



THE IMPORTANCE OF IMPORTS: PETROGRAPHIC ANALYSIS OF LEVANTINE POTTERY JARS IN EGYPT

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ABSTRACT

Interconnections between Egypt and the Levant have been a focus of research for many years. However, only more recently has the scientific method of thin section petrography of ceramic vessels been applied. Through petrography, the raw materials can be identified and related to their known origins, suggesting a provenance. Recent examination of jars dating from the Old Kingdom, Middle Kingdom and Second Intermediate Period, New Kingdom, Late Period, and Late Roman Period revealed that a number of areas in the Eastern Mediterranean were trade partners at one time or another. On the other hand, Lebanon was a long standing trade partner, undoubtedly due to the significance of the commodities exported from this region to Egypt. Thus, while the political situation in the Levant and Egypt changed dramatically across almost 3000 years, the desire to have Lebanese goods did not.

INTRODUCTION

Along with the recent increased interest in the interconnections Egypt had with its Levantine neighbors, there has been a stronger desire and ability to utilize scientific analysis to provide more specific data on this topic. Many avenues of research into the relationship between Egypt and the Levant have been explored including architecture, artifacts, and texts. The examination of these sources has increased our understanding of the social, economic, and political context of these interactions. Analysis of ceramics has also been key to this more nuanced approach and the ability to use scientific techniques to provide provenance information for imported vessels in Egypt has furthered this goal. This type of work is currently being carried out at the Institut français d'archéologie orientale and through on-site study of materials. Petrographic analysis of ceramics examines the clay and inclusions in the pottery in order to locate the geographic source of these raw materials, clarifying the areas in the Levant which provided imported goods to Egypt throughout time.

Examination of a sample of imported ceramic jars found in Egypt from several periods identified some of the trade partners active in these periods and the locations from which goods were acquired for Egyptian use. While areas in the Levant are certainly the primary sources for commodities, jars from Lebanon were identified consistently suggesting this region was of long-standing importance. Most likely this was due to the importation of resin,

as identified through analysis of residue from Late Bronze Age jars, into Egypt.¹ As resin was integral to mummification and ritual practices there is a high chance it was imported in periods before and after the New Kingdom as well. This consistency is set against changes politically in both areas that surprisingly do not seem to have dramatically impacted the movement of goods from Lebanon to Egypt. What does change over time is other trade partners with Egypt. While there is a general trend of expanding markets that bring jars from additional areas, some trade partners seem more significant in certain periods. These conclusions are only a start as additional scientific analyses of jars from more periods may change this impression. Nevertheless, the ability to examine the provenance of imports in Egypt has enabled trade contacts to be more clearly specified and diachronic trends to begin to be identified.

OLD KINGDOM IMPORTS

The earliest evidence of interconnections between Egypt and the Levant comes from sites dating to the Predynastic Period.² Petrographic analysis of Levantine shaped pottery jars from tomb U-j at Abydos revealed some to be imports, while others were possibly produced in Egypt.³

However, recent analysis of later Early Bronze Age jars found in Egypt has revealed all those examined to be imports.

Petrographic analysis of five Levantine Red Polished and Metallic Ware jars from the Early Bronze II and III periods (ca. 3000-2300 BCE) found at the site of Helwan aimed to establish their provenance (Figure 1).⁴ The examination revealed that most vessels were made with an iron-rich clay with rounded inclusions of basalt and shale. Some fine-sized quartz grains were also present. These materials are highly characteristic of the Lower Cretaceous shale outcrop found along the coast of Lebanon between Beirut and Byblos.⁵ A single vessel was produced of a more calcareous Neogene marl clay but still contained basalt fragments. The appearance of the basalt and the type of clay suggested this vessel was more likely produced in the Akkar Plain, possibly near the important Early Bronze Age site of Tell Arqa (Figure 2a).⁶ Thus, the results of this study indicate that these vessels were made along the northern Lebanese coast, possibly at the sites of Byblos and Tell Arqa. Importantly, these vessels were found in tombs that dated to the 2nd Dynasty, ca. 2900 to 2700 BCE, and provide valuable evidence for the continued importation of Levantine goods in this relatively poorly known period.

