

A Comparative Analysis of Mortuary and Domestic Artifacts from Petra's North Ridge

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ABSTRACT

Interpreting the use of material culture in mortuary contexts provides an intimate view of the social identity of both the deceased and the mourners in ancient societies. However, the material remains of mortuary practices throughout the Nabataean Kingdom (3rd century BC – 2nd century AD) have not been sufficiently investigated. Qualitative and quantitative comparisons of the material culture between contemporary mortuary and domestic contexts will establish a preliminary characterization of uniquely mortuary material culture and highlight objects that have a dual purpose within both spaces. This study focuses on the small finds from occupational or mortuary layers from at least four domestic complexes and five rock-cut shaft chamber tombs located on Petra's North Ridge dating to the 2nd century BC to the 2nd century AD. Through quantitative and qualitative analyses of the small finds, we found that jewelry items, grinding stones, spindle whorls, figurines, coins, lamps, and lids were found in both contexts, but these artifact types may be more abundant in one context than another. Alternatively, game pieces, scarabs, incense altars, votive carvings and coffin studs are specific to mortuary contexts, while pestles, spindles, and spoons were solely found in domestic contexts. Therefore, this research will provide insight into the social organization and identity of the community living on the North Ridge and shed light on Nabatean views of death, mourning, and the treatment of the deceased.

A Comparative Analysis of Mortuary and Domestic Artifacts from Petra's North Ridge

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Chapter 1

Introduction

The site of Petra in southwest Jordan served as the capital of the Nabatean Kingdom from approximately the 3rd century BC until it was annexed by the Roman Empire in 106 AD (Fig. 1) (Fiema 2003). The Nabataeans were extensively involved in a trade network extending across the Arabian Peninsula that connected the Mediterranean Sea and the Red Sea to Asia which created wealth for the kingdom. The growth of the kingdom led to architectural advancements, including the carving and building of monumental façade tombs and temples within Nabataean cities like Petra. Early excavations at Petra did not involve a systematic study of portable material culture, and instead focused on the architecture of the monumental structures. Current excavations seek to fill gaps of knowledge by concentrating on the non-monumental architecture and the everyday material culture of the Nabataeans.

Beginning in 2012, the Petra North Ridge Project focused on excavating the non-monumental mortuary and domestic spaces located along Petra's North Ridge. As part of that project, this research explores the mortuary practices of the Nabataeans through qualitative and quantitative comparative analyses of the artifacts from five 2nd century BC – 1st century AD tombs and four different 1st - 4th century AD domestic areas along the Ridge. Qualitative analysis compared artifacts on their stylistic attributes, while the quantitative analyses used Factor Analysis (FA) and Principal Component Analysis (PCA) to compare the contexts and the makeup of the artifact assemblages within each context. The method of qualitative comparative analysis has been used on ceramics, shrines, architectural elements and plant and animal remains found at Petra and neighboring Nabataean sites to gain insight into Nabatean ritual behavior.

However, the small finds, including jewelry, game pieces, coffin studs, scarabs, tools, and ritual objects that have been uncovered from Petra's North Ridge have not been extensively analyzed, let alone compared between different contexts.

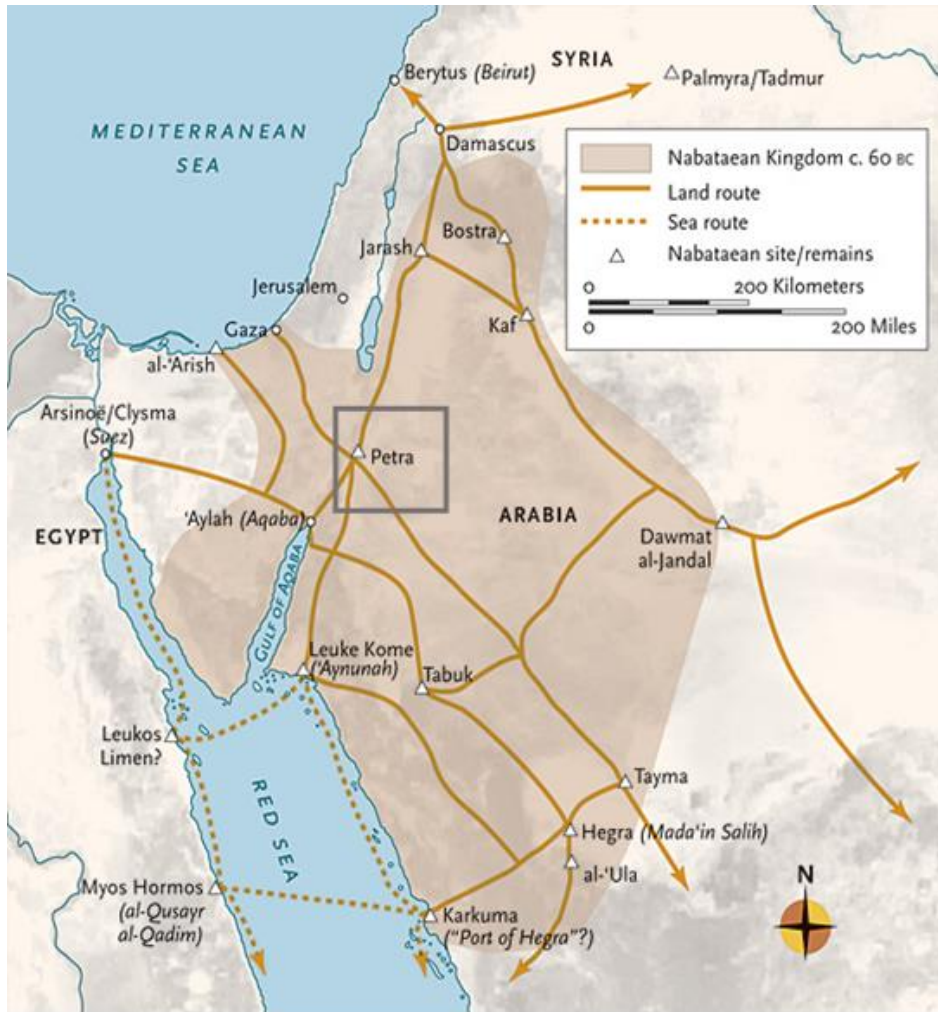


Figure 1: Location of Petra within the Nabataean Kingdom (Nehme, Villeneuve, DeGeorge 1999)

Examining mortuary material culture can provide insight into the social identity and ritual practices of the mourners and the deceased in ancient societies. The contemporary mortuary and domestic spaces on Petra's North Ridge were most likely used by members of the same family or social group (*marzeah*) which provides the opportunity to learn more about the ritual practices and beliefs of the Nabateans through quantitative and qualitative analyses of the material culture within these contexts. Additionally, the insufficient documentation of previous archaeological

research involving the tombs at Petra has limited the understanding of Nabataean mortuary artifacts. Identifying the qualitative similarities and differences of the small finds is critical to understanding the symbolic properties and the function of these items in both mortuary and domestic contexts. This comparison will delineate a specific assemblage of mortuary artifacts and has the potential to uncover Nabataean perceptions of identity and death, as well as provide insight into Nabataean mortuary practices, including the processes involved with mourning and burying the dead.

Chapter 2

Background

Introduction

Analysis of mortuary material culture provides a glimpse into the recognition of death and representation of the deceased's and mourner's social identities in ancient societies (Binford, 1971; Chesson and Hollimon, 2001). However, the Nabataean mortuary contexts have not been sufficiently investigated through archeological analysis. The majority of archaeological research has focused on the iconic Nabataean monumental architecture, such as the facade tombs, temples, churches, and shrines (McKenzie 2010; Wadeson 2012; Perry and Walker 2018; Bikai et al. 2020). Additional research has been completed on ceramic (Wenner 2016) and plant remains (Ramsay and Perry 2022) from Petra's North Ridge tombs, providing a chronological timeline and insight into activities within these contexts, but the small finds from mortuary contexts have yet to be analyzed as an assemblage reflecting mortuary behavior. An individual's social identity is linked to their membership in social groups like *marzeah*, which include occupation, religion, gender, social status, ethnicity etc. Items such as personal ornamentation, tools, coffin hardware, ritual objects, and storage accessories can provide another layer of interpretation about the activities and possibly the social identity and beliefs of the individuals within these contexts.

This research explores the mortuary practices of the Nabataeans through quantitative and qualitative analyses of the small find artifacts found in the 2nd century BC – 2nd century AD mortuary and 2nd to 4th century AD domestic contexts of Petra's North Ridge. These analyses will ultimately create a profile of the artifacts found within the shaft tombs that are related to

Nabataean mortuary behavior as opposed to domestic use. Furthermore, comparative analyses will clarify whether certain types of artifacts had a dual purpose in both mortuary and domestic settings, indicating a fluidity of use between sacred and profane spaces. Artifacts that are unique to the mortuary settings will be studied to form interpretations of their purpose and function in Nabataean mortuary rituals. This research will not only contribute to the understanding of mortuary behavior at the North Ridge of Petra, but also has the potential to further uncover Nabataean views on identity, death, and mourning.

Mortuary Theory

The act of burying one's dead is an intentional, structured, and important ritual in many cultures (Ekengren 2013). This behavior can be described as a rite of passage, a transition of a community member from the world of the living to the world of the dead (Williams 2013). The burial process is not just for the deceased individual but also serves as a way for the mourners to “cope with the physical, emotional, social, and ideological demands of death” (Ekengren 2013, 4). The interment of the deceased and related behaviors such as funerary feasting can involve material objects, referred to as grave goods, which can be left in the mortuary context of the deceased individual. These objects may have been personal belongings of the deceased or items made specifically for the burial that were used to symbolize the deceased individual's socioeconomic status, occupation, personal identity, and relationship to the mourners (Chesson and Hollimon 2001). In addition, since these items are placed in the grave by the mourners, they could be direct reflections the deceased or the mourners' perceptions of the deceased (Buikstra 1995).

Additionally, all of the artifacts found in mortuary settings may not be reflections of the individual but instead are placed in the grave for other purposes, like food offerings (Baker 2012). Similarly, ceramic and food waste found within and outside of the tombs may be the result of funerary feasting to commemorate the dead or provide offerings to deities (Dietler 2011). Tools, like grinding stones, left in the tombs could be the result of food preparation for the funeral or for future offerings (Ebeling 2002). The feasting rituals may leave deposits of animal bones, plant remains, and ceramics used for the consumption of food (Sachet 2010). These artifacts are not directly tied to or reflect the life of the deceased, but they are part of the larger mortuary practice of interring the dead.

Excavations involving the tombs located on Petra's North Ridge have uncovered human skeletal remains as well as a diverse array of artifacts related to Nabataean mortuary behavior. However, the lack of previous archaeological analysis of the tombs in Petra has limited the understanding of what a "mortuary" artifact is in this context. Thus, this study uses comparative analyses to identify specific mortuary artifacts and practices among the Nabatean population on Petra's North Ridge.

Site Formation Processes

The domestic structures and the mortuary contexts on the North Ridge would have experienced different types of abandonment. Material remains identified through archaeological analysis can provide a glimpse into the function of structures and the activities that occurred within them, but it is important to first understand how these objects entered the archaeological record, as different formation processes can impact the relationship of the artifacts to their context. The processes of artifact deposition and site abandonment can greatly affect what was

left at a site and how the artifacts are interpreted (Schiffer 1971). Ethnographic and ethnoarchaeological data (Cameron 1991; Schiffer 1971) as well as artifactual data from Tetimpa, Mexico (Plunket and Urunuela 2000), Upland Mongollon pit houses in the American Southwest (Diehl 1998), and site 3GA48 in Arkansas (Baker 1975) have provided data to explain abandonment processes. Artifacts usually are discarded in areas where they were used, such as cooking pots left in areas of food preparation. These are generally referred to as primary refuse, as opposed to secondary refuse. Secondary refuse includes artifacts deposited away from their primary area of use and therefore may not represent the function of or the activities that happened in the area where they are found. This type of refuse includes items that were thrown into a dump, put into storage, or cached (Baker 1975).

The process of site abandonment can impact the formation of the archaeological record and the interpretations regarding artifact function and location. Sites can be abandoned for multiple reasons including lack of resources, disease, warfare, and environmental catastrophes (Cameron 1991). The rate of abandonment can differ based on the reason for abandonment, impacting the density and type of material culture left behind. For instance, abandonment due to disease or lack of resources in an area may be very gradual and therefore leave more time for the site to be cleared. These sites may be completely cleared out leaving no artifacts at all, or only trash or immovable objects, leaving little for archaeologists to form interpretations about the site's function. On the other hand, a volcanic eruption or an earthquake could result in a rapid abandonment where many more artifacts were left behind based on conscious decisions made by their owners or users (Schiffer 1971). Additionally, items that are worn, broken, or difficult to transport may be left behind because there is no use for them or because they are easily replaceable (Baker 1975; Diehl 1998). However, objects that are necessary for survival, portable,

hard to make, expensive and precious, or have religious significance are often prioritized as items to be removed and kept (Plunket and Urnuela 2000). Additionally, the amount of material that is taken depends on the availability of resources such as pack animals to move the items as well as the distance and knowledge of the place of relocation (Cameron 1991; Stevenson 1982).

Additionally, in mortuary contexts formation processes including intra and inter tomb burials, environmental factors and looting activities that can impact the placement of items within a funerary context. The process of intra tomb burial is the removal of human remains or items by from their original resting local to a different area within the same context. Inter tomb burial is the removal or an individual from their original resting location to a completely different location. Both processes can cause the commingling of remains making it difficult to associated certain items with specific individuals. Additionally, the relocation of remains to a completely new location can separate them from any grave goods making it unclear what they were originally buried with (Perry and Walker 2018). This can make it difficult to interpret the social identity of the individual in question because personal or ritual items that may have originally accompanied them are completely removed. Similarly, environmental factors like flooding can disrupt the materials within the contexts moving them from their original location or it can move objects from surrounding contexts into the mortuary context making it difficult to form interpretations about the assemblages of funerary artifacts. Human intervention that is not part of the funerary rituals like looting will also disrupt the contexts, damaging or removing items which also makes it difficult to interpret the findings if certain artifacts have been removed, damages or if contexts are commingled (Schiffer 1971).

Understanding the process of site formation and abandonment in relation to the domestic and mortuary contexts along Petra's North Ridge can provide additional insight into the potential

importance and function of items in each space. This also contributes to the understanding of the potential limitations when analyzing domestic sites that have been cleared out or mortuary contexts have been disturbed. These contexts may not contain all the items that were originally used within the area, and this will be taken into consideration when comparing the presence or absence of artifacts within both contexts.

The Nabataeans

The first mention of the Nabataeans in a written source is by Diodorus Siculus during the 1st century BC. He describes the first-hand accounts of Hieronymus of Cardia, a Greek diplomat, who witnessed two attempted attacks against the Nabateans starting in 312 BC (Retso 1998). The Nabateans are described by Hieronymus as being a wealthy nomadic pastoralist group who raised camels and sheep and gained wealth from trading frankincense, myrrh, and spices throughout the Arabian Peninsula. He also noted their use of natural rock outcrops, similar to Petra, for defense against enemies (Diodorus 19.94.5). The Nabataeans are also mentioned by Strabo who describes the accounts of Athenodorus and Aelius Gallus who had contact with the Nabataeans in the 1st century BC (Strabo 16.4.21-26; Tuttle 1997). Strabo states that they are a sedentary people, living in expensive stone structures, who are involved with trade. Strabo also provides accounts for ritual feasting events with the Nabatean king as well as accounts of libations being poured on altars (Strabo 16.4.26). Based on these two accounts the Nabateans originated as a nomadic pastoralist group who over time created settlements with architectural structures like the façade tombs in Petra that date to the 1st century BC (Wadeson 2012).

The site of Petra is located in southwest Jordan and was the capital of the Nabataean kingdom. At its greatest extent in the 1st century AD, the kingdom stretched from the Sinai

Peninsula to the parts of modern-day Syria, Lebanon, Jordan, and Saudi Arabia (Nehme 2016, Graf 2021). This territory expanded over many trade routes that were essential in transferring goods across the Arabian Peninsula and into South Asia (Durand 2009). The Nabataeans became very skilled caravanners, transporting incense, spices, textiles, and precious stones through their territory (Dolinka 2003). Between the 4th and 1st centuries BC trade increased and brought wealth and prosperity into the kingdom causing it to grow (Durand 2009). During this time impressive architectural monuments were created, including temples, palaces, and the iconic façade tombs that surround the city center.

The façade tombs are not the only funerary architecture in the city. Petra is also home to standing block tombs, shaft tombs, locations for funerary feasting (*triclinia* or *biclinia*) and niches/betyls (Wadeson 2011; Wadeson 2012). The funerary architecture was in use until the time of Roman Annexation in 106 AD. After this point, the Nabataeans stopped burying their dead within these tombs, possibly due to Roman norms that forbade burials within city limits (Parker 2016). It is unclear where individuals were buried after this, but Nabateans continued to live in Petra for hundreds of years after this point.

Nabataean Mortuary Behavior

The information that is available about Nabataean religion and ritual comes from a few textual references like Strabo, as well as Nabataean inscriptions and interpretations from archaeological excavations. Many of the structures still present at Petra today were ritually significant in the past, including the Great Temple, Qasr al-Bint, the Temple of the Winged Lions, the various tombs, the carved elements in the Siq and the colonnaded street (Healey 2001; Piraud-Fournet et al. 2021). Altars, niches, and betyls present in these locations represent

worship of a deity or multiple deities. The deity Dushara is thought to be the main deity of the Nabataeans, but they also worshiped other deities like al-Uzza and Ataragatis (Wenning 2010; Piraud-Fournet et al. 2021).

Altars present in public and private spheres were used for the burning of incense or food offerings to honor and worship the deities. Each altar may have been related to; a specific deity or a single altar may have been used to provide offerings to multiple deities. Analysis of materials within the altars and from surrounding soils from the Nabataean temple at Khirbet et-Tannur, north of Petra, found incense as well as food remains from goat, sheep, and cattle and local grains like wheat that were burned as offerings (Reyes and McKenzie 2013). Some of the altar locations were accompanied by holes or grooves within the floor which were used for liquid libations (Piraud-Fournet et al. 2021). It has also been hypothesized that there were circumambulations of the altars as part of a Nabataean ritual (Healey 2001).

Niches are recessed carvings in stone that have been found in and around tombs and temples in multiple Nabataean sites as well as in Bab al Siq in Petra (Healey 2001, Wenning 2010). Many of the niches include carved betyl stones that represent a specific deity or possibly multiple deities. However, in some cases the niches are empty suggesting that some betyls were portable, and people would bring their betyl or figurine and place within the niche to worship a deity. Some of the niches were accompanied by benches to host large gatherings as well as libation areas for liquid offerings. Each niche is unique in design which may be reflective of the deity, or they may belong to different cultic groups (Wenning 2010).

