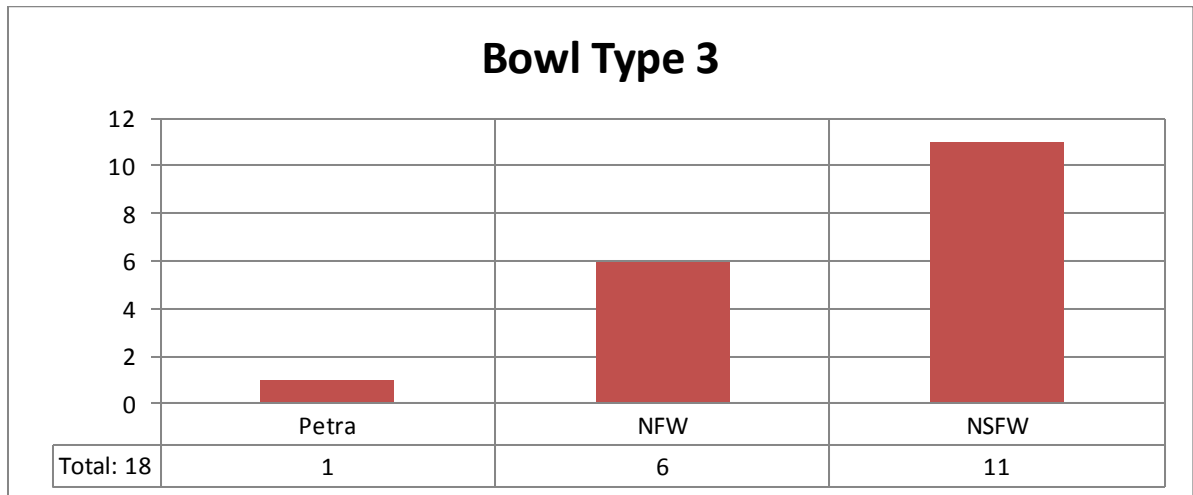
Type 2: This is a deeper bowl, hemispherical in form with either a ring or string cut base. Also dates to the first and second centuries. This type is also paralleled in the Nabataean fine ware tradition. Corresponds to later variants of RAP bowl Type 2.

Table 2.24: The fabric distribution of Type 2 bowls.



Type 3: This bowl is characterized by the distinctive notch directly below the exterior rim. It may or may not display a roulette design on the exterior surface and dates to the first and second centuries. This type is also paralleled in the Nabataean fine ware tradition. Corresponds to RAP bowl Type 3.

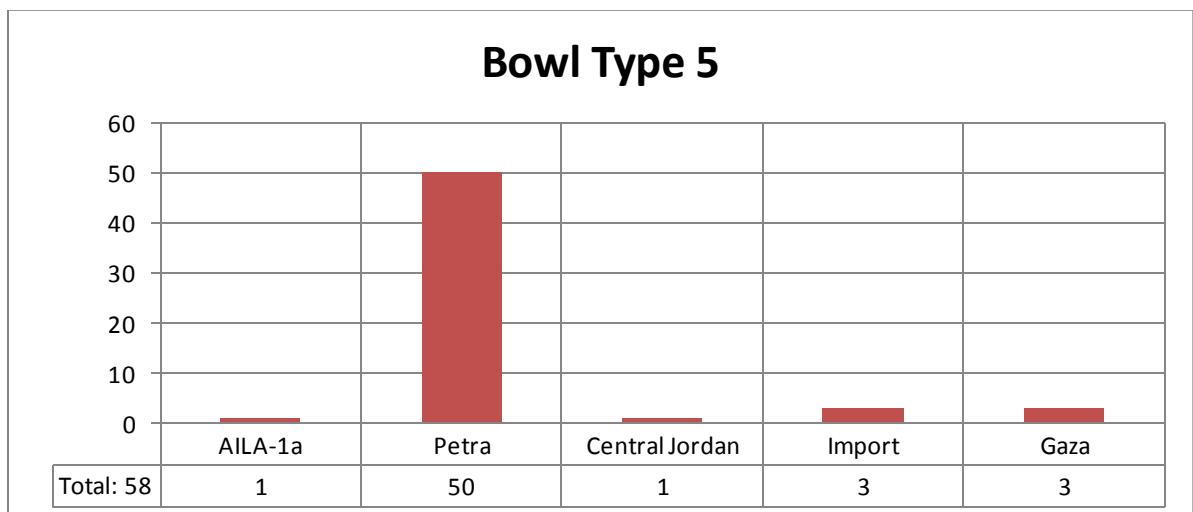
Table 2.25: The fabric distribution of Type 3 bowls.



Type 4: This is a third to fourth century bowl form with a thick, incurved, squared rim.

Type 5: Mainly found in Petra ware, this is a deep bowl with a steep sidewall, rounded rim and a flat base. It appears in late third or early fourth century contexts.

Table 2.26: The fabric distribution of Type 5 bowls.



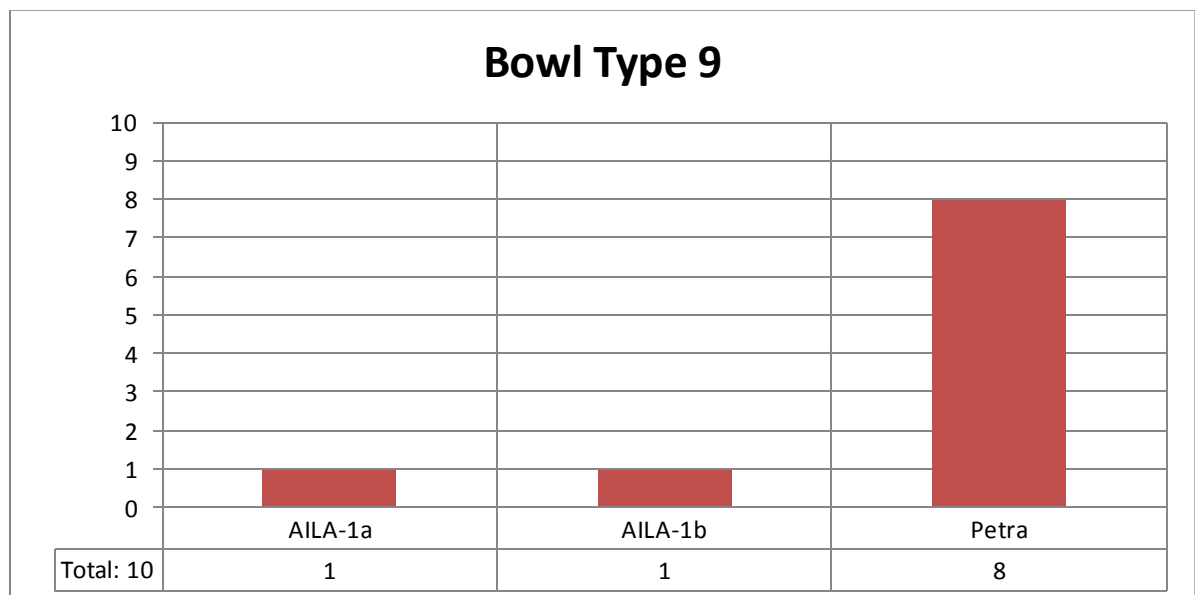
Type 6: This type is a deep bowl with a flat base, similar to Type 5. Type 6 only appears in Aila ware and displays an overhanging rim, which may or may not be grooved. The sidewall of the vessel varies from ribbed to unribbed. It appears largely in the fourth century. Corresponds to RAP bowl Types 24 and 25.

Type 7: This is a shallow bowl, characteristic of a second or early third century Petra form. It has a rounded rim with a groove under the rim exterior. Corresponds to RAP bowl Type 27.

Type 8: These are kraters with large diameters ranging from 18-29 cm, separated by those (A) less than 30 cm, and (B) those greater than 30 cm. Rim profiles vary greatly. These date from the late 1st-4th centuries. Corresponds to RAP bowl Types 13 and 14.

Type 9: This bowl displays a triangular rim which overhangs the exterior sidewall. It is typically in Petra ware and dates to the second or third century; it is similar to the Type 7.

Table 2.27: The fabric distribution of Type 9 bowls.



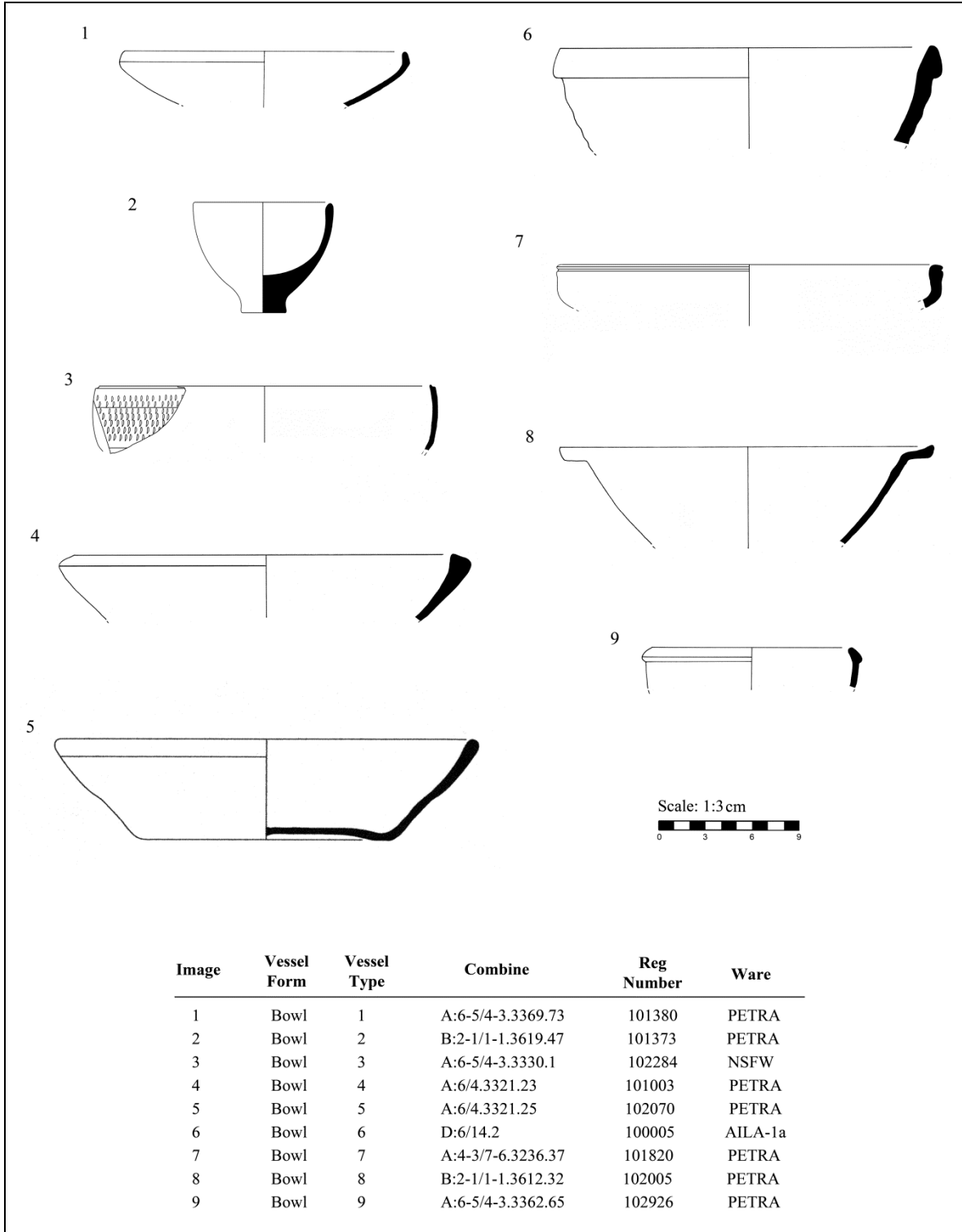
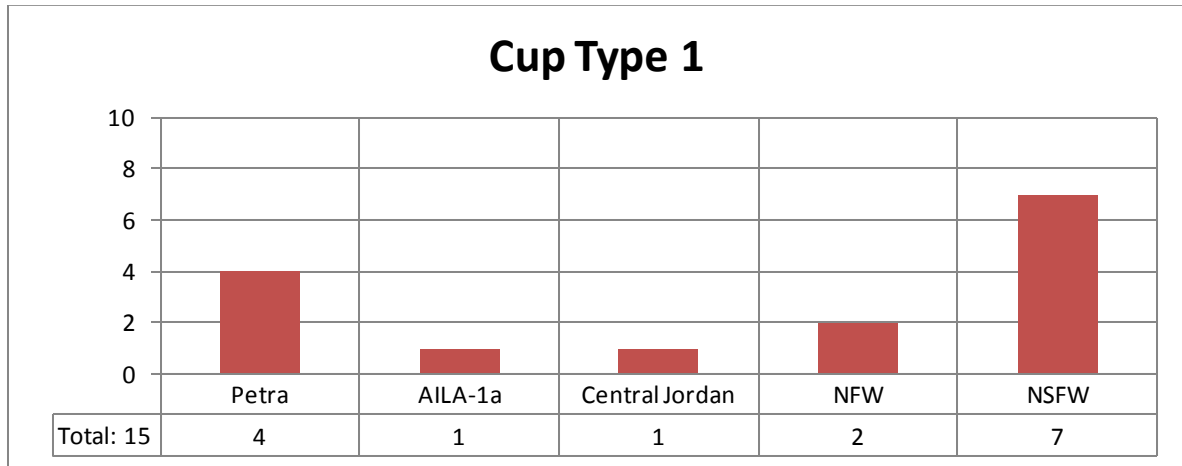


Figure 2.7: Bowl typology. (Drawing courtesy of Eric Steigmaier)

Cups: Cups are small drinking vessels. Most are globular in form and lack handles.⁴⁶

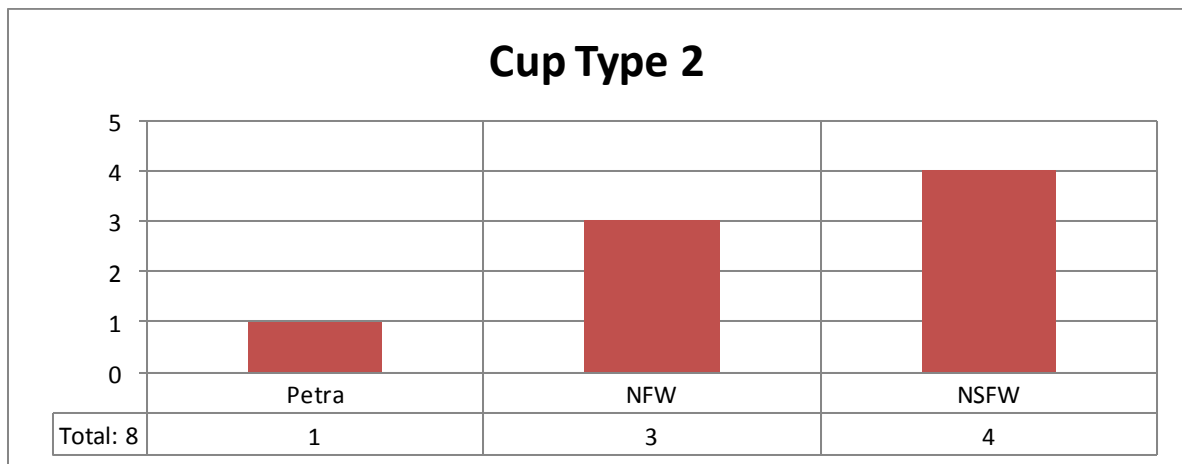
Type 1: This form is a miniature version of the cooking pot form and has several rim variations (triangular, rounded, or hooked.) This type is small and exhibits a very globular body. Possible date range is from the first to fourth centuries depending on rim profile. Corresponds to RAP cup Type 2.

Table 2.28: The fabric distribution of Type 1 cups.



Type 2: This cup type is more vertical with a globular base. It has an everted rolled rim and dates to the first and second centuries. Corresponds to RAP cup Type 3.

Table 2.29: The fabric distribution of Type 2 cups.



⁴⁶ **Tables 2.28-2.29** show the fabric distribution of the cup types from A GAP. **Figure 2.8** shows the typological characteristics of the cups from A GAP.

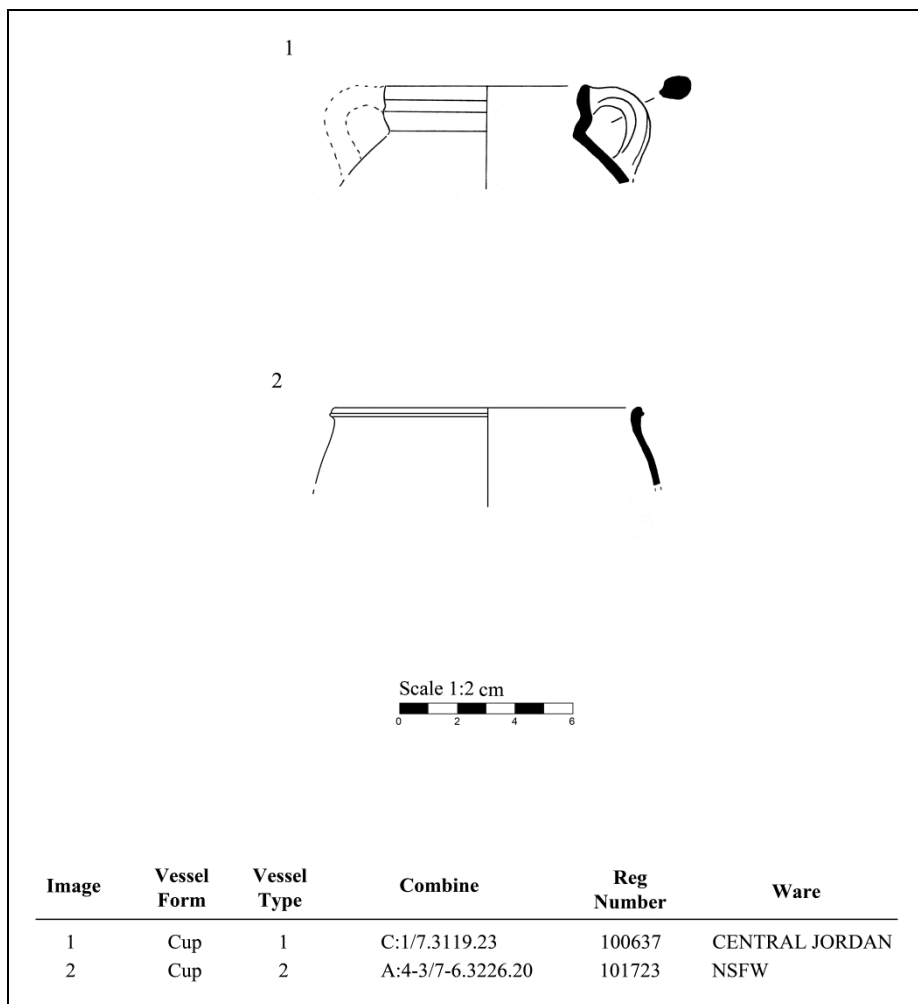


Figure 2.8: Cup typology. (Drawing courtesy of Eric Steigmaier)

Jars: Jars are defined as medium sized closed storage vessels. They typically have either two or four-handles which may attach on the rim, neck or shoulder. The jar types at AGAP range in date from the second century to the fourth century.⁴⁷

⁴⁷ **Table 2.30** shows the fabric distribution of all jar types. **Figure 2.9** shows the typological characteristics of jars from AGAP. **Figure 2.9** does not show examples of Type 1 or Type 4 jars because of the preservation of recovered sherds.

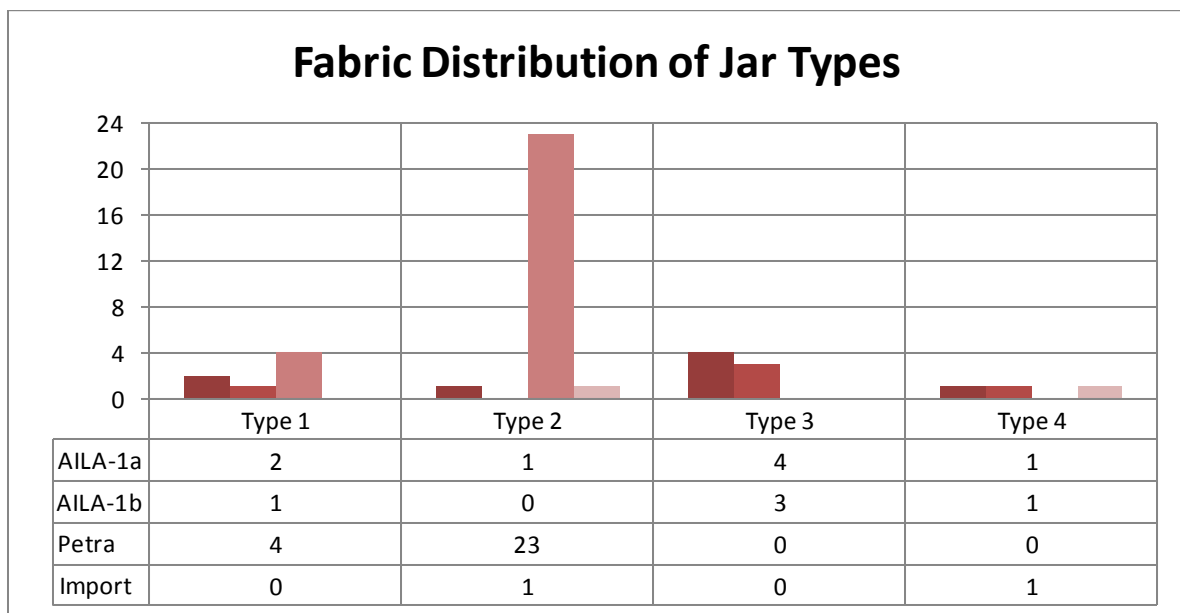
Type 1: This is a first to third century jar with a tall ribbed neck. Two handles usually attach from the rim to the shoulder, with a ribbed body and a ring base. Corresponds to the RAP jar Type 1.

Type 2: This jar has a folded rim, straight neck and is most common in Petra ware. It dates from the late second to the fourth centuries. Corresponds to the RAP jar Type 13.

Type 3: This type of vessel has a smooth transition from the rim into the body of the vessel which is exhibited by a straight, ribbed sidewall. It appears in third and fourth century contexts. Corresponds to the RAP jar Type 14.

Type 4: This is a large jar with a rounded rim and a prominent ridge at the neck and shoulder join. It has four handles, each with a large central ridge, and a ribbed body ending in a rounded base. It dates to the mid fourth century. Corresponds to the RAP jar Type 12.

Table 2.30: The distribution of jar types by fabric classification.



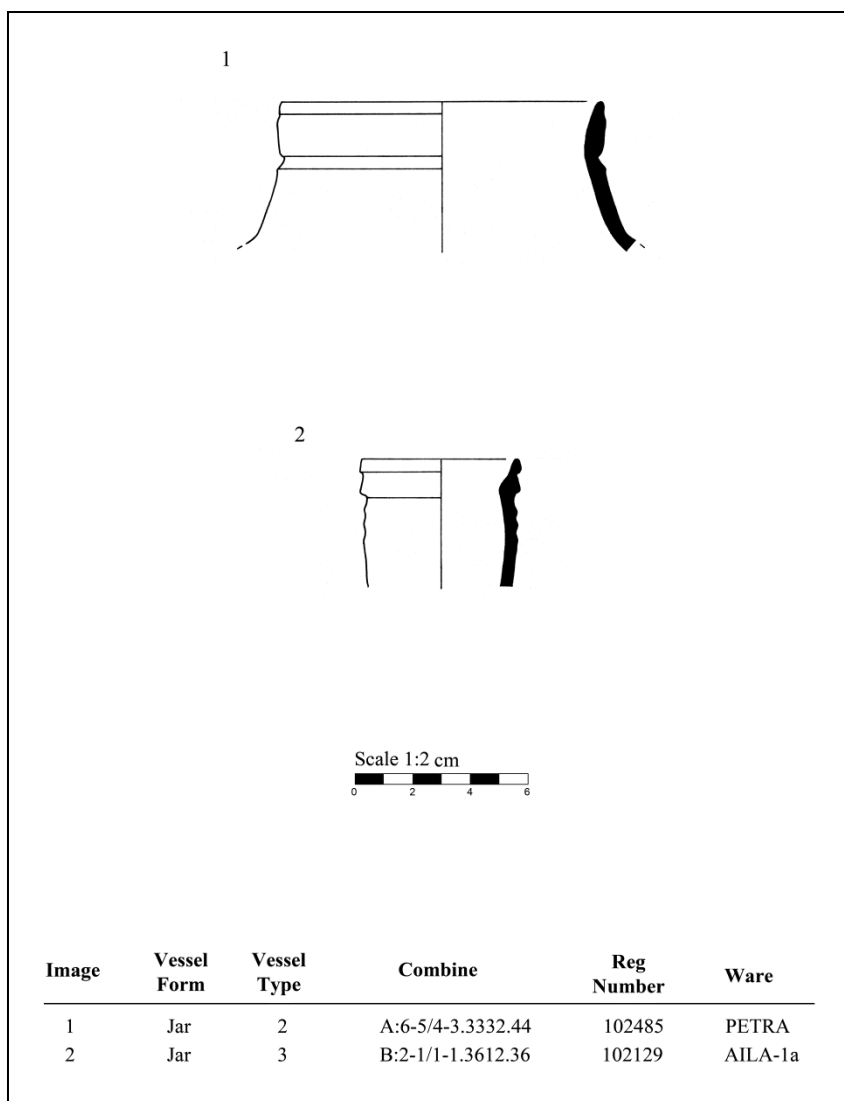


Figure 2.9: Jar typology. (Drawing courtesy of Eric Steigmaier)

Jugs: Jugs are small, closed vessels morphologically similar to jars. These smaller versions usually only have one handle-either extending from the shoulder to the rim or the neck.⁴⁸

⁴⁸ **Table 2.31** shows the fabric distribution of all jug types. **Figure 2.10** shows the typological characteristics of jugs from A GAP. **Figure 2.10** does not show an example of the Type 3 jug because of the preservation of recovered sherds.

