

**Excavations at Battle Bridge Lane in 1995:
medieval and early post-medieval development
along Tooley Street, Southwark**

IAN GRAINGER

with contributions by

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THE POTTERY

TABLE 1 Pottery from pit fill 576 broken down by fabric and forms, and quantified by rim EVEs (estimated vessel equivalents), with percentages of the total. Other vessels present include BORDG fuming pot 0.00 EVEs, BISC dish 0.09 EVEs charger 0.00 EVEs, DUTSL dish 0.00 EVEs, STGW albarello 0.00 EVEs, WESE dish 0.00 EVEs, STAR costrel 0.00 EVEs, BEAG goblet 0.00 EVEs, DUTSL 0.00 EVEs, BORDB 0.00 EVEs, DUTSL 0.00 EVEs and DUTSD 0.00 EVEs.

	BOT	BOWL	COL	DISH	JUG	PIP	POR	TANK	TYG	total	
BORDG	1.00	0.22		0.28						1.50	15%
BORDY		0.44		0.58		0.62	0.31			1.95	19.5%
ISAB				0.05						0.05	5%
FREC	1.00							0.38		1.38	14%
DTGW		0.03								0.03	0.5%
DUTR				0.20		0.20				0.40	4%
GUYS			0.05	0.71		0.68	0.17			1.61	16%
PMBL									0.07	0.07	1%
PMR			0.09	0.14	0.13	0.70				1.06	11%
RBOR		0.20								0.20	2%
TGW				0.05						0.05	0.5%
TUDB				0.25		1.41				1.66	16%
TOTAL	2.00	0.89	0.14	2.26	0.13	3.61	0.48	0.38	0.07	9.96	
	20%	9%	1%	23%	1%	36%	5%	4%	1%		100%

TABLE 2 Pottery from layer 318 broken down by fabric and forms, and quantified by rim EVEs (estimated vessel equivalents), with percentages of the total. Other vessels present include EBORD 0.00 EVEs, CHEAR 0.00 EVEs, CSTN 0.00 EVEs, SIEG 0.00 EVEs, SIEGL 0.00 EVEs residual RPOT and MPOT 0.00 EVEs.

	BOWL	CUP	DISH	DJ	JUG	PIP	PTCH	total	
DUTR						0.84		0.84	16%
DUTSD	0.07					0.07		0.14	2%
DUTSL	0.11		0.08					0.19	3%
GUYS	0.23	0.12	0.13		0.06			0.54	10%
ISAB			0.02					0.02	0.5%
LCWW						0.09		0.09	2%
RAER				0.75	0.2			0.95	17.5%
TUDB	0.32		0.16			1.65	0.51	2.64	49%
	0.73	0.12	0.39	0.75	0.26	2.65	0.51	5.41	
	14%	2%	7%	14%	5%	49%	9%		100%

TABLE 3 Pottery from layer 300 broken down by fabric and forms, and quantified by rim EVEs (estimated vessel equivalents), with percentages of the total. Other vessels present include DUTSL 0.00 EVEs, RAER drinking jug 0.00 EVEs, GUYS colander 0.00 EVEs, OLIV jar 0.00 EVEs, DUTR chafing dish 0.00 EVEs, TUDB watering can 0.00 EVEs, DUTSL 0.00 EVEs, residual MPOT 0.00 EVEs and intrusive 19th century pottery.

	BOWL	CHAF	DISH	JUG	MUG	PIP	total	
BICR						0.18	0.18	5%
BORDG	0.13		0.07	0.20			0.40	10%
BORDY	0.08		0.17			0.15	0.40	10%
FREC						0.28	0.28	7%
GUYS	0.07			0.26			0.33	8%
LCWW	0.08					0.12	0.20	5%
PMR	0.07						0.07	2%
RAER				0.46			0.46	12%
TUDB	0.03	0.12	0.09	0.09		1.26	1.59	41%
total	0.46	0.12	0.33	1.01	0.28	1.71	3.91	
	12%	3%	8%	26%	7%	44%		100%

THE BUILDING MATERIALS

Roman ceramic building materials

Residual Roman materials were found in contexts 1, 217, 220, 229, 233, 243 and 247.

