



## LATE BRONZE AGE IMPORTS AT QANTIR: PETROGRAPHIC AND CONTEXTUAL ANALYSIS OF FABRIC GROUPS

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### ABSTRACT

*Late Bronze Age imported vessels have been found throughout Egypt during the New Kingdom. Their presence is a tangible testament to the international trade carried out throughout the eastern Mediterranean during this period. Those found at Piramesses/Qantir are particularly important as they represent what was acquired by the royal court in the Nineteenth Dynasty. A petrographic study aimed to clarify the origin of the LBA Canaanite jars and some other imports at Qantir based on a fabric classification system. Examining the prevalence of fabrics from two contexts at the site suggests those areas that were likely key exporters, but also indicates other minor producers may have been involved.*

### INTRODUCTION

The study of imported jars found in Egypt over the last several decades has greatly clarified the extent of trade between Egypt and the Levant. Even in the Predynastic and Early Dynastic period commodities in large ceramic jars were arriving in Egypt from Lebanon and Palestine.<sup>1</sup> This commerce continued in the Middle Kingdom and Second Intermediate Period,<sup>2</sup> but its height was probably in the New Kingdom when Egypt controlled much of the coastal southern Levant. In fact, this “empire” was probably established in part to facilitate trade of goods to Egypt. The significant commodities, as established through residue analysis, were likely oil and resin.<sup>3</sup> The latter was undoubtedly significant for Egyptian temple rituals and as a preservative in mummification.<sup>4</sup>

Previous studies of LBA Canaanite jars in Egypt from a number of sites utilized an existing fabric classification system, which was petrographically studied for those samples from

Memphis, Saqqara, and Amarna.<sup>5</sup> However, the Canaanite jar fabrics from Qantir, some of which were not related to these existing categories, were classified according to their own site-specific system.<sup>6</sup> In order to clarify their origin, a petrographic examination of samples from the site’s fabric study collection was carried out. Second, the results were utilized to examine the presence of the fabrics in two well-studied contexts to investigate which areas in the Levant were likely primary exporters of goods to Egypt at this time and those areas that played a more minor role.

### PETROGRAPHIC STUDY OF REFERENCE COLLECTION

#### Sample Selection

The samples chosen for the petrographic study presented below were selected from the fabric reference collection constituted by David Aston over the course of his work at Qantir in the 1980s and early 1990s. This collection served as a base fabric

reference for the publication of the 1998 pottery volume of Area QI. The set continued to play such a role for a number of other pottery specialists who worked at the site in subsequent years and to the present day. It is also from this assemblage that the fabrics described in the latest pottery volume from the site were made.<sup>7</sup>

However, Aston’s study collection has undergone much change and is no longer comparable to its original status. Due to additional fresh breaks and the repackaging of the collection, some of the proveniences, or even fabric denominations, were erased, which at least for the relatively common fabrics, can often be corrected by analogy to sherds marked with their fabric groups. Therefore, the samples chosen by the ceramicists for the petrographic study were selected among sherds clearly marked with their fabric group and that still bore a readable find-slip number on their surface. All of them are non-diagnostic fragments and, with the exception of the Cypriote Bichrome ware discussed below, undoubtedly belong to rather large vessels, either Canaanite jars or large pilgrim flasks (Table 1).

In sum, the samples that were submitted to petrographic analysis so far were selected solely because of their original reference role for the study of pottery at Qantir, not for any intrinsic contextual, stratigraphical or other special significance. Furthermore, for the time being, only a single sample of each of the visually-identified fabrics was examined, thus not allowing for testing the level of concordance between petrographic data and the fabric’s visual appearance. The current analysis is only a first step towards a more comprehensive study of foreign fabrics at the site. Subsequent analysis will examine a greater number of sherds classified according to this system, but whose contexts, shapes and functions have greater significance within the site of Qantir.

### Petrographic Groups

Thin sections were made and analyzed on-site following standard procedures.<sup>8</sup> A proposed provenance is given based on knowledge of the geology of Egypt, the Levant (Syria, Lebanon, Palestine), and Cyprus<sup>9</sup> and soil maps from Lebanon and Palestine.<sup>10</sup> Other petrographic reports of Levantine imports were consulted.<sup>11</sup> The results are discussed by provenance assignment (see Table 1) and Plate 1 provides thin section images.<sup>12</sup>

#### *Palestine*

Two samples have characteristics that suggest their proposed provenance is the northern coast of Palestine. Fabrics IV.07.11 and IV.07.13 both contain common quartz and bioclasts (calcified remains of oceanic species) in similar amounts and of similar sizes.<sup>13</sup> However, the former is made from a rendzina clay that forms on the limestone outcrops prevalent in the Levant, while the latter sample was produced from a Hamra clay, an iron-rich clay typical of Palestine.<sup>14</sup>

Sample #	Fabric	Proposed Provenance
None	IV.07.01	NA
86/0274	IV.07.02	Levantine (possibly Lebanese)
84/0252a	IV.07.03	Levantine (possibly Lebanese)
84/1234	IV.07.04	Akkar Plain (possibly Tell Kazel)
87/1493	IV.07.05	Likely import (unclear provenance)
92/0773	IV.07.06	Coastal Lebanon (possibly N. Lebanon)
84/1234	IV.07.07	Coastal Lebanon
None	IV.07.08	NA
92/0767	IV.07.09	Syrian
84/1242	IV.07.10	Levantine (possibly Palestine)
88/1037	IV.07.11	Northern Coastal Palestine
92/0443	IV.07.12	Egyptian
92/0021	IV.07.13	Northern Coastal Palestine
87/0469	IV.07.14	Southern Cyprus (possibly SW Cyprus)
None	IV.07.15	Southern Cyprus (possibly SW Cyprus)
92/0115	IV.07.16	Coastal Lebanon (possibly N. Lebanon)
86/0147	IV.07.17	Lebanon
83/1221	IV.07.18	Cyprus (possibly southern Cyprus)
87/1220a	IV.07.19	Southern Cyprus (possibly SW Cyprus)
None	IV.07.20	NA

