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Front cover: Stylised 'mosaic' of agricultural and industrial activity based mostly on representations from the 2nd and 3rd centuries in the north-western Roman provinces. Illustration by Lyn Spencer.
Back cover: Topography and woodland south of the North Downs. A view from Ranmore Common, Surrey (photograph: John Edwards).

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Chapter 16

Clay, Water, Fuel: An Overview of Pottery Production in and Around Early Roman London

Louise Rayner

Introduction

This chapter considers the supply of pottery to early Roman London and examines some of the key pottery industries which contributed significantly to the pottery vessels in use in Roman London in the 1st and 2nd centuries. The foundation stones for the study of early Roman pottery in London remain two publications that resulted from the prolific work of the Department for Urban Archaeology (DUA) and Department for Greater London Archaeology (DGLA) in the 1970s and 80s. *The Roman Pottery from Southwark* (Marsh and Tyers 1979) summarises key industries supplying pottery to Southwark, as well as outlining a form type-series that remains the core of the system still in use in London. *A dated corpus of early Roman pottery from the City of London* (Davies *et al.* 1994) presents fabrics and forms across all key ware groups found in London and the analysis of a series of Roman Ceramic Phases (RCP) which examine assemblages in chronological groups and considers the changing composition and sources over time. This paper does not attempt to duplicate the breadth and detail of these two publications but instead to bring together more recent findings and flag new research and publications.

In particular, the evidence for production at the Highgate Wood and Brockley Hill/Verulamium industries will be considered including their location, resources, kiln technology, and the extent and nature of the archaeological evidence for each of these industries, as well as the products themselves (Fig. 16.1). The development of these industries will be considered against the backdrop of pre-Roman late Iron Age ceramic traditions. Evidence for pottery production within Roman London will also be explored and through these studies it is hoped we will review critically the evidence we have for the production of so many vessels – beyond the pots themselves.

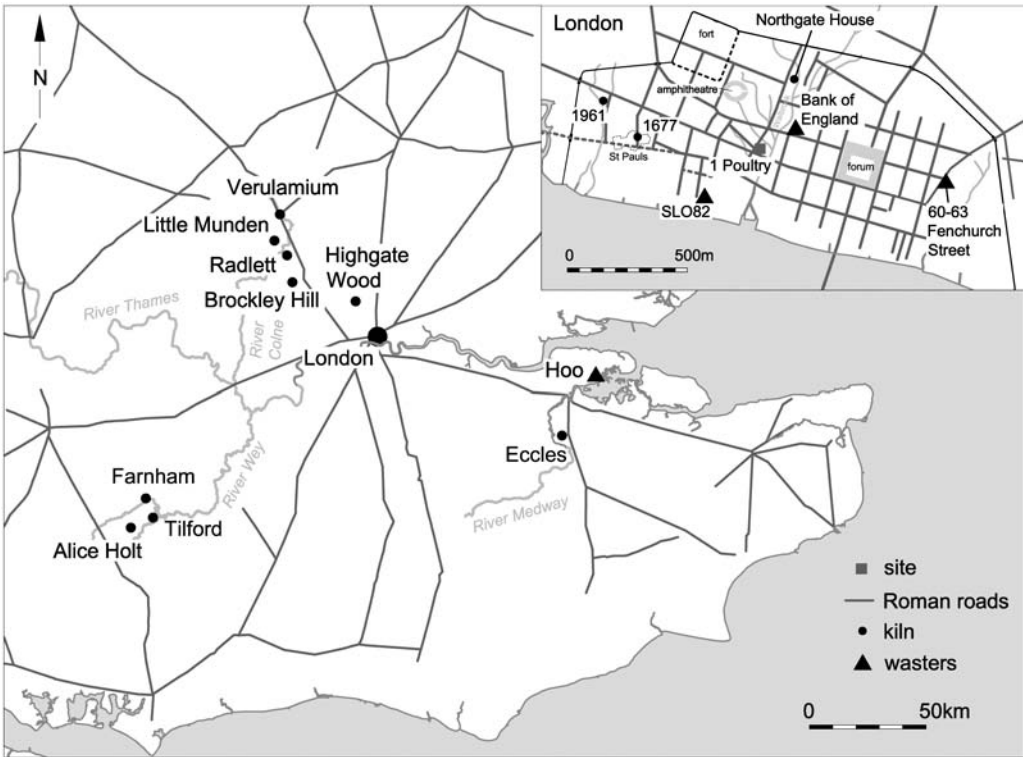

Fig. 16.1: Location of key sites.

The late Iron Age context of pottery production in south-eastern Britain

Any attempt to explore and understand the origins of these early Roman pottery industries must take into consideration the nature of pre-Roman late Iron Age pottery in the years running up to and including the Roman conquest. The picture varies from region to region in detail but there was a broad development from hand-made jars and bowls, in fabrics relatively coarsely tempered with a range of inclusion such as shell, organics, flint, grog, and sand, which have their origins in the middle Iron Age, to the introduction of wheel-made pottery sometime from 150 BC, and the appearance of 'Belgic' or 'Aylesford-Swarling' type vessels in parts of Hertfordshire, Essex, Kent and West Sussex. These two traditions, however, were not exclusive and hand-made vessels in the 'native' tradition continued in use alongside the Belgic-style wheel-made ones. Hand-made forms are mainly simple with bead-rimmed, plain-rimmed, and S-shaped vessels and with a limited range of diameter-to-height ratios achieved by the hand-building method (Tyers 1996b, 56; Hill 2002, 143–5).

'Belgic' style pottery is present in much of our region from the 1st century BC. It is usually grog-tempered and often well-made in curving forms with cordons and

carinations and a greater range of vessel height-to-diameter ratio achieved through the use of the wheel. Clearly contact with north-east Gaul, including the importation of pottery vessels and possibly potters themselves bringing the new technology, was a major influence in the cultural changes evident in these areas. These developments introduced completely new forms into the Iron Age repertoire with the appearance for the first time of functionally specific tablewares such as cups, flagons, platters, and beakers.

Against this broad backdrop, in considering Roman London, we must recall that there is no evidence for significant pre-Roman settlement in the central core and the site of Roman London at the time of foundation is still largely thought to have been unoccupied. Certainly there is no evidence for a significant pre-Roman late Iron Age presence north of the river, although there are increasing hints of small-scale settlement south of the Thames, particularly on the Bermondsey eyot, that probably pre-date the Roman conquest (Rayner 2009, 38–40; Rayner 2002, 16–18). Dating these groups with finer resolution is problematic due to the paucity of stratified assemblages but the presence of substantial sherds, vessel fragments, and other domestic objects, such as a triangular clay weight, hints at some sort of settlement in the vicinity.