More well attested are Early Bronze Age jars found in 4th Dynasty contexts, especially the nobles' tombs at Giza.⁷ An opportunity to examine some of the Giza combed ware vessels dated to the Early Bronze Age III period was provided by material from the workmen's settlement at Heit el-Ghurab Giza (Figure 1).⁸ Eighteen jar sherds were examined that dated from ca. 2600-2500 BCE. They derived from the Gallery complex that housed the workmen and the Royal Administrative Building where the high-level bureaucrats lived. Analysis revealed a soil type common in the Levant called *rendzina* that is derived from the weathering of limestone.⁹ The inclusions varied and were either mostly quartz grains and chert, or limestone and shale fragments. The latter group has features indicative of the Lower Cretaceous shale unit, while the former is more characteristic of the geology of the Upper Cretaceous outcrops along the Lebanese coast (Figure 2b).¹⁰ Thus, while the samples had some variability in the clay and inclusions, their source is likely to have been Lebanon. This may also suggest several sites in this area were participating in trade with Egypt. These results are significant because previous analysis of combed ware using chemical data was not able to specify its geologic origin, although it did suggest the pottery was heterogeneous.¹¹ The Giza material has enabled the jars to be clearly tied to Lebanon, as at least one source for the combed ware jars in Egypt.

MIDDLE KINGDOM AND SECOND INTERMEDIATE PERIOD IMPORTS

During the Middle Kingdom and Second Intermediate Period, the site of Tell el-Dab'a, ancient Avaris, in the Eastern Nile Delta undoubtedly played a large role in the importation of jars containing valuable commodities. Petrographic examination

of Middle Bronze Age Canaanite jars from this site by Cohen-Weinberger and Goren¹² revealed that the jars came from a wide range of areas in the Levant, from Syria south along the coast and all the way to southern and inland Palestine. However, Tell el-Dab'a was a large port and held a mixed population of Egyptians, Levantines, and others, so these results may not reflect the acquisition of foreign goods by the rest of Egypt.

