

2016 **Peña, J.T.** "State involvement in the supply of olive oil and wine to Rome during the late empire: problems in reconciling the textual and archaeological evidence." Invited for Florida State University Department of Classics Langford Conference "Inscribed in Clay: Theorizing the Link between Pottery and History." Tallahassee, FL, 2/20/16.

[TITLE SLIDE]>>>>INTRODUCTION

During the late empire – for our purposes let us say roughly AD 300 – 450 – the Roman state mobilized both olive oil and wine as tax in kind under the land tax for the provisioning of the populace of Rome. In this paper I will explore some of the possibilities and limitations encountered in the use of textual evidence to aid in the identification of the classes of transport amphoras employed for the packaging of the oil and wine collected under these two initiatives. For this I will focus on a set of administrative documents from Carthage relating to oil and a monumental inscription from Rome relating to wine.

[SLIDE]>>>>OLIVE OIL

[SLIDE]>>>>The initiative for the mobilization of tax oil, known as the *canon olei*, was administered by the *Praefectura Annonae*. It appears to have involved mainly or exclusively oil raised in the Diocese of Africa, and to have involved the free distribution of an unknown amount of this to an unknown number of qualified recipients, perhaps on a daily basis, possibly through a set of facilities known as *mensae oleariae*.

[SLIDE]>>>>Amphora assemblages from Rome dating to the period that interests us are dominated by African amphoras belonging to several different classes, and the question has been and remains, which of these classes served as packaging for tax oil - in effect, reached Rome as part of the command versus the market economy, and, following from this, what portion of the set of African amphoras and of amphora assemblages.

[SLIDE]>>>>A set of 32 ostraka from Carthage can be used to develop some insights into this question. These documents, dated to AD 373, are apparently administrative documents produced by the *Praefectura Annonae Africae* – the diocesan branch of the *Praefectura Annonae* – to keep track of deliveries of oil to and the amount of oil weighed and then stored at a facility at Carthage. They were found together as a group in 1911 in the course of excavations on the *Ilot de l'Amirauté*, the small island at the center of the circular harbor at Carthage. Cagnat and Merlin produced a preliminary publication of the documents in the same year in which they were recovered, after which they remained almost entirely ignored until the speaker became aware of their existence in the mid 1990s, gained access to them, and produced a long article on them that appeared in a *JRA* supplement in 1998.

The 32 ostraka, all executed on sherds of African amphora, are of two different kinds, here termed Type 1 and Type 2, with 6 belonging to Type 1, 17 to Type 2, and 9 of indeterminate type. The Type 1 documents record the reception of shipments of oil containers at the harbor at Carthage, while the Type 2 documents record the amount of oil weighed and an estimate of the amount held in storage at the facility on a particular day.

[SLIDE]>>>>While the full set of documents permits numerous fascinating insights into various aspects of state oil mobilization operations in Africa, I will today focus on information provided by one element of the Type 2 texts, which I term Element 3, that provides information that can be employed to draw inferences about the kinds of containers employed for oil mobilization operations in the Diocese of Africa.

[SLIDE]>>>>This element, which occupies the lower portion of each ostrakon,

[SLIDE]>>>>consists of a series of entries that record the amount of weighed oil and containers of unweighed oil being held at the facility. Each entry for oil containers indicates the type of container, the number of containers, and the oil collection initiative or collection district with which the containers are associated.

[SLIDE]>>>>The names of the various container types are abbreviated in a cryptic and more or less opaque fashion.

[SLIDE]>>>>At the end of the list is a figure that represents an estimate of the total weight of oil held at the facility on that day in terms of centenarii - hundredweights - and librae - pounds.

In order to obtain this figure the person who composed the document must have assumed a standard weight of oil value in librae for each container type, multiplied this by the number of containers attested for that type, added the products of these operations, and then added in the figures for hundredweights and librae of weighed oil. While the specific arithmetic practices differ from one document to the next, the standard weight of oil value assumed for each container type was apparently rounded to zero or five in order to facilitate the calculation, which was perhaps performed with the aid of an abacus.

