RHODES: MBW 1979-1980

22. VII. 80

1

Most papers of MBW
in Rhodes 1980

See other folders:

SOLEIL DEPOSIT

25/vi/80
2.01

Rhodian unstamped or of which we do not know the eponym, to get dated

(done from cards, omitting Katzev, Soled, Villanova)

ΜΣ 161 Σα ca 2/4 3rd ? (Ρ-[illegible])

ΜΣ 305 (210 [illegible]) " " "

ΜΣ 461 Σ[illegible] " " "

ΜΣ 479 Παυσανίας – [illegible] for [illegible]

ΜΣ 577 ca 270 – 240

ΜΣ 578 " " " ? ? do not find card (Βνατ[illegible] ?)

ΜΣ 624 " " " " (waiting for [illegible])

ΜΣ 822 " " " " "

Α 421

Α 453

Papad α

β

γ

δ

Mpaltze

Rhodian eponyms to get dated

25/vi/[illegible]

Dates added in pencil by VG are provisional, 2.02 and not to be published without individual check with VG.

Agesios ca 270 – 240

Athanodotos "189"

Ainesidamos A. I ca 270–240 A. II "191"

Ainetor "190"

1, Ιερ. Alexiadas 3/4 2nd

Aratophanes / [ΕΙΡΗ]ΝΑ[ΙΟΣ] A. II, ca 100 BC, cf. ΓΑΔ 27, p. [illegible] under Ε 34

Aristarchos ca 270–240

Ιερ. Aristeidas A. I 3/4 2nd A. II. "179" A. III, ca. late 2nd

Aristion ca 280–270

Aristodamos II / ΚΑΛΛΙΑΣ "181"

" / ΦΙΛΑΙΝΟΣ "

Aristokrates ca. 300

Aristomachos / ΕΣΤΙΕΙΟΣ A. I ca 150

Aristombrotidas / ΠΟΛΥΑΡΑΤΟΣ c. 4/4 2nd

Ariston / ΑΝΤΙΜΑΧΟΣ "180"

Ιερ. Ariston

Aristonidas "222" ([illegible] 1991 p.[illegible])

Ιερ. Aristonymos [illegible] 2nd ca. 1/4 1st

Aristophilos [illegible]

Harmosilas "222" ([illegible])

~~Ar~~ Ιερ. Archilaidas "177"

Astymedes / ΔΙΕΚΟΣ (+ ΕΚΥΡΗΣ) A. I "213"

" / ΙΕΡΟΝ A. II ca mid 2nd

ΒΑΚΧ[ΙΟΣ ?] late 2nd – early 1st

ΔΑΜΟΞΕ[/ ΘΕΥΔΟΤΟΣ early 3rd

Eukles / ΔΑΜΟΝΙΚΟΣ 3/4 3rd

Euphron (fab.)

Zenon (fab.)

25/vi/80
2.03

Rhodian eponyms ... (2)

Thestor "202"
Theophilos (ph)
Hieron / ΑΓΑΘΟΒΟΥΛΟΣ Hi. II 4/4 2nd
Kleonymos
Ier. Kleonymos "195"
Menon (ph)
Mytion "224" ??
Nikasagoras / ΑΓΗΣΙΠΠΟΣ N.I "182"
.. / ΔΑΜΟΚΡΑΤΗΣ " "
.. / ΔΙΟΦΑΝΤΟΣ N.II "123"
.. / ΕΥΦΡΑΝΩΡ " "
.. I
Xenostratos / ΣΩΚΡΑΤΗΣ 4/4 3rd
Onasundios 3/4 3rd
Pausanias / ΣΘΕΝΙΔΑΣ (ΜΣ 637)
.. III ?
Simylinos 2/2 3rd
Sosthatos 4/4 3rd
Sokrates
Timagoras / ΑΦΡΟΔΙΣΙΟΣ 2/2 2nd
Ier. Timagoras.
Philonidas 3/4 3rd

MRW

ACMR - Addendum (to Amphora Capacity Measurements, Rhodes, June 1979)

We measured about fifty further amphoras and took about fifty remeasurements between May 13 and 22, 1980, to complete last year's record and to look at some anomalies in the results. We used the same methods, with new equipment for the water measuring. Our containers were two 25-liter demijohns (in succession) of 24,425 and 24,909 cc (last year's was 24,630 - even modern containers of the same stated size evidently have a range of actual capacity), and a 2-liter wine bottle of 2,024 cc.

Reliability - Water Measurements In sixteen measurements of six jars (ACMR- Add. - Table A), only one was a little out of line - the third figure for A32 = MS476 was either 107 cc. lower than the highest figure for the jar or 204 cc. higher than the lowest. Otherwise, the second figure for VG R 20 was 87 cc. higher than the first and no other range exceeded 61 cc. It still seems safe to say that most water measurements are within 100 cc. of accurate (ACMR-2, where however it is incorrectly implied that the higher figures are always the more nearly accurate - usually they are, but some errors, like spilling from a container being used to fill a part-full container, work in the other direction).

Three jars measured with water in 1979 were remeasured with water in 1980, and the results were 190, 257, and 120 cc. higher. One might tentatively infer a systematic discrepancy of about 175 cc., just over 2/3% of the capacity (if taken as a round 25 liters). The jars were soaked about the same length of time this year as last before we measured them, and drank a similar amount (slightly less this year, but it was cooler and they were less exposed to sun). So they should not have been thirstier, and the only likely

explanation of systematic discrepancy is imprecision in determining the capacities of the containers used. As we measured the demijohns with the 2-liter bottles, our figures for them will reflect any error in our figures for the bottles. An error of 1/3% down in the figure for the 1979 bottle and of 1/3% up for the 1980 bottle would explain the 2/3% discfepancy in results. In two liters 1/3% is 6.7 cc., which is improbably large for error in the average of repeated measurements, so probably smaller error in measuring the bottles has been compounded in measuring the demijohns and the jars. In any case, in comparing results from sets of measurements made with different containers one must allow for a slight systematic discrepancy produced by the margins of error in determining the capacities of the containers. Here, 1980 water results will be followed by !, and should be reduced by 2/3% for comparison with 1979 water results.

The data on soaking of water into the walls of jars before measurement show that the later third-century jars absorb somewhat more and more quickly than earlier third-century jars, and that they take in roughly a half liter in the first half hour (tabl.B). It follows that if measured without soaking they would have appeared roughly a quarter liter or one percent smaller than they are. A 126 = MS 566, although early, drank over a liter and a quarter in its first half hour, both in 1979 and again in 1980 - an extreme case but a warning. For comparability of results, jars should be let soak at least half an hour, perhaps longer, though even so absorption during measurement can never be eliminated and all results will be absolutely a shade low.

ACMR - Add. - 3

Reliability - Dry Measurement Six pairs of measurements of the same jar with styrofoam pellets (ACMR - Add. - Table C) had ranges of from 20 to 165 cc. It still seems safe to say that "a single styrofoam measurement should probably be taken as normally accurate only with a margin of error of ± 1%." (ACMR - page 5) We patched the shoulder of one jar that had a piece missing with clear tape, and were able to observe how the styrofoam pellets left air space at the shoulder until the jar was shaken, when they settled into it (Claire Zimmerman's suggestion). That did not surprise us and for reasons given last year we again made no attempt to make the peflets occupy the space tightly instead of loosely. (Our own further data on trying to pack Corinthian and late Roman amphoras does not suggest that packed measurements are generally more repeatable.) But it does underline the point, that styrofoam measurements do not themselves directly give the full capacity. We get about the same amount of styrofoam into a given jar each time we measure it, and we can compare that amount to the amount taken by a jar whose capacity is known by direct measurement with water, and infer what water measurement of our jar would be likely to tell us if it were possible.

We noted above the problem of comparing water measurements made with different containers - with dry measuring there may be a similar problem in comparing different batches of measurements even when made with the same cup and by the same person. Our chief measurer was Mitsos (Mouliates) in both years, and his results repeated well in each year (ACMR - Table C and ACMR - Add. - Table C). He redid in 1980 11 jars he had done in 1979, 2 with cupfuls and 9 by pouring (the 11 are marked * in ACMR - Add. - Table D.). His results were a little higher on the two jars, and comparable on the nine. Now poured results are on the whole about 1% high (ACMR - Table D). So it looks

as if he got on the average 1% higher readings (i.e., filled his cups 1% or about 5 cc. less full) this year, and this year's figures should be adjusted 1% down for comparison with last year's. The few cross-comparisons with Roussos Angeliates' measurements last year and with Claire Zimmerman's measurements this year give no reason to suspect discrepancy.

Our final question of comparisons is concerning some jars measured with water this year for which styrofoam figures were also available. The styrofoam figures are based on the value established last year - one cup counts 515 cc. But in principle they offer new evidence for that value which may confirm or modify it. 1980 water figures should be about 2/3% higher than 1979 styrofoam figures and 1/3% lower than 1980 styrofoam figures (remebering that 1979 poured figures are 1% high). Data on six of the seven available jars (ACMR - Add. Table E) are relatively acceptable. But the three wet and three dry measurements of MS630 are disquieting - they fail to agree by a range of fully 1%, which might be tolerable for single measurements but is not for groups of three. The fixing of the cup of styrofoam in water terms is not as solid as we had hoped.

Results - Hotel Soleil Find We have figures for 134 jars (as compared with 108 last year). The range is 5 liters - from about 24 1/3 to about 29 1/3 liters (last year's higher figures were in error). Only two are below 25 liters and only 1 above 29 liters, so 98% of the jars fall within a range of 4 liters. 14 jars are below about 25.5 or above about 28.2 liters, so 90% of the jars fall within a range of 2.7 liters at 26,850 liters ± 5%. The figures by fabricant are as follows:

DAMONIKOS, with 48 jars, has one at about 24.4 liters and one apparently at about 28.4 for an apparent range of 4 liters. But in fact all but one of his jars probably fall between 25.2 and 28.2 - within 3 liters - and 40 of the 48 between 25.5 and 27.5 - within 2 liters.

KREON, with only 17 jars, nevertheless presents a less tidy picture. With two jars at about 25.0 and one at about 28.5 he has an apparent range of 3 1/2 liters. Omitting the largest jar narrows the interval to 3 liters. But in fact three jars are near 25 liters, three near 28 liters, and the other eleven all between 26 and 27.1. Perhaps we should guess at different workshops or at least workmen within the Kreon works???

MIKYTHOS, with 31 jars, runs from about 25.7 to about 29.3, for an apparent range of 3 1/2 liters. But twenty-eight are between about 26.4 and 28.8 - 2 1/2 liters, and twenty of them are between 26.4 and 28.0 - 1 1/2 liters.

XENOTIMOS, with 28 jars, runs from about 25.5 to about 28.7 for an apparent range of 3 1/4 liters. But twenty-five are between 25.7 and 28.0 - 2 1/4 liters, and twenty-three between 25.8 and 27.8 - 2 liters.

Putting all our data together (with the adjustments for the different sets of data made), no fabricant's jars are the same within three liters, but the removal of a single jar in each case brings them within three liters, and each has over 80% within two liters. Ten other or unattributed jars are nine within 26.850 ± 5%, the tenth 24.3. One jar of an earlier year is 23.1.

ACMR - Add. Table A Repeated Water Measurements - Rhodian

(i) Repetitions within May 1980

A29 = MS467	26,265	26,311		
A32 = MS476	25,426	25,487	[25,380] or [25,630]*	25,454
MS549	24,065	25,045		
MS637	24,175	24,211	24,195	
VG R 20	24,244	24,331		
[VG R 21	25,004	[24,909]**]		
VG R 90	26,273	26,328	26,277***	

*Measured by MBW alone, who was not sure after an interruption whether an amount of 250 cc. had been recorded. Doubt noted before completing measurement.

**Taken without soaking as the jar appeared to be developing a leak.

***The water taken in in starting the siphon was not counted, so this figure is a little low - on another occasion the comparable amount was 28 cc.

(ii) Repetitions in May 1980 of jars first done in June 1979

A32 = MS476	25,450*	25,260
A126 = MS566	28,127	27,870**
A129 = MS484	26,183	26,063**

*Figure chosen from the four results in (i) for purposes of comparison.

** These figures were accidentally interchanged in last year's list.

Note - soaking data for above three:

A32 1979 798 cc after 1 hr. 19/v/80 1675 cc after 4 hr.s, 40 min.s
22/v/80 450 cc (approx.) after 1 hr.

A126 1979 1640 cc " 1 hr. 10 min 1980 1475 cc after 1 hr. 5 min.

A129 1979 570 cc " 1 hr. 20 min 1980 484 cc after 1 hr.20 min.