The material from the Bermondsey eyot forms part of a growing collection of vessels, from both central London areas and more widely from across Greater London, with traits and characteristics of pre-Roman late Iron Age ceramic traditions, whether of a pre- or post-conquest date. A handful of early pre-AD 50 pottery assemblages from the wider London region have been summarised by Paul Tyers (1996a). These groups from Brentford, Highgate Wood and Park Street, Southwark all feature simple bead-rimmed jars in vesicular/organic or shell-tempered fabrics alongside finer, thin-walled, grog-tempered Belgic-style vessels. Aside from the Highgate group, the source of the pottery in these early groups is not known and we have no direct evidence for the technology used in their manufacture, beyond what can be surmised from the pots themselves.

Whilst there has been increasing interest in such material, as part of a broader growing interest in London's pre-Roman story, and consequently improved identification and publication, the small and often isolated nature of assemblages means it is still difficult to ascertain what is typical for the London region. Not surprisingly, the individual vessels and assemblages recovered display ceramic traits of several adjacent regions, reflecting the location of London at the boundaries of several Iron Age tribal areas, with material being drawn from a variety of neighbouring regions including Hertfordshire, Essex, East Sussex and Kent (Tyers 1996a; Rayner 2002, 16–18; Rayner 2009, 38–40).

If we turn to the evidence for production specifically, aside from the pottery vessels themselves, what do we have in our region for pre-Roman production? In fact, the evidence for the making and firing of pottery in Britain before the Roman conquest is scarce, presumably mainly due to the ephemeral nature of the firing

process either in surface bonfires or shallow pit-clamps (Swan 1984, 53) and even where sites of repeated burning are identified it can be difficult to associate these directly or exclusively with pottery firing.

Vivien Swan's book, *The pottery kilns of Roman Britain*, although first published in 1984, is still the most comprehensive survey of production sites and kilns to have been produced, although is obviously now out of date in terms of find spots. In this, Swan states that 'Exactly when the most rudimentary kiln technology became established in Britain is not yet certain. Out of a small group of possibly pre-Roman kilns, the number definitely so is minimal. In most instances it is impossible to determine whether pre- or immediately post-conquest dating is appropriate' (1984, 56).

This small group of possible pre-Roman kilns are simple updraught surface or semi-sunken kilns of pre- and post-Conquest date, such as the examples from Mucking in Essex, Upchurch Marshes in Kent and further afield in the Nene Valley and Derbyshire, amongst others (Swan 1984, 55), but none are known from closer to London.

Roman London and its pottery supply

The chronology and character of the foundation of Roman London has long been a subject of much study and debate, but has recently received renewed attention due to the discoveries at, and subsequent publication of, large-scale excavations in the City and south of the Thames in Southwark. These have prompted the development of new interpretations – based on both published and unpublished evidence – which present alternative models for the nature and character of Roman London's origins and particularly the presence or otherwise of a military installation (Bird 2002, 259–60; Perring 2011; Perring 2015; Wallace 2013). Current evidence suggests Roman London was founded a few years earlier than the previously accepted date of AD 50, with the recovery at 1 Poultry of a timber, with a tree-ring date of winter AD 47/48, from a cross-drain associated with the construction of the main western approach road (Hill and Rowsome 2011, 256–60; Perring 2011, 250–3).

It is clear from the earliest pottery assemblages associated with the creation of Roman London's infrastructure that romanised vessels are in use in the settlement from the outset. In this earliest period, the pottery was drawn from a large number of sources (Fig. 16.1). Imported vessels form a significant component of these assemblages, particularly fine drinking and table wares, composed of Neronian samian ware and a selection of other continental fine wares (Davies *et al.* 1994, 166–7; Pitts 2014, 143). The more utilitarian components such as jars and bowls are most commonly Romano-British produced wares, many of unknown source but including vessels from Highgate Wood (Middlesex), Alice Holt (Surrey) and north Kent (Davies *et al.* 1994, 168). Oxidised wares in the romanised forms of flagons and mortaria are also sourced from Kent (including production at Eccles and Hoo Island), with products from the Verulamium region appearing by *c.* AD 55,

but apparently absent from the very earliest levels (Davies *et al.* 1994, 168). The industries at north Kent, Alice Holt, Highgate Wood and the Verulamium region remain major suppliers until the mid-2nd century, when patterns of production and supply undergo significant changes.

Roman pottery industries

The basic requirements for pottery production are the availability of suitable clay, tempering material, water and fuel (Swan 1984, 3) and to make mass production worthwhile, the existence of potential local markets and a means of transportation are also important. Clearly the establishment of *Londinium* would have been a market of significant potential, with a number of pottery industries being established within reach of the city and where the required raw material could also be exploited.

A number of pottery industries were located close to London and became important suppliers in the 1st and 2nd centuries. Two of them, Highgate Wood and the Verulamium region, are discussed further below. The third industry was located at Alice Holt Forest and the surrounding area along the Surrey-Hampshire border and around Farnham and Tilford, just inside the county of Surrey (Lyne and Jefferies 1979), a series of workshops collectively referred to as the Alice Holt/Farnham industry.

Alice Holt/Farnham

Located on the Gault clay, the potters made use of this clay resource to produce a range of reduced grey-ware vessels, predominately jars, dishes and bowls but also flagons, beakers and lids, with production dating from around, or before, the Roman conquest through to at least the first quarter of the 4th century (Lyne and Jefferies 1979; Lyne 2012). Pottery assemblages from the recent excavations at Silchester do indicate a pre-conquest origin for the Alice Holt potteries, with butt-beaker copies, platters, bead-rimmed jars and necked bowls amongst the early products. The vessels were manufactured in a black, more granular fabric than the grey wares that became the standard of this industry post-conquest (Timby 2013, 161). The early grey-ware products are abundant in mid-1st and mid-2nd century London assemblages (for examples see Fig. 16.2), which along with Highgate Wood vessels (see below) dominate the supply of jars and bowls, peaking in the Trajanic period (Davies *et al.* 1994, 97).

Unfortunately, no well-preserved 1st- or 2nd-century kilns have been discovered, but vessels of this date have been identified in waster dumps across the Alice Holt complex (*ibid*., 17), and of course identified in consumption assemblages across Surrey, Hampshire and in London (Davies *et al*. 1994, 97–9). Excavations at Alice Holt waster dump AH.5 in 1974 did encounter some fragments of kilns of late 1st-century date, although only a small area was seen and the layering of kiln structures is difficult to untangle (Lyne 2012, 133). Two kilns include a circular pit and the use of clay blocks, but the number of flues and their location is not clear.