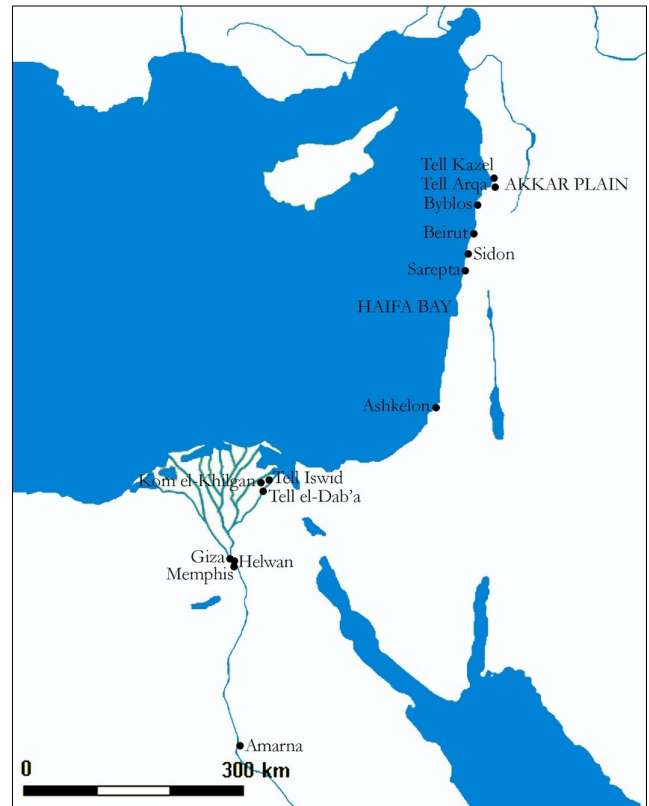


Figure 2: Map showing important sites mentioned in the text

Analysis of Middle Bronze Age jars from the city of Memphis provided another view, although the excavation had fewer strata and was limited to a smaller area of the site than the Tell el-Dab'a excavations. Petrographic and chemical analyses of fifty-six samples of Middle Bronze Age jars from Kom Rabia (Memphis), dated between ca. 1750 and 1550 BCE, revealed two primary areas of exportation, coastal Lebanon and northern coastal Palestine (Figure 1).¹³ Jars from these areas were made with *rendzina*; however, the inclusions of coastal sand varied from those with common bioclasts (calcified remains of oceanic species) and some quartz, to those with plentiful quartz and fewer bioclasts. Study of beach sand along the Levantine coast has revealed that the amount of quartz drops from south to north along the coast of Palestine, and in Lebanon bioclasts are more common than quartz.¹⁴ Therefore, the differences in the beach sand in the jars is likely to reflect various production locations, with the bioclast rich sand indicative of the Lebanese coast and

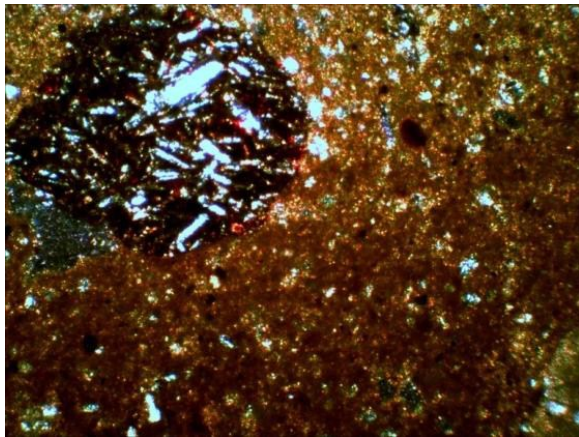


Figure 2a: Helwan EBA jar from Akkar Plain showing basalt fragment

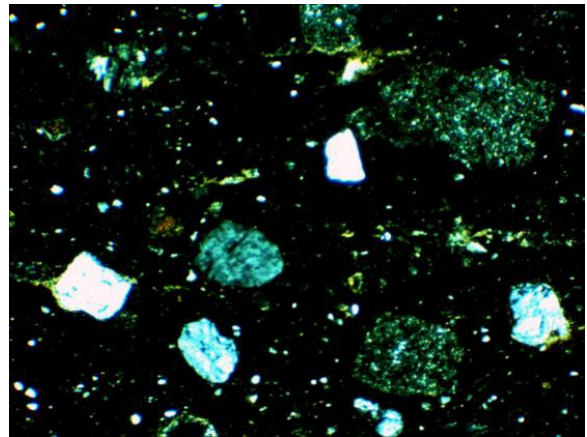


Figure 2b: Giza EBA jar from Coastal Lebanon showing quartz (white) and chert fragments

