

PHILIP MAYERSON

THE RELATIONSHIP OF P. OXY. XVII 2153 TO P. OXY. L 3595–3597

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## THE RELATIONSHIP OF P. OXY. XVII 2153 TO P.OXY. L 3595-3597

*P. Oxy.* 2153, a third century letter of a certain Didymus to an apparent administrator of an estate, is a report, among several other matters, on the yield of wine from six pressing floors. Of the total yield a number of μέτρα are put into containers, and a number of μέτρα are disbursed by order (διαταγής?). In lines 4-5 the designated measures are abbreviated as  $\chi^{\delta}$ ,  $\delta\iota\chi^{\circ}$  and  $\delta\iota\pi(\ )$ .  $\delta\iota\pi(\ )$  is readily recognized as  $\delta\iota\pi(\lambda\hat{\alpha})$ , a double jar or measure, but the first two presented the editor with a problem which he resolved, with the support of *P. Gen.* 71, as (τετρά)χ(ορα?) and δίχ(ορα ?) However, a clearer resolution to the problem came with the publication of *P. Oxy.* 3595, note to lines 11-12, that the abbreviations in 2153 represented (τετρά)χ(οα), δίχ(οα) and  $\delta\iota\pi(\lambda\text{οκέρραμα})$ .

What is striking about *P. Oxy.* 2153 is the large number of  $\chi^{\delta}$  (5132) and the smaller numbers of  $\delta\iota\pi$  (121) and  $\delta\iota\chi^{\circ}$  (27). Even more striking is the correlation of these numbers with the production schedule laid out in H. Cockle's article on pottery manufacture in Roman Egypt (*JRS* 71[1981] 81-97), regarding three leases which were later published as *P. Oxy.* L 3595-3597. These three documents called for the production of wine jars known as Ὀξυρρυγγεϊτικὰ τετράχοα λεγόμενα, διπλοκέρραμα and δίχοα.

The following is a comparison of the number of jars involved in *P. Oxy.* 2153 and 3595-3597:

	dichoa	tetrachoa	diplokerama
<i>P. Oxy.</i> 2153	37	5,132	121
3595	150	15,000	150
3596	35	8,000	100
3597	15	4,000	100

Didymus' report to the estate administrator on the yield of the six pressing floors is given in terms of the three sizes of jars turned out by the potters of 3595-3597 each with a metric relationship to the capacity of a tetrachoon designated "Oxyrhynchite" with a capacity of "20 Maximian cotylae." The tetrachoa each hold 20 cotylae, the dichoa 10, and the diplokerama 40. The 8 foreign jars (ξενικῶκουφα ἀριθμῶ η) are unrelated to the three Oxyrhynchite types and the capacity of individual jars in terms of cotylae is not known. Undoubtedly that is the reason why certain quantities of wine are expressed (lines 6-7) as μέτρα.

After providing the data for the yield of the six pressing floors in terms of tetrachoa, dichoa, diplokerama and foreign jars, Didymus states (lines 6-8) that "εἰς ἃ κατηνίχθη ἐπὶ τὸ αὐτὸ μέτρα ρκγ καὶ διαταγῆς ἐπὶ τὸ αὐτὸ μέτρα ρκγ ("into which were bottled a total of 211 measures and by order a total of 123 measures"). He then gives the total of the yield as 5464 which the editor corrects (n. 9) to 5466.

Which jars does εἰς refer to? The key to unravelling Didymus' oblique report is the Oxyrhynchite tetrachoon which is both a standard measure and a jar with a capacity of 20 Maximian cotylae.<sup>1</sup> We can determine the number of Maximian cotylae that went into the foreign jars by subtracting the total of cotylae in the three known measures from the total yield of 5466, or 109,320 cotylae, which produces a total of 1470 cotylae. The following is a breakdown of the yield in terms of cotylae and metra.

	cotylae	metra
5,132 tetrachoa	102,640	5,132
121 diplokerama	4,840	242
37 dichoa	370	18.5
8 foreign jars	1,470	73.5
total	109,320	5,466

<sup>1</sup> See my article, "The Value of the Maximian Cotylae in *P. Oxy.* L 3595 and *PSI* XII 1252", *ZPE* 131 (2000) 167-169.

With the μέτρον as the equivalent of 20 Maximian cot., the 211 metr. represent 4220 cot.; the 123 met. 2460 cot. or a total of 6680 cotylae. These 6680 cot. of wine are the total of the 121 diplokerama, the 37 dichoa, and the foreign jars containing 1,470 cot.<sup>2</sup> They are the ones that have been bottled and account for 6% of the total yield. As for the 5132 tetrachoa of wine, they represent an aggregate quantity—in bulk, so to speak—which was not bottled in conventional jars and most likely was kept in storage jars (πίθοι). The 5132 measures would represent 94% of the yield of the six pressing floors.

An estimate of the total yield in liters can be made based on the value of a Maximian cotyla which I have taken to be between 0.6 and 0.576 l. vis à vis a nominal cotyla ranging conservatively between 0.24 and 0.27 l (above n. 1). In other words, the Maximian cotyla at Oxyrhynchus was the virtual equivalent of the sextarius/xestes, the Roman standard for liquid measures. It was the relationship between the cotyla and the sextarius that appears to have been the rationale for creating the Maximian cotyla as the equivalent of the Roman sextarius. If that is so, the 109,320 Max. cot. representing 5466 metra would total some 60,000 liters.

What can be observed in the relationship of *P. Oxy.* 3595-3597 to 2153 is two ends of a process: one, the manufacture of wine jars of three standard types and capacities by Oxyrhynchus potters; and two, the filling of those jars with wine from Oxyrhynchus pressing floors. The move toward standardization in third-century Egypt can also be observed in the Heroninus archive and related Fayum documents where wine jars/measures were also triform and where the Oxyrhynchition, the basic unit of the monochoron and dichoron, can be traced back to *P. Oxy.* 3595-3597.<sup>3</sup>

New York University

Philip Mayerson

<sup>2</sup> The eight foreign jars (1.5, ξεινικόκουφα ἀριθμῶ η) cannot hold 1,479 cot. or 73.5 metra. Assuming that all were of the same capacity, each would have to contain 4.6 times more than a dipl. or over 100 liters. Although transport jars could hold as much as 35 liters (D.P.S. Peacock & D.F. Williams, *Amphorae and the Roman Economy*, p.52) 100 would be out of the question. It appears that a figure in the neighborhood of <λ>η or <μ> η is called for.

<sup>3</sup> See my article, "The Monochoron and Dichoron: Standard Measures for Wine Based on the Oxyrhynchition", *ZPE* 131 (2000) 169-172.