[SLIDE]>>>>When working on these documents I had the insight that the set of entries employed to determine the estimated total weight of oil figure at the bottom of the document was, in effect, a polynomial equation, and that with complete sets of entries for a sufficient number of documents it would be possible to solve for the standard weight values that the documents' composers had assumed for each of the container types, and from this also each container type's capacity. Since it was apparent on the basis of internal evidence that one of the container types – the one abbreviated KNT - was assigned a standard weight value of 100 pounds, this left four unknown standard weight values. As it turns out, there were four documents that preserved a complete set of entries, the minimum number that I needed to perform the operation.

[SLIDE]>>>>Before moving to the results, it will be helpful to review some basics of Roman metrology. For liquid measures the standard unit was the amphora or quadrantal, which was divided into 48 sextarii, with one amphora equal to 26.2 liters, and a sextarius 0.55 liters. Olive oil was normally measured by the libra – the Roman pound, equal to 327 grams, and we know from a metrological treatise that to convert from volume to weight Roman mensores assumed that one sextarius of oil weighed 1.5 librae.

[SLIDE]>>>>It should also be noted in this connection that the complex titulus pictus that occurred on the Dressel 20 amphora - the standard container for state oil from Baetica from the later first century BC to the fourth century AD - reports the figure for the weight of oil that the vessel contained in the so-called gamma component.

[SLIDE]>>>>In a large portion of cases – estimates range from one-third to one-half – this figure is 214, 215, or 216. If we convert the last of these figures from librae to sextarii by dividing by 1.5 we arrive at 144, the number of sextarii in three amphorae, and it is evident from this that for state oil packaging operations in Baetica there was a target module of three amphorae, expressed as 216 librae.

[SLIDE]>>>>Aware of this fact, it was with considerable exhilaration that, when I solved for the first of the container weight values, the one abbreviated ag, I obtained the figure of 215.0. As already noted, when calculating these figures the persons making the calculation rounded the assumed weight of container values to the nearest 0 or 5, with 215 therefore equal to 216.

[SLIDE]>>>>Continuing, for the container type abbreviated asab I obtained the value of 74.9;

[SLIDE]>>>>for that abbreviated as the value of 505.6;

[SLIDE]>>>>and for that abbreviated with a sign that I here render as psi the value of 397.3. The progression from a round, regular figure to figures that lie progressively farther from a 0 or 5 is likely the result of accumulating error that derived from math errors and/or truncation operations – that is, the rounding of certain figures down to the nearest hundredweight - present in some of the documents.

[SLIDE]>>>>I conjectured that the figure of 74.9 for the asab was, in fact, 75 – most likely an upward rounding of 72, the weight in librae of 1 amphora of oil;

[SLIDE]>>>>that of 505.6 for the as was, in fact, 505, the rounding upward to the nearest 5 of 504, the weight in librae of 7 amphorae of oil,

[SLIDE]>>>>and, lastly, that of 397.3 for the psi, was, in fact 400 librae, or four hundredweights of oil. In order to test these assumptions I plugged the conjectured standard weight values back into the documents and in two of these I was able to reproduce exactly the estimated total weight of oil figure at the bottom. My inability to reproduce exactly the figures in the other two documents was presumably due either to the presence of math errors in the documents themselves or unrecognized rounding and/or truncation operations.

[SLIDE]>>>>I next sought to determine the likely nature of the container types by considering their associated attributes, including capacity,

[SLIDE]>>>>whether or not they were attested in entries that represented delivery by sea,

[SLIDE]>>>>and whether or not they were attested in entries linked to the fiscus, which involved the long-term storage of the oil at the facility. Here the underlying assumption was that skin containers were unlikely to have been delivered by sea or employed for long-term storage due to the fact that they would have been prone to shifting and susceptible to holing by rats.

[SLIDE]>>>>On the basis of these considerations it seemed clear that the as, as a container with a capacity substantially larger than that of any known transport amphora, and one never associated either with a delivery by sea or the fiscus, was a skin container with a capacity equal to seven amphorae. To my knowledge, no example of such a container has survived.

