



Fig. 1: excavation in progress.

Recent work at Orchard Hill, Queen Mary's Hospital, Carshalton

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AN ARCHAEOLOGICAL evaluation was undertaken by the Museum of London Archaeology Service (MOLAS) in the grounds of Orchard Hill, the former Queen Mary's Hospital, Carshalton (TQ 2798 6222) between 29th March and 2nd April 1993. A further two-week excavation period was granted to enable full excavation (Fig. 1) of the archaeological deposits revealed in the evaluation phase. The archaeological work was carried out in response to the proposed construction of an aerials tower by Mercury Personal Communications. The site lies to the south of a late Bronze Age enclosure, which has scheduled ancient monument status (Fig. 2).

The late Bronze Age enclosure is situated on the dip slope of the North Downs at 100m (330ft) OD. The underlying geology of the site is Thanet Sand overlying chalk.

Archaeological background

The enclosure at Queen Mary's Hospital was first observed in 1903 by two local archaeologists, H. C. Colyer and N. F. Robarts, during construction of the hospital buildings. Nineteen metres (62ft) of a v-shaped ditch was exposed measuring 3.6m (12ft) wide and 2.75m (9ft) deep. Numerous objects were recovered including a large amount of pottery, loomweights and flint implements. There were no

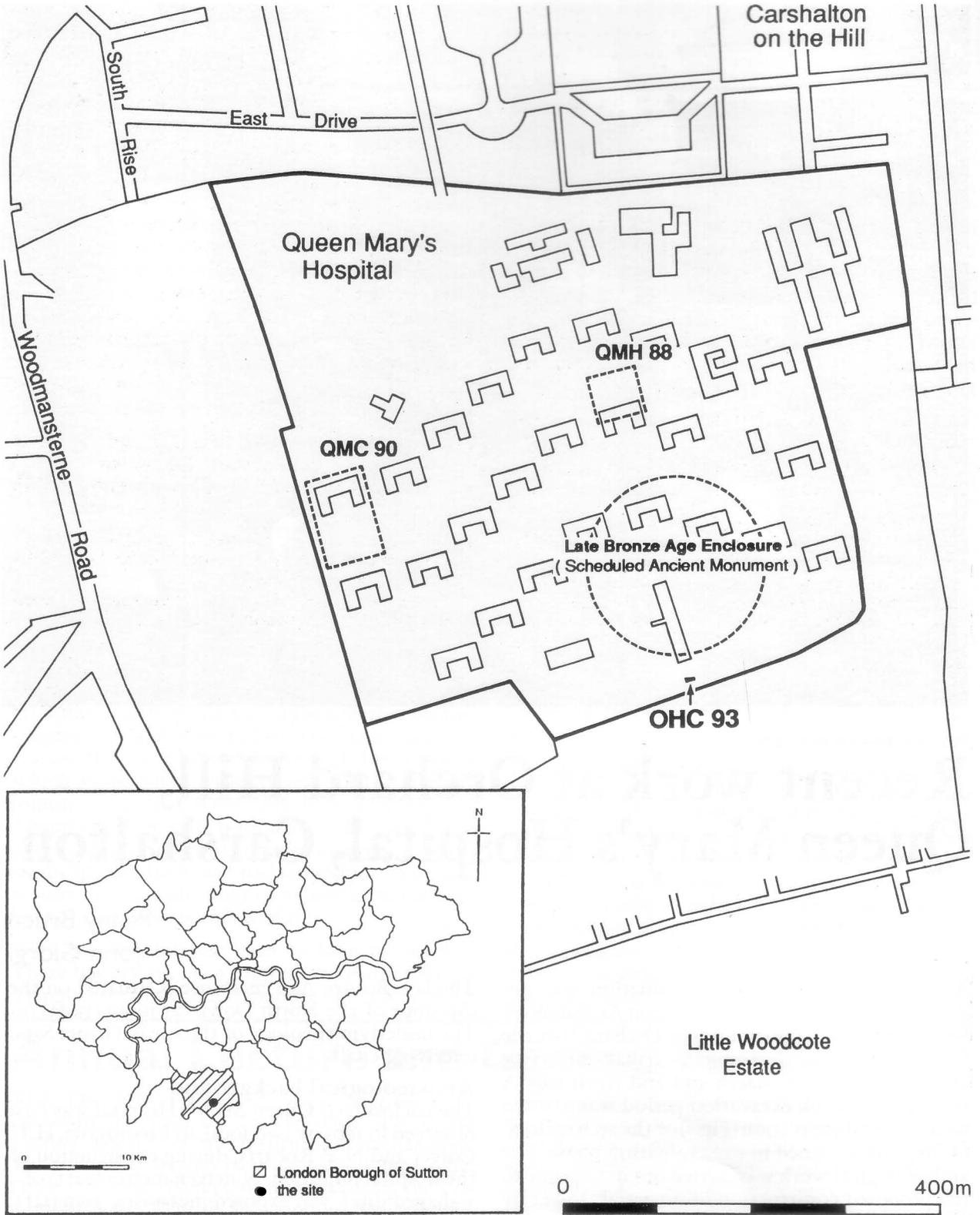


Fig. 2: site location.

signs of an accompanying bank. Roberts suggested that the ditch formed part of an enclosure approximately 150m (500ft) in diameter. Further work was undertaken in 1937 by A. W. G. Lowther during which he relocated the line of the v-shaped ditch. A 6m (20ft) length of the ditch was excavated containing five silt layers, one of which consisted of chalk-speckled sand with large chalk blocks and flint nodules, which Lowther interpreted as the collapsed revetment from the original bank¹.