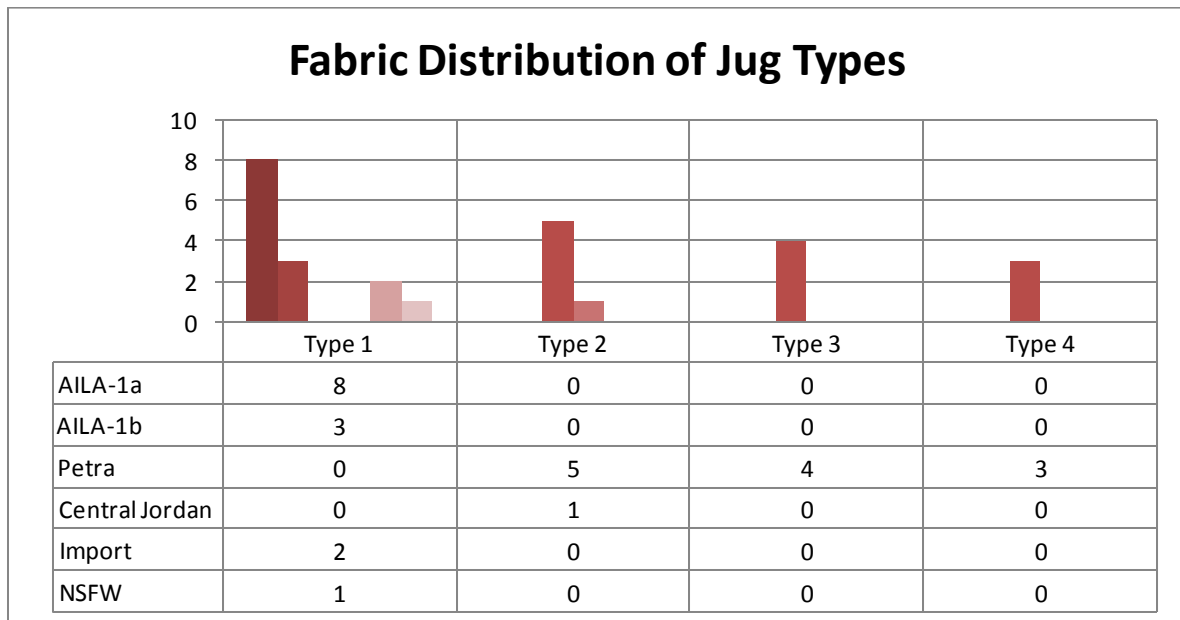
Type 1: This is canteen like vessel, usually identified as a flask: a small two handled jug with a narrow neck and a narrow flattened body. Typically ribbed, it can range from the first to fourth centuries; most examples at AGAP are from the third to fourth centuries. Corresponds to RAP jug Type 2.

Type 2: This is a globular jug with a spouted rim. There are two varieties **A)** the handle attaches on the rim and **B)** the handle attaches to the neck. It appears the early third century. Later varieties (fourth century) display a handle with a single ridge down the center and a squat, bulging neck. Corresponds to RAP jug Type 3.

Type 3: These are small jugs with folded rims and only a single handle, likely dating to the fourth century. Corresponds to RAP jug Type 4.

Type 4: This is similar in style to the Type 3 jugs but does not exhibit a folded rim. The Type 4 jugs are small, cylindrical vessels with a narrow neck, a base raised in the center (omphalos), and one handle. It is contemporary to the Type 3 and dates to the fourth century.

Table 2.31: The distribution of jug types by fabric classification.



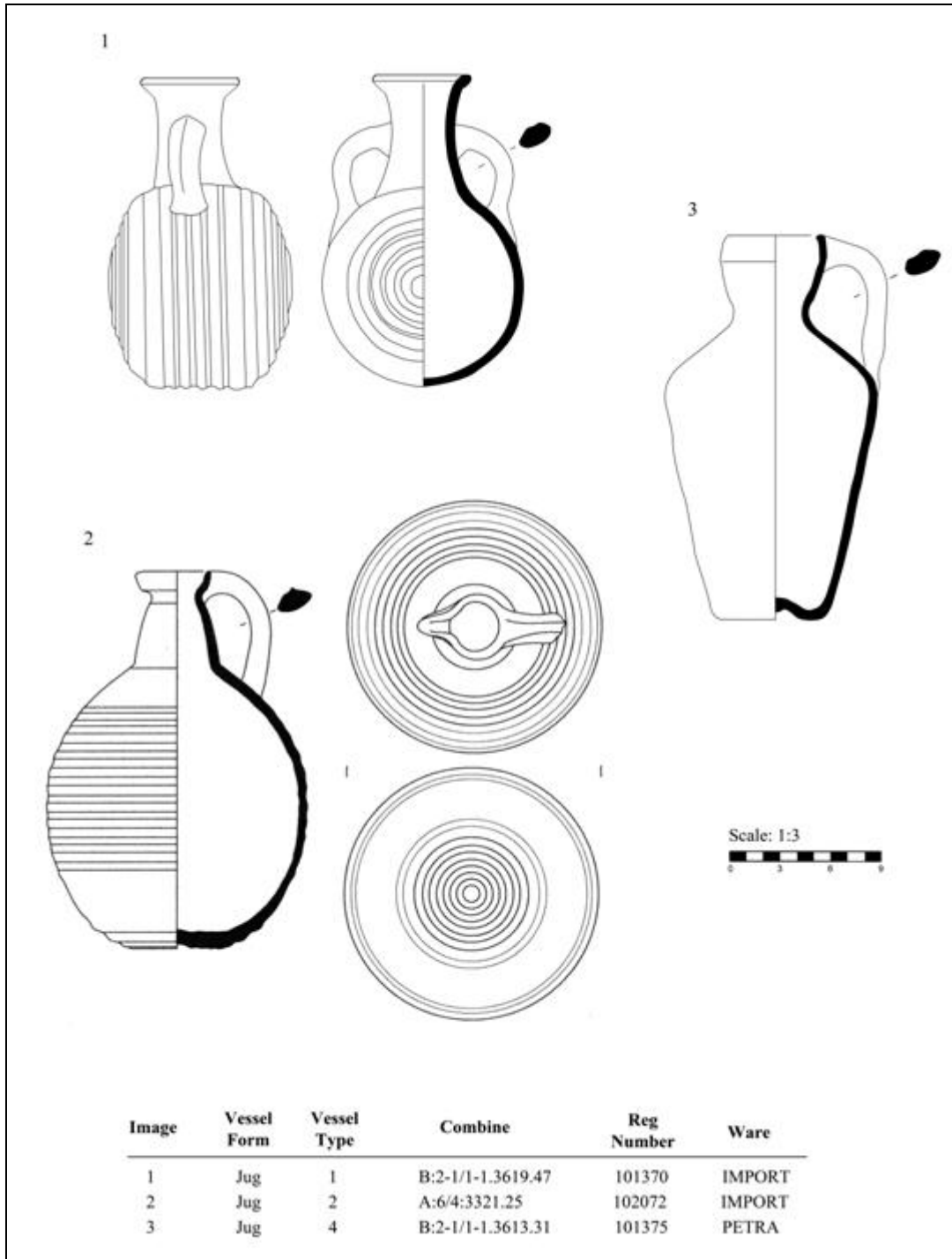


Figure 2.10: Jug typology. (Drawing courtesy of Eric Steigmaier)

Byzantine Painted Coarse Wares (BPCW): Byzantine painted coarse wares are a unique form of relatively rare table wares attested at both RAP and AGAP. Thus far, these vessels only emerge in fourth century contexts and only in various Aila wares. Interestingly, they appear in a wide variety of forms, paint colors, and painted decorations. So far, only two small sherds have been uncovered at AGAP (a flanged bowl rim and a juglet neck.)⁴⁹



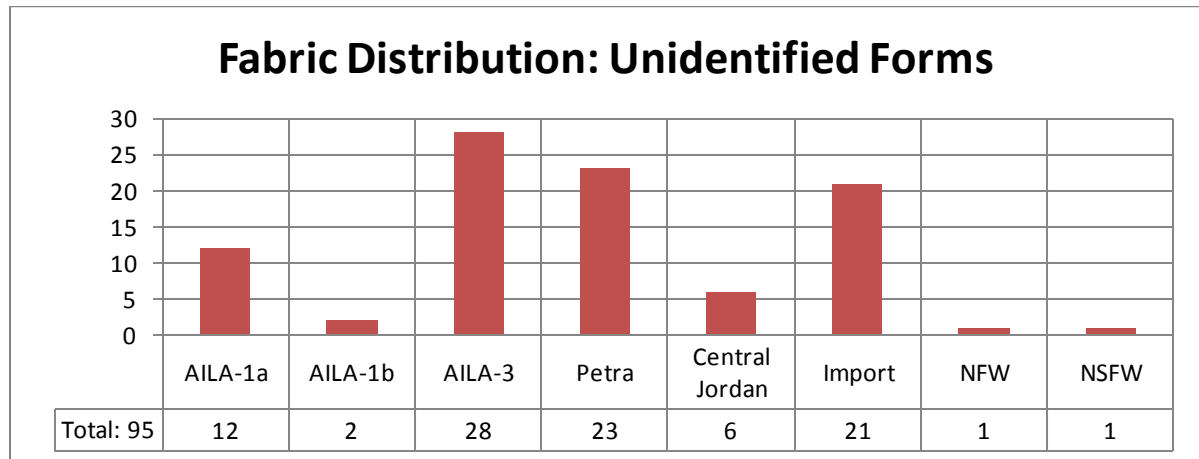
Figure 2.11: Examples of Byzantine painted coarse ware (BPCW) from RAP.

In addition to the material which naturally falls into the broad categories of cooking, table, and storage wares a number of vessels, which were common at AGAP, are classified as “other wares.” The “other wares” do not clearly fall into the above categories and are detailed below.⁵⁰

⁴⁹ See **Figure 2.11** for a sample of the Byzantine painted coarse wares recovered from the RAP excavations.

⁵⁰ There are many sherds (3.6%) from the excavation which could not be positively identified by vessel form but were classified by fabric type, as can be seen in **Table 2.32**. Also recorded from AGAP was the large number (320) of AILA-3 body sherds, though this is not included in the total registered diagnostic counts. It is probable that the majority of the AILA-3 ware body sherds represent thin-walled cooking vessels, though it is impossible to be certain.

Table 2.32: Total fabric distribution of unidentified forms.



OTHER WARES:⁵¹

Unguentaria: *Unguentaria*, or containers for unguents, were small ceramic perfume bottles. This form was produced at Petra from the first century B.C.E. to the mid-third century C.E., explaining the rareness of the form at AGAP.⁵²

Lamps: Lamps were used as a primary light source in the ancient world. Most were mold-made, often decorated, and can be classified as an intra-provincial or extra-provincial import to the site. ‘Ayn Gharandal has several different lamp forms ranging from the fourth century “South Jordan” lamp (**Figure 2.12.1**) to possible “Candlestick” lamps of the late sixth to seventh century (**Figure 2.12.3**)⁵³

⁵¹ Notably absent from this discussion are *pithoi* or large storage vessels. Excavations at ‘Ayn Gharandal have not uncovered fragments of any *pithoi*, which may be explained by the large number of amphorae found. It is possible that instead of *pithoi*, amphorae were repurposed at the site to be used as storage vessels.

⁵² AGAP excavations have only uncovered 5 unguent fragments: 1 rim, 1 base, and 3 body sherds -none sufficient for identification.

⁵³ Parker, S.T., “The Pottery”, 2006: Fig. 16.72:360. Parker, S.T., *Limes Arabicus* Interim Report, 1987: Fig 123:237. Magness, J., *Jerusalem Ceramic Chronology circa 200-800 C.E.*, Sheffield Academic Press Ltd., 1993. A total of 48 lamps have been discovered at AGAP. Many reveal poor preservation making identification

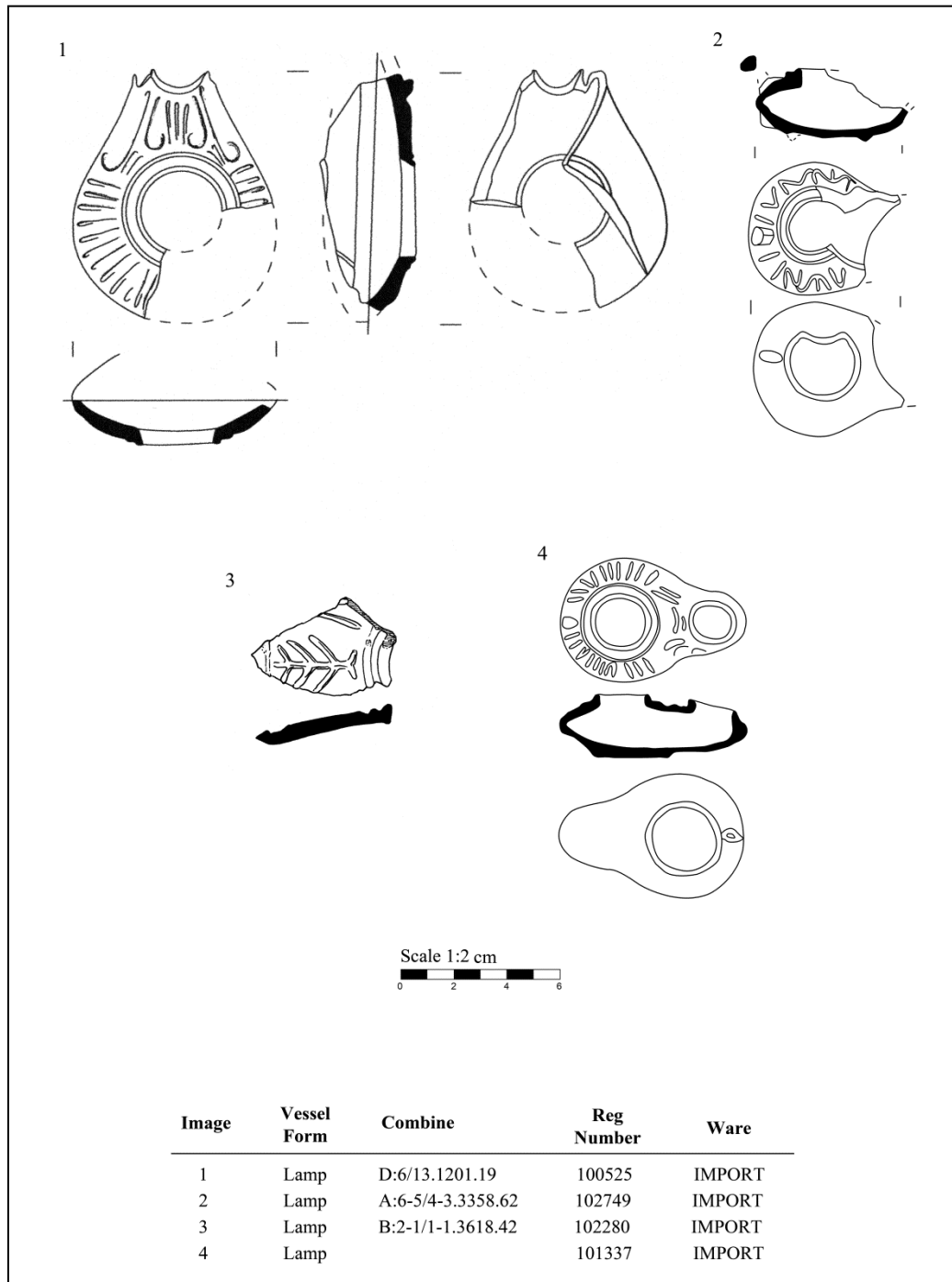


Figure 2.12: Lamp profiles from 'Ayn Gharandal.

and dating of the sherds difficult. Figure 2.14 shows the most well preserved lamps from the AGAP excavations.

Pipes: There are likely two varieties of pipes at ‘Ayn Gharandal: cylindrical pipes, used for either water transport or heating systems, and box flue pipes. There is abundant evidence of round water pipes in both the fort and the bathhouse. Most flue pipes, including a series of *in situ* box-shaped flue pipes, appeared during excavation of the bathhouse. The *in situ* flue pipes were left in place to be studied in future excavation seasons.⁵⁴

Stoppers: Stoppers were used on jars or amphorae to protect their contents. At AGAP, three stopper sherds were identified, all as secondary use. Each appeared to be body sherds from large storage jars, which had then been cut into a circular shape to fit in a small opening. One retained the plaster used to adhere it to the vessel.⁵⁵



⁵⁴ A quantification of the pipe fragments from the project cannot be accurately given as the material from 2009-2011 was not initially recorded in full. Further study is anticipated on this material, including an analysis of rim variations and fabrics.

⁵⁵ **Figure 2.13** has a sample of a box flue pipe recovered in square A:6-5/4-3 during the 2013 season and a ceramic jar stopper with plaster attached.

Figure 2.13: A- Box pipe with plaster found in the fort. B- Jar stopper with plaster attached.

Tabûn: Two fragments from the walls of a *tabûn*, or clay oven, were recovered in the secondary occupational layers of the fort.⁵⁶



Figure 2.14: *Tabûn* from A:6-5/4-3.

Basin: These are large, deep vessels with thick sidewalls and a thickened and flattened rim. The single basin sherd recovered from AGAP is a rim fragment with mat impressions, likely showing the material it was placed upon before it was fired.

This typological account of the cooking, table/storage, and other wares provides a basis for understanding the occupational history of ‘Ayn Gharandal. The change in these diverse ceramic types over time offers absolute dating of the stratigraphic layers. This

⁵⁶ **Figure 2.15** is a photo showing the intact *tabûn* from the fort.

methodology was applied to each excavation square at AGAP to shed light on the site's occupational history.⁵⁷

The Eastern Ridge is situated east of the fort complex and west of the oasis near the site. In 2011, the area was tentatively labeled as Area D-1 and a total surface sherd collection was completed. In 2013, a single 5m x 5m square was laid across the area incorporating several of the visible architectural features. Initially, it was interpreted as a Nabataean tomb based largely on the presence of a large ashlar door stop and the Nabataean pottery on the surface; however, excavations exposed two rooms containing a series of superimposed sheep-dung floor surfaces. A cist measuring 2.05m in depth and 0.96m in diameter, lying outside a doorway, was found inside the eastern room and likely served as a later water or storage installation. Several intrusive burials were found throughout the excavation area, though no ceramic material was interred with the remains. Preliminary analysis of the human remains and artifacts suggests they were from the Early Islamic period; indicating the area was likely used as a cemetery at that time.⁵⁸

Most loci from the ridge yielded little or no diagnostic pottery, rendering dating of individual stratigraphic layers difficult. It is likely that with the installation of each new floor surface the room was cleared of debris and only a few sherds remained on top of or within the floor surface. Enough diagnostic pottery was unearthed from a few loci to provide broad

⁵⁷ The AGAP team excavated in square units based on a grid format. During the 2010 and 2011 seasons all squares were 5m x 5m, however for the 2013 season the squares in the *castellum* were extended to either 10m x 10m or 10m x 5m. In 2014, excavation continued in the *principia*, completing the expanded southern section from the 2013 season.

⁵⁸ Darby, R. and E. Darby, "The 'Ayn Gharandal Archaeological Project," *Department of Antiquities of Jordan*, 2013, Unpublished report. **Figure 2.15** shows an image of Eastern Ridge.



Figure 2.15: Final excavation photograph for the Eastern Ridge. (Photo courtesy of R. Darby.)

date ranges. The eastern room within the square contained two superimposed floors, the upper **Locus 4106** and the lower **Locus 4114**. Two Class 47 amphorae sherds, dated independently of the remainder of the ceramic material from Locus 4106 provide the best dating evidence. These sherds, along with the other diagnostic finds, categorized in **Tables 2.33-2.34**, offer a broad range of the second to fourth centuries for this room. The lack of fine wares limited a more specific chronology.⁵⁹

Table 2.33: Diagnostic material for Locus 4106 and the general date range for each form.

Form	Type	Fabric	Quantity	Date Range
Amphora	Class 47	Import	2	3 rd -4 th centuries
CP	4	AILA-1a, AILA-3	2	2 nd -3 rd centuries
Bowl	3	Petra	1	1 st -2 nd centuries
Approximate Date Range for Locus:				3 rd -4 th centuries

⁵⁹ See **Table 2.9** for specific information on Class 47 amphora.

Table 2.34: Diagnostic material for Locus 4114 and the general date range for each form.

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
CP	1	Petra	1	1 st -3 rd centuries
CP	4	AILA-3	1	2 nd -3 rd centuries
Bowl	3	NFW	1	1 st -2 nd centuries
Jar	2	Petra	1	2 nd -4 th centuries
Approximate Date Range for Locus:				2 nd -4 th centuries

In the western room, sediment layers were interlaced between the various surface levels. Again, there was a lack of closely datable diagnostic sherds but those present appeared to be earlier in date compared to the eastern room. The western room yielded more Nabataean fine ware and Petra coarse ware ceramics, which may suggest a slightly earlier occupational period. For comparative data, **Table 2.35** shows the distribution of all identifiable diagnostic material from the lower loci in the western room.⁶⁰

Table 2.35: Distribution of diagnostic sherds from the occupational levels in the western room of Eastern Ridge.

<u>Locus</u>	<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Locus 4123.55	Bowl	3	NSFW	1	1 st -2 nd centuries
Locus 4123.55	Jar	2	Petra	1	2 nd -4 th centuries
Locus 4125.60	CP	2	Petra	1	2 nd -4 th centuries
Locus 4127.62	Bowl	3	NFW	1	1 st -2 nd centuries
Locus 4129.66	Bowl	9	Petra	1	2 nd -3 rd centuries
Locus 4129.66	CP	2	Petra	1	2 nd -4 th centuries
Locus 4130.68	Bowl	3	NFW	1	1 st -2 nd centuries
Locus 4130.68	Bowl	1	NFW	2	1 st -2 nd centuries
Approximate Date Range for Locus:					2 nd -4 th centuries

⁶⁰ All material in the western room is noted as being interior to **Locus 4103** the mudbrick wall outlining the structure. **Tables 2.36** and **2.37** show the fabric distribution of the diagnostic material from the western room on the Eastern Ridge.

Table 2.36: Fabric distribution of the diagnostic material in the Western Room on the Eastern Ridge.

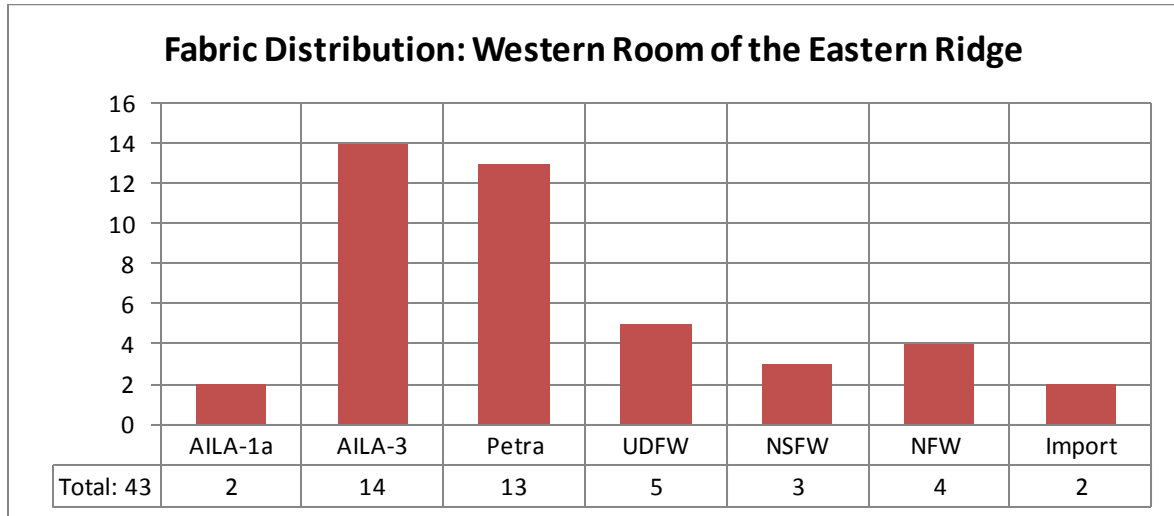


Table 2.37: The distribution of fabrics, by loci, in the Western Room on the Eastern Ridge.