**Table 1: List of samples and proposed provenance based on petrography**

#### *Lebanon*

Three samples were identified as containing clay and inclusions typical for the area of coastal Lebanon. Fabrics IV.07.06, IV.07.07, and IV.07.16 all contain bioclasts, along with some quartz, chert, and chalcedony. The differences between them include the clay type and amount of inclusions. Common to all of these is the prevalence of bioclasts relative to quartz which is characteristic of beach sand along the coast of Lebanon.<sup>15</sup> The chalcedony and chert from Senonian and Lower Eocene outcrops is also typical for Lebanon.<sup>16</sup>

Fabric IV.07.06 was produced with a Neogene marl mixed with a clay called Terra Rossa. The Neogene marl may suggest this fabric was made in northern Lebanon.<sup>17</sup> Terra Rossa was also added to the clay in Fabric IV.07.07, which in this case was a rendzina. Fabric IV.07.16 was made with rendzina without the addition of Terra Rossa. Its provenance may likewise be northern Lebanon due to the presence of fine-sized plagioclase grains that were seen in samples of Tell el-Yahudiya ware from the site of Tell Arqa.<sup>18</sup> Fabric IV.07.17 contains limestone, some quartz, and a few chalcedony and chert inclusions that suggest it derives from Lebanon. Although bioclasts are missing, the addition of Terra Rossa clay likely suggests a Lebanese fabric.<sup>19</sup>

*Akkar Plain (Northern Lebanon)*

Fabric IV.07.04 is very similar to samples published in Smith et al.<sup>20</sup> with a provenance in the Akkar Plain of northern Lebanon. The sample has a calcareous clay with inclusions of likely Neogene foraminifera and hypocrySTALLINE alkali olivine basalt, pyroxene, limestone, and chert. Such basalt in combination with a Neogene clay is characteristic for the Akkar Plain.<sup>21</sup>

*Syria*

The calcareous clay with chert (both radiolarian and replacement), limestone, pyroxene, serpentine, foraminifera, and bioclasts inclusions suggests Fabric IV.07.09 is Syrian. The mixture of sedimentary and volcanic components is indicative of an ophiolite complex. Such a geologic formation is known from southern Cyprus, the Hatay region of Turkey, and northwestern Syria.<sup>22</sup> However, only the latter has common radiolarian chert. This sample is similar to the one analyzed by Smith et al.<sup>23</sup> that was believed through comparative analyzes to derive from northwest Syria.

*Cyprus*

Three fabrics, IV.07.14, IV.07.15, and IV.07.19, have inclusions suggestive of a provenance in southern Cyprus. Fabric IV.07.14 has a mostly calcareous clay with some plutonic rock fragments and their individual grains. Limestone, chert, and microfossils are also present along with a few rock fragments that could be metamorphic. Other notable inclusions are serpentine and iron-rich argillaceous rock fragments (ARF). These sedimentary and volcanic inclusions indicate an ophiolite complex, but one lacking in radiolarian chert and with a possible minor component of metamorphic rocks. Such features suggest the Mamonia Complex in southwestern Cyprus.<sup>24</sup> In fact, the iron-rich argillaceous rock fragments are common to Cypriot fabrics<sup>25</sup> and were seen in a variety of ceramic samples petrographically analyzed from the area of Kouklia near Paleopaphos.<sup>26</sup>

Fabric IV.07.15 is similar to Fabric IV.07.14 but lacks the microfossils seen in the latter. Nevertheless, the inclusions are indicative of southern Cyprus, which has several geological sources for clay including the Miocene Pakhna and Paleogene Lefkara formations.<sup>27</sup> Some of these sources probably lack microfossils.

Microfossils are present in the sample from Fabric IV.07.19 along with a few plutonic rock fragments and their constituent minerals. The clay is iron rich and includes a few iron-rich ARF, while limestone, chert, pyroxene, and serpentine are more common. Although this is still indicative of southern Cyprus, the raw materials could derive from an area further from the metamorphic Mamonia complex. The differences in these fabrics

may reflect a number of production locations in southern Cyprus.<sup>28</sup>

Fabric IV.07.18 is from a Cypro-Palestinian Bichrome jug that was previously published under the fabric appellation IV.07.19.<sup>29</sup> Neutron Activation Analysis identified the sherd as Cypriot.<sup>30</sup> Its appearance suggests a calcareous and iron-rich clay was levigated to create a fine paste. The few inclusions include muscovite, quartz, and some micritic limestone. A few iron-rich ARF and microfossils are also present. Along with the ARF that are typical for Cypriot fabrics, the inclusions also find parallels with other Cypriot samples and suggest this is the origin of the vessel. Comparison to other petrographically analyzed fine-wares may indicate whether the vessel is from southern Cyprus as seems likely.

*General Levantine*

Several fabrics had inclusions that while characteristically Levantine, are not indicative of a specific area in the Levant. Direct comparison to other Late Bronze Age Levantine fabrics is necessary to provide a more secure provenance assignment.

Fabric IV.07.02 has common quartz grains and some bioclasts in a rendzina clay with some Terra Rossa addition. The lack of chert and chalcedony and presence of more quartz than bioclasts, may suggest a location in Palestine.

