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OLIVE-OIL AMPHORAE IMPORTS IN ROMAN BRITAIN: 20 YEARS LATER

Cèsar Carreras Monfort¹

Abstract

Pedro Pablo A. Funari carried out research in amphora studies in Roman Britain in the late 1980s and early 1990s. He was interested in the epigraphy (painted inscriptions and stamps) on the most common amphora in the Isles, which was the Baetican Dressel 20. His scholarship supposed an important change in the way amphorae were studied in the United Kingdom and influenced later scholars and research. The present paper attempts to overview his contribution in amphora research in Roman Britain, and how those studies have evolved in the last 20 years. Of course, there are new data available, but also alternative approaches in terms of methodology and interpretation.

keywords

Archaeology of Roman amphorae; Roman Britain; Pedro Paulo Abreu Funari.

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Resumo

Pedro Paulo A. Funari realizou pesquisas em anforologia na Bretanha romana no final da década de 1980 e início da década de 1990. Ele estava interessado na epigrafia (inscrições pintadas e selos) da ânfora mais comum nas ilhas, que era a Dressel 20 bética. Seu conhecimento supunha uma mudança importante na forma como as ânforas foram estudadas no Reino Unido e influenciaram os estudiosos e pesquisas posteriores. O presente trabalho tenta mostrar a sua contribuição na pesquisa de ânforas na Bretanha romana e como esses estudos evoluíram nos últimos 20 anos. Claro, existem novos dados disponíveis, mas também abordagens alternativas em termos de metodologia e interpretação.

Palavras-chave

Arqueologia das ânforas romanas; Bretanha romana; Pedro Paulo Funari.

Introduction: research in 1990s

Perhaps, people do not know that Pedro Pablo A. Funari dedicated part of his scholarship in the late 1980s and 1990s to study the olive-oil imports in Roman Britain. He was especially interested in the epigraphy on Baetican amphorae classified as Dressel 20s, which included stamps and painted inscriptions (*tituli picti*). He wandered around different British museums documenting those inscriptions present in their collections that none had paid much attention since the work by M.H.Callender (1965).

His detailed study of a few Museum collections ended with the publication in 1996 of his book *Dressel 20 inscriptions from Britain and the consumption of Spanish olive oil: with a catalogue of stamps*. His work made evident from the start the importance of olive oil consumption in Roman Britain, since the Dressel 20 amphorae were the most represented container in any amphora assemblage in the province during the Principate. Besides, he selected a series of Roman sites (London, St.Albans, Colchester, Vindolanda and Caerwent) to compare the recorded stamps, their origins and datings. One of his most original contributions was a semiotic approach in the stamps' study, comparing sizes in relation to Roman measures as well as type of letters.

Pedro Pablo's research deserved new interest in amphora studies by British scholars, who organised with his collaboration a Conference at the Museum of London called *Amphorae in Britain and the Western Empire* in 1993, whose papers were published 10 years later in the *Journal of Roman Pottery Studies* volume 10 in 2003. Previously, only the work by Williams and Peacock (1983) provided an overview on the olive-oil imports in Roman Britain.

I had the pleasure to meet him at Southampton University where I was completing my PhD also on the amphorae from Roman Britain, but using different methods and studying all types of amphorae. We decided to collaborate together complementing each other in aspects such as epigraphy, Museum collections and sample selection in order to avoid duplicating efforts. In the end, we decided to publish together a book on olive-oil imports in Roman Britain in 1998 with the title *Britannia y el Mediterráneo: estudios sobre el abastecimiento de aceite bético y africano en Britannia* (*Britannia and the Mediterranean: studies on the supply of Baetican and African olive-oil in Britannia*) with a complete catalogue of amphora stamps.

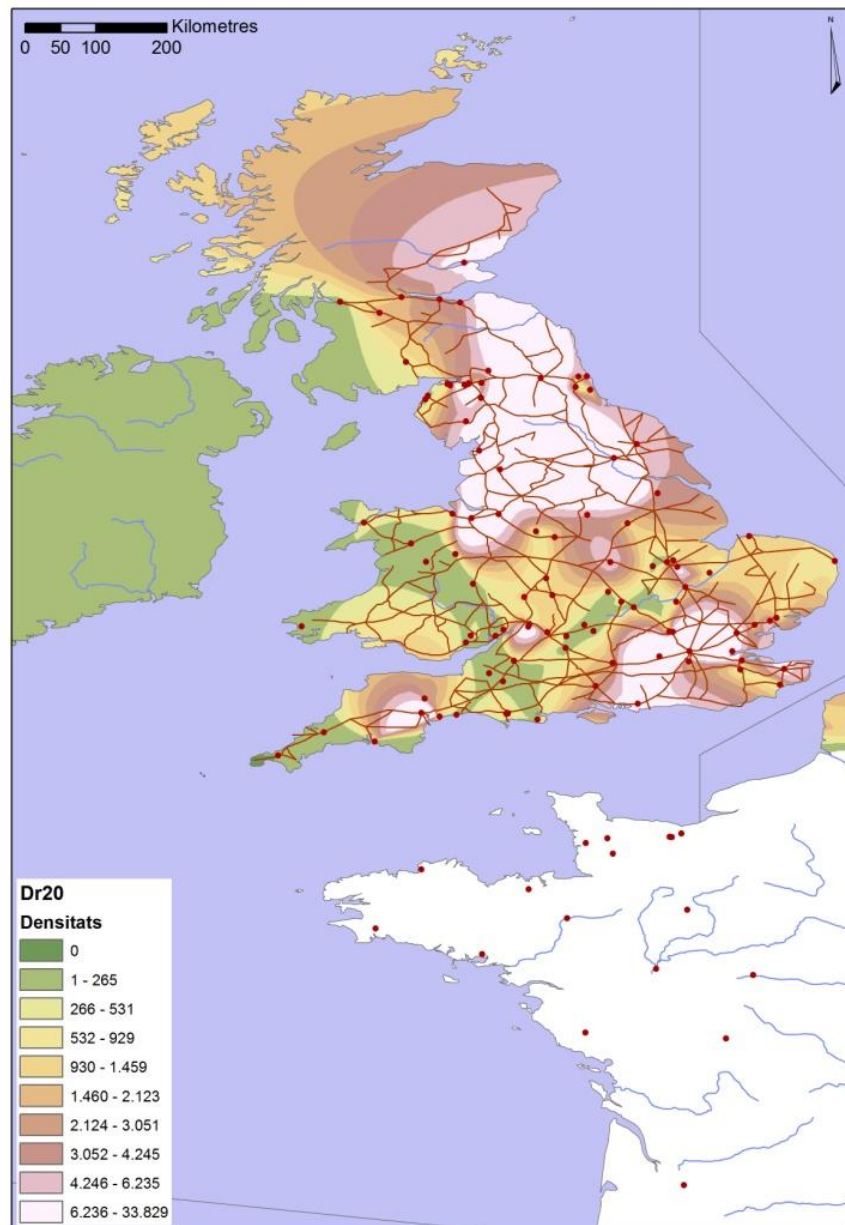


Fig.1. Distribution of Dressel 20 amphorae densities (cg/m²)