The enclosure was initially considered to date to the Iron Age², but a recent reassessment of the material indicates that the pottery has parallels with that of established late Bronze Age date³. The site of the enclosure was scheduled in 1987 by the Historic Buildings and Monuments Commission, which reflects its importance in the region.

An excavation was undertaken by the Museum of London in 1989⁴ in an area 75m (250ft) to the north of the scheduled monument. Two intercutting ditches were revealed, possibly dating to the late

Bronze Age, a large pit dating to the Iron Age, rubbish filled pits and a clay-lined pit. These results indicate that activity and perhaps even occupation extended beyond the limits of the enclosure. An archaeological watching brief undertaken by the Museum of London in 1990 to the north-west of the enclosure revealed no archaeological deposits.

Excavation 1993

One trench measuring 11 by 5.50m (36 by 18 ft) was opened during the 1993 investigation. It was located 30m (100ft) to the south of the enclosure. The observation of a high concentration of finds within a sand layer at the western area of the trench led to careful excavation of this area, by means of arbitrary spits. The finds in each spit were plotted on a series of plans to show the distribution patterns within this layer. This layer of colluvium contained most of the finds from the site.

A large cut feature was revealed obliquely truncating the south-western corner of the trench (Fig. 3). It contained three sandy silt fills [6, 7 and 8] and was

1. A. W. G. Lowther 'Report on Excavations at the site of the Early Iron Age Camp in the Grounds of Queen Mary's Hospital, Carshalton, Surrey' *Surrey Archaeol Collect* 49 (1946) 56-74.
2. E. E. Harrison 'Iron Age Material from Queen Mary Hospital, Carshalton and its Implications for the Chronology of the Earliest Iron Age in the Lower Thames Region' *Surrey*

Archaeol Collect 65 (1968) 133-138.

3. L. Adkins & S. Needham 'New Research on a Late Bronze Age Enclosure at Queen Mary's Hospital, Carshalton' *Surrey Archaeol Collect* 76 (1985) 11-50.

