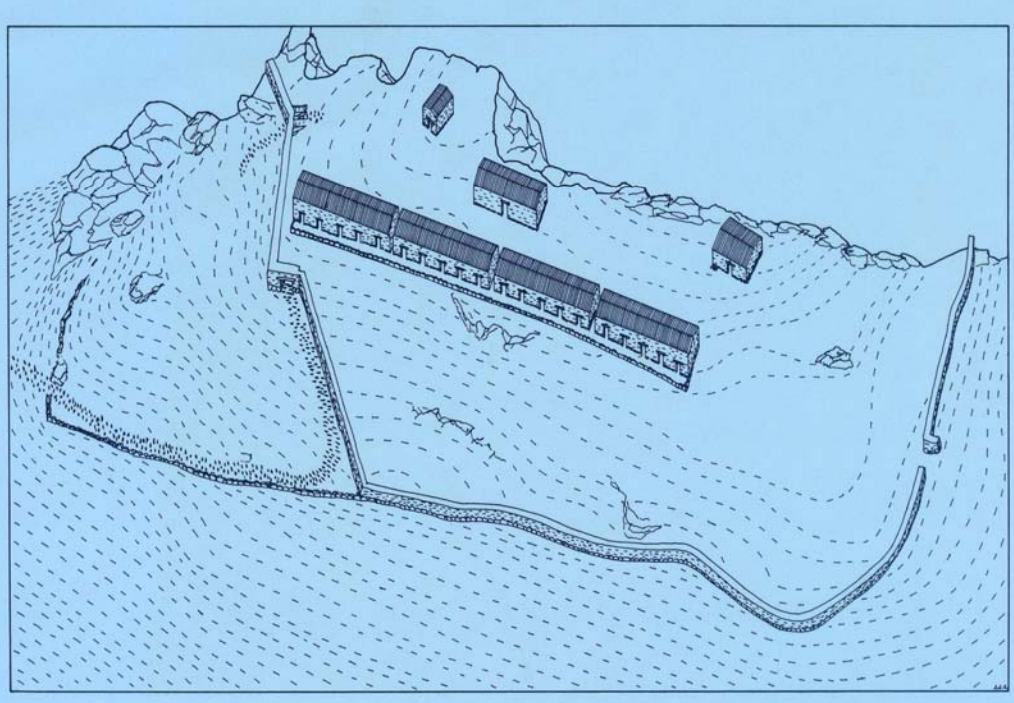
THE FORT AT PHYLLA, VRACHOS

E. SAPOUNA SAKELLARAKI, J. J. COULTON AND I. R. METZGER

Edited by

J. J. COULTON



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THE FORT AT PHYLLA, VRACHOS

EXCAVATIONS AND RESEARCHES AT A LATE ARCHAIC FORT IN CENTRAL EUBOEA

by

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with contributions by

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Edited by

J. J. COULTON

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In memory of

MERVYN REDDAWAY POPHAM

without whom
this project
would not have happened

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Chapter 7

Diet and environment

J. J. Coulton, I. R. Metzger, A. Sarpaki and S. Wall-Crowther

7.1 PLANT REMAINS (A. S.)

In 1999, with the assistance of Sheilagh Wall-Crowther, a water flotation machine, built to the designs of G. Jones (Sheffield), was was set up by the Vasiliko pumping station, near the foot of the hill, where a supply of water was made available. The selection and processing of soil samples were seriously limited by restricted water flow, shortage of labour, small soil volumes from suitable archaeological contexts, and the need to carry soil down the steep hill. Nevertheless, six substantial samples were processed during the season. Three of these came from Room 17 of Building 3: WF 00(1) from Layer B (# 102), and WF 00(4) and WF 00(5) from Layer C (# 104 and # 105); and three from Building 4: WF 00(6) and WF 00(3) from Layer C (# 204 and # 205), and WF 00(2), the largest sample, from Layer D (# 208) beneath the floor. The samples had a homogeneous brown colour except for sample WF 00(2) which consisted of grey volcanic ash (*physalidha*). The solid residue from these samples was sorted in April 2000 by Anthi Koukouraki and myself, and the bone material was passed to Sheilagh Wall-Crowther (see 7.2 below). The flot (coarse and fine) was sorted at the Institute of Mediterranean Studies, Rethymno, Crete, and the plant material was studied by myself using my personal seed collection as comparative material.

Unfortunately none of the samples contained carbonised material so there were extremely few plant remains. Sample WF 00(3) from the hollow against the N wall in Layer C of Building 4 contained a grape pip and two fragments of very damaged seeds, which due to their poor preservation could not be identified. All the seeds in the other five samples are modern. They and the snail shells recorded below suggest that there has been mixing of layers. However, no disruption of the strata was noticed during the excavation, nor was there evidence of mouse or rabbit holes, which might explain the phenomenon, although some roots ran fairly deep. The only other preserved organic remains seem to be very tiny fragments of charcoal.

7.2 BONE AND SHELL (S. W.-C.)

Bone, shell and land snails were recovered from both the 1996 and 1999 seasons at Phylla Vrachos. During the 1999 season, in addition to recovery during the normal course of excavation, some dry sieving of soil was carried out on site, and a number of soil samples were taken for water sieving. Although, as explained in 7.1 above, this soil was almost entirely devoid of plant remains, it did yield some shell and bone, including fish remains.