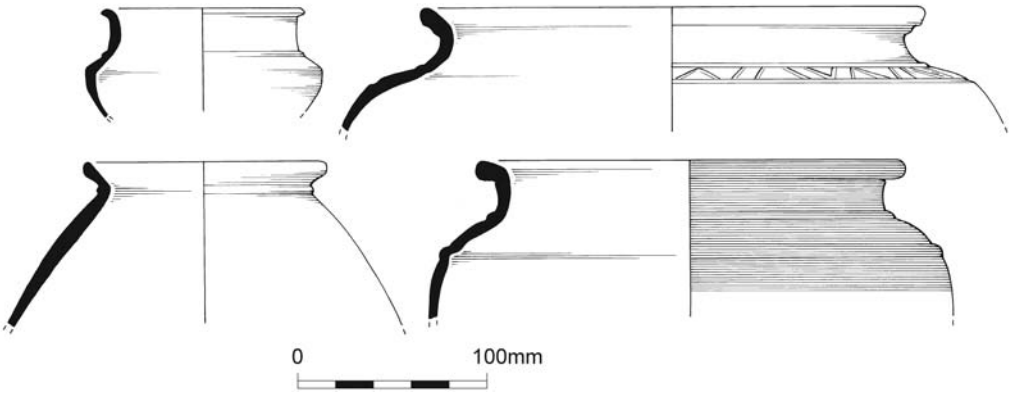

Fig. 16.2: Selection of early Alice Holt/Surrey vessels found in London (©Museum of London Archaeology).

The later industry is associated with distinctive double-flue updraught kilns which appear to come into use from the late 2nd/early 3rd century and well-preserved examples are published from Farnham (Falkner 1907), Tilford (Clark 1950) and more recently, along the A325 at Alice Holt Forest (Birbeck *et al.* 2008), and at Groom's Farm (Cooke and Powell 2014), and Osborne Farm, Kingsley (Anelay and Timby 2014).

Highgate Wood

Located in Highgate Wood, some 10km (5–6 miles) north-west of the Roman city, ten kilns and associated features were excavated in the late 1960s and early 1970s following the initial discovery in 1962. Highgate Wood forms part of the ancient Middlesex Forest and the underlying geology comprises London Clay with pockets of sand and gravel. The site lies within an area bounded on the west by Watling Street and on the east by Ermine Street (Brown and Sheldon 1969, 39). The final publication report on this important kiln site has now been completed and readers are directed to both the published report and digital archive (Brown and Sheldon forthcoming). Consequently, only a summary of the kiln site and its products is presented here.

As revealed through several seasons of excavation, the area included ten kilns along with waster heaps, a series of ditches for water management and pits relating to the preparation of clay, and evidence for four very slight wooden structures, not all of which were in use at the same time as the site was in episodic use from the mid-1st to mid-2nd centuries AD and clearly developed over a series of phases of use (Fig. 16.3; Brown and Sheldon 1974; Brown and Sheldon forthcoming). Over two tons of pottery was recovered during the excavation (Brown and Sheldon 1969, 43). The clay was presumably sourced locally to the site, although no pits large enough to suggest extraction have been revealed in the area excavated to date.

The kilns and associated assemblages excavated at Highgate represent an important industry that supplied reduced wares to London from the mid-1st to mid-2nd

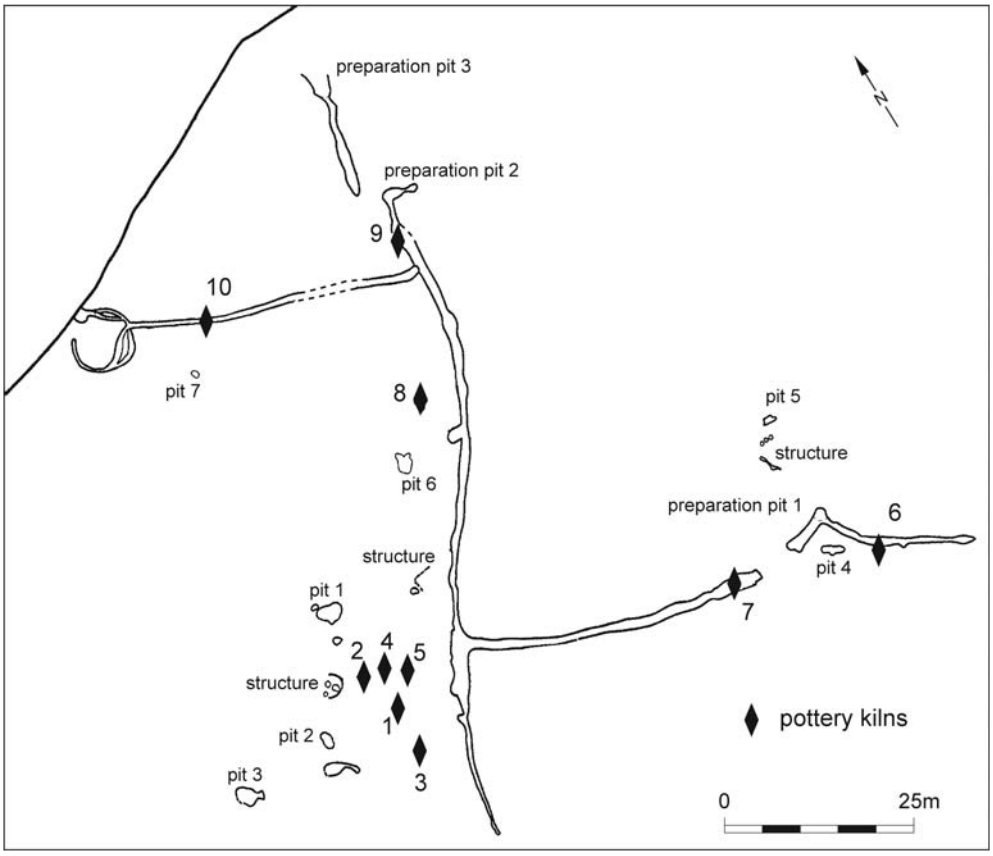

Fig. 16.3: Plan of excavations at Highgate Wood.

centuries AD. Over this period, the transition from predominately hand-made native and Belgic-style vessels to highly romanised wheel-thrown wares can be seen, with an early coarse vesicular ware (known as HWA) and grog-tempered fabric (HWB) used for native and 'Belgic' style jars, beakers and bowls from *c.* AD 50/55 (Tyers forthcoming, phase 1) progressing into romanised sand-tempered grey wares (HWB/C, HWC), which were produced from AD 70 through to the mid-2nd century (Fig. 16.4: Tyers forthcoming, phases 3 and 4).

