

Pottery Production at Heybridge

By Edward Biddulph

Introduction

Pottery production at Heybridge is attested by the presence of four pottery kilns. The largest volume of pottery was recovered from the paired-kiln complex in the hinterland zone of Area W. Two kilns were uncovered in the southern zone: one in Area L and the other in Area N (ref. site narrative). The latter yielded the poorest evidence, consisting of undiagnostic spalled sherds. Here, consideration is given to the pottery recovered from the kilns, incorporating the identification and quantification of products, dating of kiln use, and an overview of pottery production at Heybridge and its regional setting.

Descriptions of the kiln product fabrics are based on the scheme outlined by Peacock (1977, 26-33). Munsell colour references are additionally employed. The pottery from Area W stoke-hole 1589 is fully quantified and published as a single group (KPG27), including non-kiln products, and presented in the Pottery Sequence section (ref).

From the 1972 excavations of Crescent Road, Heybridge, Wickenden identified an assemblage of some 4500 sherds as 'the discarded products from a nearby kiln' (1986, 46), dating their manufacture to the mid 3rd century. Upon examination of the evidence, the present author concluded that, since none of the pottery was spalled or overfired, but, rather, small and abraded, it could not be positively identified as the waste products from a nearby kiln. The evidence concerning mid 3rd century production must remain inconclusive. However, the fabric of much of this pottery was similar to that of Elms Farm products, particularly from Area N, suggesting, at least, an identical clay source and, therefore, local production.

Area W

Kiln 1223 yielded the smallest amount of pottery; 3500g. Kiln 1618 contained the most, totalling 27,740g. The shared stoke-hole, 1589, contained just under 12,000g. Buff ware mortaria and grey ware, including many spalled and overfired sherds that have been identified as locally-produced kiln products, formed the largest components of the three pottery assemblages. By weight, 69% of the total volume of grey ware was recovered from kiln 1618, as compared to 28% in the stoke-hole and a meagre 3% in kiln 1223. Buff ware mortaria were present in similar proportions: 65% was recovered from 1618, 24% from 1589, and 11% from 1223. Kiln 1618 thus produced the most extensive range of products and best dating evidence.

A somewhat limited range of forms was produced, predominantly jars, including ledge-rimmed types and high-shouldered varieties with undercut rims. Folded beakers and bead-rimmed dishes were also manufactured. Mortaria sherds, comprising hammerhead-rimmed and bead-and-flanged types, were built into the structure of the kiln 1618, perhaps inserted as repair or to aid firing. These, too, could originally have been fired in this kiln. In contrast to 1618, the paucity of vessels from kiln 1223 provides little clue as to what was fired in it.

The minimum vessel number was calculated for the kiln products in sandy grey ware and buff ware only, which were visually distinctive. Fine grey ware was invariably abraded and products in this fabric could not be separated easily from any non-kiln fine grey wares. An accurate count of certain fine grey ware kiln vessels, mainly B2 or B4 dishes, is likely to be higher than the six vessels actually counted.

Fabrics

Sandy grey ware (GRS)

This gritty fabric has dark grey brown surfaces (2.5Y 4/2), in which frequent small white and grey quartz grains, less than 1mm in size, and occasional flint pieces up to 5mm long, are visible. The core is darker grey (2.5Y 4/0). Frequent white, grey and black inclusions are well sorted, though larger angular clear quartz grains are also present. Totals are 488g from 1223, 10247g from 1618, and 4158g from 1589.

Forms: Dish B2/B4, jars G5.5 G25, beaker H35

Fine grey ware (GRF)

Surface and core colours are as for GRS; however, inclusions are generally finer and more frequent, and when seen microscopically, have appearance reminiscent of Hadham grey ware ([ref. fabrics](#)). No flint or quartz grains are visible on the surfaces. Examples are in poor condition and invariably abraded and powdery.

Forms: Dish B2/B4, beakers H21 H35

Buff ware mortaria (BUFM)

This fabric, which is soft and invariably powdery, varies from light green- or brown-grey (5Y 7/2, 10YR 7/2) to yellow-brown (10YR 7/6). Inclusions of fine sand, and occasional mica and iron-rich particles, pink clay pellets and flint; trituration grits of angular white, grey and black flint, 2-5mm in diameter, and sparse white quartz. Traces of a dark yellow-brown (10YR 4/6) slip are visible on the external and internal surfaces of some examples. Totals are 1611g from 1223, 10310g from 1618, and 3860g from 1589.

Forms: Mortaria D3 D11 D13

Forms

B Dishes

B2/B4

Bead-rimmed dishes with tapering sides and flat bases. Most examples were recovered from kiln 1618, and mainly comprised rim sherds that could not be positively identified either as the shallow B2 or the deep B4 type. Principally a fine grey ware product.

Illustrations

3234	1517	GRS	B2
3239	1533	GRF	B4

D Mortaria

D3

Mortaria with incurving, droopy flanges and high, delineated, beads. Examples vary in height of the bead, and diameter, ranging from 280 to 360mm. The form, with its rather upright flange, is akin to the D11 hammerhead-rimmed mortarium. It differs in this respect from D3 mortaria at Chelmsford, whose flanges are set more horizontally. No precise parallel, in fact, has been found at Chelmsford or Colchester. Never common, the type was nevertheless recovered in similar quantities from kiln 1618 and stoke-hole 1589. None was found in kiln 1223.