A total of 43 bones was recovered from the excavations, of which 27 came from water sieving. Fourteen bone fragments were identifiable of which four (29%) came from water sieving. After preliminary study in Eretria Museum, a permit was obtained to bring some bone and shell back to England for further analysis. All the bone and shell are now stored with the other finds in Eretria Museum. Bone and shell were recovered from all excavation areas (Building 3 Rooms 2, 4, and 17, and Building 4). The bones are listed by context for the different excavation areas in TABLE 7.1. TABLE 7.2 lists the marine shells and invertebrates. TABLE 7.3 is a list of contexts from which land snails were recovered; several different species are represented. The total quantity of bone recovered from the site is very small, and it was in a poor state of preservation. Its condition was brittle and friable, and the surfaces had suffered some erosion.

The mammalian species represented are sheep (*Ovis aries*) and/or goat (*Capra hircus*), cattle (*Bos taurus*) and pig (*Sus domesticus*). Hence, all the common domesticated species were present at the site.

TABLE 7.1 The animal bones.

Building and Room	Layer and Context	Species	Bone element	No. of bones	Room total
Building 3					
Room 2	Layer B, # 3	*Ovis / Capra*	axis vertebra	1	1
Room 17	Layer B, # 102 (WF 1)	Unidentified	fragment	6	
	Layer C, # 104 (WF4)	Unidentified	fragment	4	
	Layer C, # 105 (WF5)	Fish	otolith	1	
	Layer D, # 36	*Ovis / Capra*	long bone	1	12
Building 4	Layer B, # 202	*Bos*	mandible	1	
		Bos	vertebra	1	
	Layer C, # 204	*Ovis / Capra*	loose tooth	1	
		Ovis / Capra	rib	1	
		Ovis / Capra	radius	1	
		Unidentified	long bone fragment	1	
		Unidentified	fragments	3	
	Layer C, # 205 (WF 3)	Fish	vertebra	1	
		Unidentified	fragments	7	
	Layer D, # 206 (WF 2)	Unidentified	fragments	6	
		Fish	otolith	1	
		Fish	jaw	1	
	Layer D, # 211	*Sus*	metapodial	1	
		Ovis / Capra	rib	1	
	Layer E, # 208	*Bos*	rib	1	
		Bos	loose tooth	1	
		Ovis / Capra	loose tooth	1	30

No other mammalian species were found. This is not, however, surprising given the very small sample size, and does not preclude their presence in antiquity. Butchery marks were noted on a cattle mandible from Building 4, confirming that these bones were food remains. A range of skeletal elements was represented by the animal bones, suggesting that whole carcasses were present at the site.

Both small and large fish are represented in the sample, but their species have not been identified.

TABLE 7.2. The marine shells and other invertebrates.

Building and Room	Layer and Context	Description	Species	No. of shells
Building 3				
Room 2	Layer B, # 7	fairly complete valve—not water worn	*Ostrea edulis*	1
	Layer B, # 9	both valves present; good condition—not water worn.	*Venus verrucosa*	1
	Layer C, # 17	2 shells + 1 fragment.	*Ostrea edulis*	3
	Layer C, # 18	shell part of one half of a bivalve good condition not water worn	*Venus verrucosa*	1
Room 4	Layer B, # 2	1 shell	Unidentified	1
	Layer B, # 3	crab's claw	Not identified to species	1
	Layer C, # 7	1 shell	Unidentified	1
Room 17	Layer A, # 101	1 fragment	*Ostrea edulis*	1
	Layer B, # 102	1 shell	*Cerithium vulgatum*	1
	Layer B, # 103	1 fragment	*Murex sp.*	1
	Layer B, # 103	1 shell	*Cardium edule*	1
	Layer C, # 104	1 shell	*Cardium edule*	1
	Layer D, # 49	1 fragment	*Murex sp.*	1
Building 4	Layer B, # 202	1 shell	*Venus verrucosa*	1
	Layer C, # 205 (WF 3)	1 crab's claw	Not identified to species	1
	Layer E, # 208	2 joining valves	*Cardium edule*	1

A total of 16 marine shells were recovered. The following species are represented (numbers of shells are given in brackets): *Venus verrucosa* (3) *Ostrea edulis* (common oyster) (5), *Murex sp.* (2), *Cardium edule* (common cockle) (3), *Cerithium vulgatum* (1), unidentified species (2). All identified shells come from edible species, and the good condition of the shells suggests that they were collected live for food. A species of crab is also represented by two tips of claws.

The extremely small size of this bone assemblage necessitates a cautious and tentative interpretation of the finds, and the increased recovery in the 1999 season means that comparisons between rooms are not safe. It can, however, be said that the main domesticates (cattle, sheep/goat, and pig) are represented, and the presence of a range of fish species and marine invertebrates suggests that a varied diet was provided from both land and sea.

There could be a number of reasons for the small size of this bone assemblage, the most plausible in my opinion being one or a combination of the following factors: poor preservation due to soil conditions; short occupation of site; disposal of most bone elsewhere; and little meat eaten.

TABLE 7.3. Contexts containing land snail shells.

