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PETROLOGICAL EXAMINATION OF AMPHORAE FROM COLCHESTER - SHEEPEN

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INTRODUCTION

Sixty-three sherds of amphorae from the 1970 excavation at Colchester-Sheepen were submitted for thin section study under the petrological microscope. In addition, three of the sherds were subjected to a heavy mineral separation. The total number of samples analyzed represent just under half of the minimum number of amphorae recovered from the site. The main object of the examination was twofold: (1) to characterize in detail the fabrics involved, and (2) if possible to suggest likely source areas in each case.

At the present time only a comparatively small number of amphorae types can confidently be allocated to a restricted area of production on form alone. Perhaps the most obvious case in this respect is the familar globular Dressel 20 which was only made in Roman Baetica, more particularly along that stretch of the Guadalquivir River and its tributaries between Cordoba and Seville (Bonsor, 1931; Ponsich, 1974; 1979; Williams and Peacock, 1984). In recent years, therefore, it has become increasingly common to take into account the various fabrics involved when allocating amphorae to their likely source areas. In some cases a hand-specimen study will be enough to identify conspicuous fabrics. The 'black sand' fabric of Dressel 1 and Dressel 2-4 from the Pompeii-Herculanium region (Peacock, 1971; 1977a), for instance, or the granitic fabric of Dressel 2-4 and Dressel 1- Pascual 1 of the Barcelona region (Tchernia and Zevi, 1972). Not all amphorae fabrics respond to study in the hand-specimen however, and when

suggesting source areas for many amphorae, recourse has increasingly been made to petrological or chemical analysis(Peacock, 1971; 1977b; Fontes et al, 1981; Laubenheimer et al, 1981; Williams, 1983). Indeed, in the case of distinctive fabrics these methods may additionally be useful in identifying amphorae forms from so undistinguished body-sherds.

Once an amphora has been tied down to a particular region it is generally assumed that this is also the source area for the contents, i.e. wine, olive-oil, fish products, etc. However, it is worth considering that there may be a case for some exportation of empty amphorae from one region to another. Fraser (1972), for example, argues persuasively that many Rhodian wine amphorae of the third and second centuries B.C. may not in fact have carried Rhodian wine but contained instead the better quality Laodician vintages. In a later period, the apparent dearth of known Roman amphorae kilns from Morocco (Ponsich and Tarradell, 1965), a region which had a thriving fish industry and would thus have been expected to have used amphorae for carrying its products, might be explained by the importation of empty amphorae, perhaps from nearby Spain. In modern times there is evidence for empty amphorae being traded along what is now the Lebanese coast in return for sheep-dung (Mallowan, 1939). However, there is no sign that in antiquity such a trade in empty containers was on anything but a very minor scale. Indeed, on the contrary there is increasing evidence for amphorae kilns being sited closeby to the production centres for amphorae-born commodities (Ponsich, 1974; 1979; Peacock, 1974; 1977c; Laubenheimer et al, 1981).

PETROLOGY OF THE COLCHESTER-SHEEPEN AMPHORAE

Dressel 1B

Two rim sherds (nos. 1 and 2) and three handles (nos.3, 4 and 5)

Previous thin section work on the Italian Dressel 1 wine amphorae by Peacock (1971)

divided the form into three main fabric groupings. Fabric 2 is the most distinctive in the hand-specimen as it is characterized by numerous inclusions of dark green augite, giving rise to the term 'black sand' fabric. An origin in the Latium region has been suggested for this fabric, on the basis of the presence of yellow garnet when viewed in thin section (Courtois and Velde, 1978). However, yellow-brown garnet is also a feature of the sands further south, and a Campanian origin, in particular the area around Pompeii and Herculaneum, has been more convincingly argued by Peacock (1977a). This fabric occurs both in the Dressel 1A and 1B forms. The recent find of a Dressel 1A rim from Lake Farm, Dorset, in the 'black sand' fabric demonstrates that this fabric also reached Britain in the 1A form (cf. Peacock, 1971). Fabric 3 is characterized by inclusions of granite, presumably from a source in southern Italy. As far as Britain is concerned, this fabric is rarely encountered.