Illustrations

3266	1619	BUFM	D3
3220	1518	BUFM	D3 Profile only
3221	1518	BUFM	D3 Profile only
3265	1619	BUFM	D3
3230	1213	BUFM	D3 Profile only
3218	1027	BUFM	D3
3207	1002	BUFM	D3
3231	1512	BUFM	D3
3213	1211	BUFM	D3

D11

Hammerhead-rimmed mortaria. Examples display considerable variation in size and shape, but are generally characterised by upright rims with flat tops. Some have curving and hooked flanges, closely resembling Chelmsford form D11.1. The smaller D11.2 is also represented. Some examples have wider 'bevels' at the top of the rim, while others are particularly large and robust, with no curve to the flange. The form was undoubtedly more common than D3 mortaria; kiln 1618 and stoke-hole 1589 yielded the most number of examples, while 1223 yielded the least.

Illustrations

3233	1512	BUFM	D11 stamped
3267	1619	BUFM	D11
3228	1213	BUFM	D11
3219	1518	BUFM	D11
3259	1615	BUFM	D11 stamped
3229	1213	BUFM	D11
3206	1002	BUFM	D11
3240	1533	BUFM	D11 Profile only
3200	1029	BUFM	D11 Profile only
3202	1029	BUFM	D11
3205	1002	BUFM	D11
3215	1211	BUFM	D11 Profile only
3201	1029	BUFM	D11 Profile only
3257	1615	BUFM	D11
3258	1615	BUFM	D11
3255	1581	BUFM	D11 Profile only
3260	1615	BUFM	D11 Profile only
3261	1615	BUFM	D11 Profile only
3204	1164	BUFM	D11 Profile only
3238	1517	BUFM	D11 Profile only
3214	1211	BUFM	D11 Profile only
3262	1615	BUFM	D11
3263	1615	BUFM	D11
3264	1615	BUFM	D11
3254	1581	BUFM	D11
3232	1512	BUFM	D11

3253	1581	BUFM	D11
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D13

Wall-sided mortaria with small spout and grooves at the top and bottom of the flange. Just one example was recovered; from pit 1621 cut into the stoke-hole 1589. Its fabric is a little coarser than is usual for buff ware mortaria, either from these kilns or Colchester. However, it is deemed a local product on the basis of its affinities with an example recovered during the Crescent Road excavations. Both are hard and gritty, and off-white to grey in colour. The latter example was thought to be a non-Colchester product, probably dating to the early 3rd century AD (Wickenden 1986, 40; fig. 21.137).

Illustration

3268	1620	BUFM	D13
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G Jars

G5

Ledge-rimmed, high-shouldered and neckless jars resembling Chelmsford forms G5.5 and G5.6. The G5.5 was made in two sizes – large (diameter of 140-180mm) and small (diameter of *c.* 100mm). The large G5.5 is notable for its consistent design; the ledge rim is created by a thin groove, rather than a gentle cupping, characteristic of the G5.5 at Chelmsford. No lids were found in either the kilns or stoke-hole, and it seems unlikely that ceramic lids were made to fit the form. The G5 type was made at Mucking, South Essex (Rodwell 1973, 22), Grays (Rodwell 1983, 27), and Orsett (Rodwell 1974, 27).

Illustrations

3241	1534	GRS	G5.5
3223	1518	GRS	G5.5
3225	1518	GRS	G5
3243	1539	GRS	G5
3217	1211	GRS	G5
3208	1002	GRS	G5
3209	1002	GRS	G5
3270	1502	GRS	G5.6

G24

Oval bodied jars with everted, slightly undercut, rims. A thin cordon appears on the short neck. Examples from these kilns are few in number, but the form was otherwise common at Heybridge.

Illustration

3210	1002	GRS	G23/G24
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G25

Jars with undercut rims, short necks and grooved shoulders. The type produced at Elms Farm resembles *Cam* 268B, a very prolific form at Colchester (Bidwell and Croom 1999, 479), and corresponds closely with Chelmsford form G25.1. Its size varies; diameters range from 140 to 180mm.

Illustrations

3224	1518	GRS	G25.1
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3245	1539	GRS	G25.1
3244	1539	GRS	G25.1
3237	1517	GRS	G25.1

H Beakers

H21

Cornice-rimmed, bag-shaped beakers, with band of roller-stamped decoration on body. Its presence is restricted to a single example. This is abraded and burnt, but traces of an external slip survive. Roller-stamped bodysherds were present in numerous contexts, but could not be confidently identified as H21 beakers. This form was also produced at Ivy Chimneys, Witham (Turner-Walker and Wallace 1999, Fig.114.25)

Illustration

3248	1539	GRF	H21
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H35

Large folded beakers with short neck, bead rim, and roller-stamped decoration on body. Examples are burnt and abraded, and only tentatively identified as local products.

Illustrations

3203	1029	GRS	H35.2
3252	1576	GRS	H35.2

H

A single example of a small ledge-rimmed vessel with a short neck was recovered from the stoke-hole 1589. This was identified as a local product on the basis of fabric. The form is unparalleled, although clearly resembles ledge-rimmed jars. Diameter 92mm.