Grog-tempered wares (HWB), predominately in jar and hooked-rimmed bowl forms (Tyers forthcoming, phase 2; Brown and Sheldon 1974, 227), were found associated with oval and twin-flued kilns set into the ditches towards the top of the hill, to the south of the site (*ibid.,* fig. 1: kilns 6 and 7, 10).

These earliest assemblages demonstrate continuity with essentially pre-Roman traditions of manufacture and style into the post-conquest period (Davies *et al.* 1994, 74) and these early potters are suggested to be native craftsman set up to supply the markets in pre-Boudican London with predominately utilitarian cooking

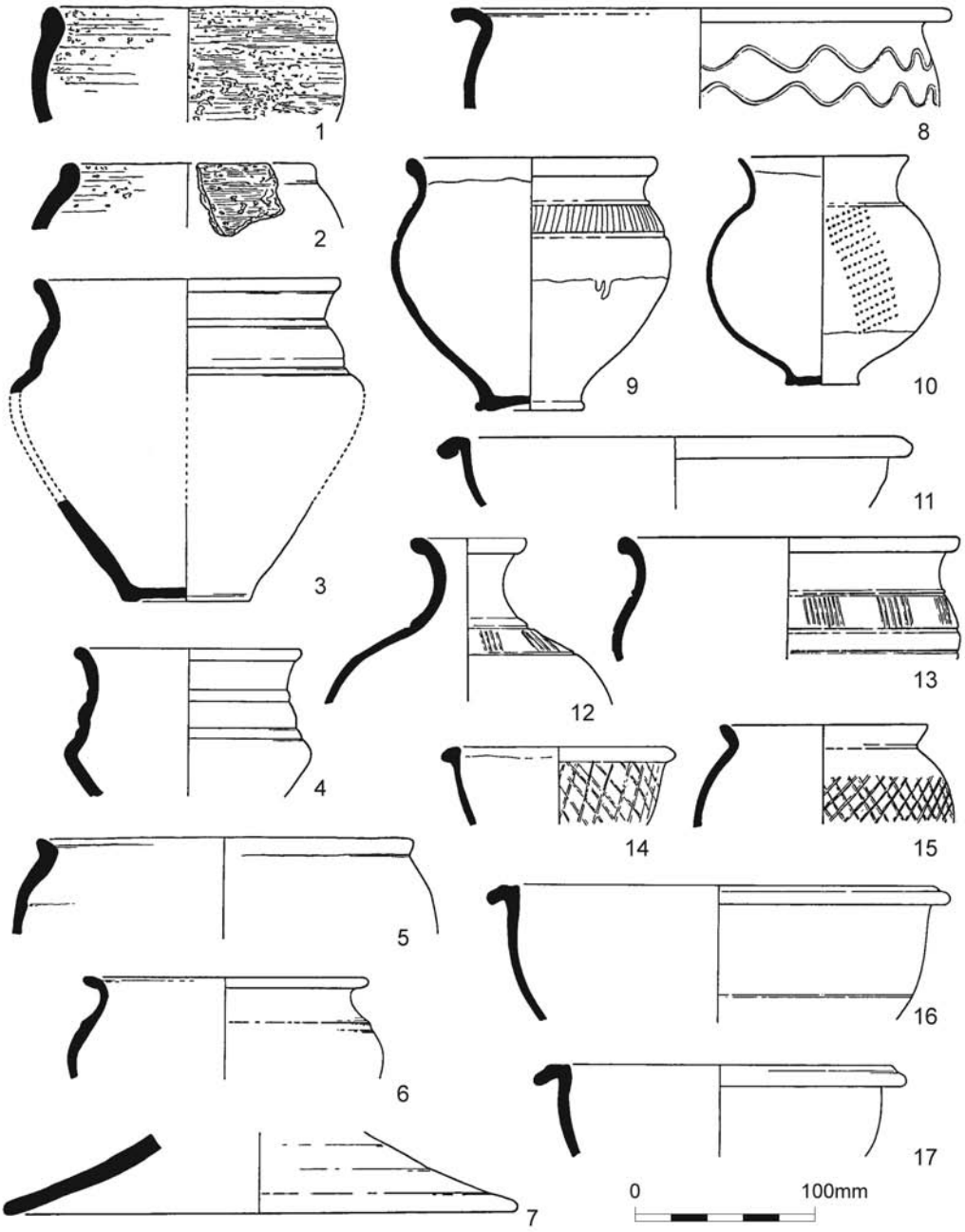

Fig. 16.4: Selection of vessels produced at Highgate Wood (HWA: 1–4; HWB 5–8; HWC 9–17). (Drawn by P. A. Tyers).

and storage vessels (Brown and Sheldon 1974, 224).

The later grey sandy wares, which are wheel-made and more romanised in form, coincide with a development in kiln technology, with a number of updraught chambered kilns uncovered, which are dated *c.* AD 100–140 (for example kiln 5, Fig. 16.5). These later kilns share a number of characteristics, although they also exhibit variation in detail: the kilns were built on or slightly cut into the clay subsoil, the furnaces and pedestals were constructed of baked clay, some of which have evidence for pre-fabricated clay wall segments (although method of floor support varies), the furnaces were all circular or roughly oval, flues were all orientated south-west (Brown and Sheldon 1969, 40–3).

Fig. 16.5: Highgate Wood kiln 5 (photograph: Bernard Brandham).

The vessels associated with these later kilns were predominately jars, bowls and lids, but also with fine beakers and flasks in the repertoire. The overall importance of this industry can be seen in the quantification of data presented in the early Roman corpus (Davies *et al.* 1994, 74) where fabrics from Highgate Wood account for 33 per cent (by weight) of all reduced wares in the pre-Boudican ceramic phase and 45 per cent of all reduced wares in the post-Boudican late Neronian/early Flavian period, declining to around 24 per cent by the mid-2nd century.

The interim reports suggested, and this is supported by the more recent analysis carried out for the final report, that the kilns were worked by itinerant potters – and not necessarily visited every year – due to the absence of permanent associated settlement and the relatively small scale of production, but yet with vessels found covering a period of some 100 years. Given the large contribution this industry appears to have made to London's pottery supply, it has been suggested that further kilns and workshops of Highgate Wood type might be found in the area, with potters visiting a number of sites for a season or two before moving on, the sites forming a dispersed but related area of pottery production (Orton 2002, 19–20).