The largest of Peacock's fabric groupings, his Fabric 1, is a broadly based group covering a wide geographical area which includes Campania and Latium, later extended to encompass Etruria as well (1977c). This large area is covered by fairly similar volcanic tracts. However, it is clear from the Sheepen results and elsewhere that it is possible to recognize nuances of fabric variation suggesting a variety of sources, perhaps all situated within this general region. For this reason it has been thought worthwhile to describe the Sheepen Dressel 1B fabrics in detail.

Fabric 1 No. 1

Thin sectioning shows numerous grains of subangular quartz, average size 0.05mm-0.30mm, and some slightly larger grains, with a scatter of potash and plagioclase felspar, pyroxene, amphibole, flecks of mica and volcanic rock, set in a dark brown anisotropic matrix of baked clay.

Fabric 2 No.2

Thin sectioning shows a fairly clean clay matrix containing a scatter of subangular quartz grains, average size 0.10 mm-0.50mm, some potash felspar, flecks of mica, black iron ore, volcanic rock and a little cryptocrystalline limestone, set in a dark reddish-brown anisotropic matrix of baked clay.

Fabric 3 Nos.3 and 4

Thin sectioning shows a groundmass of subangular quartz grains 0.20mm and under in size, with a scatter of larger grains up to 0.50mm across, together with pyroxene, potash and plagioclase felspar, flecks of mica, amphibole and volcanic rock, set in a reddish-brown anisotropic baked clay matrix.

Fabric 4 No.5

Thin sectioning shows frequent subangular quartz grains, average size 0.30mm and below, and cryptocrystalline limestone, including foraminifera, together with flecks of mica, pyroxene, potash and plagioclase felspar and volcanic rock, set in a reddish-brown anisotropic baked clay matrix.

The above results indicate four separate sources within the Campanian, Latium and Etrurian area which was suggested by Peacock (1971; 1977c). As a check on these results, the petrology of Dressel 1 amphorae from Hengistbury Head (twenty-three sherds), Danebury (six sherds) and the Lexden Tumulus (four sherds) was studied in detail.

Hengistbury Head

Dressel 1 Fabric 5

Thin sectioning shows a very clean clay matrix with a sparse scatter of inclusions

which are made up of a few subangular quartz grains, flecks of mica, potash felspar and volcanic rock, set in a straw yellow anisotropic baked clay matrix.

Dressel 1 Fabric 6

Thin sectioning shows frequent subangular quartz grains, average size 0.05mm-0.40mm, together with pyroxene, potash and plagioclase felspar, flecks of mica, volcanic rock and limestone voids, normally with a hazy white reaction rim, set in a dark reddish-brown anisotropic baked clay matrix.

Dressel 1A and 1B Fabric 7

Thin sectioning shows a groundmass of tightly packed subangular quartz grains, 0.20mm and under, with a scatter of larger grains up to 0.80mm across, together with plagioclase and potash felspar, pyroxene, flecks of mica and volcanic rock, set in a dark brown anisotropic baked clay matrix.

Dressel 1A Fabric 8

Thin sectioning shows a groundmass of subangular quartz grains 0.10mm and under, with a scatter of slightly larger grains, flecks of mica, potash felspar, volcanic rock and limestone voids, normally with a hazy white reaction rim, set in a reddish-brown anisotropic baked clay matrix.

Dressel 1 Fabric 9

Thin sectioning shows a scatter of subangular quartz grains, average size 0.30mm-0.80mm, flecks of mica, potash felspar, pyroxene and volcanic rock, set in a brown anisotropic baked clay matrix.

Dressel 1 Fabric 10

Thin sectioning shows a fairly clean clay matrix containing a scatter of

subangular quartz grains, average size 0.20mm-0.60mm, flecks of mica, potash felspar and volcanic rock, set in a reddish-brown anisotropic baked clay matrix.

Dressel 1A Fabric 11

Thin sectioning shows frequent subangular grains of quartz, average size 0.05mm-0.40mm, and flecks of mica, together with pyroxene, potash and plagioclase felspar, brown amphibole and volcanic rock, set in a reddish-yellow anisotropic baked clay matrix.

Dressel 1 and 1A Fabric 12

Thin sectioning shows frequent subangular quartz grains, average size 0.10mm-0.50mm, together with potash and plagioclase felspar, pyroxene, flecks of mica, amphibole and volcanic rock, set in a reddish-brown anisotropic baked clay matrix.