Fabric IV.07.03 is composed of a rendzina with the addition of Terra Rossa at a significant level creating a reddish fabric. The other inclusions, including fine-sized volcanic rock fragments, suggest a source from either parts of coastal Palestine, the Lower Cretaceous exposures around Byblos, the Akkar Plain, or northwestern Syria. Cyprus is unlikely due to a lack of ARF or metamorphic inclusions. In comparison with other samples, Syria, the Akkar Plain, and Palestine also do not compare well. The iron-rich nature of this sample and the Terra Rossa suggest the Lower Cretaceous unit in northern Lebanon as the best possibility.

Fabric IV.07.10 has common quartz and limestone with some bioclasts in a rendzina clay. The common quartz may suggest Palestine as a likely provenance especially given the lack of chert and chalcedony, but few directly comparable samples are known.

*Uncertain*

The single sample of IV.07.05 analyzed was shown to have been produced from a calcareous clay with inclusions of limestone and quartz that were likely added. While it does resemble Egyptian marls, marl clays are also present in the Levant. Its use for a Canaanite jar suggests further study is needed to confirm its provenance. Aston has suggested this sample may not be representative of the fabric group.<sup>31</sup> Due to its prevalence as a Canaanite jar fabric it will continue to be considered an imported type until further petrographic clarification.

PREVALENCE OF FABRICS FROM TWO QANTIR CONTEXTS

Due to the paucity of stratigraphical information for the analysed samples, two securely datable and significant features were chosen to examine the prevalence of imported fabrics at Qantir, the well of Sama’na and a layer of pottery in square b/9 in area QV (Table 2). However, within these two assemblages, no diachronic development can be shown as the study of the ceramic material is ongoing. Instead, two synchronic impressions of the moments in which the material was deposited are given. As they are both closed but secondary contexts it has to be borne in mind that the dates given are only an indication of a *terminus ante quem*.

Both contexts are exceptional not only for their well-established stratigraphical position but also for the total amount of material they contained and their share of ceramics of Levantine origin, which is much higher than in most other Qantir complexes. This makes them valuable for the purpose of giving an insight into the variability of fabrics at a specific time. However, this fact means that both assemblages are non-representative samples for

the larger site. The well and the building from QV are official facilities.<sup>32</sup> In both cases the deposited ceramic material was out of its primary context and had no function related to certain shapes or fabrics. The pottery, presumably already broken to a certain extent when deposited, was probably taken at random from a nearby, easily accessible location, most likely some kind of a refuse dump.<sup>33</sup> Therefore, one can note the presence of a certain shape or fabric in these assemblages, but not make conclusions based on their absence.<sup>34</sup>

Furthermore, the determination of the fabrics was done by visual examination under 10x magnification, comparing the sherd material with the fabric reference collection discussed above. Although such visual examination is generally reliable, it does not afford for the same precision as petrographic analysis and may be influenced by a variety of factors, such as different firing and/or different conditions of preservation. Therefore, any possible misidentification regarding the classification of those is transferred to the results that will be presented in the following discussion.

QI		QIV		QV		Sama’na		Dating
Layer	Function	Layer	Function	Layer	Function	Layer	Function	
-	-	Aa'	Canal	-	-			Persian Period
A/1	Perturbations	Aa	Squatter	-	-			Post 3rd Intermediate Period
A/2	Cemetery	Ab	Cemetery	-	Perturbations?			22nd/21st Dynasty
		Ac		-				
B/1	Demolition of precursors	Ba	Residential area	B/0	Fillings/pits/perturbations			21st/20th Dynasty
B/2a	Exercise-square/arsenal	Bb	Royal stud	B/1	"Foreign office"			20th/19th Dynasty
B/2b	Exercise-square/arsenal	Bc	Precursor Stable	B/2	Precursor "foreign office"	B	Well	19th Dynasty
B/3a	Bronze-industries/workshops	Bc/d	Glass industries	B/3	Glass industries			
B/3b	Bronze-industries/workshops	Bd/e	Workshops					
C	?(contaminated sands)	Be/f	Residential area	-				19th/18th Dynasty
D/1	Settlement/ pits	Bf/g	Settlement/ pits	-				18th Dynasty

Table 2: Overview of the stratigraphy of Qantir-Piramesses. The Levantine pottery assemblages discussed in this section come from the layers appearing in light grey (QV and Sama’na) in the table below. The sherds that were submitted to petrographic analysis and that are discussed in the ‘petrographic group’ paragraphs come from the strata colored in dark grey, in Areas QI and QIV.<sup>35</sup>

Fabric	Number of fragments	Percentage amongst Levantine Material	Percentage amongst overall material from context
			(Sherd count = 26,085)
IV.07.04	23	0.97%	0.09%
IV.07.05	490	20.72%	1.88%
IV.07.07	108	4.57%	0.41%
IV.07.09	947	40.04%	3.63%
IV.07.10	101	4.27%	0.39%
IV.07.11	235	9.94%	0.90%
IV.07.12	34	1.44%	0.13%
IV.07.13	120	5.07%	0.46%
IV.07.14	1	0.04%	0.00%
IV.07.15	133	5.67%	0.51%
IV.07.16	39	1.65%	0.15%
Import unknown[i]	94	3.97%	0.36%
Total	2,365	100%	9.15%

[i] This term refers to fabrics which could not be fitted into the existing system but which by their appearance and texture were identified as possible Levantine

**Table 3: Levantine fabrics from the Sama’na-well, (FZN<sup>39</sup> 00/0027a; 01/0010a)**

**The Well of Sama’na**

The construction of the well of Sama’na can be securely dated between the 8<sup>th</sup> and the 67<sup>th</sup> regnal year of Ramesses II by an inscription on its casing blocks.<sup>36</sup> As suggested by joining fragments of vessels, it can be assumed that at the bottom two undisturbed pottery layers, which served as water filters,<sup>37</sup> were deposited contemporaneously. These two layers contained a total of 26,085 ceramic sherds out of which 2,365 were assigned to Levantine fabrics – a rate of 9.15%. This percentage is considerably higher than what it appears in most other assemblages. Eleven different fabrics from the known system could be identified, while other fabrics interpreted as Levantine imports could not be fitted into the established fabric system.<sup>38</sup> The most common amongst the Levantine imports was the otherwise rather infrequent IV.07.09, which accounted for about 40% of the sherd count of Levantine fabrics or more than 3.5% of the overall sherd count. As this ratio has not been matched elsewhere in Qantir, it should be interpreted as a sign of the uniqueness of this assemblage. In second and third places respectively, IV.07.05 and IV.07.11 are to be found – two fabrics, which are amongst the most common at the site (Table 3). Only some of the very rare imports are missing from the material from the well.