Ritual cults or *marzeah* were a large part of Nabataean identity and society and they created a social organization of the people within the city. Evidence for this comes from clusters of similar inscriptions found around monuments, sanctuaries and feasting locations which reveal

connections between specific groups based on familial ties or shared belief in deities or cultic practices (Nehmé 2013; Healey 2001). An important activity that would have been practiced among *marzeah* is ritual banqueting and providing food offerings to the deceased. Funerary feasts in the city center would have taken place within *triclinia* or *biclinia* located near the façade tombs. The presence of niches or betyls near the feasting location is interpreted as the events being under the protection of the deity (Sachet 2010). On the North Ridge where there is an absence of dining halls, feasting may have taken place around the opening of the shaft tomb in temporary structures or in cleared areas above the tombs (Perry 2016).

The *marzeah* and families were also responsible for burying the dead and providing libations to the deceased. The Nabataeans buried their deceased within tombs, including facade, block, and shaft tombs (Wadeson 2012). Tombs may have been used by individuals belonging to the same lineage or *marzeah*, suggesting that these groups' social identities stayed consistent throughout the use of the tomb (Perry 2017). However, due to the expense of tomb construction, some of the larger tombs were split and shared between families (Wadeson 2011).

Inside the tomb, the deceased were placed in wall niches or rectangular shafts carved into the floor, but there is no evidence for uniform placement of the deceased within the grave. The deceased were wrapped in shrouds before internment and were placed either directly in the grave or in decorated or undecorated wooden coffins (Perry 2017). Two types of burials are present within the shaft tombs: primary and secondary burials. Primary burial an individual left undisturbed in their initial resting place. Secondary burial is the process of moving the deceased from their initial burial into another grave or location within the tomb. Many Nabataean burials include grave goods including items of personal adornment, ritual objects, coins, lamps, and figurines as well as ceramics that were used in the burial process. Ceramic unguentaria and

vessels held incense, liquid, and food offerings, and were used for feasting (Perry 2017; Wenner 2016). However, the process of secondary burial causes the commingling of remains making it difficult to associate individuals with specific mortuary artifacts (Perry and Walker 2018; Perry 2017).

Analysis of plant remains from the tombs located on the North Ridge concluded that grapes, wheat, lentils, figs, olives, and dates were the products of ritual feasting as well as offerings buried with the deceased during the primary phase of burial (Ramsay and Perry 2022). The food offerings within the tomb are thought to be placed at the time of burial but libations could be given via libation holes located outside of the tombs (Sachet 2009, Perry 2017). Chemical analysis of libation holes located near tombs at Umm al-Biyarah and the necropolis of ath-Thughrah concluded that liquid libations included vegetal oils and fatty acids suggesting that the libations included types of incense or oils and dairy products (Garnier et al. 2010; Sachet 2010).

While information about Nabatean mortuary practices has been provided by ceramics, altars, inscriptions and other archaeological analysis, the small finds have yet to be researched. Analysis of the small finds will focus on the function and use of these items in ritual and domestic activities, in order to provide a broader understanding of Nabatean ritual practices.

The North Ridge

The earliest archaeological excavations conducted at Petra since the 1920s focused primarily on monumental architecture. Typical of early- to mid-20th century archaeology, the field reports were incomplete, only a selective assemblage of artifacts were kept, and interpretations were limited. Excavations and research since the 1990s have started concentrating

on the non-monumental architecture of Petra, working to fill in the gaps left by previous research. Starting in 2012, the Petra North Ridge Project focused on understanding non-monumental mortuary and domestic spaces in a northern neighborhood of the ancient city (Parker and Perry 2013, 2017, 2019).

The North Ridge is located north of Petra's Colonnaded main street and east of Wadi Abu'Ulayga (Fig. 2). The ridge was initially used as a cemetery starting in the 2nd century BC and continued until the early 2nd century AD with domestic structures appearing during the 1st century AD (Parker 2016). The end of mortuary activity on the ridge coincides with the Roman annexation of Petra in 106 AD and the building of the city wall (Parker 2016). Some scholars argue that Roman law disapproved of burials within the boundaries of the city (Retief and Cilliers 2006), so it is possible that use of the North Ridge tombs was prohibited after Roman annexation. The domestic structures went out of use sometime during the mid-4th century AD and the structures partially collapsed around this period, likely due to an earthquake in 363 AD (Parker 2016). The shared location and overlap in the period of use of the mortuary and domestic contexts on the North Ridge indicate that the individuals using these spaces may have shared a common communal identity.

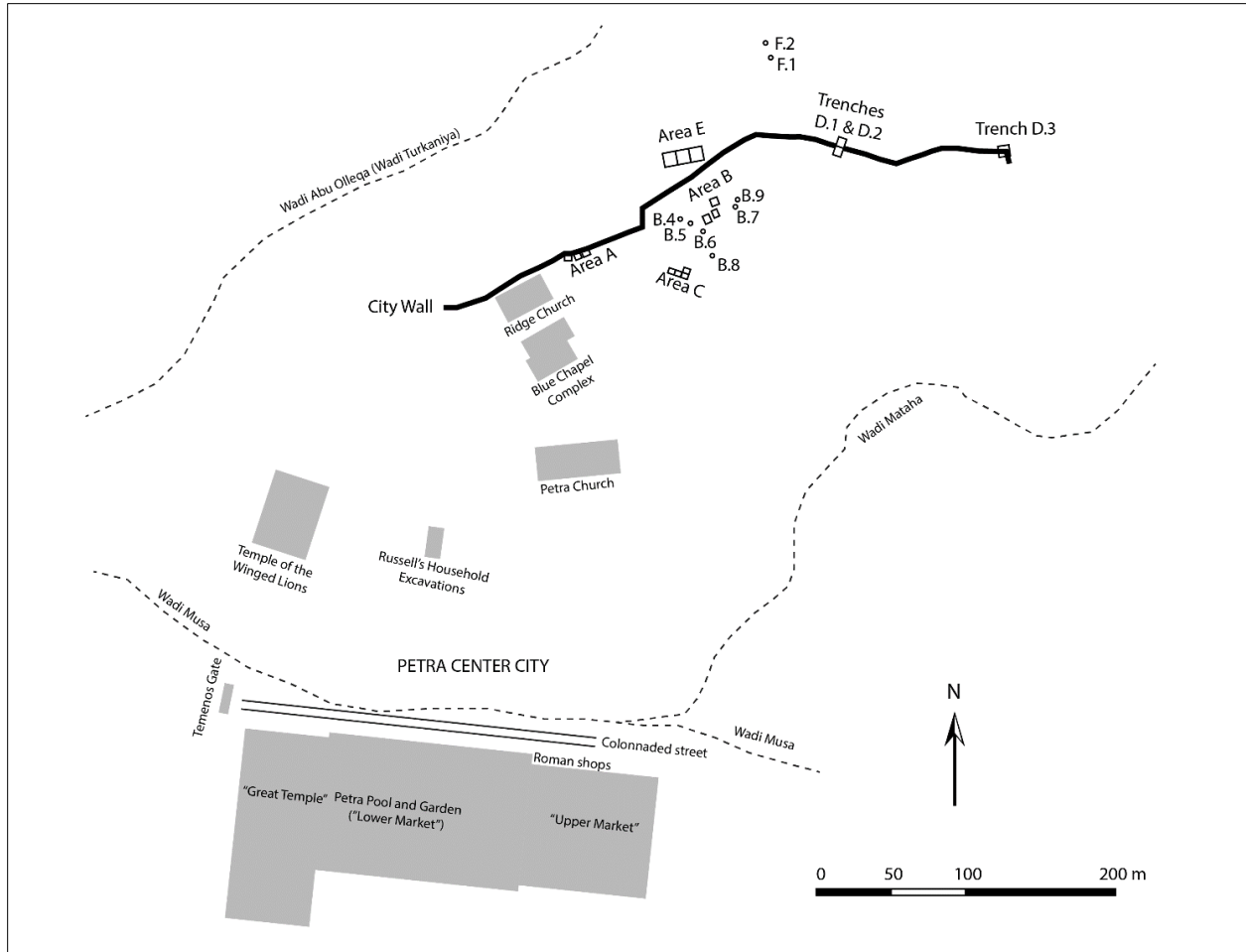


Figure 2: Location of the North Ridge within Petra (PNRP database)

The Domestic Contexts

Artifacts from occupational layers in four domestic areas (Areas A, B, C, and D) were included in this analysis. Area A trenches, A.1-A.4 (Fig. 3), exposed a series of domestic structures dating to the first century AD and portions of the northern city wall whose construction coincided with Roman annexation (Parker 2016). In some areas where the city wall was built, walls from earlier Nabataean structures were incorporated or the city wall cut through previous structures. This caused a disruption in the function of these contexts that may have impacted the artifacts left within. Most of the southern parts of the rooms in trenches A.2, A.3,

and A.4 were removed for the construction of the city wall and based on ceramic evidence, the other rooms were abandoned at the end of the 1st century AD (Parker and Perry 2013). Only trench A.1 had 2nd to 4th-century reoccupation, possibly of a non-domestic nature.

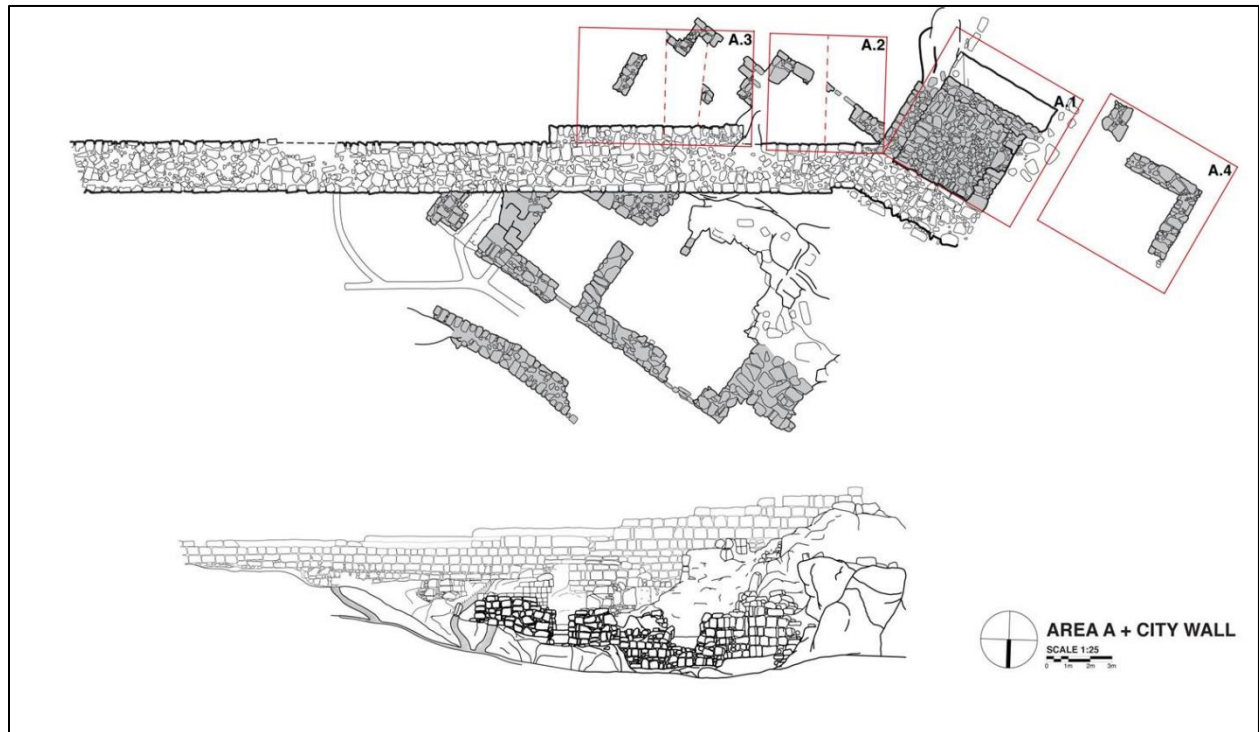


Figure 3: Area A Domestic Structures (A.1-A.3) (PNRP Database)

The three trenches in Area B were laid out on a terrace at locations where wall lines were visible (Fig. 4). Part of B.1 and B.2 exposed two living areas that incorporated the use of caves, but the unstable condition of the bedrock prevented their excavation (Parker and Perry 2013). The room in Trench B.1 had evidence of domestic activity, including an oven created by two nested ceramic jars, but the room in B.2 was largely devoid of artifacts. Trench B.3 revealed a large open-air courtyard with multiple ceramic jars suggesting that it may have been used as a storage area. Sometime in the mid-4th century, a large seismic event, likely the 363 AD

earthquake, caused the complete collapse of the room's western wall that separated it from the room in B.1. Very little was found underneath the collapse, suggesting that the contexts had been cleared prior to collapse (Parker 2016). Based on ceramic dating, the rooms in Area B were in use from the 2nd century AD until the earthquake of 363 AD (Parker and Perry 2013).

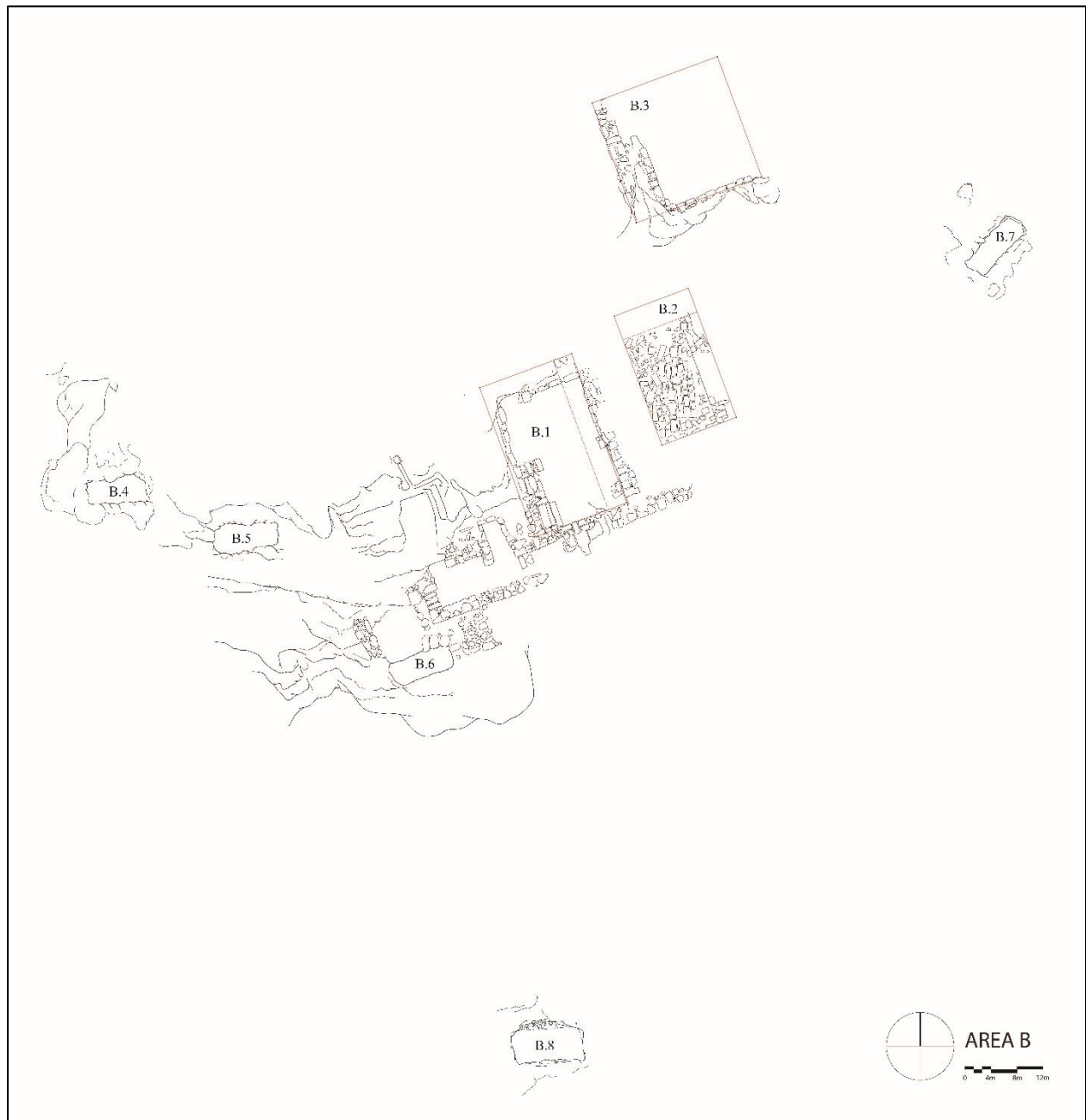


Figure 4: Area B domestic structures (B.1-B.3) and shaft tombs (B.4-B.8) (PNRP Database)

Evidence of the start of domestic activity in the early 2nd century AD was recovered in trenches C.1, C.2, and C.3 in Area C (Fig. 5). These trenches contained two rooms, a western room in C.1 and an eastern room in C.3 separated by an interior or exterior corridor in C.2. In addition, Trench C.4 partially uncovered a room to the north of C.3 connected by the C.2 hallway. Ovens were found in the rooms in trenches C.1 and C.3. Additionally, the southern wall of the room in C.3 contained multiple niches thought to have been used as storage units due to the large amounts of ceramic vessels the units contained. Another storage installation was found in the northeast corner of the room. Dating of artifacts, including ceramics and a coin, found that the structure in Area C was first occupied in the early second century around the time of Roman annexation. The remains of fallen roof arches in C.1 and broken 4th century AD pottery in C.4 suggest the eastern and western rooms were abandoned due to 4th century earthquake damage. Some post-earthquake occupation was found in C.1, only lasting until the earthquake (Parker and Perry 2017; Parker and Perry 2019).