This new work widened the number of olive-oil amphorae documented including types such as the Baetican late Dressel 23 and the North African vessels (Williams and Carreras, 1995) apart from the well-known Baetican Dressel 20. Despite the fact that the Dressel 20 amphora continued to be the most represented vessel recorded in any amphora assemblage in Roman Britain from Claudian contexts up to the late IIIrd century A.D., there were significant changes in sites, regions and chronologies that required a more accurate answer.

A general overview of the Dressel 20 amphora distribution (figure 1) according to densities from a sample of 109 sites (dots in the figure 1) revealed a high concentration of this amphora consumption in the

military area around Hadrian's Wall, the main cities of the province (London and Colchester) as well as the county of Devon (basically Exeter). If this typology was almost 60-70% in weight of most amphora assemblages in Britain, its overall distribution should identify the general pattern of olive-oil consumption (see figure 1). The other olive-oil containers less represented did not affect much such distribution since Dressel 23 was only recorded, at that time, in Winchester; whereas North African amphora were only known in few places with a very low density.

Furthermore, a series of maps with the distribution of Dressel 20 stamps from different chronological periods clearly identified the movements of the Roman army in each phase (Carreras and Funari, 1998, figures 28-32). Thereby, it was evident that Dressel 20 consumption of olive-oil was related to a military detachments, perhaps a part of the so-called *annonamilitaris*. The system was in place until the late IIIrd century A.D. with a clear downturn in olive-oil imports, when the Roman army recruits were basically acquired amongst the local population.

Why the Roman State created such a complex and costly system to supply with olive-oil their armies in the different *Limes*? The possible answer is not easy, but it was believe that olive-oil was regarded a basic staple in the legionary diet. A Mediterranean type of fat substituted by butter or lard by populations in Northern territories; in other words, an ethnic type of food of which Roman soldiers could not get without it.

Apart from the frontier, other concentration of Mediterranean population in Britain was in the Southeast where was also high density of population, another proxy that may have affected the Dressel 20 distribution. Of course, not all the potential consumers of olive-oil were of Mediterranean origin, since Dressel 20 appears everywhere even in rural sites in Southern Britain. Romanised local populations may have also consumed olive-oil but in minor quantities and paying high prices. Therefore, the purchase power also concentrated in Southeastern Britain was another proxy to understand the Dressel 20 distribution.

Finally, it was attempted to model transport costs within the Roman Britain by digitising transport infrastructures and applying GIS network analysis (ARC/INFO)(Carreras, 2000). The resulting maps identified most other amphorae distributions except the Dressel 20 amphora, because it appears to be the result of a public redistributive system that did not take into account allocation costs. However, those maps showed lower costs in the Southwestern or Southeastern coasts depending on the sea routes of the amphora shipments.

Those conclusions were reached at that time based on an almost complete collection of amphora stamps and *tituli picti*, and quantified sample of 109 sites including the main Romano-British towns and most territories. The question is, do those conclusions remain valid after 20 years?

New evidences of Dressel 20, Dressel 23 and North African amphorae: 20 years later

Of course, the sample of the 1990s was always incomplete for some of the most populated towns such as London or Colchester, and there were also many small towns without any sample as well as some territories with small representation such as the Antonine Wall, Wales and Southern Scotland.

In the last years, there have been more excavations and reports published that have increased the early amphora sample, though general trends seem to remain unchanged. The Dressel 20 vessels still are the most common container in amphora assemblages in the Principate reaching percentages of 60-50% of the total. When it does not happen, the reports indicate that it is an unusual assemblage in which normally the Gauloise 4 outnumbers the Dressel 20s. There are more examples of late amphorae Dressel 23 in places such as London or Dorchester and many more of North African amphorae in particular places in late contexts.

The most remarkable discoveries come from *Vindolanda* (Chesterholm) where more than 42 new stamps have been unearthed since 1996. Marlière and Torres (2005) published the amphorae recovered from the 2003-4 season, which included 19 new stamps and report on amphorae from different chronological periods. According to the authors, the assemblage contained 120 Dressel 20 out of 140 amphorae quantified by MNI. Dressel 20s were predominant in all the periods from A.D. 85 to 350. The presence of barrel remains in those excavations brought about the possibility of comparing volume of contents from other containers such as barrels with amphorae. The conclusions drawn suggest that wine or beer and not olive-oil may have been the main imported contents in the site, if wooden barrels were taken into account as main carrying containers (Marlière and Torres, 2005).

Fig. 2. Graffiti on Dressel 20 body sherd from Vindolanda (Inv.9311)(Marlière and Torres, 2005: 223-226)

Finally, the same paper includes a *graffitum* on Dressel 20 that reads B]ENEFICIARI (see figure 2). In the site of Vindolanda, there are evidence of *beneficiarii* on a stone inscription from the IIrd c. A.D. (AE 1940, 0108; RIB 1696) and from three wooden tablets dated between A.D. 97-120 (*Tab. Vindolanda* II, 180; 344; III, 643). *Beneficarii* were special posts in the Roman army responsible for guaranteeing the military supply as well as acting as police (Carreras, 1997). Therefore, they may have been responsible for the controlling supply of olive-oil among other goods to the Vindolanda fort.

Period	Stamps/year	Stamps
I (c. 75-90 AD)	0	0
II (c. 90-100 AD)	0.1	1
III (c. 100-105 AD)	1	5
IV (c. 105-120 AD)	0.8	12
V (c. 120-140 AD)	0.65	13
VI (c. 140-213 AD)	0.5	41
VII (c. 213-270 AD)	0.56	32
VIII (c. 270-360 AD)	0.01	1
IX (c. 360-400 AD)	0.05	2
X (post 400 AD)	0.06	3
u/s		9
unknown		4

Fig.3. Dressel 20 stamps from Vindolanda by period (after Sheehan-Finn, 2012)

But Vindolanda has also provided new finds, when Sheehan-Finn (2012) published another 23 new stamps from the 2007-2012 excavations reaching a total number of 123, number which has probably increased in the last years' campaigns. An accurate study of the dating context where all those Dressel 20 stamps come from confirms a stable supply of Baetican olive-oil from A.D.90 to A.D. 270 (see figure 3). The remaining stamps appear in later contexts but a residual material.