Dressel 1A Fabric 13

Thin sectioning shows numerous equal-sized subangular quartz grains 0.20mm and under, and frequent flecks of mica, together with plagioclase and potash felspar, pyroxene and volcanic rock, set in a dark reddish-brown anisotropic baked clay matrix

Dressel 1B Peacock's (1971) Fabric 2

'Black-sand' fabric.

All the above fabric groups from Hengistbury Head contain one sample each, with the exception of Fabric 7 which contains three and Fabric 12 which contains 12.

Danebury

Dressel 1 Fabric 14

Thin sectioning shows a scatter of subangular quartz grains up to 1.20mm across,

together with flecks of mica, pyroxene, potash felspar, volcanic rock, and a little cryptocrystalline limestone, set in a dark brown anisotropic baked clay matrix.

Dressel 1 Fabric 15

Similar to Fabric 14 but with more quartz grains and cryptocrystalline limestone.

At Danebury, Fabric 14 is represented by one sherd and Fabric 15 by five.

Lexden Tumulus

Dressel 1B similar to Fabric 12

Dressel 1B Peacock's (1971) Fabric 2

'Black sand' fabric.

At Lexden the two fabric groups are represented by two sherds each.

The petrological results from an analysis of Dressel 1A, 1B and undifferentiated Dressel 1 amphorae from Sheepen, Hengistbury Head, Danebury and the Lexden Tumulus suggest that these vessels were imported from a variety of places in the Campania - Latium - Etruria region of Italy. The number of different fabrics involved, sixteen out of thirty-eight samples further suggests that the amphorae were not manufactured at large 'factory-type' potteries (cf. Peacock, 1971), but instead were made at smaller scattered concerns. Possibly at the villa estates where the wine was produced, providing there was suitable local clay readily available.

Another implication to be drawn from these results is that the cargoes of amphorae packed by the negotiatores appear to have been mixed to a considerable degree. Thus at Sheepen out of five vessels tested, there are four different fabric groups. This implies that the five vessels came from four different Italian estates. At Hengistbury Head, out of twenty-three samples, nine fabric groups are represented implying that at least nine Italian estates supplied the wine that reached the site. While at Danebury and the Lexden Tumulus two fabric groups are represented at each site on a smaller total of amphorae. Of course, the real possibility exists that the amphorae represented at any one site may be the result of more than one cargo. However, the numbers of amphorae dealt with here are relatively small and so are possibly less likely to represent a regular trade to the sites mentioned.

Dressel 2-4

Twenty-nine samples of Dressel 2-4 amphorae from Sheepen were submitted for analysis. Of these, fourteen can almost certainly be shown to have an Italian origin. Dressel 2-4 amphorae were made in those same Italian regions as Dressel 1 and fit into Peacock's three broad fabric groups established for the latter form (1971). In some cases the new Dressel 2-4 type can be shown to be the direct successor on Italian kiln sites to the earlier Dressel 1 forms (Peacock, 1977c). This clearly shows that the adoption of the newer 'Koan-type' form did not necessarily mean a change of location for its production. For this reason those vessels from Sheepen which fall into Peacock's Fabric 1 grouping have again been subdivided on the basis of textural differences, to see if the number of postulated sources differs fundamentally from those results listed above for the Dressel 1 series.

Italian Dressel 2-4

Fabric 1 No.6

Thin sectioning shows a groundmass of subangular quartz grains 0.20mm and below in size, with a scatter of slightly larger grains, together with flecks of mica, potash felspar, a little cryptocrystalline limestone and volcanic rock, set in dark reddish-brown anisotropic baked clay matrix.

Fabric 2 Nos.32,39,40,47,48 and 139

Thin sectioning shows frequent subangular quartz grains, average size 0.05mm-0.60mm, with flecks of mica, pyroxene, potash and plagioclase felspar and volcanic rock, set in a greyish-brown anisotropic baked clay matrix.

Fabric 3 No.44

Thin sectioning shows a fairly clean clay matrix containing a scatter of subangular quartz grains, average size 0.10mm-0.80mm, flecks of mica, potash felspar, pyroxene, red iron ore and volcanic rock, set in a reddish-brown anisotropic baked clay matrix.