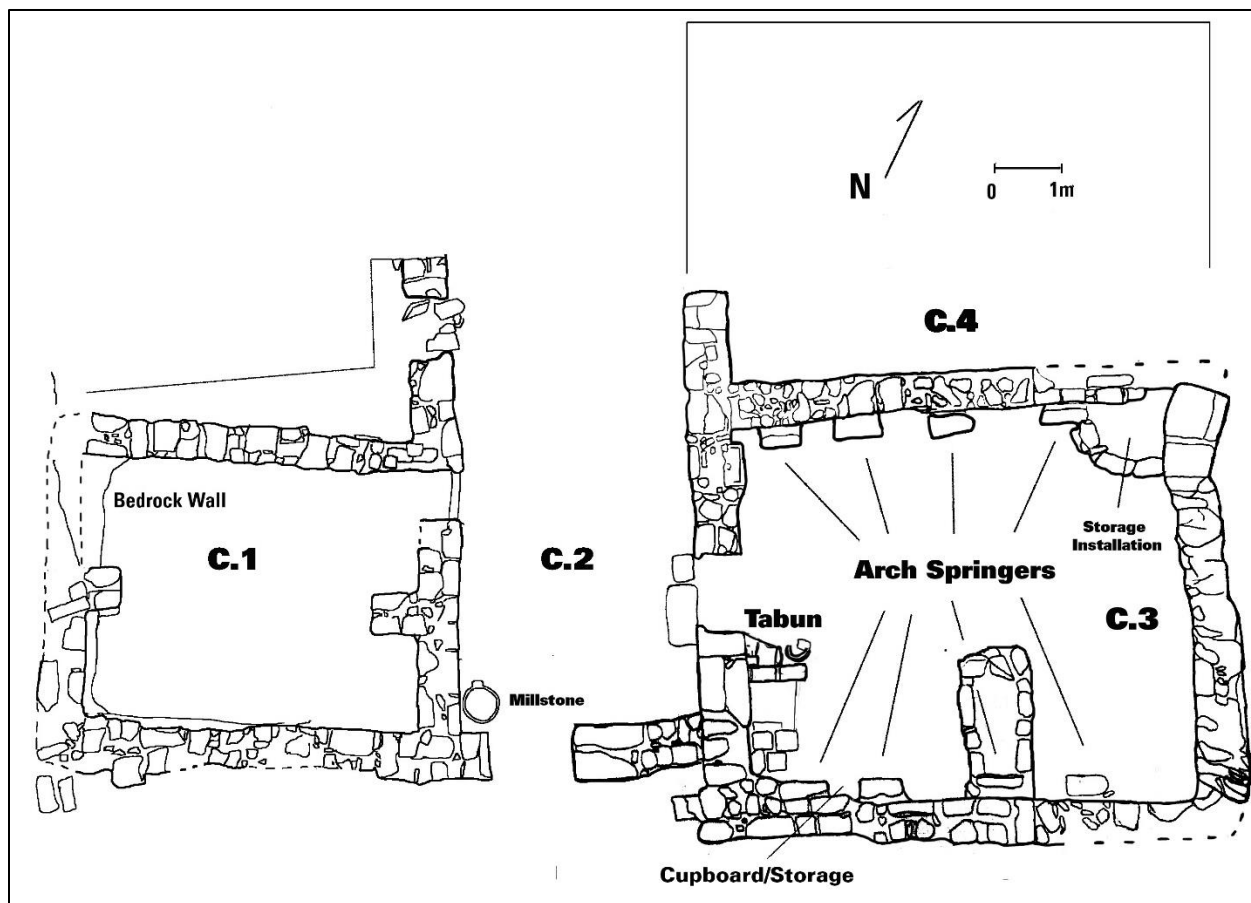


Figure 5: Area C Domestic Structures (C.1-C.4) (PNRP Database)

Area D includes trenches D.1 and D.3 (Fig. 6). Trench D.1 was laid out along the southern side of the city wall and exposed a preexisting Nabataean wall that had been cut through by the city wall. Trench D.3 was created to expose the north-east corner of the city wall and excavations found that the city wall added on to a preexisting 2nd century AD wall that cut through earlier Nabataean structures (Parker and Perry 2017). Trench D.2, to the north of the city wall, also contained parts of an abandoned Nabataean house but no artifacts were found in occupational strata that could be included in this research.



Figure 6: Area D Domestic Structures (D.1-D.3) (PNRP Database)

The Mortuary Contexts

Eight rock-cut chamber tombs were excavated on the North Ridge, five of which (B.4, B.5, B.6, B.7, and F.1) were used for burial. Only artifacts from clear mortuary (as opposed to post-mortuary) deposits were included in this analysis. The shaft tombs are generally comprised of a large rectilinear chamber with compartments for burying the deceased including wall niches and shaft graves carved into the floor. The tombs were carved using the “trench and wedge” technique which is seen in other construction characteristics of Petra and neighboring Nabataean sites like Madain Saleh (Perry and Walker 2018). Artifacts like the small finds were found within the tombs and receptacles for funerary libations were found carved next to the entrance of some of the tombs (Perry 2017) indicating that mortuary practices occurred both outside and inside of the tomb. Additionally, the tombs had areas that experienced different types of commingling, like mortuary and non-mortuary commingling. Mortuary commingling includes inter- and intra-

tomb secondary burials and non-mortuary commingling is caused by looting or environmental factors like flooding. Overall, Tombs B.4-B.7 and F.1 were used for the burials of an estimated minimum total of 134 individuals between the late 2nd century BC and late 1st century AD (Perry and Walker 2018).

Tomb B.4 (Fig.7) had one large chamber measuring 6.45m x 6.20m with two windows or openings, one on the south wall and the other on the northwest corner. One of the windows had visible tool marks meaning that it was human-made and fragments of what appeared to be window glass were found just inside the window. The edges of the other window are very eroded, so it is unclear if it was human-made or naturally created. The intended purpose of the windows is unclear, but they allowed for the later entrance of fluvial deposits that covered the Nabataean activity layers and also disturbed some of the burials. Much of the skeletal material was found within the activity layer in the tomb. Excavations revealed an “L-shaped trough” that ran along the north and west wall, a niche in the eastern wall that was probably the original burial location for 16 individuals, but only the wall niche and the western trough still contained human remains. Ceramics found among the burials within the tomb provide a period of use dating to the 1st century AD (Parker and Perry 2013).

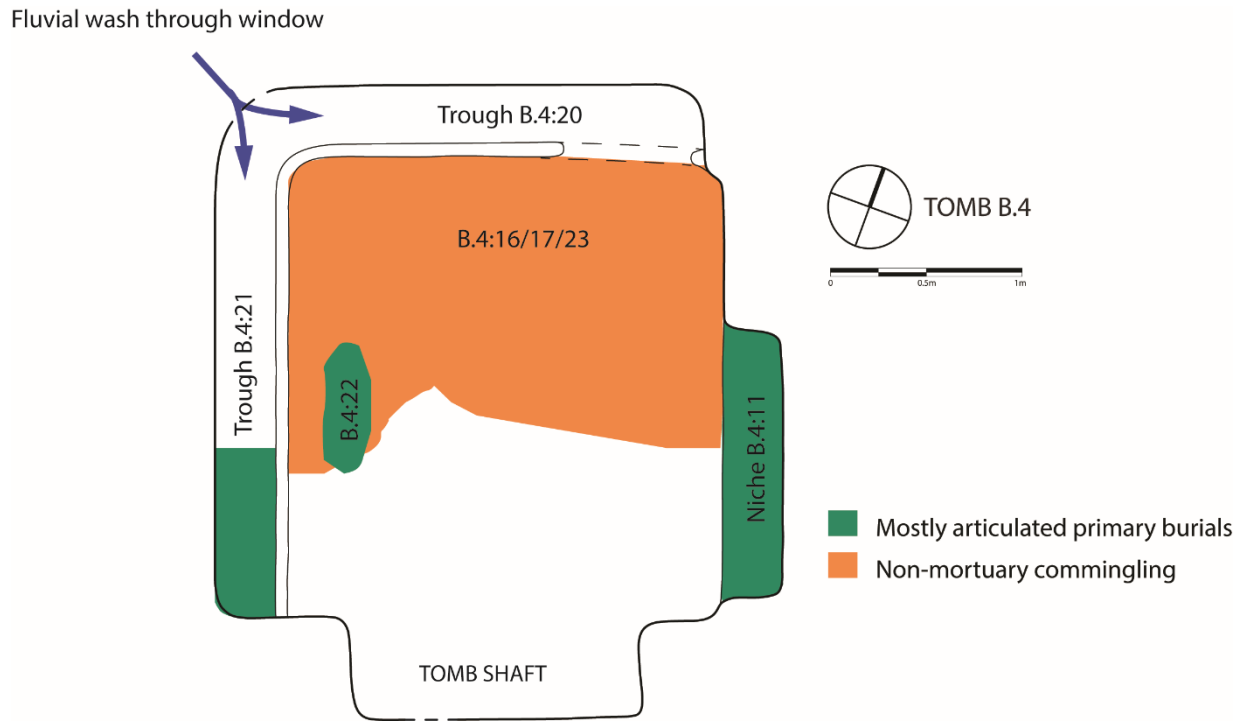


Figure 7: Floor Plan of Tomb B.4 (Perry and Walker 2018)

Tomb B.5 (Fig. 8) is close to B.4 and roughly half the size with a chamber measuring 3.54m x 2.80m. Based on the dating of ceramics the tomb began internments in the 1st century AD (Walker 2016). The northern, eastern, and western walls each had carved niches and four shaft graves were carved into the chamber floor, all of which were used for burials. One of the shaft graves was still covered with rectangular capstones (Parker and Perry 2013). A total of 70 individuals were excavated from these locations as well as from soil layers amongst the chamber floor, including 38 individuals were recovered from one of the shaft graves, suggesting that it was used as a secondary burial location (Parker and Perry 2017).

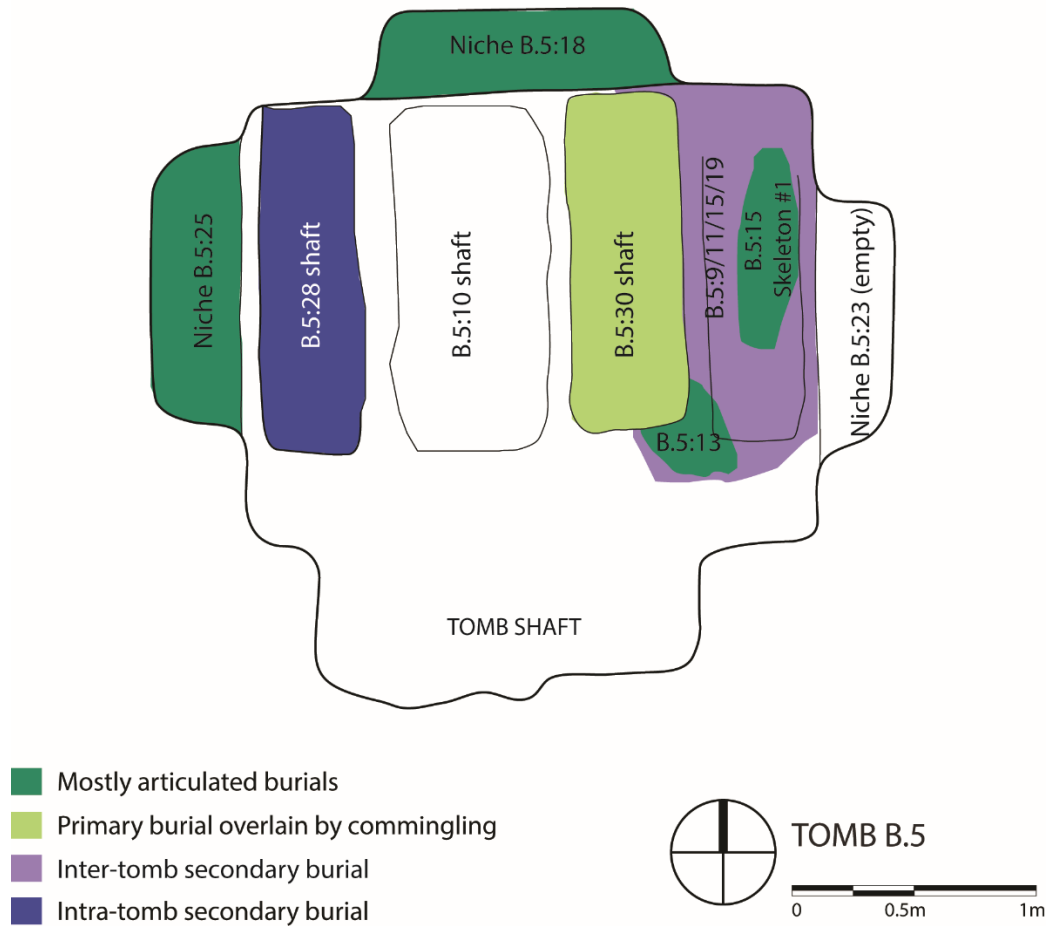


Figure 8: Floor Plan of Tomb B.5 (Perry and Walker 2018)

The entrance of tomb B.6 (Fig. 9) had three carved cups next to the shaft opening suggesting that libations could be given from outside the tomb. Inside the tomb were two chambers, a southern chamber measuring 0.85m x 2.75m and a larger northern 2.27m x 3.10m chamber. The smaller chamber contained a single shaft grave with multiple disarticulated remains on top of three articulated individuals placed on top of another. The larger chamber contained two shaft graves that were most likely originally covered with capstones and one burial contained an unguentarium in situ dating to the 1st century BC. Additionally, two ‘basins’

against the northern and eastern walls were probably used for burials, but these areas were largely disturbed due to later tomb looting. Overall, this tomb was used between the 1st century BC to the 1st century AD for the interment of 24 individuals (Parker and Perry 2017).

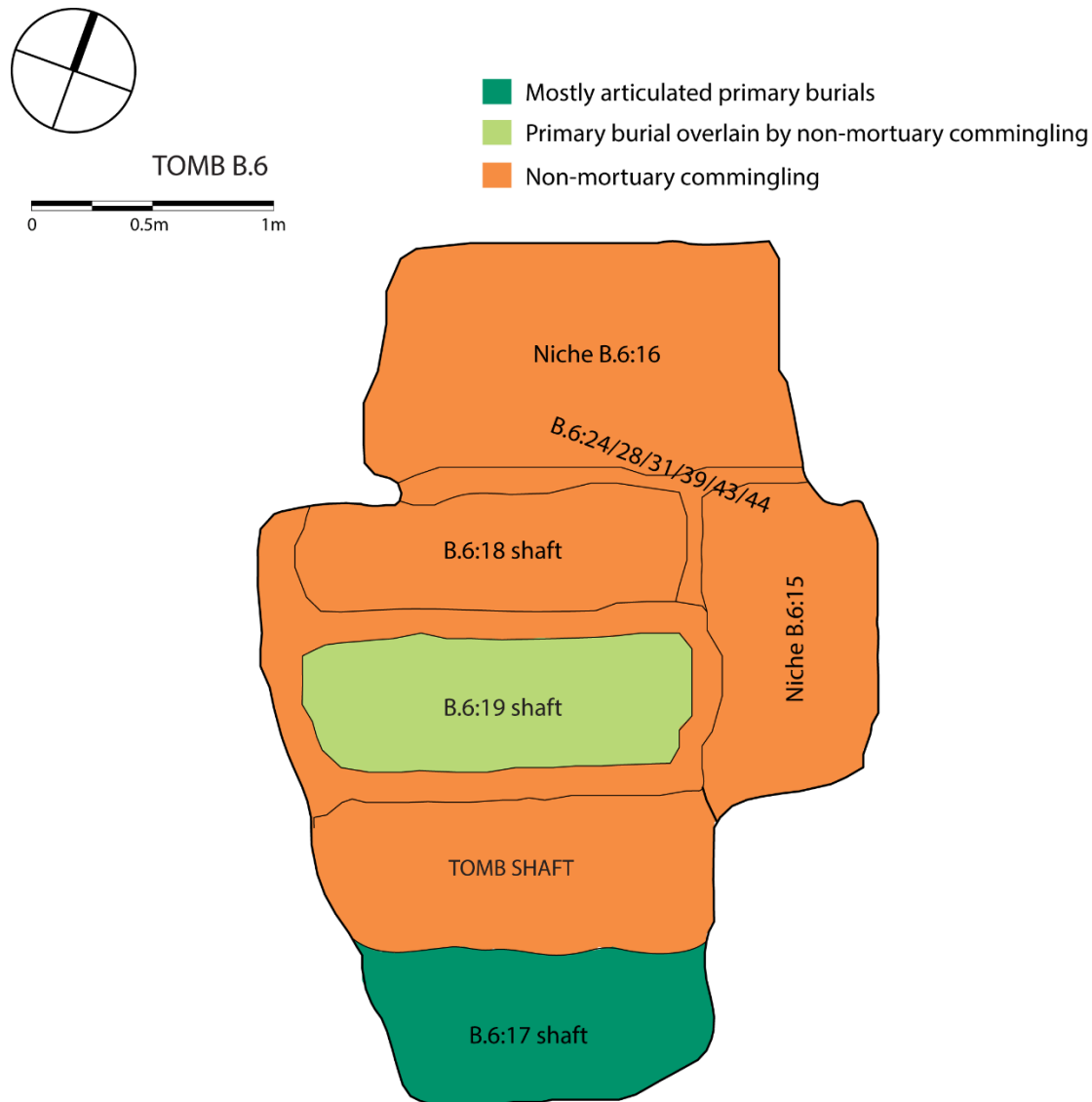
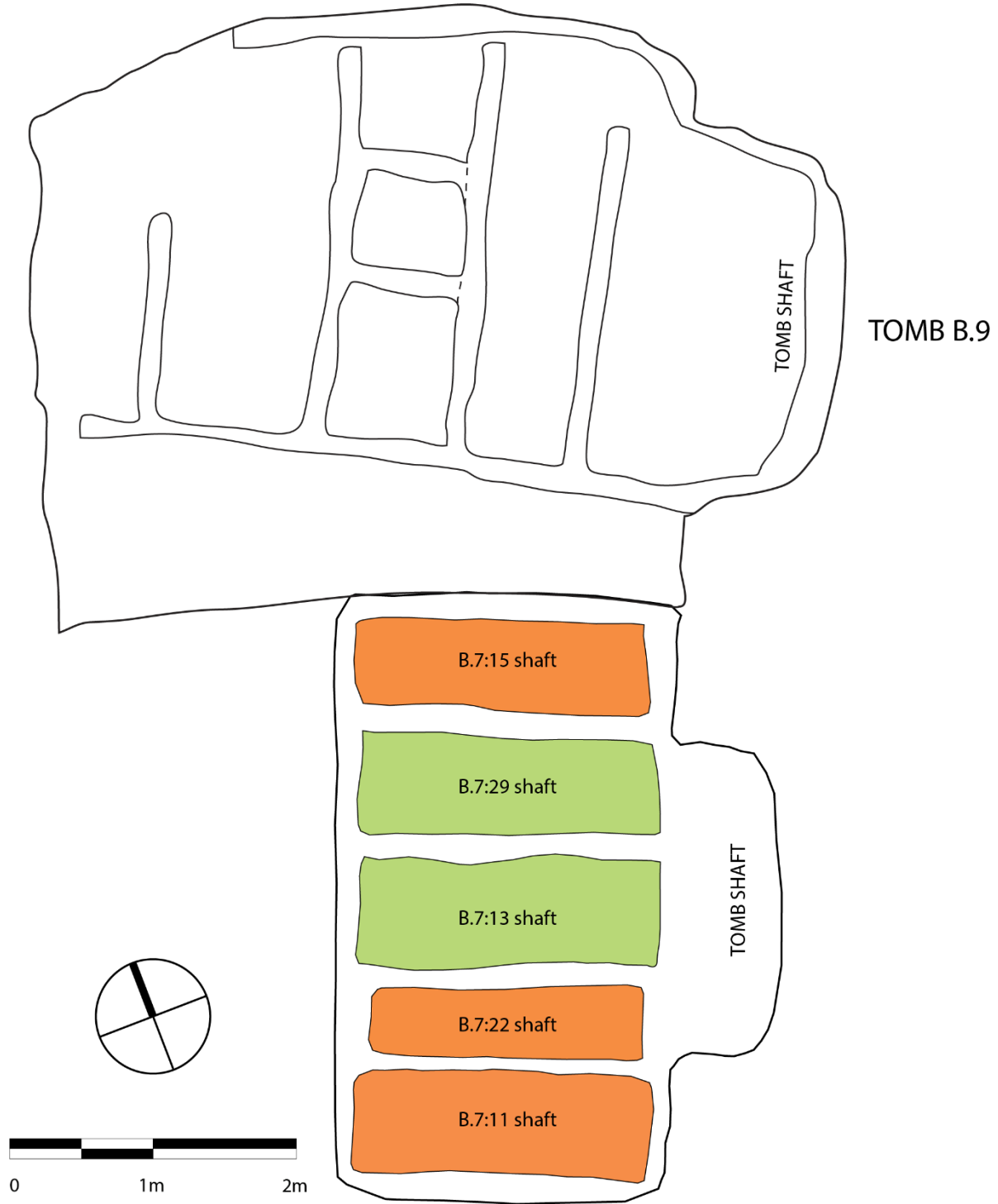


Figure 9: Floor Plan of Tomb B.6 (Perry and Walker 2018)

Tomb B.7 (Fig. 10) had one chamber measuring 2.75m x 4.10m with five shaft graves containing a total of 15 individuals as well as three dogs. There is evidence of some of the burials having capstones and two of the graves had articulated individuals at the bottom laying in a supine position with their arms at their sides. On the eastern wall, there was an entrance into

contemporary tomb B.9 that was unfinished and not used for burials. Based on ceramic dating tomb was in use from the 2nd century BC to the 2nd century AD (Parker and Perry 2017).