4. S. Tucker Queen Mary's Hospital. An Archaeological Assessment. MOLAS Archive Report (1988).

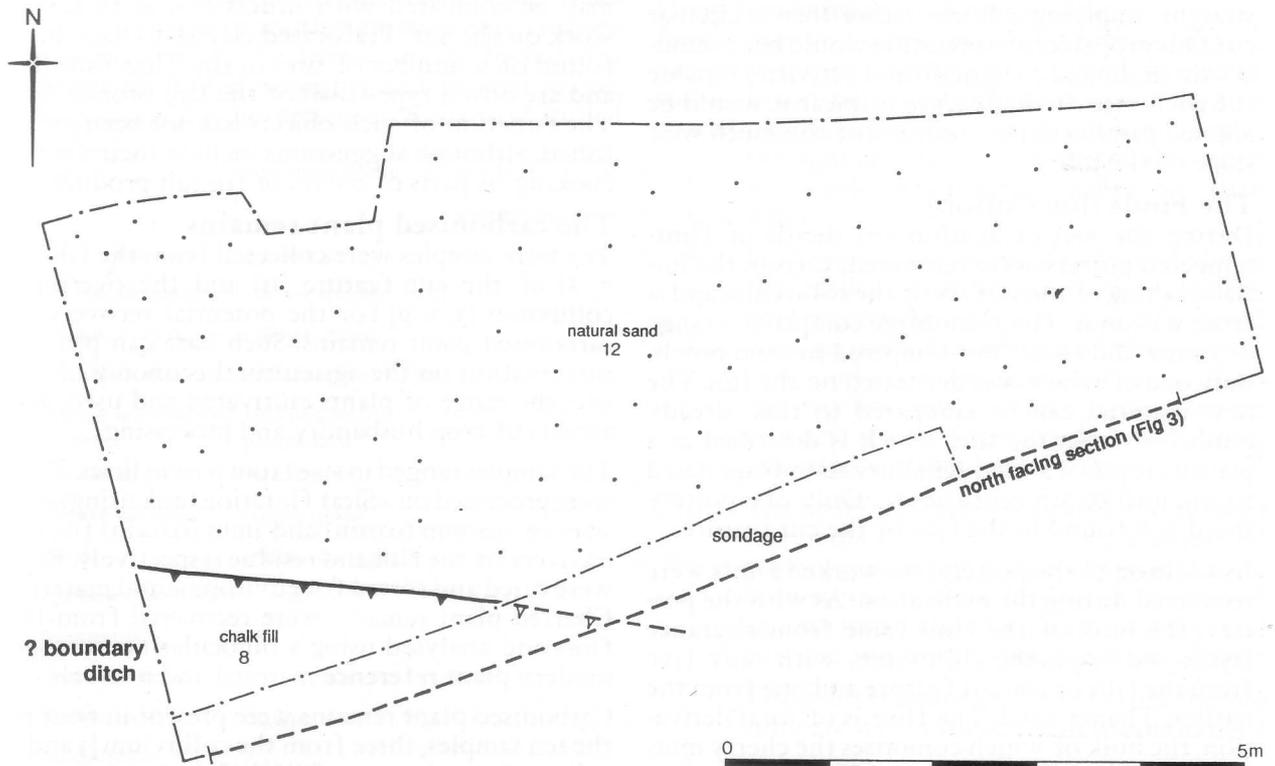


Fig. 3: trench outline showing location of ditch.

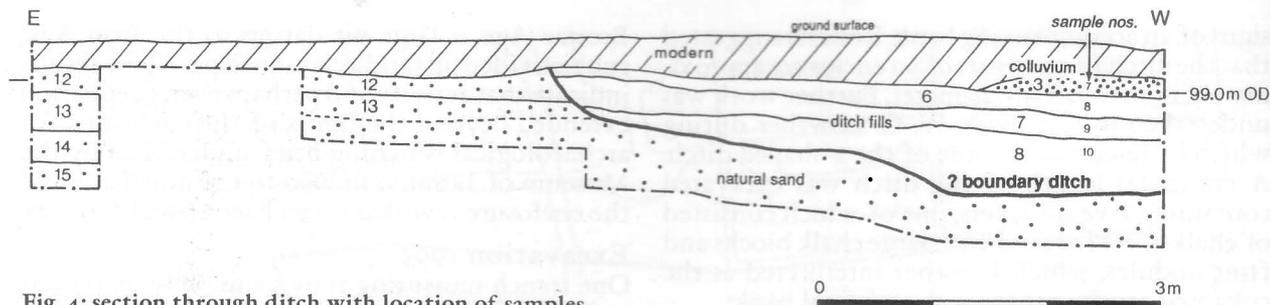


Fig. 4: section through ditch with location of samples.

sealed by the layer of colluvium (Fig. 4). A sondage was excavated by hand along the southern edge of the trench to enable the extent of this feature to be seen as this was not clear in plan, due to the similarity between the upper fills and the underlying Thanet Sands. After removal of the colluvium and the two upper fills [6 and 7] the feature was also revealed in plan at the level of the lowest fill [8]. The full extent and dimensions of this feature could not be determined due to the need to restrict investigations to the footprint of the development. The dimensions as seen were 1.80m (6ft) in width and 0.96m (3ft) depth at its maximum. It was difficult to interpret this large cut feature as only the northern edge of the cut was revealed during the excavation. The feature could be interpreted as either a large pit or as a ditch, which could be either linear or circular. The northern edge, as seen, was straight, implying a linear rather than a circular cut. One probable interpretation would be a boundary ditch, linked to agricultural activities outside the enclosure. If the feature is linear it would be aligned parallel to the contours of the south west slope of the hill.