Medieval and post-medieval ceramic building materials

Bricks

The sampled bricks from Battle Bridge Lane may be placed into three main groups: (a) red bricks dating from the period down to the Great Fire or a little later; (b) red bricks dating from the late 17th century down to c.1800 or perhaps somewhat beyond; and (c) small Dutch bricks imported into eastern England from the 17th to the 19th century. Miscellaneous bricks, not fitting into one or other of these categories, may be placed in a separate group (d).

(a) Red bricks used down to the Great Fire or a little later

These are in a soft, orange to red fabric with few inclusions (MoLAS fabric 3033) or, less frequently, in more sandy versions (3046, 3065) or a more silty version (3039) of the same basic fabric-type. They vary in size, although these variations offer little guidance to dating except that in general later bricks are somewhat thicker than earlier bricks; even in this respect, however, there are exceptions. Thicknesses (along with the other dimensions) were regulated for the London area by statute in 1571, and again in 1625, at 2¼ inches (= 57 mm) (Lloyd 1925, 12), but supervision was difficult and it is unlikely that the regulations were often strictly adhered to: indeed, an act of 1725 (12 Geo. I, c.35) complained that bricks were still being made of ‘unsizable dimensions’ (Lloyd 1925, 48-9).

Such bricks were found in the contexts shown in table 4. All but three of these are dated independently to the period from the late Middle Ages to the early 18th century (Phases 4-7), the vast majority falling within the period from the mid-17th to the early 18th century (Phases 6 and 7), consistent with what is already known about the date-range of these bricks. Contexts 257, 322, and 648 are dated to the mid-18th century (Phase 8); the relevant bricks within these contexts may be salvaged and re-used materials, following a well-attested practice.

Most exhibit sunken margins - that is, they have one or more edges (usually but not quite invariably on the upper bedface) recessed below the level of the top surface itself. They are often irregular, not lying parallel to the brick faces, and sometimes peter out towards one end. Their origin has been several times discussed, but what is certainly the correct explanation has now been offered by Ian Betts: when the mould was removed from the brick, friction pulled up small ‘lips’ on some of the brick edges; these were simply pushed down by using the bottom of the mould, so forming the sunken margins (Betts 1996, 6-10).

TABLE 4 Bricks used down to the Great Fire or a little later

Context	Fabric	Dimensions in millimetres		
		Length	Breadth	Thickness
2	3065	?	?	53
36	3033	226	100-102	50-53
	3046	222	103-5	51-6
58	3033	?	c 103	53
94	3046	?	98-102	46-50
131	3046	216	103	52
	3033	221	104	50-51
166	3046	?	?	?
170	3033	220	100-105	53-7
193	3033	227	105	58-62
257	3039	230-33	109-10	63-4
280	3033	221-8	100-105	49
		215	104-5	46-8
281	3033	225-8	112	60
283	3033	222-4	?	56-9 [cut brick]
290	3033	?	110	55
294	3033	236-8	110	59-60
		232-5	104-10	58-60
295	3033	?	95	52
296	3033	215	107-14	53-5
	3039	216	108-10	58-60
298	3033	220-22	107-10	55
		218-20	110-12	52-4
321	3033	233	114-15	63-5
		230-31	113-15	60-63
322	3033	233	114-17	60
365	3033	218-20	107-9	50-53
		235	106	50-53
378	3033	220-26	108-12	52
397	3033	226	108-12	60
		210-13	110-11	52-3
398	3033	230	115-20	53-60
		237	114-20	54-60
423	3033	?	108-10	60-61
453	3033	228-9	110-12	62-6
456	3033	216-20	106-12	55
457	3033	220	97-9	45-50
		215-20	107	46-50
459	3033	220	108-12	53-9
		221-3	100-103	55-7
505	3033	222-5	106-8	54-7
		218-20	103-5	56-8
618	3033	223	103-5	55-8
		220-24	107-9	52-6
636	3065	216-17	103-5	52-4
	3033	?	104-6	55-6
648	3033	227	104-5	64-7

(b) Red bricks used from the mid-17th century onwards

These bricks are much harder than those of the previous group and are of a darker red colour, almost purplish on occasion (MoLAS fabric 3032); they include many whitish calcium carbonate specks, and there is also a version with yellowish silty streaks (fabric 3034). Again there are size variations due to manufacture at different brickyards and to difficulties of controlling shrinkage during drying and firing. In general, however, they are thicker than bricks of the previous group. Their surfaces very often show a distinct yellowish tinge, perhaps caused by the moulding sand used in their manufacture.