It is interesting to note that Vindolanda was always occupied by auxiliary troops not legionaries and from A.D. 213 for the *IV Cohors Gallorum Equitata*. Those auxiliaries may have not been Mediterranean in origin but consumed olive-oil as any other member of the Roman army.

The new data from Vindolanda confirms the overwhelming importance of the Dressel 20 and olive-oil imports in the Northern military zone. Recent excavations at Dixon Lane junction and George Street in York (Williams, 2015) also coincide in the predominance of Dressel 20 amphorae together with Gauloise 4, as well as a representation of Campanian Dressel 2-4, and 9 sherds of North African amphorae with no shape. Again, York records the same kind of amphora assemblage typical from Northern military sites with the added North African vessels that may have arrived in the later periods.

In the Western part of the country, near Wales, there is new data from Wroxeter from the recent book on the Worcester City Campus excavation (Evans and Williams, 2014), which records the same amphora types (Dressel 20, Gauloise 4 and Campanian Dressel 2-4). Despite the low density of amphora Dressel 20 (17 cg/m²), which is common in this region, the Baetican vessel accounts for 87% in weight in the assemblage.

Perhaps London is the place where more research is required to update amphora data due to the dimension of the ancient city and the numerous rescue excavations. Only few publications available show the importance of Dressel 20 imports in the capital such as the excavation of the cemetery of Mucking (Williams, 2013) with a high proportion of this amphora type as well as one stamp reading LIT recorded.

However, there are more Dressel 20 stamps turning up from the rescue excavations that have not been properly published. Some of them seem to be even new family stamps, such as the case of the one from Moorgate (MOLAS, Inv.7842)(see figure 4). The state of Dressel 20 stamp does not allow a clear reading except the last two letters that identify a CI, whereas two incomplete characters may identify the letters A and P. The CEIPAC Roman stamps database (<http://ceipac.ub.edu/>) do not provide any match and the closest stamps are CPCI or PONTICI. The only match comes from the stamp APICI on Dressel 6B, whose fabric does not correspond to the Moorgate sample and it normally appears on the rim and not below the handle.



Fig.4. Dressel 20 stamp *in radicansae* from Moorgate (London, MOLAS Inv.7842) (courtesy of D.F.Williams)

However, the potential of the new discoveries from London excavations comes from the report of Bow Bells House (Howell, 2013), where there is the overwhelming presence of Dressel 20 and Gauloise 4, but also 31 examples of London 555, Dressel 2-4 and exotic vessels such as Dressel 28, Benghazi MR-1 and other example of Dressel 23. *Londinium* as a large capital of the province with a multicultural population provides a more complete and different pattern of amphora imports that any other place in Roman Britain. It deserves a systematic and complete quantified study of stamps and *tituli picti* as well as amphora assemblages by period that may shed some light in particular types of consumption.

Finally, the Southwestern region provides an interesting report of the amphorae from Dorchester (Smith, 2008: 4-5) with an overwhelming presence of Dressel 20s and Gauloise 4 that confirms general trends defined 20 years ago. The report also increases the numbers of Dressel 20 stamps with one LQS and other unreadable. It also shows that quantities of Gauloise 4 amphorae exceeded Dressel 20s in some periods, and there were also evidences of other olive-oil amphorae such as Dressel 23 and North African vessels (8 sherds dated in IIIrd-IV centuries AD).

This brief summary of relevant publications on amphorae in the last 20 years illustrates new discoveries and great potential of updating the data.

However, as far as we know the general trends in olive-oil supply in the province remain unaltered after those 20 years, with only some minor corrections. Of course, completing the collection of stamps (see figure 5) and painted inscriptions as well as a solid amphora sample throughout Roman Britain will reinforce this overview.



Fig.5. New LQS Dressel 20 stamp from St.Helens (Colchester)

Revising old interpretations on olive-oil consumption

Although the new data does not affect the general trends in olive-oil imports, old interpretations are subjected to some discussion. Evans (2013) refers in great detail changes in the habits of olive-oil consumption in Roman Britain with the concentration in military sites and Southeastern Britain, but paying attention to the fact that olive-oil hardly penetrate in rural sites in the South and almost nothing in the North. Therefore, local and humble populations did not probably consume the foreign olive-oil.

With the disruption of Dressel 20 military supply in the late IIIrd century A.D., the general consumption of the olive-oil in the province dropped. She argues that a Roman army composed now of local recruits from the IIIrd century onwards did not require such expenditure. The whole

interprovincial supply system collapsed but there were still commercial links with the Mediterranean provinces as presence of Dressel 23 and North African amphorae demonstrates. Besides, provincial commercial networks and routes towards the military regions were still powerful as the distribution of local pottery industries from the IIIrd century onwards reveal.