ACMR - Add. Table A - 2

(iii) Repetitions within June 1979 (from ACMR - Table A)

VG R 22	25,803	25,845	25,855
VG R 24	24,542	24,527	24,568
VG R 33	24,548	24,594	24,590

ACMR - Add. Table B Amount Soaked up before Measuring - Rhodian

A26 = MS477	After	35	min.	657 cc	After 1 hr.	735 total
A27 = MS478	"	45	"	457	" 1 hr.	515 "
A29 = MS467	"	30	"	678	" 1 hr.	826 "
A32 = MS476	"	30	"	396	" 1 hr.[550]	"
					" 1 hr. 798*	"
A33 = MS471	"	30	"	602	" 1 hr. 788	"
A103					" 2 hr. 10m 568*	"
A126 = MS566					" 1 hr. 10m 1640*	"
					" 1 hr. 5m 1475	
A129 = MS484	"	30	"	368	" 1 hr. 482	
					" 1 hr. 20m 534	"
					" 1 hr. 20m 570*	"
MS549	"	30	"	665	" 1 hr. [770]	"
MS554	"	30	"	545	" 1 hr. 811	"
MS632					" 1 hr. 40m 600	"
MS637	"	25	"	476		
MS832	"	20	"	478	" 1 hr. 594	"
VG R 20	"	30	"	730	" 1 hr. 916	"
VG R 21	"	30	"	500		
VG R 23					" 2 hr.s 1294	"
VG R 24					" 2 hr.s 1082	"
VG R 25	"	30	"	908	" 2 hr.s 1250	"
VG R 33					" 1 hr. 30m 971	"
VG R 56	"	25	"	1052	" 1 hr. 30m.1196	"
VG R 90	"	30	"	490	" 1 hr, 30m 690	"

* = 1979 bus.

ACMR - Add. Table C Repeated Dry Measurements 1980 - Rhodian

A25 = MS472	27,375	27,295	
A183 = MS333	28,725	28,885	
A169 = MS378	28,665	28,685	
[A220 = MS342	[24,570]	[24,525]]	
MS462	31,565	31,590	
MS637	23,870	23,980	23,755+

ACMR- Add. Table D Comparison of Dry Measurements 1980 and 1979

A4	20,545	20,600
A25 = MS472	27,375	*27,740
A30 see below	27,295	
* A48 = MS387	23,285	23,175
* A50 = MS385	28,195	*28,335
A69 = MS429	26,870	26,940 (av. of 2 best)
A70 = MS447	27,900	*28,930 (bad figure)
* A138 = MS548	26,360	*[26,335]
A161 = MS358	26,365	*[25,645]
* A164 = MS355	24,670	*24,670
A169 = MS378	28,665	*29,840 (bad figure)
	28,685	
A173 = MS322	25,235	[24,785]
* A178 = MS365	28,375	*28,380
A183 = MS333	28,715	**30,175 (bad figure)
	28,885	
A193 = MS422	28,945	*[29,370]

ACMR - Add. Table D - 2

*A206 = MS397	29,570	*29,695
A216 = MS350	25,185	*[25,445]
A217 = MS349	26,205	26,015
* MS462	31,565 31,590	*31,570
* MS468 = A30	25,235	*25,025
* MS504	25,780	*25,745
* MS549	24,015	*23,855
*MS604	9,330	9,270

ACMR - Add. Table E Comparison of 1980 water with dry measurements

A26 = MS477	26,137	26,185	styr.	1979
A27 = MS478	24,927	*25,105	"	"
A29 = MS467	26,300 av.	26,215	"	"
A33 = MS471	25,604+ (?200)	*25,680	"	" (chipped rim)
MS 549	24,050 av.	*23,855	"	"
		24,015	"	1980
MS 554	25,421	25,050	"	1979
		*25,300	"	"
MS637	24,190 av.	23,935	"	1980 av. of 2 better.

CAPACITIES OF AMPHORAS MEASURED IN RHODES, MAY 13 - 22, 1980

	1980	1979
A4	20,545	20,415
A25 = MS472	27,375 27,295	*27,740
A26 = MS477	26,137!	26,185
A27 = MS478	24,927!	*25,105
A29 = MS467	26,265! 26,311!	26,215
A30 = MS468	25,235	*25,025
A32 = MS476	25,454! 25,487! [25,630]! 25,426!	25,260 or [25,380]!
A33 = MS471	25,604!	*25,680
A37 = MS441	[26,595]	
A43 = MS374	26,455	
A47 = MS449	25,780	
A48 = MS387	23,285	23,175
A50 = MS385	28,195	*28,335
A51 = MS386	27,590	
A56 = MS382	27,045	
A57 = MS381	26,075	
A69 = MS429	26,870	26,945
A70 = MS447	27,900	*28,930
A72 = MS444	[28,630]	
A75 = MS445	26,700	
A77 = MS433	[26,590]	

	1980	1979
A78 = MS435	26,235	
A79 = MS434	26,130	
A85 = MS451	27,340	
A104 = MS578	24,665	
A105 = MS577	27,115	
A126 = MS566	28,127!	26,063
A128 = MS485	28,065	
A129 = MS484	26,183	26,063 cor
A138 = MS548	26,360	*[26,335]
A161 = MS358	26,365	*[25,645]
A164 = MS355	24,670	*24,670
A167 = MS376	25,345	
A168 = MS377	27,295	
A169 = MS378	25,665 25,685	*29,840
A170 = MS366	27,220	
A173 = MS322	25,235	[24,785]
A174 = MS319	26,725	
A178 = MS365	28,375	28,380
A183 = MS333	28,885 28,715	**30,175
A192 = MS437	26,565	
A193 = MS422	28,945	*[29,370]
A196 = MS400	26,420	
A205 = MS396	[25,720]	

Capacities - Rhodes, 1980 - 2

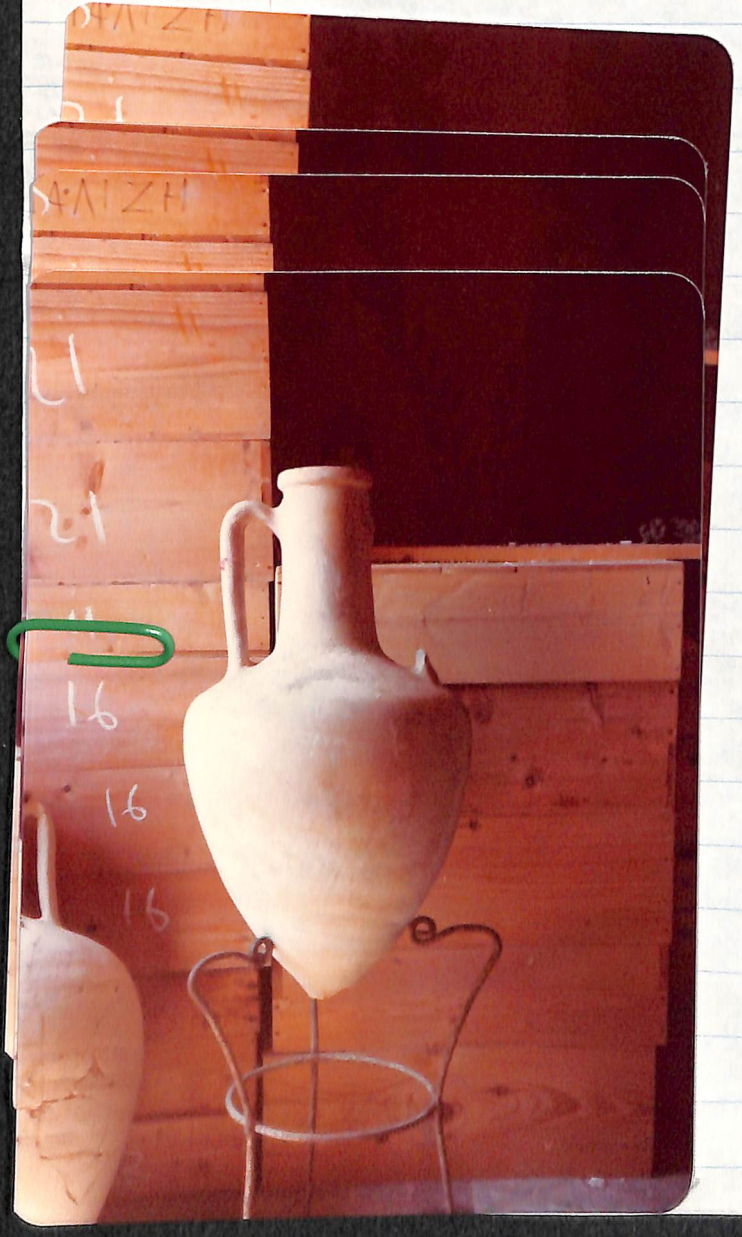
	1980	1979
A206 = MS397	29,570	*29,695
A216 = MS350	25,185	*[25,445]
A217 = MS349	26,205	*26,015
A220 = MS342	[24,525] [24,570]	
A222 = MS339	[27,735]	
A223 = MS340	[25,550]	
A225 = MS338	26,415	
A227 = MS344	25,815	
A230 = MS620	25,290	
A232 = MS622	27,025	
A235 = MS624	26,025	
A410 = MS599	[25,125]	
A483 = MS608	26,930	
MS462	31,565 31,590	*31,570
MS479	[26,265]	
MS482	25,885	
MS493	[46,670]	
MS504	25,780	*25,745
MS549	24,045! 24,065! 24,015	*23,855
MS553	[22,650]+	
MS554	25,421!	
MS603	[25,765]	
MS604	9,330	9,270

	1980	1979
MS637	24,175! 24,211! 24,195! 23,980 23,890 23,755	
MS822	26,940	
MS823	14,690	
MS824	8,200	
MS825	9,725	
MS826	[9,145]!	
MS828	21,340	
MS829	21,436! 21,405! 21,439! 21,630 21,625 21,585	
MS830	22,900!	
MS831	23,440	
MS832	20,967!	
MS835	9,425!	
MS836	7,851!	
VG R 20	24,244! 24,331!	
VG R 21	25,004! [24,909]!	
VG R 25	25,091!	
VG R 32	[24,107]+!	
VG R 56	[26,416]!+ 27,945	
VG R 90	26,273! 26,328! 26,277!	

10.IV.80 8

Wallace - capacities in Rhodes
Papademetriou, unstamped

Among jars measured IV.79 by M.B. Wallace, a few had no numbers that he could find. At this point I was not with him, and for identification PMWM photographed them. Six (above) photos attached. They did not find any stamps on these jars. Two of these in their photos show tags attached, which PMWM now follows, and said Παπαδημητρίου. So they may all come from that lot in which there were quite a lot of unstamped.



June 1979

DH 0.694
Dmax 0.376

Rhodes
In the Castello

13/vi/79

Roll C1. 17

4-6

June 1979

H 0.712
DMax 0.381

Rhodes
On the Castello

cap 28,160 L

13/vi/79

" &"

Roll C1. 76


21
21
11
16
16
16

June 1979

Rhodes
In the Castello

cap 27.640 l
14/vi/79

"8"

Roll C1. 14

PH 0.696
Dmax 0.37

June 1979

DH c.750
Dmax c.375

c/D 29.590 l
14/VI/79

"y"