These bricks occurred in the contexts shown in table 5. The earliest of these (Phase 6) is of the second half of the 17th century, during which these bricks first appeared. In fact there is independent documentary evidence for their being manufactured only after the Great Fire of 1666. Domestic ashes and other refuse, known as ‘Spanish’, were added to the bricks, making the raw bricks firmer and saving on fuel. This practice, it was declared by the Bricklayers and Tylers Company on 13 May 1714, was ‘begun about forty years since’, that is *c.*1670, and was ‘occasioned by digging up several fields contiguous to the city after the great fire which fields having ben much dinged with ashes it was observed that the bricks made with earth in those fields would be sufficiently burned [= fired] with one half of the coles commonly used’ (Cox 1989, 4, citing Lambeth Palace Library MS 2723, ff.21v-22). The firmer raw material also meant that the bricks could be pallet moulded, a method which resulted in sunken margins (see above) no longer appearing on the bricks. It is at that same time – the last decades of the 17th century – that bricks of the previous group disappear. The newer type of bricks were manufactured at an increasing number of commercial brickyards around London, whilst the new fashion for bricks encouraged their use in such areas as Southwark, as well as in the rebuilt City, where legislation required their use (or that of stone) in place of the earlier timber. Most of the 3032 and 3034 bricks from this site fit into the established date-range for such bricks (Phases 6–8).

TABLE 5 Bricks made from the mid-17th century onwards

Context	Fabric	Dimensions in millimetres		
		Length	Breadth	Thickness
160	3032	?	105	55-66 [<i>sic</i>]
170	3032	?	?	63
189	3032	?	102-6	58-63
		215	110-12	55-8
193	3032	222	103-7	66-7
257	3032	220	108-10	60-64
269	3032	229-31	113-15	50-55
270	3032	228-30	107-8	56-9
	3034	235-7	110-12	59-62
281	3032	225-30	106-12	57-60
290	3032	228-338	105-25	65
295	3032	?	100	62-3
301	3032	225-36	105	62-4
		237	98-105	60
305	3032	215-16	100-103	58-62
		218	102	60-62
322	3032	228-30	114-15	61-72 [<i>sic</i>]
		?	100-102	60-62
		216-17	103-10	65-6
324	3034	?	100-10	65-7
		226-30	100	60-63
328	3032	228-31	105-7	60-61
		?	104-7	66
330	3032	237-42	95-100	65-75
		240-48	105-7	60-80 [<i>sic</i>]
336	3032	?	100-104	65-72
348	3032	223	102-7	61-6
		225-7	104-6	65-6
373	3032	223-4	106-8	60-64
		230-31	99-102	66-8
378	3032	220-23	105	55-7
379	3032	235	106-10	60
384	3032	229-31	99-102	64
	3034	223-4	106	65-7
386	3032	230-32	108-10	60-64
		234-8	102-4	60-64
389	3032	225-30	102-5	70-80 [<i>sic</i>]
		226-30	100	60-63
390	3032	?	106	70
		208	105-10	67-8
423	3032	220-23	103-5	60-65
453	3032	228-35	100-104	59-63
479	3032	?	106-16	70-76
		?	123	65-74 [<i>sic</i>]
480	3032	222-7	110	60
		222-5	107-8	60
489	3032	?	?	62
		?	104-6	66-8
515	3032	?	?	62-5
		?	?	65-70
		?	103	65-70
581	3032	?	102-5	52-3
		?	?	59

(c) Small imported Dutch bricks

These small-format bricks are in a dense fabric with few inclusions, the result of their having been made from dredged-up river mud. They are often in a buff-yellow fabric (3036), although this may assume a greenish or grey hue if slightly overfired. Related to this is another fabric (3208), containing numerous tiny calcium carbonate specks, and varying between yellow and pinkish-red in colour, the redder forms being those from near the top of the kiln. Both types of bricks were imported from the Netherlands: they are often referred to as ‘clinkers’ (eg Clifton-Taylor 1987, 235; Brunskill 1990, 99), an Anglicisation of the Dutch *klinkers*. More properly, however, they should be termed IJssel-bricks or Gouda-bricks (Dutch: *IJsselstenen*, *Goudse stenen*), their name in the Netherlands reflecting the area in which they were first made in the mid-15th century. Somewhat later they were also made in other riparian areas, principally around Dordrecht and along the Old and New Maas. (for a full treatment: Hollestelle 1976, 121 4; also Smith 1997, 12-15). Sizes vary though all are notably smaller than contemporary English (and the normal Dutch) products, as shown in Table 6. The soft material precluded manufacture of bricks of the normal size.