**Area QV – Square b/9**

The second pottery assemblage considered here originates from an area below a presumably official building uncovered in

square b/9 with two occupational phases, the second of which might be dated to the end of the 19<sup>th</sup> Dynasty (Stratum B/1).<sup>40</sup> A *terminus ante quem non* for B/1 is given by a faience mould that names a “*pr-T3wsr.t*”. The floor of the building of the previous phase, Stratum B/2, seals a layer, which is most probably connected to a workshop related to glass-production. Within Stratum B/3 a layer containing a large amount of pottery was found. The material was lying on top of a floor of this stratum, relating the sherds to the end of its period of use. As this feature had not been disturbed by later activities, all objects from that layer can be assigned to a chronological position contemporaneous to Stratum B/3, i.e. the mid-19<sup>th</sup> Dynasty (see Table 2). This floor layer was composed of a sandy clay, mixed with slags, oxidised lumps of clay and a large amount of pottery. The ceramic material within square b/9 of Stratum B/3 is again not representative for the general situation at Qantir as the rate of Levantine pottery amounted to almost 64% of the overall sherd count. The comparative ratio for the whole locus QV is 9.28%.<sup>41</sup> If the complex used in this study is excluded from the count, the ratio is down to 6.20% (Table 4). This high percentage of imports shows that the pottery found here had been taken from a very specific place – perhaps a warehouse or distribution centre.

Fabrics IV.07.03 and IV.07.14 in square QV-b/9 are not present anywhere else in QV, and only IV.07.13 is not present amongst the material (Table 5). The ranking of the most common fabrics, on the other hand, shows little variability. IV.07.04, IV.07.05 and IV.07.11 account for the biggest share in both QV-b/9 and the assemblages from the rest of QV. But there are remarkable differences to the Sama’na-well. Especially IV.07.09,

Fabric	Number of Fragments	Percentage Amongst Levantine Material	Percentage Amongst Overall Material from Locus
			(Sherd Count = 38,069)
IV.07.03	0	0%	0%
IV.07.04	493	20.90%	1.30%
IV.07.05	927	39.30%	2.44%
IV.07.06	34	1.44%	0.09%
IV.07.07	18	0.76%	0.05%
IV.07.09	58	2.46%	0.15%
IV.07.10	68	2.88%	0.18%
IV.07.11	624	26.45%	1.64%
IV.07.12	81	3.43%	0.21%
IV.07.13	28	1.19%	0.07%
IV.07.14	0	0%	0%
Import unknown	28	1.19%	0.07%
Total	2,359	100%	6.20%

**Table 4: Levantine fabrics from QV, all contexts and all FZN, excluding FZN 2000/0380; 0411; 0442; 0605; 0626**

Fabric	Number of fragments	Percentage amongst Levantine Material	Percentage amongst overall material from context
			(Sherd count = 2,146)
IV.07.03	18	1.31%	0.84%
IV.07.04	349	25.44%	16.26%
IV.07.05	398	29.00%	18.55%
IV.07.06	71	5.17%	3.30%
IV.07.07	38	2.77%	1.77%
IV.07.09	15	1.09%	0.70%
IV.07.10	111	8.09%	5.17%
IV.07.11	256	18.66%	11.93%
IV.07.12	5	0.36%	0.23%
IV.07.13	0	0%	0%
IV.07.14	43	3.13%	2.00%
Import unknown	68	4.96%	3.17%
Total	1,372	100%	63.93%

Table 5: Levantine fabrics from QV, Square b/9 (FZN 2000/0380; 0411; 0442; 0605; 0626)

Fabric	Proposed Provenance	Memphis/Amarna Group	Well	QV (b/9)
IV.07.02	Levantine (possibly Lebanese)	Unknown	Not recorded	Not recorded
IV.07.03	Levantine (possibly Lebanese)	Unknown	Not recorded	Rare
IV.07.04	Akkar Plain (possibly Tell Kazel)	Group 3	Rare	Common
IV.07.05	Likely import (unclear provenance)	Unknown	Common	Common
IV.07.06	Coastal Lebanon (possibly N. Lebanon)	Group 5	Not recorded	Rare
IV.07.07	Coastal Lebanon	Group 5	Rare	Rare
IV.07.09	Syrian	Group 4	Very common	Rare
IV.07.10	Levantine (possibly Palestine)	Unknown	Rare	Rare
IV.07.11	Northern Coastal Palestine	Group 2	Rare	Common
IV.07.12	Egyptian	None	Rare	Rare
IV.07.13	Northern Coastal Palestine	Group 2	Rare	None
IV.07.14	Southern Cyprus (possibly SW Cyprus)	Group 6	Rare	Rare
IV.07.15	Southern Cyprus (possibly SW Cyprus)	Group 6	Rare	Not recorded
IV.07.16	Coastal Lebanon (possibly N. Lebanon)	Group 5	Rare	Not recorded
IV.07.17	Lebanon	Unknown	Not recorded	Not recorded
IV.07.18	Cyprus (possibly southern Cyprus)	Group 6?	Not recorded	Not recorded
IV.07.19	Southern Cyprus (possibly SW Cyprus)	Group 6?	Not recorded	Not recorded

Table 6: Summary of fabrics from the investigated contexts and suggested correlation with petrographic groups from Memphis and Amarna. Unknown are those that cannot at the moment be positively linked to any of the Memphis/Amarna imported fabrics.

which accounted for about 40% of the sherd-count at Sama'na, here only accounts for about 1%.