Illustrations

3226	1518	GRS	H
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J Flagons

Cam 370

Large double-handled flagon with heavily reeded rim. The single example present was set into the pedestal of kiln 1618. The rim of the flagon is warped, and its fabric identical to that of other grey ware products. The flagon may well be a waster product from a previous firing within this kiln, placed in the pedestal as repair. Alternatively, it might be from another and earlier, as yet undiscovered, kiln in the vicinity. The form is absent at Chelmsford, but present at Colchester, albeit poorly represented in a coarse oxidised ware only.

Illustration

3256	1615	GRS	Cam 370 flagon
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S Miscellaneous

S

Bodysherds from two examples of a curiously shaped vessel were recovered. The sherds are thick-walled, cylindrical and decorated with a band of rouletting. As no rim or base sherds were found, the form or function is impossible to discern. Its cylindrical shape and decoration suggest a beaker, although it is remarkably robust. It may have been placed in a kiln as a support or bar, but it is wheel-made and shows no signs of repeated firings. It may have functioned simply as a test-piece prior to the firing of a whole load. Its fabric, too, is typical of kiln products.

Illustration

3269	1576	GRS	S cylindrical rouletted body sherd
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Quantification

	Kiln 1223		Kiln 1618		Stoke-hole 1589		<i>Total</i>
	<i>EVE</i>	% <i>EVE</i>	<i>EVE</i>	% <i>EVE</i>	<i>EVE</i>	% <i>EVE</i>	
B2/B4	-	-	0.48	5	0.06	1	0.54
D11	0.64	84	2.70	26	1.40	33	4.74
D3	-	-	0.58	5	0.49	12	1.07
G24	-	-	0.14	1	-	-	0.14
G25	-	-	1.13	11	0.09	2	1.22
G5.5	-	-	3.48	33	1.49	35	4.97
G5.5 (miniature)	-	-	0.72	7	0.41	10	1.13
G5.6	-	-	-	-	0.11	3	0.11
H21	-	-	0.17	2	-	-	0.17
H35	0.12	16	0.17	2	-	-	0.29
H-new	-	-	-	-	0.17	4	0.17
Cam 370	-	-	1.00	9	-	-	1.00
<i>Total</i>	0.76		10.57		4.22		15.55

Table 00: Quantification of Area W kiln products by EVE

	Kiln 1223	Kiln 1618	Stoke-hole 1589	<i>Total</i>
Dishes	-	3	2	5
Mortaria	8	43	34	85
Jars	-	34	21	55
Beakers	1	4	1	6
Flagons	-	1	-	1
Miscellaneous	-	1	1	2
<i>Total</i>	9	86	59	154

Table 00. Quantification of Area W kiln products by minimum vessel number

As quantified by EVE, ledge-rimmed jars were clearly the most prolific form, and very likely candidates for firing in kiln 1618. Beakers are not well represented here and, like the *Cam 370* flagon, are possibly not products of these kilns. Even assuming that all of these forms were produced here, the range of forms is very narrow. The pottery kiln at Ivy Chimneys, Witham, yielded 9.9kg of kiln products, with seventeen separate vessel forms represented (Turner-Walker and Wallace 1999, 170). From kilns 1223 and 1618, and stoke-hole 1589, sandy grey ware alone weighed almost 15kg, yet only a maximum of seven different vessel types was produced in this fabric. The difference between volume of kiln products and range of forms is more marked at

Palmer's School in Grays. Here, the kiln yielded over 46kg of kiln pottery and six vessel types (Rodwell 1983, 26). This situation is perhaps unsurprising. Potters responded to demand, rather than risk producing pottery that no one wanted. At Heybridge, potters produced ledge-rimmed jars simply because there was a market for them. Doubtless the shape facilitated mass production; a cut groove on top of the rim and absence of decoration meant that the form could be turned out rapidly. A high diversity of forms, then, is not necessarily indicative of a high level of output.

The amounts of grey ware recovered from both Area W kilns are perhaps lower than is typical. A kiln at Ivy Chimneys yielded 13.5 EVE of kiln products (Turner-Walker and Wallace 1999, 170). Over forty EVE were recovered from the late Roman kiln at Inworth, and the Moulsham Street kiln, Chelmsford, produced 28.5 EVE (Going 1987, 74-84). These kilns are similar in size to both kiln 1223 and 1618, yet the latter pair yielded a little under 10 EVE. Again, that the size of the assemblage from the kilns is small may have less to do with the volume of actual production and more to do with volume of waste generated and the manner of disposal of such waste. The assemblage found within the kilns may represent the final dumping of pottery waste, a store of seconds or the last batch of unsold pottery, putting the kilns firmly out of use. Waste produced at each previous firing may well have been discarded away from the immediate environment of the kilns themselves.

Like grey ware, the range of buff ware mortaria forms is restricted, although there is subtle variations of shape. Hammerhead-rimmed D11 mortaria clearly predominate in this fabric and, in terms of vessel count, are more numerous than ledge-rimmed jars.