Rhodes
In the Castello

Roll C1. 15

10.IV.80 8

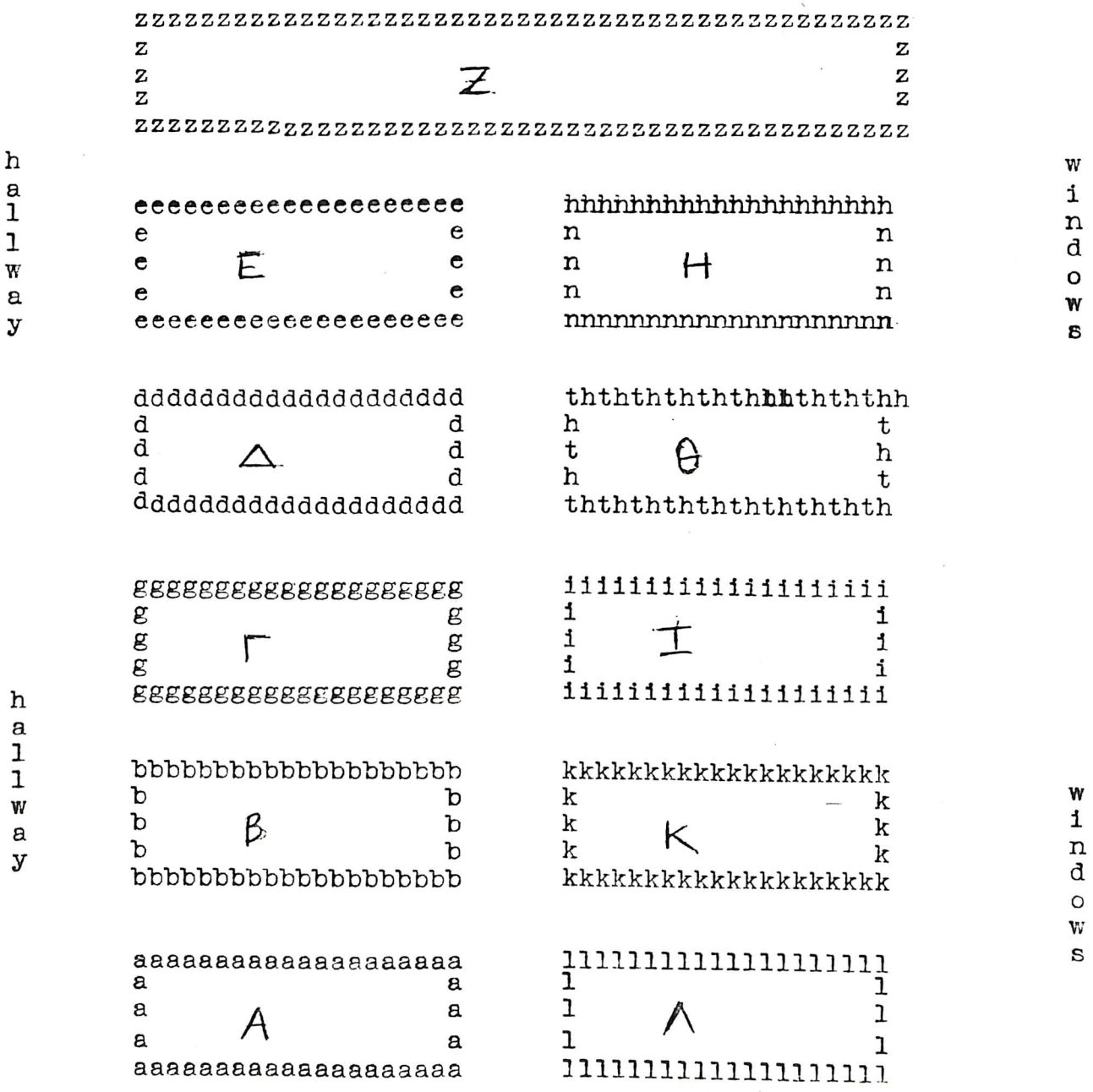
Wallace - capacities in Pluvis
Papademetriou lot unstamped

Among jars measured VI.79 by M.B. Wallace, a few had no numbers that he could find. At this point I was not with him, and for identification PMWM photographed them. See (above) photo attached. They did not find any stamps on these jars. Two of them in their photos show tags attached, which PMWM now calls no. and said Παπαδημητρίου. So they may all come from that lot ↑ in which there were quite a lot of unstamped.

vi/80

9.01

back wall



19/vi/80 MBW

9.02

Rhodes ephoria floor plan--Amphoras

Z(a)

u/	A97	A99	A101	A103	A105 MΣ 577	A107	A108	A110
u/	A98	A100	A102	A104 MΣ578	A106 MΣ576		A109	A111
a/	A126 MΣ566	A128 MΣ485	A130	A132	A134	A136	A138 MΣ548	A140
l/	A127	A129 MΣ484	A131 MΣ457	A133 MΣ492	A135		A137	A139

E

u/	A73 MΣ439	A74 MΣ455	A75 MΣ445	A76 MΣ440	A77 MΣ433	A78 MΣ435
u/	A79 MΣ434	A80 MΣ419	A81 MΣ420	A82 MΣ417	A83 MΣ415	A84 MΣ418
l/	A85 MΣ451	A86 MΣ388	A87 MΣ412	A88 MΣ475	A89 MΣ414	A90 MΣ408
l/	A91 MΣ321	A92 MΣ404	A93 MΣ410	A94 MΣ411	A95 MΣ409	A96 MΣ416

△

u/	A49 MΣ384	A50 MΣ385	A51 MΣ386	A52 MΣ362	A53 MΣ379	A54 MΣ380
u/	A55 MΣ383	A56 MΣ382	A57 MΣ381	A58 MΣ438	A59 MΣ446	A60 MΣ436
a/	A61 MΣ425	A62 MΣ431	A63 MΣ430	A64 MΣ424	A65 MΣ432	A66 MΣ426
l/	A72 MΣ444	A71 MΣ448	A70 MΣ447	A69 MΣ429	A68 MΣ428	A67 MΣ427

Rhodes ephoria floor plan(cont.)

9.03

Γ

u/	A37 MΣ441	A38 MΣ390	A39 MΣ371
u/	A40 MΣ452	A41 MΣ372	A42 MΣ373
l/	A43 MΣ374	A44 MΣ453	A45 MΣ454
l/	A46 MΣ450	A47 MΣ449	A48 MΣ387

B

u/	A13	A14	A15	A16	A17	A18
u/	A19	A20	A21	A22	A23 MΣ469	A24 MΣ473
l/	A25 MΣ472	A26 MΣ477	A27 MΣ478	A28 MΣ470	A29 MΣ467	A30 MΣ468
l/	A31 MΣ474	A32 MΣ476	A33 MΣ471	A34 MΣ443	A35 MΣ389	A36 MΣ442

A

u/	A1	A2	A3	A4	A5	A6
l/	A7	A8	A9	A10	A11	A12

Rhodes ephoria floor plan(cont.)

Z(b)

u/	A112	A114	A116	A118	A120	A122	A124	
u/	A113	A115	A117	A119	A121	A123	A125	
l/	A141	A143	A145	A146	A278	A280	A282	A284
l/	A142	A144	[A277	A279	A281	A283	A285]	→

H

u/	A156 MΣ361	A157 MΣ360	A158 MΣ359	A159 MΣ356	A160 MΣ357	A161 MΣ358
u/	A162 MΣ353	A163 MΣ354	A164 MΣ355	A165 MΣ370	A166 MΣ375	A167 MΣ376
l/	A168 MΣ377	A169 MΣ378	A170 MΣ366	A171 MΣ363	A172 MΣ364	A173 MΣ322
l/	A174 MΣ319	A175 MΣ320	A176 MΣ368	A177 MΣ367	A178 MΣ365	A179 MΣ325

Θ

u/	A180 MΣ324	A181 MΣ323	A182 MΣ336	A183 MΣ333	A184 MΣ330	A185 MΣ334
u/	A186 MΣ332	A187 MΣ331	A188 MΣ329	A189 MΣ328	A190 MΣ335	A191 MΣ337
l/	A192 MΣ437	A193 MΣ422	A194 MΣ421	A195 MΣ369	A196 MΣ400	A197 MΣ423
l/	A198 MΣ405	A199 MΣ406	A200 MΣ407	A201 MΣ403	A202 MΣ402	A203 MΣ401

Rhodes ephoria floor plan (cont.)

9.05

I

u/	A204 MΣ399	A205 MΣ396	A206 MΣ397 ↑ MΣ413 neck only	A207 MΣ398	A208 MΣ393	A209 ~~MΣ394~~ MΣ394
u/	A210 MΣ346	A211 MΣ391	A212 MΣ351	A213 MΣ352	A214 MΣ395	A215 MΣ392
1/	A216 MΣ350	A217 MΣ349	A218 MΣ347	A219 MΣ348	A220 MΣ342	A221 MΣ345
1/	A222 MΣ339	A223 MΣ340	A224 MΣ341	A225 MΣ338	A226 MΣ343	A227 MΣ344

K

u/	A228 MΣ326	A229 MΣ327	A230 MΣ 620	A231 MΣ 621	A232 MΣ 622	A233 MΣ 623
u/	A234 MΣ456	A235	A236 MΣ 625	A237 MΣ496	A238	A239
1/	A240	A241	A242	A243	A244	A245
1/	A246	A247	A248	A249	A250	A251

Λ

u/	A252 ~~MΣ1223~~	A253	A254 ~~MΣ1247~~	[A255] ← bottom + neck	[A256	A257	A258]
u/	A259 ~~MΣ1287~~	A260	A261 ~~MΣ1290~~	A262 ~~MΣ1286~~	A263	A264	
1/	A265	A266	A267	A268	A269	A270	
1/	A271	A272	A273	A274	A275	A276	

MBW — RHODES 10.01

University of Toronto
TORONTO, CANADA M5S 1A1

DEPARTMENT OF CLASSICS
16 HART HOUSE CIRCLE

March 11, 1980

Miss V. Grace
American School of Classical Studies
54 Souidias St.
Athens 140, Greece

Dear Virginia:

I seem now to be a vast number of letters behind. This is partly due to a couple of mild bouts of flu over the last three weeks and no doubt also general disorganization. First, your letter of January 24th chiefly about Mortimer Chambers. I enclose xeroxes of his letter and my reply. I have not heard from him again nor seen any draft for his proposed commentary. I quite agree that nothing positive can be concluded from Johnson's estimates but I did think that the variance of the linear dimensions he reported might make people cautious about inferring capacity standards from the jars.

Panathenaics are something that a student of capacities must go into at some point, which I have not yet done anything about. I had supposed that they began in the 560's and that there were not any clearly before the Burgon amphora, and I am not one of those who will let Solon out of the 590's. But I suppose that there might have been earlier ones that we have not found yet. I knew that several had been found at Eretria (indeed in a book about Greece the Greek Consulate just sent me they are listed as an attraction of the Eretria Museum). They should be measured by styrofoam and perhaps if they are in Athens this summer that would be an opportunity or would the Eretria Museum be less resistant to scholarly attentions? I am a little hesitant, however, to apply for another permit in a new area when I have not yet published any work resulting from any of the series of permits I have had over the last four years, and the Panathenaics in particular would be slow to work up into a state that meant anything because of the checks that would have to be made from California to London and beyond. What do you think?

Secondly, about our proposed trip to Rhodes, I really ought to have got things straighter sooner. As it is, I enclose copies of letters to Dr. Papachristdoulou and to Henry Immerwahr, and a second quasi-public letter to you of which I am sending copies to the other two. The vagueness about Maggie's dates is I understand a matter of whether it

...2

will be cheaper to go straight to Athens or to take a charter to Athens and a London-Athens charter and she will be letting you know about that any day now.

I also enclose a xerox of a letter to Katzev which may serve as some sort of report of our activities in Ann Arbor. I talked to Barbara and Carolyn on the phone Thursday on the eve of Barbara's departure for Israel and they were in reasonably good form, and somewhat intrigued by ~~the~~ a scheme to have styrofoam made something like a quarter the weight of an equivalent volume of water so that we could use scales. But this might be to compound error, and it seems that good scales are expensive. Barbara will be coming to Athens about July 16 and will be in Ann Arbor in September so that I shall overlap her twice. Although I sent Katzev some draft of the methods paper as we revised it in Ann Arbor I think you will not object to my saving your package for the summer when it will be a little more complete.

I enclose also copies of an exchange of letters with Petruso which may amuse you.

Yours sincerely,

Max

MBW:MP M.B. Wallace

P.S. Is there anything Thasian I should do for which I need a permit (a world French good will do?)?

RHODES

10.03

University of Toronto
TORONTO, CANADA M5S 1A1

DEPARTMENT OF CLASSICS
16 HART HOUSE CIRCLE

March 11, 1980

Miss V. Grace
American School of Classical Studies
54 Souidias St.
Athens 140, Greece

Dear Virginia:

My Toronto-Athens ticket is May 9-July 23. I wish I had discussed the details of the possible visit to Rhodes more with you in December. I enclose a copy of the letter of Dr. Papachrisdoulou about it. What I am least sure about is application to the Ministry. If we all go together, is it possible and proper for Maggie and me to be included under your permission? If there is any likelihood of my being there when you are not, should there be a separate application for me? Time is short enough so that I am sending a sort of conditional request to the Director to apply to the Ministry separately for me if you and he think it desirable. Also what about accommodations? In view of the ~~asking~~ timing (~~through~~ by which I apologize) might I leave them to you and to Maggie after she arrives, which I gather is to be April 4th or a day or two later?

Yours sincerely,

Max Wallace

M.B. Wallace

MBW:MP
cc-Dr. J. Papachristodoulou
Prof. H. Immerwahr

11.01

University of Toronto
TORONTO, CANADA M5S 1A1

DEPARTMENT OF CLASSICS
16 HART HOUSE CIRCLE

November 19, 1979

Miss Virginia Grace,
c/o Mrs. F.R. Grace,
113 Lakeview Avenue,
Cambridge, Mass. 02138

Dear Virginia,

You are here early! And I am late in acknowledging your letter of October the 1st and the offprint, which arrived shortly after the letter. I had forgotten how much there was in it (including an alarming promise to publish Samian Capacities).