Building and Room	Layer and Context
Building 3	
Room 2	Layer B, # 7
Room 17	Layer B, # 103
	Layer B, # 103
	Layer B, # 103
	Layer C, # 104
	Layer C, # 105
Building 4	Layer A, # 201
	Layer E, # 208
	Layer E, # 212
	Layer E, # 213

7.3 DIET AND FOOD PREPARATION (I. R. M., A. S., S. W.-C., J. J. C.)

It is unusual to have any evidence available for the commissariat of an ancient Greek garrison, for few of the many known fortifications have been excavated, and literary evidence generally relates to the provisioning of soldiers on campaign rather than on garrison duty. The evidence from Phylla Vrachos, which appears to have housed a garrison (Chapter 9), is therefore important in spite of its scantiness. This section aims to bring together the evidence from the various specialist studies to illuminate the questions of what the garrison ate and drank, and how its provision and preparation were organised. It has been composed by J. J. C., who is therefore responsible for all errors, but the ideas, information and references derive from all four of those indicated above. The Phylla Vrachos evidence can be set against the literary evidence for the food supply of an army on the move (Kromeyer and Veith 1928, 76–8; Anderson 1970, 43–55; and Pritchett 1971, 30–52), although this largely relates to the fifth and fourth centuries. The much fuller evidence for the diet and commissariat of the Roman army (Davies 1971) is of more limited relevance because its social status was different—the standing army of an imperial power, stationed in subordinate provinces, rather than a citizen army raised for a limited objective—and because much of the archaeological evidence relates to northwestern Europe.

The Phylla Vrachos finds can also be compared with normal domestic arrangements (for ancient Greek diet in general see Dalby 1996; Davidson 1997; Garnsey 1998; Schwarz 1995; and Wilkins *et al.* 1995, all with further references). Some comparative evidence comes from Olynthos, where occupation was about a century later, and this has been reconsidered by Cahill (1991) and Nevett (1992; 1999), but few domestic assemblages of the archaic or classical periods have been published with a similar aim in view. Two non-domestic dining contexts are available for comparison, however.

The finds from the sanctuary of Demeter and Kore at Corinth, where extensive dining facilities in a cult context have been found and studied (Bookides 1990; 1993; Bookides *et al.* 1999), reveal a consistent pattern, with points of similarity and contrast to the Phylla Vrachos material, which was maintained over several centuries. Slightly different patterns emerge from the debris of dining, probably public in character, from the NW corner of the Athenian Agora, which has been studied by Rotroff and Oakley (1992; public function, 35–46).

An initial issue to be considered is the scarcity of the botanical and zoological material. The virtual absence of seeds from the samples is unsurprising, for in the Greek environment seeds must normally be charred, mineralised or silicified (most commonly charred) to be preserved, and no hearths or other sources of burning were found in the areas excavated. The scarcity of bones, which need no unusual conditions for survival and are commonly found in excavations, needs a more specific explanation. One factor is the shallowness of the floor deposits, which tends to reduce bone survival, but the few bones found are in good enough condition to be recognisable, and even delicate fish bones have been recovered from sieving, so that soil conditions were not wholly hostile to bones. Behavioural explanations for their small number are therefore more likely than taphonomic ones. The apparently short life of the garrison buildings is obviously one factor, but a more important one may be the nearness of the N cliffs, which provided an unusually convenient means of rubbish disposal. Cleanliness after food consumption may have been part of the training and discipline of soldiers, although the frequent movement of camps may suggest that it was not (Anderson 1970, 61). These possibilities make it hard to assess the third and simplest explanation, that bones are few because little meat was eaten.

The assumption that the functions of the pottery types found in a room will indicate the activities carried out there is widespread and in principle reasonable, but Nevett (1999, 57–60) points out that storage, disposal, and post-depositional effects may all affect the location of finds within a site, so that the relationship of pottery types and activities may not be a simple one. However, particularly at an isolated site like Phylla Vrachos, the pottery found within the site as a whole is likely to have been in use at that site. Further, the sherds excavated consist almost exclusively of small pieces belonging to different vessels, and this suggests that they represent refuse. Sherds from above the floor were presumably trodden into the floor, when the rest of the vessel was discarded. Although their location within each room may not be significant, therefore, they probably result from activities carried out in that room, since there would be no reason to bring fragments in from elsewhere. Sherds from below the floor presumably result from activities carried out somewhere at the site. Analysis of the frequency of shapes represented should therefore give some indication of the function of the Phylla Vrachos site in general, and of Buildings 3 and 4 in particular.

Drinking vessels formed 73% of the catalogued fine ware from Buildings 3 and 4, and 53% of the catalogued pottery as a whole (see above Chapter 4 (4.8), TABLE 4.1 and TABLES 7.4–7.5, FIG. 7.1). Most were small cups and skyphoi with a diameter of 12–15 cm and a capacity of about 200 cl (established by comparison with complete examples from the Thesmophorion at Eretria). They are also a significant feature in domestic and other assemblages, but not to the same extent. Robinson (1950, 42) gives figures for most of the fine ware found in funerary and non-funerary contexts at Olynthos in 1934 and 1938; drinking vessels amounted to *c.* 20% of the non-funerary component of this pottery, so substantially less than at Phylla Vrachos. Intensive survey in NW Kea found only about 55% of the archaic and classical pottery found at rural sites to be table ware in general; drinking vessels are not separately tabulated. These sites are interpreted as residential farmsteads, and the survey pottery from the polis of Koressos yielded a similar figure (Whitelaw 1998, 231–2, tables 12–13). Figures for the various pot shapes in the dining assemblage from the Athenian Agora show drinking vessels as 64% of the fine ware and 24% of the total assemblage (Rotroff and Oakley 1992, tables on 131–8). Although the published material excludes a number of drinking vessels and kraters (Rotroff and Oakley 1992, 41), the quantities are also significantly less than for Phylla Vrachos (TABLES 7.4–7.5, FIG. 7.1). Drinking vessels were also the commonest vase type from the dining area of the Demeter sanctuary at Corinth (Bookidis *et al.* 1999, 14), but no figures are given.