TOMBS B.7 & B.9



- Primary burial overlain by non-mortuary commingling
- Non-mortuary commingling

Figure 10: Floor Plan of Tomb B.7 and B.9 (Perry and Walker 2018)

Lastly, tomb F.1 (Fig. 11) had a main chamber with one shaft grave (Locus 16) and a smaller chamber containing two shafts (Loci 24 and 25). At least 10 commingled individuals were excavated from locus 16, four from locus 24 and three articulated burials in locus 25. The burials in loci 24 and 25 were covered with capstones and underneath there were dog burials on top of the human remains. Material remains suggest that the tomb was used for burials during the 1st century AD disposal (Parker and Perry 2019).

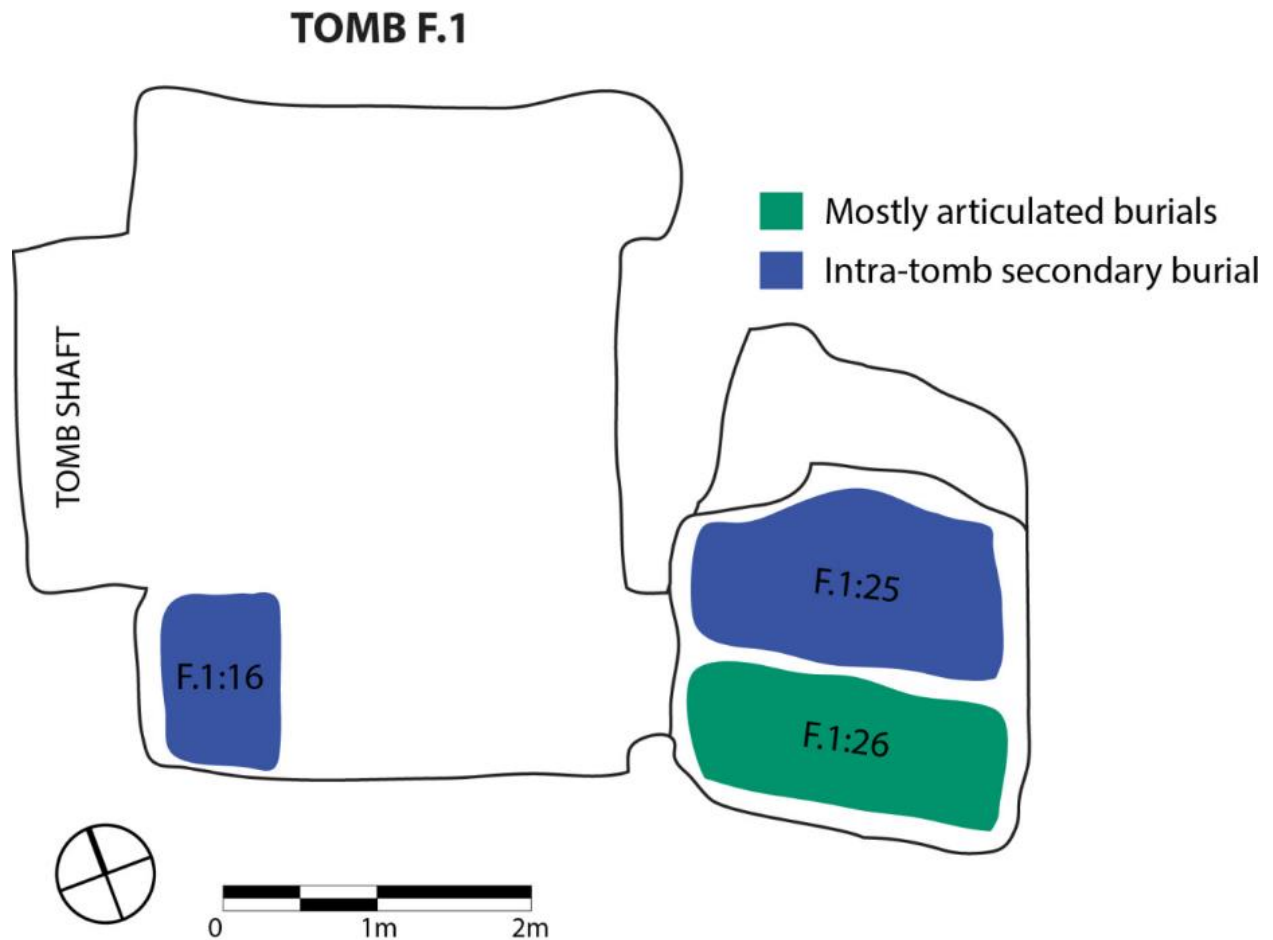


Figure 11: Floor Plan of Tomb F.1 (Perry and Walker 2018)

Excavations of both domestic and mortuary contexts on Petra's North Ridge have produced a variety of artifacts including ceramics, tools, jewelry, and other objects of personal ornamentation. The non-ceramic small finds have not been extensively analyzed, let alone compared between different contexts. Ceramic coroplastic objects such as figurines have been studied (Tuttle 2009; Alpass 2010) but have not been assessed based on their mortuary versus domestic use. Additionally, the practice of intra-tomb secondary burial as well as looting has resulted in commingled skeletal and artifactual contexts within the tombs, making associations between individuals and specific artifact assemblages difficult. Consequently, artifacts at the Petra North Ridge Site that are linked to mortuary behavior will be assessed as a tomb-level assemblage rather than reflecting specific instances in mortuary history.

Exploring Mortuary Practices Through Material Culture

Quantitative and qualitative analyses will be used to explore the mortuary and domestic artifact assemblages from Petra's North Ridge to further the understanding of Nabataean mortuary practices between the 1st century BC and the 2nd century AD. Understanding the use of material culture in mortuary contexts can be achieved through both quantitative and qualitative analyses. This analysis requires multiple steps: first, the type and function of the artifacts must be determined through comparative analysis with objects from other temporally and regionally analogous sites; second, patterns related to artifact and context types (for example, domestic or mortuary) need to be identified through qualitative and quantitative analyses; and finally, these patterns need to be interpreted in the context of mortuary behavior.

Statistical methods have been applied in archaeology to understand spatial artifact patterning, particularly discerning variation between context types. Two examples of these statistical methods include Factor Analysis (FA) and principal components analysis (PCA).

These methods are used to explain the variation in discrete sets of data by identifying the underlying variables causing the variation, however, there are a few differences. FA assumes that the total amount of variation in the dataset can be divided into two types of variance, common and unique. Common variance describes that variance that is shared between sets of variables while unique variance encompasses any errors or variance that may be specific to a certain object. Overall, Factor Analysis explains the common variance of the data and divides it into factors based on the underlying latent variables (Kim and Mueller 1978). Factor Analysis is often used to create typologies or identify shared characteristics of artifacts or contexts. For example, Factor Analysis aided in understanding the spatial clustering of lithics from a rock shelter site in Curracurrang, Australia, based on the measurements, shape, blade angle and other attributes of the lithics (Glover 1969). Additionally, FA focusing on the grouping of pre-identified “elite”, “ritual”, or “occupation-specific” artifacts in mortuary contexts at Neolithic Taosi in China helped to interpret the social identities and statuses of the deceased. (Bai 2022).

Similarly, PCA has been used to find correlations among large sets of data, such as identifying what artifacts tend to appear together across different contexts. Unlike Factor Analysis, principal components analysis looks to explain the total amount of variance of a dataset based on underlying variables and then divides the data into smaller sets or principals that are not correlated with each other (Dunteman 1989). The first principal explains the main source of the variation within the assemblage and the second principle explains the second source of variation and so on until all of the variation is explained. This method has been used in Finland to identify variation in Stone Age dwellings across the country based on their elevation and architecture (Kammonen and Sundell 2016). Additionally, this method aided in analyzing the clustering of specific plant pollens at certain sites in Prehistoric Norway as a means to provide

evidence and understanding of agricultural practices and land cultivation during this period (Prøsch-Danielsen and Simonsen 1988).

Artifact assemblages most often have been compared using qualitative analysis to identify differences and similarities in artifact types and build interpretations of the contexts in which they are found. Two examples of comparing mortuary versus domestic artifacts come from the sites of Titriş Höyük in Turkey as well as Grasshopper Pueblo in Arizona, US. At the Early Bronze Age site of Titriş Höyük in southeastern Turkey, domestic areas were excavated along with tombs located under the floors of the residences to understand how ritual behavior and household activities intertwined within a domestic space (Nishimura 2015). The same style of pottery was found within both contexts, but the greater abundance within the tombs was interpreted as remains of funerary feasts or offerings to the deceased. However, elements of personal ornamentation showed no variation in style or design between the two contexts. Nishimura (2015) states that the pattern of goods found between the residences and the tombs suggests that burying individuals with items reflecting their social or familial identity was not the primary intent of the mourners. This is understandable considering the intimate colocation of domestic and mortuary space, coupled with the understanding that the deceased's family members were the primary visitors of the tombs. The continuity of the artifacts between contexts suggests that daily activities became ritualized during the burial and mourning process. Overall, this shows the interaction between the living and the dead and the ritualization of household items existed on a spectrum between the ordinary and the sacred.

Comparing artifacts between mortuary and domestic contexts at Grasshopper Pueblo in central Arizona on the other hand noted little overlap between social personae represented in each space (Whittlesey and Reid 2001). Archaeologists observed that individuals were buried

with “specialized tool kits” but these did not contain tools that were used for domestic chores such as grinding stones, hammer stones and flaked stone tools and instead were items that are theorized to have been used in ritualistic activities. Thus, archaeologists concluded that the mourners were burying the deceased with items that represented their “social and ceremonial identities” rather than representing their routine domestic activities (Whittlesey and Reid 2001).

Qualitative comparative analyses of ceramics, architecture, plant, and animal remains, and shrine locations within Petra and other Nabataean sites suggest that funerary activities infiltrated both domestic and mortuary contexts. Analysis of ceramics and faunal remains from ritual feasting contexts indicates that despite some regional variation, the assemblages have the same characteristics (Durand 2017). For example, while frequency of certain ceramic types may vary slightly between banqueting contexts, the consistency in their representation indicates feasting was a heavily ritualized activity and an important component of self-identity in Nabataea. Animals consumed during ritual feasting may have varied slightly based either on ritual preferences or logistical factors. The comparison of faunal remains from Obodas Chapel in Petra to other Nabataean sites suggests a stronger preference for the use of sheep and goats in ritual activity at Obodas Chapel compared to other banqueting sites (Monchot 2017). It is not clear, however, whether or not this was a practical choice due to the difficulty in bringing other less nimble animals to this remote shrine.

Analysis of ceramics from the mortuary and domestic contexts of the North Ridge established that the types of ceramics used for food preparation were the same between both contexts, however they may have been used for different purposes (Wenner 2016). Unlike the domestic cooking pots, the ones found in tombs lacked evidence of charring, suggesting that they were used for storing food offerings instead of cooking. Wenner (2016) also notes that

unguentaria, which are small juglets used to hold perfumed oils, were not found within the domestic areas (Wenner 2016). These vessels likely had multiple mortuary purposes, from masking the smell of decay within the tombs (Perry 2017) to perfuming the deceased (Sachet 2009).

Other investigations comparing mortuary and domestic spaces at Petra have found similarities between the two contexts. Parallels in architectural elements have been discovered between monumental tomb facades, elite residences, and public buildings at Petra. For example, busts of deities are a very common decoration on the public buildings in Petra's city-center but they are also present on a Nabatean 'mansion' located in ez-Zantur (Schmid 2021). Similarly, the "Dionysian hall" in Beidha, a potentially private space, was decorated with elephant capitals similar to the Great Temple located in Petra's city center (Schmid 2021). Additionally, plant remains from mortuary deposits in the Petra North Ridge tombs, likely the remnants of funerary feasting, differ little from the plants that were consumed daily at the site. Evidence of barley, figs, wheat, olives, dates, grapes, and lentils were found in both the household structures in the ez-Zantur area of Petra (Bouchaud et al. 2017) and the Petra North Ridge tombs (Ramsay and Perry 2022). These plants were cultivated by the Nabateans in the local Petra area and were used as food for animals and humans (Bouchaud et al. 2017). Lastly, ritual offerings and commemoration elements like altars, shrines, and betyls have been found throughout the mortuary landscape of Nabataea, but some have also been discovered in domestic settings. In the public sphere, these ritual sites are frequently seen carved into the rock walls along the Siq and near the façade tombs. Within a Nabataean home in Adh- Dharrah two standing stone betyls were found, one was located over a small channel with a basin that would have been used to catch liquids in the form of libations (al-Muheisen and Piraud-Fournet 2013). The other betyl was

located along a terrace suggesting that some ritual practices were conducted outside.

Additionally, textual evidence from Strabo mentions “They worship the sun, building an altar on top of the house, and pouring libations on it daily and burning incense” (Strabo 16.4.26). The presence of shrines in private homes suggests that ritual behavior is not exclusive to mortuary settings but can also take place in private within the household (al-Muheisen and Piraud-Fournet 2013). These examples speak to the fluidity of artifacts reflecting ritual practices between the mortuary and domestic spheres of Nabataean culture.

It is clear from the previous research that there is not always a definite delineation between artifact assemblages found in mortuary or domestic spheres (Bikai et al. 2020; Wenner 2016; al-Muheisen and Piraud-Fournet 2013; Ramsay and Perry 2022; Schmid 2021). Identifying the similarities and differences in the style, material, shape, or type of the small finds can lead to a better understanding of the symbolic properties or use of the item. For example, objects from the mortuary setting that are made from precious metals or stones may be indicative of social status or could have been a means of protection from evil spirits (De Jong, 2017). Additionally, similar artifacts found in both mortuary and domestic settings may provide insight into the transmutation of objects from profane to sacred spaces. This research will not only contribute to the understanding of mortuary behavior at the North Ridge of Petra, but also has the potential to further uncover Nabataean views on identity, death, and mourning

Chapter 3

Methods and Materials

This research used qualitative and quantitative methods for a comparative analysis of the small finds from Petra's North Ridge. These artifacts were excavated by the Petra North Ridge Project during excavation seasons in 2012, 2014, and 2016. Eight shaft tombs and sections of five different residential areas were uncovered during these excavations. For my thesis, I focused on five tombs that contained mortuary deposits, four from Area B (B.4 - B.7) and one from Area F (F.1). In addition, I incorporated artifacts excavated from occupation layers in domestic complexes found in Areas A (Trench A.2), B (Trenches B.1- B.2), C (Trenches C.1 - C.4), and D (Trenches D.1 and D.3). Area E will be excluded from this analysis due to its status as an elite *villa urbana*. Only artifacts excavated from layers of clear mortuary and occupational activity were included in this study. Artifacts from 26 loci in the mortuary contexts (see Appendix 2) and 29 loci from the domestic contexts (see Appendix 2) were examined. Only mostly complete and/or potentially functionally diagnostic artifacts were included in this analysis, which resulted in a total of 433 artifacts, 384 from mortuary contexts and 49 from domestic. Preliminary field observations of these artifacts, including their identification, material, and measurements, were previously recorded and preliminary photos taken. The initial stage of this analysis involved reviewing the existing photographs and descriptions and identifying artifacts that needed further visual and photographic documentation. Photographs of the objects were retaken as necessary using a Canon EOS Rebel T1i digital camera. The artifacts from the 2016 season were analyzed at East Carolina University. The artifacts from the 2014 season, which were held in storage at the Department of Antiquities repository in Petra were analyzed at the American Center of Research (ACOR) in Amman. Unfortunately, the artifacts from the 2012 season could not be found within

the Department of Antiquities storage facilities in Petra or Tabarbour, and thus analysis of the artifacts were based solely on field-produced photographs and descriptions.

Comparative Analyses of Artifacts

Qualitative Analysis

The qualitative analysis focused on characterizing the type, count, material, design, and function of each artifact to reveal the similarities and differences between the artifacts in mortuary versus domestic contexts (Spradley 2001). First, I used artifact catalogues and site reports from contemporary Near Eastern sites for differentiating the artifacts and identifying their possible function. Artifacts that remained unidentifiable or with no artifact parallels at this stage of research were removed from further analysis. Once the remaining 433 small finds were identified, they were categorized based on the following functional categories: personal ornamentation, coffin hardware, lamps, figurines, coins, tools, ritual objects storage, and game pieces. Qualitative analysis has already been completed on the figurines, lamps, and coins, so these were not focused on here.

For my analysis of the beads, I relied on Beck (1928) to create descriptions of the beads' shape. No categorization method of the coffin studs exists in the literature, so descriptions by Hirschfeld and Amir (2007) of 'bells' from En Gedi were used as a model. Spindle whorls were classified by shape, material and design based on examples from Hesban (Ray 1995), Humayma (Olsen and Schick 2013), Hammat Gader (Hirschfeld 1997) and Jebel Khalid (Clark et al. 2002). Lastly, the jewelry was first separated by type, material, shape, and forms of latches and closures using parallels from Jerash (Ostrasz 2020; Zayadine 1986), En Gedi (Hirschfeld 2007) and Carmel (Dar et al. 2009)

Quantitative Analysis

Factor Analysis (FA) and Principal Component Analysis (PCA) were the quantitative methods used to assess how the artifacts are distributed between contexts and identify patterns of correlation within the assemblage by context. Both analyses were run using the trench or tomb as the context i.d., utilizing a model-free approach that did not assume a certain context was “domestic” or “mortuary”. I used the program JMP Pro 16.0 to complete both the Factor and Principal Component analyses. Factor Analysis (FA) is a statistical method that is used to explain most of the variation within a dataset by identifying correlated variables and grouping them into factors (Bruin 2006). In this case, Factor Analysis was used to see how the contexts would cluster based on the variation of the artifacts within them. I ran FA twice with varimax rotation. In the first run the factors were set to group contexts based on the categories of artifacts they contained and in the second run by a more specific artifact identification. The results were analyzed to see if the individual factors clustered based on an underlying variable (called a “latent variable”) that can be used to characterize and/or interpret each group of contexts for example, by function of the contexts or factors involved in site formation processes.