[SLIDE]>>>>The culleus, a skin container with a notional capacity of 20 amphorae – presumably the kind shown mounted on a wagon in this fresco from Pompeii - was made from a single ox hide, so it may be that the as was manufactured from one-half of an ox hide. Given the size of these containers, their transport to Carthage would have required the use of a heavy cart or wagon, presumably operated by the *cursus publicus* – the state post system. Worth noting is that an entry in the *Codex Theodosianus* from AD 357 sets the maximum load for the two types of heavy wagons operated by the *cursus publicus* at 1000 and 1500 *librae*, roughly the weight of two and three filled as, respectively, and it may be that the size of these containers and the load limits for these vehicles were related.

[SLIDE]>>>>The asab, while of a size compatible with that of a transport amphora, was also never attested with a delivery by sea or the *fiscus*. These observations, together with the fact that this abbreviation begins with the two letters of the as abbreviation, suggests that this container type was also a skin container.

[SLIDE]>>>>A container of roughly this size, made from the hide of a single goat, is known from the Cave of Letters in Israel. A mule, donkey or camel could have carried four of these containers – two slung to either side

[SLIDE]>>>>– as illustrated in the appliques on this African Sigillata C Hayes Form 55C plate from central Tunisia dated to AD 325-350, a near perfect match for our ostraka in both location and date.

[SLIDE]>>>>The words *ascopa* and *ascopera* were both employed in late Latin to indicate a skin container, and it seems likely that the abbreviation as stands for one or the other of these.

[SLIDE]>>>>Asab – rendered as *asabce* in one ostrakon - may perhaps be an abbreviation for *ascopa/ascopera* a *byzacena* – *Byzacena*-style skin container. Many of the shipments in which these containers are attested likely originated in northern *Byzacena*, and it thus seems possible that the small, one-amphora size skin container was associated with this province.

[SLIDE]>>>>The other three container types are attested in association with the *fiscus*, two of these are attested for deliveries by sea, and all have a capacity that falls within the range of sizes attested for transport amphoras. I thus conclude that they represent some kind of transport amphora, with the KNT a one hundredweight-capacity container,

[SLIDE]>>>>the ag a three amphora-capacity container,

[SLIDE]>>>>and the psi a four hundredweight-capacity container.

[SLIDE]>>>>So far as their names are concerned, KNT is presumably an abbreviation for *centenarium*,

[SLIDE]>>>>and ag perhaps an abbreviation for *amphora gemellaria*, that is, a double container, for complex reasons that I will not here venture in to.

[SLIDE]>>>>I have no suggestion for how to expand the psi abbreviation.

[SLIDE]>>>>So far as identifications of these three container types with specific classes of transport amphora are concerned, for my 1998 publication I carried out capacity measurements

employing profile drawings of several examples of various classes of African amphoras by means of an AutoCAD routine,

[SLIDE]>>>>and on the basis of the results suggested that the KNT was likely the Keay 25,

[SLIDE]>>>>the ag the Keay 35,

[SLIDE]>>>>and the psi the wide-bodied Keay 35.

[SLIDE]>>>>The resulting scheme is that indicated in the table now on the screen.

[SLIDE]>>>>Since that time our knowledge of the content and provenience of the various classes of African amphoras manufactured in the fourth and fifth centuries has been considerably advanced, thanks in large measure to the work of Michelle Bonifay, who carried out a systematic survey of African amphoras from shipwreck sites with a view to determining which classes regularly bore pitch linings, and thus would not have been employed for the packaging of oil, and which have systematically produced macro-remains of fish products. He concluded that the Keay 25 - the most common African amphora of this period- was mostly or exclusively employed for some content other than oil, most likely wine; that the Keay 35B variety and the wide-bodied Keay 35 were employed for the packaging of fish products, and that while the Keay 35A was an oil container, it was not manufactured in northern Zeugitana.

[SLIDE]>>>>These results very substantially undercut the set of suggested identifications that I made in 1998, and I am now in a position to offer some tentative revisions to these as follows: The centenarium may well correspond to larger examples of the Late African 1 amphora, which is of the requisite capacity and was manufactured in the Carthage area into the late fourth century. A sixth kind of container that appears only in the Type 1 documents, where it is termed the Caproreses centenarium leve - that is, the light or short hundredweight container from Caproreses - a district in the interior of western Byzacena - may well correspond to the Keay 27, a container with a capacity of 100 pounds of oil or slightly less manufactured in a distinctive fabric that suggests that it originated in this general area. The Keay 3B similis and Keay 39 appear to have capacities that lie in the range of 80 liters, and may well correspond to the ag. The only transport amphora large enough to correspond to the psi other than the wide-bodied Keay 35 is the so-called African storage amphora, for which I possess no capacity data.