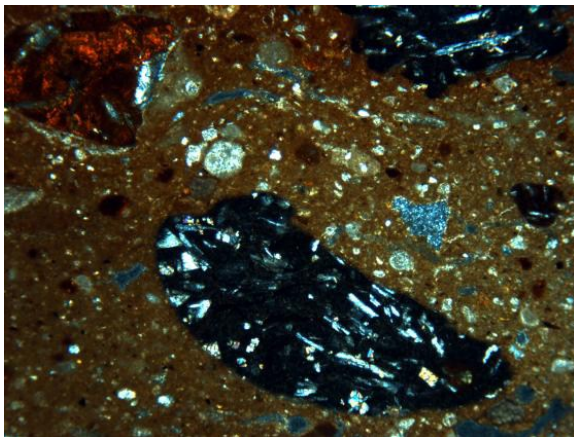


Figure 2c: Memphis MBA jar from Akkar Plain showing basalt fragment

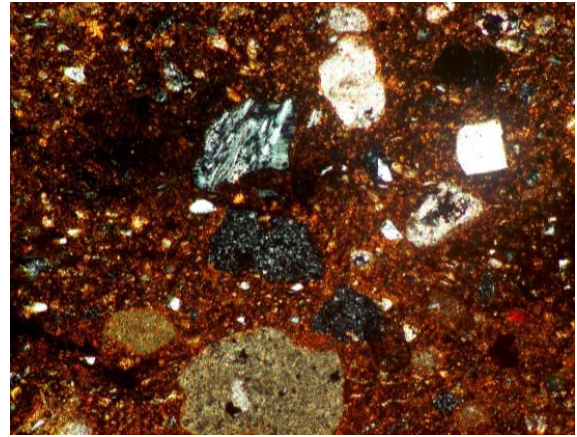


Figure 2d: Kom el-Khilgan MBA jar from Coastal Lebanon showing costal sand

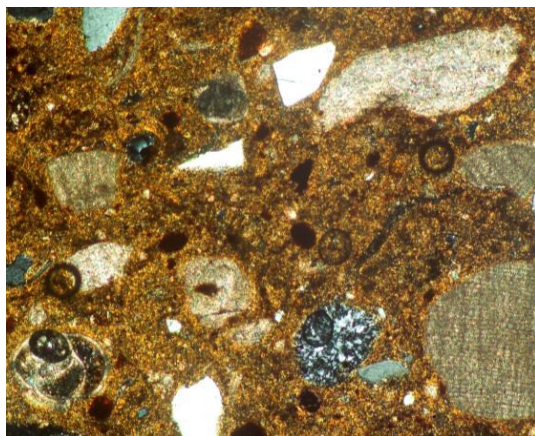


Figure 2e: Tell Iswid Torpedo jar from Coastal Lebanon showing coastal sand

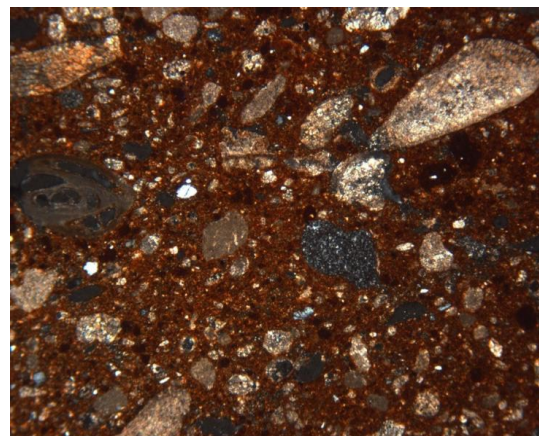


Figure 2f: Amarna LRA from Coastal Lebanon showing coastal sand

Figure 2: Petrographic thin section images of jar samples in cross polarized light. Image width =2.75 mm.

the quartz rich sand characteristic of the Palestinian coast. A few jars were from the Akkar Plain as indicated by the Neogene clay and basalt fragments (Figure 2c). An area probably in northern Lebanon also sent jars that were noticeable by their large limestone fragments and iron-rich clay, which are likely from the Lower Cretaceous shale unit. Finally, one sample was made from loess and fragments of *kurkur*, a calcitic cemented sandstone. Both are common in southern Palestine near Ashkelon.¹⁵

These results indicate that jars produced along the Lebanese and Palestinian coasts were acquired by the inhabitants of both Memphis and Tell el-Dab'a. However, the jars at Tell el-Dab'a derive from several production areas, namely Syria and inland Palestine, which are not attested in the Memphis sample. This may be due to the smaller scale of the Memphis excavation that may not have recovered fragments of less common jars. Other factors affecting this difference in importation could be whether the contents were transported to Memphis and/or the presence of a dominantly Egyptian population at this site. One possibility is that goods from inland Palestine were desirable to the Levantine population at Tell el-Dab'a but not to Egyptians in Memphis. Importantly, both studies provided valuable information on which areas were participating in trade with Egypt during this period and also highlight that Lebanon continued as one of the major trade partners.