Locus	Ware	Quantity	Total
4121	AILA-1a	1	3
	AILA-3	1	
	NSFW	1	
4123	NSFW	1	6
	Petra	3	
	Import	1	
	UDFW	1	
4124	AILA-1a	1	1
4125	Petra	1	3
	UDFW	2	
4126	Petra	2	2
4127	NFW	1	1
4128	NSFW	1	6
	Petra	2	
	Import	1	
	UDFW	2	
4129	Petra	3	4
	AILA-3	1	
4130	NFW	3	8
	Petra	2	
	AILA-3	1	

The superimposed floors suggest a series of successive occupational levels on the ridge over some unknown period of time. Unfortunately, this presents a few problems when interpreting the remains from the structure. Even though each occupational locus was sifted very little ceramic material was discovered, complicating the analysis. Based on the available ceramics it appears that the primary occupation of the Eastern Ridge was significantly earlier than the occupation of the fort, even though it is clear from later burials and modern artifacts that the structure continued in use after the abandonment of the fort.

The bathhouse adjacent to the fort presents similar problems. The bathhouse was excavated in 2010 when four rooms were partially cleared, the *caldarium*, the *tepidarium*, the *frigidarium*, and an adjacent latrine. A 2009 survey revealed that the bathhouse had been disturbed by both looters and modern construction activities. Excavations yielded modern artifacts at the floor level in the *tepidarium*, which was completely excavated, confirming contamination of all loci within this room. In contrast, it appeared that the *caldarium* and *frigidarium* were largely excluded from looting, though neither yielded significant ceramic finds. This deficiency of sealed contexts rendered a stratigraphic dating of the bathhouse improbable based on the 2010 material. Both of these areas were only partially excavated and were further uncovered during the 2015 season.⁶¹

Nevertheless, despite only a few unstratified finds, some key evidence emerged from the bathhouse material, including a single, largely intact lamp (**Figure 2.12.1.**) This Early Byzantine lamp dates to the fourth century and contains characteristic crook designs. Additionally, there were a large number of datable amphora sherds, which made up 27.1% of

⁶¹ For a description of the rooms see Darby, et. al., "The 'Ayn Gharandal Archaeological Project," 2012.

the diagnostic finds from the bathhouse (**Table 2.38.**) **Table 2.8** shows that Gazan amphorae were the most prevalent amphorae at AGAP, including the bathhouse, where Gaza accounted for 78.9% of the amphorae recovered (**Table 2.39.**) The bathhouse also yielded a remarkable amount of *in-situ tubuli*, used to heat the *caldarium* and *tepidarium*. There were two different forms, cylindrical pipes typically viewed as “water-pipes” and rectangular box pipes with perforations in opposite side-walls; however, the difference in their function within the structures was not examined in detail in 2010. Several samples were collected for further study and a typology may be developed to aid in dating the structure in the absence of sealed contexts. Though not definitive, much of this material can broadly be dated to the third and fourth centuries; if accurate, this would correspond with the primary occupation of the fort. Admittedly most of the material found in the bathhouse would not have been used there, rather the material culture may reflect the period of the decommissioning of the bathhouse.⁶²

⁶² Parker, S. T., “The Pottery,” in *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project, 1980-1989*, Washington, DC: Dumbarton Oaks, 2006. **Figure 2.16** is an image of the *in situ tubuli* in the bathhouse. Hoss, S., “Small Finds in Roman *Thermae*: An Introduction,” in *Thermae in context: Roman bathhouses in the town and in daily life*, eds. Binsfeld, A., S. Hoss, and H. Posche. *Archaeologia Mosellana* 10. Luxembourg, Musee national d’histoire et d’art. Forthcoming; Whitmore, A., “Artefact Assemblages from Roman Baths: Expected, Typical, and Rare Finds,” in *Thermae in context: Roman bathhouses in the town and in daily life*, eds. Binsfeld, A., S. Hoss, and H. Posche. *Archaeologia Mosellana* 10. Luxembourg, Musee national d’histoire et d’art. Forthcoming.

Table 2.38: Distribution of diagnostic vessel forms recovered from the bathhouse.

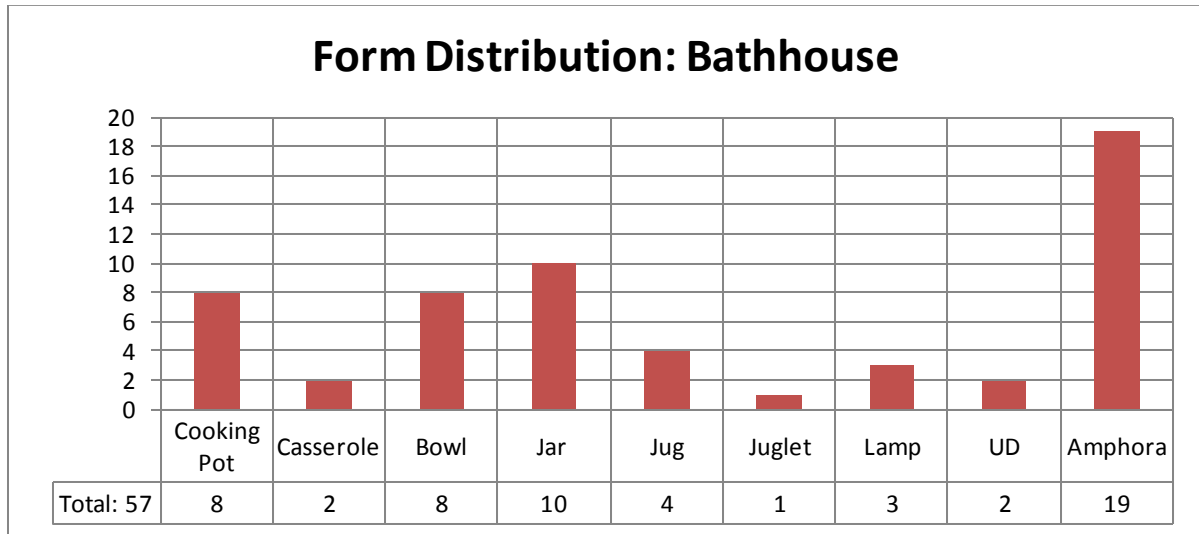


Table 2.39: Distribution of amphorae in the bathhouse.

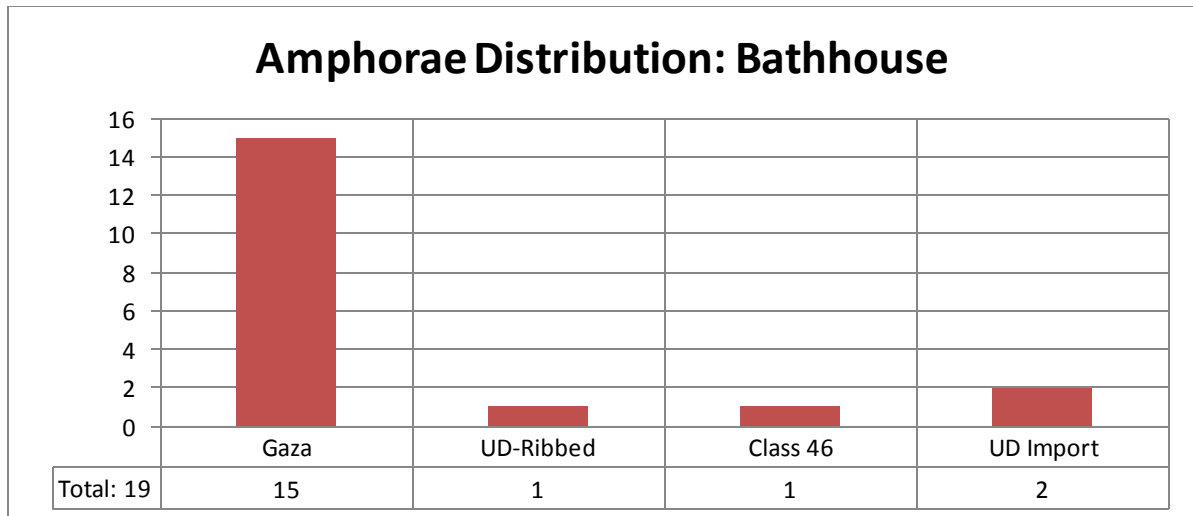




Figure 2.16: *In-situ* tubuli from the bathhouse. (Photo courtesy of R. Darby.)

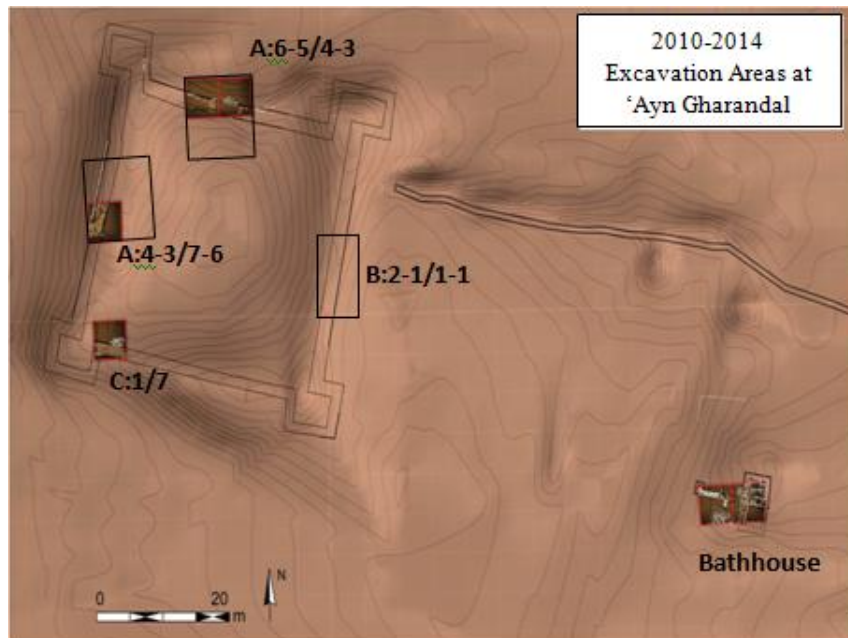


Figure 2.17: Excavation areas at 'Ayn Gharandal. (Adapted from image by R. Darby.)

The stratigraphic evidence can be best understood following a discussion of the excavated areas and the general layout of the fort. The fort (ca. 38m x 38m) lies ca. 50m northwest of the bathhouse. The fort structure has four projecting corner towers and an east facing gate. Excavation began in 2010 with three 5m x 5m squares: two on the western curtain wall (A:3/7 and C:1/7) and one (A:6/4) along the northern curtain wall. In 2011 excavation in each square reached the bedrock foundation beneath the fort walls. Square A:3/7 was expanded in 2011, incorporating a portion of A:4/7 (also opened in 2011), to complete excavation of an Early Islamic period interment. In 2013, Squares A:3/7 and A:6/4 were expanded to 10m x 10m squares (A:4-3/7-6 and A:6-5/4-3 respectively) to accommodate architectural features discovered the previous season. A new square (B:2-1/1-1, measuring 10m x 5m) was opened in 2013 to encompass the eastern gate and the area directly outside the entrance. In 2014 the area of A:4-3/7-6 was reopened to complete excavation in a room identified as the *principia*.⁶³

Square C:1/7 on the south curtain wall was in close proximity to the southwest corner tower. The square was bisected in mid-season to restrict excavation to the western sector. In this sector excavators discovered a cross wall with stone foundations and stairs leading towards the corner tower, which divided the remaining area. The smallest percentage of ceramic material was recovered from this square (8.7%); however, **Tables 2.40 and 2.41** show the notable variations in vessel forms and the significant number of fine ware imports. Amphorae were present in abundant quantities in C:1/7; they constitute 29.4% of the ceramic finds from the square, significantly more than in the other excavation units. Predictably,

⁶³ **Figure 2.17** displays the layout of excavation squares in the fort.

Gazan amphorae dominate (75.4%), though many recorded from this area likely represent a single vessel.⁶⁴

Table 2.40: Distribution of vessel forms in Square C:1/7 during the 2010-2011 seasons.

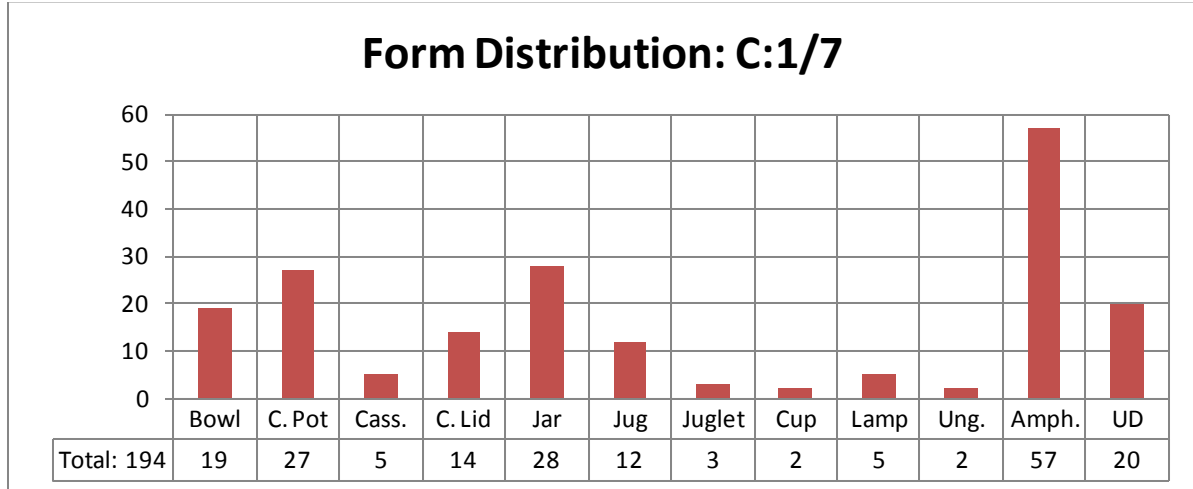
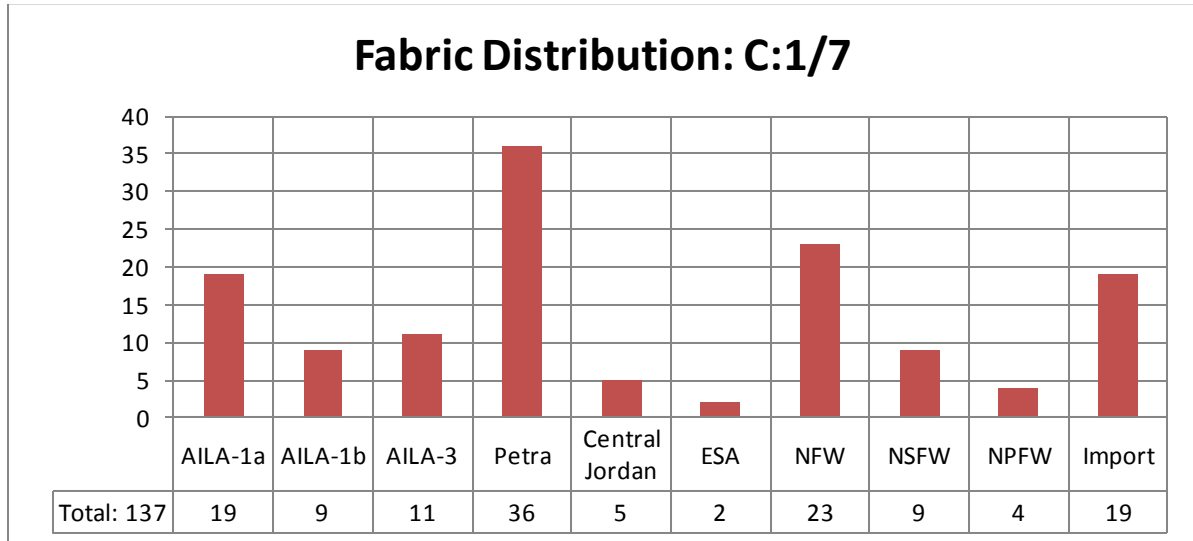


Table 2.41: Distribution of intra- and extra-provincial imported material to the site found in Square C:1/7.⁶⁵



⁶⁴ See **Table 2.2** for the distribution of diagnostic material from the fort. **Table 2.42** displays the amphorae varieties found in Square C:1/7. **Figure 2.18** is an image of C:1/7 at the end of the 2011 season.

⁶⁵ The fabric distribution in this table does not include the amphorae.

Table 2.42: Amphorae in Square C:1/7.⁶⁶

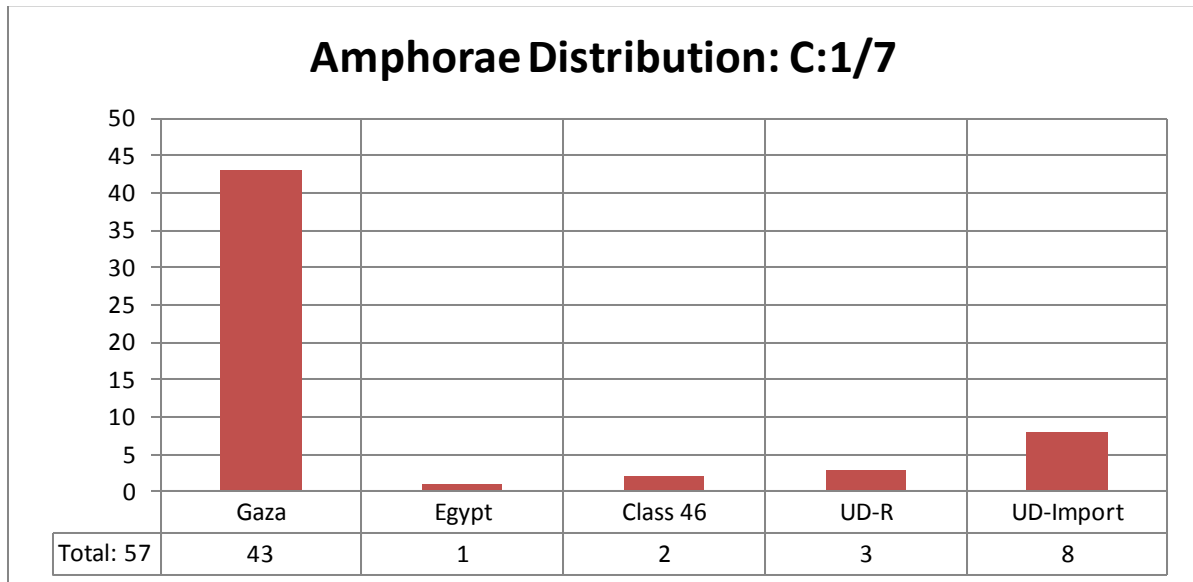


Figure 2.18: Final excavation photo for C:1/7. (Photo courtesy of R. Darby.)

One square, A:3/7, was opened along the western curtain wall in 2010. Early in the season a series of human interments, which extended beyond the limits of A:3/7, prompted

⁶⁶ Two of the Gazan amphorae were identified as Class 48 rims.

opening an adjacent square, A:4/7. Similar to the burials located on the Eastern Ridge, these appear to be Early Islamic in date but contained little to no associated ceramic material. The northern face of an east-west partition wall extended along the southern edge of Square A:3/7. The partition wall consisted of a stone foundation, topped with coursed mudbrick. Also located in this room was a collection of painted plaster bearing a Greek *dipinto*. By the completion of the season, the portion of Square A:3/7 interior to the curtain wall had been completely excavated to the bedrock. The strategic location of this room, directly opposite the gate entryway, the large size, and the painted plaster strongly implied the area was the *principia*, or headquarters, of the fort.

This excavation was expanded in 2013 to 10m x 10m, relabeled as A:4-3/7-6, to expose the entire *principia*. Excavation revealed a complete room in the southern area of the 10m x 10m square, separated from the northern half by another mudbrick partition wall running east to west from the curtain wall. Collapsed stones from piers on the north and south walls were found inside the southern room. The entrance to the room was in the eastern baulk, directly across from the gate entrance but just outside the excavation. A substantial number of later burials slowed the progress of excavation and led to the closing of the northern area. Due to the interments, main occupational phases were not reached in the remainder of the square and the ceramic material available provided little information for dating.⁶⁷

⁶⁷ **Figure 2.19** shows the layout of Square A:4-3/7-6 at the end of the 2013 and 2014 seasons.



Figure 2.19: Final excavation photos for A:4-3/7-6. (Photos courtesy of R. Darby.)

Square A:4-3/7-6 was the only area reopened during a short excavation season in 2014. The goal was to complete excavation in the southern sector of the square, focusing entirely on the *principia*. Between the 2013 and 2014 seasons, severe flood damage had compromised several areas of the fort. At the start of the 2014 season, this damage and previous backfill was removed from A:4-3/7-6. Based on the stratigraphic deposition of soil in the square there is evidence of a primary occupation sequence (**Loci 3262/3265/3266**) and a thick sand deposition comprised of sandy soil and ash lenses, likely indicative of periods of abandonment alternating with some squatter occupation (**Loci 3260/3261**). The primary occupational level consists of a layer of occupational debris (**Locus 3262**), a primary floor surface (**Locus 3235**), and a subfloor layer (**Locus 3266**). No datable material was recovered from either the floor or subfloor surfaces; however the occupation debris yielded enough material to broadly date the locus to the early-mid fourth century.

At the conclusion of the season, the ceramics from the 2014 loci were combined and associated with loci from the 2011 probe. The abandonment and squatter occupation **Locus**

3221, from the 2011 season, is likely equivalent to **Locus 3260** from 2014. The ceramics recovered from these two loci date to the fourth century. **Locus 3222**, equal to **Locus 3261**, was found directly below **Loci 3221/3260**. It is highly possible all of these loci are essentially equivalent and thus can be combined, expanding the datable ceramic evidence for this abandonment and squatter phase.

The final association is with the primary occupation phases of **Locus 3223** with **Locus 3262**. This occupational level contained an ARS F61 rim dated ca. 325-400/420, which would place a *terminus post quem* of 325. Complicating this classification is a sixth century FBW sherd, though it is likely the result of contamination from the intrusive burials. **Locus 3262** was excavated in three different sectors. The uppermost portion of this locus was removed over the entire room, collecting the uppermost ceramic material. It was here that the ARS F61 A was discovered. The accumulation beneath this was divided into the western and eastern sectors of the square. No ceramic material was discovered in the lower strata which definitively date later than the early fourth century.⁶⁸

⁶⁸ See **Tables 2.43** and **2.44** for an analysis of the diagnostic material found in **Loci 3223** and **3262** from A:4-3/7-6.

Table 2.43: Identified diagnostic material from Square A:3-7, Locus 3223, in 2011.

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Bowl	1	NFW	1	1 st -2 nd centuries
Bowl	4	Petra	2	3 rd -4 th centuries
Bowl	5	Petra	1	3 rd -4 th centuries
CP	2	Petra, Import	4	2 nd -4 th centuries
CP	4	Import	1	2 nd -3 rd centuries
CP	5	Petra, AILA-1a	2	4 th century
Jar	1	AILA-1b	1	1 st -3 rd centuries
Amphorae	Class 46	Import	2	4 th -6 th centuries
Amphorae	N/A	Egypt	2	4 th -5 th centuries
Amphora	N/A	Gaza	1	3 rd -5 th centuries
Approximate Date Range for Locus:				4 th - 6 th centuries

Table 2.44: Identified diagnostic material from Square A:3-7, Locus 3262, in 2014.