The Finds (Jon Cotton)

During the 1993 excavation 120 sherds of flint-tempered pottery were recovered, 31 from the initial cleaning of the surface of the colluvium and 85 from within it. The assemblage comprises a range of coarse and finer flint-tempered jars and bowls, only one of which was decorated on the rim. The new material can be compared to that already published from the site, which is described as a plain ware post-Deverel-Rimbury assemblage dated to the 10th to 8th centuries BC. Only one pottery sherd was found in the fills of the cut feature.

In addition to the pottery, 154 worked flints were recovered during the excavation. As with the pottery, the bulk of the flint came from clearance layers and from the colluvium, with only five from the fills of the cut feature and one from the natural Thanet Sand. The flint is of local derivation, the bulk of which comprises the cherty mottled grey/black North Downs flint. There were also 19 pieces of Bull Head Bed flint and two

fragments of gravel cobbles. Nine of the worked flints had been burnt. In addition, ten bags of unworked fire-cracked flint were recovered.

No diagnostic artefacts were found, but the presence of two poorly prepared cores and a number of broad thick flakes, many terminating in hinge fractures, is typical of later prehistoric assemblages. Similar material was recovered during the earlier work at the site, the bulk of which was ascribed to the late Bronze Age on account of associated ceramics and metalwork. Apart from the later prehistoric material, one probable mesolithic opposed-platform core was found in the clearance layer.

Two definite and one possible fragment of perforated clay slabs were recovered from the colluvium and the clearance layer (Fig. 5). The largest fragment has traces of up to six perforations. These may be compared with others found in earlier work on the site. Perforated clay slabs have been found on a number of sites in the Thames valley and are now a type-fossil of the late Bronze Age. The function of such objects has not been established, although suggestions include their use for cooking, as parts of ovens, or for salt production.

The carbonised plant remains

Ten bulk samples were collected from the fills [6, 7, 8] of the cut feature [11] and the overlying colluvium [3, 5, 9] for the potential recovery of carbonised plant remains. Such data can provide information on the agricultural economy of the site; the range of plants cultivated and used, and aspects of crop husbandry and processing.

The samples ranged in size from 15 to 30 litres. They were processed on a Siraf flotation tank using sieve sizes of 0.25mm (0.01in) and 1mm (0.04in) for the recovery of the flot and residue respectively. Both were dried and sorted for environmental material. Charred plant remains were recovered from the flots and analysed using a binocular microscope, modern plant reference material and manuals.

Carbonised plant remains were present in four of the ten samples, three from the colluvium [3 and 5] and one from the upper fill [6] of the linear feature [11]. The results are summarised in Table 1.

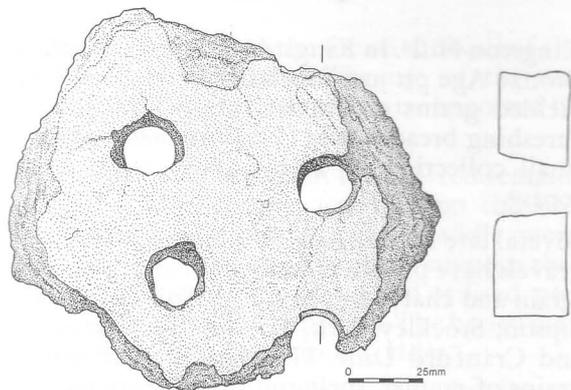


Fig. 5: drawing of perforated slab.

An estimated 375 plant items were recovered. Most of the evidence consisted of cereal grains (97.1% of the material), plus small quantities of cereal chaff (0.8%) and weed seeds (2.1%). The cereal grains were generally poorly preserved and the majority could not be identified to either species or genus level.