These results are further supported by recent analyses of twenty-two Middle Bronze Age Canaanite jars from another Delta site, Kom el-Khilgan (Figure 1).¹⁶ The analysis indicated that eleven of the jars were from the area of coastal Lebanon produced from rendzina clay and coastal sand dominated by bioclasts (Figure 2d). As with the Memphite samples, the slight differences in clay and inclusions of the samples indicated several production areas along the Lebanese coast were probably producing the vessels. A few samples were made with *Hamra*, an iron-rich clay common in Palestine, and quartz dominated beach sand that is characteristic for coastal sand from Palestine.¹⁷ One sample was made with Neogene clay and basalt inclusions that indicate a likely provenance in the Akkar Plain. Finally, one sample, while made of rendzina, had inclusions of iron-stained radiolarian chert and chalcedony. These suggest the vessel more likely came from coastal Syria.¹⁸ While no jars from this area were found at Memphis, they were identified at Tell el-Dab'a. Therefore, for some reason Syrian imported jars appear to be restricted to the Delta, at least based on the current state of research. While more analyses of Middle Bronze Age Canaanite jars are needed, the initial picture is an increase in the number of areas exporting commodities to Egypt during the Middle Kingdom and Second Intermediate Period than in the previous periods.

NEW KINGDOM IMPORTS

The increase in the number of areas exporting commodities

to Egypt in the Middle Kingdom and Second Intermediate Period continues in the New Kingdom. Petrographic analysis of Late Bronze Age (ca. 1550-1200 BCE) Canaanite jars from Amarna and Memphis revealed that while some areas continued to be trade partners in this period, others appear to no longer export goods to Egypt.¹⁹ In the latter category is the area of inland Palestine; no jars were identified that could be petrographically assigned to this area. Perhaps the lack of a Levantine population at Tell el-Dab'a meant that demand for products from this region was no longer present. Areas that continued to export commodities to Egypt included coastal Palestine and Lebanon. The latter jars were made of rendzina clay and had coastal sand inclusions with common bioclasts. Jars from the Akkar Plain are also found in Egypt during the New Kingdom, but petrographically their appearance is different. While basalt inclusions are still present, the clay appears more calcareous and lacks Neogene microfossils.²⁰ This may indicate a different site was producing the vessels, possibly Tell Kazel as it was now an Egyptian administrative center. Late Bronze Age Canaanite jars from Syria continue to be imported to Egypt, but now vessels from Cyprus are also likely to be bringing commodities from this area to the Egyptians. This highlights an expansion of trade partners in a period when Egypt was playing a larger role in the Eastern Mediterranean. This role included creating an empire in the Levant, one which clearly did not affect the exportation of goods from this region to Egypt and in fact may have facilitated an increase in trade. Not surprisingly, the importance of Lebanon as an exporter of valuable commodities also persisted in this period.

LATE PERIOD IMPORTS

Perhaps the pinnacle of trade between Egypt and the Levant occurred in the Third Intermediate and Late periods when Phoenician traders were commonly moving commodities around the Mediterranean. This group mainly occupied the area of the Lebanese coast, a region with a long history of sending exports to Egypt. To examine whether importation of commodities from Lebanon continued, and discoveries of Phoenician type jars appeared to indicate that it did, samples of five different types of torpedo jars (successors to the Canaanite jars) were analyzed petrographically. These jars were found at the site of Tell Iswid in the Delta and dated to the 26th Dynasty, 664-525 BCE, a time when the capital of Egypt was at Sais near to Tell Iswid (Figure 1).

The results indicated that all of the jars were produced with rendzina clay and coastal sand temper.²¹ The sand contained mostly bioclasts with some quartz and chert grains, a composition indicative of the coastal sand found in Lebanon (Figure 2e). In fact, the appearance of all but one of these vessels was similar to a ceramic fabric identified petrographically by Bettles.²² This fabric, her Fabric Class 1A, is believed to be local

to Sarepta and indicates a likely provenance for the Tell Iswid samples. One vessel contained more quartz sand that may suggest a location of production closer to Haifa Bay or Sidon, although the clay was virtually identical. The analysis suggested that different torpedo jar shapes were probably produced at the same site and their various forms may indicate the commodity contained or the presence of different workshops. Furthermore, the preeminence of coastal Lebanon in exporting goods to Egypt has been shown to continue into the Late Period.