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Bowl	1	NPFW	1	1 st century
Bowl	F61A	ARS	1	325-400/420
CP	2	Petra, Cen. Jordan, AILA-1a	15	2 nd -4 th centuries
CP	5	AILA-1a, AILA-3	5	4 th century
UD	N/A	Axumite	1	4 th century
Amphorae	Class 45	Import	1	1 st -5 th centuries
Amphorae	N/A	Egypt	5	4 th -5 th centuries
Amphora	N/A	Gaza	2	3 rd -5 th centuries
Approximate Date Range for Locus:				4 th - 5 th centuries

The ceramic material in A:4-3/7-6 is highly varied (**Table 2.45**), with 41.8% of the finds representing table wares and 34.1% cooking wares. Amphorae only account for 16.5% of the ceramic material from Square A:4-3/7-6; the majority of these come from wind-blown sand deposits near the surface. Most amphorae recovered were identified (**Table 2.46**), which is useful for dating and understanding trade relationships. On a final note, this area recovered the largest collection of Nabataean fine ware sherds from the fort (**Table 2.47**); excluding the amphorae, the Nabataean fine wares equate to 15.9% of the diagnostic finds in this square.

Table 2.45: Distribution of vessel forms from Square A:4-3/7-6.⁶⁹

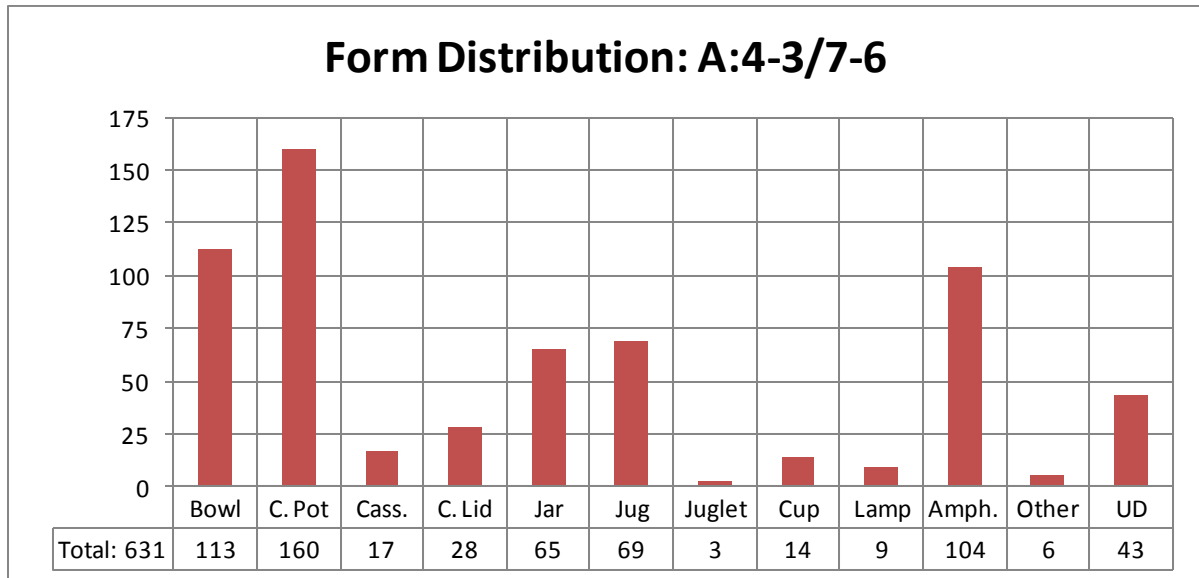
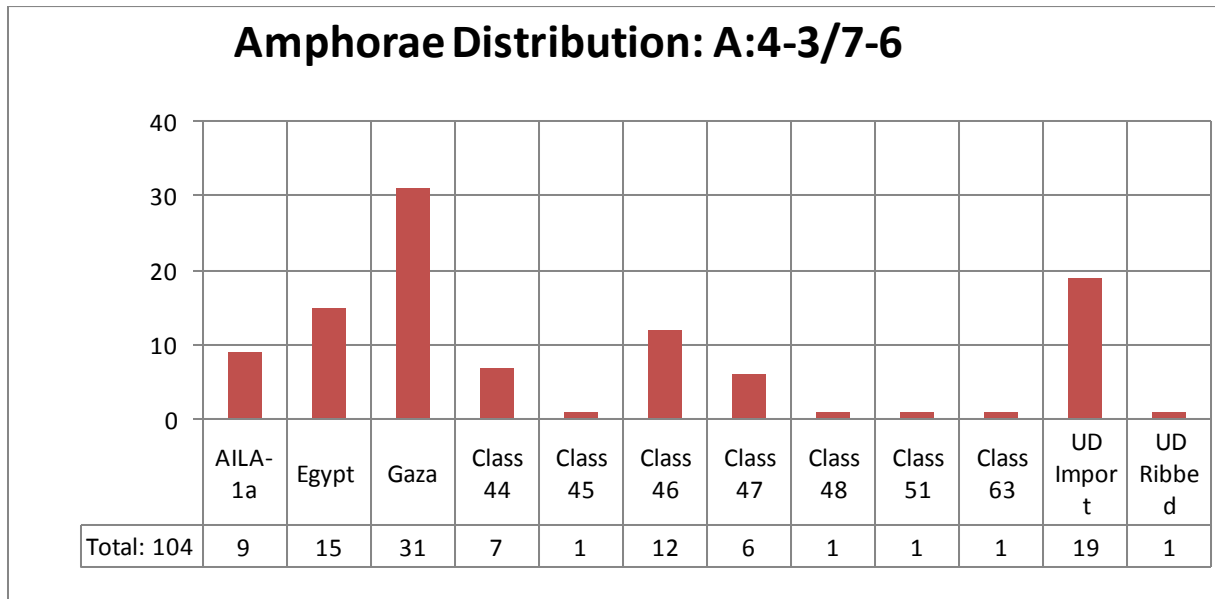


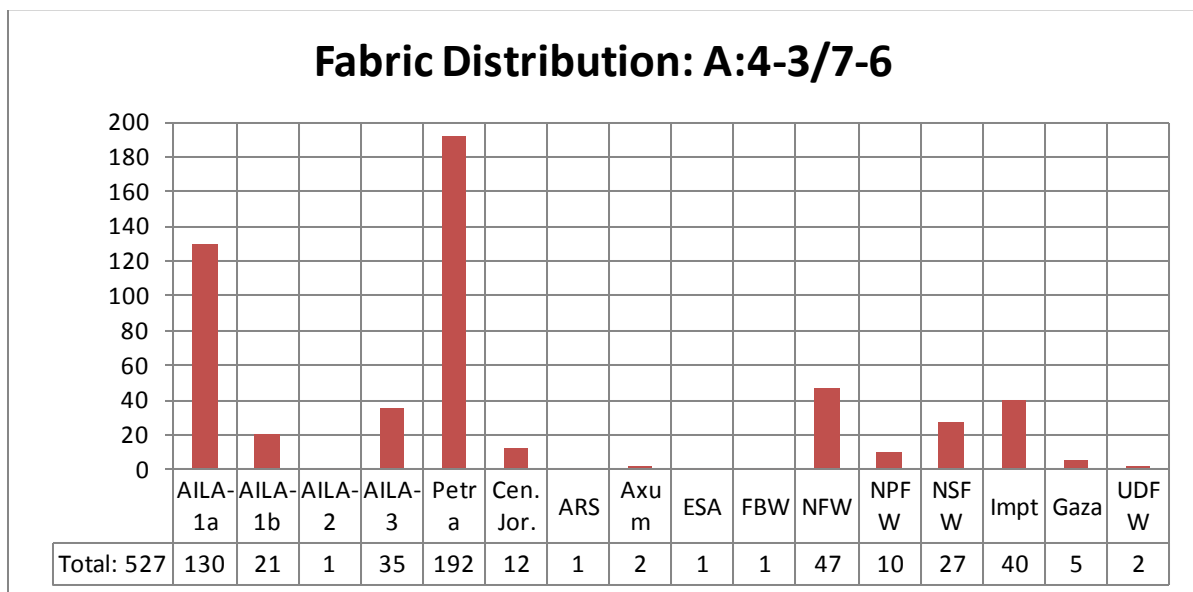
Table 2.46: Amphorae types present in Square A:4-3/7-6.⁷⁰



⁶⁹ The *Other* category includes 1-unguentaria, 1-basin, 1-tabun, 1-stopper, 1-brick, and 1-tile. Pipes are not included in this count. The data in this chart incorporates the finds from Squares A:3/7 and A:4/7.

⁷⁰ The AILA-1a amphorae noted above are unique to this area and appear to be imitations of the Class 46 amphora. Refer to **Table 2.9** for amphorae dates. The data in this chart incorporates the finds from Squares A:3/7 and A:4/7.

Table 2.47: Intra- and extra-provincial imported material to the site found in Square A:4-3/7-6.⁷¹



Along the northern curtain wall Square A:6/4 (5m x 5m) was excavated in 2010 and in 2011 when excavations uncovered portions of two rooms along the fort wall, separated by a mudbrick partition wall. To either side of the partition wall were stone piers with arch springers sitting atop a leveling gravel layer that was also present in A:3/7 and C:1/7. Both rooms in A:6/4 had been excavated to floor level, though neither was completely exposed because of the skewed alignment of the architecture versus the excavation grid layout.⁷²

Square A:6/4 was expanded in 2013 to 10m x 10m (A:6-5/4-3), incorporating areas south and east of the original square. With this expansion, a third room, in the easternmost portion of the square, was partially uncovered. It was also separated by a mudbrick partition wall with evidence of stone piers with arch springers. Access to each room was through

⁷¹The data in this chart incorporates the finds from Squares A:3/7 and A:4/7. The fabric distribution in this table does not include the amphorae or pipes.

⁷² **Figure 2.20** is an image of end of 2011 season for A:6/4.



Figure 2.20: Final excavation photos for A:6-5/4-3. (Photos courtesy of R. Darby.)

doorways in the south through an east-west cross wall. This provided the complete dimensions for two of the three rooms. The western-most room measures 3.66 m east-west by 3.68 m north-south, whereas the center room measures 3.83 m east-west in the north, 3.92 m east-west in the south, and 3.68 m north-south in the west, 3.67 m north-south in the east. Excavation reached the lowest preserved occupation levels in each room, although the “courtyard,” outside the rooms, was only partially excavated.

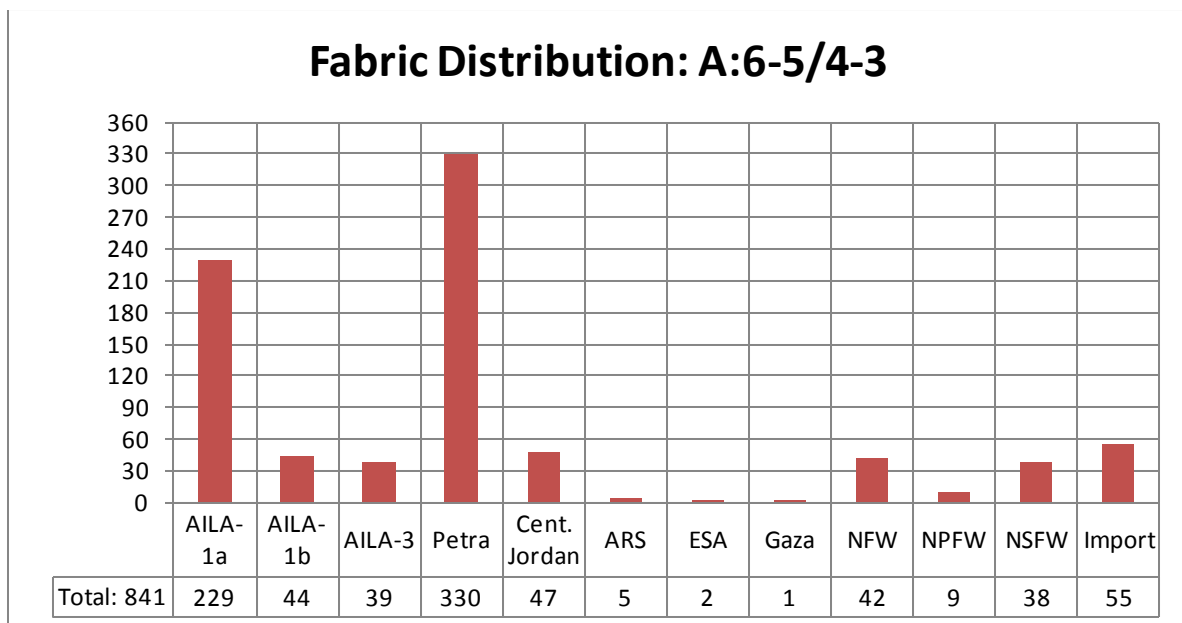
This square was rich in ceramics, comprising 47.3% of the sherds from the fort (**Table 2.2.**) As elsewhere, Aila and Petra dominate among the diagnostic material (**Table 2.48**), accounting for 37.1% and 39.2% of the ceramic finds respectively with a similar distribution between cooking and table ware vessels (34.3%; 36.7%, **Table 2.49**). Of the registered ceramic material from this square, ca. 11.6% was imported amphorae, significantly less than the other excavated areas. Regardless, this does not detract from the variety of amphorae present in the square (**Table 2.50.**) The diagnostic material was divided by the loci distinctly associated with each room, providing a comparative analysis of the vessel forms

(Table 2.51.) Unfortunately this data, while informative, cannot account for the unfinished excavation in the eastern room.



Figure 2.21: Complete vessels from Locus 3329. (Photos courtesy of R. Darby.)

Table 2.48: Fabric distribution of intra- and extra-provincial diagnostic material recovered from Square A:6-5/4-3.⁷³



⁷³ The data in this chart incorporates the finds from Squares A:6/4 and A:6-5/4-3. The fabric distribution in this table does not include the amphorae.

Table 2.49: Distribution of vessel forms from Square A:4-3/7-6.⁷⁴

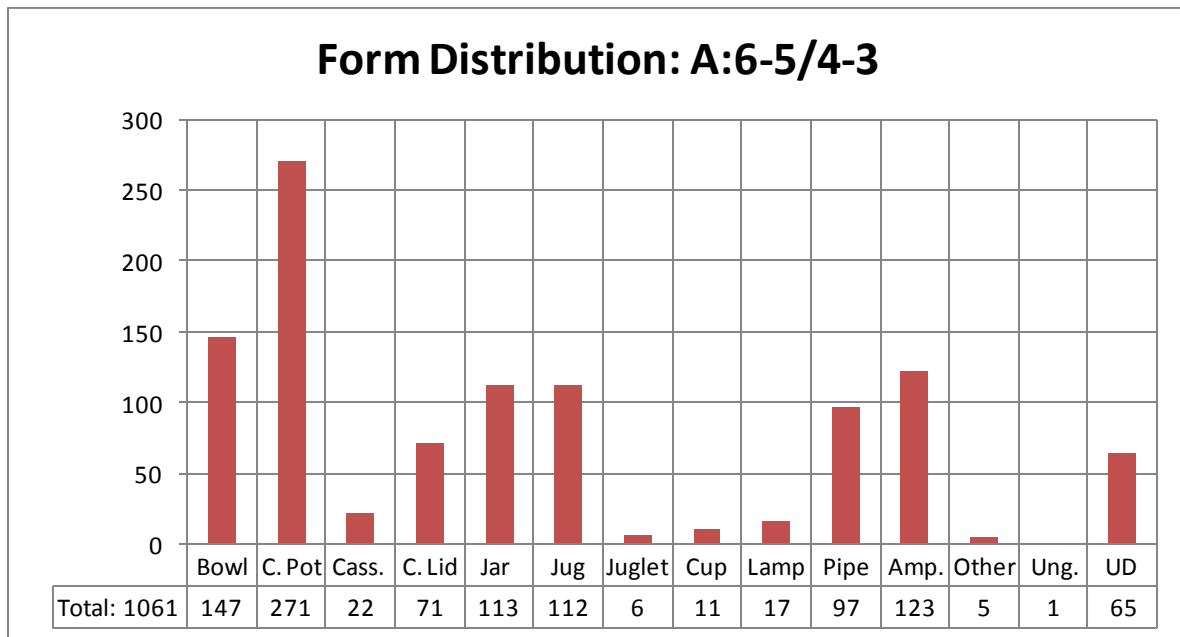
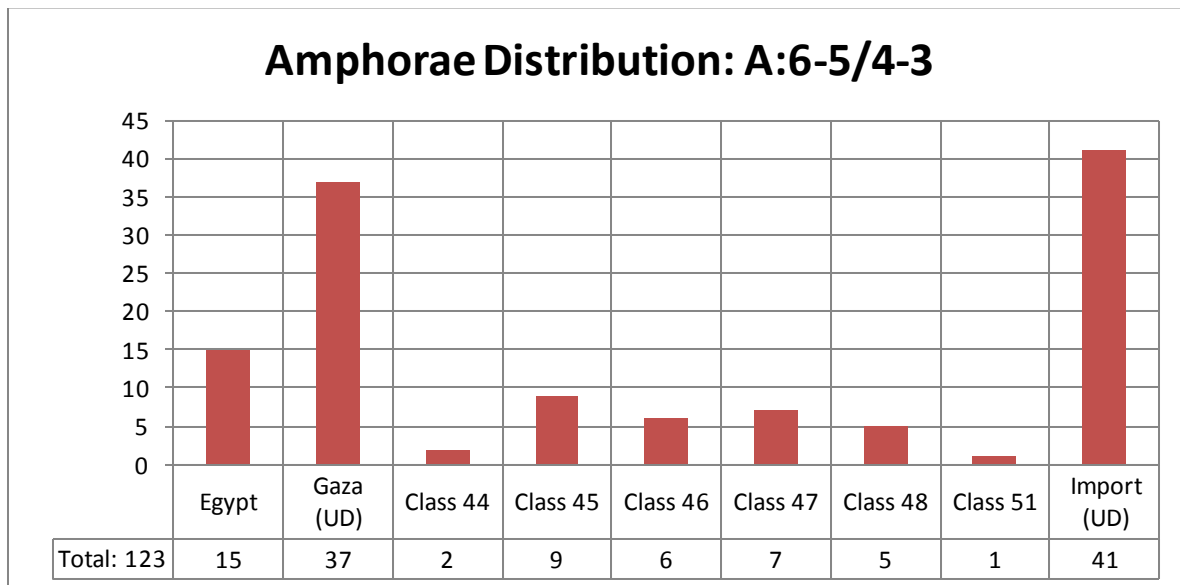


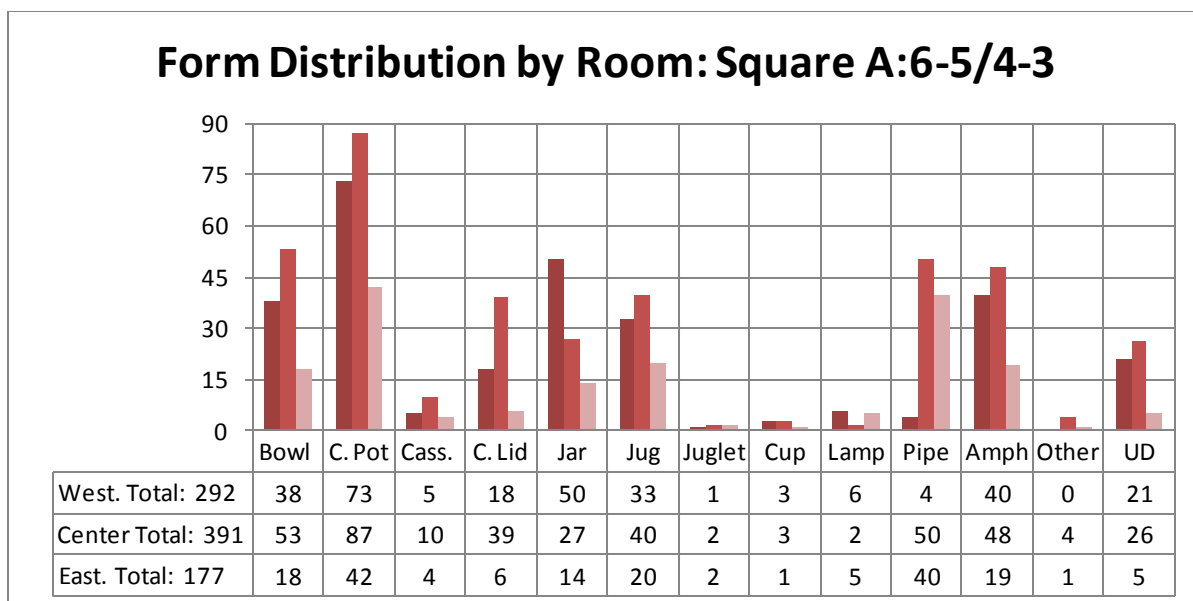
Table 2.50: Amphorae types present in Square A:6-5/4-3.⁷⁵



⁷⁴The *Other* category includes 2-tiles, 2-stoppers, and 1-tabun fragment.

⁷⁵The data in this chart incorporates the finds from Squares A:6/4 and A:6-5/4-3.

Table 2.51: Comparative distribution of vessel forms among the three rooms found in Square A:6-5/4-3.⁷⁶



The three rooms had similar stratigraphic deposition layers but the three excavated floor surfaces were strikingly different: a cobblestone floor in the southern portion of the eastern room, a flagstone floor in the northeast corner of the center room, and a gravel floor in the western room. Above these floors lay the primary occupation horizon identified in each room by its soft, silty soil laced with ash and lime inclusions. Each occupation layer contained similar diagnostic material dating between the late third and fourth centuries. A small assemblage of complete vessels was excavated from **Locus 3329** in the central room

⁷⁶ The *Other* category for the center room includes 2-stoppers and 2-tiles; in the eastern room this is the tabûn fragment. The count does not include material from architectural loci, backfill loci or loci which cannot be identified with a specific room. For the western room the loci included are: **3318, 3321, 3322, 3324, 3326, 3341, 3354, 3358, 3364, 3365, and 3368**. The center room included loci: **3319, 3323, 3325, 3336, 3337, 3342, 3345, 3346, 3347, 3348, 3351, 3361, 3369, and 3370**. From the eastern room the loci are: **3335, 3338, 3339, 3343, 3350, 3353, 3356, 3357, 3359, 3360, 3362, 3363, 3366, and 3367**.

(**Figure 2.21.**) This assemblage was comprised of two jugs and a complete lamp, all dating to the fourth century. Following this initial occupation, the stratigraphy suggests a period of abandonment at the fort. Present in the loci associated as squatter phase are a series of ash lenses. These ash lenses are indications of secondary squatter occupation during the main abandonment of the fort. The diagnostic material from these loci was comparable to the ceramics from the primary occupation level.⁷⁷

Table 2.52: Locus 3322.

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Amphorae	Class 48	Gaza	2	3 rd -4 th /5 th centuries
Amphorae	N/A	Gaza	2	3 rd -5 th centuries
Amphora	Class 46	Import	1	4 th -6 th centuries
Bowl	Byz. Painted Coarse Ware	AILA-1a	1	4 th century
Bowl	8a	AILA-1a	1	Late 1 st -4 th centuries
CP	2	AILA-3, Petra	2	2 nd -4 th centuries
CP	5	AILA-1a	1	Mid-4 th century
Approximate Date Range for Locus:				4 th - 6 th centuries

⁷⁷ **Tables 2.52-2.58** identify the datable diagnostic material from the primary occupation horizon by locus. **Loci 3322** and **3358** correspond to the primary occupation in the western room. **Loci 3325, 3361, and 3369** correspond to the primary occupation in the central room. **Loci 3353 and 3356** correspond to the primary occupation in the eastern room. The abandonment phase is identified by the following loci: **3311, 3313, 3318, and 3341** in the western room; **3319 and 3351** in the central room; **3343** in the eastern room.

Table 2.53: Locus 3358.

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Amphorae	Class 45	Import	3	1 st -5 th centuries
Amphorae	N/A	Gaza	2	3 rd -5 th centuries
Amphora	N/A	Egypt	1	4 th -5 th centuries
Bowl	1	NPFW (4)	1	2 nd -4 th centuries
Bowl	2	AILA-1a	1	1 st -2 nd centuries
Bowl	5	Petra	1	3 rd -4 th centuries
Bowl	6	AILA-1b	1	4 th century
CL	2	Petra, C. Jordan	3	3 rd -4 th centuries
CP	2	Petra, C. Jordan, AILA-1a	8	2 nd -4 th centuries
Jar	2	Petra	1	2 nd -4 th centuries
Jug	2a	Petra	1	3 rd -4 th centuries
Approximate Date Range for Locus:				4 th -5 th centuries

Table 2.54: Locus 3325.

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Amphorae	N/A	Gaza	3	3 rd -5 th centuries
Bowl	1	NSFW	3	1 st -2 nd centuries
CP	2	Petra	1	2 nd -4 th centuries
CP	4	Petra	1	Late 2 nd -3 rd centuries
Approximate Date Range for Locus:				3 rd -5 th centuries

Table 2.55: Locus 3361.