Fabric 4 No.37

Thin sectioning shows frequent subangular quartz grains, average size 0.05mm-0.20mm, and flecks of mica, together with potash felspar and volcanic rock, set in a reddish-brown anisotropic baked clay matrix.

Fabric 5 No. 27

Thin sectioning shows a scatter of subangular quartz grains, average size 0.20mm-0.40mm, flecks of mica, potash felspar, red iron ore, phyllite and volcanic rock, set in a greyish-brown anisotropic baked clay matrix.

Fabric 6 No.35

Thin sectioning shows frequent subangular quartz grains ranging in size from 0.05mm-1.00mm, flecks of mica, potash felspar, volcanic rock and a few limestone voids, normally with a hazy white reaction rim, set in a reddish-brown anisotropic baked clay matrix.

Fabric 7 No.34

Thin sectioning shows a groundmass of numerous subangular quartz grains, 0.20mm and under in size, with a scatter of slightly larger grains, pyroxene, flecks of mica, amphibole, potash felspar, some sandstone and volcanic rock, set in a dark brown anisotropic baked clay matrix.

Peacock's (1971) Fabric 2 Nos.41 and 42

'Black sand' fabric.

These results suggest that the twelve Italian Dressel 2-4 samples which fall into Peacock's (1971) Fabric 1 can be further subdivided into seven fabric groups. Eight fabric groups altogether for the Italian Dressel 2-4 at Sheepen taking into account the two samples in the 'black sand' of Peacock's Fabric 2. Taken with the Dressel 1 petrological results from Hengistbury Head, Danebury, the Lexden Tumulus and Sheepen, this would seem to indicate that no one particular area of Campania, Latium and Etruria dominated the export market to Iron Age and early Roman Britain of the wine amphorae Dressel 1 and 2-4. Furthermore, the evidence also suggests that there may have been as many sources for Dressel 1 as there were for the later, more widely distributed Dressel 2-4. Work is currently in progress to examine further the Dressel 1 and 2-4 fabrics that were reaching Britain.

Dressel 2-4 of Catalan origin

Two bodysherds (nos.22 and 23)

Thin sectioning shows numerous inclusions of quartz and felspar, both plagioclase and potash, a little mica and small fragments of granite, set in a dark reddish-brown anisotropic baked clay matrix. The sherds are very distinctive in the hand-specimen, and are in a hard, rough dark red to reddish-brown fabric (Munsell 10R 4/4 to 4/6), with large white grains of quartz and felspar scattered throughout. These are the 'points blancs' of Tchernia and Zevi (1972). This Dressel 2-4 amphorae fabric is characteristic of the Catalan region of Spain, in particular the granitic region around Barcelona, where a number of amphorae kilns are known (Tchernia and Zevi, 1972; Pascual, 1977). These amphorae probably held wine, as the Layetania area where they come from was praised by Martial as having a quality of wine second only to that of Campania (xiii, 118).

Dressel 2-4 of possible Baetican origin

Rim (no.30) and spike (no.31).

In thin section these samples are similar in composition and texture to the Camulodunum 185A handle below (no.29) and to Dressel 20 amphora which come from the area of the Guadalquivir River (Williams and Peacock, 1983). The main inclusions consist of large grains of quartz, quartzite and felspar, together with a little sandstone, chert and mica-schist. In view of the fabric similarities with amphorae of known Baetican origin, a source in Baetica appears likely for these vessels.

Dressel 2-4 of indeterminate origin

All of the samples listed below contain little else except such common minerals as grains of quartz and flecks of mica, together with the odd piece of felspar

and limestone. Due to the ubiquity of these inclusions in pottery, it is not possible to be specific about geological origins on this information alone. Texturally, there would appear to be considerable variety amongst those Dressel 2-4 types with common inclusions, suggesting that several different clay sources were used, and implying that these vessels were made in several different locations and unlikely to be the products from a single production centre. For this reason a number of fabric groupings have been made based on a textural analysis of the samples.

Fabric 1

Spike (no.11) and part handle (no.7)

Thin sectioning shows a scatter of subangular quartz grains, average size 0.10mm-0.40mm, some flecks of mica and a little cryptocrystalline limestone, set in a dark brown anisotropic baked clay matrix.