I then ran Principal Component Analysis (PCA) twice using correlation matrices. PCA is used to explain the total amount of variation within an assemblage and forms groups called principal components based on the consistency of variable covariance or correlation among the dataset (Bruin 2006). Similar to FA, the first run of PCA was based on artifact category and the second was based on artifact identification, but in this case, it was to determine how the artifacts correlate based on their context. As the contexts of the artifacts were kept hidden, the results would determine if artifacts from certain contexts (e.g., mortuary, or domestic) would naturally group together based on the nature of each assemblage. These results will be used to understand

if there are distinct differences in the types of artifacts that group together and if specific groups of artifacts are solely found in certain contexts. The stylistic variation and abundance or lack of artifacts in each context will indicate which artifacts have specific ritual or domestic uses and if there are artifacts have a dual purpose. These analyses will not only help to form more interpretations about the use of artifacts but about broader Nabataean domestic and ritual practices.

The presence of the same type of artifact within both contexts could provide evidence for the diffusion of ritual practices or domiciliary functions between mortuary and domestic settings. Additionally, different materials or designs could equip the artifacts with distinct meanings and serve as a way to commemorate the dead, provide protection from evil spirits, to represent the social status or identity of the deceased (De Jong, 2017). This analysis will provide a comprehensive assemblage of artifacts used for ritual purposes within the non-elite shaft tombs at Petra. Furthermore, identifying unique mortuary artifact assemblages has the potential to uncover Nabataean perceptions of death and the process of embodying social identity through material culture.

Chapter 4

Results

The small finds in this collection included altars, beads, bracelets, rings, earrings, bells, fibula (pin), pendants, spindles/hairpins, spindle whorls, spoons, pestles, scarabs, dice, *astragali*, figurines, coins, lamps, and coffin studs (Appendix 1 included artifact photographs). Artifact parallels from late Iron Age to Byzantine period sites throughout the Near East like Hesban, Humayma, Jerash, En-Gedi, Hanita, Hammat Gader, Maresha, Tel Anafa, Sepphoris, Madain Saleh in Petra aided in the identification and interpretation of the artifacts.

The quantitative analyses utilizing Factor Analysis and Principal Component Analysis as well as the qualitative method of comparative analysis shed light on the distribution pattern of artifacts within the contexts. The artifact profiles from the domestic and mortuary contexts on Petra's North Ridge identified artifact categories that were present in one context but not the other. For instance, while artifacts related to personal ornamentation, tools, figurines, coins, storage, and lamps were found in both contexts, coffin hardware, game pieces, and ritual objects were only present in the tombs (Table 3 shows the breakdown of the artifacts within these categories). Despite being present in both contexts, some object types were more abundant in number and stylistic variation in one context than another.

PNRP Artifacts	
Artifact Category	Artifact Type
Personal Ornamentation	Bead
	Bell
	Earring
	Scarab
	Bracelet
	Pendant
	Hairpin
	Fibula
	Ring
Tools	Grinding Stone
	Spindle Whorls
	Spindles
	Pestle
	Spoon
Figurine	Figurine
Coins	Coins
Storage	Lid
Ritual Object	Altar
	Votive Carving
Coffin Studs	Coffin Studs
Game Pieces	Die
	Sphere
	Astragali
Lamps	Lamps

Table 1: Breakdown of Artifacts by Type and Category

Description of Artifacts

Personal Ornamentation

Items of personal ornamentation include rings, earrings, bracelets, *fibulae*, pendants, beads, scarabs, and hairpins. One fragmented *fibula* (Object 1752) found in the assemblage was constructed from copper alloy with a scalloped edge, but no fibula has been identified with the same pattern. The one pendant discovered (Object 363) is pear-shaped with an agate oval and is wrapped with gold wire attachment loops on either end. Pendants made of similar materials have been found at the Nabatean necropolis in Humayma, Jordan but are different in shape (Olsen and Schick 2013: Fig. 11.2). A partial copper alloy bell (Object 1207) was also found at this site and may have been a jewelry item or was attached to clothing. The bottom portion of the bell is missing but the top half is hemispherical with a suspension loop and is very similar to bell (Object #1222) from Roman contexts at Hesban, Jordan (Ray 1995).

The copper alloy and iron rings in this assemblage are jewelry items that would have been worn as rings. There are a variety of types of rings including plain, bezel, signet, and ones with overlapping ends. Two of the rings (Objects 1536 and 2133) are pieces of wire that were wrapped to form a circle and they have overlapping ends at the closure. Similar examples are seen at sites like Hesban (Ray 1995: fig 13.13.18; fig 13.15.17) and Roman and Byzantine contexts in Carmel, Israel (Dar 2009; Object M66). A plain copper alloy signet ring was also found (Object 1268) and is similar to rings also found at Hesban (Ray 1995: fig 13.16.8) and Carmel (Dar 2009: Object M4). The plain rings do not have any decoration and the ends at the closure do not overlap. One of the plain rings constructed of copper alloy (Object 177) can be compared to artifact JH2004 from Roman Jerash, Jordan (Kehrberg and Ostrasz 2017). A partial bezel ring made of both iron and copper alloy (Object 508) was found and is missing its setting. While bezel rings have been found in contemporary Roman contexts, no exact parallels of those from the North Ridge were discovered.

The bracelets in this collection were made of copper alloy, iron, and glass. The copper alloy and iron bracelets are not complete and have no decoration, so it is hard to determine the type of closure or if there are parallels at contemporary sites. The glass bracelet however had a groove running around the center (Object 692) similar to glass bracelets found at Hesban (Ray 1995: fig 13.12) and Late Roman contexts in En-Gedi, Israel (Hirschfeld and Amir 2007: Fig. 21 and 22) that date to similar periods.

Copper alloy, iron, and gold earrings are also part of this collection. A copper alloy earring is a flattened piece of wire that was twisted to create a design and then it was formed into a loop (Object 1917). There have been no exact parallels found but the closure is similar to ones from Hesban (Ray 1995: Fig 13.18.4). There were two pairs of iron loop earrings (Objects 2000 and 2090) that are circular with a crimped section used for suspension and these are similar to earrings from two areas in Petra, one of them being the North Ridge (Murray and Ellis 1940: No.4; Bikai, Perry and Kanellopoulos 2020: No. 413), and in Hellenistic/ Roman contexts in Tell El Mazar, Israel (Yassine 1984: fig 55.142). A pair of gold earrings (Objects 2091 and 2092) are lunate shaped with twisted wire closures. Parallels were found at Hesban (Ray 1995: fig 13.20.2 and 13.20.3) and from a shaft in one of the tombs from Petra's Royal Nabataean Necropolis (Zayadine 1974: Objects 23 and 24).

Three scarabs were also found that were constructed from limestone and ceramic. One of the scarabs (object 387) has incised lines that resemble a beetle. Similarly, Object 448 has faded markings indicating the possible head of a beetle. This item may have been covered in a blue or green paint that has faded over time but there is still evidence of it left in the incised markings. Unfortunately, limited descriptions and pictures have made it unclear if the underside of these scarabs have any markings. Scarabs at the site of Hesban were found that had blank undersides

and they concluded that these were not Egyptian scarabs and should be categorized as imitations of scarabs or beads because of the lack of inscription (Ray 1995: Fig 7.1 and 7.2). Lastly object 491 has inscriptions on the underside but there were no parallels found and it was classified as an imitation of an Egyptian scarab in the final excavation reports (Walker 2016).

The beads found in these contexts are made of a variety of materials including stone, glass, coral, ceramic and shell. These were most likely worn on necklaces with multiple styles and materials of beads on the same necklace (Ray 1995; Murray and Ellis 1940). Beads of similar shapes and materials, including semi-precious stones like amethyst and carnelian as well as glass beads, have been found in Tombs 1 and 2 excavated previously along Petra's North Ridge (Bikai, Perry and Kanellopoulos 2020: No. 316-334), in addition, at Hesban (Ray 1995: Fig 13.2), Hanita (Barag 1978: Fig. 18) and Humayma (Oleson and Schick 2013: Fig 11.2.1a; Fig. 11.1.8). A spherical ceramic bead with a ribbed design (Object 417) is similar to beads from Tombs 1 and 2 from Petra (Bikai, Perry and Kanellopoulos 2020: No. 318 and 322) and a 3rd/4th century tomb at Hanita, Israel (Barag 1978: No. 134). Bead 464 is a pierced scallop shell, and an almost identical shell bead is pictured in "A Street in Petra" (Murray and Ellis 1940: Plate XXXVI: 11). A single cowry shell was also found on the North Ridge that was used as a bead. Cowry shells were also found in Nabataean tombs at Wadi Mataha in Jordan (Johnson 2013). Object 2190 is an irregular bead that has four points on one end and incised lined around the center. Parallels have been found at Karm al-Shaikh (Baramki 1931) and Orhan Mor (personal communication with Tali Erickson-Gini) and similar designs have been found at Hesban (Ray 1995: 14.1.4), Hanita (Barag 1978: Fig.18 136) and during the Queen Aila Airport, Jordan excavation that unearthed Nabataean materials (Ibrahim, Gordon, and Wolfgang 1987: plate XXX 40). Parallels have not been found for Objects 357, 405, 414, 415, 1681, 1378 and 2097.

Hairpins are rods usually made from bone that have a point on one end and a design on the other, that are used to hold one's hair in place. Hairpins were popular during this period as personal accessories and have been found at contemporary sites like Hesban (Ray 1995). Objects 1255, 1256, 549 and 1581 are fragmented making it difficult to concretely distinguish them as hairpins or as spindles that have a very similar shape and design but acted as a tool used in textile manufacturing which is described more below.

Tools

The tools found at this site included a spoon, spindles, spindle whorls, pestles, and ground stone items. The spoon is made of bone and is partial with the handle missing (1741). Examples of contemporary Nabataean bone spoons were found near the colonnaded street in Petra (Zayadine 1974: Fig. 4) and an example is also on display at the Petra Museum (Personal Observation: JP2547).

Spindles are rods or sticks that are made of bone and have been worked to create a smooth surface usually with a design at the head and a point at the base (Ray 1995). Spindles were used for spinning wool into thread or yarn. Spindles have a very similar shape to hair pins and the fragmented state of these objects within this collection makes it difficult to differentiate between the, however they do have some differing characteristics. Spindles tend to be larger in diameter and length compared to hair pins and the design on the head is meant to hold the thread in place as it is spun. Hair pins are meant to hold the hair in place and be relatively invisible, so they are smaller but can still have a sphere or incised line pattern at the head (Ray 1995). Objects 1255 and 1256 are two fragments that reattach, and it is possible that these pieces were part of a spindle. The design on one end has two sharp notches that would be more likely to be used to hold thread in place. It also has a similar width and design compared to the spindles found at Hesban (Ray 1995: Fig 11.1 and 11.2) and Tel Anafa (Berlin and Herbert 2018: WT 314,

WT315 and WT317). Objects 549 and 1581 have no carved or incised designs and due to their fragmented state, it is indeterminate whether they are spindles or pins.

Spindle whorls are circular objects made of stone or bone that rest at the end of a spindle and help to maintain the spinning momentum of the spindle. Three different shapes of spindle whorls commonly found in the Near East are pyramidal, hemispherical, and flat (Ray 1995). Three of the whorls in this assemblage are flat and made of bone, however only one of them has an incised line around the perimeter (Object 1533) while the other two do not have an incised design (Objects 1325 and 1493). Parallels to object 1533 were found at Humayma (Oleson and Schick 2013: Fig.11.4.11) and these types of whorls were abundant during the Roman and Byzantine periods. Whorls numbered 251 and 194 from the site of Sepphoris (Nagy 1996) are similar to the flat whorls without design from the North Ridge. Additionally, a bone hemispherical whorl (Object 585) found in one of the tombs had incised lines, one around the hole's perimeter and the other in the middle between the hole and the perimeter. Parallels to this whorl are seen in Sepphoris (Nagy 1996: No. 198) and from a late Roman tomb in Hesban (Ray 1995: Fig. 11.4.13). There are two stone whorls in this collection that are a pyramidal shape, one made of basalt (Object 1442) and the other of steatite (Object 2079). Other pyramidal whorls made out of similar stone materials were found at Hesban (Ray 1995: 11.5.7) and Hammat Gader (Hirschfeld 1997: cat. No. 15 and 16).

Pestles are handheld smoothed stones that are used for grinding materials like grains. While many ground stone tools were found across the North Ridge, only two pestles were found within occupational or mortuary layers, including a cylindrical limestone pestle (Object 1232) and a rounded rectangular basalt pestle (Object 1801). Similar pestles made of the same materials are found at contemporary sites like Hesban (Ray 1995: Fig 9.3) and Nabataean

Madain Saleh (Gazagne and Nehme 2016). Other ground stone objects include two basalt fragments (Objects 1701 and 557) that have corners suggesting that they were a type of ground stone dish or a type of mortar. Two flat polished basalt stones, one circular (Object 1334) and one rectangular (Object 1343), were possibly polishing or rubbing stones similar stones from Hesban (Ray 1995: Fig 9.8). Object 1163 is a limestone hemisphere with a square cut out in the center. No parallels have been found but it is possible that it was a small mortar or meant to hold another item like a stone or wooden shaft. Object 2068 is an ovular basalt stone with a hole through the center. Unfortunately, no exact parallels have been found but it is a similar style to Roman rotary querns (Williams-Thorpe 1988). Additionally, Object 1110 is a partially ground stone object with a square hole that may have held a dowel and was used as millstone or other grinding mechanism. It is similar to “a Pompeian style mill” from Capernaum, Israel (Williams-Thorpe and Thorpe 1993). Lastly, object 1198 is a rectangular shaped basalt stone with smooth edges, however, no parallels have been found but it may have been used for grinding grains or other food items.

Coffin Studs

Coffin studs are copper alloy caps that were used for decorating wooden. The Petra North Ridge Project was the first to classify these objects as a type of coffin hardware. Previously, they were referred to as bells because they have a similar shape and a metal rod inside, however, they have no suspension loop, and the metal fragment inside is most likely a tack and not a bell clapper. In the North Ridge shaft tombs, the studs were found scattered around the interred individuals and some were found attached to wood pieces, suggesting they were coffin decorations (Perry and Walker 2018). Similar types of artifacts were found in Tomb 2 on the North Ridge (Bikai, Perry and Kanellopoulos 2020), at En-Gedi (Hirschfeld and Amir 2007:

Fig. 48 and 49), other shaft tombs in Petra excavated by Zayadine (1979 Pl. LXXXVI; 1970 Fig. 12), and in a room from Wadi Farasa East in Petra (Schmid 2005: Fig 7). At Wadi Farasa, these studs were thought to have decorated wooden furniture or a door. Schmid also mentions that Kolb (personal communication) identified parallels of the studs in the late Roman contexts of the Nabataean house az-Zantur in Petra (Schmid 2005).

Game Pieces

Game pieces in this assemblage included a single die, a sphere, and astragali. The die is made of bone and has six sides with marks representing the numbers one through six, similar to a modern die (Object 462). The marks are dots that are surrounded by circles which is a design that is present on contemporary dice from Hesban (Ray 1995: Object 1442), Roman Sepphoris, Israel (Nagy 1996: No. 152 and 153) and the Roman bath house of Hammat Gader, Israel (Hirschfeld 1997: No.6). A small sandstone sphere was also found in shaft tomb B.4 (Object 463). A similar sphere dating to the Byzantine period was also found at Hammat Gader and was classified as a game piece (Hirschfeld 1997: N0.7). Lastly, there are a total of 38 worked sheep and goat astragali found within two shaft tombs. These were classified as game pieces because their sides were purposefully worn or had shaved down. Astragali have been used as game pieces throughout the Near East since the Middle Bronze age (Mazzorin and Minniti 2013). Parallels more contemporary with the North Ridge assemblage include Maresha from Hellenistic and Roman contexts (Perry-gal, Stern and Erich 2022: Fig 4), Khorasan, Iran (Sabori et al 2016: Fig 2) and Roman Tel Anafa (Berlin and Herbert 2018: BI 5).

Storage

Items related to storage included two lids, one that was alabaster (Object 1346) and the other made from limestone (1170). These may have been used to cover unguentaria or other containers. Unfortunately, no parallels have been found for these lids.

Ritual Objects

Two ritual objects including an altar (Object 1535) and a votive carving (Object 1534) were found on the North Ridge. The altar is rectangular with an inset rectangle on the surface, and it has four legs on the bottom. A very similar altar was found in Tomb 2 on the North Ridge (Bikai, Perry, and Kanellopoulos 2020: No. 481) and at a Nabataean temple in Khirbet et-Tannur (Reyes and McKenzie 2013: Fig 10.10) and these were believed to have been used for burning incense. The votive carving was carved out of limestone and depicts the Syrian Allat or Atargatis seated in the center with a lion on each side (Wenning and Perry 2021) and is similar to a statue of Allat from the Roman site of Palmyra, Syria (Dirven 2022: Fig. 2).

Figurines, Lamps, and Coins

Lastly, three categories of artifacts have already been examined but their presence in mortuary versus domestic contexts has not been assessed. Thirty-three terracotta figurines were excavated from the North Ridge contexts. The figurines are human or have animal characteristics indicating their identification as ibex, horse, or camel. There was also a total of 40 copper alloy Nabatean and Roman coins excavated from the North Ridge that had a date range from the 1st to the 3rd century AD. Lastly, eight ceramic lamps were found that had Nabatean or Hellenistic characteristics. These were oil lamps that were used for light or unguentaria were placed on top to heat the perfumed oils located within. These three types of artifacts have been found at sites throughout Petra, including sites along the North Ridge (Fiema et al 2001 Bikai, Perry and Kanellopoulos 2020), Petra's Temple of the Winged Lions (Piraud-Fournet et al 2021), and are

mentioned in “A Street in Petra” (Murray and Ellis 1940), as well as other contemporary Near Eastern sites like Hesban (Ray 1995), Humayma (Olsen and Schick 2013) and Madain Saleh (Nehmé, Al-Talhi and Villeneuve 2011).

Comparative Analyses

Qualitative Analysis

Qualitative comparative analysis was then used to identify similarities and differences in stylistic variability and counts of the artifacts between contexts. There was a larger variety and abundance of personal ornamentation items in the tomb contexts compared to the domestic contexts. In fact, a total of nine items of personal ornamentation were found in the domestic contexts including three beads, a bell, a fibula, an earring, a bracelet, and two rings while there were 67 items of personal ornamentation found in the mortuary contexts, including 40 beads, eight earrings, seven bracelets, eight rings, one pendant, and three scarabs.

The beads within these assemblages were compared based on their material and shape. Materials of construction include stone, glass, bone, coral, ceramic, and shell. The stone beads included amethyst, agate, basalt, and sandstone. Shapes were categorized into disc, bicone, circular, barrel, a complete shell, tabular and irregular. The beads that were found in the domestic context consisted of two bone and one glass bead. In the mortuary context, beads made from a larger variety of materials were present, including four bone, eleven glass, two ceramic, five shell, six amethyst, two coral, seven carnelian, one agate, one basalt, and one sandstone bead. Two of the three beads from the domestic context were similar in shape and material to beads from the mortuary context. The glass bead from the domestic context (Object 1441) had a similar barrel shape to five of the glass beads (Object's 1736, 2137, 2198, 2128, 2136) in the

mortuary context, however, object 1441 is longer and has a speckled pattern that is not seen in the mortuary beads. One bone bead from the domestic context (Object 1681) and three from the mortuary context (Object's 405, 414-415) are disc-shaped, however, the ones from the tombs had smoother edges and incised lines around the perimeter. It is also important to note that not all beads were spread evenly between the tombs or domestic contexts. The majority of beads associated with a mortuary context were found throughout tomb F.1, including all of the amethyst, glass, agate, basalt, carnelian beads, along with a few shell, coral, and bone beads. Additionally, only one bead was found in B.6, two in B.4, two in B.7 and B.5 had no beads present. In the domestic contexts, one bead was found in each of the following trenches C.1, C.2, and D.3.