[SLIDE]>>>>I can thus tentatively offer a revised scheme along the lines of the table now shown on the screen. I hope to obtain additional capacity data for these and other classes of African amphoras of the fourth and fifth centuries over the next two or three years that will allow me to confirm or reject these conjectures.

[SLIDE]>>>>WINE

[SLIDE]>>>>The initiative for the mobilization of tax wine, known as the canon vinarius, was administered by the Praefectura Urbi. It appears to have involved exclusively wine raised in the Diocese of Italia, and from AD 365 involved the sale of wine at a subsidized price equal to three quarters of the market price for that type of wine. The basis for distribution before this date is unknown. The wine was stored in the Templum Solis in the northeast Campus Martius, and may also have been distributed through the mensae oleariae.

[SLIDE]>>>>Amphora assemblages from Rome dating to the period that interests us are marked by a very conspicuous presence of small (that is, ca. 6 to 20 liter capacity), flat-bottomed transport amphoras originating in central and southern Italy and Sicily, including the Empoli amphora, the Keay 52, Ostia 1.455-456, the Crypta Balbi 2, and various other less well documented classes. Many of these are of conspicuously sloppy manufacture, and many first appear in the late third century, roughly the period when the state wine supply was probably initiated, and there has been an inclination among amphora specialists to regard these at least in part as containers employed for the packaging of wine brought to Rome in this connection. Here, too, it would be extremely interesting to scholars of the economy of the later Roman empire and of the urbs to have more definitive information on this score.

[SLIDE]>>>>For some insight on this question we may look to *CIL* 6.1785, a monumental inscription discovered in 1765 at San Silvestro in Capite, more or less the site of the Templum Solis. It consists of five partially joining marble fragments that preserve only a portion of the original text. This specifies a set of procedures to be observed in connection with the consigning of some unspecified substance to some unspecified authority by unspecified individuals at a place referred to as the Ciconiae – the Storks - a river port facility probably located on the left bank of the Tiber somewhere in the Tor di Nona district. It can be safely inferred that the transaction in question involved the consigning of tax wine to the Praefectura Urbi by landowners. The inscription was likely erected at the Templum Solis, with another copy perhaps set up at the Ciconiae. The text can be assigned in general terms to the period ca. AD 330-400, and it can perhaps be linked either to one or the other of two entries in the Codex Theodosianus dated to AD 365 and AD 377.

[SLIDE]>>>>The translation and interpretation of the text have been problematic, due both to its fragmentary condition and to the fact that it contains the names of specific categories of functionaries whose duties can only be guessed at. The first part of the preserved portion of the text consists of a list of five categories of functionaries and the amount of cash in nummi that is owed them – presumably by the possessor – as a sportula.

[SLIDE]>>>>The austores – presumably emptiers or drawers of some kind – are owed 30 nummi per cask;

[SLIDE]>>>>the tabularii – clerks – are owed 20 nummi for each apoca, or tax receipt;

[SLIDE]>>>>the exasciator – apparently a person who dug something out with a hatchet- or trowel-like implement, is owed 10 nummi per cask;

[SLIDE]>>>>the falancarii – porters who employed a phalanga, or carrying pole – who carry the barrels to the temple – presumably the Templum Solis – and the barrel guards are each owed what would appear to be a flat fee – although perhaps a fee levied per cask is implicit here - in nummi, with the amount not preserved.

[SLIDE]>>>>Then follows a notation that after the degustatio, or formal tasting of the wine to insure that it had not soured, vessels termed ampullae were to be returned to the possessor, that is, the landowner.

[SLIDE]>>>>The preserved portion of the text ends with the specification that a payment of 120 nummi per cask is due a set of functionaries termed professionarii – that is, persons whose duties are linked to the issuing of a professio – or tax declaration. These would appear to represent an additional category of functionary, although it cannot be entirely excluded that this term refers to the five categories already named, with the figure of 120 nummi corresponding to the sum of the previously specified amounts.