The cereals

Some of the cereal grains were identified as wheat (*Triticum* sp.) and barley (*Hordeum sativum*). Several wheat grains were characteristic of the glume wheat emmer (*Triticum dicoccum*), the presence of which was confirmed by two spikelet forks. One glume base was also recovered although it was not sufficiently diagnostic to establish whether it belonged to emmer or another glume wheat, einkorn (*T. monococcum*). The barley grains included a number of hulled, straight and twisted grains, which suggests the presence of six-row hulled barley.

species	common name	context	3	3	5	2
		sample no.	1	7	2	3
<i>Triticum dicoccum</i>	emmer grain		2	13		
<i>Triticum dicoccum</i>	emmer spikelet fork				1	
<i>Triticum cf. dicoccum</i>	emmer grain		2	5		
<i>Triticum cf. dicoccum</i>	emmer spikelet fork				1	
<i>Triticum monococcum/dicoccum</i>	einkorn/emmer glume base				1	
<i>Triticum spp.</i>	wheat grain		4	30		
<i>Hordeum sativum</i>	barley grain				22	
<i>Cerealia</i>	indet. cereal grain		8	25	250	3
<i>Polygonum cf. aviculare</i>	knotgrass				2	
<i>Polygonum spp.</i>	-					2
<i>Polygonaceae indet.</i>	-				1	
<i>cf. Bromus sp.</i>	brome				1	
indeterminate	-					2

Table 1: plant remains.

The weeds

The few seeds of other plants that were recovered included knotgrass (*Polygonum aviculare*), *Polygonum* spp., and possibly brome (*Bromus* sp.).

The interpretation of the assemblages

The predominance of cereal grains suggests that the material represents the product of the advanced stages of crop-processing; for example, accidentally burnt grains from food preparation. The fragmentary condition of the charred material may indicate that it was subjected to direct intense heat in oxidizing conditions. It may also be a result of post-depositional processes including archaeological recovery and processing.

Most (87.7%) of the evidence was recovered from context 5, a dark grey sandy silty area, one of several such localised areas within the colluvium. This sample produced a seed density of 65.8 seeds per litre of soil but yielded few other inclusions; occasional charcoal fragments, pottery sherds and moderate quantities of flint. This area may represent the remnants of redeposited crop-processing residues/cleanings from small local hearths or fires.

The remaining samples consisted of much smaller quantities of material, presumably derived from the activities described above.

Crop husbandry and processing

Both barley and wheat may have been cultivated near the site. Emmer may grow in a wide variety of soil and climatic conditions. Barley, as a shallow rooted crop, is best suited to lighter loams, such as the light calcareous soils around the site. It is less tolerant of excessive moisture than wheat⁵.

However, there is insufficient evidence for detailed information on crop husbandry and processing activities. The few weed seeds recovered from the assemblages may be found growing in a range of habitats and may have derived from plants growing near the site or from arable weeds being imported with the cereal crop.

The chaff (spikelet forks and glume base) represents the residue from an advanced stage of processing; glume wheats may have been stored in their husks for protection against insect and fungal infestation, and parched and threshed on a piecemeal basis.

The plant remains recovered from the site compare well with other archaeobotanical

5. G. Barker *Prehistoric Farming in Europe* (1985) Cambridge University Press.

studies from Bronze Age settlements in the region and from southern England as a whole. A recent review of the evidence from the British Isles shows that emmer, the glume wheat spelt (*Triticum spelta*), and six-row barley, are usually the best represented cereal grains recovered from Bronze Age sites⁶.

Earlier excavations at Queen Mary's Hospital by Robarts and Lowther produced finds of charred wheat and six-row hulled barley from a number of vessels and hearths within the enclosure ditch or from layers above it⁷.

Two km to the north of the site, excavations at Carshalton House on the edge of the River Wandle yielded a small charred grain assemblage including barley, possible wheat grains and weed seeds, from the primary fill of a late Bronze Age pit/ditch⁸.

Excavations on the Sussex Downlands have also produced evidence suggesting that emmer and barley were important crops in the late Bronze Age; e.g. at Itford Hill⁹. At Blackpatch, East Sussex, these two grains were the best represented cereal crops in large quantities of charred material which also included some spelt wheat and beans¹⁰.