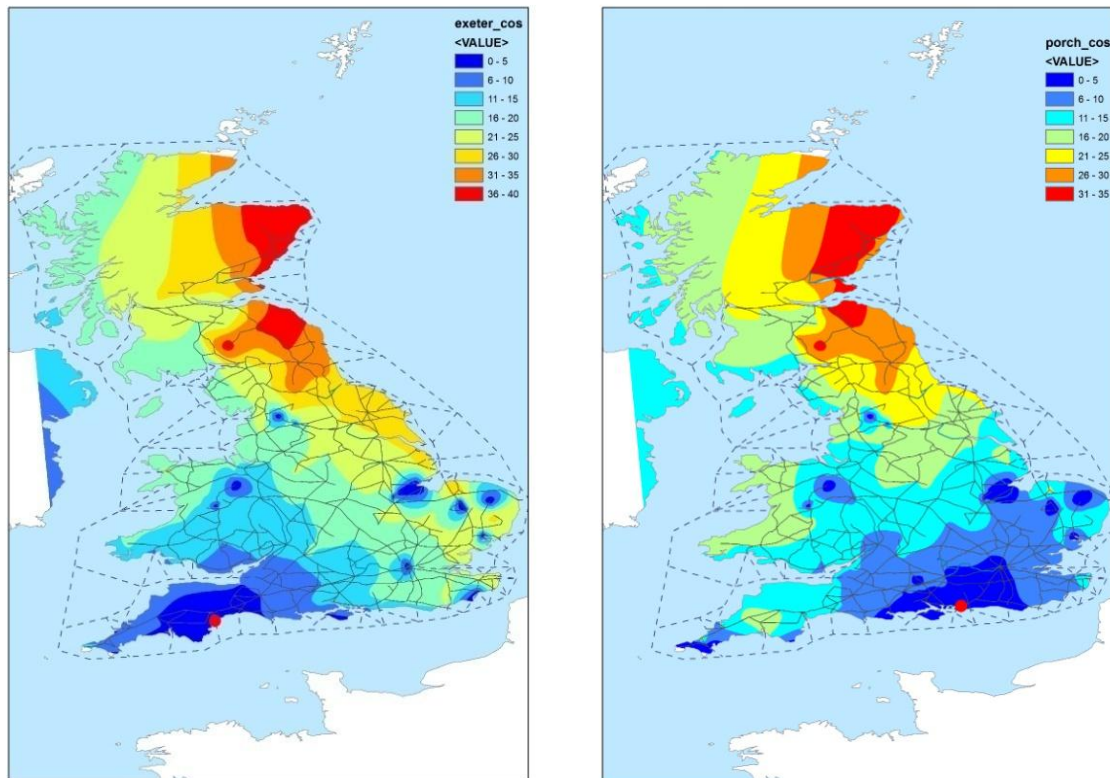


Fig.6. Transport simulation costs from in ARC/GIS from Exeter (left) and Porchester (right) (Carreras and De Soto, 2013)

These distributions of the local pottery products from the IIIrd centuries remind us the simulation models of transport costs created in GIS to explain amphorae distribution (Carreras, 2000). They identify clearly those pottery distributions as happened with most amphorae except the Dressel 20 (figure 1). The transport simulation models for Roman Britain were updated in 2013 (Carreras and De Soto, 2013) with a better software (ARC/GIS) and algorithm (Kernel analysis) providing a more accurate insight into the allocation factors.

The figure 6 shows the result of simulation from Exeter (left) and Porchester (right) as two potential crossing points of the English Channel from which amphorae may have arrived. There are other maps starting at Dover or Colchester that perfectly identify the so-called Eastern coast trade (Evans, 2013), whereas the two illustrated in figure 6 may recognise the Western coast trade.

If the Dressel 20 amphora distribution could not be recognised in any of these maps because probably the State intervention altered the effect of transport costs, the maps from Exeter and Porchester may fit in the distribution of the other minority amphorae.

As was said above, the number of sites with Dressel 23 has increased to at least 3 cities (Winchester, London, Dorchester), though in very small quantities. Despite that more quantified data is required; the present Dressel 23 distribution appears to identify a Southern distribution, perhaps closer to the simulation map from Porchester.

With regards to the amphorae from Northern Africa², the evidence is greater and scattered though it never matched the imports of the early Dressel 20 vessel. Nowadays, there are evidences of North African amphorae at York, Exeter, London, Leicester, Lincoln, Colchester, Winchester, Mucking (London), Dorchester (Dorset), Mothecombe (Devon), Bantham (Devon), Springhead (Kent) and Tintagel castle (Cornwall). Most evidences of those amphorae appear in the South, and mainly the South-western coast, with an exception at the military legionary headquarters of York in the North. The South-western distribution coincides with the local Southwestern trade routes (Evans, 2013) and location of other products from Eastern Mediterranean such as Phocian Red Slip and Late Roman amphorae, also documented in Ireland (Kelly, 2010). This concentration in the South-Western ports suggests the Atlantic itinerary as the most probable route towards the British Isles from the Mediterranean (Carreras and Morais, 2012).

The use of network analyses for archaeological interpretation has been increased in the last decade with a new development of software and their social application. With regards to Roman Britain, there are a couple of brilliant works that analyse distributions of exotic plants in the British Isles (Livarda and Orengo, 2015; Orengo and Livarda, 2016). The first work covers the distribution of these exotic plants coming from other provinces and latitudes within the city of *Londinium* (London) employing SNA analysis, which develops the algorism of centrality degree (consumption concentration) and betweenness centrality (redistribution centres)(Livarda and Orengo, 2015). Both concepts identify primary consumers and possible distribution markets in Roman London that may envisage other proxies such as ethnic groups, purchase power and

² Not all the North African vessels contained olive-oil; on the contrary, there are some of them transporting products such as fish-sauce. Therefore, it is important to take this point into account.

specialised markets or traders. The works analyse those different patterns of distribution for each chronological period that evidence some changes.

The second work analyses distribution of those exotic plants taken for the whole province of Roman Britain employing the same concepts and software (Orengo and Livarda, 2016). This second case study reinforces the importance of the road network and introduces the LCR (the least cost route) to explain degree of centrality and betweenness centrality. With regards to consumption concentration (degree of centrality), there are high concentrations in London, Midlands and York (as well as other minor military sites such as Newstead, Carlisle, Ribchester, Castleford). Therefore, neither general military distribution is recorded nor Mediterranean population, but a possible combination of diet preferences as well as purchase power appear to reflect to this distribution, though it is difficult to demonstrate.

Consumption pattern is a challenging issue that has hardly taken into account by the specialised literature. Swan (1992) attempted to relate the presence of new pottery groups (Ebor ware) that resembled forms of North African cooking wares (i.e. casseroles) in late Roman York with the arrival of African migrants. She related this pottery evidence with the campaigns of *Septimius Severus* (AD 208-211) in Northern Britain, in which *Eboracum* (York) was the military headquarter of his campaign (*Legio VI Victrix*). She argued that together with those troops, also came North African potters' in the city of York. The evidence of African migrants is scarce based on inscriptions such as moorish freedman at South Shields (RIB 1064; - AD c.160-180) or *Numerous Maurorum Aurelianorum* at Burgh-by-Sands (RIB 2042 - AD 253-8) as well as human skeletons with negroid traits at the Thentholme Drive cemetery (York). It is also argued that Constance and Constantine also favoured African migration towards York.

The ivory bangle lady (Leach *et alii*, 2010) is one of those tombs at the Thentholme Drive cemetery that has been identified as possible African woman. The burial consists of a stone coffin and a series of good, in which objects of ivory stand out. Besides the measures of the woman skull (craniometrics) appears to identify a possible African migrant.