Fuel in the form of charcoal is evidenced in the kilns including examples of oak, hornbeam, and hawthorn which are still the major woodland species on the site today. The potters at Highgate are likely to have made use of a variety of fuel resources from the woodland including coppiced wood and cordwood and it is suggested that

they were part of an efficient system of woodland management in the hinterland of *Londinium* (Brown and Sheldon forthcoming).

The Verulamium Region industry

A second industry of significance to Roman London comprised a series of workshops and kilns located on Watling Street between Brockley Hill and Verulamium with centres at Brockley Hill, Radlett, Verulam Hill Field and Bricket Wood – these are collectively known as the Verulamium Region industry. Most of these kilns are dated to the 1st–2nd centuries, and they produced a highly standardised series of vessels, dominated by flagons and mortaria, suggesting they form a unified industry. The kilns at Brockley Hill are the closest to London, located some 12 miles north of the City, with St Albans eight miles further to the north along Watling Street. Brockley Hill has also produced material relating to the earliest phase of this industry, of Claudian or early Neronian date (Tyers 1998, 292). A kiln and associated debris of the mortaria potter Oastrius at Bricket Wood is also dated to *c.* AD 55–70 (Saunders and Havercroft 1977). The predominately oxidised products of this industry were manufactured exploiting outcrops of light-firing clays of the Reading Beds (Vince and Tomber 2005, 175).

The fieldwork that uncovered the majority of evidence related to this industry largely took place in the late 1930s–mid-1950s and late 1960s and mid-1970s and has been published in a series of articles in local and county journals (Marsh and Tyers 1979, 534–5 provides a comprehensive gazetteer and bibliography of the known kilns). The kilns of Brockley Hill have been the most extensively excavated. Much of this was carried out in the 1970s but a developer-funded excavation in 2000 located another kiln and quantity of pottery (Smith *et al.* 2008). At Brockley Hill the earliest kiln-associated material, from a pit, was dated to the AD 50s by association with samian and coins (Castle 1973; Tyers 1998). The earliest dated kiln from this industry is at Little Munden, dated to AD 55–75 (Saunders and Havercroft 1977); although it is suggested that the Brockley Hill group is slightly earlier with production commencing around AD 50 (Bird 2005, 22).

As Bird has already suggested, the location of Brockley Hill and the other kilns of the Verulamium region, at around the same time as the foundation of London and construction of Watling Street, implies a close relationship between the two, with the industry supplying highly romanised forms to the new city and making use of the new road system in order to transport substantial numbers of vessels to this market (Bird 2005, 23).

The importance of the supply of the wares from the Verulamium Region industry to early Roman London cannot be overstated, although in recent years the picture has become more complex (see below). Whilst evidence from pre-Boudican levels in London has long suggested that the Verulamium white wares were common by *c.* AD 55/60 (Davies *et al.* 1994, 168), small quantities of vessels were in circulation earlier than this, as evidenced, for example, by sherds from 1 Poultry in assemblages associated with the construction of the early road system (Rayner 2011, 272), where

associated dumping is dated by dendrochronology to the years AD 53–5 (Hill and Rowsome 2011, 263–72).

In general, for the pre-Boudican period (Davies *et al.* 1994, 167–8: Roman Ceramic Phase 1A) Verulamium Region wares account for 22 per cent of all oxidised wares; by the late Neronian – early Flavian period (Davies *et al.* 1994, 186: Roman Ceramic Phase 1B) this has risen to 72 per cent of all oxidised wares and correspondingly most other early oxidised wares have declined. By the Flavian period (Davies *et al.* 1994, 192–5: Roman Ceramic Phase 2), the ware accounts for over 75 per cent of all oxidised wares – a picture of dominance unmatched by any of the other ware types present in London in this early period – and is maintained through the Trajanic period (Davies *et al.* 1994, 203: Roman Ceramic Phase 3). Following the discovery in 1999 and 2000 of kilns producing Verulamium Region white ware type vessels (amongst other wares) at Northgate House, Moorgate in the City of London, from *c.* AD 110, the question of supply from the Verulamium Region industry in the early–mid-2nd century has become more complex (see below for further discussion).

The kilns of the Verulamium Region industry

Much of the industry is defined by large collections of wasters, kiln debris and pits with potters' clay, although often without kiln structures directly associated. The earliest recorded kiln is at Little Munden Farm, Bricket Wood, with a shallow-set rectangular chamber with rectangular tongues and side piers all of tiles and all bonded with clay. The flue was walled and possibly corbelled with tiles – a common feature of the kilns of the Verulamium Region industry (Swan 1984, 98). Although it is not certain whether the tiles were made alongside pottery or at separate tile factories, there is clearly a close relationship between the two.

In general, despite reasonable amounts of fieldwork, we still have a poor understanding of the associated kilns used by the Verulamium Region industry. Much of the fieldwork was carried out under rescue or salvage conditions so only small areas were seen; at Brockley Hill it appears kilns were demolished, possibly because many were very shallow as seen at Bricket Wood. As more or less surface kilns, these have to be levelled in order for re-building or re-use of the site, rather than simply backfilled (Swan 1984, 98). So although at Brockley Hill some 14 kilns have been identified, now located within a scheduled monument zone, detailed understanding of the structures is lacking. Where sufficient of the kiln structures has survived, the main type in the 1st–early 2nd centuries was oval or circular with a narrow tongue support and solid-clay vented floor, although it is these latter elements that survive more rarely.

In 2000, Oxford Archaeology undertook a planning-led excavation at Brockley Hill House which revealed a further kiln, although this was also heavily truncated by later features, two large pits presumed to be for clay extraction, and Verulamium-type pottery which accounted for 88 per cent by sherd count of the 10,200 sherds recovered (Smith *et al.* 2008). No actual wasters were present although much of the

pottery had a patchy surface finish, possibly due to poor control of kiln temperatures, and other sherds were poorly finished and overfired. Their discard, though imperfect or 'seconds' but still usable vessels, suggests a high level of quality control being carried out (Brown 2008, 90).

Charcoal analysis from this excavation has shed some light on our understanding of the use of fuel, at least at this Brockley Hill kiln. Samples within the kiln were mainly oak heartwood with some willow, maple, alder, hazel, hawthorn, blackthorn and ash roundwood. Oak was present consistently across samples, using fairly wide roundwood, which suggests slow-growing trees of considerable age. The other species may have been associated with the kiln superstructure collapse (Gale 2008, 104–6). The presence of oak wood is perhaps not surprising given the location of the kilns on the wooded London Clay (Bird 1996, 226) but the presence of logs or billets of mature oak wood obtained from slow-growing trees is a useful addition to the data on kiln fuel (Gale 2008, 107).