TABLE 6 Small imported Dutch bricks

Context	Fabric	Dimensions in millimetres		
		Length	Breadth	Thickness
164	3036	178-82	81-5	36-7
	3036	?	84	34
269	3208	180	89-90	45
	3208	174-6	85-7	40-45
283	3208	179	84-5	35-41
	3208	170	80-83	36-40
	3208	178	88	43-5
402	3036	178-80	84-6	42-3
	3036	177	87-8	44-5
403	3208	181-4	86	41-4
	3208	185	90-93	40-45
457	3208	180-2	82-4	43-5
	3208	180	90	40-41
458	3036	185-8	87-90	38-43
	3208	170-78	85-6	38-41
480	3036	181	91-3	40-42
	3036	180-82	86-90	42
489	3036	163	65-70	43
618	3036	175-7	85-8	40-41
	3036	170	83	52-6

It was between the 17th and the 19th centuries that they were fairly regularly imported into eastern ports of England (Clifton-Taylor 1987, 235; Chalklin 1965, 147, 181). Their chief use in the Netherlands was for chimney-construction and for paving (Hollestelle, 1976, 122), the latter sometimes being highly decorative (eg an early 18th century example at Kromme Nieuwe Gracht 43, Utrecht, where they were combined with purple bricks: Kipp 1986, 171 2). In England too they were principally used for paving, though they were also used for cisterns and soap-boiling vats (Neve 1726, 40);

occasionally they were used for building walls. When used for paving they were normally, though not invariably, laid on-edge in a herringbone pattern.

(d) Other brick types

A small number of bricks from this site do not belong to any of the groups already discussed. Their date-ranges are not always fully understood as yet, and the data from this site therefore contributes something to the development of such a chronology.

From Phase 5 (late 16th early 17th century), context 645 came samples in fabric 3073, a yellowish to light brown fabric with frequent quartz and occasional red iron oxide and light brown clay inclusions. Shell fragments are sometimes present, though not in the bricks sampled from this site. No lengths were preserved but the other dimensions were 110 12 x 53 mm and 110 12 x 51 mm, which accords with the average size of other examples of such bricks. From this site it would appear that they were being made in the late 16th century to the early 17th century, though of course manufacture may have continued into later times.

From contexts 278 and 645 came samples in fabric 3031. Colours vary but at this site the bricks were off-white to yellow; the fabric is fairly soft with an even, sandy texture. No lengths were preserved but the other dimensions were 110 x 57 mm, 102 x 56 mm, 110 12 x 53 mm, and 110 12 x 51 mm. They are late medieval in date, those of similar dimensions sometimes belonging to the 15th century, although the full date-range has yet to be established. Within contexts 278 and 645 at this site they must be residual or perhaps re-used; their broken condition would be accordant with this.

From context 283 came samples in fabric 3043, yellowish-brown in hue with streaking and speckling of the fabric and with occasional shell fragments. The samples measured 179 x 84-5 x 35 41 mm and 170 x 80 83 x 36 40 mm. Both were distorted and distinctly 'hatched' (that is, warped along their lengths); both too had sunken margins. Such bricks belong to the immediate post-Fire period, and their occurrence in context 283 accords with this. It is not yet known for how long they persisted.

From context 336 came one example in fabric 3047, a fine sandy fabric, orange in colour and containing frequent quartz and dark red iron oxide. Such bricks are further distinguished by fine moulding sand adhering to the faces. The example measured 227-32 x 105 7 x 65 6 mm. It had sharp arises but was not quite 'square' in its angles a fault which probably occurred during the drying process. Bricks of this type have been recovered from structures firmly dated to the 1680s at St Paul's Cathedral (site code: SPU96; Smith 1998, 42-3)

Peg-Tiles

On this site peg-tiles were recovered from unstratified contexts and from contexts 1, 2, 3, 4, 9, 58, 63, 66, 70, 71, 94, 115, 120, 158, 160, 164, 170, 220, 227, 229, 233, 235, 237, 243, 245, 247, 455, 469, 473, 489, 502, 557, 581, 600, 602, 607, 648, 658, 663, 692, 696, 705, 706, 708, 714, and 748.