Fabric 2

Bodysherd/part handle (no.10)

Thin sectioning shows frequent subangular quartz grains , average size 0.05mm-0.20mm, with a scatter of slightly larger grains, and a little plagioclase felspar and flecks of mica, set in a dark brown anisotropic baked clay matrix.

Fabric 3

Rim (no.43)

Thin sectioning shows numerous subangular quartz grains, average size 0.05mm-0.10mm, with a scatter of slightly larger grains, a little sandstone and flecks of mica, set in a dark brown anisotropic baked clay matrix.

Fabric 4

Rim (no.8)

Thin sectioning shows fragments of mica-schist, plentiful flecks of mica, some felspar and a little quartz, set in a dark brown anisotropic baked clay matrix.

Fabric 5

Spike (no.12)

Thin sectioning shows ill-sorted subangular quartz grains ranging up to 1mm in size, a little felspar and flecks of mica, set in a greyish-brown anisotropic baked clay matrix.

Fabric 6

Handle (no.36) and spike (no.45)

Thin sectioning shows plentiful flecks of mica, a little plagioclase felspar, chert and a scatter of quartz, set in a reddish-brown anisotropic baked clay matrix.

Fabric 7

Handle (no.38)

Thin sectioning shows a groundmass of silt-sized quartz grains and flecks of mica, with a scatter of larger grains of quartz and quartzite, set in a reddish-brown anisotropic baked clay matrix.

Fabric 8

Spike (no.140)

Thin sectioning shows frequent grains of quartz in the size-range 0.10mm-0.50mm, a little chert and flecks of mica, set in a greyish-brown anisotropic baked clay matrix.

Fabric 9

Rim and handle (no.33)

Thin sectioning shows a groundmass of silt-sized quartz grains, with a few slightly larger grains, and plentiful flecks of mica, set in a reddish-brown anisotropic baked clay matrix.

Comments

Of the twenty-nine sherds of Dressel 2-4 sampled, fourteen can be attributed to an Italian origin, two are from Catalonia, two possibly from Baetica and eleven are from unknown sources. If these Dressel 2-4 sherds are representative of the total Sheepen vessels of this form, then we can see that during the period A.D.43-60/61, about half the Dressel 2-4 wine amphorae reaching the site were being imported from Italy. Moreover, it would appear that the vintages were being drawn from a variety of estates in the wine growing areas of Campania, Latium and Etruria. The total Italian import may even be higher, as it is possible that some Italian vessels are included in the indeterminate category, perhaps coming from the non-volcanic areas of southern Italy (cf. Zevi, 1966).

It is interesting to compare these results with selective thin sectioning of the ten Dressel 2-4 amphorae from the Lexden Tumulus, dated to the last years of the first century B.C. (Peacock, 1971), which suggests that at this date the form was probably exclusively imported from Italy. This not to say that during the last years of the first century B.C. and early years of the first century A.D. Italy was the sole supplier of wine to Late Iron Age Britain. The presence in Britain at this time of Rhodian amphora from the eastern Aegean and Dressel 1 - Pascual 1 from Catalonia (Williams, 1981), shows that non-Italian wine was also reaching the country. The Sheepen results do suggest, however, that by the middle years of the first century A.D. inroads were being made into the Italian Dressel 2-4 trade, particularly by Spain, and that as well as receiving the

traditional olive-oil and fish products from Baetica, Britain was also importing Dressel 2-4 wine amphora from that province.

Rhodian style amphorae

A number of Rhodian style amphorae have been thin sectioned and allocated to Peacock's (1977b) fabric divisions. It is worth pointing out that unlike the Dressel 2-4 types, based on the Koan form but made at a variety of places around the western Mediterranean area and even in Britain (Castle, 1978), the Rhodian style of amphora does not appear to have been copied in the West, and so the distribution of this form represents importation from the eastern Aegean.

Fabric 1

Four rims (nos.59,64,67 and 141), one handle (no.66) and two bodysherds (nos.134 and 137).

In thin section all the samples can be seen to contain frequent red and brown grains of serpentine and a little quartz and limestone, set in a reddish-brown anisotropic baked clay matrix. The mineralogy suggests Peacock's (1977b) Fabric 1, with an origin in Rhodes itself.