Form	Type	Fabric	Quantity	Date Range
Amphora	Class 44	Import	1	4 th -mid-7 th centuries
Amphorae	Class 45	Import	2	1 st -5 th centuries
Amphora	Class 46	Import	1	4 th -6 th centuries
Amphora	Class 47	Import	1	3 rd -4 th centuries
Amphora	Class 51	Import	1	Late 4 th -5 th centuries
Bowl	1	AILA-1a, Petra	2	1 st -2 nd centuries
Bowl	5	Petra	4	3 rd -4 th centuries
Bowl	7	Petra	3	2 nd -early 3 rd centuries
Casserole	1	AILA-1a		Late 3 rd -4 th centuries
CL	2	AILA-1a, Petra, C. Jordan	5	3 rd -4 th centuries
CP	2	AILA-1a, Petra, C. Jordan	6	2 nd -4 th centuries
CP	5	AILA-1a, Import	4	Mid-4 th century
CP	6	Petra	1	4 th century
Jar	3	AILA-1b	1	3 rd -4 th centuries
Jug	1	AILA-1b	1	1 st -4 th centuries
Jug	2	Petra	1	3 rd -4 th centuries
Approximate Date Range for Locus:				4 th -7 th centuries

Table 2.56: Locus 3369.

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Amphorae	Class 45	Import	2	1 st -5 th centuries
Amphorae	Class 47	Import	1	3 rd -4 th centuries
Amphorae	N/A	Gaza	6	3 rd -5 th centuries
Bowl	57	ARS	1	325-400
Bowl	1	Petra, NSFV	4	1 st -2 nd centuries
Bowl	4	Petra	1	3 rd -4 th centuries
Bowl	5	Petra	1	3 rd -4 th centuries
Bowl	8a	Petra	1	Late 1 st -4 th centuries
Casserole	1	AILA-3	1	Late 3 rd -4 th centuries
CL	2	Petra, AILA-1a, AILA-3, Import	8	3 rd -4 th centuries
CP	2	Petra, AILA-1a, Import	17	2 nd -4 th centuries
CP	4	Petra	1	Late 2 nd -3 rd centuries
CP	5	Petra, C. Jordan, AILA-1a, AILA-1b	9	Mid-4 th century
CP	6	AILA-1a	2	4 th century
CP	7	AILA-1a	2	Late 4 th century
Cup	2	NFW	1	1 st -2 nd centuries
Jug	3	Petra	1	4 th century
Jug	4	Petra	1	4 th century
Approximate Date Range for Locus:				4 th -5 th centuries

Table 2.57: Locus 3353

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Amphora	Class 45	Import	1	1 st -5 th centuries
CP	2	Petra, AILA-1a	5	2 nd -4 th centuries
CP	5	AILA-1b	1	Early- mid-4 th century
CP	6	Petra	2	4 th century
Bowl	7	Petra	1	2 nd -early 3 rd centuries
Approximate Date Range for Locus:				4 th -5 th centuries

Table 2.58: Locus 3356.

<u>Form</u>	<u>Type</u>	<u>Fabric</u>	<u>Quantity</u>	<u>Date Range</u>
Amphora	Class 45	Import	1	1 st -5 th centuries
Amphora	N/A	Gaza	1	3 rd -5 th centuries
Amphora	N/A	Egypt	3	4 th -5 th centuries
Bowl	5	Petra	1	3 rd -4 th centuries
CL	2	Petra, AILA-1a	2	3 rd -4 th centuries
CP	1	AILA-1a	1	1 st -2 nd centuries
CP	2	Petra, AILA-1a	21	2 nd -4 th centuries
CP	4	AILA-1a, AILA-3	2	Late 2 nd -3 rd centuries
CP	5	AILA-1b, Petra	2	Mid-4 th century
CP	6	Petra	1	4 th century
Jug	1	AILA-1a	1	1 st -4 th centuries
Jug	2a	Petra, C. Jordan	2	3 rd -4 th centuries
Approximate Date Range for Locus:				4 th -5 th centuries

As previously mentioned, a probe (B:1/1) was opened along the eastern curtain wall in 2011 to locate the fort's entrance. This was expanded to 10m x 5m in 2013, then labeled Square B:2-1/1-1. The excavated area incorporated a portion of the gate entrance and the area directly outside the gate to the east. As elsewhere, later intrusive Islamic burials throughout the square hindered the excavation. East of the curtain wall, the gate's archway was discovered as part of a combined mudbrick and stone collapse, while above the arch collapse was a large limestone block bearing the fort's dedicatory inscription.⁷⁸

Square B:2-1/1-1 exposed two distinct areas: that east of the curtain wall outside the fort and that within the gateway. Primary occupation levels were not reached in either area, restricting analysis of the ceramic material. Both areas did recover evidence of a presumed secondary occupation. East of the gate, **Loci 3612** and **3613** comprised a thick deposit of

⁷⁸ **Figure 2.22** shows the arch collapse with inscription placed above.

organic material rich in datable ceramics, including an assemblage of two complete cooking pots and a complete jug of the fourth century (**Figure 2.23.**) This material closely corresponded with secondary occupation levels within the gate entry, **Loci 3618** and **3619**. In this area was another fourth century assemblage of two complete cooking pots, a reconstructable jug and bowl, shown in (**Figure 2.23.**) This occupation layer lay directly above a remodeled entry and threshold, **Locus 3614**, which reduced the size of the gate entrance from 2.4m to ca. 1m.⁷⁹



Figure 2.22: Gate arch collapse with inscription stone. (Photo courtesy of R. Darby.)

The overall distribution of the ceramic material from the gate differs greatly from other areas of the site. **Table 2.59** quantifies the vessel types excavated in B:2-1/1-1; there is a prominence of cooking pots (36.6% of the diagnostic material), over all other forms. Amphorae only account for 4.6% of the material and are limited stratigraphically to the

⁷⁹ **Figure 2.23** does not include images of the complete bowl or the complete type 6 cooking pot from **Locus 3619** because of their fragmentary state.

secondary occupation beyond the curtain wall (**Table 2.60.**) There was minimal (5.9%) fine ware, which suggests residual or surface finds (**Table 2.61.**) Other than the single Axumite sherd, found outside the curtain wall in **Locus 3617**, the fabric distribution remains comparable with the majority of the ceramics imported from Aila or Petra.⁸⁰



Figure 2.23: Ceramic assemblages from B:2-1/1-1. (Photos courtesy of R. Darby.)

Table 2.59: Distribution of vessel forms from Square B:2-1/1-1.

⁸⁰ **Figure 2.24** shows the final photo of B:2-1/1-1 in 2013.

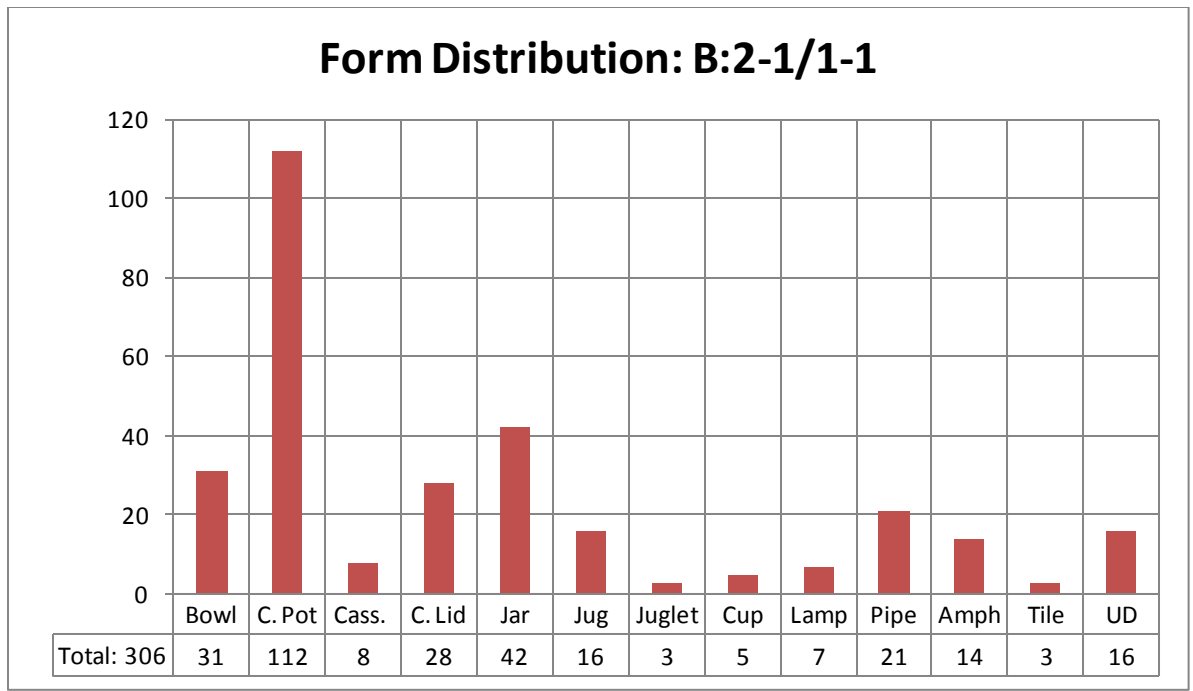


Table 2.60: Types of amphorae present in Square B:2-1/1-1.

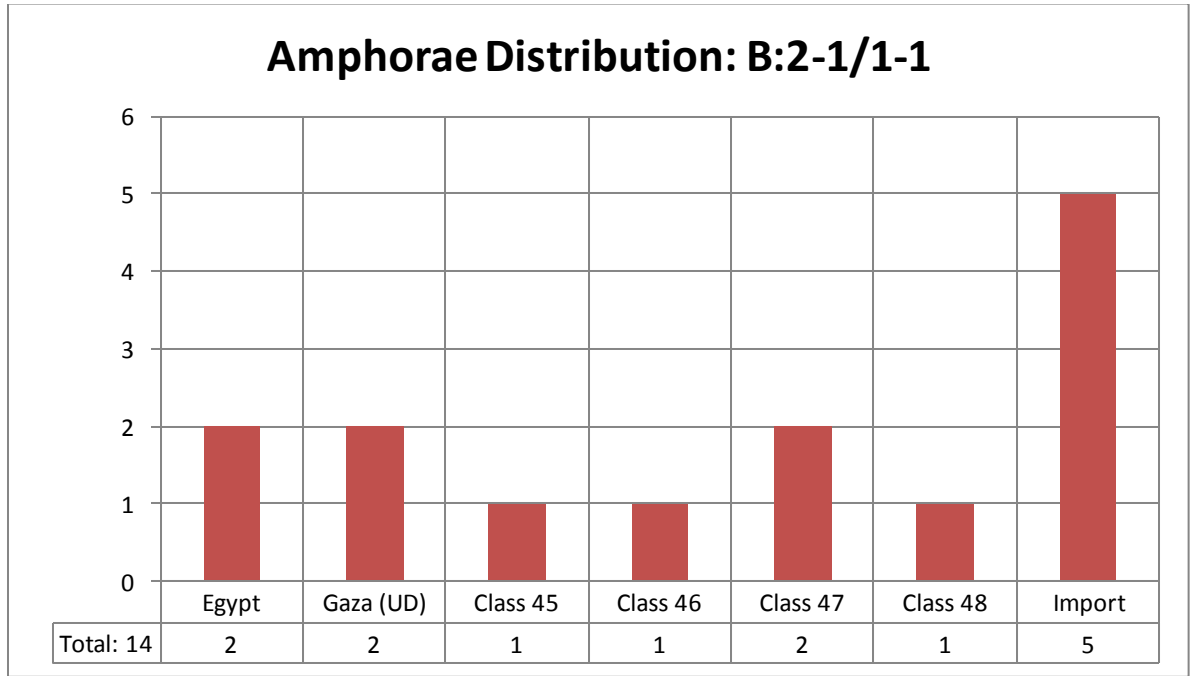


Table 2.61: Fabric distribution of intra- and extra-provincial diagnostic material recovered from Square B:2-1/1-1.⁸¹

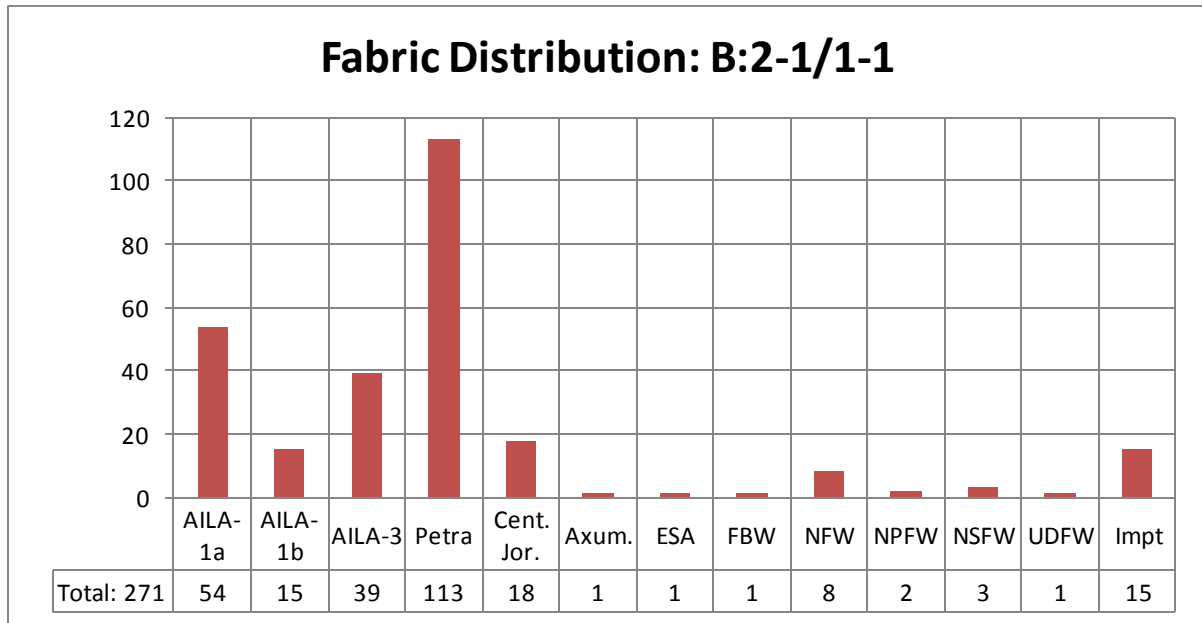


Figure 2.24: Final Excavation photo of B:2-1/1-1. (Photo courtesy of R. Darby.)

The compilation of ceramic evidence from all areas provides a few notable observations. In the fort, evidence from all three squares suggests at least two occupation

⁸¹ The fabric distribution in this table does not include the amphorae or pipes.

horizons. The first, around the early fourth century, is documented through material found directly above installed floors in rooms along the northern curtain wall and above the gravel layer in A:4-3/7-6. The second occupation is visible in A:6-5/4-3, as suggested by the presence of ash lenses, and in B:2-1/1-1 through the remodeled gate entrance and associated finds. This second phase also appears to date to the fourth century, though the absence of closely datable material makes it difficult to accurately define.

While the ceramic material tentatively supports dating the fort to the beginning of the fourth century, ceramics from the Eastern Ridge are much earlier, largely from the first or second centuries. Based on ceramics it is probable that the structure on the Eastern Ridge was constructed as an Early Roman/Nabataean watch-post in use for a period of time before the *cohort* was stationed at the site, but perhaps reoccupied for a similar purpose during the fourth century occupation of the fort. This, along with the Islamic period burials, exhibits the multi-period use of 'Ayn Gharandal. The looting and destruction of the bathhouse limits the interpretation of the associated material; however, the minimal ceramic evidence recovered suggests a contemporaneous date with the *castellum*. Further excavation and a study of both the ceramic vessels and the ceramics utilized for construction should illuminate the relationship between the bathhouse and the fort.

Finally, as it has been noted, the inhabitants of 'Ayn Gharandal imported all ceramic materials. The location of 'Ayn Gharandal, though remote, was situated on a major trade route connecting the port of Aila to the south and the commercial entrepôt of Petra to the north, effectively connecting the inhabitants to the entire Roman world. Considering the relatively small size of the fort and its garrison, the variety of ceramic material from the site

(**Tables 2.4, 2. 6, and 2.8**) is impressive. Various explanations for the evidence of ceramic diversity, including intra-provincial and extra-provincial trade relationships, will be discussed in the following chapters.

CHAPTER 3: The Intra-provincial Trade Connections

The previous chapter provided a quantitative analysis of the ceramic material from ‘Ayn Gharandal. This quantitative data elucidated a typological catalogue of vessel forms, while the analysis strived to establish a chronological occupation sequence for each excavated area. When evaluating the ceramic material, a distribution profile of ceramic wares emerged, linking ‘Ayn Gharandal to regions within and outside of the site’s provincial territory. The following two chapters will expand on the distribution of this ceramic material, focusing first on the intra-provincial connections (Chapter 3) and concluding with the extra-provincial (Chapter 4.) This chapter will begin by defining the terms supply and trade as it relates to the ceramic material that has been recovered from ‘Ayn Gharandal. Following this will be a discussion of the term intra-provincial and a brief history of the Roman province of *Palaestina* in relation to the occupation of the site. After outlining the intra-provincial boundaries, this chapter will examine the local trade routes and the major sites which contribute to the ceramic corpus at ‘Ayn Gharandal. Concluding this study will be a discussion of the intra-provincial material as it relates to both supply and trade.

One of the key factors in analyzing the ceramic material is to understand the terms *trade* and *supply* as they relate to the current context. Trade can technically be defined as the buying of goods in exchange for an item of equal value. Applying this description to the current evaluation, any item that the individual soldiers or other local inhabitants would have paid for can be identified as a traded good. The location of ‘Ayn Gharandal precludes the possibility that the garrison was able to attain a level of self-sufficiency that would make

trade, especially in ceramic goods, unnecessary; therefore it is a fair assumption to say many items uncovered were likely there because of trade. Unfortunately this broad definition does very little to illuminate why there is an abundance of coarse ware ceramics. For the purposes of this thesis, the definition of trade has been broken down into two distinct categories to reflect the nature of the ceramic corpus. The first is the trade of low-end luxury items such as fine wares. Items of this nature can be defined as a high-risk, high-cost, and sometimes long-distance trade. These items are of a higher value and in some cases traveled from great distances to the site, increasing the transport risk for the trader. The second category is trade in coarse ware materials, or short-distance low-cost trade. Many of these items were locally produced or purchased and were likely regarded as necessary provisions. As will be discussed below, this is the form of trade most evident at 'Ayn Gharandal.

Conversely, supply refers to resources that were provided to the garrison, specifically in this case related to the *annona militaris*. The *annona* was comprised of governmentally supplied rations such as wine, grain, and oil. These consumable goods could have arrived to the site in various ceramic materials like amphorae, jugs, or in unpreserved materials like baskets and fabric or leather containers. Determining the extent of supply is based in part on the productivity of the site. Some areas of the southeastern frontier have uncovered evidence of moderate self-sufficiency as related to agricultural production. Currently, excavations at 'Ayn Gharandal have not uncovered similar systems to suggest any locally produced essentials. Without written records, much of the analysis provided below is speculation based

on the quality of the preserved materials; unaccounted for are those items that are no longer present in the archaeological record.⁸²

In this analysis, the term intra-provincial refers only to those sites within the same province as ‘Ayn Gharandal. Primarily this refers to *provincia Palaestina*, though there are problems with this generalization. Presently the site of ‘Ayn Gharandal is located in the Wadi Araba valley on the modern day border of Jordan and Israel. Under direct Roman rule, this site lay first (106 – ca. 300) within the province of *Arabia*, then within the province of *Palaestina*. The garrison at ‘Ayn Gharandal, the *cohors II Galatarum*, was relocated from farther north in Palestine to ‘Ayn Gharandal in the early fourth century, during Diocletian’s eastern provincial reorganization. At this time, Diocletian was reallocating significant territory south of the Dead Sea from the Roman province of *Arabia* to the province of *Palaestina*. This move was initiated by the transfer of two legionary forces to the eastern frontier: the *legio VI Ferrata* at Udruh and the *legio X Fretensis* at Aila.⁸³

⁸² For details on agricultural productivity along the southeastern frontier see: Crawford, P., “The Plant Remains,” in *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project*, Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006; Smith, A. and J. Ramsay, “Desert agriculture at Bir Madhkur: The first archaeobotanical evidence to support the timing and scale of agriculture during the Late Roman/Byzantine period in the hinterland of Petra,” in *Journal of Arid Environments* 99:2013; Ramsay, J. and S. Thomas Parker, “A Diachronic Look at the Agricultural Economy at the Red Sea Port of Aila: An Archaeobotanical Case for Hinterland Production in Arid Environments,” in *Bulletin of the American Schools of Oriental Research* 376, 2016; Ramsay, J., “The Archaeobotanical Remains,” in *The 2003-2007 Excavations in the Late Roman Fort at Yotvata*, Eisenbrauns, 2015. Oleson, J. P., Oleson, J. P., “The Origins and Design of Nabataean Water-Supply Systems,” in *Studies in the History and Archaeology of Jordan V*; 1995: 707-709; Oleson, J. P., “Landscape and Cityscape in the Hisma: The resources of Ancient Al-Humayma,” in *Studies in the History and Archaeology of Jordan VI*; 1997. For more information on the *annona* see: Jones, A.H.M., *The Later Roman Army*, Baltimore: The Johns Hopkins University, 1964; Garnsey, P. and R. Saller, *The Roman Empire: Economy, Society, and Culture*, University of California Press, 1987.

⁸³ Darby, R., “Aufidius Priscus, the *cohors Secunda Galatarum*, and Diocletian’s re-organization of *Arabia* and *Palaestina*: the new tetrarchic inscription from ‘Ayn Gharandal,” in *Journal of Roman Archaeology* 28: 2015. For a further discussion of Diocletian’s reforms see Chapter 1 of this volume.

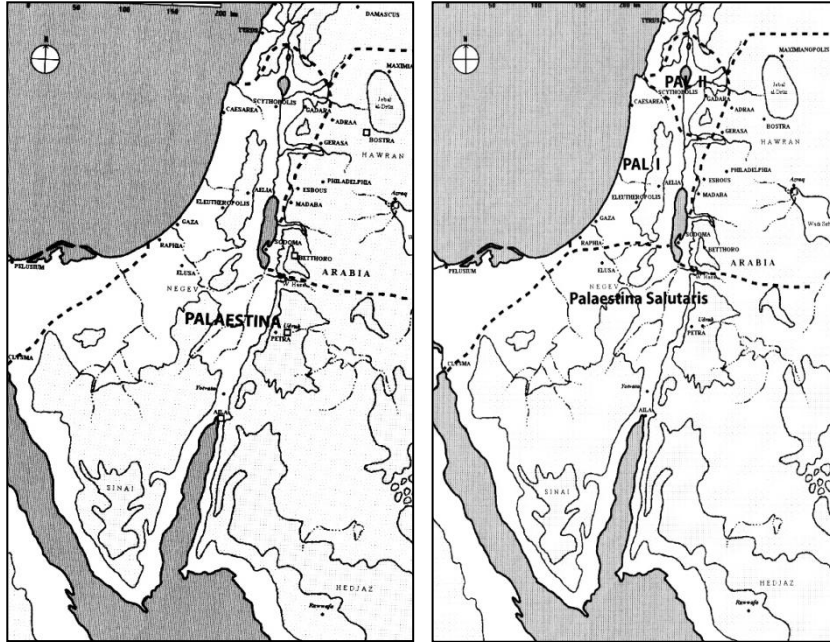


Figure 3.1: Provincial redistribution of Palaestina. (Adapted from Siplia, J., *The Reorganization of Provincial Territories in Light of the Imperial Decision-Making Process*, 2009.)

With this new provincial distribution, *Palaestina* was assigned two legions and a number of auxiliary units, including eleven cohorts such as the *cohors II Galatarum* and a large expansive territory, which simultaneously limited the power of the provincial governor of *Arabia* and significantly expanded the influence of the governor of *Palaestina*. *Palaestina* remained a large province until the mid-fourth century when the area was divided into *Palaestina*, in the north, and *Palaestina Salutaris*, in the south. ‘Ayn Gharandal was incorporated into this new southern division, *Palaestina Salutaris*, until the late fourth century, when this area was renamed *Palaestina Tertia*, after the province of *Palaestina* had been further sub-divided. The current examination of intra-provincial relationships focuses

primarily on the area of *Palaestina (Tertia) Salutaris* and identifies known road systems, which were instrumental in facilitating the exchange of ceramic materials.⁸⁴

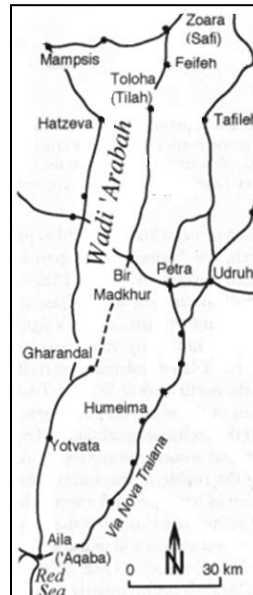


Figure 3.2: Road systems in Wadi Araba. (Adapted from Niemi, “Torn Asunder: Earthquakes at Qasr at Tilah.”)