Peg-tiles generally belong to one of a small number of fabric types: 2271, 2276, 2586, 2587, and 2816, all fairly similar but distinguished by varying amounts of quartz and/or silt and sometimes by the moulding sand. The very similarity of these types makes it extremely difficult to date peg-tiles with any precision. Those made before the 15th century tend to be thinner and are often characterised by the presence of glaze on the lower part of the upper surface; the glaze may be in small spots splashed onto the surface

(‘splash glaze’) or may be applied more continuously (‘cover glaze’). Few examples were recovered from this site; they are given in table 7.

TABLE 7 Peg tiles with splash or cover glaze

Context	Fabric	Glaze
235	2271	Brown cover glaze
243	2586	Brown splash glaze
		Greenish-brown cover glaze
147	2271	Dark brown (almost black) cover glaze
663	2586	Brown cover glaze

Interestingly, all these contexts belong either to Phase 3 (12th 14th centuries; contexts 235, 243, 247) or to Phase 4 (14th 16th centuries; context 663), thus confirming the situation known from other London sites with regard to the dating of glazed peg-tiles. As on some of the tiles from other sites, the lead glaze is not always well applied. The vast majority of the earlier peg-tiles have two circular holes for the fixing pegs or nails. Peg-tiles made from the late 15th century onwards tend both to be thicker and to be of more uniform thickness. Glaze is no longer present. Peg/nail holes are more diverse, although circular holes remain dominant; but they may now also be square, diamond-shaped, or even hexagonal; occasionally they are just irregular. Hole-shapes from this site are given in table 8.

TABLE 8 Peg tiles with peg/nail holes

Shape	Contexts
Square:	245
Diagonal:	66; 71; 115; 227; 502; 696; 708
Hexagonal(?):	9; 120
Irregular:	1; 4

The majority of peg-tiles from this site probably belong to the late 15th century or later. This is especially true of the tiles in fabric 2276 – similar to fabric 2271 but with a distinctively fine moulding-sand. Such tiles are not normally found in London before the late 15th century. They were recovered from unstratified contexts and from contexts 58, 63, 66, 115, 158 and 164. These contexts belong either to Phase 4 (14th 16th century) or to later phases, consistent with what is known of the dating of these tiles.

Of particular interest is a tile from context 9, which is in fabric 2278. This is a cream-coloured fabric with a hard texture. It is possibly from a tiliary in north-west Kent and is of a type only very rarely found in London. The dating-range is uncertain, but it is probably of late medieval date; the context is of Phase 4 (14th 16th century), consistent with such a dating. Most of the peg-tiles from the site were fragmentary. No whole tiles were recovered, although a few preserved complete widths. They are given in table 9.

TABLE 9 Peg tiles with complete widths surviving

Context	Dimensions in millimetres	
	Width	Thickness
Unstratified	160	6-7 <i>[sic]</i>
	161-2	19-20
58	157	13-14
235	153	12-13
245	159	8 <i>[sic]</i>
455	156-7	13
	151-5	12-14
489	154	15
581	150	12-16
706	148-9	15-15
714	161-4	14-15

Pantiles

At this site pantiles were recovered from contexts 63, 158, 160, 164, 166, 648 and 705. That from context 705, dated to Phase 4 (14th–16th centuries) is especially interesting, if the context is not contaminated. Such an early date is unexpected, though not impossible, particularly on a Thames-side site such as Battle Bridge Lane. Pantiles were manufactured in the Netherlands from the late Middle Ages: on the basis of documentary evidence Dr Johanna Hollestelle suggests the mid-15th century for their invention (Hollestelle 1976, 64 5, 126), whilst Prof. C.L. Temminck-Groll favours a slightly later date, in the early 16th or perhaps in the *late* 15th century (cited in Sandon 1977, 73). Although they seem not to appear in port books before the early 17th century (eg at Boston in 1639: Hinton 1956, 258 9), they were clearly available for export from the Netherlands long before that date. Moreover, in excavations at the Maison Dieu Hospital at Ospringe near Faversham, Kent, pantiles were found which seem to be associated with late 16th century destruction levels (Smith 1979, 121). A date towards the end of Battle Bridge Lane Phase 4 is thus entirely feasible.

Also interesting, though less perplexing, is the example from context 160, which belongs to Phase 6 (mid to late 17th century). As mentioned above, pantiles are known from documentary and archaeological evidence to have been in use in London at that time, even though their greatest period of use came later.