Alan Johnston I met him in London when attending the Centennial of the Hellenic Society and he was very friendly and told me about graffitti on Pan-Athenaics. He hasn't yet sent me any xerox of that but he did send me an offprint of the BSA 1978 paper. I am afraid I set him on the track of the translation of the Brashinsky paper.

Brashinsky I entirely agree that publication is useless without specific data including identification for ~~our~~ each jar involved. You will be happy if perhaps a little surprised to hear that in his paper on Hellenistic Rhodian Capacity Standards which Maggie has just finished translating from Brief Notices 154 he does give data jar by jar but this is partly because he has only a few new ones I fear. I have only one or two Chia between 25 and 26 litres and although I am soft on linear measurements I am not so soft as to think that any formulas have been adequately established. I do not have your typescript of 13.10.62 on Chian measurements. The embarrassing truth is that the relevant box of Pa's papers keeps eluding us. Maggie and I cannot quite believe that further searching will not turn it up. If we ever get enough Chian to publish I will certainly refer rigorously to the standards decree (not the coinage decree) without I hope falling into as it were opposite, or metrological, error and assuming, rather than seeking to see, that the different types ~~of~~ of standards bore an easy relation to one another. I have been in correspondence on this sort of issue both with Tony Andrewes, who has taken the view in his chapter on Solon for the revised CAH that coin weights were borrowed along with the name of the MNA from the East and that native Greek Standards need not in the 7th century, indeed should not correlate with them.

Papachristodoulou

I enclose a copy of his reply to that tedious typescript you saw in July. My letter to him had contained a suggestion of a visit in the 2nd half of May but I see from your letter that you have unfinished business there and make the obvious suggestion that we might come together. If that seems like a good idea does May remain the right month? I expect to get to Athens the 10th or 11th, then planning on being in Greece, as before, until roughly mid-July, or maybe the end of the month if the teaching assignments for next year don't include strange courses. Shall we perhaps be seeing you on your current visit? Maggie and Dougald will be in London from December the 19th to January the 4th and I am not sure whether we can prevail on you to travel ~~this~~ far north as Toronto, In any case, though if it fitted ~~along with the~~ a second visit we should be very pleased. I shall be at Boston from the 27th to the 30th.

Ungentaria

I enclose a brief note on my inconclusive activities of the 5th of July which may amuse. I sent a copy some time ago to Ginny but haven't had any comment.

Katzev

Michael sent me some comments on the Rhodian report. Apparently in the end I have persuaded him that the value of a cup of pellets can only be inferred by comparison with water measurements for a given sort ~~of~~ size of jar, rather than measured directly. It looks as if he will be measuring in Cyprus this spring.

I saw Carolyn Koehler at the Philadephia meeting on Classical Trade (published in Expedition) and gather that she has a lot of Corinthian figures. She and Barbara and I will be getting together in January and hope to hammer out at last a Capacities-taking draft, after which I shall send you an even longer letter.

Yours sincerely,

Mac

MB:DB

MINISTRY OF CULTURE AND SCIENCE
ARCHAEOLOGICAL INSTITUTE OF DODECANESE
RHODES-GREECE

RHODES, 23/7/79

Prof Malcolm Wallace
American School of Classical Studies
54 Souidias Street
A t h e n s (140)

Dear Prof Wallace,

Thank you very mueh for your letter of July 7th ahd the information included.

We shallbe glad to see you again next year. A new application to the Ministry of Culture and science for 1980 would be necessary. We have nothing against the time you suggest but I think it would be better to fix it more precisely during the early months of the next year.

Please give my regards to your sister.-

Yours sincerely

JOHN PAPACHRISTODOULOU
EPHOR OF ANTIQUITIES

C 3.

May 1980

Claire, VG, MBW, Mitsos Mouliates

C_2.

May 1980

Aunt Martha, Maggie, ~~Herodus~~ and Obelix on Rhodes

V.80

(stolen from Claire)

Aunt Martha, Maggie, Manolis and Obelix on Rhodes

v.80

(stolen from Claire!)

K

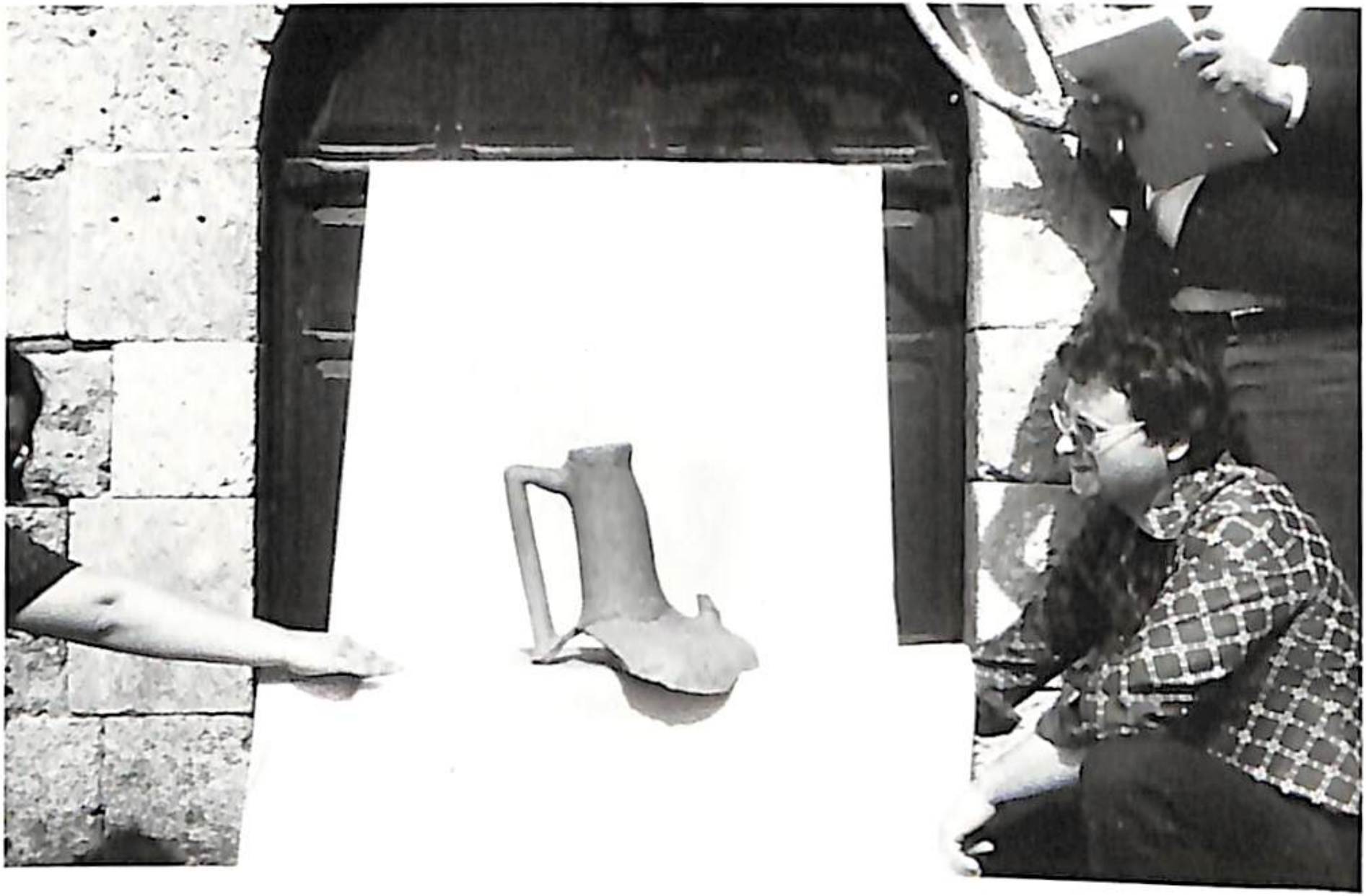
C. 3.

May 1980

ΜΑΝΩΛΗ

20.V.80

17-6



KOULA X.80

Z57.19

Mε 458

Αθανόδοτος, ep

18-6

Claire with goat-head on Patmos

May 26(?) 1980

To Aunt Martha

Hugs and kisses! Claire xxx

Claire and 4 soldiers she met on the boat from Rhodes to Patmos, May 21, 1980.

For Aunt Martha

P

C3.

May 1980

C3.

May 1980

C 3.

May 1980

11 July 1979

24

Dear Miss Grace,

I am putting in your box a copy of "Amphora Capacity Measurements, Rhodes, June 1979" and a copy of Mr. Wallace's letter to Dr. Papachristodoulou as instructed by Mr. Wallace before his departure.

Sincerely,

Thomas Loening

Please return to VG

a/s rec'd 11.VII.79 p.m.

25

American School of Classical Studies
54 Souidias St.,
Athens 140.

[ca 8.VII.79]

Dear Dr. Papachristodoulou:

I am most appreciative of your kindness and of your help with the amphoras, and I might have written sooner to say so. But even a brief account of our measuring took time to make. What is enclosed could be better, but I wanted to send something before going home, and it does state methods and results.

The methods and the basic ideas are of course Miss Grace's (who is writing separately). The errors were mine, like the idea of pouring styrofoam pellets from one jar to the next - cf. page 5. I have not checked all the figures, nor asked a statistician about them - whether, for instance, the median figures or the averages or the middles of the ranges are the most significant. And the discussion of the results generally is preliminary and tantative. My impression is that Miss Grace finds both the idea that jars were accepted within a range of ± 5% or circa 2.7 liters and the idea that the standard could slip down and be raised again in practice without any formal public change being made (page 9) rather unconvincing.

I shall be working on the problems over the winter, and I should very much like to come back to you next summer for a few days to go on with the study. I regret proposing to try your patience and disrupt your workrooms a second time (especially when what we did this time actually damaged certain amphoras). But you have more material than I realized and more than I could handle this time even though we stayed longer than we had planned. Partly I had hoped that measuring about half of the Soleil find would give enough information, and it now seems better to measure all of them (we did in fact 109 of about 130 that are measurable). Also I should think more about the Villanova jars, and others in Apotheke 5 of the Museum. And Table E indicates some of the checks that need to be made on the figures that we have already collected. Would a visit of a week or ten days in mid-May or any later part of the summer be possible?

Yours sincerely

Malcolm Wallace

(Malcolm Wallace)

PS I apologize for my inexpert typing, done on several machines - in the List at the end ' and ' are meant to be the same.

PPS There should at some point have been a reference to VG R 22, 23, 24, and 33 as jars published by Maiuri in Annuario 4/5 (1921/2) 249-267, under numbers XIII, XVII, XVII, and I.

Please return to VG

7/vii/79 (find version before mine went to Canada)

26.01

AMPHORA CAPACITY MEASUREMENTS, RHODES, JUNE 1979

By the kind permission of the Greek Archaeological Service and with the very generous cooperation and assistance of the Ephor of Antiquities for Rhodes, Dr. Papachristodoulou, and his staff we were able to measure about 175 amphoras at the ephoreia between June 1 and June 14, 1979. Our purpose was to add to the considerable number of measurements of Hellenistic Rhodian amphoras already taken, primarily by V. Grace, and to learn more about the taking and the interpreting of such measurements.

The method used depended on whether the jar could be measured with water. For WATER MEASUREMENT, a jar was set in a tripod on a raised surface, adjusted until level, and filled with water to the brim. The jar was then left to absorb water into its clay walls for one or two hours, and water was added until the jar was again full to the brim. The water was then siphoned out with a piece of clear plastic tubing circa 0.01 m. in diameter and circa 2 m. long. One person inserted one end of the tubing, with a stick tied to it to prevent curling and to take it down toward the bottom of the jar, a very little way into the jar at first, not displacing water over the brim, and quickly lowered it as the surface of the water in the neck of the jar sank. The other person sucked from the other end of the tubing until the flow of water was established, inserted it into the mouth of a 25-liter demijohn, and spat into the demijohn the water taken in. When the demijohn was full to the brim the tubing was moved to a 2-liter whisky bottle, which could be reused several times if necessary by blocking the tubing with a thumb over the lower end while emptying the bottle. When the siphoning failed the jar was emptied through a funnel into whichever container was part-full at the time, and the part-full container was then filled with a known amount of water from

a graduated measuring cylinder (in the case of the demijohn larger amounts could be poured in also from the 2-liter bottle). A record was kept of how many times the demijohn and the bottle had been filled; the capacity of the amphora was regarded as that amount less the amount added to make the last containerful complete (e.g., Jar x took 1 demijohn plus 2 bottles minus 130 cc.). The exact size of the containers was found by repeated measurement with the graduated cylinder: the bottle held 2,055 cc. and the demijohn 24,630 cc. The result was then calculated in cc. by substituting these values (some examples in Table A).