Fabric 3

Two handles (nos.60 and 61) and one spike (no.62)

Thin sectioning reveals little else but grains of quartz, mica and some potash felspar, set in a dark reddish-brown anisotropic baked clay matrix. All three samples probably belong to Peacock's (1977b) Fabric 3, with an Aegean origin, although they appear slightly sandier than is usual for this group.

Fabric 7

Rim (no.136) and handle (no.65)

In thin section both samples contain frequent small fragments of phyllite, a scatter of fine quartz and a little mica, set in a light reddish-brown anisotropic baked clay matrix. This composition is not described in Peacock's (1977b) six Rhodian style fabric groups, and so these two sherds have been designated Fabric 7. A metamorphic origin is indicated by the presence of phyllite in the clay, but much of the Aegean area is composed of metamorphic deposits and it is not possible at this stage to be more precise about likely source areas.

Comments

The majority of Rhodian style sherds examined (seven of the twelve) are in Peacock's Fabric 1, which he suggests is particularly common on early military sites in Britain (1977). The Sheepen site was technically civilian but with a strong military connection, which might explain the large percentage of Fabric 1. The presence of five samples of Fabrics 3 and 7 may possibly reflect the civilian element at Sheepen.

Probable Dressel 28

Two handles (nos.133 and 138) and five bases (nos.128,129,130,131 and 132). When dealing with non-rim sherds of the amphorae forms Dressel 28 and Pélichet 47, it can often be difficult to decide to which form a sherd belongs due to the similarities of type. The petrology is not altogether helpful in this matter, as Dressel 28 are known to have been made in southern France, at Velaux, Bouches-du-Rhône (Tchernia and Villa, 1977), in an area where Pélichet 47 is also known to have been made (Laubenheimer et al, 1981). Dressel 28 was also made in Spain in Tarraconensis (Tchernia, 1971; Tchernia and Villa, 1977; Keay and Jones,

1983) and possibly Baetica (Colls et al, 1977; although see also Parker and Price, 1981).

In this case it was decided to allocate the material to the Dressel 28 form because of the large size of the flat-bottomed bases, which gave the appearance of being wider than those normally associated with the Pélichet 47 form. In thin section samples 128-133 all contain plentiful flecks of mica, a little quartz and small fragments of metamorphic rock, while no.131 also has some limestone. This composition is similar to sections of Pélichet 47 the writer has made and so it is possible that samples 128-133 all come from southern France. Sample 138 shows a different composition to the latter, containing frequent subangular grains of quartz, average size 0.10mm-0.30mm, some plagioclase felspar, amphibole and flecks of mica.

Camulodunum 185A/Haltern 70

Handle (no.29) and bodysherd (no.135)

Both sherds are from the amphora type Camulodunum 185A/Haltern 70. This form has its origin in Baetica, the similarity in fabric with Dressel 20 suggesting a source in the region of the Guadalquivir River (Peacock, 1971). Thin sectioning of both sherds showed a composition identical to that found in Dressel 20 (cf. Williams and Peacock, 1983), namely large grains of quartz, quartzite and felspar, with some sandstone, chert and mica-schist. A heavy mineral separation on sample no.29 confirms the similarity of fabric with Dressel 20 and with previous analysis of Camulodunum 185A (cf. Peacock, 1971, Table 1), for it produced a suite of minerals rich in garnet (Table 1 no.1).

Amphorae of the form Camulodunum 185A/Haltern 70 from the Port Vendres II shipwreck carry inscriptions describing the contents as defrutum, a sweet liquid obtained by boiling down the must (Colls et al, 1977; Parker and Price,

TABLE 1 : Heavy Mineral Results

No.	Ref.	Total Count of Non-Opaque Minerals									
		Zircon	Rutile	Tourmaline	Apatite	Epidote	Garnet	Andalusite	Amphibole	Staurolite	No. grains counted
1.	Cam. 185A/ Haltern 70 (Sheepen 29)	16.8	1.2	3.4	3.2	——	52.6	18.1	4.2	0.5	353
2.	Cam. 185B/ Beltran 1 (Sheepen 92)	35.5	2.8	2.5	2.0	27.5	10.2	19.5	—	—	236
3.	Haltern 70 variant (Sheepen 119)	32.9	3.8	0.5	2.6	38.7	11.8	9.7	—	—	187

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