In the lower Thames Valley, caches of charred wheat grain were recorded from Coombe Warren,

Kingston Hill¹¹. In Kingston itself, samples from a Bronze Age pit just south of the Hogsmill River yielded grains of emmer, barley, possible free-threshing bread wheat (*Triticum aestivum*) and a small collection of arable and wasteland weed seeds¹².

Several late Bronze Age sites on the West London gravels have produced evidence for glume wheats (grain and chaff) and barley — Wall Garden Farm, Sipson; Stockley Park, Dawley; Holloway Lane; and Cranford Lane, Harlington¹³. Further west, grains of emmer, spelt and barley were recovered from excavations at Runnymede¹⁴.

Molluscs (Keith Wilkinson)

Two samples from the lower fill of the ditch contained many mollusc shells. The results are summarised in Table 2. Analysis of these shells showed that the 'ditch' never contained water, although the presence of shade-loving species such as *Carychium tridentatum*, *Discus rotundatus*, and *Oxychilus* sp. indicate that it is likely to have been inhabited by plants. However, outside the 'ditch' the environment was probably open. The particular combination of 'open country' species (*Vallonia excentrica*, *Vertigo pygmaea*, *Pupilla muscorum*, *Vallonia costata*), indicates arable conditions¹⁵ outside the 'ditch', perhaps suggesting that the ditch itself was some kind of field boundary.

	context	8	8
species	sample	5	10
<i>Carychium tridentatum</i>	Risso	5	7
<i>Cochlicopa lubrica</i>	Muller	21	15
<i>Cochlicopa lubricella</i>	Porro		1
<i>Cochlicopa</i> sp.		18	6
<i>Vertigo pygmaea</i>	Draparnaud	24	19
<i>Pupilla muscorum</i>	Linnaeus	41	19
<i>Vallonia costata</i>	Muller	29	27
<i>Vallonia excentrica</i>	Sterki	85	65
<i>Punctum pygmaeum</i>	Draparnaud	3	3
<i>Discus rotundatus</i>	Muller		2
<i>Nesovitrea hammonia</i>	Strom		2
<i>Oxychilus cellarius</i>	Muller		7
<i>Oxychilus allarius</i>	Muller	18	6
<i>Ceciliodes acicula</i>	Muller	26	37
<i>Hellicella itala</i>	Linnaeus	1	1
<i>Trichia hispida</i>	Linnaeus	27	24
<i>Trichia striolata</i>	Pfeiffer	3	2
<i>Cepaea nemoralis</i>	Linnaeus	1	
total (excl. <i>C. acidula</i>)		285	197

Table 2: molluscan results.

The late Bronze Age agricultural economy at Queen Mary's Hospital

The archaeobotanical evidence suggests that emmer and barley were being cultivated near the settlement. However, it is impossible to establish the relative importance of these crops to the

6. J. Greig 'The British Isles' in W. Van Zeist, K. Wasylkowska, K. Behre (eds) *Progress in Old World Palaeoethnobotany* (1991) 299-334.

7. *Op cit* fn 3.

8. A. C. Skelton *The Bronze Age at Carshalton House, a summary of the present evidence*. Excavation Report (1994).

9. R. Scaife 'A Review of Later Quaternary Plant Microfossil and Macrofossil Research in Southern England; with reference to Environmental Archaeological Evidence' in H. Keeley (ed) *Environmental Archaeology: A Regional Review Vol. II*. Historic Buildings and Monuments Commission for England. Occasional Paper No 1 (1987) 125-203.

10. P. Hinton 'Carbonised seeds' in P. Drewett (ed) 'Later Bronze Age downland economy and excavations at Black Patch, East Sussex' *Proc Prehist Soc* 48 (1982) 382-390.

11. D. Field & S. Needham 'Evidence for Bronze Age settlement on Coombe Warren, Kingston Hill' *Surrey Archaeol Collect* 77 (1986) 127-151.

12. J. Giorgi *Environmental Appraisal Report for the Bittoms, Kingston* (BIM90) MOLAS Archive Report (1992).

13. J. Giorgi *West London Gravels Assessment Report. The Environmental Samples* MOLAS Archive Report (1993).

14. *Op cit* fn 6.