Reliability: Water from the jar might be spilt (especially in transferring the tubing from the demijohn to the bottle or in blocking it while the bottle was emptied). Fortunately the jars measured were often about the size of the demijohn, so that the flow through the tubing had to be disturbed only once or not at all. When three Rhodian jars (VG R 22,24, and 33) were each measured with water three times the maximum difference was only 52 cc. (in about 25,000 cc., so the range was 0.2%). Pairs of measurements on two Chian and one unidentified jar (MS607, A260, and no number) had ranges of 2, 28, and 26 cc. With one Chian jar, however, two measurements differed by 267 cc. (MS628 - for all seven jars see Table A). This may have been partly the result of a possible error in recording (omission of one use of the graduated cylinder, holding 150 cc.), but we have occasionally had before an "unlucky" set of water measurements where the range was as much as 250-300 cc. Most water results probably range from almost accurate to about 100 cc. lower than they should be, with a few as much as a quarter-liter low.

Secondly, some water soaks into the walls of the jar during measuring (even if the jar has been left to soak up water for a long time before the measuring). Since the Rhodian jars each absorbed from about 400 to about 1300 cc while soaking up before measuring, the additional loss during measuring (less than fifteen minutes, while the soaking was from one to two hours) for jars that were already thoroughly soaked can hardly have been more than a quarter of a liter in the worst case, and was probably usually much less. (For soaking-up figures see Table B.)

Finally, in antiquity jars used to carry wine were smeared with resin or other gummy matter to prevent the wine from being absorbed by the clay, and the gum will have taken a little space; also a little space must be allowed for air and for stoppering at the top. Our figures are not adjusted for the effects of absorption, lining, or stoppering - we list simply amounts of water we got out of full amphoras. The figures are at least comparable to each other, and we expect also fairly close to the usable capacity of the jars in antiquity.

If a jar could not be measured with water (for instance, the jars from the Hotel de Soleil find were broken and mended, and we did no water measuring at the Kastello), we measured it with SMALL STYROFOAM PELLETS of about uniform size. A jar was set in a tripod and adjusted until level. A metal cup was repeatedly dipped into the sack of pellets until overflowing, and a stick drawn across it slowly but firmly to remove the excess and produce uniform cupfuls. The cupfuls were poured through a funnel into

the jar. Each time the cup was emptied the person pouring announced its number, which the other person repeated aloud and wrote down, preventing any mistake in the count. When the jar was level full to the brim, as shown by drawing the stick across it, the amount left in the last cupful was measured in the graduated cylinder. A record of the capacity then existed as a number of cupfuls less a number of cc. To establish the number of cc. which should be counted for each cupful we took the averages of repeated styrofoam measurements of four Rhodian jars (VG R 22, 23, 24, and 33) and assumed that they should be equal to the value for the capacity determined by repeated water measurements of the same jars. The resulting combined figure was 515.2, so we counted each cupful as 515 cc. (Table C)

Reliability: The styrofoam pellets may occupy the space inside the jar loosely or more tightly, and of course the jar will hold more pellets if they are packed in more tightly. It might seem desirable to stuff as many pellets into the jars as one could (e.g. by stirring with a stick), but this is time-consuming and may be bad for weak jars, and the results are rather unreliable (it seems as if one can go on getting a few more pellets in almost indefinitely). Earlier tests suggested that "loose" figures when we made no effort at all to "stuff" the jar were as repeatable on later attempts as "tight" figures, and so we took only "loose" figures. These do have the disadvantage that if a jar is tapped or slightly shaken by accident the pellets immediately settle down in it, and in a few cases we got more pellets in than we should have as a result.

Another problem resulted from a short-cut in the method.

26.05

As many of the jars were of similar size we thought it would be quicker not to measure each jar individually by cupfuls, but, when one jar was full, to pour the pellets from it into the next jar, and record how much had to be added or subtracted, and then to pour the resulting amount into the next jar, and so on. (E.g., if Jar x held 50 cups - 300 cc., Jar y might be that amount plus 2 cups - 200 cc., therefore 52 cups minus 500 cc., Jar z the new amount minus 3 cups and 400 cc., therefore 49 cups minus 900 cc., etc.) To reduce any problems resulting from this procedure, we started again with a new "direct" measurement by cupfuls every fourth or fifth jar, and ~~nine~~ ten jars were measured both directly by cupfuls and indirectly by pouring from other jars. In ~~eight~~ nine cases the direct measurements by cupful were distinctly lower, and on the average they were lower by about one percent (Table D). In the attached list "poured" styrofoam measurements are accordingly marked with an *, and are probably about one percent too high on average. ** indicates measurements made after more than four pourings in a series. Measurements which are otherwise particularly dubious, either because of the amount of cardboard and plasticine patching or because of an error like a slight spill or shaking of the jar, are given in parentheses. Of course, even the figures for ordinary measurements by cupful have a margin of error; the range of pairs of measurements by cupful on four jars was circa 100 cc., or less than 0.5% (Table C) - with one other jar it was 810 cc. (A69 = MS429 (see Table E). A single styrofoam measurement should probably be taken as normally accurate only with a margin of error of ± 1%.

The results are not uninteresting, though much more study and comparison with other data is needed before conclusions can be drawn. Almost all the Rhodian jars measured are dated by V. Grace between

circa 300 B.C. and circa 200 B.C. All are between 20 and 31 1/2 liters in size (except MS604 at 9 1/4 liters) - all but two are between 23 and 30 1/4 liters - all but eleven are between 24 1/2 and 29 liters. These results are not unlike other known results (some of which are summarized below). Accepting as a working hypothesis that jars that were stamped with the same eponym were certified as acceptable on the same standard, we can explain such an apparently wide range of variation in several different ways. The standard may have been adjusted or even altered once or more often. Even the jars of one fabricant (pottery) in one year will naturally vary somewhat from the standard that is aimed at. Some of the jars measured may have been discarded as failing to conform acceptably to the standard intended (the reuse of the Soleil and Villanova jars for other purposes than as containers is at least compatible with their being rejected batches). And some of our measurements will be wrong in ways that may affect the picture.

The jars of the Soleil find from the one year of the eponym Pausanias, circa 240-230 B.C. range, surprisingly, from 24 3/4 to 30 1/4 liters; in fact jars with the "Kreon" fabricant stamp cover that range, 5 1/2 liters. One might well question whether they could ever have been used in trade or were not rather discards. However, the jars of Pausanias/Damonikos, Pausanias/Mikythos, and Pausanias/Xenotimos are less varied. With Damonikos only 1 of 41 jars falls outside the range 25 1/4 to 28 1/4 liters (median value 26 1/4), with Mikythos 4 of 27 jars fall outside 26 1/2 to 29 liters (median value 27 1/4), with Xenotimos 1 of 26 jars falls outside 25 3/4 to 28 1/2 liters (median value 27 1/4 liters). Does this range of 2 1/2 or 3 liters suggest that the jars would or would not be acceptable?

By comparison, in the year of Theuphanes about 210 B.C., 1 of 12 jars of Kleisimbrotidas falls outside the range 25 to 26 3/4 liters (median value 25 3/4 liters). In the years of Kratidas and Hieron about 200 B.C. 28 of 29 jars of Diskos measured by V. Grace evidently fall within the range 24 1/2 to 26 1/4 liters (median value 25 liters). Some further measurements by V. Grace of jars of various eponym years and fabricants suggest that there was an increase of size shortly after 200 B.C. (to a median value of perhaps 27 or more liters). A good deal earlier, about 300 B.C. 23 (presumably contemporary) jars from the Kyrenia shipwreck measured by M. Katzev showed more variation, though 18 were between 24 3/4 and 27 1/4 liters (median value 26 liters).

Rather than suppose that most of this evidence is the misleading evidence of discards, we might accept a range of 2 1/2 to 3 liters, exceeded by the occasional jar (12 of Kreon's 14 jars are between 25 1/2 and 29 liters, median value 26 3/4). Such a range of about ± 5% does not seem excessive in the manufacture of large clay vessels intended to be uniform, and is indeed no greater than the apparent normal range of Greek commercial stone and metal weights. In the year of Pausanias 93 out of 109 measurements fell within the range 27 liters ± 5% (25,650 - 28,350 - or 2.7 liters. [By coincidence if the range is shifted downward to 26.7 liters ± 5%, or approximately 25,350 - 28,050 liters, there are still 93 jars within it, but 13 above and only 3 below instead of 9 and 7.]. Since styrofoam measurements may be 1% too high or too low, and poured measurements are from about 0% to 2% too high, in fact measurements within -6% and +8% of a norm are compatible with a real variation in jar size of ± 5%, and 102 of the 109 measurements fall within these limits. So well over 90% of the jars of the year of Pausanias we measured probably really fall within the range 27 liters ± 5%. In addition,

75% or so of the jars of one fabricant in one year are uniform within a much smaller range of perhaps 1 1/2 liters or under ± 3% (as are 21 of the 27 measurements of Pausanias/Mikythos jars). The ranges for the years of Theuphanes, Kratidas, and Hieron (the only others for which we have even ten or a dozen figures) are at least no worse. A range of 1 1/2 liters for most jars, and of 3 liters to cover nearly but not absolutely all jars, may continue to seem large. It is particularly odd that the median value appears to decrease or to increase by such small amounts - a liter or even half a liter. It would be difficult for an ancient authority to ascertain or even to specify such changes. The difference of median values among different fabricants in the year of Pausanias is even odder. The hypothesis of a ± 5% range has difficulties.

Of course, the capacity of an amphora is determined by its linear dimensions, and uniformity or variety of capacities implies uniformity or variety of linear dimensions. We measured the height (H), the interior height or depth (D), the maximum diameter (Dmax), the height of the maximum diameter (HDmax), the height of the neck (Hneck), and the maximum diameter of the neck (Dneck). These figures (see Table F) give plenty of scope for hypothesis, and what follows is partial and preliminary. (We omit for now HDmax as the least reliably measured and Dneck as least important for capacity.) The Pausanias/Xenotimos jars are less in height and greater in maximum diameter than the others of the same year, their median dimensions being H 77 cm., D 70 3/4 cm., Dmax 36 1/2 cm., Hneck 23 1/4 cm. Mikythos' jars are distinctly taller and slimmer, with median H 79 1/4, D 73 1/4, Dmax 36, Hneck 23 3/4; Kreon's and Damonikos' jars are intermediate in dimensions, with median H 78 1/4 cm., D 72 cm., Dmax 36 1/4 cm., Hneck 24 cm.

Dimensions of individual jars of the same fabricant (as recorded by us) have ranges of from 1 3/4 to 4 1/2 cm. (and Kreon has one outsize jar). If the few most different specimens are excluded, the ranges of the majority of jars' dimensions are from 1 to 3 cm., and Aenotimos has on the whole the smallest ranges of the four.

For Theuphanes/Kleisimbrotidas our figures are, median H 77 3/4 cm., D 73 cm., Dmax 35 1/4 cm., Hneck 25 cm. For Hieron/Diskos with Kratidas/Diskos V. Grace's figures give H 78, Dmax 34 3/4, and for the larger jars of the earlier 2nd century, H about 82, Dmax about 34 1/2 or 34 3/4. For the much earlier Kyrenia jars M. Katzev's figures give H 96, Dmax 36 3/4, a quite different design, which nonetheless produced a median capacity very close to that of Theuphanes/Kleisimbrotidas. Thus between the Soleil and the Villanova finds H remains about the same, while Dmax declines by stages about 1 1/4 cm. in relation with a decline in capacity of nearly 2 liters. Immediately afterwards, jars became larger in capacity and greater in height, the diameter remaining small. The range of normal H and D is about ± 1 1/2 cm. and of normal Dmax about ± 3/4 cm., or about ± 4% (excluding extremes). Since jars shrink differently in firing, the ranges of dimensions in each pottery in each year before firing must have been very small indeed.

In summary, apparent uniformity is combined with variations of median capacity, height, and diameter, even among different potteries in the same year, and a rise and fall of median capacities between 25 and 27 1/2 liters (with almost all jars between 24 1/2 and 28 1/2-29 liters). More wrecks with Rhodian jars in trade would help show whether our evidence is misleading. If not, we see neither disregard of uniformity nor close uniformity to one standard or even, apparently, to a standard which was changed once or more. It is only a speculation that the variations reflect decline in times of indifference and compensating increases in periods of general and official concern with standards.