Most examples of both mortaria types were built into the structure of kiln 1618. These mortaria were almost certainly locally produced [ref. stamps]. Like kiln 1618, pottery was inserted into the original structure of a kiln at Ellingham in Norfolk. Both kilns show no obvious signs of repair. Hartley (1973, 143) suggests that this technique reduced the risk of kiln fracture upon initial firing. While the mortarium kiln at Ellingham, Norfolk, is 1.8m in diameter (Gurney and Rogerson 1997, 2), and that its capacity perhaps suited the wide design of its products, mortaria did not necessarily require large kilns. Mortaria were among the chief products from Colchester, yet were fired in kiln chambers sometimes only 1m across (Hull 1963, 158; 168). A high dome, rather than a wide chamber, facilitated the high temperatures required to fire the form. As both kiln 1223 and 1618 were 1.4m across, it remains feasible that mortaria could have been fired in either.

Wherever mortaria were fired, the high number of vessels in stoke-hole 1589 suggests that the kiln or kilns that produced them continued to do so after some of their products were used to construct kiln 1618. The number of vessels in 1223 is comparatively low. If mortaria were fired in this kiln, the chamber was sealed soon after it fell out of use, providing little opportunity for waste material to accumulate.

Dating

Kiln 1223 was probably built during the late 2nd century. Kiln 1618 was constructed in the late 2nd or early 3rd century AD and abandoned during the early 3rd century AD. The grey ware products in 1618 are not by themselves closely datable; ledge-rimmed jars date from the 2nd century at Chelmsford (Going 1987, 23), and

production of the form up to the mid 3rd century AD is attested at Witham (Turner-Walker and Wallace 1999, 170). The forms G24 and G25 have wider date ranges, continuing into the 4th century AD at Colchester (Bidwell and Croom 1999, 479). Significantly, the G5 jar was the commonest jar form at Heybridge during Ceramic Phases 7-8 (AD170-260).

The date of construction is best provided by the mortaria built into the structure of kiln 1618. Generally, hammerhead-rimmed D11 mortaria date to the second half of the 2nd century AD at Chelmsford and Colchester, continuing at both sites into the 3rd century AD (Going 1987, 21). K. Hartley places the production of the stamped mortaria from the kilns to the early part of the date range, AD170-190 ([ref. mort. stamps](#)). However, construction of 1618 could be later, since *unstamped* mortaria were manufactured beyond this date. Early 3rd century use is supported by folded H35 beakers and absence from the kilns of any pottery dating exclusively after this time.

The archaeomagnetic date range of AD90-210 for the last firing of 1618 is too wide to be of any real value, but it nevertheless fits with early 3rd century abandonment. In the absence of strong pottery dating, the archaeomagnetic date of AD140-170 for 1223 is of greater use ([ref archaeomag. rep.](#)). Taken together, the dating evidence suggests that 1223 was abandoned before 1618, which may have been functioning into the 3rd century. Kiln 1223 may even have been built first, with 1618 being its replacement. However, 1223 remained open after disuse and continued to accumulate material until both kilns were effectively sealed. Both yielded very small amounts of non-kiln products, largely restricted to abraded body sherds, and including Nene Valley colour-coated and Hadham oxidised wares. Final closure of the entire complex is therefore likely to have occurred during the first half of the 3rd century.

Area L

Summary

Kiln 14858 yielded 10,654g of pottery. Eighty-six per cent of this was spalled and overfired and has been identified as waste products. This waste material was present in three fabrics: black-surfaced ware, sandy grey ware and fine grey ware, of which sandy grey ware formed the largest proportion. Large quantities of waste pottery were also recovered from three nearby pits: 14655, 14744 and 14809. Since fabric, form and date of the pottery in these features were identical to waste pottery recovered from the kiln, it has been assumed that the source of all this material is the same. By weight, pit 14655 yielded over half of the total amount of kiln waste. Pit 14809 yielded the least, just 4% of the total.

A limited range of forms was produced. Oval-bodied jars with undercut rims and plain-rimmed dishes predominated, but bead-and-flanged dishes, wide-mouthed bowl-jars, and bifid-rimmed jars were also manufactured. Notably, only bowl-jars and dishes were made in fine grey ware. Jars were reserved for the coarser black-surfaced and sandy grey ware fabrics.

Fabrics

Black-surfaced ware (BSW)

This moderately hard fabric has very dark grey to black (10YR 3/1) surfaces, red-brown (5YR 4/4) margins, and light to dark grey (10YR 6/1 to 4/1) core. Moderate white and red crushed flints, less than 3mm long, protrude through the surfaces. Inclusions of frequent tiny quartz grains; larger and sparser angular white and clear grains are visible macroscopically. Totals are 3030g from kiln 14858, 7226g from pit 14655, 1060g from pit 14744, and 462g from pit 14809.

Forms: Dishes B1 B6, bowl-jar E5, jar G24

Sandy grey ware (GRS)

The fabric has dark grey (10YR 4/1) surfaces, with some lighter grey (10YR 4/2) patches. The core is usually red-brown (5YR 4/2); some examples are grey throughout. Inclusions are as for BSW, except that surfaces and core are flintier. Totals are 5720g from kiln 14858, 7005g from pit 14655, 2225g from pit 14744, and 758g from pit 14809.

Forms: Dishes B1 B6, bowl-jar E5, jars G24 G42 G bifid rim

Fine grey ware (GRF)

Smooth surfaces, sometimes burnished. Surface colour as GRS; some very dark grey, almost black surface patches, presumably the result of firing. Light grey (10YR 6/1 to 5/1) core. Inclusions as for GRS. Totals are 428g from kiln 14858, 905g from pit 14655, 100g from pit 14744, and 18g from pit 14809.