## DISCUSSION

The petrographic results reported here show the extent of trade contacts for this period, something already seen for the sites of Memphis, Saqqara, and Amarna, but now also confirmed for Qantir. These results support previous work that also suggested the trading partners did not change from the 18<sup>th</sup> to 19<sup>th</sup> Dynasties and it seems unlikely that the military involvement of Egypt in the Levant greatly affected its interregional commerce.<sup>42</sup> More specific details on differences between the imports from Amarna and Qantir will have to wait for direct comparative analysis,<sup>43</sup> but generally a few things can be identified. Qantir fabrics IV.07.11 and IV.07.13 are similar to Fabric Group 2 from the northern coast of Palestine as seen in the LBA Canaanite jars from Memphis and Amarna (Table 6).<sup>44</sup> The Qantir fabrics may include some samples from Group 1, but basalt fragments were not identified in the two Qantir samples as they were in the Amarna and Memphis fabrics. Qantir fabric IV.07.04 is very similar to Group 3 in the Memphis and Amarna material both in terms of clay and inclusions.<sup>45</sup> Less clear is the connection between Qantir fabric IV.07.09 and Group 4. Both have radiolarian and replacement chert, basalt, and serpentine, however, the Qantir example did not contain quartzite or schist.<sup>46</sup> While both Group 4 and fabric IV.07.09 do derive from Syria, they may have been produced in

slightly different areas. Group 5 is assigned to coastal Lebanon and there was notable variability in the samples.<sup>47</sup> Such variability explains why at Qantir three different fabrics were assigned this provenance. Undoubtedly, some are similar to those from Memphis and Amarna, but there are probably others that reflect either different locations along the Lebanese coast or workshops utilizing slightly different raw materials. Finally, Group 6 comprises those samples from Amarna and Memphis assigned a provenance of southern Cyprus.<sup>48</sup> In comparison to the three fabrics from Qantir with this provenance, IV.07.14 and IV.07.15 may be the most analogous since they have little chert but inclusions of plagiogranite. As with the other samples, direct comparison is needed to determine how similar the fabrics are and if differences suggest changes in production locations associated with the latter part of the New Kingdom.

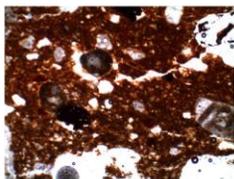
The general contextual data from the analyzed sherds and the frequency of fabrics from two well-dated contexts provide information on which areas were key to exporting goods to Egypt during the Ramesside period. The earlier context is probably the well of Sama'na, dated to the reign of Ramesses II (see Table 6). In this period, the common fabrics were the IV.07.05 (likely import with unclear provenance), or Syrian. This may either reflect preferences at the time or the availability of material to fill the well. The Levantine imports from Square b/9 in area QV are likely dated to almost the same period. The IV.07.05 fabrics are also common here along with vessels which probably come from the Akkar Plain and northern coastal Palestine, a production location that was prevalent throughout the New Kingdom.<sup>49</sup> However, this context is also unique and may represent the imports specific to a warehouse.

## CONCLUSION

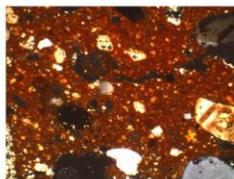
These results while preliminary and requiring additional petrographic examination and comparison, do shed some light on importation trends during the 19<sup>th</sup> and 20<sup>th</sup> Dynasties for the capital of Egypt. They suggest that some of the locations exporting goods to Egypt during the early part of the New Kingdom continued to do so in the later New Kingdom, while others may have been less significant. Undoubtedly, political changes both within Egypt and the Levant affected trade if only on a small scale. Clearly, Eastern Mediterranean trade was a complex endeavor with many participants. Further studies should continue to illuminate these patterns through the analysis of Qantir imports from more secure and more varied contexts. Shape information may also be added to examine any connection between vessel form and location of production.

## ACKNOWLEDGMENTS

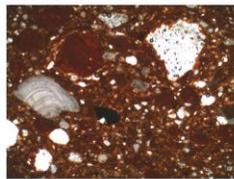
This research was facilitated by the Ministry of Antiquities. Work at Qantir was made possible by Prof. Thilo Rehren and Dr. Edgar Pusch. Appreciation is owed to Ms. Janine Bourriau and Dr. Laurence Smith from the University of Cambridge for the opportunity to study petrographically MBA and LBA Canaanite jars from Egypt. Much gratitude is given to Dr. Yuval Goren of the University of Tel Aviv for his enormous help in understanding Levantine ceramic raw materials. Valuable comments were contributed by two reviewers.