Other contexts yielding pantiles belong either to Phase 7 (early 18th century) or to Phase 8 (mid-later 18th century): pantiles were widely used in London at that time.

The pantiles from this site were in a limited number of fabrics: 2275 (contexts 158, 164, 166, 705), 3094 (context 648), 3202 (context 63) and 3225 (context 160). It is not possible at present to distinguish Dutch-made from English-made tiles on the basis of their fabrics.

All pieces recovered were fragmentary. No lengths were preserved and only one width: the pantile from context 164 was 235 mm wide and 14 16 mm thick. This is narrower than the minimum width laid down by the act of 1725 (12 Geo I, c.35), which stipulated that pantiles were to be not less than 13½ by 9½ by ½ inch (333 by 241 by 13 mm) after firing. The fact has little implication for dating, even if this is an English product rather than a Dutch import, since the legislation was incapable of careful policing and was widely disregarded.

Pantiles were fixed by nibs depending from the centre of the top of the tile. Pegs or nails were not used. Nibs vary considerably, but in London they are usually between 45 and 100 mm in length, between 18 and 38 mm in width, and between 8 and 18 mm in depth. Two tiles from this site had nibs of unusual depth: that from context 166 was 19 mm deep and that from context 160 no less than 22 mm deep; the latter had had its sides knife-trimmed before firing.

All the pantiles from this site were red and unglazed, although that from context 648 had a few spots of brown splash-glaze; this was almost certainly accidental. The pantile from context 164 had a burned upper surface.

It is perhaps worth mentioning that their status as roofing materials was never high. They were much used on sheds, outbuildings, and industrial buildings; on higher status housing Kew palace being a rare exception - they were nearly always restricted to the upper pitches of Mansard roofs, for which plain tiles were not suited, and where, significantly, they were not visible from street level (Smith 1999, 7-9).

Floor-tiles

Medieval and post-medieval floor-tiles were found in a number of contexts. Nearly all were certainly or very probably Netherlands imports of medieval date.

(a) Medieval English floor-tile

The one definite English-made floor-tile came from context 9. Unfortunately its top surface had broken off. It was in fabric 2894, which has a fine clay matrix with assorted quartz and occasional iron oxide. It is associated with the tileyard at Penn, Bucks, which was in operation between the 1330s and the 1380s and supplied floor-tiles to London (and elsewhere), where large numbers have been found (Eames 1980, vol.1, 221 6; Eames 1992, 55 8). This fragment is probably of Penn manufacture. Context 9 is dated to Phase 4 (14th to 16th century), which is consistent with this. No dimensions were preserved on this fragment.

(b) Medieval 'Flemish' floor-tiles

It is customary to refer to these tiles as 'Flemish', although they were in fact made in, and exported from, the Greater Netherlands as a whole, not just Flanders proper. A distinguishing characteristic is the presence of small nail-holes in the corners. These are the result (as also in the manufacture of later Dutch tin-glazed wall tiles) of trimming with a knife and a square wooden template which was held firmly in position by small nails projecting slightly from its lower face (Drury 1981, 130). These seem invariably to be present on 'Flemish' tiles, although where thick slip is used under the glaze they may not be apparent; of course, where fragments alone exist, lacking corners, such holes will not be found. At this site a definite nail-hole was preserved only in the piece from context 719, although a *possible* nail-hole was observed in the fragment from context 160. The fabric-types of these tiles are also fairly distinctive. MoLAS fabric numbers are given in table 10, which also gives thicknesses and details of glazing. No other dimensions were preserved.

TABLE 10 Medieval Flemish floor tiles

Context	Fabric	Thickness in mm	Glaze
9	2318	25	Yellow and brown
160	1977	21-3	Yellow and brown
237	1678	?	Yellow
245	2850	38-40	Buff (poorly fired)
300	2318	?	Brown
318	3083	34-6	Yellow
		29-30	Brown
515	1977	30-31	Yellow and brown
576	1977	25-6	Yellow and brown
663	2324	31-2	Yellow (crazed)
	2850	28-9	Buff-yellow
710	2191	25-6	Yellow
	2324	35	Yellow
719	1678	30	Yellow

In context 576 was an overfired fragment, 27 8mm thick; its condition did not allow recognition of its fabric, although it was probably a silty 'Flemish' type. At the edges the glaze was yellow but elsewhere had overfired to a dull grey.

Those tiles with both yellow and brown glaze showed no discernible pattern. In some cases, indeed, it seems certain that the change of colour is due to no more than poor covering with white slip beneath the lead glaze.