Table A Repeated Water Measurements

VG R 22 Rhodian
1 demijohn + 1 bottle - 4 x 200 cc. - (200 - 118)
1 " + 1 " - 4 x " - (200 - 160)
1 " + 1 " - 4 x " - (200 - 170)

Calculation: The demijohn held 24,630
The bottle held 2,055
26,685

The amount required to fill the bottle in addition to what came from the jar ranged from 882 to 830 cc. Some spill was noted in the first measurement, less in the second, less again in the third. The second and the third vary by only 10 cc., and it seems appropriate to disregard the first and average them. So, subtract 835 cc.

Result:
26,685
835
25,850 25,850

VG R 24 Rhodian
1 demijohn - (200 - 112)
1 " - (200 - 97)
1 " --(200 - 138)

Calculation: The demijohn held 24,630

The amount required to fill it in addition to what came from the jar ranged from 103 to 62 cc. The measurement which was noted as likely to be the best was in fact the lowest, so none should be neglected, but the three averaged. So, subtract 84 cc.

Result:
24,630
84
24,546 round to 24,550

VG R 33 Rhodian
1 demijohn - (200 - 118)
1 " - (200 - 164)
1 " - (200 - 160)

Calculation: The demijohn held 24,630

The amount required to fill it in addition to what came from the jar ranged from 82 to 40 cc. There seems no reason to disregard any of the three. So, average, and subtract 53 cc.

Result:
24,630
53
24,577 round to 24,580

MS607 Chian 5 bottles - (200 - 144)
5 " - (200 - 142)

Calculation: The bottle held 2,055

5 x 2,055 = 10,275. The amount required to fill the last bottle in addition to what came from the jar ranged from 58 to 56 cc. So, average, and subtract 57 cc.

Result:

10,275
57
10,218 10,218

MS628 Chian 1 demijohn - 2 bottles - 20 x 150 cc. - (150 - 100)
1 " - 3 " - 8 " - (150 - 88)

Calculation: The demijohn held 24,630
The bottle held 2,055

(a)
24,630 | 20,520
4,110 | 3,050
20,520 | 17,470

(b)
24,630 | 18,465
6,165 | 1,262
18,465 | 17,203

17,470 - 17,203 = 267. There may be an error of recording (say, 1 x 150). But, not knowing, one must average.

Result:

17,203
134
17,337 round to (17,350)

A260 Chian 1 demijohn - 1 bottle - 17 x 200 cc.
1 " - 2 " - (1 bottle - 3 x 200 - (200 - 62))

Calculation: The demijohn held 24,630
The bottle held 2,055

(a)
24,630 | 22,575
2,055 | 3,400
22,575 | 19,175

(b)
24,630 | 20,520 | 2,055
4,110 | 1,317 | 738
20,520 | 19,203 | 1,317

19,203 - 19,175 = 28. So, average

Result:

19,175
14
19,189 round to 19,190 or since the second result used fewer measurements to 19,200

No number Unknown type 5 bottles - 4 x 200 cc. - (200 - 102)
5 " - 4 " - (200 - 128)

Calculation: The bottle held 2,055

5 x 2,055 = 10,275. (a) 10,275 / 898 / 9,377 (b) 10,275 / 872 / 9,403

9,403 - 9,377 = 26. Averaging, 9,377 + 13 gives [illegible]: 9,390

Table B Amount Soaked up before Measuring - Rhodian

A32 = MS476	left for one hour		798 cc.
A103	"	2 hr 10 min	568
A126 MS566	"	1 hr 20 min	570
A129 MS484	"	1 hr 20 min	415
MS609	"	1 hr 30 min	1200
MS632	"	[not recorded]	600
VG R 23	"	2 hr 10 min	1294
VG R 24	"	2 hr 0 min	1082
VG R 33	"	1 hr 30 min	1084

Note that the last three jars are all from the Villanova find, and MS609 is of about the same date.

Table C Average Value of a Cup of Styrofoam Pellets

VG R 22	50 cups - 50 cc.	
	50 cups + 30 cc.	
	(51 cups - 460 cc., which, substituting 1 cup = 515 cc.*, is	
	50 cups + 55 cc.	
Average	50 cups + 12 cc.	Jar held 25,850 cc. water (Table A)
So	50 cups styrofoam is equivalent to	25,838 cc.
RESULT	1 cup	516.7 cc.
VG R 23	50 cups - 435 cc.	
	50 cups - 485 cc.	
Average	50 cups - 460 cc.	Jar held 25,300 cc. water
So	50 cups	25,760 cc.
	1 cup	515.2 cc.
VG R 24	48 cups - 250 cc.	
	48 cups - 150 cc.	
Average	48 cups - 200 cc.	Jar held 24,550 cc. water (Table A)
So	48 cups	24,750 cc.
	1 cup	515.6 cc.
VG R 33	48 cups - 25 cc.	
	48 cups - 110 cc.	
Average	48 cups - 68 cc.	Jar held 24,580 cc. water (Table A)
So	48 cups	24,648 cc.
	1 cup	513.5 cc.

Now average the values for one cup 515.25cc.

*Justified by the other three calculations

Table D Comparison of Styrofoam Measurements by Pouring and by Cup

A35 = MS389	54 cups - 1775	poured = 51 cups - 230		
		By cups 51 - 455		
		DIFFERENCE 225		225
A92 = MS404	54 cups - 2250	poured = 50 cups - 190		
		By cups 50 - 425		
		DIFFERENCE 235		235
A177 = MS367	60 cups - 2355	poured = 55 cups + 220		
		By cups 55 - 280		
		DIFFERENCE 500		500
A186 = MS332	63 cups - 5510	poured = 52 cups + 155		
		By cups 52 - 85		
		DIFFERENCE 240		240
A198 = MS405	58 cups - 2350	poured = 53 cups + 225		
		By cups 53 - 40		
		DIFFERENCE 265		265
A200 = MS407	60 cups - 4930	poured = 51 cups - 295		
		By cups 51 - 480		
		DIFFERENCE 185		185
A210 = MS346	63 cups - 5175	poured = 53 cups - 25		
		By cups 52 - 20		
		DIFFERENCE 515 - 5		510
MS554	54 cups - 2510	poured = 49 cups + 65		
		By cups 49 - 185		
		DIFFERENCE 250		250
VG R 24	50 cups - 1075	poured = 48 cups - 45		
	48 cups - 250	poured = 48 cups - 250		
	AVERAGE	48 cups - 150		
	Average by cupfuls	48 cups - 200	(Table C)	
	DIFFERENCE	50		50
VG R 33	50 cups - 1165	poured = 48 cups - 135		
	Average by cupfuls	48 cups - 48		
	DIFFERENCE	-87		-87

The poured figure for A177 was produced by only three pourings in a row, though that for A210 came from eight pourings and might well be more different than the rest. There is no good reason why the difference should be less for the two Villanova jars. The five results that have the poured figures about 250 cc. higher are clearly the typical ones.

Table 1 Range of Repeated Measurements by Cupful

VG R 22	105 cc.	(3 measurements - Table C)
VG R 23	50 cc.	(2 " ")
VG R 24	100 cc.	(2 " ")
VG R 33	85 cc.	(2 " ")
A69 = MS429	810 cc.	This jar was measured a third time after we found that it had accidentally been done twice and that the discrepancy was so great, and the third measurement was only 10 cc. different from the second.

It is hard to know what to think about the discrepant figure. By comparison, when seven jars of various sizes and series were each measured three times with styrofoam at the Agora the maximum range was 350 cc and the next greatest 200 cc. (2 jars). A mistake in recording one cup is barely possible, but as the discrepant figure is higher than the two that agreed it would have to be of writing the figure for the last cup, forgetting, and putting the following number down. Even so a difference of 310 would be high. The measurement was made on Mitsos' first day, and perhaps his cupfuls were not yet as standard as they became.

Operators and Measurements: Apart from the discrepant figure the repetitions here are very little different from the original measurements, suggesting that the pouring was consistent on the whole (as well as the method sound). But all the pairs of figures are for jars done by Mitsos. On the first three days Roussos did 21 jars. 16 of the figures fall within a liter of 27 liters and do not affect any of our tentative conclusions, and 2 of the others are almost in that range and not troubling. It looks as if Roussos was pretty consistent with Litsos. But the figures for A173 = MS322 (Kreon [24,785]), A183 = MS333 (Kreon **30,175), and A216 = MS350 (Kreon *[25,445]) are of some importance, as is the fact that Roussos did 8 of Kreon's 14 jars. It would be desirable to have Mitsos redo these three and A217 = MS349 (Kreon 26,075 - Roussos' only "direct" Kreon measurement.

Finally, notice that for A4 Mitsos' result was 40 cups, nine 40 cups - 390 cc., my sister's 40 cups - 180.

Table F Linear Dimensions

Fabricant	Height	Depth	Diameter	Height of Neck
Xenotimos				
max.-min.	0.783-754	0.723-695	0.388-351	0.253-221
range	3 cm.	2 3/4	3 3/4	3 1/4
median	0.770	0.708	0.366	0.232
21 of 26 jars				
max.-min.	0.780-762	0.715-695	0.371-358	0.237-226
range	1 3/4	2 cm.	1 1/4	1 cm.
median	0.771	0.707	0.366	0.232
Mikythos				
max.-min.	0.812-769	0.748-704	0.372-351	0.253-227
range	4 1/4	4 1/2	2 cm.	2 1/2
median	0.793	0.731	0.361	0.237
21 of 27 jars				
max.-min.	0.803-774	0.745-721	0.366-357	0.243-231
range	3 cm.	2 1/2	1 cm.	1 1/4
median	0.793	0.733	0.361	0.237
Ireon				
max.-min.	0.860-767	0.744-706	0.372-355	0.247-224
range	9 1/4	3 3/4	1 3/4	2 1/4
median	0.785	0.720	0.365	0.238
11 of 14 jars				
max.-min.	0.797-772	0.739-714	0.366-355	0.243-230
range	2 1/2	2 1/2	1 cm.	1 1/4
median	0.782	0.721	0.364	0.237
Damonikos				
max.-min.	0.807-764	0.748-704	0.372-350	0.255-217
range	4 1/4	4 1/2	2 1/4	3 3/4
median	0.782	0.721	0.361	0.240
31 of 38 jars				
max.-min.	0.801-771	0.737-707	0.372-356	0.250-231
range	3 cm.	3 cm.	1 1/2	2 cm.
median	0.782	0.720	0.362	0.240
Kleisimbrotidas				
max.-min.	0.787-770	0.738-721	0.388-347	0.255-233
range	1 3/4	1 3/4	4 cm.	2 1/4
median	0.779	0.729	0.353	0.250
11 of 12 jars				
max.-min	0.785-770	0.734-721	0.361-347	0.255-241
range	1 1/2	1 1/4	1 1/2	1 1/2
median	0.778	0.729	0.353	0.251

CAPACITIES OF AMPHORAS MEASURED IN RHODES, JUNE 1-14, 1979

A4	20,415	A48 = MS387	23,175
A23 = MS469	26,780	A49 = MS384	°28,020
A24 = MS473	°25,740	A50 = MS385	°28,335
A25 = MS472	°27,740		
A26 = MS477	26,185	A52 = MS362	°(26,015)
A27 = MS478	°25,105	A53 = MS379	°26,340
A28 = MS470	°26,380	A54 = MS380	°27,335
A29 = MS467	26,215	A55 = MS383	27,050
A30 = MS468	°25,025		
A31 = MS474	°25,450	A58 = MS438	°(27,585)
A32 = MS476	25,260	A59 = MS446	°26,715
A33 = MS471	°25,680	A60 = MS436	26,980
A34 = MS443	°25,535	A61 = MS425	°25,775
A35 = MS389	25,810	A62 = MS431	°27,690
A36 = MS442	°26,605	A63 = MS430	°26,005
		A64 = MS424	28,840
A38 = MS390	°27,825	A65 = MS432	°25,780
A39 = MS371	28,025	A66 = MS426	°27,520
		A67 = MS427	°(27,155)
A41 = MS372	°(26,975)	A68 = MS428	°27,805
A42 = MS373	°(25,805)	A69 = MS429	26,945
		A70 = MS447	°28,930
A44 = MS453	°26,980	A71 = MS448	°27,825
A45 = MS454	°(27,640)		
A46 = MS450	°25,780	A73 = MS439	°26,860

