CALCULATING VESSEL VOLUMES

The computer program "Vase" (© Greg Christiana, 1994) can calculate the maximum volume of a vessel if its profile is drawn on a computer screen and a dimension (e.g., height) is known. The maximum volume» is greater than the capacity of the vessel since it is based on an exterior profile.

The program seems to be reasonably accurate. Pithos ZA Zb 3 from the LM I villa at Epano Zakros[1] is inscribed in Linear A:

.1		VINa **32**
.1	DI-DI-KA-SE • A-SA-MU-NE • A-SE	
.2	A-TA-I-*301-DE-KA • A-RE-PI-RE-NA • TI-TI-KU	

VINUM **32** probably corresponds to the pithos's capacity, which, when calculated by "Vase," amounted to 996 liters based on the exterior profile; if the number "32" represents wet units, then the unit would have to smaller than (996/32 liters or) 31.13 liters. This amount would correspond to the Mycenaean wet unit of 28.8 l. as calculated in the first edition of *Documents in Mycenaean Greek* (*Docs*; the 2nd edition gives 36 liters).[2] If this correspondence is correct, it would suggest that the Mycenaean wet unit was based on a similar Linear A wet unit of less than 30 liters..

Using "Vase," I calculated the maximum volumes of the following vessels, using a dry unit of 96 l. as published in *Docs*[1] (120 l., *Docs*[2]) and a wet unit of 28.8 l. in *Docs*[1] (36 l., *Docs*[2]):

VESSEL	Liters	Mycenaean Dry units	Mycenaean Wet units
Tiryns XII,[3] 156-7, pl. 82.1 (LH III C dev)	23.0	.24 (.19) < **1/4**	.80 (.64) ≤ **3/4**
Popham, *MUM*[4] P41 (pl. 75a)	25.8	.27 (.22) ≈ **1/4**	.90 (.72) ≤ **7/8**
Tiryns XII, 59, pl. 25.1 (LH III B2)	28.5	.30 (.24) ≈ **1/4**	.99 (.79) ≤ **1**
Popham, *MUM* P72 (pl. 75b)	32.7	.34 (.27) ≤ **1/3**	1.1 (.91) ≈ **1**
Popham, *MUM* P126 (pl. 76b)	34.0	.35 (.28) ≈ **1/3**	1.2 (.94) ≈ **1**
Popham, *MUM* H191 (pl. 77b)	35.5	.37 (.30) ≈ **1/3**	1.2 (.97) ≈ **1**
Christakis,[5] fig. 2: Palaikastro NP 69 (H. 48)	40.6	.42 (.34) ≈ **3/8**	1.4 (1.1) ≤ **1 3/8**
Popham, *MUM* P56 (pl. 77a)	41.0	.43 (.34) ≈ **3/8**	1.4 (1.1) ≤ **1 3/8**
Popham, *MUM* P69 (pl. 76a)	43.9	.46 (.37) < **1/2**	1.5 (1.2) ≤ **1 1/2**
Mycenaean krater (Larnaca Museum)[6]	53.0	.55 (.44) ≈ **1/2**	1.8 (1.5) ≈ **1 3/4**
Christakis, fig. 2: Knossos, Acr. House (H.54)	53.1	.55 (.44) ≈ **1/2**	1.8 (1.5) ≈ **1 3/4**
Christakis, fig. 2: Palaikastro NP 65 (H. 52)	55.0	.58 (.46) ≈ **1/2**	1.9 (1.5) ≤ **1 7/8**
Popham, *MUM* P57 (pl. 75e)	56.0	.58 (.47) ≈ **1/2**	1.9 (1.5) ≤ **1 7/8**
Popham, *MUM* P51 (pl. 76c)	57.8	.60 (.48) ≈ **1/2**	2.0 (1.6) ≤ **2**
Popham, *MUM* M99 (pl. 75d)	58.0	.60 (.48) ≈ **1/2**	2.0 (1.6) ≤ **2**
Popham, *MUM* P60 (pl. 76d)	60.0	.63 (.50) ≈ **5/8**	2.1 (1.7) ≤ **2**
Popham, *MUM* M50 (pl. 77d)	62.0	.65 (.52) ≈ **5/8**	2.2 (1.7) ≤ **2 1/8**
Popham, *MUM* P125 (pl. 77c)	63.0	.66 (.53) < **2/3**	2.2 (1.8) ≤ **2 1/8**

1 N. PLATON and W. BRICE, *Enepigraphoi pinakides kai pithoi grammikou systematos A ek Zakrou/Inscribed Tablets and Pithos of Linear A System from Zakro* (1975) 82-5, 156-7, 173; L. GODART and J.-P. OLIVIER, *Recueil des inscriptions en Linéaire A* (1976-1985) vol. 4, 112-3.

2 M. VENTRIS and J. CHADWICK, *Documents in Mycenaean Greek* (1956 & 1959) 58-60 (both editions).

3 U. JANTZEN and W. GÜNTNER, *Tiryns, XII: Figürlich bemalte mykenische Keramik aus Tiryns* (2000).

4 M.R. POPHAM, *The Minoan Unexplored Mansion at Knossos* (1984).

5 K.S. CHRISTAKIS, "Pithoi and Food Storage in Neopalatial Crete," *WorldArch* 31 (1999) 1-20.

6 Information from Alison South, email message 25 May 2001; the krater is "Our largest Mycenaean krater (probably one of the largest known) = 53 litres or 75 bottles of wine."

Christakis, fig. 2: Palaikastro NP 68 (H. 63)	75.9	.79 (.63) ≈ **3/4**	2.6 (2.1) ≈ **2 1/2**
Popham, *MUM* P75 (pl. 78b)	83.6	.87 (.70) ≈ **7/8**	2.9 (2.3) ≤ **2 7/8**
Popham, *MUM* M41 (pl. 78a)	117.6	1.23 (.98) ≈ **1**	4.1 (3.3) ≈ **4**
Christakis, fig. 2: Tylissos, House A (H. 92)	193.1	2.0 (1.6) ≤ **2**	6.7 (5.4) **6-5**
Christakis, fig. 2: Tylissos, House A (H. 120)	319.8	3.3 (2.7) ≤ **3 1/3**	11.1 (8.9) ≤ **11, 10?**
Epanno Zakros (H. 170): **32 VINUM**	996.0	10.4 (8.3) ≤ **10 1/3**	34.6 (27.7) ≤ **34, 32?**
Kannia[7] fig. 29e (H. 180.6, if H a: 170 cm)	1212.4	12.6 (10.1) ≤ **12.5**	42.1 (33.7) ≤ **42, 40?**
Kannia fig. 29a (if H a: 170 cm)	1287.4	13.4 (10.7) ≤ **13 1/3**	44.7 (35.8) ≤ **44**
Kannia fig. 29b (H. 191.25, if H a: 170 cm)	1292.0	13.5 (10.8) ≤ **13 1/2**	44.9 (35.9) ≤ **44**
Kannia fig. 29f (H. 184.9, if H a: 170 cm)	1334.7	13.9 (11.1) ≤ **13 3/4**	46.3 (37.1) ≤ **46, 45?**
Kannia fig. 29d (H. 193.4, if H a: 170 cm)	1377.5	14.4 (11.5) ≤ **14 1/3**	47.8 (38.3) ≈ **47**
Kannia fig. 29c (H. 180.6, if H a: 170 cm)	1430.5	14.9 (11.9) ≤ **15**	49.7 (39.7) ≤ **49**

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7 D. LEVI, "Scavi di Kannia," *BdA* (1959) 237-65.