LATE ROMAN PERIOD IMPORTS

Egypt’s inclusion in the Roman Empire opened up many more areas as potential trade partners and expanded the range of available commodities. An opportunity to examine the variety of imported jars during the Late Roman or Byzantine period was provided by work conducted on the Coptic Christian settlements at Amarna (Figure 1).²³ These settlements were constructed within the 18th Dynasty nobles’ tombs and also featured external structures. Samples representative of five different types of Late Roman amphorae (LRA) from the 5th

Century CE were examined through petrographic analysis. Additionally, three amphorae that appeared to not be directly related to an established type were also analyzed.

The results confirmed that goods imported to Egypt in this period derived from many areas of the Eastern Mediterranean. Those found at Amarna include a LRA1 vessel and an unknown type that are petrographically from Cyprus or coastal Syria. A LRA3 appears to be from southwestern Turkey or Greece, while an example of a LRA4 seems consistent with its previously suggested provenance of Gaza. Evidence for local production of amphorae was seen in the Nile clay used to make a LRA7 example. Both the LRA8 sample (Spatheion type) and an unknown type contained a clay and inclusions suggestive of a sedimentary area but a specific provenance could not be proposed. More importantly, one of the unknown amphora type samples featured rendzina clay with plentiful bioclasts (Figure 2f). This now well-known recipe is indicative of production along the Lebanese coast. This confirms that even as late as the 5th century CE imported commodities were being acquired from Lebanon, even while many more areas in the Eastern Mediterranean were now providing goods.

Excavation	Date	Number of Samples	Main Petrographic Features	Proposed Provenance
Helwan	ca. 3000-2300 BCE	5	Iron-rich clay and Lower Cretaceous inclusions; Neogene marl clay and basalt inclusions	Northern Lebanon including Akkar Plain
Giza	ca. 2600-2500 BCE	18	Rendzina clay and Lower or Upper Cretaceous inclusions	Lebanon
Memphis	ca. 1750-1550 BCE	34	Rendzina clay and coastal sand or Lower Cretaceous inclusions; Neogene marl clay and basalt inclusions	Coastal Lebanon including Akkar Plain
Kom el-Khilgan	ca. 1750-1550 BCE	12	Rendzina clay and coastal sand inclusions; Neogene marl clay and basalt inclusions	Coastal Lebanon including Akkar Plain
Tell Iswid	664-525 BCE	5	Rendzina clay and coastal sand inclusions	Coastal Lebanon
Amarna	5 th Century CE	1	Rendzina clay and coastal sand inclusions	Coastal Lebanon

Table 1: Summary of samples that are believed to derive from Lebanon

CONCLUSION

The goal of this paper was to bring together the results of a number of recent scientific studies of imports to reveal some diachronic patterns in trade and highlight the significance of

Lebanon as a source of valuable commodities. The studies also reveal changes in trade partners in certain periods, although focus on the Levant appears to have been consistent. This is most likely due to the desirable goods such as resin that can only be found in this area. Lebanon in particular was probably a source

for this commodity. Jars from this area were found in each period studied revealing the consistent need for Lebanese products. One interesting discovery was a change in the materials used to make the jars (Table 1). In the Early Bronze Age raw materials were acquired from the Late Cretaceous Shale unit found in northern Lebanon. However, during the Middle Kingdom and Second Intermediate Period a shift to coastal sand and clay is noticeable. This may relate to the increase in jars coming to Egypt in this period and a focus on coastal Levantine settlements. This change in materials is maintained at least into the 5th century CE. Such changes in raw materials use undoubtedly reflects the economic and social situation in both Egypt and the Levant. Thus, the petrographic analysis of imported jars in Egypt has revealed valuable information on the trade partners Egypt had and the impact this trade may have had on the production of transport jars.

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NOTES

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