A74	= MS455	*(27,230)	A129	= MS484	27,870
A76	= MS440	*(28,230)	A131	= MS457	26,620
A80	= MS419	*27,530	A133	= MS492	26,205
A81	= MS420	*26,705			
A82	= MS417	26,340	A138	= MS548	*(26,335)
A83	= MS415	*25,780			
A84	= MS418	27,900	A156	= MS361	*26,820
			A157	= MS360	*28,135
A86	= MS388	26,780	A158	= MS359	*26,060
A87	= MS412	*27,970	A159	= MS356	25,865
A88	= MS475	*25,360	A160	= MS357	*(26,075)
A89	= MS414	*(26,390)	A161	= MS358	*(25,645)
A90	= MS408	*(27,860)	A162	= MS353	**27,880
A91	= MS321	**(26,470)	A163	= MS354	*(26,455)
A92	= MS404	25,325	A164	= MS355	*24,670
A93	= MS410	*27,265	A165	= MS370	*26,940
A94	= MS411	*25,960	A166	= MS375	*(26,850)
A95	= MS409	*(27,470)			
A96	= MS416	*25,995	A169	= MS378	*29,840
A103		25,640	A171	= MS363	26,105
			A172	= MS364	27,250
A106	= MS576	*24,900	A173	= MS322	*(24,785)
A126	= MS566	26,063	A176	= MS368	25,680

A177 = MS367	28,045	A206 = MS397	*29,095
A178 = MS365	28,380	A207 = MS398	*26,585
A179 = MS325	*27,165	A208 = MS393	*25,985
A180 = MS324	*(26,555)	A209 = MS394	*27,435
A181 = MS323	*27,165	A210 = MS346	26,780
A182 = MS336	*25,960	A211 = MS391	*26,620
A183 = MS333	**30,175	A212 = MS351	*(28,245)
A184 = MS330	**27,350	A213 = MS352	*26,335
A185 = MS334	*27,415	A214 = MS395	*28,450
A186 = MS332	26,695	A215 = MS392	*26,435
A187 = MS331	**26,950	A216 = MS350	*(25,445)
A188 = MS329	**26,510	A217 = MS349	*26,015
A189 = MS328	**25,860	A218 = MS347	*26,700
A190 = MS335	*27,780	A219 = MS348	*28,025
A191 = MS337	*27,375		
		A221 = MS345	**27,325
A193 = MS422	*(29,370)		
A194 = MS421	*(28,930)	A224 = MS341	**26,005
A195 = MS369	(25,940)		
		A226 = MS343	**27,855
A197 = MS423	*27,380		
A198 = MS405	27,255	A228 = MS326	*27,245
A199 = MS406	26,845	A229 = MS327	**27,320
A200 = MS407	25,785		
A201 = MS403	*27,230	A237 = MS404	*27,340
A202 = MS402	*26,640		
A203 = MS401	*27,440	A260	19,200
A204 = MS399	*25,440		
		A356	27,838

A409 = MS598	*24,530	MS607	10,270
		MS609	26,240 M
A417	*26,440	MS610	11,124 M
		MS611	10,890
A419 = MS600	27,003	MS628	(17,350) M
		MS629	*21,020 M
A421	*(25,630)	MS630	*17,390 M
		MS631	*17,245 M
A453	28,840	MS632	25,585 M
		MS633	29,596 M
A456 = MS601	*28,465	MS634	9,385
A457 = MS602	*25,450	MS635	9,860

MS161	24,170 K[astello]	VG R 22	25,850 M
MS304	30,245 K	VG R 23	25,300 M
MS305	*29,200 K	VG R 24	24,550 M
MS313	23,170 K	VG R 33	24,580 M
MS461	**27,325		
MS462	*31,570	Papademetriou Intact	*28,160
MS463	*25,875 K	" 1 handle	*26,275
MS480	*27,985 K	" No oe, neck line	*29,580
MS481	*26,095 K		
MS504	*25,745	" No toe, no line	*27,640
MS539	*26,555 M[ouseio]		
MS549	*23,855 K	Baltze 2/7	25,165
MS604	9,270 K	(Last 5 in K[astello])	
MS605	(9,785) M	Underlined numbers are of non-Rhodian amphoras	
		No number Unidentified	9,390

M-C

24/vi/79

28

Rhodes vi/79 Results

ca. 6-7.vii.79

Undated Rhodian

			date ca.
~~ΜΣ 461~~		~~27,325~~	
480	Σθενείδας (φ.)	27,985	270-250
481	Παυσανίας (φ.)	26,095	mid 3rd
484	(not read - mp)	27,870 w	2/4 3rd
492	φ. Δορκυλίδα	26,205	"210"
496	Ἀντιδίων (φ.)	27,340	280-271
504	Τιμοκλῆς (φ.) 1st	25,745	270-250
539	φ. "	26,555	" "
548	Ἄγερος (φ.)	[26,335]	280-271
554	Ἀριστ	25,050	? 280-271 ?
566	φ. Δαμοκλείδης (η Εὐκλεῦς)	26,063	300-280
576	Δαμοκράτης (φ.)	24,900	270-250
598	Ἀριστακλῆς (φ.)	24,530	
600	φ. "	27,005	
601	φ. Ἀριστόμαχος (2)	28,465	end of 2nd or early 1st
602	φ. Ἑστιαῖος	25,450	4/4 2nd
604	(mist, ½ 3rd)	9,270	1/2 3rd
609		26,240	

A 103	25,640
ΜΣ 161	24.170
A 417	26,440
A 421	[25,630]
A 453	28,840
Papademetriou - total	28,160
Orchalke	26,275
Notee - neck line	29,580
Notee - notice	27,640
Baltge 2/7	25,165

Non-Rhodian - Chian

ΜΣ 607	10,208
628	17,350
629	21,020
630	17,390
631	17,245
634	9,385
A 260	19,200

- Thasian

" ΜΣ 610	11,124
" " 611	10,890

Rhodian - Villanova

VGR 22	25,850
23	25,300
24	24,550
33	24,580

9.vii.79

MBW copied the dates I have entered above (in t.c. pencil) before returning this sheet to me yesterday.

5/vii/79 29.01

MEASURING UNGENTARIA AT THE AGORA, 5/vii/79

Susan Rotroff showed me the four drawers containing about 200 fusiform ungentarii (behind the South Work-Room, Cabinet 13, drawers 2,3,5, and 6). Miscellaneous shapes, sizes, and contexts. The most from one context and with some chance of coherence were in Drawer 2, "Grave 14" (which Miss Grace tells me is Grave K in C. Boulter, "Graves in Lenormant St., Athens," Hesperia 32 (1963) - Boulter's date is, probably C2a.). The 23 that could be filled with water and stand upright I took in three sets, filled the ones in a set with water from the Agora plastic graduated cylinder, put a few more drops in to make up for absorption (minimal), causing each to overflow slightly, and emptied into the same cylinder. Sources of error: the table is not absolutely level (which chiefly affected reading the level in the cylinder), and one didn't always shake every drop out, at least into the cylinder. The lines on the plastic come every two cc., and I had difficulty seeing intermediate amounts. From all this and the repetitions listed it seems that a single measurement might be out 2 cc either way.

P10378	24	24
P10380	28	30
P10382	28	27
P10381	30	31
P10383	24+	
P10384	24	
P10386	24	
[P10387]	24	
P10374	24	
[P10]388	14	

P10390	12	12
P10391	16	
P10392	12	13
P10393	16	
P10394	16	
P10395	18+	16+
P10,401	8	10
P10,399	14	
P10,402	12	
P10,396	18	20

P10397	16	
P10404	8	7
P10398	21	20+

Looking at them, I thought 404 should be smaller than the rest, and that 390 and 398 should constitute the next smallest size (so I missed 401), and that the others might be two sizes. In short, if there were three or four sizes (8, 16, 24, [32?]), I wouldn't have been a very alert customer. And they are small, cheap-looking objects not made, perhaps, for real consumption. Boulter comments on how carelessly they were made (1 rejected 3 that would hold water but wouldn't stand on a table). I wouldn't be surprised if there were meant to be two sizes (not counting 404) and the smaller was a bit nominal (the six 24s have some attraction). But one won't establish that sort of thing without access to a fair number of the strictly contemporary products of a higher-class ungent peddling place.

27/vi/79 30.01

CAPACITIES OF SOME AMPHORAS TAKEN IN RHODES, JUNE 1979

MS			ep.	fab			ep	fab.	MS
—	A4	20,415			A48	23,175	Εὐκλῆς	?Δαμονικ?	387
469	A23	26,780	Θεοφάνης	Κλαυσιμβρ.	A49	*28,020	Παυσ. I	Ξενότιμος	384
473	A24	*25,740	"	"	A50	*28,335	"	Μικυθος	385
472	A25	*27,740	"	"					
477	A26	26,185	"	"	A52	*(26,015)	"	[Δαμονικ]	362
478	A27	*25,105	"	"	A53	*26,340	"	["]	379
470	A28	*26,380	"	"	A54	27,335	"	Κρεάν	360
467	A29	26,215	"	"	A55	27,050	"	Μικυθος	383
468	A30	*25,025	"	"					
474	A31	*25,450	"	"	A58	*(27,585)	"	Ξενότιμος	438
476	A32	25,260	"	"	A59	*26,715	"	Δαμονικ.	446
471	A33	*25,680	"	"	A60	26,980	"	Μικυθος	436
443	A34	*25,535	Παυσανίας I.	Μικυθος	A61	*25,775	["]	Δαμονικ	425
389	A35	25,810	"	" Ξενότιμος	A62	*27,690	"	"	431
442	A36	*26,605	"	" Παυσ.	A63	*26,005	"	"	430
					A64	28,840	"	Μικ.	424
390	A38	*27,825	"	" (Δαμόνικος)	A65	*25,780	"	Ξενοτ.	432
371	A39	28,025	"	" Μικυθος	A66	*27,520	"	Μικ.	426
					A67	*(27,155)	"	Ξενοτ.	427
372	A41	*(26,975)	(")	" Δαμόνικος	A68	*27,805	["]	Δαμον.	428
373	A42	*(25,805)	"	" "	A69	26,945	"	Μικ.	429
					A70	*28,930	"	Κρεων	447
453	A44	*26,890	"	" Μικυθος	A71	*27,825	"	Μικυθος	448
454	A45	*(27,640)	"	" Ξενότιμος					
450	A46	*25,780	"	" (Δαμόνικος)	A73	* ~~(27,230)~~ 26,860	["]	Δαμον.	439

Dates of eponyms
- ep. Εὐκλῆς (2nd?) ca. contemp. with Παυσ. I
- " Θεοφάνης "213 BC"
- " Παυσανίας I 3/4 3rd

A74 *(27,230)

A76 *(28,230)

A80 *27,530

A81 *26,705

A82 26,340

A83 *25,780

A84 27,900

A86 26,780

A87 *27,970

A88 *25,360

A89 *(26,390)

A90 *(27,860)

A91 **(26,470)

A92 25,325

A93 *27,265

A94 *25,960

A95 *(27,470)

A96 *25,995

A103 25,640

A106 *24,900

A126 26,063

A129 27,870

A131 26,620

A133 26,205

A138 *(26,335)

A156 *26,820

A157 *28,135

A158 *26,060

A159 25,865

A160 *(26,075)

A161 *(25,645)

A163 *(26,455)

A162 **27,880

A164 *24,670

A165 *26,940

A166 *(26,850)

A169 *28,840

A171 26,105

A172 27,250
A173 (24,785)

A176 25,680
A177 28,045
A178 28,380
A179 *27,165
A180 *(26,555)
A181 *27,165
A182 *25,960
333 A183 **30,175 Kaus. Kgs4V
A184 **27,350
A185 *27,415
A186 26,695
A187 **26,950
A188 **26,510
A189 **25,860
A190 *27,780
A191 *27,375

A193 *(29,370)
A194 *(28,930)
A195 (25,940)

A197 *27,380
A198 27,255
A199 26,845
A200 25,785
A201 *27,230

A202 *26,640
A203 *27,440
A204 *25,440

A206 *29,695
A207 *26,585
A208 *25,985
A209 *27,435
A210 26,780
A211 *26,620
A212 *(28,245)
A213 *26,335
A214 *28,450
A215 *26,435
A216 *(25,445)
A217 *26,015
A218 *26,700
A219 *28,025