The Olynthos material is of course later, from later fifth and first half of the fourth century, but the Agora dining assemblage is closer to Phylla Vrachos in date (*c.* 480–430 BC, with a concentration around 460–450 BC; Rotroff and Oakley 1992, 9–10, 51–2). There is no reason to suppose that pottery usage changed greatly during the fifth century. Potentially more significant are the problems of quantification. It is not clear how the figures for Olynthos were obtained, but probably by counting the complete and near complete vessels, without descending to the small fragments that have often been catalogued (and so counted) at Phylla Vrachos. Furthermore they exclude 'many saucers, jugs,

TABLE 7.4. Fine ware shapes at Phylla Vrachos, NW corner of Athenian Agora, and Olynthos (non-funerary, 1934 and 1938); based on TABLE 4.1, Rotroff and Oakley 1992, 131–8, and Robinson 1950, 42.

	Phylla		Athens			Olynthos	
	items	%	RF + BG items	Total items	%	items	%
Mixing vessels	0	0	89 + 0	89	5	18	3
Large containers (amphorae, hydriai, stamnoi)	0	0	20 + 0	20	1	30	6
Jugs, oinochoai, pelikai	8	6	10 + 61	71	4	75	14
Small containers (oil?) (askoi, lekythoi, lagynoi, olpai)	3	2	24 + 108	132	7	179	33
Drinking vessels	96	73	30 + 1091	1121	64	110	20
Plates, saucers, dishes, bowls	6	4	1 + 273	274	16	69	13
Lekanides, pyxides and covers	19	14	1 + 15	16	1	42	8
Other	0	0	2 + 11	13	1	15	3
TOTAL FINE WARE	132		177 + 1559	1763		538	

TABLE 7.5. Fine and coarse ware shapes at Phylla Vrachos and NW corner of Athenian Agora; based on TABLE 4.1 and Rotroff and Oakley 1992, 131–8.

	Phylla		Athens		
	items	%	RF + BG items	Total items	%
Fine wares					
Mixing vessels	0	0	89 + 0	89	2
Large containers (amphorae, hydriai, stamnoi)	0	0	20 + 0	20	0.4
Jugs, oinochoai, pelikai	8	4	10 + 61	71	2
Small containers (oil?) (askoi, lekythoi, lagynoi, olpai)	3	2	24 + 108	132	3
Drinking vessels	96	53	30 + 1091	1121	25
Plates, saucers, dishes, bowls	6	4	1 + 273	274	16
Lekanides, pyxides and covers	19	10	1 + 15	16	1
Other shapes	0	0	2 + 11	13	1
Total fine wares	132	73	177 + 1559	1763	39
			'weeded no.' × corr.	'orig. no.'	%
Lamps	13	7	331 × 4.85	1605	35
Coarse or household wares					
Transport amphorae	7	4	48 × 4.85	233	5
Dishes	3	2	0	0	0
Oinochoai, table amphorae	8	4	74 × 4.85	359	8
Lekanai	0	0	unweeded	115	3
Cooking ware	15	8	78 × 4.85	378	8
Storage vessels	3	2	0	0	0
Spindle whorls, loom weights	0	0	unweeded	20	0.5
Other shapes	0	0	unweeded	34	0.8
Total coarse or household wares	36	20		1139	25
TOTAL ITEMS	181			4507	

kitchen ware, kernoi, kothons, fragments etc.', so can at best only be used for comparison with the fine wares at the two other sites. The problems faced in quantifying the Athenian Agora assemblage are well discussed by Rotroff and Oakley (1992, 131–3, 137), and the method used was different again. There are also difficulties in the assumption that the shape categories will have been similarly defined in each case. Nevertheless, it seems preferable to use the figures that exist, rather than to

ignore the whole issue of differences in shape frequency. TABLE 7.4 presents the figures for the fine ware from the three sites, and TABLE 7.5 compares the frequencies in the Phylla Vrachos and Athenian Agora assemblages for both fine and coarse pottery. The shape categories have been made consistent as far as possible, and for this reason do not coincide exactly with those in TABLE 4.1. ***K 30,** which is too shallow for drinking, has been included under 'plates and dishes', while the narrow-necked ***K 34**, ***K 85**, and ***K 141** have been included under oil flasks rather than jugs etc. Naturally, where only part of a shape survives, the step from sherd to function is sometimes an uncertain one. The figures for Olynthos are obtained by subtracting the numbers of pots from graves from the total numbers. Those for the coarse ware from the Agora assemblage have been adjusted to allow for the fact that much had been discarded before the counting, reducing its volume from 34 to 7 tins. In TABLE 7.5 the numbers for the shapes affected by this 'weeding' have been multiplied by $34/7 = 4.8$, on the assumption that the ratio of shapes in the original 34 tins was much the same as the ratio in the surviving seven. Without this adjustment it would have been impossible to compare the figures for fine and coarse wares.