Forms: Dishes B1 B6, bowl-jar E5

Forms

B Dishes

B1

Plain-rimmed dishes with flat bases. Rims are slightly bulbous and inturned. Burnishing in narrow bands on external and internal surfaces. Diameters range from 120 to 240mm. Gillam (1977, 76) suggested that this type was possibly used as a lid in conjunction with the flanged B6 type, forming a set akin to a casserole. The frequent appearance of both forms within kiln 14858 and associated pits, and the fact that diameters of both forms seemingly correlate lends some credence to this suggestion. Indeed, some of the more complete B1 dishes fitted the B6 dishes rather well.

Illustrations

849	14564	BSW	B1
850	14564	BSW	B1 with post-firing graffito (AI- or IV)
860	14743	GRS	B1

B6

Bead-and-flanged dishes with tapered, slightly convex, sides and flat bases, corresponding closely to Chelmsford form B6.2. There is variation in the shape of the flange, which is usually downturned, and can be fat and short or thin and extended. The flange is less frequently upturned. In many instances, the flange had broken off, probably during firing. Burnished bands decorate most vessels, never completely covering the external and internal surfaces. Diameter range: 180 to 240mm.

Illustrations

846	14564	GRF	B6
847	14564	GRF	B6
851	14564	BSW	B6
852	14564	BSW	B6

E Bowl-jar*E5*

Round-bodied, wide-mouthed vessels with bead rims. Products correspond to Chelmsford forms E5.3 and E5.4. The former has a typical diameter of 140mm; the latter is larger with a diameter range of 200 to 240mm. Decoration is restricted to shoulder grooves and a single burnished wavy line, though this is by no means present on all vessels. The form was commonly produced elsewhere, including Moulsham Street, Chelmsford (Going 1987, fig. 35.7-9), Ivy Chimneys, Witham (Turner-Walker and Wallace 1999, fig. 113.8-9), and Mucking (Rodwell 1973, type K). This vessel type was also present in the Crescent Road kiln waste assemblage (Wickenden 1986, fig. 17.39-40).

Illustrations

855	14564	GRS	E5.4
856	14564	GRS	E5.4
862	14743	GRS	E5.3

G Jars*G24*

Jars with oval bodies, undercut bead-rims, and slightly stepped shoulders. Diameter range: 140-260mm. The product closely resembles Chelmsford form G24.2. There are no decorative details, but products are typically coarser and flintier than dishes or bowl-jars, and no example appears in fine grey ware. The form was produced at Ivy Chimneys, Witham (Turner-Walker and Wallace 1999, fig. 113.16), Moulsham Street, Chelmsford (Going 1987, fig. 35.10), Orsett (Rodwell 1975, fig. 8.61), and Mucking (Jones and Rodwell 1973, type J), among other sites.

Illustrations

859	14564	GRS	G24.2
863	14743	GRS	G24.2
864	14743	GRS	G24.2

G42

Short-necked 'storage jars' with wide, rounded bodies and thick bead rims. Examples have 'wheat-ear' stabbed shoulder decoration, and diameters of 200 and 240mm. Exact parallels are lacking, but similar vessels were produced at, for example, Mucking (Rodwell 1973, type S), Moulsham Street, Chelmsford (Going 1987, fig. 35.18) and Inworth (Going 1987, fig. 41.23).

Illustration

857	14564	GRS	G42
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G bifid rim

Jars with bifid rim and short neck. Though non-joining, the two rim sherds from separate pits are likely to form part of a single vessel. Despite this very low incidence,

local production is very likely. Its fabric is identical to sandy grey ware recovered from kiln 14858, the rim sherds are spalled, and there are no close parallels.

Illustration

858	14564	GRS	G bifid rim
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Quantification

	Kiln 14858		Pit 14655		Pit 14744		Pit 14809		<i>Total</i>
	<i>EVE</i>	<i>% EVE</i>							
B1	0.61	19	2.03	31	1.53	33	0.05	4	4.22
B6	0.57	18	1.82	27	1.12	24	0.45	38	3.96
E5	0.28	9	0.76	11	0.82	17	0.34	29	2.20
G24	1.70	54	1.70	26	0.78	16	0.34	29	4.52
G42	-	-	0.11	2	0.28	6	-	-	0.39
G bifid	-	-	0.22	3	0.17	4	-	-	0.39
<i>Total</i>	3.16		6.64		4.70		1.18		15.68

Table 00. Quantification of Area L kiln products by EVE

	Kiln 14858	Pit 14655	Pit 14744	Pit 14809	Total
Dishes	10	37	29	3	79
Bowl-jars	2	5	7	2	16
Jars	11	12	7	1	31
Total	23	54	43	6	126