The Verulamium Region industry specialised in oxidised flagons and mortaria but also produced bowls, jars and amphorae – highly romanised forms, which given the early date of inception are most likely to have been manufactured by immigrant potters (Swan 1984, 97–8; see Tyers 1998 for discussion of the origins of the early potters). It is suggested that the industry was established to supply pottery to the growing market for 'continental-types' and possibly even to fulfil military contracts particularly for vessels such as mortaria, for which there was no precedent in the pre-Roman period and which native potters would be completely unaccustomed to producing.

The mortaria in particular achieved a nationwide distribution and in the northern military zone in the 1st century the bulk of mortaria came from this industry. The steady military demand was clearly part of the underlying success of these potteries which was maintained until into the early 2nd century when apparent movement of potters from Brockley Hill to Hartshill/Mancetter signalled the loss of the northern mortaria markets. Other potters left to work in the Oxfordshire region (Hartley 2005, 114) and the mortaria stamp evidence from Northgate House suggests that the movement of potters to London is also possible, which given the other evidence of links between the two industries seems likely (*ibid.*, 96–102). The latest kilns of the Verulamium Region industry are structurally different and located immediately south of Verulamium itself, further indication of an industry undergoing change, with the potteries apparently moving closer to their local markets (Swan 1984, 98).

Evidence from the city of London

Evidence for pottery production within the urban centre was relatively piecemeal and inconclusive until more recent excavations discovered the presence of kilns in the Walbrook Valley and provided a focus for an industry previously represented only by pottery wasters and vessels. It seems likely that both in the Walbrook valley

and to the west between Newgate Street and St Paul's, significant other evidence – of which only glimpses have been seen – has been lost through truncation by later developments or destroyed unrecorded.

Around St Paul's

The earliest record of evidence for production within the Roman city dates from 1677, when four kilns were uncovered during rebuilding of St Paul's Cathedral (various publications cite the date of 1672 for this discovery; the publication *St Paul's Cathedral before Wren* (Schofield 2011) presents the most recent and comprehensive consideration of this evidence, with John Schofield concluding that a date of 1677 is most likely (*ibid.,* 34)). From the surviving notes and sketches, the kilns appear to be of the updraught type with a vented floor, arranged around a single central stokehole, which is an unusual construction, although the records are limited and difficult to interpret. A drawing of pottery vessels does survive and these have previously been linked to the kiln, but were re-assessed by Robin Symonds and thought more likely to relate to other excavations (Schofield 2011, 35; *contra* Marsden 1969). Full analysis of the Northgate House, Moorgate production site (see below) has demonstrated that items such as the unguentaria/amphora stoppers and lamps shown amongst the pottery drawings and suggested by Symonds 'most likely to have been imported from sources outside Britain' are part of the repertoire of vessels being produced in the Walbrook valley and therefore do not necessarily need to be excluded as possible kiln products. The 'poppy-head' beakers can now also be paralleled in the Moorgate assemblage and do not necessarily have to be Highgate Wood products as suggested (Schofield 2011, 35), and the flagons, mortaria and plain jars are typical forms in the Moorgate assemblage. In the absence of the vessels themselves, attribution based on drawings is always going to be problematic but it may be that the pottery portrayed is more likely to be kiln products than the 2011 publication suggests.

In 1961, a further kiln was found just to the north of St Paul's during the Paternoster Development Scheme, which was also an updraught type with a central pedestal and solid floor of clay bricks, with vent holes positioned around the edge rather than evenly across the floor. Pottery found with the clay dated to late 1st to early 2nd century (Marsden 1969, 42–4). As well as the St Paul's area, evidence for production in the Walbrook valley was found during the rebuilding of the Bank of England between 1926 and 1934, in the form of large quantities of London ware, and then in 1936 wasters were found at 1–4 Copthall Close/20–28 Moorgate, including coarse reduced ware, mica-dusted ware and London ware (see Marsh and Tyers 1976 for full summary).

Sugar Loaf Court ware

In 1982, further pottery production debris was discovered. Sugar Loaf Court ware (SLOW), named after the site on which the wasters and kiln debris were found, is a distinctive pre-Boudican pottery type (Davies *et al.* 1994, 29–34). The presence of wasters and kiln debris indicated local manufacture, although kiln structures were

absent and it is not clear whether the material was actually manufactured at that location or simply dumped from a production site in the vicinity. The presence of associated burnt debris including fired clay suggests that whichever scenario, the material has not travelled far from the point of manufacture. The pottery is manufactured in the local London Clay and in firing colours range from deep red and orange occasionally through to a reduced dark grey.

The range of forms, including collar-rimmed flagons, shouldered jars, beakers, carinated bowls, hemi-spherical cups, mortaria and lids, places the vessels firmly within a continental tradition and probably involved migrant potters (Fig. 16.6). In Britain these forms are closely associated with military sites such as Wroxeter and Usk, but evidence for a direct military association to SLOW is still under debate and there are many aspects of the SLOW production that are still poorly understood.

Whatever its origin, SLOW has long-been recognised as an important pre-Boudican ware (Chadburn and Tyers 1984; Davies *et al.* 1994, 29). Significant quantities were recovered in the early phases at 1 Poultry and adjacent sites, including, importantly, vessels dumped into low timber revetments (specifically Structure 4) constructed in AD 53 to stabilise the main east–west road (Hill and Rowsome 2011, 264–5; Rayner 2011, 268). In the pre-Boudican Roman ceramic phase (RCP1A) it accounts for almost half of all oxidised wares, although it was acknowledged that this is inflated by the inclusion of the Sugar Loaf Court site data and that the distribution is variable (Davies *et al.* 1994, 168). As more recent analysis has demonstrated, this pattern of variability remains despite the increasing ceramic dataset excavated from across the City, and whilst it occurs in small quantities at most sites with Neronian activities, it seems (to date) to only account for larger proportions at sites associated with the nucleus of the early settlement east of the Walbrook at 5–12 Fenchurch Street (FEN83) and 168 Fenchurch Street (FEH95; Dunwoodie 2004) (see Rayner 2011, 268; Richardson 2004, 38–9) and to a lesser and probably related extent, those along the main east–west road (such as 1 Poultry and 72–75 Cheapside).