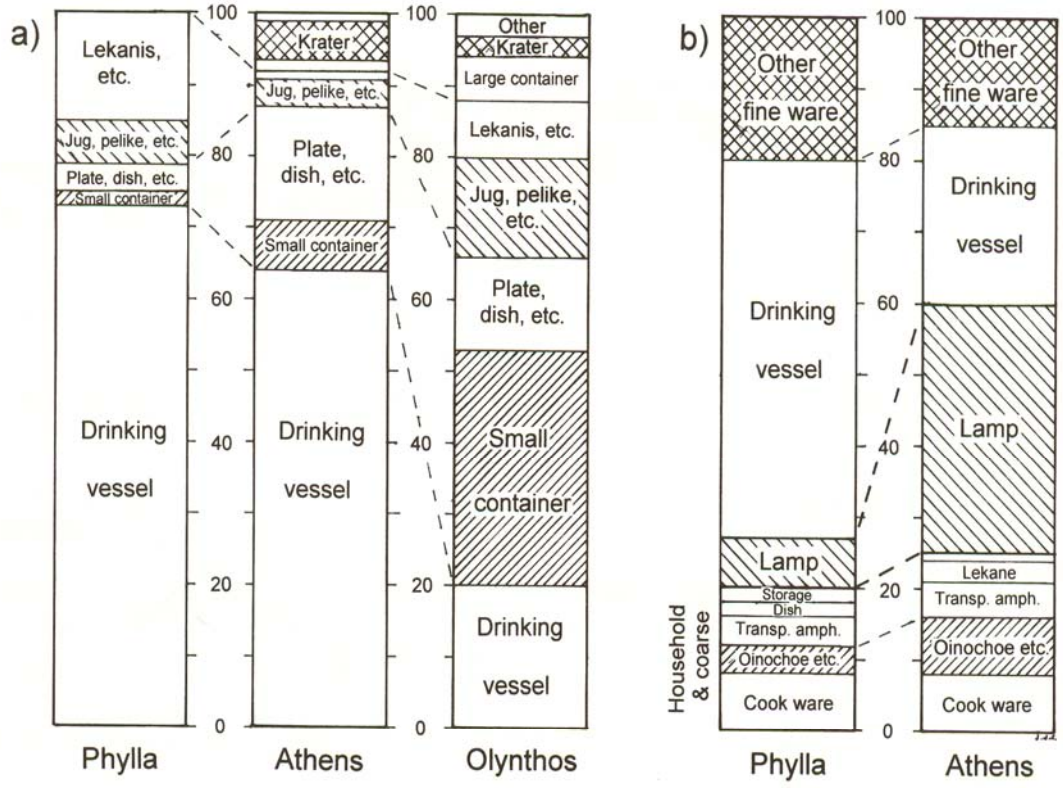

FIG. 7.1. Histograms of pottery shape frequencies (%): (*a*) fine pottery from Phylla Vrachos, Athens (NW Agora) and Olynthos (non-funerary, 1934 and 1938); (*b*) all pottery from Phylla Vrachos and Athens (NW Agora). Both are based on TABLES 7.4–7.5, and use the same shape groups.

There is little evidence at Phylla Vrachos for the kraters (Section 4.8, TABLE 4.1), although they are a normal feature of domestic assemblages (e.g. Pfaff 1999, 68–9, table 1). They form 3% of the non-funerary fine ware at Olynthos and 5% of the fine ware in the Agora assemblage, where they were perhaps all decorated (TABLE 7.4 FIG. 7.1: *a*); Rotroff and Oakley 1992, 44–5 on the Agora kraters). The larger skyphoi may have been used for the mixing of wine and water instead. This has been suggested for the semi-glazed bowls in the Demeter sanctuary at Corinth (Bookidis 1990, 92–3), where kraters are also largely absent, but the general simplicity of the cups at Phylla Vrachos suggests an informal setting, and each man may simply have mixed wine and water to taste in his own cup,

making a special mixing vessel unnecessary. Kraters are associated with the formal drinking rituals characteristic of symposia, in the iconography of which they played a major part (Lissarague 1990, 197–201), and at Sparta the rituals of communal drinking seem to have been a vital social bond for the *syssition*, the basic military unit (Murray 1991). However, there is no evidence that kraters were taken on campaign.

Sherds of transport amphorae in every room excavated show that some wine was brought up to the fort from some distance (most are Euboean, but one appears to be Cypriot; Section 4.11), but they are few in relation to the number of cups attested and the likely wine consumption. It is likely that locally grown wine was also brought to the fort in skins (for representations of wineskins in party play: Lissarague 1990, 68–76, figs. 50–8; wineskins in use: figs. 25, 28b). Wooden casks would also have vanished, but seem not to have been normal in Greece, since Herodotos 4.2 notes as strange the Scythian use of 'wooden vessels' (ξύλινα αγγεία) for milk. At Koroni in Attica a large number of amphorae for imported wine were found in the presumed Ptolemaic fort (Vanderpool *et al.* 1962, esp. 58; for the interpretation of the site as a fort see Chapter 9). Plain painted oinochoai and jugs would presumably have served as containers for wine while it was in use, rather than for storage.

Evidence for the role played by wine in military life, as a giver of courage and an agent of group bonding, has been discussed by Hanson (1969, 126–31) and Murray (1991). It was a standard item of military diet (e.g. Thuc. 4.16.1), one or two kotylai per man (*c.* 250 or 500 cl) being the normal daily allowance. Even with 17% alcohol (the maximum obtainable naturally; Murray 1991, 101 n. 24), a kotyle of wine diluted with the usual three parts of water would provide a litre of liquid with a relatively low alcohol content (4.4%), and perhaps with some disinfectant value (Singleton 1995, 75). However, soldiers could provide their own supplies on top of the ration, and the unsettling effect of wine on an insufficiently occupied garrison force is well illustrated in Demosthenes' speech *Against Konon* (54.3–5), where the sons of Konon, in camp at Panakton, are alleged to have spent most of the day drinking, leading to boorish and undisciplined behaviour. The many fragments of drinking vessels may imply that the Phylla Vrachos troops behaved similarly; but diluted wine was also a normal drink in a domestic setting, and the quantity of drinking vessels may rather reflect the large number of troops passing through the fort, being perhaps the only utensil which every man needed to provide. The scratched initials on the cups **K 148** and ***K 169** and on the skyphos ***K 11** certainly suggest individual ownership, and a cup (κώθων) was a standard part of a Spartan soldier's equipment (Plutarch, *Lycurgus* 9.7–8); actual examples have been found at Halieis (Stibbe 1994, 40, 42).