[SLIDE]>>>>This text has generally been understood – as shown in the translation now on the screen - to indicate that casks were employed for the packaging of the tax wine brought to Rome, with the ampullae referred to representing sample flasks in which a sample of the wine was packaged for tasting by a functionary. Since the Ciconiae may well have served in large measure for the offloading of cargoes brought down the Tiber from the interior of Italy – more or less the function served during the medieval and early modern periods by the nearby Porta di Ripetta, it is thought that this text might refer specifically to tax wine originating in this area, perhaps also at no great distance from the urbs, given that it was landowners who consigned the wine rather than susceptores vini, men belonging to the body of functionaries organized in AD 365 for the collection and conveyance to Rome of tax wine.

[SLIDE]>>>>This scenario certainly fits well with the activities associated with the Porta di Ripetta, for which one of the principle cargoes was central Italian wine packaged in casks.

[SLIDE]>>>>Quite serendipitously, the Catacombs of Priscilla in Rome preserve a fresco that can be dated more or less to the period of the inscription that depicts, to one side, two casks set on the ground and, to the other, a group of eight men carrying a cask by means of carrying poles – evidently an illustration of the falancarii at work.

[SLIDE]>>>>But elements of this interpretation of the text have always troubled me. For starters, it has never made sense to me that ownership of the occasional sample flask along with whatever residual wine it might have contained would be an issue of such consequence that the Praefectura Urbi would have felt obliged to rule on the matter.

[SLIDE]>>>>Nor has it been easy to visualize what jobs were done by the auctores and the exasciator if the transaction simply consisted of consigning sealed casks and unstoppering and tasting the wine in an accompanying sample flask.

[SLIDE]>>>>And finally, the use of the verb referre to characterize the work of the falancarii has always puzzled me.

[SLIDE]>>>>Does this not oblige us to infer that the casks started out at the temple, with falancarii carrying these back to their point of origin, or, as the standard interpretation would have it, is it acceptable to understand this to mean simply that the falancarii carried the casks back with them to their base of operations.

[SLIDE]>>>>In light of these difficulties I would like to suggest that perhaps the best interpretation of this text is one quite different from the standard one, as embodied in the translation that I now show. By this reading, the transaction involved the consignment at the Ciconiae of wine packaged in small, flat-bottomed amphoras here termed ampullae – a word which is, after all, simply the diminutive of amphora. Here the amphoras were unstoppered by the exasciator, subjected to the degustatio, and, after approval, had their content decanted by the austores into empty, presumably used casks that had been brought down from the Templum Solis by the falancarii. The empty amphoras – likely many score or even some hundreds in number – were then returned to the landowner to do with whatever he or she wished. The landowner then paid the requisite fees according to how many of the casks his wine had filled, and the falancarii carried the refilled casks back to the Templum Solis for storage and the eventual distribution of their content.

[SLIDE]>>>>The landowners might have carried the empty amphoras back to their estates for refilling to meet their tax obligation for the following tax trimester, or unloaded them on the used amphora market, which evidence such as this second century AD epitaph of a man styled a negotians porto vinario lagonaris – jug merchant at the wine port – suggest existed at Rome.

[SLIDE]>>>>Cargoes of tax wine could have reached the Ciconiae by being towed or rowed upstream as well as floated down the Tiber with the current, meaning that tax wine could have reached this facility from a variety of locations throughout Italia, not just the Tiber catchment upstream of Rome.

[SLIDE]>>>>If all of this is true, then our inscription is not incompatible with the possibility that the various classes of small, flat-bottomed amphoras that explode in the pottery record of Rome during the period in question did, in fact, reach Rome at least in part as packaging for tax wine.

CONCLUSIONS

[SLIDE]>>>>The two case studies presented here illustrate how a close reading of texts can help to elucidate the role that transport amphoras played as packaging for the oil and wine mobilized by the Roman state as tax in kind for the victualling of the urbs during the late imperial period. While the texts that I have focused on today are sub-literary, literary texts, including the letters of Symmachus, Ammianus Marcellinus, even the SHA, and, in particular, the Codex Theodosianus, also contain much relevant and useful information. While the interpretation of these is complicated and their implications often unclear or ambiguous, the

student of the pottery of the late empire will do well to keep in mind that this corner of Roman archaeology can be, and I would argue, should be, an historical archaeology.