The imports of good number of North African amphorae in Roman York that have also documented in the last 20 years, gives more ground to this hypothesis.

The present and future development of DNA analyses of Roman cemeteries in Britain will shed light into the real composition of Romano-

British populations and the relative importance of migrants. Those DNA analyses that have started to give some relevant results in places such as London may give ground to an ethnic proxy in the consumption of particular type of foods as the case of olive-oil and exotic plants.

So far, scholars that study food consumption in Roman Britain (Alcock, 2001; Cool, 2006) describe all the food evidences and possible diet strategies without distinguishing between different populations. Romanisation is the ambiguous term that justifies the adoption of new ingredients, but quantities and preferences seem to vary according to the population origin.

For instance, Cool (2006: 63) pays attention to differences in consumption of olive-oil at York in the IIIrd century A.D. with the end of the public redistribution system. She believes that olive-oil was a staple in the kitchen, but no longer required when most recruits in the provincial army come from the own Britain. She illustrates the use of olive-oil in cooking with a unique lipid analysis of a *patina* at Chelmsford with remains of olive-oil and eggs, so one of the first “fried eggs” documented (Cool, 2006: 64). Finally, she remembers that the consumption of exotic plants (i.e. spices) is well-recorded in the military sites (Vindolanda tablet 184).

It can be concluded with a final reflection on the North African amphora concentration in South-Western Britain. New discoveries confirm an important consumption of African olive-oil in this region that does not seem to reflect any special food identity (Jarrett, 2010). On the contrary, they arrival together with other Eastern Mediterranean products (Late Roman amphora, Phocian Red Slip) bolsters the idea that its distribution is related to particular maritime routes and transport costs associated.

The rest of the picture: amphora distribution in Western Roman Empire

Most new information on the olive-oil trade in Roman times come from other provinces, whose discoveries complement to some extent our view on the imports of Roman Britain. New data have turned up with regards to amphorae typologies, new stamps and *tituli picti*, better dating or stamps families. Perhaps, the most important contribution comes from the own production areas of the olive-oil amphorae, either Guadalquivir valley or North Africa.

The Guadalquivir valley has provided in the last 20 years discoveries of more amphorae workshops associated to a series of typologies such as Dressel 20 and Dressel 23, but also some variants, as well as new stamps.

Berni (2008) published a synthesis of all olive-oil vessels produced in the Guadalquivir valley in more than 100 hundred amphora workshops, explaining relationships between stamps. He defined the concept of stamps' families, which include variations of stamps from the same producing centre that probably indicate a different chronology. This association of stamps proposed made easier to identify origins of some unknown stamps, and a better dating of some of them.

With reference to Northern Africa, the work by Bonifay (2004) has improved our knowledge of local amphorae typologies, their origin and fabrics within Northern Africa region as well as the accurate content for each form. This means that some North African amphorae attributes to the olive-oil trade, are no longer containers of this product but of wine or fish-sauce. Although the number and percentage of North African vessels in Britain is relatively low, the new information modifies some previous conceptions.

Finally, the excavations of Monte Testaccio (Rome) (Blázquez and Remesal, 2010; 2014) complement the documentation of olive-oil imports since this large dump of amphorae records stamps and *tituli picti* associate to Baetican and African amphorae. Nowadays, it is mainly important for late IInd century and IIIrd century A.D. contexts for dating and relating stamps to particular workshops. Apart from the publications, new data from Monte Testaccio can be accessed in the CEIPAC database (<http://ceipac.ub.edu>).

All this new data, modifies some statistics of the previous work by Carreras and Funari (1998) in aspects related to Dressel 20 epigraphy such as catalogue, dating, origin and production regions. Such changes are not relevant regarding internal distribution of olive-oil in the province, but they may be important in terms of chronology and regional trade.

However, other similar studies with amphora quantification and publication of stamps and *tituli picti* in Continental sites complement the distribution of Roman Britain. They offer us a way to infer the possible route from which those products arrive to the British Isles. For instance, figure 7 illustrates high densities of amphorae Dressel 20 in more than 200 sites in the provinces of *Germania*, *Gallia* and *Britannia*.

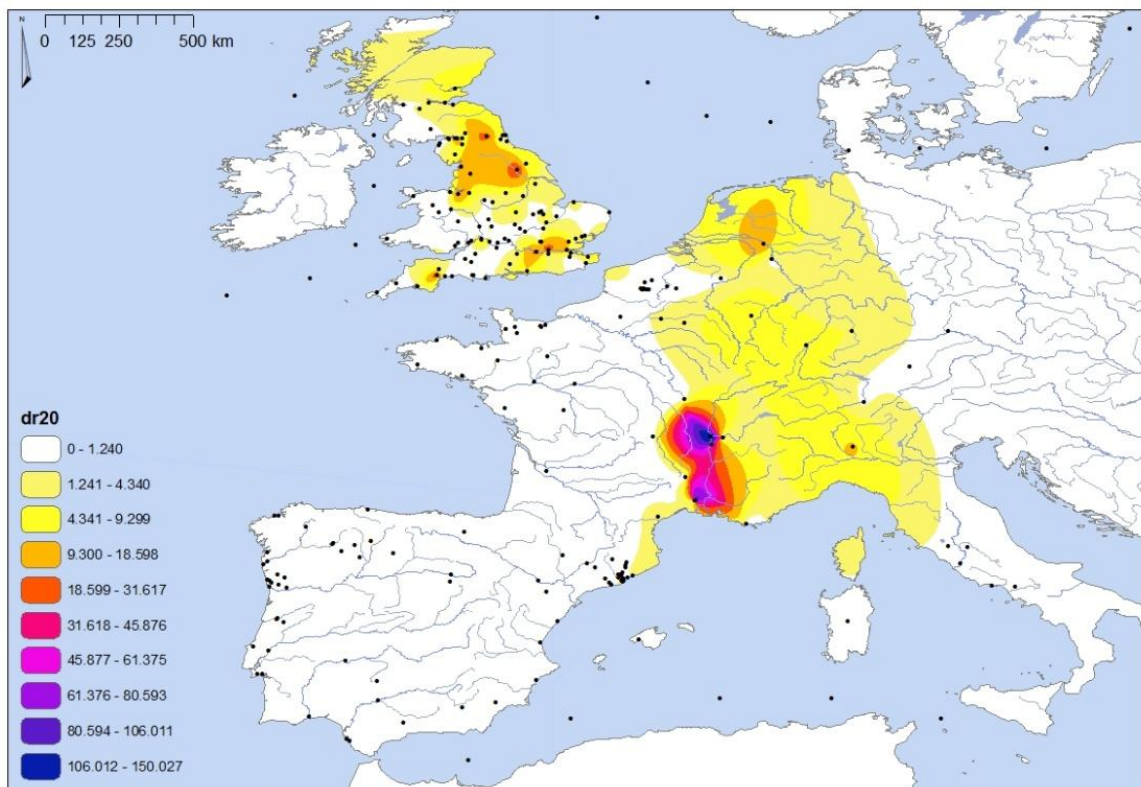


Fig. 7. Distribution of amphorae Dressel 20 densities (cg/m²) in the Western Roman Empire