Water would be needed on a larger scale, both to mix with the wine and for cooking and washing (for washing as a normal evening routine see Xenophon, *Hell.* 7.2.22; the small narrow-necked oil flasks at Phylla Vrachos (***K 34, *K 141,** and perhaps ***K 85, *K 126**) may have been used in this connection rather than, or as well as, for oil as a condiment at meals). Engels (1978, 144–5, tables 1–3) suggests a daily allowance of *c.* 2.5 l per man for Alexander's army on campaign, which would mean 400–500 litres a day for the whole Phylla Vrachos garrison; but a lower daily ration would be possible in an emergency. No hydriai to bring water to the point of use have been recognised, although some of the sherds assigned to amphorae might have belonged to hydriai; perhaps some of the larger jugs also served this purpose. If correctly identified, the cistern just outside the later wall circuit would have provided the normal water supply; it could have held at least 12,000 l, enough to last the full garrison about a month at Engels's rate, but probably not enough for the whole summer even at a reduced rate. So if the fort was fully and permanently occupied, water would have to be brought from below, presumably in skins on pack animals. In any case, with a vulnerable water supply, the garrison can not have expected to resist a seige.

The staple food in ancient Greece, in both civil and military contexts, was cereal: wheat or barley. A soldier's ration was one choinix (*c.* 1 litre) per day (Herodotus 7.17; Diogenes Laertius 8.18; Ducrey and van Effenterre 1969, 282–3) or two (Thucydides 4.16.1). Wheat, baked into bread, was generally held to be preferable to barley, and portable millstones to grind it into flour might be carried on campaign (Philip of Macedon allowed one attendant per 10 infantry men to carry them and the ropes—for huts?; Frontinus, *Strategems* 4.1.6). The stones found in Rooms 2 and 4 (**SF 2, 3, 6**) do not belong to the saddle querns widely used for grinding flour for bread (Moritz 1958, 37–41), and no trace of ovens was found at Phylla Vrachos; contrast the Demeter sanctuary at Corinth, where there were saddle querns but no ovens (Bookidis 1993, 54–5). But in either of the two likely historical contexts for the Phylla Vrachos garrison (Chapter 9), bread could have been brought from the home base. Parched barley meal (ἄλφιτα) was widely used on campaign (e.g. Xenophon, *Hell.* 7.2.22), and had the advantage in a military context that when mixed into cakes (μᾶζα) with water, oil or wine, it did not need to be cooked before eating (Thucydides 3.49.3; Braun 1995). **SF 2, 3** and **6** might have

been used for crushing barley meal. Biscuit (hard tack; *bucellatum*, παξαμᾶς), which is also ready to eat and long lasting, was the characteristic item of Roman and Byzantine military diet from at least the third century AD (Davies 1971, 124–5; Koukoules 1952, 24, 29–30; Kolias 1984, 197–9), but it seems not to have been used by classical Greek soldiers; the late Hellenistic Paxamos is claimed as its inventor (Dalby 1996, 164–5). For the Romans poor rations included a kind of spelt porrage, but this was not normal in classical Greece (Schwarz 1995, 55).

Cereals were normally eaten with an *opson* (ὄψον), something to give it flavour. Simplest and most easily portable were cheese, olives, garlic, and onions (e.g. Aristophanes, *Pax* 1129, *Ach.* 544–54, Xenophon, *Anab.* 7.1.37), but apart from olive pips (which were not found at Phylla Vrachos) none of these would leave any trace. The single surviving grape pip may indicate that fruit was also eaten in season.

Meat and fish were also popular when available. Sheep, goats, pigs, and cattle, would be available in principle (Dalby 1996, 58–60), but for most people meat was not a major item of diet (Garnsey 1999, 16–17, 123–6). The food supply provided by the people of Herakleia for the Ten Thousand included meat (with much larger quantities of grain and wine) but that provided by the people of Sinope did not (Xenophon, *Anab.* 6.1.15, 6.2.3), and although Roman soldiers certainly ate meat (Davies 1971, 125–8; Garnsey 1999, 125–6), the garrison diet at Bearsden near Glasgow seems to have consisted largely of wholemeal bread (Knights *et al.*, 1983). The few bones recovered from Buildings 3 and 4 show that sheep/goat, cattle and pig were eaten at Phylla Vrachos, and the bones from below the floor show that this occurred also before the buildings were provided. Hare, wild fowl, and deer could probably be hunted in the area, although no bones were found. The sling shot (?) **SF 8–9, 12–13** may have been collected for this purpose rather than, or as well as, for fighting, although they would be rather heavy for the smaller game. As already mentioned, there is no way of telling whether the scarcity of bones results from efficient disposal of them or from a low-meat diet.