Oxidised wares at 60–63 Fenchurch Street

Excavation in 2001 at 60–63 Fenchurch Street, on the eastern slope of Cornhill, produced a significant group of oxidised wasters associated with pre-Boudican and post-Boudican levels including two hearths or clamp kilns (Birbeck and Schuster 2009). The successive hearth/kiln features were both truncated but the larger was sub-rectangular in plan, 1.00m long, 0.80m wide and 0.15m deep with steep sides and a flat base (*ibid*., 14–15). Other details are scant, but the features had clearly undergone high-temperature heating as demonstrated by the deep red colour of the fired clay around the edges (*ibid*., 14, fig. 8).

The pottery was recovered from a range of contexts but formed a homogenous group including overfired, warped, and cracked waster sherds, as well as underfired examples, indicative of pottery production in the immediate vicinity, perhaps related to the kiln/hearth features. The fabric is broadly comparable with the London/Local

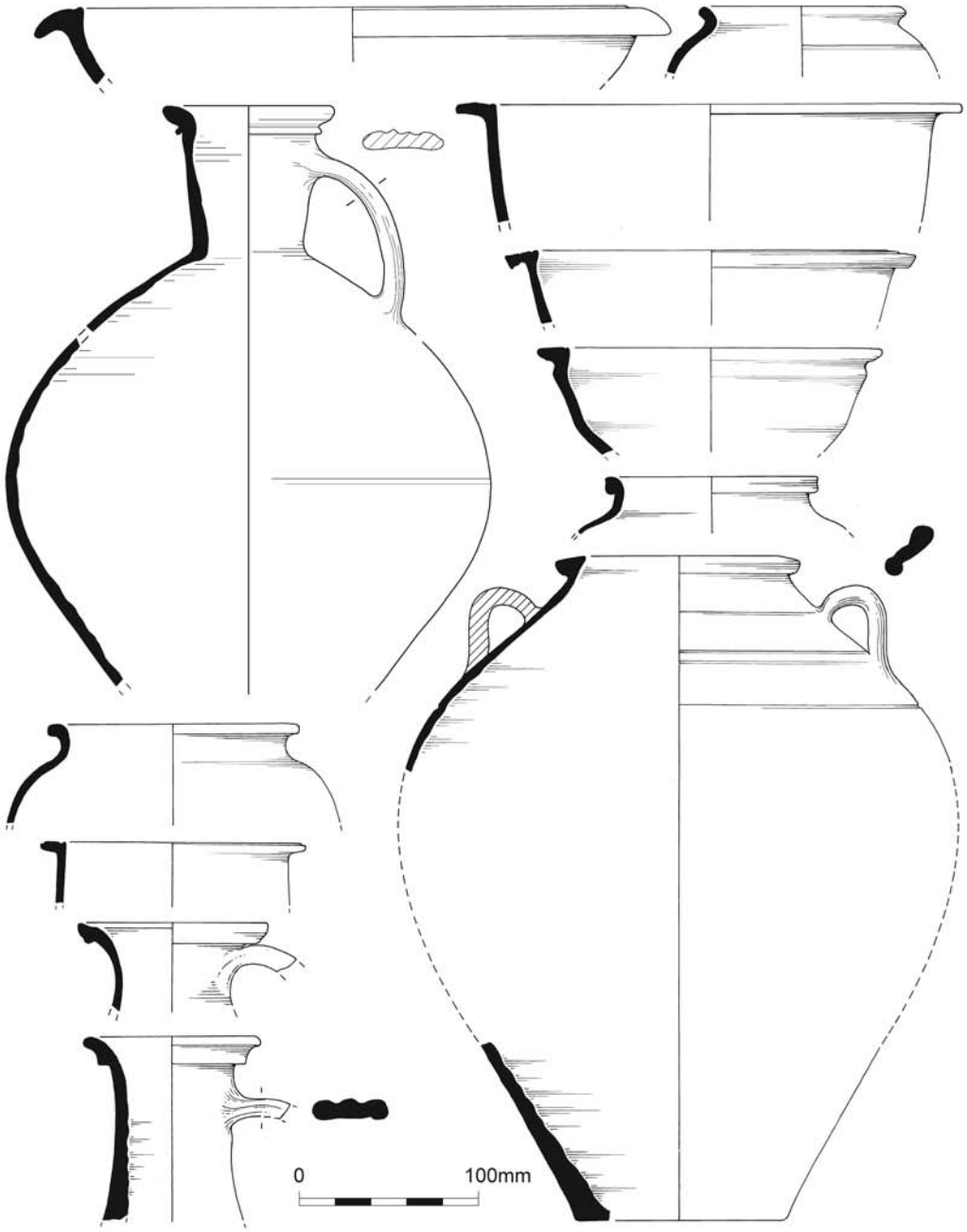

Fig. 16.6: Selection of vessels in Sugar Loaf Court ware (©Museum of London Archaeology).

Oxidised fabric (Davies *et al.* 1994, 34–6: LOXI) and also has similarities with SLOW, although it is not exactly the same as either. It is likely to have been manufactured in local London Clay although to date no petrological or chemical studies have been undertaken. Traces of white slip are common, which is a feature absent from the current SLOW and LOXI repertoire. The forms present in this new Fenchurch Street group are a highly intriguing collection of SLOW-like collared flagons, plus ring-necked and disc-mouth flagons which also find little comparison in the known SLOW or LOXI repertoires (Fig. 16.7; Seager Smith 2009a, 15; 2009b, 55). Such forms are present however at other early post-conquest production sites such as at Eccles, and Hoo Island, both in Kent. White-slipped oxidised flagons, including both collar-rimmed and early ring-necked types, were present in the early Structure 4 assemblage at 1 Poultry (Rayner 2011, 272, fig. 259) and although not exactly matched in the published examples may originate from this source.

The discovery of this waster group is intriguing, particularly given its similarities to the broadly contemporary Sugar Loaf Court ware (SLOW) and the slightly later London oxidised wares (LOXI). It remains to be seen whether examples will be positively identified amongst assemblages at other sites but the variety of production in the early post-conquest period is clearly more complex than previously thought.

Northgate House, Moorgate kilns

The earlier finds of pottery wasters at Copthall Close were thrown into sharp relief in 1999–2000 when during excavations at 20–28 Moorgate, two kilns and associated pits and production debris were uncovered. These excavations are published in detail (Seeley and Drummond-Murray 2005) and only a summary is provided here.

Dating to the early 2nd century two large circular kilns were identified which have dramatically altered understanding of pottery production and supply in this period. Some 24,338 sherds were recovered associated with this period of activity on the site, of which 20,614 were deemed to be products related to the kilns (*ibid.*, 162).