Concentrations of Dressel 20s are recorded in the Rhone valley and consumption centres such as Roman military sites in the German and British *Limes*. The general view of the Western Roman Empire confirms that those Baetican olive-oil amphorae were allocated in military destinations as a part of a complex public redistributive system. Of course, the map is still full of gaps due to the lack of research or accurate quantification of amphorae and their associated epigraphy.

Fortunately, the panorama is changing gradually with new regional or archaeological sites studies that fill those gaps in territories like Northern Gaul. For instance, Laubenheimer and Marliere (2010) published a book on the amphorae from Northwest Gaul, a region between *Germania Inferior* and *Britannia*, which shows the same amphora types but in less quantities. Likewise, the region of Franche-Comté is also a territory whose amphora evidence is being under study, and hopefully the results will be published soon.

With regards to *Germania Inferior*, a general view of the Spanish imports in the early Principate can be gathered from the work by González Cesteros (2014), who substantiates an important presence of Baetican olive-oil amphorae in most military camps, but the data is quantified in a way that is difficult to compare with other sites and regions. However, his work is interesting with regards to the early typologies of Baetican olive-oil amphorae previous to the Dressel 20 with forms such as Oberaden 83 and Haltern 71 in camps such as Oberaden, Haltern or Anreppen.

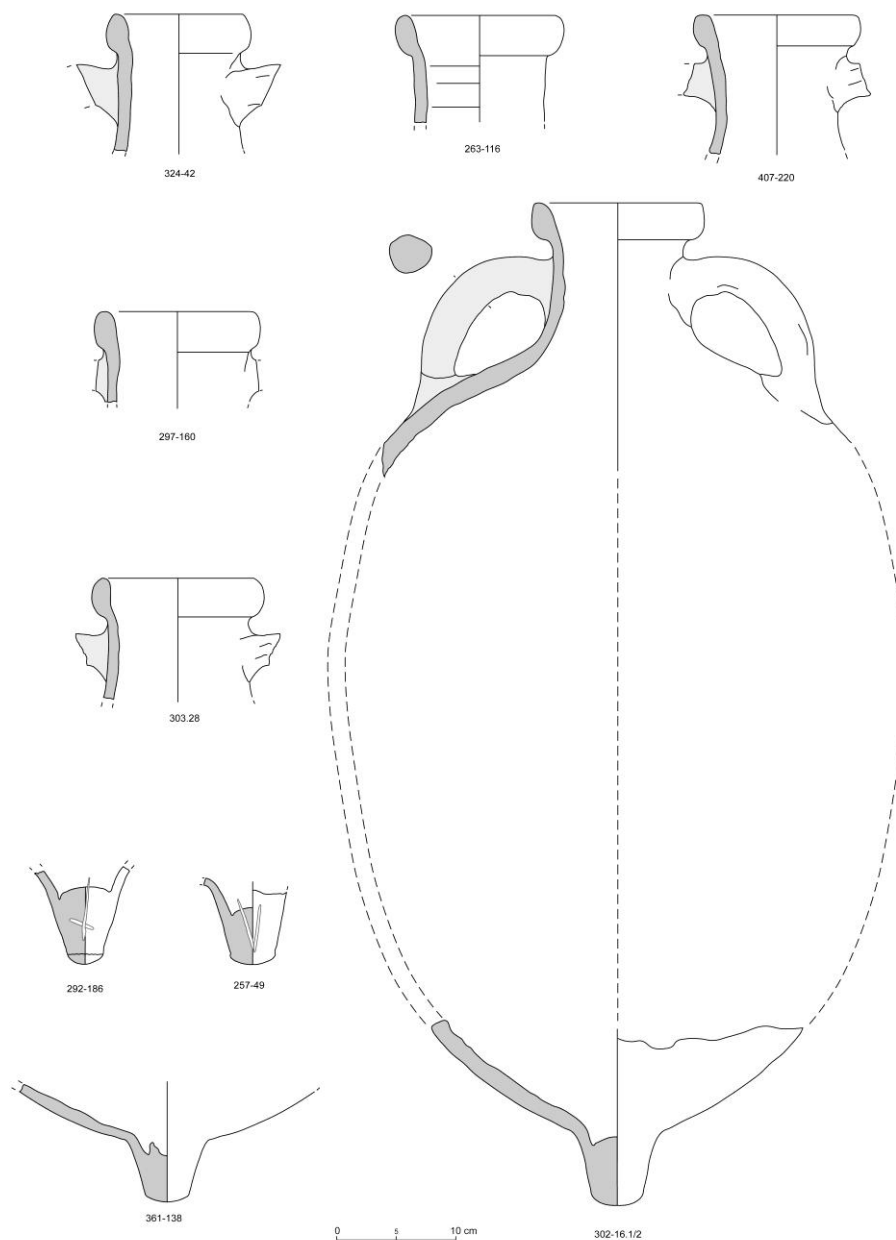


Fig. 8. Examples of Oberaden 83 from Kops Plateau (Nijmegen) (Carreras and van der Berg, 2017: 52, fig.4)

The short occupation of some military camps in the both riversides of the river Rhine contributes a very accurate data of how the olive-oil trade started in the *Germania Inferior*. For instance, the site of *Novaesium* (Neuss) documents at least 7 well-dated military wooden-camps from 16 BC to A.D. 43. All the amphorae were classified and quantified according to the camp and period to which they belong (Carreras and Berni, 2014), so we could determine when particular typologies were first imported in the site.