Fish was perhaps more widely eaten than meat (Dalby 1996, 67–8). Sardines are among the campaign supplies mentioned in Aristophanes (*Acharn.* 544–54), and later in the same play Lamachos sets off on campaign with salted fish as well as salt and onions. Two fish bones and several shells show that seafood also formed some part of the diet at Phylla Vrachos, and the possible net weight and sail ring fragment (**SF 16–17**) also suggest connections between the garrison and seagoers, even if the soldiers did not necessarily fish for themselves. Shells and salt fish also formed part of the meals eaten by Athenian officials near the NW corner of the Athenian Agora, but bones (not yet identified) were found also (Rotroff and Oakley 1992, 48).

The many fragments of chytrai and other cooking pots show that the *opson* at Phylla Vrachos frequently consisted of something cooked, and this was probably normal when conditions allowed Xenophon (e.g. *Hell.* 7.2.22). Peas, beans and lentils, cooked into soups or stews (ἔτνος), were popular among normal fifth-century Athenians (Schwartz 1995, 55–6), and provided a useful element in ancient Greek nutrition and agriculture (Sarpaki 1992; Garnsey 1998, 210–11, 214–25). Meat stews and soups were also cooked (Aristophanes, *Knights* 174; ζωμός), presumably made with meat unsuitable for roasting; at Phylla Vrachos such meat would probably come as part of any whole animals brought to the site, not as a separate item, so its potential contribution to diet depends on the problem of bone scarcity already discussed. But stewing of young animals may soften bones sufficiently to preclude their survival in the ground.

The shallow and deep lekanides and bowls could have been used for serving cooked food as well as for cheese, onions etc., and the shallow dish ***K 30** was perhaps used for small items such as grapes or olives (cf. Sparkes and Talcott 1970, 138). Plates, if used, must have been made of wood, since no trace of them was found. Plates are shown on each diner's table on the Eurytios krater (Arias *et al.* 1962, 282, pl. 32, IX), but are often omitted from banquet scenes (as Boardman 1974, fig. 161.1–2, 219), and clay plates may not have been normal household articles before the late fifth century (Sparkes and Talcott 1970, 144). Bread and solid food were probably eaten by hand, and bread perhaps used in place of a plate.

All the items of food and drink suggested above for the Phylla Vrachos garrison could have been obtained locally, from the territory of either Eretria or Chalkis—as indeed in most other parts of the Greek world. The vulnerability of the probable cistern and the availability of fish suggest a normally friendly environment, and if so much of the pottery was obtained locally (Section 4.11), food supplies were probably also largely local. Neither of the political contexts suggested in Chapter 9 would require the garrison to be supplied from a distance. But some food items, like some of the pottery, may have been brought from outside Euboea.

A daily ration of 1 *choinix* of grain (*c.* 1 litre) per man, and 1 *kotyle* of wine (0.25 l—a ratio of 4:1) was normal, although the Athenians allowed these quantities for the servants of the Spartan force trapped on Sphakteria in 425 BC, but twice as much for the Spartiates themselves. Engels (1978, 144–5, tables 1–3) prefers the higher figure (3 lb = 1.35 kg) as the daily grain ration for each man in the army of Alexander the Great. Other evidence of relative quantities is provided by Xenophon; the people of Sinope provided grain and wine in a ratio of *c.* 3:1; those of Herakleia in a ratio of *c.* 2:1; and Koiratadas of Boeotia suggested a ratio 1:1, or 20:20:1:1 for grain, wine, onions, and garlic (Xenophon, *Anab.* 6.1.15, 6.2.3, 7.1.33).

We have seen in Section 3.2.10 that Building 3 could have held around 200 men. The fact that some of these may have been servants need not affect the supply quantities, since servants required feeding too (Thuc. 3.17.3), but if the servants slept outside the rooms, that would increase the number of mouths to be fed, while if some rooms were not used for accommodation the number would be reduced. Using the figures with all due reserve, however, we can calculate the approximate requirements of the full Phylla Vrachos garrison as at least 200 litres of grain and 50 litres of wine per day. To these, following Koiratadas, we should add some 20 litres of *opson*. A rough conversion from volume to weight [200 × .7 + 50 × 1 + 20 × .8 = 140 + 50 + 16] produces a figure of about 200 kg per day or 6000 kg (about 66 mule loads) for the full garrison for a month. If water also had to be brought up to make good the inadequacy of the cistern, a daily water ration of 2.5 litres (2.5 kg) per man (see above) would amount to an additional 15,000 kg (165 mule loads) for the full garrison for a month.

These somewhat hypothetical figures become important if the supplies were provided and stored centrally. A month's supply of water could probably be deposited in the supposed cistern, but a month's supply of grain and wine would need significant roofed storage space. No evidence for a central food store was found, but one or more of the unexcavated rooms of Building 3 could have served this purpose. Six thousand litres of grain (at least 6 cu. m.) would fill half a room in Building 3 to a depth of *c.* 40 cm. In fact only a few fragments of storage jars were found in the excavated rooms, and those were comparatively small. Nor were fragments of large pithoi found on the surface elsewhere. The negative evidence is not conclusive, but it seems likely that wherever the grain and/or pulses were stored, they were held in the sacks or bags used to bring them to the site, rather than in large pithoi. By contrast storage vessels (including amphorae) made up about 25% of the archaic and classical pottery from the rural sites interpreted as farmsteads in NW Kea (Whitelaw 1998, table 12).