The provincial boundaries of *Palaestina Salutaris* provide access points to both the Mediterranean and the Red Sea through the port cities of Gaza and Aila respectively. Connecting these and other major cities, a series of roadways stretch across the southern expanse of the province. These roadways may be interpreted as transit routes, which

⁸⁴ **Figure 3.1** highlights the reorganization and distribution of *Palaestina*. Sipilä, J., *The Reorganization of Provincial Territories in Light of the Imperial Decision-Making Process*, The Finnish Society of Sciences and Letters, 2009:149-161; Roll, I., “Crossing the Negev in Late Roman Times: the Administrative development of *Palaestina Tertia Salutaris* and of its Imperial Road Network,” in *The Late Roman Army i-Jn the Near East from Diocletian to the Arab Conquest: Proceedings of a colloquium held at Potenza, Acerenza and Matera, Italy (May 2005)*, ed. Ariel Lewin and Pietrina Pellegrini, BAR International Series 1717, Oxford Archaeopress, 2007:119-130. The province of *Arabia* originally had only one legion stationed at Bostra, the *legio III Cyrenaica*, and Diocletian added the *legio IV Martia*, stationed at el-Lejjun. The removal of the *X Fretensis* from Jerusalem to Aila added military support to the southeastern frontier yet deprived *Palaestina* of a legionary force. Without the provincial reorganization, the reallocation of the *VI Ferrata* and the *X Fretensis* would have granted *Arabia* four legionary units – making it stronger than the surrounding provinces. (Roll, “Crossing the Negev,” 2007:121.) **Figure 3.2** outlines the major and minor routes in *Palaestina Salutaris*. **Figure 3.3** highlights the major cities along the Incense Road.

distribute goods and supplies to the inhabitants of the region. While there are several largely undocumented minor routes through the Negev and the Wadi Araba, there are three primary road systems which traverse the province: the Petra-Gaza road, the *via nova Traiana*, and the Araba road. The Petra-Gaza road was an east-west sector of the Incense Road, which extended from the port of Gaza to Shabwah, the capital city of Hawdramat, in Southern Arabia. The *via nova Traiana* was a major imperial road extending from Aila northward, along the eastern frontier. A subsidiary imperial road, known in this thesis as the Araba road, paralleled the *via nova* through the Wadi Araba and connected the Red Sea to Jerusalem.⁸⁵

Sites in Southern Arabia were known for the trade of luxury items such as spices, frankincense, and myrrh. Primarily these sites were located along the coast, making sea transport both cost-effective and convenient. Though overland transport was costly, caravans were prominent in this region and transported goods north along the Incense Road to Gaza and the Mediterranean beyond. According to Pliny, the Incense Road was dotted by 65 caravan stations for travelers to rest and replenish stocks. Many of these stations were located at towns or oases where merchants could supplement their cargos with secondary products such as fabric, glass, or ceramic materials. The Incense Road thrived from the first century B.C.E. until at least the third century C.E. and facilitated an extensive intra-provincial trade network. With the political and economic problems throughout the Roman Empire in the

⁸⁵ Singer, C., "The Incense Kingdoms of Yemen: An Outline History of the South Arabian Incense Trade," in *Food for the Gods: New Light on the Ancient Incense Trade*, eds. D. Peacock and D. Williams, Exeter: Short Run Press, 2007:4-27; Roll, "Crossing the Negev," 2007:125. **Figure 3.3** highlights major cities along the path of the Incense Road including Shabwah and Petra.

third century, trade across the Incense Road seems to have diminished; however, reduced local trade continued on the Negev stretch between Gaza and Petra.⁸⁶

Petra was a major commercial city from the first to third centuries with a large ceramic industry, creating both luxury and household vessels. The wide-spread distribution of these ceramic materials, both along the Incense Road and at other sites, confirms Petra's active participation in local trade networks. The city's connection to the production and trade of perfumed oils is documented in the works of writers such as Diodorus Siculus and Strabo. Each highlights the wealth and prosperity of the Nabataean kingdom both through the trade of aromatics and the raw materials from *Arabia Felix*, as well as their

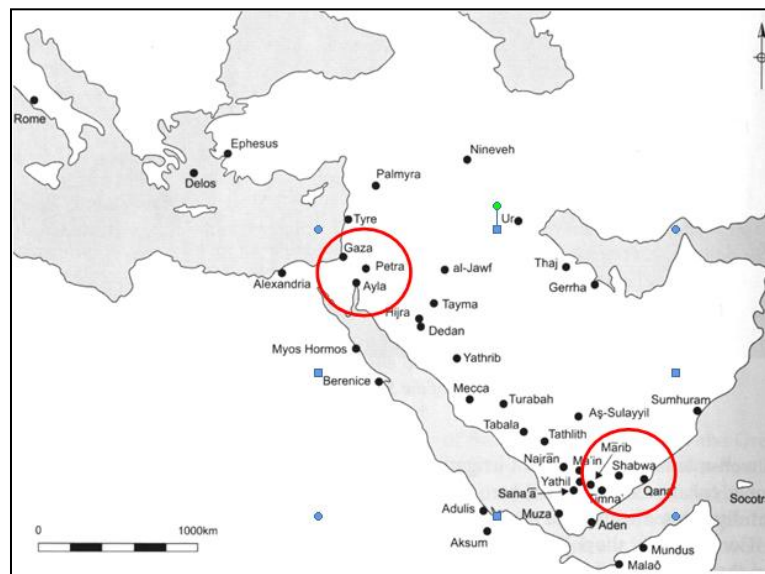


Figure 3.3: Major cities along the Incense Road. (Adapted from Singer, C., “The Incense Kingdoms of Yemen: An Outline History of the South Arabian Incense Trade,” 2007.)

⁸⁶ Pliny, *Naturalis Historia*, 12:32.64; Erickson-Gini, T. and Israel, Y., “Excavating the Nabataean Incense Road,” in *Journal of Eastern Mediterranean Archaeology and Heritage Studies*, 1:1, 2013:24.

native products such as gold and silver. The Nabataeans were skilled in utilizing these raw materials to create luxury oils and perfumes. These value added products were bottled in ceramic or glass vessels called *unguentaria*, which would have been transported and traded across local road networks, along with the Nabataean painted fine ware and coarse ware pottery manufactured from local clay sources. These secondary products would have been combined with the material shipped to or from the Mediterranean, expanding the distribution of Petra's products.⁸⁷

The terminus for the Incense Road was the port city of Gaza along the Mediterranean coast. From Gaza the goods obtained from South Arabia and transiting through *Palaestina* could be transported anywhere in the Roman Empire. Conversely, materials imported to Gaza could be transported back across *Palaestina* and *Arabia*, introducing new products to the east. Gaza itself was known for its wine, documented in both literary sources and the distribution of the distinctive amphorae in which they were transported. Imported fine ware vessels obtained at the port, such as African Red Slip (ARS) and Eastern Sigillata (ESA), may have “piggy-backed” on these amphorae and dot the road networks to *Arabia Felix*. The prevalence of these materials so far inland highlights the reciprocal nature of the Incense Road during this early period.⁸⁸

The political and economic problems that the Roman Empire faced in the third century had a significant impact on eastern trade routes, especially the Incense Road. The

⁸⁷ Sipilä, J., *The Reorganization of Provincial Territories*, 2009:146; Dio. Sic. 19.94.4-10; Strabo, *Geographica*, 16.4.21-26.

⁸⁸ For further information on the prevalence on Gazan wine in the Byzantine period see Mayerson, P., “The Wine and Vineyards of Gaza in the Byzantine Period,” in *Bulletin of the American Schools of Oriental Research*, 257:1985.

extra-provincial trade was significantly reduced and sections of the Incense Road became virtually obsolete. Along the northern Negev, however, the increased Roman military presence insured that trade, albeit limited, continued to pass along the route between Gaza and Petra. At many of these sites, the ceramic assemblages exhibit evidence of trade with Petra throughout the third and early fourth centuries. By the mid to late fourth century, many of the sites located along this stretch are completely abandoned, signaling the final end to this lucrative trade network.⁸⁹

Along the eastern boundary of *Palaestina*, the *via nova Traiana* lay close to the border that separated the Roman Empire from the unconquered peoples to the east. The primary purpose of this road is highly debated, with some scholars attributing its strong military presence as defensive and others describing it as a facilitator for trade and communication. The *via nova Traiana* was established in the early second century under Trajan and ran north-south, terminating in the south at the port city of Aila. The road extended north through *Palaestina* passing through Petra, and ran well into *Arabia* before terminating at the city of Bostra.⁹⁰

The connection with Aila was vital for the Roman Empire, regardless of the primary use of the *via nova Traiana*, because it provided almost uncontested access to lands beyond the southeastern frontier of the empire. From the port, merchants acquired goods in bulk at a cheaper price largely due to the reduced cost of sea transport. Local industries, such as metallurgy and ceramic production, helped to fuel the local economy and especially flourished with the arrival of the *legio X Fretensis* at the beginning of the fourth century. The

⁸⁹ Erickson-Gini, et al., "Incense Road," 2013: 28-32.

⁹⁰ For a discussion on the significance of the *via nova Traiana* see Chapter 1 of this volume.

arrival of the legion brought increased population, wealth, and resources to the city. As the population increased, so did the need for external supplies and larger quantities of local goods. Aila's position, at the tip of the Red Sea and the terminus of the *via nova Traiana*, provided a unique opportunity for local products, such as ceramic materials, to be transported to neighboring provinces of the empire and beyond to the Red Sea littoral and the Indian Ocean. Along the *via nova Traiana*, traders could transport Aila produced pottery, in addition to other external supplies, to Petra, the Kerak plateau, and beyond. This connection would account for the presence of a limited number of Aila ceramics in Petra and other sites in southern Jordan and Israel.⁹¹

After passing through Petra, the *via nova Traiana* traversed the Kerak plateau in central Jordan. Based on excavations at the legionary site of el-Lejjun and surrounding military sites, it is assumed a relatively large ceramic production center existed in this region. This is supported by comparable ceramic materials of a similar ware appearing in Petra, Aila, and at 'Ayn Gharandal.

Much like the Petra-Gaza road, the *via nova Traiana* facilitated the transport of goods, such as ceramics through *Palaestina*. Discounting the four legionary bases stationed on or east of the *via nova Traiana*, the *X Fretensis* at Aila, the *VI Ferrata* at Udruh near Petra, the *IV Martia* at el-Lejjun, and the *III Cyrenaica* at Bostra, most of the sites along this road were smaller auxiliary forts and fortlets. This integral military presence would have given travelers and merchants a certain degree of security, while also providing convenient commercial opportunities. The majority of these smaller sites would have lacked the

⁹¹ Dolinka, B., *Nabataean Aila (Aqaba, Jordan) from a Ceramic Perspective*, BAR International Series, 2003.

necessary resources to become entirely self-sufficient, making the trade and supply of materials from Petra or Aila vital to their station on the frontier. Unlike the Petra-Gaza road, it is likely that some of these eastern sites were maintained until Justinian's reduction of the frontier forces in the early sixth century. Evidence of Aila's continued presence along the *via nova Traiana* can be found in the Aila amphorae discovered in small quantities at Petra, Humayma, and other sites.⁹²

Paralleling the *via nova Traiana* in the west was the Araba road. The Araba road extended from Aila in the south, through Wadi Araba, until reaching the Dead Sea. Branches from the Araba road extended northwest through the Negev to Gaza and north from the southern end of the Dead Sea through the hill country to Jerusalem. Unlike the Petra-Gaza road or the *via nova Traiana*, the Araba road was a compilation of paved and unpaved road systems joining at north-south and east-west junctures. These road systems converged at auxiliary fortlets or small *caravanserai* typically located near fertile areas or water sources. Though the presence of a unified "road" is highly contested, a series of milestones located in throughout the Wadi Araba indicate the presence of a road during the third to fourth century. From extant writings of Eusebius it is clear the *X Fretensis* was stationed at Aila, making it not implausible that the Araba road functioned as a transit route, carrying the *X Fretensis* from Jerusalem and Aila; the string of fourth century fortlets in Wadi Araba (Yotvata, 'Ayn Gharandal, Bir Madhkur, Mezzad Hazeva, and Qasr et-Tlah) likely aided in that transition. These auxiliary fortlets in Wadi Arabia each form a *quadriburgium*, or square fort with four

⁹² Procopius, *Anecdota*, 24.12-14. For Justinian's military policies in the sixth century, Procopius provides the most in depth, though biased, account. Procopius admonishes the abandonment of the eastern frontier by Justinian noting how his peace treaty with the Persians has cost the soldiers their livelihood and occupation.

projecting corner towers. They dot the landscape between the Negev and the *via nova Traiana*, visually demarcating a sort of secondary frontier.⁹³

The utilization of the Araba road is fundamental for explaining the *raison d'être* of the military presence in Wadi Araba. Like the *via nova Traiana*, this road also allows access to the port city of Aila and its materials. Additionally, as the Araba road intersects the Petra-Gaza road, supplies travelling to the Mediterranean or Southern Arabia can also be transported south towards the Red Sea. The proximity to the Negev provides access to smaller, localized manufactured goods such as ceramics or other imported products such as grain. Finally, the connection to the Mediterranean coast at Gaza gives the southern sites access to imports from outside the provincial domain of *Palaestina (Tertia) Salutaris*.

For 'Ayn Gharandal, the interconnectedness of these road systems allowed the site to import materials from the major production centers and benefit from the movement of goods. The east-west connections through Wadi Araba granted access to the *via nova Traiana* and the Negev without directly involving merchants in Aila. The Araba road allowed products from Aila, and indirectly the Red Sea, to be transported north to Gharandal in transit to the northern sites. Alternately, south-bound caravans originating from northern *Palaestina* or along the Petra-Gaza road passed the military sites along the Araba road as well.

In order to determine the dependence on trade for the Roman garrison stationed at 'Ayn Gharandal it is necessary to evaluate the degree to which they were supplied locally. As

⁹³ Eusebius, *Onomastikon* 8.7-9; Isaac, B., "Roman Organization in the Arabah in the Fourth Century AD," in *Crossing the Rift: Resources, routes, settlement patterns and interaction in the Wadi Arabah*, eds. P. Bienkowski and K. Galor, Oxbow Books, 2006: 219; Sipilä, *The Reorganization of Provincial Territories*, 2009:157. Smith, A., *Wadi Araba in Classical and Late Antiquity: An Historical Geography*, Oxford: Archaeopress, 2010.

noted in the previous chapter, the ceramic corpus at 'Ayn Gharandal is highly varied. From the intra-provincial materials, a large percentage (83.3%) derives from the Petra or Aila production centers; however, the corpus also includes ceramics from Gaza, central Jordan and other, as yet unidentifiable fabrics (16.7%). Gharandal, although 100km north of Aila and 40km southwest of Petra, maintained a relationship with each through the extensive road system.

A detailed analysis of the ceramic material shows a large number of coarse ware vessels present at the site. Coarse ware materials were utilitarian vessels, typically roughly made, thick, heavy, and lacking exterior decoration; they were not acquired for their value or appearance, but because they served a purpose. At 'Ayn Gharandal, 74.2% of all registered diagnostic material is coarse ware; from this, 83.3% derives from the intra-provincial production sources. The majority of these coarse wares are table wares (33.6%; 24.2% are bowls and jars) with a slightly smaller percentage of cooking vessels (31.7%.) Furthermore, a notable minority of unidentified coarse ware sherds were recorded from the site (11.6%.) Based on the current analysis, it is unclear whether these sherds are representative of intra-provincial or extra-provincial production centers. Little work has been completed on potential ceramic production centers in the Negev, which would aid in the further identification of these sherds. This extends the possibility that a portion of the unidentified coarse wares may originate from these unknown sources. Nevertheless, it is indisputable that the primary source for coarse ware materials arrived through intra-provincial sources.

Amphorae, which chiefly carried staple goods such as wine, oil, and garum, are seen from both intra-provincial and extra-provincial sources. Interior to *Palaestina* are the

amphorae from Gaza and the local Class 46 “Palestinian” amphorae. These two forms comprise 6.5% of the total ceramic corpus and 48.7% of the total amphorae collected from ‘Ayn Gharandal. Both the Gaza and Palestinian amphorae have been closely associated with wine as the chief transport, though in limited quantities may have carried oil. This is not to say that exterior resources of these foods were not sought after, but rather that local sources were exploited first, probably for reasons of cost.

In terms of fine ware materials, the only intra-provincial “fine wares” are in the Nabataean fine ware tradition, primarily the painted fine wares (NPFW.) NPFW began in the second century B.C.E. and extended into the fourth century C.E. As the tradition progressed into later periods, the painted vessels became coarser and thicker with simplistic decorations. Since military occupation of the fort began ca. 300, everything prior to NPFW Dekorphase 4 (second-fourth century) is considered residual. At ‘Ayn Gharandal, 46.4% (14 sherds) of the fine wares are classified as NPFW Dekorphase 4 dating to the late third or early fourth century; by the fourth century a production center in Aila is replicating the design style creating a new Byzantine Painted coarse ware (BPCW) in the NPFW tradition.⁹⁴

The intra-provincial coarse wares are significant to the discussion of trade and supply not only to better comprehend the necessities of the soldiers stationed at ‘Ayn Gharandal but also to understand the movement of goods along the frontier. The transit system that existed in and around Wadi Araba clearly supported the transfer of goods from one site to another.

⁹⁴ Schmid, S.G. and B. Kolb, *Petra- Ez Zantur II: Ergebnisse der Schweizerisch- Liechtensteinischen Ausgrabungen*, Germany: Philipp von Zabern, 2000. NFW and NSFW primarily date to the first or second centuries and are residual to the site, therefore are not discussed as a contemporary fine ware intraprovincial import. According to S. T. Parker, excavation results from Aila (Roman Aqaba Project) and Petra (Petra North Ridge Project) yielded almost no collection of NPFW Dekorphase 4 sherds, indicating that even in the production city this particular fine ware tradition was declining rapidly.

Coarse ware materials from the two major production centers, Petra and Aila, dominate the corpus. It is unclear how these items were acquired but it is feasible coarse ware vessels were viewed as limited use items- utilitarian goods that were cheap enough to replace as needed. This theory posits that these ceramic materials were of minimal value to the consumer and were acquired as a result of other transactions. An example could be a merchant using these pots as food containers, selling the food and relinquishing the vessel to the consumer. If the collection of sherds is analyzed in this way it appears that the coarse wares are so prevalent because they are a by-product the soldier received at a minimal cost. In terms of trade and supply, the purchase of such goods labels these coarse ware vessels as objects of trade, though only as low-cost, low-risk provisions.⁹⁵

It is more difficult to discern the utility of the intra-provincial fine wares and amphorae that were present. The low-end luxury items, though originating from a local source, were reasonably high-cost high-risk trade items due to their stylized decorations and delicateness. Unlike the coarse ware materials, these would have been intentionally purchased as superfluous personal items rather than for utilitarian purposes or bought as packaging for food. Locally sourced amphorae are a different issue entirely. Amphorae, presumed to carry items such as wine, oil, or garum, are oftentimes viewed in military contexts as direct evidence of the *annona militaris*. While this approximation may be true, several factors complicate this analysis. Initially it seems imperative to note that amphorae, as large storage vessels, were able to be reused after dispensing of their initial contents.

⁹⁵ Stoffels, E., "Native Service: Batavian pottery in Roman military context," in TRAC 2008: Proceedings of the Eighteenth Annual Theoretical Roman Archaeology Conference, Amsterdam 2008, eds. M. Driessen, S. Heerem, J. Hendriks, F. Kemmers, and R. Visser; Oxford: Oxbow Books, 2009.

These large, thick, and heavy vessels were costly to carry through overland transport systems and most likely were refilled at their intended destination. Secondly, even though extensive analysis has been conducted on amphorae, for many forms the initial contents are still unknown- limiting the amount of information that can be surmised about their purpose in any given context. Finally, though the Roman military often sought to supply garrisons with locally produced goods, it is difficult to determine what was brought to the site and if the contents derive from similar locations as the vessels. Bearing these caveats in mind, the intra-provincial amphorae found at ‘Ayn Gharandal, specifically the Gazan forms, are among the better understood forms and were likely carrying wine for the soldiers. If this is the case this evidence points to a locally produced supply of not just ceramics but agricultural goods. This provides a stark contrast to the coarse ware materials, suggesting a multifaceted and complicated trade and supply network through this province.

CHAPTER 4: The Extra-provincial Trade Connections

Trade and supply are fluid terms that help elucidate the interactions between Roman government, military, and civilian populations, specifically along the southeastern frontier. Patterns emerge when examining the intra- and extra-provincial ceramic materials, as they fall into these categories, highlighting the interconnectedness of the region. For the extra-provincially supplied ceramics the acquisition of materials, though relevant, is slightly less significant than the distribution. Analyzing the distribution patterns of extra-provincial ceramics in relation to neighboring sites affords a greater understanding of the extensiveness of the transit network created both within and outside of the Roman Empire.

The material recovered from 'Ayn Gharandal suggests two types of extra-provincial imports. The first group derives from surrounding provinces whose products were likely transported overland, originating in Arabia or Syria. The Kerak plateau region in central Jordan, for instance, provided 'Ayn Gharandal with a small, but noticeable amount of coarse ware materials, primarily cooking vessels. The second group includes smaller contingents of regionally produced fine ware luxury items, such as African Red Slip pottery from Tunisia. Several ceramic fragments of Egyptian amphorae, African Red Slip, and Axumite sherds indicate the tangential exchange relationship between *Palaestina* and the African provinces during the Tetrarchic period. Throughout this chapter, an examination of the extra-provincial transit routes impacting 'Ayn Gharandal will be discussed, followed by an interpretation of the extra-provincial ceramic material as it relates to both trade and supply.

Northeast of ‘Ayn Gharandal, in the province of Arabia, the legionary base at el-Lejjun occupied a critical vantage point along the frontier. The fortress lies within the military zone extending about 20km from the *via nova Traiana*, east to the edge of the north Arabian Desert. This vantage point allows the site to control and protect the productive farmland and urban centers of the Kerak plateau. The climate in this plateau is significantly more fertile than in Wadi Araba, allowing the military garrisons and the surrounding *vici* to have achieved some level of self-sufficiency since their installation ca. 300. This is visible in the evidence that supports local crop production, livestock breeding, and other local industries. The Kerak plateau possessed rich clay beds that led to the development of one or more ceramic production centers. These were apparently sufficient to accommodate the regional military garrisons, the local civilian population, and provide enough surplus to trade, ship, or exchange with sites further to the south such as Petra, ‘Ayn Gharandal, and Aila. The proximity to the *via nova Traiana* and the roads in Wadi Araba would have allowed the easy transfer of such goods along the secured frontier.⁹⁶

Based on comparative studies between the ceramic finds at the archaeological sites of el-Lejjun, Aqaba, and ‘Ayn Gharandal, it is evident that many vessels produced in the Kerak plateau mirrored forms produced at both Petra and Aila. Even though Petra diminished as a major production center for fine ware in the third century, coarse ware materials continued to

⁹⁶ Toplyn, M., “Livestock and *Limitanei*: The Zoological Evidence” in Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project 1980-1989*, Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006; Crawford, P., “The Plant Remains,” in Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project 1980-1989* Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006; Parker, S. T., “Introduction,” in Parker, *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project 1980-1989*, Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2006.