One remarkable feature is that Haltern 70 was the first Baetican amphorae typology imported in good numbers in Neuss, and later the forms Oberaden 83 and Haltern 71, which are the precedents of the Dressel 20 vessels. The Oberaden 83 appears in the first military camp (16-12 BC) and evolves to Haltern 71 and later to the Dressel 20, which is the most important Baetican typology in the camp 7 (AD 28-43). It should be boun in mind that Britain was conquered by Emperor Claudius in AD 43, when the Dressel 20 version was already the standard olive-oil amphora produced in the Guadalquivir valley.

However, Britain documents few examples of Oberaden 83 (*circa* 20 BC - A.D. 9) dated in the last decade BC, in pre-Roman context at Prae Wood and Gatesbury Track (Williams and Peacock, 1983). Therefore, there was a testimonial consumption of olive-oil amongst the Iron Age communities in Britain. By the way, no evidence of Haltern 71 (*circa* A.D. 1- A.D. 40) has been recorded so far.

The recent study of the military camp of Kops Plateau (Nijmegen) (Carreras and van den Berg, 2017) also provides testimony of early amphora imports in the *Germania Inferior*. The site was occupied between 12 BC and AD 68/69, and also shows the typological evolution of the Baetican globular olive-oil amphorae from Oberaden 83 to Haltern 71 and finally, the Dressel 20. The importance of olive-oil consumption in the site increased over the time, being Dressel 20 the most important amphora type in its last phase.

Finally, the still unpublished studies of the amphora from Xanten is another evidence in the German *Limes* that shows the relevance of the olive-oil consumption amongst military. Most contexts in Xanten belongs to the IInd century AD and document an overwhelming presence of Baetican Dressel 20 olive-oil amphorae as happens in Roman Britain. Therefore, the imports of Dressel 20 amphorae in military sites show a common pattern in these *Limes* provinces, which reinforces the idea of a public supply system. Although the study is still unfinished, more 400

amphora stamps are recorded at Xanten, so it is one of the most important olive-oil markets of this province.

Although distributions of Dressel 20 appear to be similar between Britain and Germany, it does not happen the same with the North African containers. There are only a few examples of North African amphorae in the German provinces (i.e. Kops Plateau – Carreras and van den Berg, 2017), even in later periods. Perhaps, trading routes in Late Roman period were diverse, and the Atlantic itinerary was the main route towards the British Isles. In the last years there has been a new interest in the research of the Atlantic Ocean as a key trading route between different Roman provinces (Carreras and Morais, 2012).

Despite difficulties in underwater archaeology in the Atlantic waters, coastal sites have provided numerous archaeological materials that related Mediterranean production centres with Northern consumption places. Apart from the numerous ports in the Lusitanian and Gallic coasts that have documented similar olive-oil amphorae of those recorded in great numbers in the German and British *Limes*, recently the publication of the pottery from Vigo (Fernández, 2014) in the NW Spain has turned out to be an important Late redistributive port.

Vicus (Vigo) records great amount of North African Red slip as well as African and Eastern Later Roman vessels, which reminds the same kind of imports recorded in late contexts in the Irish Sea and Cornwall. Therefore, Vigo may have acted as a compulsory port of call in the shipment towards the Northern lands. Some of scarce North African olive-oil transported in those latitudes was consumed here in its way to the Northern British markets (Fernández, 2014).

Conclusions

As it was said at the start, more than twenty years have gone by since the pioneering research on olive-oil imports in Roman Britain by Pedro Pablo Abreu Funari came out. Despite the distance in time and archaeological work, most conclusions drawn at that period are still in place, because new data does not seem to contradict previous hypotheses. However, the data sample ought to be improved with the new materials and update all the resulting statistics and maps, paying special attention to places such as London or Vindolanda, where there have been important discoveries. In the case of Roman London, the sample studied 20 years ago was not large enough for a city of its size. Therefore, any further improvement

will require a more complete study of many of the amphora assemblages that still remain in the Museum of London. Perhaps, it is one of the cities of Britain that may offer future surprises in volume and variety of olive-oil consumption, so further research is required. Apart from the cities, some territories studied in the past did not have enough data, because of the lack of amphora publications or direct study by researchers. Therefore, there is still blank areas that should be filled with available data.

As has been shown in this paper, the number of stamps and *tituli picti* on Dressel 20 amphora are increasing with new excavations, so catalogues published twenty years ago are out of date. Probably, there is no a huge number of new stamps but a constant update and publication is necessary. Once those catalogues and databases are completely updated, it will possible to revise again conclusions drawn from statistics and maps of previous corpora. The feeling is that there will be minor changes in those conclusions, but fresh data is required to justify this point.

Olive-oil was an exotic food ingredient in the cuisine of the British Isles, but not the only product of this kind. Recent studies of exotic plants reveal a similar strange pattern of distribution in the province that deserves a more throughout explanation in terms of cost, purchase power, ethnic preferences or even symbolism. Combining distributions of different products with similar patterns is in fact leading us to identify variance in the social composition of the Romano-British population. This approach is at the beginning and requires complex methodologies that may relate different kinds of data. One of these new methodologies is the analysis of DNA that allows us to discriminate different populations in Roman Britain, concentrated in different regions, periods and cities. The first excellent results obtained from the cemeteries of Roman London, in which was documented an heterogeneous population coming from the Mediterranean, Northern Africa and even China with a relatively low local population. Such new data may help to analyse topics such as migration and ethnicity in the Roman Empire that was not possible before.

Another topic is how those products reached the province of Roman Britain. So far transport models have been develop to identify the most suitable routes, and then they can be compared with the amphorae recorded on sites along those routes. Many regions in Western Europe are currently studied with similar methodologies in quantification that will allow a more accurate view of those potential routes. In the long term, data of other Roman provinces will help to understand the mechanisms of olive-oil trade in Roman Britain.

Summing up, the studies on olive-oil imports in Roman Britain are far from finished. They started almost twenty years ago with a first catalogue of all amphorae evidence (Baetican and North African vessels including their epigraphy) with its correspondent interpretation. At that time, a series of hypotheses were put forward that generate new questions on patterns of consumption such as ethnicity, purchase power or symbolism. They are still open to study with other types of data (exotic plants, pottery, DNA) that may help addressing our own queries.