Herodotos (7.187) makes an effort to calculate the supply train needed by Xerxes' army in 480 BC, but most of the evidence for military supply relates to the later fifth and fourth centuries. Athenian troops called up for campaign were expected to bring their own food for the first three days or so (Pritchett 1971, 32–4); thereafter their commanders saw to it that supplies were available. Foraging from enemy territory was encouraged where appropriate, but as indicated above, the Phylla Vrachos fort was probably in normally friendly territory, so this source would not be available. Otherwise commanders often arranged the food supply by making sure that there was a local market and paying each man a daily food allowance, rather than by providing rations centrally. It is unclear whether the same system could have worked at Phylla Vrachos, for in the late sixth century the monetary economy was less developed (although quite small denominations were already available from several mints; Howgego 1995, 7). But on the one hand garrison troops serving for a prolonged period are unlikely to have had to provide food from their own resources; and on the other even an archaic polis generally tended to devolve responsibility as far as possible to an individual. So some equivalent combination of state support and individual initiative seems more likely at Phylla Vrachos than a fully centralised commissariat.

Certainly there is some evidence that responsibility for food preparation was devolved at Phylla Vrachos, as in the fourth century (e.g. Xenophon, *Hell.* 5.1.18; 7.2.22; Plutarch, *Lys.* 11.4; Pritchett 1971, 36, n. 30). Centralised cooking would need large metal cauldrons, which are occasionally shown in use for cooking on contemporary vases (e.g. Pierce 1993, fig. 12 [Athens, Acrop. Mus. 654]; Kunisch 1997, pl. 90.270 [Louvre CP 10918]), and cauldrons (λέβητες) are counted as cook's equipment by Pollux (10.95) and in a Homeric simile (*Iliad* 21.362). Being valuable, they would naturally have been removed from the fort when it was abandoned. But the existence of so many coarse sherds belonging to cooking pots of a normal domestic size shows that a great deal of cooking was in fact carried out in smaller units. Most serving dishes are also small (12–18 cm across). And although the drinking vessels are generally similar to each other in size and types, they are not so similar as to suggest that they were bought in bulk by some central authority. As noted above, their number, and the occasional scratched initials, suggest that each soldier provided his own cup.

Although the mainly later literary evidence suggests that individual soldiers were generally responsible for obtaining (with central help) and preparing their own food, mess mates (σύσσιτοι) or tent mates (σύσκηνοι) could act together on occasion (Xenophon, *Anab.* 5.8.5; Demosthenes 54.3–5). In the latter passage Ariston says that 'we' (clearly distinguished from 'I') followed normal Athenian urban manners in eating and drinking, and 'our slaves' prepared the evening meal; although it is not explicitly stated, the story suggests some co-operation among the mess mates in organising their meals as well as in complaining to the commander. The nine to twelve occupants of a room in Building 3 may similarly have formed a co-operative group, and the still unused hearth in Room 2 (but not in Rooms 4 or 17) may have been the decision of one such group. Most of the cooking pots and serving dishes at Phylla Vrachos could have served either one person or a small group, depending on what went into them. But the cooking pot ***K 9**, 33 cm across, the deep lekanides ***K 32** and ***K 33**, around 40 cm across, and the large unpainted dish ***K 204**, 32 cm across would all be more appropriate for a small group than for an individual. There seem to have been no cooking pots comparable to the tiny ones (*c.* 6 cm across) found in the Demeter sanctuary at Corinth (Bookidis 1993, 52–3, 61, table 3.2; Bookidis *et al.* 1999, 14–15).

No evidence was found for the place or places where cooking was carried out. It was not done in the rooms excavated, perhaps for reasons of hygiene, smell, or (in summer at least) comfort. But presumably it took place quite nearby; in the Demeter sanctuary at Corinth cooking facilities were immediately beside the dining rooms. The access terrace in front of Building 3 was wide enough not to be blocked by small hearths serving each room, but the flattish ground behind the building was also easily accessible, by means of the three passages. The same three passages would also allow easy disposal of rubbish over the N cliffs.

Similarly no evidence was found of latrine facilities. Ample concealment from the fort could be reached on the W slope via the small postern gate (Section 3.1.2). But soldiers were not encouraged to stray far for such purposes (Anderson 1970, 61), and other options (e.g. the N cliff?) could have been chosen; acceptable privacy is a matter of convention.

The picture of military life provided by the evidence from Phylla Vrachos is far from complete, but it provides a general confirmation and some supplement for the literary evidence, and is consistent with the view that the conditions of the classical period already applied to a large extent in the late archaic period.

BRITISH SCHOOL
AT ATHENS

THE FORT AT PHYLLA, VRACHOS

(Supplementary Volume No. 33)

EXCAVATIONS AND RESEARCHES AT A LATE ARCHAIC FORT IN CENTRAL EUBOEA

E. SAPOUNA SAKELLARAKI, J. J. COULTON AND I. R. METZGER

With additional contributions by

A. Sarpaki and S. Wall-Crowther

Many ancient Greek fortifications are known but there has been little excavation within them. This account of survey and excavation within the fort at Phylla, Vrachos in central Euboea therefore starts to fill a significant gap. The garrison was housed in a purpose-built 20-room barrack building, and excavation shows that this, with the associated redevelopment of the fort, belongs to a brief occupation phase between the Athenian defeat of Chalkis in 507 BC and the Persian invasion of 490 BC. An earlier period of use in the late eighth century BC may relate to the semi-legendary Lelantine War between Chalkis and Eretria.

Full presentations of the excavation and architecture by J. J. Coulton and of the pottery by I. Metzger provide the basis for a detailed examination of the evidence for garrison life in the late archaic period, about which written sources are virtually silent. The archaeological context of the fort, in the border area between Eretria and Chalkis, is presented by E. Sakellaraki, former Ephor of Euboea, and a final chapter brings out the historical significance of the site.

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