15. J. G. Evans 'An approach to the interpretation of dry-ground and wet-ground molluscan taxocenes from central-southern England' in D. R. Harris and K. D. Thomas (eds.) *Modelling Ecological Change* London: Institute of Archaeology (1991) 75-90.

agricultural economy of the site on the basis of the limited evidence available. The use of the surrounding area for arable farming is supported by the molluscan evidence.

There is little evidence from the charred remains alone for crop-processing activities on the site, although the recovery of numerous saddle quern fragments from earlier excavations¹⁶ suggests that the cereals were being processed and utilised, presumably for human consumption. The barley may have also been used for animal fodder.

Animal husbandry also probably played an important part in the agricultural economy. While no identifiable bones were found from the current excavations, the record of cattle, sheep, pig and horse bones from earlier investigations in the enclosure ditch, suggests their use as livestock on the site. This is supported by finds of loomweights and spindlewhorls from the same excavations¹⁷.

Recent investigations carried out by MOLAS to the north of the enclosure¹⁸ show that similar crops continued to be utilised in the Iron Age. Barley and emmer were the best-represented grain types together with small quantities of bread wheat, in charred material recovered from an Iron Age pit. Loomweights and spindlewhorls from the same pit suggests that sheep husbandry may have continued to play a role in the agricultural economy.

It has been argued that by the Bronze Age, farming had become firmly established, replacing a system in the Neolithic period where present evidence suggests a greater reliance on collected plant resources¹⁹. Meadows, pastures and heathlands were being managed and utilised by the Bronze Age²⁰. With the intensification of arable farming in this period, there is also "increasing evidence for surplus production, the exchange of foodstuffs and differentiation and specialisation at the regional scale in southern England"²¹.

Whether Queen Mary's Hospital was part of a hierarchy of sites involved in an agricultural exchange system between, for example, the North Downs and the lower Thames Valley, is impossible to establish on the basis of the present evidence. It has been suggested that the site may have been a regional focus for a tract of downland ten km or so

across²². Hopefully, further environmental studies from this site and others in the area will clarify the situation regarding the late Bronze Age agricultural economy of the North Downs.

Summary

The archaeological investigation at Orchard Hill, Carshalton, although restricted to a small area, enabled the retrieval of a significant amount of pottery, struck flint and fire-cracked flint, two perforated clay slabs and environmental data (charred plant remains and molluscs), all of which contribute to the late Bronze Age assemblage from earlier excavations in the grounds of the hospital. The bulk of the finds were recovered from a layer of colluvium, which sealed a large cut feature, possibly a boundary ditch, although the interpretation of this feature is open to debate.

The presence of such a feature, be it a large pit or ditch, to the south of the main enclosure, is a further illustration of external activity. Earlier excavations on the site have revealed external activity to the north of the enclosure in the form of ditches and pits²³. Although the main area of settlement would have been within the enclosure the external area would have been utilised as well, in particular for activities which would produce disturbance or fumes, such as metal-working.

In addition, it is known from extensive field-walking in the area to the south-east of the site (Little Woodcote²⁴) that there was significant prehistoric activity in this area. It is important to view the late Bronze Age enclosure at Queen Mary's Hospital in the wider context of the landscape and to stress the importance of study of the external areas as well as the internal area of the enclosure to gain a balanced view of a late Bronze Age settlement and its associated activities.

Acknowledgements

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8. BAR International Series 496 (1989) 243-261.

20. *Op cit* fn 6.

21. *Op cit* fn 5, 215.

22. *Op cit* fn 3.

23. *Op cit* fn 4.

24. L. Adkins & R. A. Adkins 'Mesolithic, Neolithic and Bronze Age flint artefacts from Little Woodcote' *Surrey Archaeol Collect* 77 (1986) 187-196.

16. *Op cit* fn 3.

17. *Op cit* fn 3.

18. *Op cit* fn 4.

19. L. Moffett, M. A. Robinson, V. Straker 'Cereals, Fruit and Nuts: Charred Plant Remains from Neolithic Sites in England and Wales and the Neolithic Economy' in A. Milles, D. Williams & N. Gardner (eds.) *The Beginnings of Agriculture. Symposia of the Association for Environmental Archaeology* No.