References

- ALCOCK, J. *Food in Roman Britain*. Oxford, 2001.
- BERNI, P. *Epigrafía anfórica de la Bética. Nuevas formas de análisis*. Barcelona, 2008.
- BLÁZQUEZ, J.M.; REMESAL, J. *Estudios sobre el Monte Testaccio* (vol. 5). Barcelona, 2010.
- BLÁZQUEZ, J.M.; REMESAL, J. *Estudios sobre el Monte Testaccio* (vol. 6). Barcelona, 2014.
- BONIFAY, M. *Etudes sur la ceramique romaine tardive d'Afrique*. BAR Int.Ser. 1301, Oxford, 2004.
- CALLENDER, M.H. *Roman amphorae: with an index of stamps*. London, 1965.
- CARRERAS, C. "Los beneficiarii y la red de aprovisionamiento militar de Britannia e Hispania". *Gerión* 15, 1997, pp.151-176.
- CARRERAS, C. *Economía del imperio romano: la importación de alimentos*. Barcelona, 2000.
- CARRERAS, C.; BERNI, P. "Hispanic Imports in the First Military Camps of Novaesium (Neuss): Lager 1-7 (Augustus-Flavians)". *MBAH* 32, 2014, pp.173-208
- CARRERAS, C.; DE SOTO, P. "The Roman transport network: a precedent for the integration of European mobility". *Historical Methods: A Journal of Quantitative and Interdisciplinary History* vol.46.3, 2013, pp.117-133.
- CARRERAS, C.; FUNARI, P.P.A. *Britannia y el Mediterráneo: estudios sobre el abastecimiento de aceite bético y africano en Britannia*. Barcelona, 1996.
- CARRERAS, C.; MORAIS, R. "The Atlantic Roman trade during the Principate: new evidence from the Western façade". *Oxford Archaeological Journal* 31.4, 2012, pp.419-441.

CARRERAS, C.; VAN DEN BERG, J. *Amphorae from the Kops Plateau (Nijmegen). Trade and supply to the Lower-Rhineland from the Augustan period to AD 69/79*. Archaeopress Roman Archaeology 20, 2017, Oxford.

CARRERAS, C.; WILLIAMS, D.F. "Spanish olive oil trade in late Roman Britain: Dressel 23 amphorae from Winchester". *Journal of Roman Pottery Studies* vol. 10, 2003, pp.64-68.

COOL, H.E.M. *Eating and drinking in Roman Britain*. London, 2006.

EVANS, J.C. "Balancing the Scales: Romano-British Pottery in Early Late Antiquity". *Late Antiquity Archaeology*, volumen 10, issue 1, 2013, pp.425-450.

EVANS, J.C.; WILLIAMS, D.F. "The amphorae". In S.Sworn, H.Dalwood, C.J.Evans and E.Pearson (eds.) *Archaeological excavation at the City Campus, University of Worcester*. Wroxeter, 2014, pp.67-68.

FERNÁNDEZ, A. *El comercio tardoantiguo (s.IV-VII) en el Noroeste Peninsular a través del registro cerámico de la ría de Vigo*. Roman and Late Antique Mediterranean Pottery 5, Archaeopress. Oxford, 2014.

FUNARI, P.P.A. *Dressel 20 inscriptions from Britain and the consumption of Spanish olive oil: with a catalogue of stamps*. BAR Tempus Reparatum, Oxford, 1996.

GONZÁLEZ CESTEROS, H. *Ánforas hispanas en la Germania Inferior antes de la formación de la provincia 20 a.C. - 69 d.C.*(Ump. Thesis), Universitat Rovira Virgili, 2014.

HOWELL, I. *Roman and medieval development South of Cheapside. Excavations at Bow Bells House, City of London, 2005-6*. Museum of London Archaeology, Archaeology Study Series 26, 2013, London.

JARRETT, K. *(Ethnic, social, and cultural identity in Roman to post-Roman Southwest Britain*. Sheffield, 2010.

KELLY, A.M. "The Discovery of Phocaeen Red Slip Ware (PRSW) Form 3 and Bii ware (LR1 amphorae) on sites in Ireland - an analysis within a broader framework". *Proceedings Of The Royal Irish Academy*, 110 : 2010, 35-88

LAUBENHEIMER, F.; MARLIERE, E. *Échanges et vie économique dans le Nord-Ouest des Gaules. Le témoignage des amphores du IIe siècle avant J.C au IVe siècle après J.C.*, Besançon, 2010.

LEACH, S.;ECKARDT, H. ;CHENERY, C. ; MULDER, G. ; LEWIS, M. "A lady of York: migration, ethnicity and identity in Roman Britain". *Antiquity* 84 (323), 2010, pp.131-145.

LIVARDA, A.; ORENGO, H. "Reconstructing the Roman London flavourscape: New insights into the exotic plant trade using network and spatial analyses". *Journal of Archaeological Science*, 55, 2015, 244-252.

MARLIERE, E.; TORRES, P. "Tonneaux et amphores à Vindolanda: contribution à la connaissance de l'approvisionnement des troupes stationnées sur le mur d'Hadrien (II)". In A.Birley and J.Blake (eds.) *Vindolanda. The excavation of 2003/4*. Vindolanda, 2005, pp.214-236.

ORENGO, H.; LIVARDA, A. "The seeds of commerce: A network analysis-based approach to the Romano-British transport system". *Journal of Archaeological Science*, 66, 2016, 21-35

SHEEHAN-FINN, K. "Vindolanda's amphora stamps". Chesterholm Stone Project Vindolanda, 2012, pp.1-21.

SMITH, R.S. *Suburban life in Roman Durnovaria. Additional Specialist report: Finds pottery*. Dorchester, 2008.

SWAN, V.G. "Legio VI and its men: African legionaries in Britain". *Journal of Roman Pottery Studies* 5 : 1992,1-33.

SWAN, V.G. *Ethnicity, conquest, and recruitment: two case studies from the Northern military provinces*. *Journal of Roman Archaeology (suppl. Series)*, Ann Arbor.

WILLIAMS, D.F. "Amphorae". In M.Jones and T.Jones (eds.) *Romano-British settlement and cemetery. Mucking excavations*. London, 2013, pp.152-153.

WILLIAMS, D.F. "The Amphorae". In J.M.McComish (ed.) *Roman, Anglian and Anglo-Scandinavian activity and medieval cemetery on land at the junction of Dixon Lane and George Street, York*. York, 2015, pp.95-98.

WILLIAMS, D.F.; CARRERAS, C. "North African amphorae in Roman Britain: a Re-appraisal". *Britannia* 26, 1995, pp.231-252.

WILLIAMS, D.F.; PEACOCK, D.P.S. "The importation of olive-oil into Roman Britain". En J.M.Blázquez and J.Remesal (eds) *Producción y comercio de aceite de oliva en la Antigüedad*. II Congreso,. Madrid, 1983, pp.263-280.