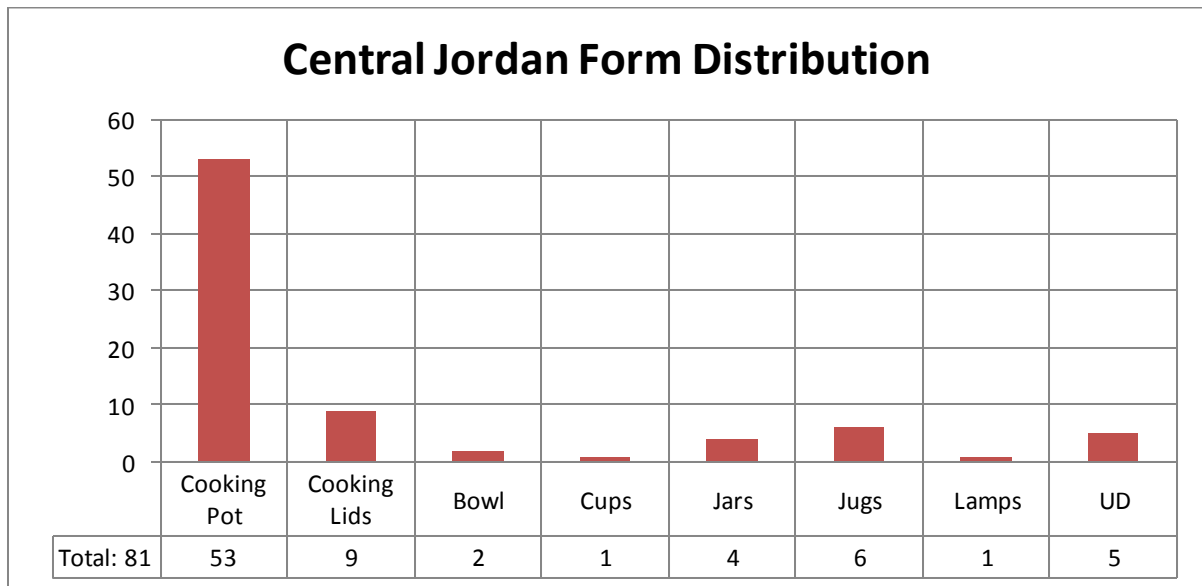
be both produced and exported throughout the fourth century. After the installation of the military garrisons on the frontier, the distribution of central Jordan ceramics increased and continued into the fifth century. Conversely, Aila continued as a production source well into the Islamic period and exported pottery, including amphorae, both north and south. Even with their own strong production tradition, Petra ceramics and a very limited, but noticeable amount of central Jordan material was uncovered throughout the Aila excavations.⁹⁷

When analyzing the ceramic material from ‘Ayn Gharandal, 5% (146 sherds) of the ceramic corpus originated from central Jordan around the Kerak plateau. Of this, approximately 55% (81 sherds) were identified as diagnostic pieces, with 44% (36 sherds) of the diagnostics typologically identified according to the classification system developed for ‘Ayn Gharandal. This distribution of goods primarily consisted of cooking vessels, specifically cooking pots (65%, 53 sherds- diagnostic and non-diagnostic), which correlates to the general distribution of ceramic materials at Gharandal. Even though this is a limited corpus, the appearance of central Jordan wares at ‘Ayn Gharandal affords a limited degree of conjecture. First, during the *Limes Arabicus* excavation, there was no direct evidence that the military was directly involved in ceramic production. What this would indicate is a civilian population producing materials to be distributed to a variety of audiences that obviously included the Roman military. Additionally, this information reinforces the strength of the transit system along the southeastern frontier as these materials are attested at sites outside *Arabia*. Finally, the fairly limited form distribution may suggest cooking wares were in

⁹⁷ Parker, S. T., “The Pottery,” in *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project, 1980-1989*, Washington, DC: Dumbarton Oaks, 2006; Parker, S. T., “The Pottery,” in *The Roman Aqaba Project Final Report: Volume II*. In preparation.

higher demand, based on either their contents or their versatility or the fact that cooking vessels needed to be replaced at higher rates, due to their penchant for taking on food tastes, and could be replaced at those rates because they were cheap. In this limited case, the acquisition of central Jordan ceramics implies a much larger distribution network, encompassing much of the southeastern frontier.⁹⁸

Table 4.1: Distribution of central Jordan diagnostic materials present at ‘Ayn Gharandal.



Looking beyond the extra-provincial imports from *Arabia*, a notable portion of fine wares from Egyptian provinces was present at Gharandal. Although extra-provincial fine wares account for less than 1% of the identified corpus (25 sherds- including Eastern

⁹⁸ **Table 4.1** displays the form distribution for central Jordan wares. A full examination of the diagnostic material from ‘Ayn Gharandal is presented in Chapter 2. **Table 2.4** displays comparative data on ware distribution and **Tables 2.10-17** display the distribution patterns of cooking pot forms.

Sigillata [ESA], African Red Slip [ARS], and unidentified fine wares [UDFW]), their arrival signifies a larger transit network that functioned beyond provincial boundaries. African Red Slip (ARS), from Tunisia, was a fourth century import that is well attested at Aila and appears in smaller numbers at sites further inland, including ‘Ayn Gharandal. The burnished red-slip and stamped decorations common on many ARS forms classify them as fine wares and the paucity of the forms help label them as luxury goods. ARS only represents 36% (9 sherds) of the imported extra-provincial fine ware materials (28% of the total fine wares) at the site. Out of the nine fragments recovered, three have been clearly identified as early-mid fourth century forms (a Form 50A [300-360], a Form 57 [325-400], and a Form 59 [320-380/420]), implying an acquisition after the transfer of the garrison.⁹⁹

This diminutive quantity could imply several things: a limited supply, a limited interest, or the expensive cost typically attributed to the acquisition of luxury items. The limitations on supply and interest in the materials may go hand-in-hand given ‘Ayn Gharandal’s location in Wadi Araba. At periphery sites, such as Gharandal, it is plausible to assume supply needs would supersede individual interests in luxury goods. At the same time, it is not unreasonable to attribute the scarcity of these items to transport costs as well. In addition to the shipping costs, which may have been mitigated by packaging these imports with others such as Egyptian amphorae, there were also hazards of the overland route. Most extraneous items, upon arriving at the port cities, would likely be unloaded to city merchants rather than risk costly transport to interior civilian or military sites.

⁹⁹ Eastern Sigillata A (ESA) sherds are not presented in this discussion because they predate the arrival of the *cohors*. Hayes, J., *Late Roman Pottery*, London: The British School at Rome, 1972.

When evaluating the presence of such fine wares at the Roman port at Aila, this seems reasonable. The preliminary ceramic evaluation from the Roman Aqaba Project (RAP) uncovered several different forms of low-end luxury items that are not present at Gharandal. Although transport to interior sites was risky, the knowledge that there was a market for it may have tempted independent traders to carry limited quantities of fine ware pottery, in addition to other supplies, northward. It is equally possible that an inhabitant of Gharandal may have purchased the fine ware material for a lower cost at the port and carried it back on the return journey, chancing the possibility of breakage as he had no profit to make. As excavations are ongoing, it is likely that more fine ware items will appear in the archaeological record, giving us a clearer understanding of the importance of fine wares at Gharandal.¹⁰⁰

The introduction of the *legio X Fretensis* to the port city of Aila, along with the newly added auxiliary units based in Wadi Araba, must have significantly increased regional demand for imported foods and many other goods, particularly higher quality goods. The hyper-arid climate severely limits the potential for local food production throughout the area but archaeobotanical finds from the RAP excavations uncovered evidence that suggests some

¹⁰⁰ Culclasure, D., *The Supply of the Roman Military in Wadi Arabah during Late Antiquity (ca. 284-636 C.E.)*, MA Thesis, NCSU, 2017. In his thesis, Culclasure notes that ARS dominates the Late Roman red ware corpus, which also includes Egyptian Red Slip [ERS], Cypriot Red Slip [CRS], and Phocaeen Red Slip [PRS]. Culclasure also states that it is difficult to determine why there is such a large presence in the city - if it represents a large demand from the legionary soldiers present in or near the city, or if it is a reflection of the interests of the civilian population at Aila (Culclasure, *Supply of the Roman Military*, 71.)

Though not a direct comparison, information provided in the Vindolanda tablets may be used as evidence to suggest soldiers would venture to nearby cities in order to acquire necessary goods. Tablet 302 is a “shopping list” for items the author needs to acquire. This list indicates the author would like several items (100 apples, 100 to 200 eggs, etc.) if found “for a fair price.” At the very least, this makes the possibility of a soldier or inhabitant at ‘Ayn Gharandal purchasing items, such as fine wares, in Aila a reasonable suggestion. (Vindolanda Tablets Online- Tablet 302: vindolanda.csad.ox.ac.uk)

degree of local agricultural production was possible in the region, although the extent is debatable. Remains of agricultural weed species, cereal grains, fruits, and crop by-products at Aila paint a complicated history of the agriculture in this area. Excavations uncovered the presence of chaff and weed seeds, common in agricultural fields, in first to third century contexts, suggesting the possibility of significant local agricultural production near Aila. With the arrival of the legionary garrison in the fourth century there is a distinct shift in the botanical record that shows a smaller percentage of weed seeds and grain chaff but an increase in the percentage of cereal grains. This data suggested that the arrival of the legion necessitated a greater reliance on imported foodstuffs.¹⁰¹

During this period, Egypt was one of the largest suppliers of grain for the Roman Empire. Trajan's re-dredging of the Nile-Red Sea canal in the early second century reopened a direct all-water route between the Nile Valley and the Red Sea, albeit if only on a seasonal basis, which would have allowed the east easier access to imported materials from Egyptian provinces. Notably, several Egyptian ports were also strategically stationed along the western coast of the Red Sea. Excavations at Aila and the Egyptian ports of Clysma, Berenike, and Myos Hormos highlight a symbiotic trading relationship between the port cities at different times from the first to sixth centuries. For an arid region to sustain large populations and production centers, imported agricultural products would have mitigated the strain imposed on the local environment. At Aila especially, the presence of imported amphorae intimate an

¹⁰¹Ramsay, J. and S. Thomas Parker, "A Diachronic Look at the Agricultural Economy at the Red Sea Port of Aila: An Archaeobotanical Case for Hinterland Production in Arid Environments," in *Bulletin of the American Schools of Oriental Research* 376, 2016. For an in depth discussion of local water systems see: Oleson, J. P., "The Origins and Design of Nabataean Water-Supply Systems," in *Studies in the History and Archaeology of Jordan V*; 1995: 707-709 and Oleson, J.P., "Landscape and Cityscape in the Hisma: The resources of Ancient Al-Humayma," in *Studies in the History and Archaeology of Jordan VI*; 1997.

extensive trading relationship with Egypt likely because of the increased need for cereal grains.¹⁰²

Extra-provincial amphorae account for ca. 6% (168 sherds- including Egyptian amphorae) of the ceramics at the site. Based on current analysis approximately 51.7% (87 sherds) of these are classified as unidentified amphorae, which could not be further defined based on fabric or form, 20.2% (34 sherds) represent Egyptian amphorae, and 27.9% (47 sherds) are other identified extra-provincial amphorae. These amphorae are identified based on fabric composition as well as shape and thickness. The primarily fourth century dating for the identified amphorae fits precisely with the arrival and tenure of the *cohors II Galatarum* at ‘Ayn Gharandal. The percentage of amphorae at the site, especially from Egyptian sources is unsurprising considering the sites proximity to Aila and Red Sea trade. While the contents of these vessels remains unknown it is possible the amphorae carried wine, or less likely, olive oil. As with the intra-provincial imported amphorae, the reason for acquiring such materials or goods is speculative but they could have acted as supplies for the *annona militaris*.¹⁰³

The identification of coarse ware Axumite sherds presents a unique find at ‘Ayn Gharandal. Axumite, originating in Ethiopia, is a coarse hand-made ceramic form that is typically thick and roughly hewn; the materials are burnished on the visible surface and are

¹⁰² Tomber, R., *Indo-Roman Trade: From Pots to Pepper*, Duckworth & Co., 2008:57-87. Garnsey, P. & R. Saller, *The Roman Empire: Economy, Society, and Culture*, University of California Press, 1987: 89-94.

¹⁰³ Peacock, D.P.S. and D.F. Williams, *Amphorae and the Roman Economy: An Introductory Guide*, New York: Longman, 1986. Other identified extra-provincial amphorae types present at Gharandal, based on Peacock and Williams’ typology are: Class 44, Class 45, Class 47, and Class 51. It is possible that the unidentified amphorae sherds may represent unknown intra-provincial production sources, however, since more production centers are known from outside the province they are treated here as extra-provincial imports. Amphorae are further discussed in Chapter 2 of this volume.

comprised of a great deal of organic temper. This pottery tradition appeared in the mid to late fourth century and extended through the fifth. Even though the production of Axumite falls squarely within the occupation at Gharandal the presence is an anomaly in the ceramic make-up. Based on the limited published material from the region, Axumite does not appear to be a typical import and it is hard to believe that a large market would have existed for such a roughly made coarse ware. Of note is that the presence of Axumite does speak to the extensive transport, if not trade, network throughout the eastern empire, with non-local coarse wares being transported significant distances from their area of production.

The extra-provincial imported material is varied and highlights the extent of interaction beyond the provincial borders during the fourth century. This interaction is visible in many forms: the production of ceramic materials by civilian populations; the distribution of materials from large port cities; and the acquisition of materials- either through government representatives or individuals, be they traders or purchasing for themselves and possibly their friends- which brought the ceramic material to 'Ayn Gharandal. For the extra-provincial materials the ceramic distribution is interesting when comparing Aila and Gharandal. Aila, a large port city with access to materials from the Red Sea and Indian Ocean, not unexpectedly displays a huge diversity in ceramic composition. Fine ware imports and amphorae are numerous and varied, indicating the strong trading relationships with other port cities. What is significant to note from this exchange is the degree to which these materials are transported to the interior of the province. At 'Ayn Gharandal the amount of extra-provincial fine ware is limited to only ARS forms- and even that is limited in number.

Amphorae are slightly more varied but the limited quantities suggested that the intra-provincial amphorae accounted for a larger percentage of the garrisons supply.

The purpose for acquisition appears similar to the intra-provincial ceramics. Once again there is a notable amount of coarse ware materials that represent low-risk, low-cost trading ventures, this time from slightly further afield around the Kerak plateau. The ARS, a low-end luxury item, is a perfect example of a high-risk, high-cost, and long distance traded good. So far the limited quantities at Gharandal would suggest trade in such materials was not lucrative so far north of the port. Amphorae, once again, are harder to pinpoint. The lack of consistency in amphorae types could be significant. It is possible the variety of amphorae indicates a preference for certain materials; perhaps the wine from Egypt was better than other Mediterranean varieties. Conversely, perhaps the type of amphorae or the quality of the content is immaterial, it was just the type of contents that were important- the garrison needed wine and this was all that was available. Even though generalizations are possible, given the incomplete data from excavations, both at 'Ayn Gharandal and neighboring sites, the amount of information that can be gleaned from ceramic materials is limited.

CHAPTER 5:
Supplying the Southeastern Frontier:
An Analysis of Military Sites in *Arabia* and *Palaestina*

The previous chapters have focused on the ceramic material from the auxiliary fort of ‘Ayn Gharandal in Wadi Araba. A detailed analysis has made it clear this site was occupied predominately in the fourth century with evidence for later Islamic period burials after the abandonment of the fort. Though located west of the provincial boundary, ‘Ayn Gharandal was connected to other military and civilian sites by a series of extensive road networks that facilitated the movement of troops, military supplies, civilians, and commerce throughout *Palaestina*, *Arabia*, and beyond. The ceramic material underscores the significance of imported material to the site as no local ceramic production source was identified. This concluding chapter aims to compare the ceramic material from ‘Ayn Gharandal to other contemporary military sites on the southeastern frontier, address the extent to which ceramic evidence can elucidate trade and supply networks, and comment on the nature of the *limitanei* in this region.

Military installations are visible along each of the major road systems that traverse the southern expanse of the Roman Empire. In *Palaestina* and *Arabia* legionary and auxiliary units line both the *via nova Traiana* and the interior roads through Wadi Araba. The military units are interspersed along these boundaries visually demarcating a boundary between the Roman Empire and unconquered lands to the east. Although each site has a specific ceramic footprint, the similarities among the forts along this frontier are clearly evident in their ceramic materials.

A typological and fabric analysis on published ceramics from military sites in the area will place the ceramic corpus at Gharandal in a larger regional context. To summarize, in Chapter 2, Petra and Aila were identified as primary sources for local commercial goods in the southern part of the empire. Ceramic material from the Kerak plateau was far less numerous at southern sites but predominates at northern military locations. Theoretically, the quantities of extra-provincial imported goods, such as amphorae and fine wares will vary based on the site and proximity to port cities or trans-provincial routes, partially explaining the unique aspects in the ceramic profiles of individual sites. In what follows, the identified typological analysis will be utilized to consider possible explanations for the distribution of ceramic vessels.¹⁰⁴

The Roman Military in the East: A view from Inscriptions

Inscriptions are a major source for understanding the relationships among sites. Though rare in the archaeological record, this evidence may provide insight into intra- or extra-provincial connections within local communities. Through an analysis of their date, content, and location, this form of evidence may define or substantiate various material finds. When comparing the inscriptional evidence from both ‘Ayn Gharandal and the site of Yotvata, the analysis can be utilized in two ways: to corroborate the designation of the site as military and to highlight, when possible, connections between these two specific sites.¹⁰⁵

¹⁰⁴ The extent of publication in regards to ceramic materials varies widely for many sites in *Palaestina* and *Arabia*. As such, a direct quantitative comparison cannot be established between most sites and ‘Ayn Gharandal.

¹⁰⁵ Other notable inscriptions are present in the region, such as the dedicatory inscription at Udrh but due to a lack of ceramic material will not be utilized in this analysis. For more information on this inscription see:

Although the Tetrarchic inscription recovered at ‘Ayn Gharandal unquestionably identifies it as a military installation, the inscription also provided further insight into how the site relates to similar *quadriburgia* in Wadi Araba. A Latin dedicatory inscription was placed directly above the main gateway leading into the fort. This inscription confirmed name of the site as *Arieldela*, as mentioned in the *Notitia Dignatatum* (Or. 34.44). The inscription includes seven lines of text with traces of red paint within an incised *tabula ansata*. The translation reads: “For perpetual peace, the emperors Diocletian and [Maximianus] and the Caesars Constantius and Maximianus stationed (in this place) the *Cohors II Galatarum* through the foresight of Priscus, governor of the province....” There are two erasures of text: the name of Maximian and another of the province, though Reflectance Transformation Imaging (RTI) picked up traces of the letter “P” most likely representing the province *Palaestina*. Between the years 311-312 Constantine I issued a *damnatio memoriae* against the *Augustus* Maximian, resulting in an erasure of his name from this dedicatory inscription.¹⁰⁶

The closest fort to Gharandal is Yotvata, which lies just to the southwest in the Araba valley. Yotvata was also constructed as a *quadriburgium*, with rooms lining the interior wall faces around a central courtyard, an eastern-facing gate, and an exterior bathhouse. A Latin dedicatory inscription, a close parallel to that at ‘Ayn Gharandal, was uncovered in 1985.

Kennedy, D. and H. Falahat, “*Castra legionis VI Ferratae*: a building inscription for the legionary fortress at Udruh near Petra,” in *Journal of Roman Archaeology*, 21. 2008:157

¹⁰⁶ Darby, R., “Aufidius Priscus, the cohorts *Secunda Galatarum*, and Diocletian’s re-organization of *Arabia* and *Palaestina*: the new tetrarchic inscription from ‘Ayn Gharandal,” in *Journal of Roman Archaeology* 28: 2015. *Notitia Dignatatum* Or. 34.44. For additional information on Aufidius Priscus see Burrell, B. “Two inscribed columns from Caesarea Maritima,” *ZPE* 99:1993 and Lehmann, C.M. and K. G. Holum, *The Greek and Latin inscriptions of Caesarea Maritima*, Boston, MA. 2000:49-51.

Both stones are similar in their display of an inscription within a *tabula ansata*. This inscription details the installation of the *ala Costia*, auxiliary unit stationed at the site during the Tetrarchy. The inscription dates to 293-305 based on Diocletian and Maximian named as *Augusti* and Constantius and Maximianus as *Caesares* and also mentions the provincial governor, Priscus. Later erasures due to the *damnatio memoriae* and the provincial name are also seen in the Yotvata text. This region was renamed several times whilst under Roman control, including *Arabia*, *Palaestina*, *Palaestina Salutaris*, and finally *Palaestina Tertia*. Israel Roll, who originally published the Yotvata inscription, has suggested the erasure of the province name does reflect the administrative change from “*Arabia*” to “*Palaestina*” in this period.¹⁰⁷

The inscriptions document the differences in the two units stationed in the Araba - the *ala* (cavalry) unit at Yotvata and the *cohors* (infantry) unit at ‘Ayn Gharandal, though forts were constructed in the same period. Given all the other evidence for Tetrarchic military activity in this region, including a series of milestones in Wadi Araba, it seems reasonable to suggest that other similar *quadriburgia* in the valley may also date to this period. One such example is Bir Madhkur, located further north in Wadi Araba ca. 10km northwest of Petra. The design of the fort resembles other *quadriburgia* from the area with four projecting corner towers. Surface ceramic surveys recovered material dating from the Nabataean to Early

¹⁰⁷ Smith II, A., “Bir Madhkur Project: A Preliminary Report on Recent Fieldwork,” in *Bulletin of the American Schools of Oriental Research*, 340:2005. Smith II, A., *Wadi Araba in Classical and Late Antiquity: An Historical Geography*, Oxford: Archaeopress, 2010; Roll, I. “A Latin Imperial Inscription from the Time of Diocletian Found at Yotvata,” in *Israel Exploration Journal*, 39:3. 1989. Roll, I. and U. Avner, “Tetrarchic Milestones Found near Yahel in the Southern Aravah,” in *Zeitschrift für Papyrologie und Epigraphik*, 165, 2008:271. For a comparative image of the Gharandal and Yotvata inscriptions see **Figure 5.1**. See Chapter 3 for a further discussion of the provincial changes in the third and fourth centuries.

Byzantine periods, overlapping in date with Yotvata and ‘Ayn Gharandal. Unfortunately no ceramic material has thus far been published from Bir Madhkur, making it impossible to complete a comparative ceramic study; however, a comparison of the ceramics from both Yotvata and ‘Ayn Gharandal was utilized to elicit any differences between these units in terms of trade and supply. Likewise, publication of ceramic material from several contemporary military sites to the northeast by the *Limes Arabicus* Project should provide further insights, since this includes both legionary and auxiliary garrisons.¹⁰⁸



Figure 5.1: Dedicatory inscriptions from ‘Ayn Gharandal and Yotvata.

Ceramic Comparanda from Military Sites

Before this analysis can be conducted, however, a few caveats must be addressed.

The first is related to the recording system of the ceramic materials, which varies between

¹⁰⁸ Roll, I. “A Latin Imperial Inscription,” 1989. See **Figure 1.6** for a map of fourth century military installations in *Arabia/Palaestina*.

sites. The process utilized in ceramic analysis for ‘Ayn Gharandal was adapted from the system employed with artifacts from the Roman Aqaba Project (RAP). This system focused on three different factors: 1) quantifying diagnostic and non-diagnostic ceramic materials, 2) identifying fabric similarities between sherds, and 3) developing a typological classification that is site specific. This type of analysis and comparison was possible between multiple sites because of the ceramicists’ access to an unpublished corpus of material. Further differences arise when considering the various research questions ceramicists ask, which dictate the type of information collected. For ‘Ayn Gharandal a primary research question was the location and types of pottery present at the site and whether parallels can be drawn to other sites in southern Jordan. This framework necessitated accurate descriptions and images of vessel forms to create a typology that may be duplicated for other sites.¹⁰⁹

At ‘Ayn Gharandal, an in-depth study of the quantity, form, and fabric of excavated ceramic materials determined that most intra-provincial ceramic material was made of local coarse ware fabrics from Aila and Petra with a limited amount of intra-provincial fine wares, all in the Nabataean fine ware tradition (NFW, NSFW, NPFW). The extra-provincial materials included “local” coarse wares, imported amphorae, and a limited amount of imported fine wares such as African Red Slip (ARS).

The recently published Yotvata final report provides interesting *comparanda*. A close comparison of the ceramic assemblages is impossible due to the differences in methodology,

¹⁰⁹ For a detailed analysis of methodology for the RAP excavations see Parker, S. T., *The Roman Aqaba Project Final Report: Volume II*. In preparation. Similar data access and analysis has been conducted in part on materials from both the Petra Garden and Pool Complex project (PGPC) and the Petra North Ridge Project (PNRP). Focus for the Yotvata material will be on the published pieces from the collection, however, personal examination of a selection of materials in 2014 indicated a similar construction of fabrics.

but valuable information may be extrapolated from the published corpus and from first-hand examination of a selection of the material. Of note is the paucity of imported fine ware materials at the site. Much like Gharandal, the extent of imported fine wares is limited to a Nabataean Painted fine ware sherd, Dekorphase 4, and a few ARS sherds dating to the fourth century. The excavators state that this indicated Yotvata did not have a strong connection with long distance trade- specifically as it relates to imported fine wares.