Included within the category of personal ornamentation is jewelry. A total of five pieces of jewelry were found in four trenches within the domestic areas, including two ring fragments, one bracelet fragment, a complete earring, and a fibula (pin) fragment. All of the jewelry in this context was made out of copper alloy (Object 546). A total of 22 jewelry items were found in the mortuary context and similar to the beads, there is a larger variety of materials used to make the jewelry within this context, including glass, copper alloy, iron, agate, and gold. Copper alloy rings and bracelets are found in both mortuary (Objects 177, 1268, 1536, 176, 425, 1181, 1554) and domestic contexts (Objects 1229, 1788), however, it is difficult to determine if they share similarities in design or closure style due to the fragmented and corroded condition of the ring and bracelet from the domestic context. All of the tombs contained jewelry pieces except for tomb B.6. A majority of the jewelry items in the mortuary context came from Tomb F.1, including all of the earrings, and B.5 also had a significant amount including the majority of the bracelets. The items made out of gold were also found within these two tombs.

In the domestic contexts a total of 16 tools were found including four bone spindles/hair pin fragments, four spindle whorls, two pestles, six ground stone tools and one spoon (Table 4). The majority of the items came from area C, and no tools were found in area A. The mortuary context had significantly fewer tools including two spindle whorls and three ground stone tools. The spindle whorls found in the mortuary context are both made of bone and decorated with an incised line on the surface, object 585 is hemispherical and object 1533 is flat. Two of the four whorls in the domestic context are made of bone and are flat, however unlike the mortuary context these ones do not have a design (Objects 1325 and 1493). The domestic area also has two stone pyramidal whorls (Objects 1442 and 2079), a material and shape that was not present in the tombs. Two of the basalt grinding stones in tomb B.4 appear to be the remains of a bowl or dish similar to fragment 1701 in domestic area C. Additionally, within the storage category, a single lid was found in each context. The one in domestic area C.3 was made of limestone and had a checkered design with a loop on top for attachment (Object 1170), while the one found in tomb B.7 was made out of alabaster (Object 1346) with no apparent design.

A total of 27 terracotta figurines were found in the tombs including two that had human characteristics, as well as nine horse, three camel, and thirteen indeterminate fragments. In the domestic context, there were a total of six fragments, including three with human characteristics, one ibex horn, and two indeterminate fragments. There were also 15 coins found in the domestic context and 25 coins in the mortuary context. A majority of the coins in both contexts are Nabataean dating between the 1st – 2nd century AD and reference Nabataean Kings like, Aretas IV, Rabbell II and Malichus II (See Table 4). Additionally, seven lamps were excavated from the tombs, some that were charred and some uncharred, as well as one charred lamp from the domestic contexts.

Date	Mortuary	Domestic
Nabataean: 1st Century AD	2	1
Rabbell II	2	
Aretas IV	10	3
Malichus II	1	
Nabataean	4	
Constantine	1	
Constantius	2	
Trajan		2
Gallienus		1
1st -2nd Century AD		1
3rd Century AD		1
330-335 AD	1	
Indeterminate Date	2	6
Total	25	15

Table 2: Coins

There were four categories of artifacts found in the mortuary contexts that were not present in the domestic areas including, ritual objects specifically an altar (Object 1535) and a votive carving (Object 1534), as well as game pieces, coffin hardware as well as a few items from personal ornamentation including scarabs. There were three different types of game pieces including a total of 38 astragali, a die (Object 462) and a sphere (Object 463). The die is partial but appears to be marked like a modern die with dots representing numbers 1 through 6 on each side. The die and the sphere along with five of the astragali were found in tomb B.4 while the rest of the astragali were excavated from B.7. Three scarabs were also found in tombs B.4 and B.5. Unfortunately, due to limited access and minimal photographs and descriptions, it is unclear whether or not these were beads for jewelry or a type of token.

Lastly, there were a total of 211 coffin studs found between tombs F.1, B.5, and B.6. The coffin studs from the North Ridge have three different shapes including, hemispherical, semi-elliptic, and flared semi-elliptic. Hemispherical studs have a more rounded shape while the semi-

elliptic studs are shaped like a thimble, and the flared semi-elliptic are shaped like a bell curve. There are a total of 65 hemispherical, 44 semi-elliptic, 19 flared semi-elliptic and 83 indeterminate fragments. Tomb B.5 only had evidence of hemispherical studs (total 7) while, B.6 contained no hemispherical studs and F.1 produced hemispherical and semi-elliptical studs. Tomb B.6 contained similar amounts of semi-elliptic (total 22) and flared semi-elliptic (total 19) studs as well as 37 indeterminate. In F.1 the majority of the studs were hemispherical (total 58), but this tomb also contained 22 semi-elliptic and 20 indeterminate studs.

Quantitative Analysis

Factor Analysis

Factor Analysis identified four factors in the first run and five factors in the second run that reflected the consistency of the artifacts across the contexts. The numbers in black highlight that the item is significant. FA based on patterning of different artifact categories within the contexts produced four factors with eigenvalues above 1.0 that explained 89.6% of the variation within the sample (See Table 5). In general, the factors tended to cluster by context type, meaning that the domestic contexts grouped together as did the mortuary contexts based on the artifacts present within those contexts. The factors that grouped together had either positive or negative loading values. The positive loading values indicate that the variables, in this case, the context based on trench or tomb number, are positively correlated and the higher the loading value the stronger the correlation. Negative loading values mean that the variables have a negative correlation and are related to variables completely opposite from the ones with high positive values. The first factor included five different trenches, B (B.1), C (C.1, C.2), and D (D.3) which had typical domestic assemblages which include coins, tools and figurines as well as

tomb B.4 that had more domestic items than the other tombs. Factor 2 contained three domestic trenches, including C.4, B.2 and A.2, all of which had a single figurine. Factor 3 contained tombs F.1, B.5, B.6 which were the only tombs with coffin studs and a negative loading value for B.7 because of the lack of coffin studs and abundance of game pieces that aren't seen in the same quantities in other contexts. Lastly, Factor 4 included both domestic contexts D.1 and C.3 as well as two tomb contexts, B.4 and B.7, both with negative loading values. The negative loading values are indicative of a significant difference in the category of the artifacts within the context compared to the contexts with positive loadings. Tomb B.7 stands out in this analysis because it did not group with a positive loading in any of the four factors, but it did have a negative loading in Factor 3 and Factor 4 showing that it had a strong difference compared to the clustered contexts.

Latent variables		Typical domestic assemblage	Cleared occupation context	Typical tomb assemblage	Cleared occupation context
Context		Factor 1	Factor 2	Factor 3	Factor 4
Domestic	C2	0.956734	-0.197659	0.014148	0.195585
Domestic	D3	0.915152	-0.002487	0.004111	0.278484
Mortuary	B4	0.836949	0.007397	-0.134155	-0.436315
Domestic	B1	0.812802	-0.096336	0.1229	-0.293471
Domestic	C1	0.791326	-0.000874	-0.023099	0.375949
Domestic	C4	-0.070812	0.996311	-0.027136	0.009476
Domestic	B2	-0.070812	0.996311	-0.027136	0.009476
Domestic	A2	-0.070812	0.996311	-0.027136	0.009476
Mortuary	B7	-0.130082	-0.037416	-0.440122	-0.636643
Mortuary	F1	0.081465	-0.075898	0.975938	-0.097367
Mortuary	B5	0.137607	0.093666	0.967295	-0.116003
Mortuary	B6	-0.27672	-0.122551	0.92997	-0.049339
Domestic	D1	0.040419	0.249978	-0.258232	0.864251
Domestic	C3	0.039607	-0.251556	-0.26742	0.802794
Eigenvalues		4.1119	3.3986	2.875	2.1519
% Variance		27.696	22.736	22.292	16.829

Table 3: Factor Analysis of Contexts by Artifact Category

Factor Analysis using artifact typology resulted in five factors with eigenvalues above 1.0 that explained a total of 88.2% of the variation (See Table 6). The clustering pattern of the contexts in this run was similar to the initial artifact category groupings, although the domestic and mortuary areas separated out more clearly. Factor 1 included four domestic trenches, C.4, B.2, A.2 and D.1 and Factor 2 contained domestic areas, D.3, C.1, C.2 and D.1. Factor 3 had a grouping of three tombs, B.5, B.6 and F.1 and factor 4 included two tombs B.4, and B.7. Lastly, factor five included D.1 and C.3 and a negative loading for B.1. B.1 only had a negative loading value with one group and did not cluster with any other groups, suggesting that it contains a unique array of objects compared to the other contexts. While D.1 clustered with three different groups its loading value was always around 0.5 which was not as high as the other values within the clusters.

Latent variables		Cleared Occupation Context	Typical Domestic Assemblage	Tomb Assemblage with Coffin Studs	Tomb Assemblage with Game Pieces	Cleared Occupation Context
Context		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Domestic	B2	0.994644	0.011764	0.041078	0.064330	0.001019
Domestic	A2	0.994644	0.011764	0.041078	0.064330	0.001019
Domestic	C4	0.994644	0.011764	0.041078	0.064330	0.001019
Domestic	D3	0.080576	0.961854	0.011688	0.038524	-0.021528
Domestic	C2	-0.141234	0.884692	-0.013032	0.058653	0.036294
Domestic	C1	0.072515	0.883718	0.039739	0.030557	0.197971
Domestic	D1	0.490244	0.555264	-0.058930	-0.095892	0.531168
Domestic	B1	-0.021179	0.042352	-0.133239	-0.173294	-0.687939
Mortuary	B6	-0.060117	-0.091220	0.982209	-0.057275	0.024298
Mortuary	F1	-0.003021	0.092953	0.975984	0.035036	-0.009871
Mortuary	B5	0.181182	0.019728	0.961854	-0.052198	0.003332
Mortuary	B7	0.049492	-0.146459	-0.063848	0.920180	0.080973
Mortuary	B4	0.122716	0.395796	-0.010696	0.830808	-0.118161
Domestic	C3	-0.076514	0.252051	-0.158291	-0.247954	0.778685
Eigenvalues		3.7502	3.0423	2.7231	1.6944	1.1356
% Variance		23.573	21.845	20.713	11.880	10.171

Table 4: Factor Analysis of Contexts by Artifact Typology

Similarities can be seen from the first two runs of Factor Analysis. For example, certain tombs or domestic trenches grouped together each time, including trenches C.1, C.2, and D.3; C.4, B.2, and A.2; and D.1 and C.3. Tombs B.5, B.6, and F.1 clustered together in both runs and tombs B.4 and B.7 grouped together in the first run with a negative loading and in the second run with positive loadings, suggesting that they have similarities based on the distribution of artifacts within the tombs.

Principal Component Analysis

Principal component analysis (PCA) based on a correlation matrix was used to evaluate eight artifact categories, including coffin hardware, coins, figurines, game pieces, personal ornamentation, ritual objects, storage, and tools (See Table 7). The first principal component included coffin hardware, coins, figurines, and personal ornamentation. The second component contained objects used for storage (vessel lids), ritual objects, and game pieces. The objects in the first two components reflect items that are generally found in tombs, while the third component included only tools, which are predominantly found in domestic contexts.

	Mortuary Artifact	Mortuary Artifacts	Domestic Artifacts
Artifact Category	Principal 1	Principal 2	Principal 3
Coffin Hardware	0.43792	0.06607	0.00555
Coins	0.49498	0.0829	0.19237
Figurine	0.44883	0.31076	-0.08736
Game Pieces	-0.14674	0.55092	-0.28031
Personal Ornamentation	0.50319	0.16242	0.07742
Ritual Object	-0.15565	0.55254	-0.27396
Storage	-0.21921	0.48451	0.37892
Tools	-0.12149	0.14918	0.80754
% Variance	34.434	40.378	25.188

Table 5: Principal Component Analysis of Artifact Category by Context with Eigenvalues

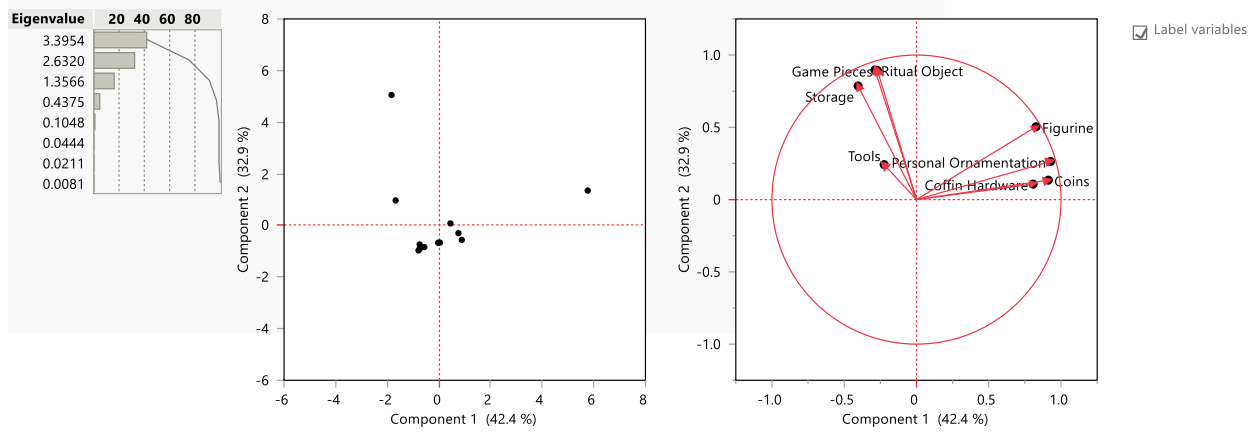


Figure 12: Principal Component Analysis Based on Artifact Category Scree Plot and PCA Plot

PCA based on a correlation matrix was run a second time to examine 22 types of artifacts, which produced seven principal components with eigenvalues greater than 1.0 (See Table 8). The first principal component includes positive loadings for the figurines, beads, coffin studs, rings, coins, and earrings, as well as negative loadings for spindle whorls, pestles, bells, and spoons. The second includes beads, bells, coins, earrings, figurines, grinding stones, lids, pestles, and spoons. It is important to note that the loading values in the first two components are not high. Positive loadings for altars, votives, and game pieces and a negative loading for grinding stones were included in the third principal component. The fourth component contained hair pins/ spindles, rings, scarabs, and spindle whorls and the sixth contained hair pins/ spindles but negative loadings on rings and scarabs. Lastly, the seventh component included a high positive loading for fibula and a low positive loading for coins as well as a negative loading for coffin studs.

Artifact Type	Principal 1	Principal 2	Principal 3	Principal 4	Principal 5	Principal 6	Principal 7
Altar	-0.09217	0.11757	0.47157	0.07368	-0.14140	0.04426	0.02477
Votive	-0.09217	0.11757	0.47157	0.07368	-0.14140	0.04426	0.02477
Bead	0.28812	0.33099	-0.00623	-0.15815	0.01872	-0.06447	0.00378
Bell	-0.28689	0.28003	-0.21603	0.10203	0.00138	-0.03432	-0.04039
Bracelet	0.20525	0.01141	-0.07397	0.48098	0.07860	0.01366	0.19849
Coffin stud	0.26564	0.20216	-0.08192	-0.03001	-0.28572	0.18283	-0.28524
Coin	0.28153	0.29656	-0.10359	-0.12130	0.07099	0.11713	0.20556
Earring	0.27218	0.31091	-0.04717	-0.19558	-0.05761	0.02665	-0.04763
Fibula	0.00750	-0.06080	-0.06780	-0.04669	-0.18684	0.05033	0.80961
Figurine	0.30428	0.30469	0.11812	0.06871	-0.06943	0.03010	-0.01158
Game Piece	-0.07831	0.12271	0.48050	0.09288	-0.03698	-0.03136	0.04928
Grinding Stone	-0.23756	0.31981	-0.23986	0.04428	-0.04161	-0.01611	0.11086
hair pin/ spindle	-0.02176	-0.08035	0.00237	-0.20410	0.41924	0.47553	-0.12293
Jewelry	0.12806	-0.08443	-0.08433	0.42301	-0.21020	0.25869	-0.28068
Lid	-0.27898	0.29263	0.18808	0.12932	-0.10305	0.00732	-0.01150
Pendant	0.12276	-0.06068	-0.06094	0.52325	0.02623	0.09453	-0.02031
Pestle	-0.28689	0.28003	-0.21603	0.10203	0.00138	-0.03432	-0.04039
Pin	-0.01155	-0.11483	-0.01874	-0.09633	-0.10602	-0.65010	-0.22737
Ring	0.25726	0.23472	0.10601	0.02497	0.33765	-0.30994	-0.01707
Scarab	0.11490	-0.00236	0.02358	0.32761	0.46561	-0.28636	0.09863
Spindle whorl	-0.20625	0.12992	0.15731	-0.04309	0.49735	0.18150	-0.04587
Spoon	-0.28689	0.28003	-0.21603	0.10203	0.00138	-0.03432	-0.04039

Table 6: Principal Component Analysis of Artifact Type by Context with Eigenvalues

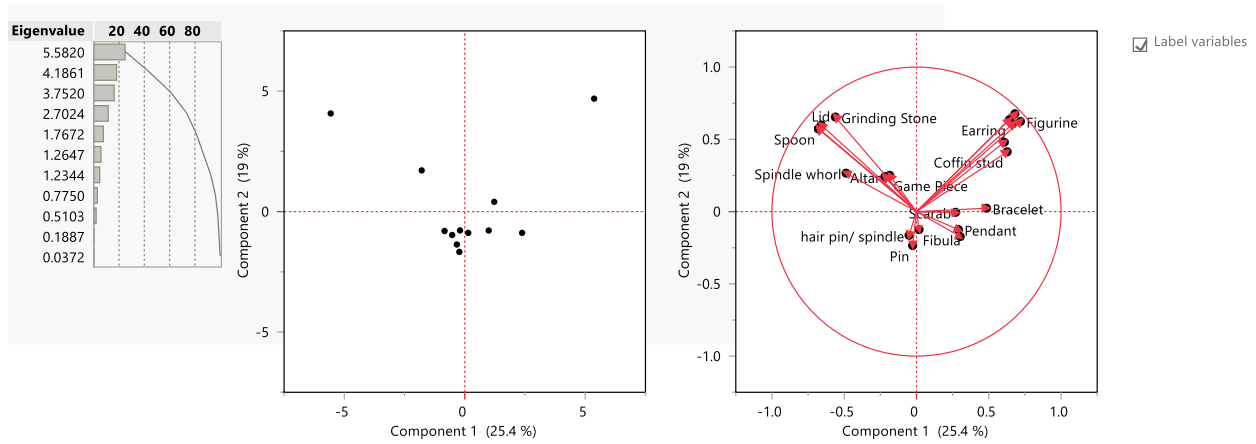


Figure 13: Principal Component Analysis Based on Artifact Category Scree Plot and PCA Plot

PCA also produced similarities between the first and second run. Altars and votives, which are ritual objects, tended to group with game pieces in both runs most likely because they are exclusively found in the mortuary context. Additionally, items of personal ornamentation, like jewelry tended to group with coins, figurines, and coffin studs. Although items of personal ornamentation, coins, and figurines are found in both contexts, a larger majority are present in the mortuary context which would explain why they tend to group with coffin studs which are solely found in the tombs.