Table 00. Quantification of Area L kiln products by minimum vessel number

Measured by EVE, dishes were the most prolific type, followed by jars and then bowl-jars. The order of vessel frequency is retained when the minimum vessel number is calculated. It can be seen that, of the dishes, the B1-type is slightly more numerous than the B6, and the G24 jar far outnumbers other jar forms. Notably, G24 jars were the most frequently produced form at the Moulsham Street kilns, Chelmsford (Going 1987, 74), followed by B1 and then B6 dishes. As at Orsett (Cheer 1998, 99) and Chelmsford, B1-type dishes are better represented than B6-type dishes, although the difference at Heybridge is perhaps negligible. There is no obvious reason for this difference, except to suggest that plain-rimmed dishes were simply in greater demand than bead-and-flanged dishes. It might also be suggested that B6 dishes were always made to pair B1 dishes, but additional B1 dishes were produced for lone use. Bowl-jars never rivalled jars and dishes in terms of the quantity of production. This appears to be the case, not only here, but also at Chelmsford (Going 1987, 74) and Mucking (Rodwell 1973, 36-7). The relative popularity of all these products must derive from functional differences. Jars and dishes perhaps had multiple functions, for example, cooking, storage and tableware. Consequently, more vessels were required to fulfil these roles, and replace vessels that broke through constant use. Bowl-jars possibly served singular and less intense functions, perhaps confined to the dinner table, and therefore lasted longer.

This functional division may also explain why fine grey ware was the least common of the three kiln fabrics (Table 00).

<i>Fabric</i>	<i>EVE</i>	<i>Weight (g)</i>
GRS	9.92	15708
BSW	6.06	11778
GRF	2.79	1451

Table 00. Total quantities of Area L kiln products by EVE and weight

The amount of kiln waste recovered from kiln 14858 was very low compared to the forty-odd EVE collected from the kilns at Moulsham Street, Chelmsford and twenty EVE from Inworth. The overall quantity is, of course, higher, but the figure remains comparatively low. Indeed, rim circumferences were rarely more than half-complete. As in Area W, the pottery recovered here, and particularly from the kiln, seems to represent little more than the 'sweepings-up' of already broken and discarded waste material.

The similarities between the waste pottery collected from kiln 14858 and its associated pits and the pottery produced at Inworth and Chelmsford merit comment. These production sites can be linked on the basis of the crushed flint temper that the potters used, and more or less identical forms, suggesting a single potting tradition. While itinerant potters might link two manufacturing sites of comparable date, it is harder to apply to a tradition lasting almost 100 years. The mechanisms that introduced flint-tempered pottery is unknown, though strong cultural and economic links within the region doubtless had their parts to play.

Dating

These products, presumably fired in kiln 14858, were manufactured sometime during the late 3rd century or the first half of the 4th century AD. Production probably ceased before the mid 4th century AD. These assertions are made on the basis of the fabrics and range of forms produced. The sandy grey and black-surfaced fabrics represented here were tempered with crushed flint, and could be regarded as forming part of the tradition of flint-tempered fabrics in Essex. Flint-tempered pottery was recovered from the Moulsham Street kiln in Chelmsford (Going 1987, 74-8), and the much flintier Rettendon-type fabric produced at Inworth (Going 1987, 83), Sandon (Drury 1976), and Rettendon itself (Tildesley 1971). Going (1987, 89) provided a late 3rd to mid 4th century AD date for the production of these fabrics, which he viewed as forming an interconnected workshop industry.

Some of these sites also offer parallels to the range of forms represented at Elms Farm. Potters working at the Moulsham Street kiln site included all six forms, except the bifid-rimmed jar, in their repertoire. A late 3rd or 4th century kiln assemblage from Orsett (Rodwell 1975, 32) included B1 and B6 dishes, E5 bowl-jars and G24 jars. The parallels from Inworth are less exact, though most of the six vessel types are broadly represented. The B6 dish is perhaps key to providing a date. While B1, E5 and G24 jars were produced prior to the late 3rd century, B6 dishes were only made after *c.* AD 260 (Going 1987, 15). Notably, the form is absent from the kiln assemblage from Ivy Chimneys, which dates no later than the mid 3rd century AD (Turner-Walker and Wallace 1999, 170).

While a late 3rd century, or later, date for pottery production is reasonably certain, the date of abandonment is less clear. Pit 14655 produced typically later 4th century

pottery, including late shell-tempered ware, and a coin of Valentinian II (388-392), but these could well be intrusive. The pottery, particularly, is very abraded. That production ceased before the mid 4th century is suggested more strongly by the presence in the same feature of a G24 jar in Rettendon ware and a Nene Valley colour-coated bowl with painted decoration from pit 14744. The latter is of a type that declined after the mid 4th century (Perrin 1999, 104). Both imply that waste products were deposited any time up to, but no later than, the mid 4th century AD. Notably, the kiln itself yielded nothing of exclusive mid 4th century date or later.

The archaeomagnetic dating is inconclusive, but does not necessarily contradict the pottery dating. Two dates for the last firing of the kiln are offered: AD150-210 and AD270-400 ([ref. archaeomag. rep.](#)).

Area N

Summary

Kiln 10906 yielded 6346g of pottery, none of which could be positively identified as waste products. There were, however, a number of larger bodysherds and diagnostic fine grey ware rim sherds in good condition amongst the small and abraded sherds, and are feasibly kiln products for these reasons. A total of 2113g was recovered from kiln 11423. Again, no products were identified by form, although the kiln contained the occasional group of spalled or heat-damaged sandy grey ware sherds. This small collection, amounting to 240g or 11% of the total, has been tentatively identified as kiln waste.

Fabrics

Fine grey ware (GRF)

A micaceous fabric with dark grey (5Y 5/1 to 4/1) surfaces and darker grey (2.5Y 4/0) or grey brown (2.5Y 4/2) core. Fine clay matrix with well-sorted white quartz, resulting in a speckled appearance. Occasional larger quartz grains, visible macroscopically. Surfaces have patchy burnish.