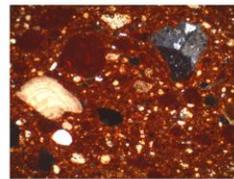
IV.07.02 - PPL



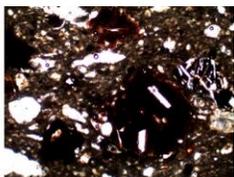
IV.07.02 - XPL



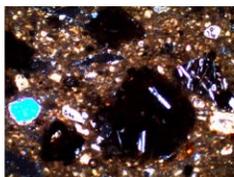
IV.07.03 - PPL



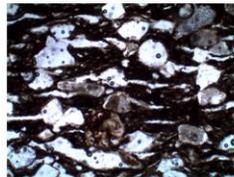
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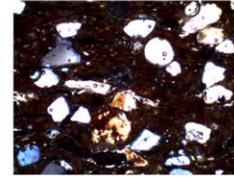
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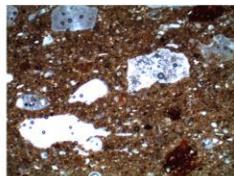
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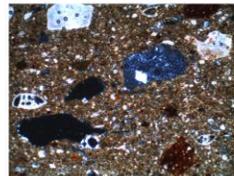
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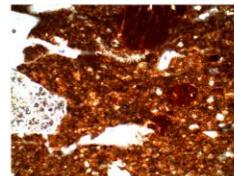
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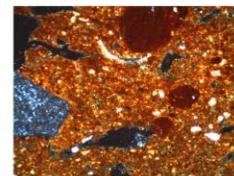
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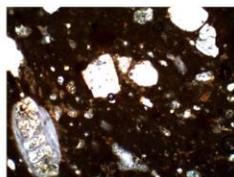
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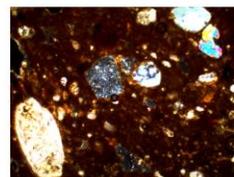
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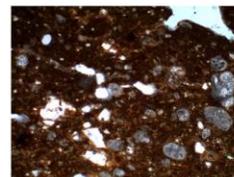
IV.07.07 - XPL



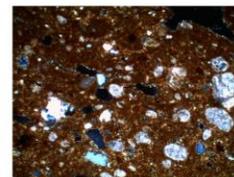
IV.07.09 - PPL



IV.07.09 - XPL



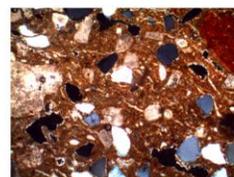
IV.07.10 - PPL



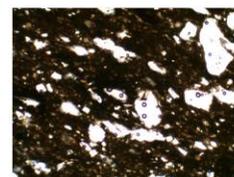
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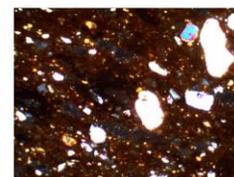
IV.07.11 - PPL



IV.07.11 - XPL



IV.07.12 - PPL



IV.07.12 - XPL

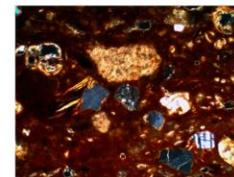
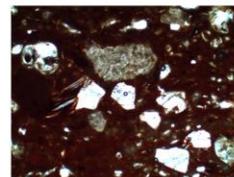
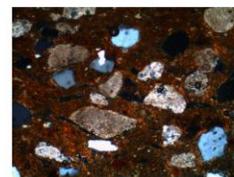
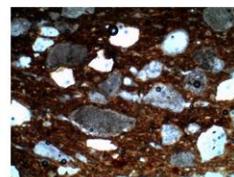