The Yotvata publication also includes several amphorae recovered during excavations. Many of the amphorae mirror the evidence analyzed from ‘Ayn Gharandal. The publication also notes several amphorae forms that were recovered during excavations, including forms that are also present at Gharandal, namely the Class 47 “Hollow Foot” (Fig. 2.20:3) and the Class 48 Gaza (Fig. 2.19:1). Although Magness also reports a North African amphora (Fig. 2.20:2) otherwise unattested at Gharandal, the overall picture from the published amphorae suggest both forts relied on similar sources of imported food to supply these garrisons.¹¹⁰

Magness also noted that much of the ceramic material was produced within the general region. To compare this analysis with Gharandal, ceramic fabrics have been reconstructed when possible from the physical descriptions of the pottery provided by Magness in **Table 5.1**. Based on key phrases, the majority of the published assemblage has

¹¹⁰I would like to thank Dr. Jodi Magness for the opportunity to examine a selection of the material from the Yotvata excavations. Davies, G and J. Magness, “The 2003-2007 Excavations: Architecture and Stratigraphy,” in Davies, G. and J. Magness, *The 2003-2007 Excavations in the Late Roman Fort at Yotvata*, Eisenbrauns, 2015: 1-73; Magness, J., “The Pottery,” in Davies, G. and J. Magness, *The 2003-2007 Excavations in the Late Roman Fort at Yotvata*, Eisenbrauns, 2015: 74-141. For the NPFW image see Fig. 1:3. For images of the ARS sherds published from Yotvata see Figures 2.1:1-2; 2.13.1. Personal examination of the Yotvata pottery in 2014 also indicated that Egyptian amphorae may have been present at the site as well.

been sourced to either Petra or Aila, with Aila dominating the corpus. The verbal descriptions for the remaining sherds were insufficient to suggest a production source but upon physical examination may fall under one of these categories. What appeared to be missing from the published assemblage are sherds that would indicate central Jordan production, however, several explanations may account for this absence. It is possible that central Jordan sherds were discovered but not in sufficient quantity to be published. As the information presented from Yotvata focuses more on vessel form rather than fabric, it is unsurprising that central Jordan would not be represented. Equally feasible, based on the site's proximity to Aila, additional ceramic supplies from central Jordan may have been unnecessary and thus were not part of the assemblage. The large quantities of Aila material published would tend to support this theory. Lastly, perhaps central Jordan ceramics materials were present but they were not recognized.¹¹¹

As the majority of the published material can be connected to Petra or Aila, it is unsurprising that many of the vessel forms also mirror types identified at 'Ayn Gharandal. **Table 5.2** indicates the correlations between 'Ayn Gharandal types and the Yotvata images. From the table it is evident that not all images represent direct parallels. In many instances this is due to the quality of preservation. For instance, at 'Ayn Gharandal, casseroles are typed based on handle variations; the published Yotvata examples do not have preserved handles. A few instances arise where the forms in the assemblages differ. From Gharandal, this difference does not mean the form is wholly absent from the assemblage. Rather, it

¹¹¹ Actual analysis of the fabrics may vary slightly from the projection.

Table 5.1: Fabric identification of Yotvata pottery.

Key Phrases	Image	Fabric Designation
<ul style="list-style-type: none"> - Hard-fired - Thin - Relatively smooth - Orange brown ware - Thin orange core/ red core - Dark grey core - Tiny-small white grits 	Figs. 1.5, 1.6, 1.8 Figs. 2.2:3, 6 Fig. 2.4:4 Fig. 2.8:5 Figs. 2.9:3-4, 6 Fig. 2.13:2 Fig. 2.13:4 Fig. 2.14:1 Figs. 2.18:3-5 Fig. 2.20:4, 9	Petra
<ul style="list-style-type: none"> - Light pink/orange ware - Yellow slip - Glistening mica flecks - Purple- brown ware - Thick - Gritty 	Fig. 2.2:7 Figs. 2.5:4-5 Figs. 2.6:1, 7 Fig. 2.8:3-4, 6-9 Fig. 2.16:2 Figs. 2.17:2 Fig. 2.18:2, 7-8 Fig. 2.19:3 Fig. 2.21:2-3	Aila 1a
<ul style="list-style-type: none"> - Thick - Brown/yellow ware - Yellow slip - White grits - Glistening flecks - Gritty 	Fig. 1.7, 1.9 Figs. 2.2:1-2 Fig. 2.6:2-5 Figs. 2.9:1 Fig. 2.19:2 Fig. 2.20:5, 8, 10	Aila 1b
<ul style="list-style-type: none"> - Buff (yellow), white-green ware - Yellow slip - Tiny dark grits - Thin - Lightweight 	Fig. 2.6:6 Fig. 2.7:2	Aila 2
<ul style="list-style-type: none"> - Very thin - Brittle - Dark red-brown (cooking) ware - Dark orange-brown (cooking) ware - White and dark grits - Gritty - Gold mica flecks 	Fig. 2.2:5 Figs. 2.3:1-3 Figs 2.4:1, 5-7 Figs. 2.5:2 Fig. 2.14:2 Figs. 2.15:2-3 Figs. 2.16:1, 3 Fig. 2.17:3 Fig. 2.18:1	Aila 3

indicates the form is not distinctive enough or present in significant quantities to classify a type. The question of why certain forms are available at Gharandal but not at Yotvata is a question that cannot be answered based on the available resources.¹¹²

Despite its restrictions, this analysis suggests the ceramic assemblage from Yotvata is basically similar to Gharandal. In this comparison, two different types of auxiliary units are analyzed but show very little diversity in the ceramic assemblages. Both sites imported the bulk of their utilitarian coarse ware from the two major production centers of Aila and Petra. Larger quantities of “cooking wares,” when compared to “table wares” such as bowls, cups, or plates, are present at each site with similar type variations. The dearth of table wares is likely because the cooking ware forms served dual purposes and were used for both cooking and serving/eating. Also noted at each site was the paucity of imported fine ware ceramics. Goods such as ARS or late Nabataean fine ware were minimal, indicating that these items were either not in high demand or too expensive to procure. Though a variety of amphorae appeared at both forts, there is no direct evidence to suggest these carried “luxury” items over necessary supplies.¹¹³

¹¹² For a look at the published Yotvata casserole lids see Magness, J. “The Pottery,” p. 114-115, Fig. 2.18:4-8. For data on the amount of unclassified types see Chapter 2.

¹¹³ Magness, J. “The Pottery”, 2015: 75.

Table 5.2: Typological comparison between Gharandal and Yotvata.

Vessel Form/Type	Description	Yotvata Image
Cooking Pot- 2	Groove above and below the rim	Figs. 2.4.2-3 Figs. 2. 16.1, 3
Cooking Pot- 3	Squared rim	Fig. 2.4:1
Cooking Pot- 4	Deep grooved rim	Figs. 2.4.5-7 Figs. 2.15:2-3
Cooking Pot- 5	Rounded rim	Fig. 2.2:7 Figs. 2.3:1-4 Figs. 2.14.1-3
Cooking Pot- 6	Hooked rim	Fig. 2.13:4
Cooking Pot- 7	Everted rim	Fig. 2.15:1
Casserole- 1	Horizontal loop handle	Figs. 2.18:1-2
Bowl- 6	Overhanging rim	Fig. 2.1:9 Figs. 2.2:1-2
Bowl- 7	Rounded rim with groove	Fig. 2.1:5 Fig. 2.13:2
Bowl- 9	Small overhanging triangular rim	Fig. 2.1:6
Jar- 2	Folded rim	Figs. 2.6:5-6 Fig. 2.19:2
Jar- 3	Straight neck	Fig. 2.21:1(?)
Jar- 4	Rounded rim with ridge	Fig. 2.6:4
Jug- 1	Flask	Fig. 2.8:9 Figs. 2.9:1-2 Fig. 2.20:6
Jug- 2	Spouted rim	Fig. 2.8:3

North of Bir Madhkur also in the Araba valley is the multi-period site of Mezad 'En Hazeva. The Roman period occupation at the site is evidenced in the partially extant fort. The ceramic material was analyzed by Tali Erickson-Gini who divided the corpus by stratigraphic periods. Although the published ceramic finds from Hazeva are relatively limited in comparison, several discoveries arise when examining the material. Initially, it is apparent that there are many forms that were present at Hazeva that are wholly absent from the

Gharandal corpus, most notably in the form of large basins, baskets and *mortaria*. Also significant are the quantities of published images of bowls when compared to cooking pots. Like ‘Ayn Gharandal and Yotvata, Hazeva has a limited presence of imported amphorae, including Peacock and Williams’ Classes 45, 48, and 51 and fine wares, such as ARS. Notably different, Hazeva also uncovered evidence of a Peacock and Williams’ Class 51 amphora dating to the late fourth or fifth century. **Table 5.3** provides a brief typological comparison of the common forms between Hazeva and ‘Ayn Gharandal. Unfortunately, the sometimes brief visual description makes fabric identification difficult but suggestions have been made when possible.¹¹⁴

Table 5.3: Typological comparison between ‘Ayn Gharandal and Mezad ‘En Hazeva.

Vessel Form/Type	Description	Image	Fabric
Cooking Pot- 4	Deep grooved rim	2.64	Petra
Cooking Pot- 6	Hooked rim	4.53-4.54	N/A
Bowl- 7	Rounded rim with groove	4.9	Aila 1a
Jar- 3	Straight neck	4.39- (Similar form?)	Aila 1a
Jug- 2	Spouted rim	4.27	Aila 1b
		4.36	N/A
		4.56	N/A
Jug- 3	Folded rim	4.31	Aila 1a/Petra?

Further north, along the *via nova Traiana*, the *Limes Arabicus* Project (LAP) excavated the legionary based at el-Lejjun and a series of small military sites near the Kerak plateau. As with Yotvata, the following analysis compares ceramic vessel forms at Gharandal

¹¹⁴ Erickson-Gini, T., *Crisis and Renewal – Settlement in the Central Negev In the Third and Fourth Centuries C.E.: With an Emphasis on the Finds from Recent Excavations in Mampsis, Oboda and Mexad ‘En Hazeva*, Hebrew University in Jerusalem, Dissertation, 2004 c/f

with each of the sites from the LAP excavations where possible. A few sites in particular (Qasr Bshir, Khirbet el-Fityan, Da'janiya, and el-Lejjun) share similar occupation periods with 'Ayn Gharandal and will be analyzed in greater detail. As 'Ayn Gharandal was constructed around the early fourth century, the ceramic material from each of the LAP sites will focus specifically on this period.

The legionary fortress at el-Lejjun lies on the edge of the arable farmland of the Kerak plateau between the *via nova Traiana* and the desert to the east. The fortress at el-Lejjun, likely occupied by the *legio IV Martia*, was constructed around 300 and remained occupied until an earthquake in 551 heavily damaged the structure. Qasr Bshir, Khirbet el-Fityan, and Da'janiya are roughly fourth century Roman *castella* that were situated near the Kerak plateau in close proximity to the legionary base at el-Lejjun. These sites follow the general characteristics of fourth century fortlets in this area with rooms lining the curtain walls, opening to a central courtyard, with projecting corner towers. Of these sites, Da'janiya provides the closest parallel to 'Ayn Gharandal from this area because of its location within the province of *Palaestina*. Rujm Beni Yasser, a small earlier fortlet ca. 1km east of el-Lejjun, was also part of the LAP excavations but due to the early date of the ceramic material is not presented in this analysis.

The ceramic finds were represented in both an interim report, which highlighted material from Qasr Bshir, Khirbet el-Fityan, and various excavation areas at el-Lejjun in addition to a final report that enumerated more ceramic finds from el-Lejjun and Da'janiya. The interim report presented a typological classification that represented common ceramic

Table 5.4: Typological comparison between ‘Ayn Gharandal and the LAP excavation sites.¹¹⁵

Vessel Form/Type	Description	Site	Image
Cooking Pot- 1	Triangular rim	Qasr Bshir	36
Cooking Pot- 2	Groove above and below the rim	Qasr Bshir	33-35
Cooking Pot- 4	Deep grooved rim	Khirbet Fityan Lejjun	46, 48-49 82-83, 97, 117
Cooking Pot- 5	Rounded rim	Qasr Bshir Lejjun	38 (?) 141
Cooking Pot- 6	Hooked rim	Qasr Bshir Lejjun	37; 39 84, 96, 100, 102, 104, 119, 134-135, 137
Casserole- 1	Horizontal loop handle	Khirbet Fityan Lejjun	55 144, 147, 149
Cooking Lid-2	Bulbous handle	Lejjun	86, 150
Bowl- 2	Hemispherical	Lejjun	94
Bowl- 3	Notched rim	Qasr Bshir	43
Bowl- 5	Rounded rim with flat base	Lejjun	95
Bowl- 7	Rounded rim with groove	Qasr Bshir Lejjun	42 113
Bowl- 8	Krater	Khirbet Fityan	77-78
Cup- 2	Globular	Qasr Bshir Lejjun	41 91
Jar- 3	Straight neck	Lejjun	107-108, 162-164
Jar- 4	Rounded rim with ridge	Lejjun	154-158
Jug- 2	Spouted rim	Lejjun	165-166

¹¹⁵ Material presented here is only from the Interim Report.

forms with a small selection of rarer materials. From the visual descriptions provided by Parker, the majority of the coarse ware material falls into two basic fabric descriptions: a light brown/orange/yellow ware or a gray ware, both with small inclusions. This fabric is the characteristic central Jordan ware visible at other sites.¹¹⁶

Presented in **Table 5.4** is a type comparison from the *Limes* interim report with the Gharandal typology. As was noted with the Yotvata material, there is a site based variation in vessel types. This variation may be due to the excavated areas, available ceramic materials, or a limited representation of material. One of the most interesting finds through this analysis is how often ceramic forms are imitated at different production centers. Even though most of the material from the *Limes* excavations represents central Jordan, the same forms are available in Petra and Aila fabrics. The LAP final report focused on additional secure stratigraphic contexts and new excavated material from el-Lejjun and Da'janiya not presented in the interim report. **Table 5.5** presents the comparative analysis with these new images.

When comparing the LAP ceramics to Gharandal, several parallels can be drawn between the distributions of material. According to the published material both corpora show an affinity for a variety of cooking ware forms, specifically cooking pots. Outside of the coarse ware materials, Parker also noted the relative scarcity of imported amphorae to the site. Egyptian amphorae, relatively common at southern sites like Gharandal and Aila, are

¹¹⁶ Parker, S. T., "The Pottery," in *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project, 1980-1989*, Washington, DC: Dumbarton Oaks, 2006: 329-364; Parker, S. T., "The Pottery," in *The Roman Frontier in Central Jordan: Interim Report on the Limes Arabicus Project, 1980-1985*, Bulletin of the American Schools of Oriental Research, 1987: 525-619. Typically the gray ware is representative of later material and is not visible in strictly fourth century assemblages.

completely absent from the LAP excavation; even Gaza amphorae were extremely rare. Class 44, 46, and 47 amphorae, based on Peacock and Williams' typological classification were also noted in the assemblages though to varying degrees. Parker postulates that the limited quantities of amphorae could be a result of limited areas of excavation or areas that had been cleaned out prior to abandonment.¹¹⁷

Imported fine ware materials made up only ca. 0.2% of the ceramic corpus (about 300 sherds) but the variety is worthy of note. ARS, as with other sites was the most common form of imported fine ware but PRS, CRS, and ERS sherds were also uncovered. What was unique about these stratified finds is the presence of these low-end luxury items in barracks rooms at Da'janiya. As Parker notes this type of distribution suggests that legionary troops were not the only ones that could afford such items.¹¹⁸

Ceramic Comparanda from Roman Aila

An interesting comparison can be drawn between these military forts and the port city of Aila. Although the complete corpus of material from the RAP excavations is forthcoming, David Culclasure has provided significant data in his 2017 M.A. thesis. Aila was a major production center from the first to eighth centuries, specializing in coarse ware materials and, from the fifth century onwards, in Aila amphorae. Analysis of the ceramic material suggests that a significant minority was imported from Petra and a tiny percentage from central Jordan. Even in limited quantities, the presence of other coarse wares could imply a trading

¹¹⁷ Parker, S.T., "The Pottery," in *Final Report on the Limes Arabicus Project*, 2006.

¹¹⁸ Parker, S. T., "The Pottery," in *The Roman Frontier in Central Jordan: Final Report*, 2006: 329-364; Parker, S. T., "The Pottery," in *The Roman Frontier in Central Jordan: Interim Report*, 1987: 525-619.

relationship between Aila and other production centers. In view of the very small numbers of particularly the central Jordan wares, this would most likely mean a trade of the contents of

Table 5.5: Typological comparison between ‘Ayn Gharandal, el-Lejjun, and Da’janiya..119

Vessel Form/Type	Description	Site	Image
Cooking Pot- 2	Groove above and below the rim	Da’janiya	287, 290-292, 325
Cooking Pot- 4	Deep grooved rim	Lejjun Da’janiya	1-3, 5, 148 285-286, 288-289
Cooking Pot- 5	Rounded rim	Lejjun	4, 11-12, 81, 147, 207
Cooking Pot- 6	Hooked rim	Lejjun Da’janiya	9, 13, 80, 93-94, 119, 139, 146, 158, 208, 210- 211, 243 295, 298
Casserole- 1	Horizontal loop handle	Lejjun	149, 178
Cooking Lid-2	Bulbous handle	Lejjun	197
Bowl- 1	Carinated	Lejjun Da’janiya	154 339
Bowl- 5	Rounded rim with flat base	Lejjun	105, 109, 202
Bowl- 7	Rounded rim with groove	Lejjun Da’janiya	69, 132 343-348
Bowl- 8	Krater	Lejjun Da’janiya	108 318
Jar- 2	Folded rim	Da’janiya	335
Jar- 3	Straight neck	Lejjun	35-36, 98
Jar- 4	Rounded rim with ridge	Lejjun	23-24, 84, 143, 179, 206, 237-238
Jug- 1	Flask	Da’janiya	302-303
Jug- 2	Spouted rim	Lejjun Da’janiya	38-40, 128 306-307

¹¹⁹ Material presented here is only from the Final Report.

the pots rather than the pots themselves. A more likely explanation is that the material was brought to Aila as personal possessions. For extra-provincial imports, quantification of amphorae revealed that approximately 56.3% of amphorae (3328 sherds) derive from a fourth century context at Aila. Of this percentage Egypt was by far the largest contributor, but other amphorae including Gaza, Peacock and Williams' Classes 44, 45, 46, 47, and unidentified varieties were also present, although in insignificant quantities compared to Egypt and Gaza.

When comparing this to available data from military sites further north the smaller forts exhibited a diverse assemblage. This is probably connected to the fact that as a port, Aila imported a large number and variety of vessel types, both as ceramic and for their contents. Aila's ceramic analysis also revealed a large collection of imported fine wares, mostly ARS and Egyptian Red Slip (ERS) plus a handful of Phocaeen Red Slip (PRS), and Cypriot Red Slip (CRS). This variety implies there was a large demand for these items in the port city. As Culclasure rightly notes, this is hardly surprising considering the large number of ESA imports to the city in the first and second centuries, even though this pattern is not replicated in Wadi Araba.¹²⁰

Though not directly comparable due to Aila's character as a port city with a significant military presence in the fourth and fifth centuries, the evidence from Aila provides insight into the nature of trade and supply in this region. Initially, it is easy to understand the relationship between the southern Araba sites and Aila. The proximity to a major ceramic

¹²⁰ Culclasure, D., *The Supply of the Roman Military in Wadi Arabah during Late Antiquity (ca. 284-636 C.E.)*, MA Thesis, NCSU, 2017: 68-76. Parker, S.T., *The Roman Aqaba Project Final Report: Volume 2*, Boston: ACOR. In preparation. Though not mentioned in his analysis, personal examination on the ceramic material from RAP also indicated material from central Jordan.

production center results in a significant portion of material imported from that site. The variability in fourth century amphorae present at Aila is similar to the variety present at the smaller military garrisons in Wadi Araba. It is reasonable to assume that a portion of these amphorae were imported as part of the *annona militaris* for garrisons stationed at Aila and further north. Probably the most significant contrast between the Aila pottery and the military installations mentioned above is the amount fine wares. The comparatively large quantities discovered at Aila are in stark contrast to the miniscule numbers uncovered in the LAP excavations, at Yotvata, and at Gharandal. This evidence can be partly explained by Aila's direct access to the sea versus the landlocked location of the sites to the north. In addition to the supply of wares, the demand has to be taken into consideration as well. Aila probably had a reasonably high demand for fine ware materials, as its population likely included wealthy traders in addition to the legion garrisoned at the city. However, the dearth of fine table ware at both the smaller auxiliary sites as well as the legionary base at el-Lejjun is curious. While transport costs must certainly have negatively impacted the price of fine wares for the inhabitants of these military installations, it is unlikely that this was to an extent that raised it to unreasonable limits where soldiers would not have afforded the material. Auxiliary soldiers, though not rich, were better off than the majority of the population. It seems that other circumstances, such as the areas chosen for excavation, may be responsible for the surprisingly low number of fine wares. In particular, a lack of material from rubbish pits was excavated.¹²¹

¹²¹ Further comparison and analysis can be conducted after the publication of Parker's forthcoming volume. Similarities between the 'Ayn Gharandal ceramic types and the Aila types from RAP are noted in Chapter 2. Speidel, M.A., "Das römische Heer als Kulturträger. Lebensweisen und Wertvorstellungen der Legionssoldaten

Discussion and Conclusions

This comparative data is very useful in illuminating the similarities between sites and illustrates the importance of the transit system in the east. For sites that appear to be limited in arable land, such as ‘Ayn Gharandal, access to goods was a necessity. Excavations so far have not uncovered any evidence of local agricultural production, and the source at ‘Ayn Gharandal is too small to have supported all the agricultural goods for both the village, that most likely was present at the site, plus the inhabitants of the fort. Consequently, it must be assumed that the garrison was unable to be completely self-sufficient. This resulted in a fairly large commercial relationship with productive cities, such as Aila and Petra. Sites further north along the Kerak plateau had only minor percentages of imported finds, suggesting a limited reliance on external imports. Even with this information the conclusions that can be drawn from analyzing ceramic materials are limited. Though some conclusions can be drawn regarding production source and styles of vessels, the ceramic evidence is only a small portion of the material culture found through excavation. To fully comprehend the nature of trade and supply along the southeastern frontier employing ceramic evidence, more information is needed. Ceramic vessels only allude to the function of the form but, in most cases, cannot shed light on the vessel contents, who purchased the vessel, or the reason behind the purchase.

For the purpose of this thesis, trade was defined as both low-cost low-risk trade and high-cost, high-risk, sometimes long-distance trade. Supply, conversely, was identified as

an de rNordgrenyen des Römischen Reiches im ersten Jahrhundert n. Chr.” in Speidel, M.A., *Heer und Herrschaft im römischen Reich*, 2009: 515-544; Pollard, N., *Soldiers, Cities, and Civilians in Roman Syria*, Ann Arbor: 2000.

necessary provisions that were supplied to soldiers, typically as part of the *annona militaris*. Even in these situations much of the data is based on conjecture. Similar vessel types from multiple production centers and the appearance of multiple fabrics at sites suggests that provincial boundaries posed no obstacle for local traders or travelers. Given the hyper-arid landscape and paucity of a sedentary population, especially in the southern Araba, it is likely that its military garrisons were largely responsible for securing movement of goods and people through the valley. In light of this evidence, the extent of trade and supply networks is more valuable to current scholarship. Coarse ware utilitarian vessels were identified as low-cost trade because of their ubiquity in the archaeological record. Fine wares such as ARS were viewed as low-end luxury items that were more expensive but not out of reach for military soldiers, though the paucity may indicate that inhabitants were only minimally engaged in this ceramic trade. Imported amphorae are more ambiguous as there is very little evidence of their contents and no archaeological evidence here to corroborate their use solely as transport jars for the *annona militaris*.

Furthermore this ceramic evidence can imply only a few things about the nature of the *limitanei* in this region. With the extensive trade relations that are evident through the ceramic corpora, it is clear that one function of the string of military sites along the southeastern frontier was the protection of the transit routes that existed in this region. This is interesting given that both infantry and cavalry units were stationed in the Wadi Araba. In his analysis of the installation of the *cohors II Galatarum* at ‘Ayn Gharandal, Robert Darby notes that at the beginning of the fourth century a redistribution of auxiliary forces was deployed in *Palaestina* in order to assist with the transfer of the legionary forces. Auxiliary

units were stationed at key junctures where they could secure water sources in preparation. Ceramic material recovered in strata after the transfer of the legion showed very little differentiation between the assemblages at the cavalry or infantry bases. It is possible that over time the garrisons began to serve different functions, with ‘Ayn Gharandal serving as a caravan stop for travelers. Unfortunately, ceramic evidence is unable to assist with this conjecture without evidence from a *vicus*, village, or caravanserai. Subsequent excavation and publication of both the known military sites, with associated *vici* and rubbish pits, as well as civilian sites will hopefully be able to provide a more comprehensive picture of the trade and supply in Wadi Araba.¹²²

¹²² Culclasure, D., *The Supply of the Roman Military*, 2017:81; Magness, J. “The Pottery,” 2015: 62. Darby, R. “Aufidius Priscus,” 2015:483.

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