Forms: Dish B2, bowl-jar E2, jar G pedestal base

Sandy grey ware (GRS)

A micaceous and slightly gritty fabric. Surface colours vary in shades of grey (10YR 6/1 to 4/1). Inclusions of white and clear quartz grains, and very occasional flint. No forms identified.

Forms and dating

Three vessel types, all in fine grey ware, were identified as possible products of kiln 10906: a shallow bead-rimmed dish (B2), a ledge-rimmed neckless globular jar (E2), and a jar with a frilled pedestal base resembling *Cam* 207. Single examples of each were recovered.

Whether fired in the kiln or not, they suggest that the kiln was abandoned probably in the first half of the 3rd century AD. Pedestalled jars were manufactured in Essex during this time, for example at Grays (Rodwell 1983, 34) and Mucking (Pollard

1983, 135), while the E2 bowl-jar dates from the late 2nd century onwards (Going 1987, 21). The dish provides a mid 3rd century ceiling. This form was produced up to or a little beyond this date at Ivy Chimneys (Turner-Walker and Wallace 1999, 170) and Orsett (Cheer 1998, 101), but was absent from late 3rd century-plus kiln assemblages at Chelmsford or Inworth (Going 1987, 78; 88). Much of the pottery recovered from the kiln deposits more strongly suggests early to mid 3rd century abandonment, and includes an H35 folded beaker and a D3 mortarium.

Kiln 11423 could well have been broadly contemporary with 10906. Pottery, including BB2, recovered from packing deposits date construction to the second half of the 2nd century AD, while bead-rimmed dishes from disuse deposits suggest that the kiln was abandoned by the mid 3rd century AD. This accords well with the archaeomagnetic date of AD225-250 for its last firing (ref. [archaeomag. rep.](#)).

Discussion

A combination of stratigraphy, artefactual evidence and archaeomagnetic dating fixes the maximum lifespans of the kilns and places them within a chronological sequence. However, establishing the *actual* length of time that the kilns were in use, the scale of production and the organization of the work are altogether more challenging, and are beset with problems of interpretation. But it is these answers that provide insights into the part that pottery production played in the economy of Heybridge and the daily lives of its inhabitants.

A sense of scale is achieved by estimating the kiln output. Using the assumed wastage rate of 5-10% (Cheer 1998, 99), the approximate total weights of products from the kilns in Areas W, L and N is 300 to 600kg, 290 to 580kg, and 2.5 to 3kg. respectively.

	<i>Wastage rate at 5% (g)</i>	<i>Wastage rate at 10% (g)</i>
Area L	578740	289370
Area W (BUFM)	315620	157810
Area W (GRS)	297860	148930
Area N	4800	2400

Table 00. Suggested output on the basis of 5-10% wastage rate

Together, these are well below the total attained at Orsett ‘Cock’, but still must be regarded as conservative estimates. As Cheer noted (1998, 99), the total quantity of waste pottery available from a site is an unknown factor. In any case, these figures are based on the total amount of recovered kiln products, which potentially represent any number of firings. Clearly, the output from a single firing cannot be estimated reliably, as the resultant waste material cannot be isolated. While a greater volume of kiln products were recovered from Orsett, the Heybridge kilns may have had fewer firings, but produced more pottery.

Kiln size, too, does not necessarily reflect cumulative output, though has some bearing on the maximum loads held by each kiln in a single firing. All but one of the Elms Farm kilns measured between 1.3 and 1.5m in diameter. This compares favourably to some Mucking (Jones and Rodwell 1973, fig. 2) and Orsett ‘Cock’ kilns (Carter 1998, 62-70), which were between 1.0 and 1.6m wide. These yielded far larger quantities and more diverse ranges of pottery than was present at Heybridge,

though all these kilns may have had similar capacities. However, without the evidence of the superstructure, the exact capacities remain unknown.

<i>Kiln</i>	<i>Diameter (m)</i>
Area W	1.4
Area N	1.3
Area L	1.3
Regional Average	1.3

Table 00. Comparison of kiln diameter. The figure for the average diameter is based on twenty-four regional kilns, including Heybridge. A full list is provided in the Archive

Far more problematic is linking the pottery to the use of the kilns. While spoiled pottery can be recognised by its condition (e.g. overfired or blown), it cannot be ascertained whether pottery recovered from the backfills of kilns were actually fired in those kilns. The presence of sherds that are clearly not local, such as Nene Valley and Hadham wares serves to remind us that the kilns, once abandoned, are, to some extent, merely ordinary receptacles for rubbish. In addition, the waste pottery recovered from a kiln more likely to relate to its last firing, rather than reflect its entire use. While quantification of kiln products takes us towards an estimate of the scale of pottery production, it cannot so usefully indicate the life span of any kiln or the number of firings undertaken.