(c) Post-medieval 'Flemish' paving tile

Context 459 yielded a single example of a post-medieval paving tile of characteristically large size and unglazed. The example from this site measures 254 6 x 243 -5 x 34mm, and has the usual sloping (bevelled) edges. Such tiles usually have nail-holes in two opposite corners, the result of using a nailed template for trimming, as with the earlier 'Flemish' tiles (see above). In this example there was a nail-hole of 1.5 mm diameter in one corner, the opposite corner being missing. Such tiles were in use from the period immediately before the Great Fire and continued in use down to the Victorian period. Context 459 is dated to Phase 6 (mid to later 17th century), so that this must be an early example of the type. As with the earlier tiles, they were exported not just from Flanders but from the whole of the Greater Netherlands.

(d) Tin-glazed ('Delftware') tile

Just one example of a tin-glazed tile (MoLAS accession <104>) was found at this site and that, unfortunately, unstratified. This is incomplete, but one dimension is 135 mm, indicating a tile some 135mm square; its thickness is 16mm. The sides slope slightly inwards towards the bottom. It is in fabric 3078 and is painted in positive, blue on white, with a pattern requiring four such tiles to form a complete design of a many-petalled rose surrounded by a strapwork border. The glaze is clear and there is no crazing. There is a fault at one corner, where the fabric has blistered slightly during firing, but not enough to render the tile unfit for use. It is certainly not a waster.

Exact parallels to the design exist both in polychrome and in blue and white, this being one of the commonest designs at Pickleherring Quay, where wasters – on which

the design had run during firing – were found (Hume 1977, 56; Horne 1989, 13). Tiles with this design were also found in the mid-19th century on the site of the Royal Exchange (Britton 1987, 196). Although this is in origin a Flemish design, the wasters from Pickleherring Quay indicate local manufacture. The smooth white glaze on the tile from this site, free from the crazing which is often a characteristic of the Dutch tiles, supports this.

THE ANIMAL BONE

TABLE 11 List of contexts and bone abundance (in stratigraphic sequence)
 Quantities of hand collected bone, all weights in kilogrammes.
 Sample: Y(es) and N(o) sample taken. Date: ceramic dating.

Phase	Context	Weight of bone	Number of bones	Sample	Context description	Date
3	229	0.84	54	N	ditch fill	1230-1250
	247	1.06	64	N	waterlain clay/silt layer	1240-1290
4	706	2.70	47	N	Pitfill	1270-1500
	711	0.24	13	Y	lower fill of pond	1300-1650
	663	15.03	320	Y	pond backfill	1480-1600
	710	2.61	51	Y	as 663	as 663
	713	0.24	13	N	as 663	as 663
	714	0.65	9	Y	as 663	as 663
	702	0.87	32	Y	as 663	as 663
	756	0.62	24	N	channel fill	1480-1550
	66	0.24	7	Y	latrine fill	1480-1600
5	414	4.06	115	N	waterlain silt layer	1550-1600
	620	3.81	91	N	one of 3 posthole fills	1480-1600
	622	1.92	32	N	as 620	1480-1600
	576	10.51	243	Y	Pitfill	1580-1600
	501	3.17	112	Y	Pitfill	1550-1600
	639	2.05	52	N	layer over pond backfills	1550-1600
	659	0.80	20	Y	well fill	1600-1700
7	455	2.26	59	N	levelling layer	1600-1700
8	164	0.25	11	N	Pitfill	1670-1750
	648	0.88	10	N	barrel fill	1720-1750
	717	5.07	6	N	barrel fill	1720-1780
	718	1.19	23	Y	as 717 - lower fill	

TABLE 12a–b Species representation for each phase (hand collected)

Phase	3		4		5		7	8
Species	N	%	N	%	N	%	N	N
Cattle	52	44.0	136	27.1	189	28.4	19	23
Cattle-size	24	20.3	105	20.8	153	23.0	17	11
Sheep/goat	17	14.4	165	32.7	208	31.2	16	9
Pig	6	5.0	32	6.3	38	5.7	1	2
Sheep-size	11	9.3	46	9.1	63	9.5	4	3
Dog	–		5	1.0	1	0.2	–	–
Cat	–		–		–		1	–
Fallow deer	1	1.1	2	0.4	2	0.3	–	–
Hare/rabbit	–		4	0.8	–		–	–
Rabbit	–		2	0.4	3	0.4	1	1
Chicken	4	3.4	6	1.2	4	0.6	1	–
Goose	3	2.5	1	0.2	2	0.3	–	–
Duck	–		–		5	0.2	–	–
?Red Kite	–		–		1	0.2	–	–
TOTAL	118		504		665		60	49

b) Weight (in grammes)