Alongside local oxidised wares, local grey wares, (Copthall Close grey ware), reduced London ware, and other mica-dusted, marbled and eggshell finewares, which had for some time been suggested as local London products, the major discovery was the presence of pottery wasters and vessels which to all intent and appearance were identical to Verulamium Region products including the distinctive white wares, as well as a range of similar Verulamium-type forms but in a mixed clay (*ibid.*, 84).

A detailed programme of petrological and chemical analysis was carried out with samples from both Northgate House kilns and Brockley Hill, which suggested that the whitewares were produced in clay exploited from the same Reading Beds as Brockley Hill and that, where used without further treatment or mixing, it was not possible to distinguish London samples from those from Brockley Hill. The red wares were produced in London Clay with characteristics of clay sourced in the London area and

Fig. 16.7: Selection of vessels from 60–63 Fenchurch Street (©Wessex Archaeology).

similar to the red-firing clay used at Brockley Hill to make red-bodied white-slipped wares (Vince and Tomber 2005).

The reduced wares were also manufactured using the secondary London Clay. Given that the Walbrook stream cuts the gravel terrace and clay, London Clay would have

been available for extraction in the area. Water would also have been provided by the Walbrook stream, and wells were also identified on the site (Seeley and Drummond-Murray 2005, 137).

At least two circular kilns were excavated at Northgate House and related to the first phase of production (*c.* AD 110/20–40). Known as the 'blue kiln', one of them appeared to have been used for the firing of reduced grey wares – or at least in its last firing – and seems to be the earliest kiln uncovered. A circular pit formed the furnace chamber which was lined with clay and retained a central support, a low internal ledge and corbels on the side to support the oven floor. The central support was constructed of sun-dried bricks. The oven floor was pierced with circular vents, some of which appear to have been covered with lids in the last firing. No evidence of the superstructure was found (*ibid*., 15). The other circular or 'red kiln' also had a solid oven floor pierced by circular vents, but unusually the floor was supported by a single arch of prefabricated bricks resting on two pilasters attached to the kiln walls, with two additional arches from the back wall (*ibid*., 19–21).

Fuel is evidenced by the presence of charcoal in the kilns and waster groups, which from identification suggests oak was the main fuel source, with smaller quantities of hazel, hawthorn, maple and birch. From the evidence, mainly branches and the tops of medium to large trees were used, perhaps indicating cooperation and coordination between different crafts and industries who might have been exploiting the same resource (*ibid*., 138).

The discovery of this workshop, and the results of the characterisation studies suggesting that the light-firing clays of the Reading Beds were being imported from Brockley Hill to London for the production, raised important questions about the relationship between the two production sites (*ibid.,* 142–4). Aside from the clay and shared vessel repertoire, some of the mortaria stamps found on vessels at Northgate are of potters also known to have worked at Brockley Hill, and in two cases also at Radlett. This may indicate some movement of potters from Brockley Hill to London, although the evidence is inconclusive (see Hartley 2005, 100–2).

There are also some notable differences between the Northgate kilns and structures identified at Brockley Hill. At Northgate there is no evidence for the use of tiles in the structures, although this is frequently the case in Verulamium Region kilns, and at Brockley Hill the kilns are surface-built or shallow-sunken, whilst the Northgate kilns are set constructed in pits.

So what to make of these findings? The movement of mortaria makers from the Verulamium Region to the Mancetter/Hartshill potteries in Warwickshire at the turn of the 2nd century has been established through the detailed study of the potters' stamps. The evidence from the Northgate kilns may suggest that, at a similar date, potters from the Verulamium region also moved and set up in the Walbrook valley, probably to be closer to the important and expanding market in Roman London.

Understanding the relationship between these two industries is ongoing and further compositional and technological assessment of samples from Brockley Hill

and Northgate has recently been undertaken as a postgraduate study (Amicone 2011; Amicone and Quinn 2015). A further 50 samples from Brockley Hill were analysed by thin section petrography and geochemistry (ED-XRF), as well as some raw material prospection, and compared to the thin sections and data from Northgate House. The study concluded that the Brockley Hill and Northgate House samples 'contain a similar range of petrographic and elemental variability and exhibit some very good petrographic and geochemical matches' and that macroscopically the pottery would be very difficult to distinguish (*ibid*., 16–17).

The increasing complexity of production evidence in London is exemplified by three vessels recently published from Cheapside in the City of London (Howell 2013, fig. 15, <P11>–<P13>). From a group dated *c.* AD 60–80 are three reed-rimmed bowls: one in the Sugar Loaf Court fabric and two in unsourced oxidised wares, with a finish comparable to Verulamium Region white wares but notably made using mixed clays (Howell 2013, 15). These vessels have not been identified as London oxidised wares (LOXI), and in this group would pre-date the established date of manufacture taking place at the Northgate kilns; but the practice of mixing other clays with London brickearth was established in examples within the Northgate assemblage (Seeley and Drummond-Murray 2005, 115; Vince and Tomber 2005, 175). It is possible that these two reed-rimmed bowls in the mixed clay hint at another early pre-Flavian workshop, perhaps an earlier incarnation of the workshops located at Northgate House or possibly interaction with the potters working at Brockley Hill, used to working with the Reading Beds clay. Until more vessels are uncovered, we can only speculate as to their significance and mode of production, but the recent discoveries, coupled with the Fenchurch Street oxidised ware wasters, suggest that a review of early oxidised wares and re-examination of pre-Flavian assemblages may prove fruitful.

Conclusions

We have seen that the evidence for pottery production, even in these few examples, is varied and complex and that even for important industries supplying London the archaeological evidence for the structures, workshops and associated features involved in the production of so many vessels, is often limited at best and in many cases patchy and inadequate.

It is also clear, that whilst resources such as clay and fuel were of fundamental importance and clearly the prime drivers for the location of kilns, other aspects such as the proximity to markets were also influential and may have encouraged the relocation of potters and even maybe workshops. Whilst the transportation of clay, as in the case of the Northgate House workshop, involved additional effort, it seems the desire to be close to the market was perhaps, at that point in time, enough to encourage relocation.

The Northgate House kilns and the Fenchurch Street oxidised waster groups demonstrate how new discoveries can significantly progress our understanding of

this complex pattern of production and supply. New discoveries are being made all the time, adding new information to the already massive ceramic dataset in existence for Roman London. This dataset, both digital and the physical archives of pottery, continues to reap reward when studied, reviewed and re-examined, enabling new interpretations to be proposed and challenged. There is great scope for much more research and the study of Roman pottery in London would benefit greatly.

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