The qualitative and quantitative analyses along with the artifact parallels from contemporary sites aided in outlining the differences in the assemblages between the mortuary and domestic contexts. While coffin hardware, game pieces, and ritual objects were only present in the tombs, artifacts related to personal ornamentation, tools, figurines, coins, storage, and lamps were found in both contexts. Furthermore, objects that were present in both contexts were not equally distributed in the tombs or domestic areas and also differed in abundance, material, and style. Developing theories regarding the variation in the assemblages between these two contexts will form a better understanding of the Nabataean mortuary practices.

Chapter 5

Discussion

Interpreting the results from the qualitative and quantitative comparative analyses provides insight into patterns of artifact distribution within the tombs and domestic areas. The statistical analyses determined that the contexts and artifacts were generally grouped based on their assumed function. However, there were a few exceptions to this which leads to the idea that there is not a uniform mortuary or domestic assemblage. Additionally, the qualitative analysis and information drawn from sources from contemporary sites have provided additional interpretations about the placement of artifacts within mortuary and domestic contexts. Finally, while some artifacts were found only in one context, others were found in both contexts suggesting that they have multiple functions in Nabatean daily and ritual activities.

The presence of 384 artifacts in the tombs and only 49 in the domestic contexts may also have skewed this data and the ability to interpret whether the abundance of artifacts within the tombs is due to ritual practices or to site formation processes that cleared the contexts of the domestic areas.

Quantitative Analyses

The quantitative analyses revealed patterns and explained the variation in the artifact assemblages in the tombs and domestic areas. The first Factor Analysis run resulted in four factors based on artifact category. The five contexts in Factor 1 were all domestic except for tomb B.4. The latent variables in this context consisted of artifact categories typical of domestic contexts, including coins, personal ornamentation, and tools. Tomb B.4 contained three out of the four tools found in the mortuary contexts which, along with other domestic artifacts, may

have entered through the window in its northwest corner explaining an assemblage similar to the domestic contexts. The second factor includes trenches C.4, B.2 and A.2, which are all small deposits including only a single figurine. The limited number of artifacts is possibly due to post-occupational clearing in these domestic areas. Three mortuary contexts grouped together in Factor 3 based on the presence of coffin studs that are absent in all other contexts. Lastly, Factor 4 included trenches in domestic areas, D.1 and C.3, which are set apart from the domestic contexts in Factor 1 because they have significantly fewer items of personal ornamentation. Tomb. B.7 had a negative loading in Factors 3 and 4 due to the large abundance of game pieces found within the tomb, as well as the ritual objects which are not found in other contexts. Tomb B.4 also had a negative loading in Factor 4, possibly because of the presence of game pieces and an abundance of personal ornamentation.

The results for the second run of Factor Analysis included five factors representing artifact identification that have a very similar pattern to the first run. Factor 1 included only domestic contexts that included a single figurine similar to Factor 2 in the first run. Factor 2 includes domestic areas, D.3, C.2, C.1, and D.1 which are predominantly made up of tools, figurines, and coins. Next, the contexts included in Factor 3 is the same as Factor 3 in the first run, including the three tombs that have coffin studs. Factor 4 includes tombs B.4 and B.7 which are most likely grouped together based on the presence of game pieces within these contexts that are not present in other areas. Lastly, Factor 5 included D.1 and C.3 which also grouped together in the first run. These two domestic contexts are set apart from the other domestic areas because they only include one item of personal ornamentation and in C.3 this item is a bell which is the only one in this collection. Additionally, even though C.3 has similar amounts of tools and coins compared to the contexts in Factor 2, the tools include the only spoon and pestle found as well as

the lid which sets this assemblage apart from others. D.1 is included in three of the factors, 1, 2 and 5, but has the highest correlation with Factor 2. Overall, both of these runs were accurate and useful but Factor Analysis by artifact type tended to mask the variation of artifacts that are seen in this collection.

In the first run of Factor Analysis, Factor 1 included a typical domestic assemblage, Factor 3 is representative of a mortuary assemblage, and Factors 2 and 4 seem to represent occupational contexts that were cleared based on the amount of soil and density of artifacts from the occupational layers. Similarly, in the second run Factor 2 is representative of a typical domestic assemblage, Factors 3 and 4 included different variations of mortuary assemblages and Factors 1 and 5 revealed assemblages of cleared occupational areas. In general, throughout both runs each context tended to group with the same context, domestic with domestic and mortuary with mortuary. However, not all the tombs or the domestic contexts have similar assemblages of artifacts. For example, Tomb B.4 and B.7 are not correlated with the other mortuary areas due to the presence and abundance of certain artifacts that are not shared between all of the tombs. This means that there is not necessarily a predictable or identifiable mortuary or domestic assemblage on Petra's North Ridge. Additionally, the correlation between tomb B.4 and certain domestic contexts shows that there is overlap between the items found between the different contexts and that there is not necessarily a distinct domestic or mortuary assemblage.

The first run of principal component analysis, or PCA, explained the total variance in the PNRP assemblage by separating the artifact categories into groups that are generally reflective of mortuary or domestic contexts. The first principal component explained that artifact categories including personal ornamentation, figurines, coins, and coffin hardware were a prominent source of variation in the collection across contexts. These objects are usually found within a context

together and as the amount of one category increases so do the others that is, they are correlated and they covary. The artifacts in these categories, except for coffin hardware, were present in both mortuary and domestic contexts but were more abundant in the tombs. The second principal component designated game pieces, ritual objects, and storage-related items as the second greatest source of variation and these items were also more abundant in the mortuary contexts, particularly tombs B.4 and B.7. Lastly, Principal Component 3 has a high positive loading value for tools, which are responsible for the remaining variation within the assemblage. While tools are found in both contexts, they are more prevalent in the domestic areas.

The second run of Principal Component Analysis based on artifact identification resulted in seven principal components that explained the variation of the artifact identification across contexts. The first two principal components had very low and insignificant loading values suggesting that each artifact type on its own only minimally impacts the principal component and together they are not strongly correlated and/or are not driving variation in assemblages between different contexts. It is also difficult to point out if they are representative of either a mortuary or domestic area. This can be interpreted as the existence of a significant amount of overlap with the artifact assemblages between both the mortuary and domestic contexts. Principal Component 3, making up the third most variation in the assemblage has high loadings for the two ritual objects and game pieces, and this is reflective of the mortuary assemblage within tomb B.7 which contains the largest amount of game pieces and the only altar and votive carving in this collection. Principal Component 4 consisted of jewelry items like bracelets and pendants indicating that there is a co-occurrence of these two items in the mortuary contexts. Principal Component 5 has a grouping of spindle whorls, spindles/hair pins and scarabs, with the scarabs being solely found in the tombs, while the spindles/hairpins are found specifically in the

domestic areas. However, the spindles whorls are found in both areas, specifically in the contexts which contain the majority of the spindles/hairpins and scarabs. Principal Component 6 has a positive loading for spindles/hairpins and since these items are found in two loadings, this grouping of spindles/hairpins represents the remaining ones from the domestic contexts that are not present in the same contexts from the artifacts in PC 5. Lastly, Principal Component 7 making up the remaining variation, has a positive loading for the fibula which represents part of a mortuary assemblage and is the only fibula in the collection. The second run of Principal Component Analysis identified certain groups of artifacts that are very specific to certain contexts that are outliers in the general assemblage of the mortuary and domestic areas. Based on the results from the PCA it is difficult to determine if one run was more successful than the other. The first run based on artifact category identified more clearly the general sources of variation within the context, but it did not acknowledge the unique differences of the artifacts within the artifact categories that are present in the second run. The second run identified items that are only present in specific tombs or domestic contexts but are not found generally throughout each context, such as the altar, votive carving, bracelets, fibula, game pieces, hairpin/spindles, pendant, scarab and spindle whorls. Overall PCA provided evidence that these two contexts have a lot of overlap between the assemblages and that there is not always a distinct association between these artifacts and a specific context. However, the artifacts in both contexts may have had different functions or symbolic properties in each context. Additionally, the artifacts that are outliers indicate that there is not a uniform assemblage of artifacts for each context but there are items that may be unique to different social identities or ritual practices.

When completing the statistical analyses hairpins and spindles were grouped together due to their fragmentary state and the inability to designate the fragments into either category. This

makes it difficult to distinguish which categories spindles or hairpins are present with in either context.

Qualitative Analysis

Comparative analysis revealed that items of personal ornamentation, coffin hardware, lamps, figurines, coins, tools, and lids were found in both domestic and mortuary contexts while ritual objects, coffin hardware, and game pieces were solely found in the tombs along the North Ridge. The artifacts found in both contexts differed in quantity, material, and style and these differences may be representative of how social identity or status was presented in mortuary contexts. Also, the artifact categories that were only present in the tombs may be specific mortuary items, or their absence from the domestic contexts is linked to site formation processes. In addition, comparisons with artifacts found in contemporary Near Eastern sites aided in interpreting the ritual significance and dual purpose of the artifacts found along the North Ridge.

Personal Ornamentation

Jewelry

The jewelry items found within the mortuary contexts are more abundant and constructed of a larger variety of materials compared to the domestic areas. In both contexts, items including rings, earrings, bracelets, pendants, fibulae, and beads were found. It is possible that these items were worn as personal accessories, used as ornamentation or may have been placed in these areas for other purposes. Similarly, the bell found in Area C.3 may have been a jewelry item or attached to clothing as a decoration (Ray 1995). While bone and glass beads were found in both contexts, shell, coral, amethyst, and carnelian beads were solely found in the tombs. Similarly, the jewelry items made from gold were also only found in the tombs while iron and copper alloy

pieces were found in both contexts. The differences in materials between these contexts may be a result of individuals being buried with their most precious items, which could also be indicative of social status. Additionally, Nabataean men, women and children have been depicted wearing jewelry on coins and terracotta figurines. However, these analyses have indicated that certain jewelry items like earrings tend to be depicted on women more than men and certain items like crowns were only worn by Kings and Queens (al Masri, al Awneh and Bala'awi 2012; Alzoubi, al Masri and al Ajouny 2013). This suggests that the presence of certain jewelry items in either context may be representative of gender identity or status. Alternatively, the smaller number of personal items in the domestic contexts could have resulted from abandonment processes where people took with them their most personal items, or these items were later looted from these sites.

The beads found in the mortuary and domestic contexts were most likely worn on necklaces in antiquity. Some of the beads found in the tombs were created from carnelian and amethyst which were considered precious stones in antiquity and were important commodities along the trade route through the Arabian Peninsula (Alexander, Ioannis and Changhong 2021) and because of this may have been seen as a symbol of social status. Additionally, the color purple was considered a symbol of social status in the eastern Mediterranean region, especially in the Roman and Byzantine eras (Vougogiannopoulou and Skaltsounis 2012). Strabo even mentions that the Nabataean king wore purple as a symbol of their status (Strabo *Geography* 16.4.6), so the presence of purple amethyst beads on jewelry may have had intrinsic status in this community. Most of the beads made out of these semi-precious materials in addition to a pair of gold earrings were found in a single tomb (F.1), perhaps used to symbolize associations to the elite because they were able to afford or access these items. However, the lack of these materials

in other tombs could be the result of looting or environmental disturbance and does not necessarily indicate lower status of the deceased in these contexts. Similarly, the absence of semi-precious materials in the domestic areas may be a result of clearing out these spaces for abandonment or construction of the city wall.

Additionally, one of the shell beads found in tomb F.1 was a cowrie shell. Since the Bronze Age, cowrie shells have been used as grave goods in the Levant, specifically in the graves of children and women to represent fertility or provide protection from evil (Golani 2014). It is not clear if cowrie shells had the same symbolic meaning to the Nabateans, but cowrie shells have also been found in the Temple of the Winged Lions and therefore can be linked to ritual spaces within Petra.

Hairpins

It is unclear whether objects 1255, 1256, 549 and 1581 are hairpins or spindles due to their fragmented condition. On the North Ridge these items were only found in the domestic contexts, but they have been found in tombs at contemporary Near Eastern Sites. As hairpins they would have been used for pinning up hair and categorized as items of personal adornment. They may have been left in the domestic areas because they were fragmented or deemed unnecessary to take.

Scarabs

The Egyptian scarab is a representation of a dung beetle, which lays its eggs in balls of dung that it transports by rolling across the ground. The Egyptians linked this process to the cycle of death and rebirth. Scarabs worn by the living as a form of protection or placed with the deceased to aid in the transfer to the afterlife. Additionally, scarabs that had inscriptions on the

underside were used as individual seals or as ‘blessings’ from deities (Cooney 2008). Although these items originated in Egypt, original and imitation scarabs have been found in many areas outside of Egypt including the Near East (Adderley 2012; Boschloos and Akkermans 2021). The scarabs found on the North Ridge are imitations of Egyptian scarabs that may have been produced locally or were accessed through trade. Scarab object #491 has an inscription on the underside and may have been used as a seal or stamp by the owner in their daily life. Since these items were only found in the mortuary settings, they may be specific to funerary practices. However, if they were associated with jewelry they may have also been present in the daily activities of these individuals and therefore also present in the domestic spaces, although none were recovered in these areas. Egyptian cultural influence can be seen throughout Petra, for example the presence of the Isis icon in Wadi as- Siyyagh (Wenning and Merklein 2001). The inclusion of scarabs in these mortuary contexts is another example of how Egyptian beliefs are incorporated into Nabatean culture and ritual practices.

Game Pieces

Sheep and goat astragali, many of them worked, have been found in domestic, funerary, and ritual areas, throughout the Near East and the Mediterranean world. These repurposed objects, along with dice and other tokens have been used as game pieces or ritual items since the Early Bronze Age (Perry-gal, Stern and Erlich 2022; Mazzorin and Minniti 2013; Sabori et al. 2016). Game pieces have been found in Roman period military forts, dumps, baths, households, ritual areas, and funerary sites. Scholars have mostly linked their presence to game-playing, but they also were used for divination, aiding soldiers with military strategy, or helping merchants close transactions or exchange goods (Jankovik 2018; Glazer and Struklec 2013). Additionally, astragali found in the Roman and Hellenistic tombs in the Mediterranean and Levant have been

interpreted as personal items that were used as game pieces in these individuals' lives or as ritual items used during the funerary process as offerings to a deity or as protective amulets (Sabori et al. 2016; Gilmour 1997). Evidence of game-playing in Petra, such as game boards found carved into bedrock throughout the site, located in gathering places in public areas and also outside of tombs (Glazer and Struklec 2013). Games likely served as entertainment, but they may have also been incorporated into ritual activities associated with the funerary process or divination. The astragali along with the die and sphere found within the tombs, may not be associated with these rock-carved boards (which traditionally use pebbles), but the ritualized playing of games may also mean that the game pieces have a ritual aspect (Glazer and Struklec 2013).

A total of 38 worked astragali were found in two tombs, B.7 and B.4. All of the astragali identified as artifacts (as opposed to ecofacts) had purposively smoothed surfaces, either medial and lateral or dorsal and plantar. The five astragali in tomb B.4 were found in two different contexts that contained commingled remains. A single astragalus was found in the same loci as the die and sphere game pieces and the four other astragali were found in a separate locus within the same tomb. The other 33 astragali were from tomb B.7 and many came from the same loci as the incense altar and votive carving. The presence of astragali in these tombs could be interpreted as personal game pieces or as protective amulets in the funerary context. However, in B.7 it is possible that the astragali were used as offerings to Atargatis or Allat represented by the votive carving. On the North Ridge these gaming pieces are only found within the mortuary contexts and their absence in domestic contexts may be due to removal during site abandonment or clearing processes.

Storage

The storage artifact category contains two vessel lids, one from the mortuary and the other from the domestic contexts. These are most likely associated with vessels that held oils or ointments for incense or for medical practices. They would have been used in daily activities but also in the burial settings as offerings or a perfume (Hanus and Yehoshua 2013; Hassel 1997).

Ritual Objects

The items characterized as ritual artifacts included a votive carving and an incense altar. These are items that were specifically made to complete ritual activities like worshipping a deity or burning incense in a ritual or funerary setting. The artifacts were found in a grave containing a mostly articulated individual, B.7:33, however there is evidence of disturbance in the grave and the layers on top of the skeleton contained commingled human remains from adjacent graves, meaning that it is not clear whether or not the objects belong to the articulated individual. Analysis of the votive carving indicated that the depicted goddess was most likely Atargatis or Allat and may have been used to protect the deceased (Wenning and Perry 2021). However, the carving of the goddess is not an exact match to other depictions of these goddesses, and not all were widely worshiped at Petra, so it is possible that the carving is not local. Strontium isotope analysis has concluded that the individuals in the tomb were all local to the Petra area (Wenning and Perry 2021) suggesting that the deceased was most likely introduced to the goddess and ritual object through trade and purchased the carving from a merchant. However, this does not exclude the deceased from being incorporated into a small group of people that worshiped these goddesses within Petra and may be a symbol of their *marzeah* or religious beliefs. Additionally, votive carvings were not specific to the funerary contexts. In Petra these types of objects could be placed within niches in public or ritual spaces like temples to worship a specific deity (Wenning 2010).

The incense altar (Object 1535) is similar to ones found at contemporary Nabataean sites like the temple at Khirbet et-Tannur (Reyes and McKenzie 2013: Fig 10.10) and from Tomb 2 along the North Ridge (Bikai, Perry and Kanellopoulos 2020: No. 481). Altars of this size and shape were usually used for burning incense but some have been found without burn marks, including object 1535, suggesting that they had more of a symbolic purpose and were made specifically for the burial process (Reyes and McKenzie 2013). Altars were only found within the tombs on the North Ridge, but there is evidence of altars being found in Nabataean domestic areas, like the household courtyards in Aila (modern Aqaba) and az-Zantur in Petra. In Aila, a ceramic altar was found at the bottom of a pit accompanied by ash deposits and fragments of animal bones and in az-Zantur the altar was found in a house suggesting that altars were used for ritual practices in non-mortuary contexts (Retzleff 2003; Schmid 2005).

The votive carving as well as the incense altar can be considered portable personal ritual items. Items such as stone altars found in the Temple of the Winged Lions were interpreted as items that the temple could sell to individuals during pilgrimage (Piraud-Fournet et al. 2021), The portability of altars meant they could be used by merchants or other mobile individuals so that they could complete their rituals while on the road (Hassell 2005). For this reason, other votive carvings or incense altars may have been taken by the individuals from the domestic contexts when they were cleared explaining the absence of these objects in the domestic contexts along the North Ridge.