Plate 1

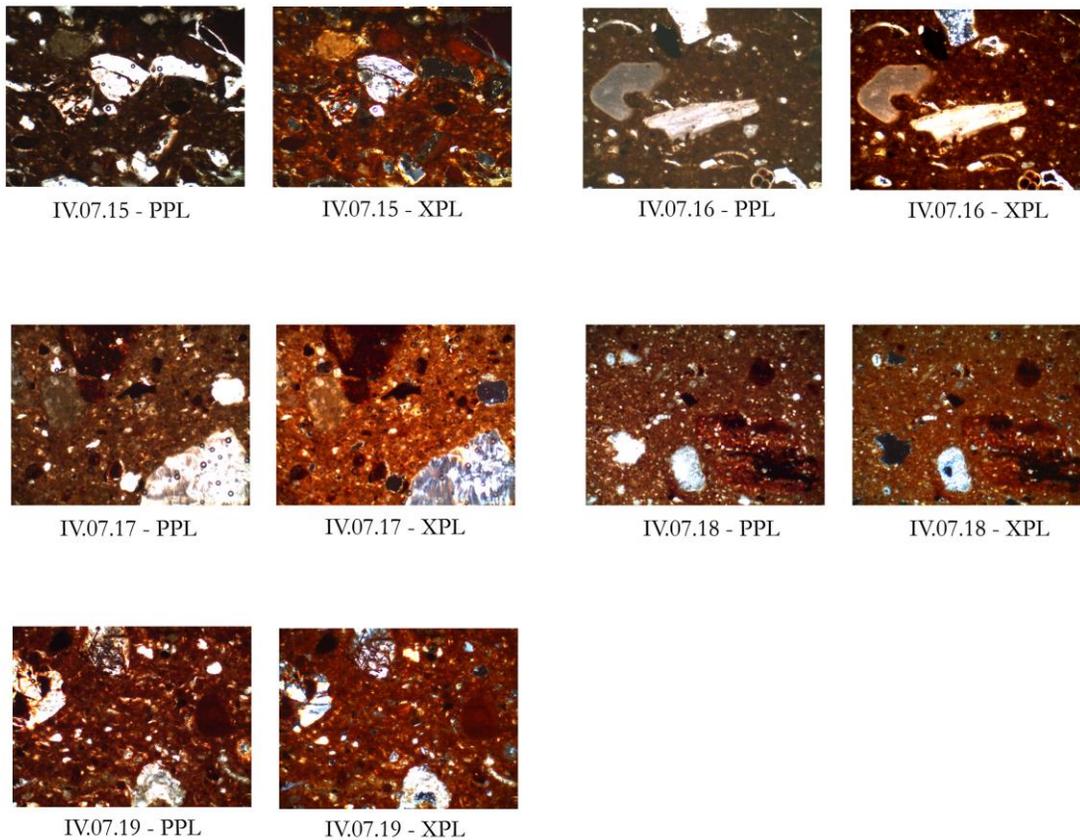


Plate 2

NOTES

- <sup>1</sup> Mary Ownby, "Petrographic Analysis of Pottery from Tell el-Farkha," in Agnieszka Mączyńska (ed.), *The Nile Delta as a centre of cultural interactions between Upper Egypt and the Southern Levant in the 4th millennium BC*. Studies in African Archaeology 13. (Poznan: Poznan Archaeological Museum and authors, 2014), 217-235.
- <sup>2</sup> Anat Cohen-Weinberger and Yuval Goren, "Levantine-Egyptian Interactions During the 12th to the 15th Dynasties based on the Petrography of the Canaanite Pottery from Tell el-Dab'a," *Ägypten und Levante XIV* (2004): 69-100.; Mary Ownby, *Canaanite Jars from Memphis as Evidence for Trade and Political Relationships in the Middle Bronze Age*, Unpublished PhD Thesis (University of Cambridge, 2010).
- <sup>3</sup> Margaret Serpico, *Mediterranean Resins in New Kingdom Egypt: A Multidisciplinary Approach to Trade and Usage*, Unpublished PhD Thesis (University College London, 1996).; Margaret Serpico and Raymond White, "The Botanical Identity and Transport of Incense during the Egyptian New Kingdom," *Antiquity* 74 (2000): 884-897.
- <sup>4</sup> Benjamin Stern, Carl Heron, Lorna Corr, Margaret Serpico, and Janine Bourriau, "Compositional Variations in Aged and Heated Pistacia Resin found in Late Bronze Age Canaanite Amphorae and Bowls from Amarna, Egypt," *Archaeometry* 45 (2003): 457-469.
- <sup>5</sup> Laurence M.V. Smith, Janine Bourriau, Yuval Goren, Michael Hughes, and Margaret Serpico, "The Provenance of Canaanite Amphorae found at Memphis and Amarna in the New Kingdom: results 2000-2002," in Janine Bourriau and Jacke Phillips (eds), *Invention and Innovation: The Social Context of Technological Change 2, Egypt, the Aegean and the Near East, 1650-1150 BC* (Oxford: Oxbow Books, 2004), 55-77.
- <sup>6</sup> David Aston, *Qantir I. Die Keramik des Grabungsplatzes Q1. Teil 1. Corpus of Fabrics, Wares, and Shapes* (Mainz am Rhein: Verlag Phillip von Zabern, 1998), 69-72.; David Aston, Hans Mommsen, Penelope Mountjoy, Edgar Pusch, and Thilo Rehren, "Die in- und ausländischen Werkstoffe der Grabung Qantir in Wort und Bild," in Edgar Pusch (ed.), *Die Keramik des Grabungsplatzes Q1. Teil 2: Schaber – Scherben –*