Instead, the life span of a kiln may be better established by identifying rebuild and repair. Taking Fulford's suggestion of one rebuild per season (1975a, 22), the absence of visible signs of repair or rebuild in all but two of the kilns suggests that they each had a life-span of no more than a single potting season. Kiln 11423 showed at least one episode of repair, suggesting continued use into a second season. The mortaria built into kiln 1618 may also be evidence of repair. The flue walls of Kiln 11423 in Area N had also been repaired at least once. Identifying repair, however, is problematic, as it becomes visible only when parts of the previous structure remain extant. The original structure would leave little trace if it were replaced in one go. In addition, parts of the structure may have needed repair on a regular basis, so that, by the end of the first season, the kiln had already undergone structural changes.

A single or short period of use may help to explain the somewhat limited repertoire suggested by the Area W and L waste pottery. Potters were likely to have set up a kiln and produced pottery knowing that they would be able to sell it. What was produced during the initial period of use perhaps represented the immediate satisfaction of the market. Expansion of the repertoire came when potters became more familiar with the demands of the market or felt confident to introduce new shapes. Both suggest an element of longer-term production, and in the case of the latter, financial security. A narrow range of forms, then, does not necessarily suggest small-scale production, but rather an intensive and short production period.

On the current evidence, then, pottery was manufactured at Heybridge on a seemingly intermittent basis between the late 2nd and first half of the 4th century. However, given the view that the kilns could have been functioning for longer, the possibility that production was continuous between these dates and beyond cannot be dismissed. In addition, it is by no means unreasonable to suggest that there remain other, as yet

undiscovered, kilns at Heybridge located away from the settlement nearer to abundant fuel sources, such as woodland.

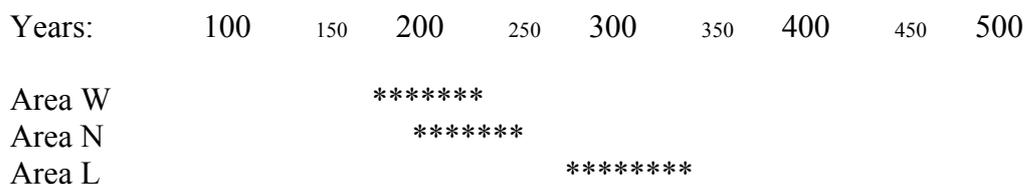


Figure 00. Chronology of production at Heybridge

The presence of itinerant potters provides a model that conveniently explains sporadic production. A potter would relocate, set up a kiln and satisfy the immediate demand before moving on. But as long as pottery was used, there was a demand for it. An itinerant potter would need to return to a location on a regular basis, perhaps every year. Competition between potters might complicate matters, with rival potters also setting up kilns. If anything, given this model, we should expect makers' marks on coarse pottery in order to differentiate products, and the presence of many more kilns. The effort required finding suitable locations with good clay and fuel sources, setting up a kiln and preparing the clay before actually making pots should not be underestimated. Once an infrastructure was in place, the potter might well be reluctant to shut-up shop, move on and start afresh. An alternative model proposes that a potter was permanently resident in the settlement, returning to his kiln on a seasonal basis or during the time that was available for potting. The potter might supply other settlements by transporting the goods himself or using the services of a middleman. Opinion now tends to favour the latter model, based as it is on ethnographic parallels (Cheer 1998, 101). The close proximity of some kilns to domestic plots also supports this model, although such locations may be the exception, rather than the rule.

What constitutes the 'potting season' deserves some attention. Presumably, if potters were farmers engaging in agriculture as well as tending livestock, a potting season was equal to the number of months spent away from farming related activities. Periods available for potting extended across the year, but these may have been short. Heated drying sheds would certainly be required for winter and spring production, as these months could scarcely have been advantageous to the potter, who would not be able to dry pots in wet and cold weather or easily collect dry fuel. Seasonal manufacture, predominantly during the drier and warmer months, provides the best explanation for the evidence at Elms Farm. It implies production of a surplus: potters must produce enough vessels to meet an all-year round demand. Furthermore, this suggests intensive production, which would not necessarily benefit from the uncertainties of the market, and perhaps even discourage potters from testing the market and extending their repertoires.

In summary, despite the ambiguities of the evidence, the kilns at Heybridge were probably in service for a short time, perhaps for one or two seasons only. While the impact of these kilns was restricted, pottery production is likely to have played an integral part in the local economy throughout the late Iron Age and Roman periods. It has been argued elsewhere that most coarse wares had a probable local origin (ref.

synthesis), and the absence of kilns does not necessarily mean that no local production took place. It is evident that a single potter, even working for part of the year only, could have supplied the settlement at Heybridge, which had a population of no more than 400 people (probably nearer 200) at any one time. Greene (1993, 44) has suggested that four potters working for a period of ten years supplied all the pottery required for a legionary fortress in which the population at any given time would have certainly numbered in the thousands. Assuming a working life of 20 to 25 years, over a period of 150 years – roughly the period that the kiln evidence encompasses – we should expect just six potters to have been active (or eighteen potters to cover the entire late Iron Age and Roman occupation). Assuming that the best place to locate a kiln is in a sheltered place with access to fuel and water, it is unlikely that excavation of a settlement itself, rather than its hinterland, would reveal many kilns.

The potters themselves were probably ‘part-time’, undertaking the work during slack periods of the farming calendar. If so, local production cannot properly be termed an industry. Unlike pottery manufacture at Heybridge, large production centres, such as those in the Nene Valley and at Colchester, were organised on industrial lines, implying permanent production, wider distribution, and a full-time ‘professional’ workforce responding to and influencing the market.