A221 **27,325

A224 **26,005

A226 **27,855

A228 *27,245
A229 **27,320

A237 *27,340

A260	19,200	
A356	27,834	
A409	*24,530	
A417	*26,440	
A419	27,003	
A421	*(25,630)	
A453	28,840	
A456	*28,465	
A457	*25,450	
MS161	24,170	K
MS304	30,245	K
MS305	*29,200	K
MS313	23,170	K
MS461	**27,325	
MS462	*31,570	
MS463	*25,875	K
MS480	*27,985	K
MS481	*26,095	K
MS504	*25,745	
MS539	*26,555	M[ouseio]
MS549	*23,855	K
MS604	9,270	M
MS605	9,785	M
MS607	10,208	
MS609	26,240	M
MS610	11,124	M
MS611	10,890	
MS628	17,350	M
MS629	*21,020	M
MS630	*17,390	M
MS631	*17,245	M
MS632	25,585	M
MS634	9,385	
MS635	9,860	
VG R 22	25,850	M
VG R 23	25,300	M
VG R 24	24,550	M
VG R 33	24,580	M

Papademetriou	Intact	*28,160
"	One handle	*26,275
"	No toe - neck line	*29,580
"	No toe or line	*27,640

Baltze 2/7 25,165

(Last 5 in K[astello])

Underlined numbers are of non-Rhodian jars

Calibration of measuring containers
for brandy: Dewar's and Johnny Walker bottle
with 200 cc cylinder

Johnny Walker measured by
200 cc cylinder (measured by filling)

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 – 148 cc. 2200 / 17 / 2200 / −148 / 2052 — 2052

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 – 142 cc 2200 / 142 / 2058 — 2058

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 – 144 cc 2200 / 144 / 2056 — 2056

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 – 145 cc — 2055

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 – 143 2200 / 143 / 2057 — 2057

5 | 10278

2055.6

Τσιμπήλια measured by
Johnny Walker (measured by emptying) 2055 / 12 / 4140

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 – (200 cc − 175 cc) 24660 / 125 / 24535 — 24,535

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 – (200 cc − 165 cc) 24660 / 35 / 24625 — 24,625

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 – (200 − 141 cc) 24660 / 59 / 24601 — 24,601

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 – (200 − 180 cc) 24660 / 180 / 24640 — 24,640

filling: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 – (…) 24,6…

emptying 1 2 3 4 5 6 7 8 9 10 11 12 – (200 − 190 cc) 24,6…

last 5, omitting
1, 2 each one
24601
24640
24625
24640
24640
23146
24,629

M-C

24/vi/79
32

Rhodes vi/79 Results

Non-Rhodian – Misc.

Para Lesbian
ΜΣ 486 = Δ 356 — 27,838w
CB 46 — 9,390w
Unclear
ΜΣ 605 — 9,785
Geo-Hdic
ΜΣ 633 — 29,581w
Heraclean Portion
ΜΣ 635 — 9,860
Coan — 39,210
—
Cor A
Halysos 1373 — 65,855

M-C

23/vi/79

33

Rhodes vi/79 Results

Epoynms before Pausanias

Eukles ME 387 = A48	Damonikos	no month	23,175
		"	• 31,570
Ariston ME 462	Hieroteles		
		"	• 25,875
Aristokrates ME 463	Ion		
		"	• 23,855
Aristarchos ME 549	Hieroteles		
Unstamped ME 632	"as early as ka5v"		25,505
	"late 4th-Early 3rd		
~~ME~~ A41	On A4 "compare ME 461		20,415
			•• 27,325
IE 461	"mushroom-rim"		
			• 29,200
IE 305	"rather mushroom-rim" Epigraphus		
Theophilos IE 313			23,170

M-C Rhodes vi/79 Results

Pausanias		Xenotimos	Yan	
321	91		.. [26,470]	
ΜΣ 323	= A181		*27, ~~810~~ 165	2
325	179		*27, 165	2
326	228		*27, 245 /	
332	186		26, 695	
343	226		.. 27, 855 /	
345	221		.. 27, 325 /	
358	161		• [25, 645] LOWEST	
361	156		• 26, 820	
367	177		28045 /	
378	169		• 29, 840 HIGHEST	
384	49		• 28, 020	
388	86		26, 780	
389	35		25, 810	
401	203		• 27, 440 /	
406	199		26, 845	
410	93		• 27, 265 /	
411	94		• 25, 960	
412	87		• 27, 970 /	
423	197		• 27, 380 /	
427	67		• [27, 155]	
438	58		• [27, 585] /	
454	45		• [27, 640] /	

2 d. between 28,045 & ~~25,960~~ 25,810
Range 2 1/4 Target 26 7/8 Median 27,245

23

M-C

22/vi/79

35

Rhodes vi/79 Results

Pausanias	Xenotimos	Arp
ME 353	A162	28,880
395	214	28,450

Pausanias	Xenotimos	Apt
ME 432	A65	25,780

M-C

22/vi/79

36

Rhodes – vi/79 Results

Pausanias

M. Knights

Yacht.

ME	A	
327	229	** 27,320
335	190	• 27,780
346	210	26,780
348	219	• 28,025 2
354	163	• [26,455] LOWEST
370	165	• 26,940
371	39	28,025
383	55	27,050
385	50	• 28,335
397	206	• 29,695 HIGHEST
402	202	• 26,640 ~~LOWEST~~
403	201	• 27,230
405	198	27,255
408	90	• [27,860] v. poor
409	95	• [27,470]
418	84	27,900
421	194	• [28,930] high
422	193	• [29,370] a little high
426	66	• 27,520
429	69	26,945
436	60	26,980
448	71	• 27,825
453	44	• 26,980
455	74	• [27,230] Low

24

2 [illegible] better ca 29 8 28,335 and [26, ~~455~~ 455]

Range 1²/3 Target 27 [illegible]

Median 27,255

M-C

22/vi/79

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Rhodes - vi/79 Results

P		M. kyllos	Apt.	
MΣ 341	A 224		26,005	2
443	34		25,535	

P		M. kyllos	Apt.	
MΣ 424	A 64		28,840	

M-C Rhodes – vi/79 Results

Pausanias Damonikos ᾿Αγρ.

ΜΣ 328 = Α189
352 213
356 159
359 158
373 42
391 211
416 96
419 80
425 61
428 68
431 62

11

• [25,860] see 35 [illegible]
• 26,335
25,865
• 26,060
• [25,805] prob not [illegible]
• 26,620
• 25,995
• 27,530
• 25,775 LOWEST
• 27,805 HIGHEST
• 27,690

11 between 25,775 & 27,805
Range 2 Total 26 3/4
Median 26,000

Pausanias Damonikos Θεοφ

ΜΣ 365 = Α178

• 28,380

Damonikos Βαδ.

⟨Pausanias⟩
ΜΣ 372 = Α41

• [26,975]
actually prob. a Gr result

M-C

22/vi/79

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Rhodes vi/79 Results

Pawsenses

M	A
336	182
357	160
364	172
394	209
399	204
420	81
439	73

Demonbers 7/2K

- 25,690
- [26,075]
- 27,250
- 27,435
- 25,440 Lowest
- 26,705
- 26,860

Pawsenses

M	A
347	218
351	212
398	207
407	200
430	63
446	59

13

Demonbers 7/2K

- 26700
- [28,245] Highest
- 26,585
- 25,785
- 26,005
- 26,715

12 beats 27,435 & 25,440
Range 2 Target 26½
Median 26,710

1-C

22/vi/79

40

Rhodes - vi/79 Results

ausanias

Krean

A-p.

15	329	A188
	350	216
	363	171
	375	166
	380	54
	392	215

- [26,510] 2 Sec 33 wkst
- [25,445]
- 26,105
- [26,850] lunch
- 27,335
- 26,435

M-C

22/vi/79

41

Rhodes vi/79 Results

Pausanias

ΜΣ 322
ΜΣ 324
ΜΣ 330
ΜΣ 331
ΜΣ 333
ΜΣ 349
ΜΣ 440
ΜΣ 447

Kroon

Α 173
Α 180
Α 184
Α 187
Α 183
Α 217
Α 76
Α 70

Yale

[24,785] slightly low — Lowest
*[26,555] ? low
••[27,350] 2
••[26,950] 2 — Seen 3325 h
•• 30,175 in Annex?
26,015
•[28,230]
•28,930

Range [24,785 low] 30,175
27 ½ Mid 26,950

M-C 22/vi/79

Rhodes vi/79 Results

Pausanias	⟨Damonikos⟩			no month
				• 27,415
ME 334	A 185			• 27,375
337	191			• 24,670 LOWEST
355	164	[	]	• 28,135 HIGHEST
360	157	[	]	• [26,015] high
362	52	[	]	25,680
368	176			[25,940] nullthor but just v. metal
369	195	[	]	• 26,340
379	53			• 27,825
390	38	[	]	• 25,985
393	208	[	]	25,325
404	92			• [26,390]
414	84			• 25,780
415	83			26,340
417	82			• 25,780
450	46			

15

Damonikos - all

4/1

HIGHEST • 28,380
LOWEST • 24,670 NEXT 25,325
RANGE 3 SO TARGET 26 3/4

MEDIAN (1st pointg)
25 ///
27 HH ///
26½ HH //
26½ ///
26,340

23/vi/79

Rhodes vi/79 Results

Pausanias

Pausanias

Pausanias

Σ 442 = A 36

• 26,605

24/vi/79

Rhodes vi/79 Results

Pausanias alter — Kleisinbrotidas — Dalios

ΜΣ 457 A 131 — •26,620

Thespiaes — Kleisinbrotidas — Ἰχθ

ΜΣ 467 A 29 — 26,215
469 23 — 26,780
472 25 — •27,740 HIGHEST
474 31 — •25,450
477 26 — 26,185
478 27 — •25,105 Τιτυμ

Thespiaes — Kleisinbrotidas

ΜΣ 468 A 30 — •25,025 LOWEST
470 28 — •26,380
476 32 — 25,260w

Thespiaes — Kleisinbrotidas — Apt

ΜΣ 471 A 33 — •25,680

Thespiaes — [Kleisinbrotidas] — incert.

ΜΣ 473 A 24 — •25,740
475 88 — •25,360

Table F - Linear Dimensions

Fabricant	HMAX MED MIN	DMAX MED MIN	DMAX MAX MED MIN	HAECK MAX MED MIN
Xenotimos-all	0.783, 0.770, 0.754	0.388, 0.366, 0.351	0.723, 0.708, 0.695	0.253, 0.232, 0.221
ranges	3 cm	3 3/4 cm	2 3/4 cm	3/4 cm
-20 of 26	0.780, 0.771, 0.762	0.715, 0.707, 0.695	0.371, 0.366, 0.358	0.237, 0.232, 0.226
ranges	1 3/4 cm	2 cm	1 1/4 cm	1 cm
M. kyltos-all	0.812, 0.793, 0.769	0.748, 0.731, 0.704;	0.372, 0.361, 0.351,	0.253, 0.237, 0.22
ranges	4 1/4 cm	4 1/2 cm	2 cm	2 1/2 cm
-21 of 27	0.803, 0.793, 0.774, 0.745,	0.733, 0.721;	0.366, 0.361, 0.357,	0.243, 0.237, 0.2
ranges	3 cm	2 1/2 cm	1 cm	1 1/4 cm
Krean-all	0.860, 0.785, 0.767;	0.744, 0.720, 0.706;	0.372, 0.365, 0.355;	0.247, 0.232, 0.22
ranges	9 1/4 cm	9 3/4 cm	1 3/4 cm	2 cm
-11 of 14	0.797, 0.782, 0.772;	0.739, 0.721, 0.714;	0.366, 0.364, 0.355;	0.243, 0.237, 0.23
ranges	2 1/2 cm	2 1/2 cm	1 cm	1 1/4 cm
Damonchus-all	0.807, 0.782, 0.764;	0.748, 0.721, 0.704;	0.372, 0.361, 0.350;	0.255, 0.240, 0.2
ranges	4 1/4 cm	4 1/2 cm	2 1/4 cm	3 3/4 cm
-31 of 39	0.801, 0.782, 0.771;	0.737, 0.720, 0.707;	0.372, 0.362, 0.356;	0.250, 0.240, 0.2
ranges	3 cm	3 cm	1 1/2 cm	2 cm.
"NORM" for YR	0.782	0.720	0.363	0.237
Kleisimbrotidus-all	0.787, 0.779, 0.770; 0.738,	0.729, 0.721;	0.388, 0.353, 0.347;	0.255, 0.250, 0.23
	1 3/4 cm	1 3/4 cm	4 cm	2 1/4 cm
-11 of 12	0.785, 0.778, 0.770;	0.734, 0.729, 0.721;	0.361, 0.353, 0.347;	0.255, 0.251, 0.24
	1 1/2 cm	1 1/4 cm	1 1/2 cm	1 1/2 cm
Diskos-Hiean-all	0.79, 0.776, 0.765		0.35, 0.345, 0.336	
Kratids-all	0.792, 0.78, 0.765		0.357, 0.35, 0.342	