- Marken* (Hildesheim: Verlag Gebrüder Gerstenberg, 2007), 513-555.
- <sup>7</sup> See above, note vi.
- <sup>8</sup> Janine Bourriau and Paul Nicholson, "Marl Clay Pottery Fabrics of the New Kingdom from Memphis, Saqqara and Amarna," *The Journal of Egyptian Archaeology* 78 (1992): 29-91.; Janine Bourriau, Laurence M.V. Smith, and Paul Nicholson, *New Kingdom Pottery Fabrics: Nile clay and mixed Nile/Marl clay fabrics from Memphis and Amarna* (London: The Egypt Exploration Society, 2000).; Ian Whitbread, *Greek transport amphorae: a petrological and archaeological study*, Fitch Laboratory Occasional Paper 4 (Athens: British School at Athens, 1995).
- <sup>9</sup> See Ownby 2010.
- <sup>10</sup> Moshe Wieder, and David Adan-Bayewitz, "Soil Parent Materials and the Pottery of Roman Galilee: A Comparative Study", *Geoarchaeology* 17 (2002): 393-415.
- <sup>11</sup> i.e. Cohen-Weinberger and Goren 2004; Smith et al. 2004.
- <sup>12</sup> The full petrographic description for each sample is contained in an unpublished report that can be acquired through request to the first author.
- <sup>13</sup> Dorit Sivan, Gedaliahu Gvirtzman, and Eytan Sass, "Quaternary Stratigraphy and Paleogeography of the Galilee Coastal Plain, Israel," *Quaternary Research* 51 (1999): 280-94.
- <sup>14</sup> Hlaiwi, M., *Soil Map of Arab Countries, Soil Map of Syria and Lebanon*, (Damascus: The Arab Center for the Studies of Arid Zones and Dry Lands, Soil Sciences Division, 1985); Dorit Sivan, *Paleogeography of the Galilee coastal plain during the Quaternary*, Report GSI/18/96 (Jerusalem: Geological Survey of Israel, 1996).
- <sup>15</sup> Binyamin Buchbinder, "Stratigraphic significance of the alga *Amphiroa* in Neogene-Quaternary bioclastic sediments from Israel," *Israel Journal of Earth Sciences* 24 (1975): 44-48.
- <sup>16</sup> Zaid R. Beydoun, "The Levantine countries: the geology of Syria and Lebanon (maritime regions)," in Alan E.M. Nairn, William H. Kaner, and Francis G. Stehli (eds), *The ocean basins and margins. 4A: The eastern Mediterranean* (Plenum Press: New York and London, 1977), 319-353.
- <sup>17</sup> Beydoun 1977.
- <sup>18</sup> Hanan Charaf and Mary Ownby, "The Tell el-Yahudiya Ware from Tell Arqa," in Manfred Bietak and David Aston (eds), *Tell el-Dab'a VIII. The Tell el-Yahudiya Ware and its Classification* (Wien: Verlag der Österreichischen Akademie der Wissenschaften, 2012), 591-620.
- <sup>19</sup> Cohen-Weinberger and Goren 2004:73.
- <sup>20</sup> Smith et al. 2004: 61, 64-65.
- <sup>21</sup> Louis Dubertret, "Introduction à la Carte Géologique à 1/50,000e du Liban," *Notes et mémoires sur le Moyen-Orient* 13 (1974): 345-403.
- <sup>22</sup> Hubert Whitechurch, Thierry Juteau, and Raymond Montigny, "Role of Eastern Mediterranean ophiolites (Turkey, Syria, Cyprus) in the history of the Neo-Tethys," in John E. Dixon and Alastair H.F. Robertson, (eds), *The Geological Evolution of the Eastern Mediterranean* (Oxford: The Geological Society, 1984), 301-317.
- <sup>23</sup> Smith et al. 2004: 61-62, 65-66.
- <sup>24</sup> Ian G. Gass, Christopher J. MacLeod, Bramley J. Murton, Andreas Panayiotou, Kapo Simonian, and Costas Xenophontos, *The Geology of the Southern Troodos Transform Fault Zone*. Cyprus Geological Survey Department Memoir No. 9 (Nicosia: Geological Survey Department, 1994).
- <sup>25</sup> Sarah J. Vaughan, "Late Cypriote Base Ring wares: studies in raw materials and technology," in Andrew Middleton and Ian Freestone (eds), *Recent Developments in Ceramic Petrology*, British Museum Occasional Paper No. 81 (London: The British Museum, 1991), 337-368.
- <sup>26</sup> Mary Ownby, *Kouklia Petrographic Analysis Report*. Unpublished report.
- <sup>27</sup> Geological Map of the Pafos-Kallepeia Area, Sheet 16 III & IV 1:25,000 (Nicosia: Geological Survey Department of Cyprus, 2008).
- <sup>28</sup> Richard E. Jones and Sarah J. Vaughn, "Appendix IV, Part 2: A Study of Some „Canaanite“ Jar Fragments from Maa-Palaeokastro by Petrographic and Chemical Analysis," in Vasos Karageorghis and Martha Demas (eds.), *Excavations at Maa-Palaeokastro 1979-1986* (Nicosia: Department of Antiquities, Cyprus, 1988), 386-398.
- <sup>29</sup> Aston 1998:632, no 2566.
- <sup>30</sup> Penelope Mountjoy and Hans Mommsen 'Mycenaean Pottery from Qantir-Piramesse, Egypt' *Annual of the British School at Athens* 96 (2001):123-155.
- <sup>31</sup> David Aston, personal communication June 2014. "I can only suggest that perhaps the sample 87/1493, which is not a published piece, was misidentified by me in the first place."
- <sup>32</sup> The well was inscribed with the royal protocol of Ramesses II and can therefore be identified as an official installation. See also below.
- <sup>33</sup> Almost no vessel could be reassembled completely, even though in both cases during and after processing considerable efforts were taken.
- <sup>34</sup> The absence of evidence does not necessarily mean evidence of absence. See John Gee, "Egyptologists' Fallacies: Fallacies Arising from Limited Evidence," *Journal of Egyptian History*, 3 (2010): 137-158.
- <sup>35</sup> After Franzmeier 2010, 57, Tab. 06, adapted from Pusch and Rehren 2007, 130, Tab. 19.
- <sup>36</sup> For the well see Henning Franzmeier, *Ein Brunnen in der Ramsesstadt. Untersuchungen zu Typologie und Funktion von Brunnenbauwerken im Ägypten des Neuen Reiches* (Hildesheim: Verlag Gebrüder Gerstenberg, 2010). For the inscription and the dating see *ibid.*, 41-43.

<sup>37</sup> Henning Franzmeier, "The Secondary Function of Pottery - A Case Study from Qantir-Piramesses," in Bettina Bader and Mary F. Ownby (eds.), *Functional Aspects of Egyptian Ceramics in their Archaeological Context. Proceedings of a Conference held at the McDonalds Institute for Archaeological Research, Cambridge, July 24th - July 25th 2009* (Leuven - Paris - Walpole, MA: Ujtgiverij Peeters en Departement Oosterse Studies, 2013), 293-306.

<sup>38</sup> These fabrics will be subject to further analysis in the future.

<sup>39</sup> The acronym FZN stands for „Fundzettelnummer“ – find-slip-number. Within the recording system of Qantir, it is used for defining the relationship between a find and its context. This means that finds of one type from a specific archaeological feature or context will be assigned one specific FZN. In case of pottery, where thousands of fragments may come from a single context, the assemblage will receive the same FZN, say FZN 00/0027a, while the individual sherds within the

assemblage will be assigned comma-numbers, such as 00/0027a, 0001-n.

<sup>40</sup> QV has not yet been published comprehensively. For an introduction into the site see Edgar B. Pusch and Thilo Rehren, *Hochtemperatur-Technologie in der Ramses-Stadt. Rubinglas für den Pharaon*, 2 vols. (Hildesheim: Verlag Gebrüder Gerstenberg, 2007), vol. 1, 41-44.

<sup>41</sup> From QV a total of 39,512 ceramic sherds was recovered out of which 2,941 were of Levantine origin. Outside the context discussed here the numbers are respectively 37,160 and 1,383.

<sup>42</sup> Serpico and White 2000.

<sup>43</sup> Ownby examined the LBA Canaanite jar thin sections from Memphis and Amarna as part of her PhD research at the University of Cambridge.

<sup>44</sup> Smith et al. 2004: 58, 63-64.

<sup>45</sup> Smith et al. 2004: 64-65.

<sup>46</sup> Smith et al. 2004: 61, 65.

<sup>47</sup> Smith et al. 2004: 62, 71, 73.

<sup>48</sup> Smith et al. 2004: 67-70.

<sup>49</sup> Smith et al. 2004