Coffin Studs

Coffin studs were used to decorate wooden coffins in tombs B.5, B.6 and F.1 along the North Ridge and were also found in tomb B1.1 located in a separate area of Petra (Zayadine 1979).

However, they were absent from contemporary tombs B.4 and B.7 that also had wooden coffins suggesting that the studs were preferred by certain families, or *marzeah*. Additionally, the shapes of studs differed in quantity between the three North Ridge tombs. The only identifiable studs in tomb B.5 were hemispherical, while in tomb B.6 semi-elliptical and flared semi-elliptic were found and in F.1 hemispherical and semi-elliptic studs were present. A majority of the studs were found in commingled areas making it unclear if a specific type of stud is related to people with certain social identities or if multiple types of studs were present on a single coffin. However, studs found in shaft B.6.19 were associated with a primary burial that was mostly articulated with evidence of coffin wood. The majority of the studs found in this location were semi-elliptic but there were also three flared semi-elliptic studs. This may indicate that multiple types of studs were used on a single coffin and the type of stud was based on availability. However, not every type of stud was found in each tomb which may indicate that the stud types could have been made by different craftsmen or different shapes were produced over different periods of time. Additionally, while the coffin studs were solely found in the mortuary contexts on the North Ridge, similar artifacts were uncovered attached to a wooden door in a room on a lower terrace in Wadi Farasa dating to the 1st century AD, as well as in the Nabataean house of az-Zantur from late Roman contexts (Schmid 2005). Wadi Farasa is associated with a *triclinia* and façade tombs, but the contexts that the studs were found in did not have funerary remains indicating that these studs may have not been specific to coffins. No description is included for the studs found at az-Zantur, but Schmid (2005) indicated that they were similar to the studs found at Wadi Farasa which have a hemispherical shape. Therefore, these metal decorations, though not common in other contexts, may not be entirely indicative of funerary contexts and were used for the decoration of coffins as well as other wooden furnishings.

Tools

The tools excavated included spindles, spindle whorls, grinding stones and pestles but only spindle whorls and grinding stones were present in both contexts. The tools in the domestic areas were used for grinding grains, associated with eating food, and potentially production of textiles. The ground stone fragments (Objects 556 and 557) may have been vessels or mortars for grinding food materials in the domestic areas, and in the mortuary setting these may have been used for preparing food offerings or as vessels that contained offerings. One grinding stone (Object 2068), similar to Roman rotary quern, was found in a mortuary context, suggesting it also was used for the preparation of food materials for offerings or to represent an individual's occupation. The two spindle whorls found in the tombs are most likely symbolic of the social occupation or daily activities of the individual they were buried with. While not all of these tools are found in both contexts, there is archaeological evidence for spindles being placed in tombs to indicate occupation or personal identity and therefore cannot be excluded from Nabataean funerary spaces (Ray 1995).

Material Culture Elements of Nabataean Mortuary Practices

These analyses have concluded that there are no clearly specific mortuary artifacts. While the coffin studs, scarabs, game pieces, ritual objects, and objects constructed out of gold, amethyst, and carnelian were only found in these mortuary contexts on the North Ridge, similar artifacts have been found in domestic contexts at contemporary Nabataean and Near Eastern sites. This suggests that these items may have also been present in the domestic areas but may have been displaced due to site formation processes. For example, the building of the city wall and the 363 AD earthquake caused many of the domestic contexts in Areas A and D to be cleared before

their destruction. The material culture in these domestic contexts, may have either been taken by the individuals that had lived in the houses, thrown out in dumps, or looted. Items like jewelry that were worn on the body may have remained with the individuals as they were worn daily, however, precious materials could have also been looted if they remained in the structure after abandonment. Similarly, ritual objects or items that were deemed important or irreplaceable may have been taken by the occupants and kept instead of thrown out. Overall, the Nabateans did not have clear mortuary or domestic items but instead, the material culture had different functions and symbolic properties in each context.

Additionally, variations within each tombs' assemblage indicated that there is no uniform mortuary assemblage across all contexts, however some patterns did emerge. For example, in tombs that contained game pieces, coffin studs were absent and vice versa. The differences in assemblage could be linked to specific burial practices based on the *marzeah* or family. Coffin studs may have been used to distinguish which group an individual belonged to or the variation is based on trends during the time of burial. Similarly, it is possible that game pieces were placed in the burials as offerings, protective amulets or personal belongings and were used to indicate association with a specific cult, relationship to a deity, as a marker of the persons daily activities or possibly occupation as a merchant or military figure. Items of storage as well as the votive carving and the altar were specific to a single tomb. The lid was possibly associated with unguentaria or other vessels that would hold incense or liquid offerings. The altar was used for or symbolized the bringing of incense and the votive carving for worshipping a deity. These items were all found in tomb B.7 and are associated with ritual offerings or activities but their absence in other tombs may mean that they are specific to a cult or family practices for interring the dead and providing offerings. Similarly, coins are a very common grave good in Petra with few

exceptions like tomb B.7. Their absence in specific contexts could be based on the deceased's families' burial traditions or disturbances within the tomb that removed the coins. Tools were also found in most of the tombs except for B.5 and B.6 but the type of tool did vary in each of the contexts. Spindle whorls were found in B.4 and B.7 and grinding stones were present in B.4 and F.1. Both items may have reflected the deceased's occupation or were used as a marker of daily activities, but the grinding stones may have also been used to grind or hold food offerings for the deceased. Additionally, there are artifact categories found in all tombs including lamps, figurines, and personal ornamentation. The presence of these items may be representative of shared ritual activities in Petra, so while there may be ones that are linked to lineage or cultic activity there are other rituals that are shared culturally in Petra. However, the items of personal ornamentation may have had different meanings depending on cult, family, or the individual they were buried with. Personal ornamentation included a variety of artifacts like jewelry, scarabs, hairpins, and a bell. These items were most likely personal items that were worn or carried by the deceased during their lifetime. In the tomb they may have been present because they were simply something the person wore in their daily life, or they were chosen by the mourners to represent their relationship to the deceased. Overall, they may have represented the actual or perceived social identity of the deceased individual. Precious materials like gold, amethyst or carnelian could be indicative of status, suggesting that these individuals had additional wealth or access to materials that could not be obtained by everyone. Scarabs may have had ritual significance that provided protection for the living and the dead. Different amounts, types and stylistic variations of these artifacts were found in each tomb making each tombs mortuary assemblage unique. While the assemblages are not uniform across every context, tools, personal ornamentation, ritual objects, coffin hardware, game pieces, lamps, coins and figurines have all been used to

indicate social identity, association with a marzeah or specific family line and ritual beliefs which are common themes shared throughout the mortuary contexts.

Chapter 6

Conclusion

This research was aimed at uncovering a discrete assemblage of mortuary artifacts from five tombs and four domestic areas along Petra's North Ridge. Artifact types including coffin studs, coins, figurines, lamps, a votive carving, an altar, a lid, grinding stones, spindle whorls, game pieces, beads, earrings, bracelets, rings, a pendant, and scarabs were found in the mortuary contexts along the North Ridge. However, qualitative and quantitative analyses concluded that these artifacts are not specific to funerary contexts and instead have dual purposes between domestic and mortuary contexts meaning that there is no discrete mortuary assemblage. Artifact categories including personal ornamentation, storage, tools, lamps, figurines, and coins were present in both contexts meaning that these items shared a dual, however, different quantities and characteristics of the artifacts were present in the tombs compared to the domestic areas. Items of personal ornamentation, lamps, coins, and figurines were more prevalent, and jewelry was made from a larger variety of materials including gold, amethyst, and carnelian in the tombs, and tools were more abundant in the domestic contexts. Similarly, items including coffin studs, ritual objects, scarabs and game pieces were solely found in the mortuary contexts on the North Ridge but at contemporary sites, these items have also been found in domestic areas suggesting that they are not necessarily specific to funerary rituals in Nabataea and may have also served a dual purpose. The reason for the absence or limited number of items in the domestic areas may be the result of site formation processes that caused items to be removed. These items may have been looted, thrown away or precious personal and ritual items may have been kept by the individuals that had inhabited the site.

Items of personal ornamentation within the tombs represented the deceased's actual or perceived social identity as they were objects worn by the deceased throughout their lives or items that the mourners chose to adorn them with at their time of death. Tools including the spindle whorls and the grinding stone may have been used to symbolize occupation, but the grinding stones could have also been used to prepare food offerings. Similarly, the lid may have covered an incense or libation container and was part of the funerary process. Items like the altar and votive carving symbolize ritual practices like worship of deities and burning incense and were either classified as a personal item of the deceased representing social identity or it was incorporated into the ritual activities used in the burial process. Game pieces may have also been a symbol of social identity, representing popular activities that the deceased was involved in throughout their life. Lastly, coffin studs are copper alloy decorations that are used to embellish wooden coffins, it is unclear if they had ritual significance but they are not found in every tomb that had wooden coffins so they may be specific to a time period or social group. Additionally, not all the artifacts were found in equal quantities across all tombs suggesting that there were ritual preferences based on the family, *marzeah* or possibly social status of the interred.

It is clear from this analysis that Nabateans buried individuals with grave goods that represented the deceased's membership in a *marzeah*, occupation, status, gender identity, and beliefs and there were also remains of ritual activities like feasting and food offerings that were incorporated into the mortuary assemblage. This research has created an understanding for the duality of Nabataean mortuary artifacts and has also given insight into how the Nabateans represented and formed connections to the deceased.

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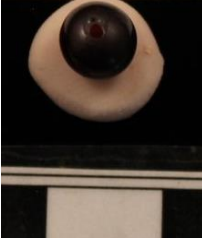


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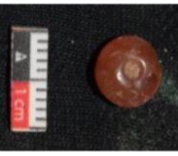


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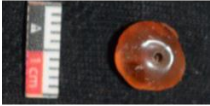

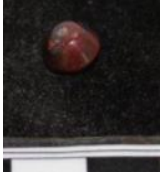






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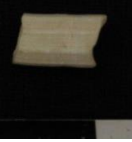




Appendix I: Artifacts


Personal Ornamentation: Beads			
Domestic Beads			
Glass			
D.3	1441		Long Barrel
Bone			
C.1	1681		Disc
C.2	1880		Barrel
Mortuary Beads			
Glass			
F1	2201		Circular
F.1	2001		circular
F.1	1736		Barrel







F.1	2137		Barrel
F.1	2198		Barrel
F.1	2128		Barrel
F.1	2136		Barrel
F.1	2002		Tabular
F.1	2208		Oblate disc
F.1	2220		Oblate disc
F.1	2210		Oblate disc
Bone			
B.4	405		Disc









B.4	414-415		disc
F.1	2190		Irregular
Ceramic			
B.4	424		Circular
B.4	417		Circular
Carnelian			
F.1	2217		Bicone
F.1	2206		Convex bicone
F.1	2204		Truncated bicone
F.1	2203		Convex bicone







F.1	2202		Convex bicone
F1	2192		Convex bicone
F.1	2135		Truncated bicone
Amethyst			
F.1	2196		Bicone
F.1	2219		Truncated bicone
F.1	2216		Truncated bicone
F.1	2134		Truncated bicone
F.1	1658		Truncated bicone
F.1	1670		Convex bicone
Agate			







F.1	2218		Barrel shaped
Basalt			
F.1	2097		tabular
Sandstone			
B.4	357		Irregular
Coral			
F.1	2199		Barrel
B.6	1128		Barrel
Shell			
F.1	2195		Complete shell
B.4	464		Complete shell
F.1	2189		Disc
B.7	1617		Truncated bicone




B.7	1378		Irregular
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Mortuary Personal Ornamentation			
Pendant			
B.5	363		Gold and Agate
Bracelets			
B.4	692		Glass
B.5	176		Copper Alloy
B.5	425		Copper Alloy
B.5	1181		Copper Alloy
B.5	1554		Copper Alloy










B.5	1269		Iron
F.1	2003		Iron
Earrings			
F.1	2000		Copper Alloy
F.1	2090		Copper Alloy
F.1	2091		Gold
F.1	2092		Gold
F.1	2191		Iron
F.1	2209		Iron
Rings			








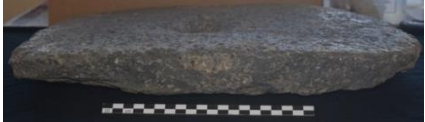
B.4	177		Copper Alloy
B.5	1268		Copper Alloy
B.7	1536		Copper Alloy
B.4	420		Iron
B.4	508		Iron
F.1	2133		Iron
Scarabs			

B.4	387		Stone
B.4	448		Ceramic
B.5	491		Ceramic
Domestic Personal Ornamentation			
Rings			
B.1	546		Glass
D.3	1229		Copper Alloy
Earring			
C.2	1917		Copper Alloy
Bracelet			





C.1	1788		Copper Alloy
Fibula			
C.1	1752		Copper Alloy
Bell			
C.3	1207		Copper Alloy





Domestic Tools			
Spindles/Hair pins			
B.1	549		Bone
D.3	1255-1256		Bone
C.2	1581		Bone
Whorls			
D.1	1325		Bone

C.2	1493				Bone
D.3	1442				Basalt
C.3	2079				Steatite
Ground Stone					
C.1	1163				Limestone
C.3	1110				Basalt
C.3	1198				Basalt
D.1	1334				Basalt
C.3	1343				Basalt
C.3	1701				Basalt
Pestle					

D.3	1232		Siltstone
C.3	1801		Basalt
Spoon			
C.3	1741		Bone
Mortuary Tools			
Whorls			
B.4	585		Bone
B.7	1533		Bone
Ground Stones			
B.4	556		Basalt
B.4	557		Basalt
F.1	2068		Basalt
Domestic Storage			
Lid			

C.3	1170		Limestone
Mortuary Storage			
Lid			
B.7	1346		Alabaster

Mortuary Ritual Objects				
B.7	1534		Limestone	Carved Votive
B.7	1535		Limestone	Altar
Mortuary Game Pieces				
Totals: B.7: 33 B.4: 5			Bone	Astragali
B.4	462		Bone	Die

B.4	463		Bone	Sphere
Mortuary Coffin Studs				
Flared Semi-Elliptic	Total: 19		Tomb Totals B.5: 0 B.6: 19 F.1: 0	Copper Alloy w/ Iron tacs
Semi-Elliptic	Total: 44		Tomb Totals B.5: 0 B.6: 22 F.1: 22	Copper Alloy w/ Iron tacs
Hemispherical	Total: 65		Tomb Totals B.5: 7 B.6: 0 F.1: 58	Copper Alloy w/ Iron tacs

Appendix II: Description of Contexts

Descriptions of Mortuary Loci from the Petra North Ridge included in this Analysis

Context	Description of Burials	Period
B.4:10	Fill containing partially articulated remains in niche B.4:11	1st C AD
B.4:16	Floor deposits with commingled remains	1st C AD
B.4:18	Fill in burial "trough" B.4:21	1st C AD
B.4:22	Floor deposit amongst commingled remains & articulated skeleton	1st C AD
B.4:23	Floor deposit amongst commingled remains	1st C AD
B.5:9	Soil surrounding partially articulated remains on the chamber floor	1st C AD
B.5:11	Fill in shaft B.5:26 and above B.5:31 possibly washed in from floor deposits	
B.5:13	Floor deposit amongst commingled remains	1st C AD
B.5:15	Floor deposit amongst commingled remains	1st C AD
B.5:19	Floor deposit among commingled remains	1st C AD
B.5:31	Fill from shaft grave B.5:26	1st C AD
B.5:32	Fill from shaft grave B.5:10 with evidence of looting	
B.5:34	Fill in floor shaft grave B.5:28 containing densely packed commingled remains	1st C AD
B.5:35	Fill in floor shaft grave B.5:28 containing densely packed commingled remains	1st C AD
B.6:23	1 st layer of fill in B.6:17 containing partially articulated and commingled remains	1st C BC
B.6:27	2nd layer of fill in deep shaft B.6:17 containing partially articulated and commingled remains	
B.6:31	Disturbed mortuary deposits	
B.6:33	3rd layer of fill in deep shaft B.6:17 containing partially articulated and commingled remains	
B.6:34	4th layer of fill in deep shaft B.6:17 containing partially articulated and commingled remains	
B.6:37	Disturbed mortuary deposits	
B.6:39	Disturbed mortuary deposits	
B.6:40	5th layer of fill in shaft B.6:17 containing partially articulated and commingled remains	
B.6:41	6th layer of fill in shaft B.6:17 containing partially articulated and commingled remains	
B.6:42	Fill within shaft grave B.6:19 containing a mostly articulated burial with coffin wood and complete unguent	
B.6:43	Disturbed mortuary deposits in B.6:15	
B.6:44	Disturbed mortuary deposits within shaft B.6:18	

B.7:10	Fill in shaft grave B.7:11 with evidence of early looting	
B.7:16	Disturbed fill in shaft B.7:11	
B.7:19	Fill in shaft grave B.7:11 (below B.7:10) with evidence of early looting	
B.7:20	Disturbed fill in B.7	
B.7:33	Fill amongst mostly articulated burial in shaft grave B.7:29	
B.7:34	Fill amongst disturbed commingled remains in shaft grave B.7:22	
F.1:22	2nd layer of fill in shaft F.1:16	
F.1:26	Fill within shaft F.1:24	
F.1:28	3rd layer of fill in shaft F.1:16	
F.1:29	4th layer of fill in shaft F.1:16	
F.1:30	Fill within shaft F.1:25	

Description of Domestic Loci from the Petra North Ridge used in this Analysis.

Context	Description	Period
A.2:19	Possible occupation layer above bedrock	2nd century AD
B.1:14	Layer containing a plastered floor	Early Byzantine Reoccupation
B.1:15	Beaten earth floor	2nd century AD
B.2:5	Layer containing remnants of a wall that most likely collapsed in an earthquake	2nd century AD
C.1:12	Latest layer of occupation in this context	2nd century AD?
C.1:16	Occupation layer directly above the floor	
C.1:17	Beaten earth floor	
C.1:30	Occupation layer	
C.1:34	Occupation or abandonment layer before the structure collapsed	
C.2:9	Occupation layer containing ash	
C.2:11	Occupation layer below C.2:9	
C.2:31	Occupation layer below C.2:9	
C.2:41	Occupation layer	Early Byzantine Reoccupation
C.3:14	Occupation layer containing ash directly above bedrock	
C.3:15	Occupation layer on top of the bedrock and beaten earth floor in C.3:22	
C.3:22	Beaten earth floor	
C.3:33	Possible occupation layer underneath collapse	
C.3:46	Possible beaten earth floor	
C.3:48	Beaten earth floor	
C.3:50	Floor bedding over bedrock	
C.3:68	Stone installation next to tannur C.3:66	
C.4:10	Possible occupation layer above bedrock	
D.1:26	Possible occupation or post occupation cleared layer	

D.1:30	Possible occupation layer: 19 cm thick layer - may be post-occupation abandonment	
D.3:28	Possible occupation or dump layer	
D.3:31	Possible occupation layer on top of bedrock	
D.3:34	possible occupation layer under wall D.3:19	
D.3:37	Extension of the possible occupation layer in D.3:34	
D.3:38	Occupation layer underneath D.3:37	