Phase	3		4		5		7		8	
Species	Wt	%	Wt	%	Wt	%	Wt	%	Wt	%
Cattle	1334	71.0	15366	67.1	15344	58.5	1430	63.4	6571	88.9
Cattle-size	254	13.4	3261	14.2	3999	15.2	378	16.8	237	3.2
Sheep/goat	161	8.5	2664	11.6	6019	22.9	400	17.7	230	3.1
Pig	84	4.4	1298	5.6	547	2.1	18	0.8	339	4.6
Sheep-size	40	2.1	188	0.9	213	0.8	27	1.3	12	0.2
Fallow deer	15	0.6	112	0.6	107	0.5	–		–	
TOTAL	1888		22889		26229		2253		7389	

TABLE 13a-b Species representation by phase (sieved bone)

Phase	4	5	8
a) mammal, bird and amphibian			
Cattle	16	4	7
Cattle-size	12	6	15
Sheep/goat	76	14	10
Pig	8	25	2
Sheep-size	17	60	22
Cattle/Sheep-size	185	45	90
Dog	4		
Hare	6	1	
Rabbit	5	2	10
Small rodent	6	1	4
Chicken	8		4
Chicken-size	22	3	12
Goose	2		2
Dove	1		
Amphibian	1	2	
b) fish			
Cod	++	++	++
Whiting	++	+	-
?Ling	+	-	-
Gadidae (small)	+	+	+
Mackerel	+	-	-
Plaice/Flounder	+	+	-
Wrasse	+	-	-
Thornback ray	+	-	-
Eel	+	-	+
?Roach	+	-	-
Pike	+	-	-
Salmonidae	+	-	-
Cyprinidae	+	+	+
TOTAL (1)	150	30	20

+ species present, ++ species most abundant

(1) approximate number of identifiable bones in each phase

THE DOMESTIC ANIMALS

In each of the topics described below the majority of the data was taken from the better represented assemblages found in phases 4 and 5.

Butchery

Cattle and cattle-size

A major feature of the butchery noticed on a very large proportion of the cattle bones (as well as the cattle-size vertebrae and ribs) is the extensive use of the cleaver. The clear intention of the observed butchery using this instrument was not only to joint the carcass but also to subdivide the individual bones within the meat-rich part of the skeleton, no doubt to produce 'soup' or 'stew' bones. Butchery inevitably followed a set pattern of dressing and halving the carcass, followed by jointing chops through or adjacent to the articular surfaces of the limb bones and vertebrae. The subdivision of skeletal parts is particularly noticeable with the ribs, those with chop marks invariably showing parallel cuts producing rib portions varying between approximately 0.15 to 0.20m in length. This overall heavy-handed pattern of butchery has been noticed at numerous other late medieval and post medieval sites in London eg within the 16th century levels at Finsbury Island Pavement (Rielly 1996).

It is worth mentioning that one of the larger assemblages, the pond backfill (663) in phase 4 trench 6, produced a number of large skull fragments, two of which were clearly poleaxed. In addition the horncores had been removed from the same skull fragments in a manner reminiscent (as mentioned in the last section) of that seen on a number of cattle horncore assemblages found within or adjacent to the city (Rielly & Pipe, forthcoming). The method generally involved two or three blows with the cleaver, the intention being to remove the horn intact without removing too much of the skull. This deposit did produce a similarly chopped horncore. However most of the removed horncores were clearly deposited elsewhere. It can perhaps be assumed that most of these skull fragments represent the waste from an abattoir/butcher, rather than from some industrial source. The opposite would appear to be the case regarding the concentrated small group of horncores found within the phase 8 trench 6 barrel. These again show the butchery method which is apparently characteristic of an industrial use.

Sheep/goat and sheep-size

Though less extensively butchered relative to the cattle bones, a large proportion of the sheep/goat fragments do show cut marks, most of which have been made with a cleaver. Unlike cattle the jointing stage appears to involve a subdivision through the limb bone shafts rather than through the articular ends. This difference is undoubtedly related to the different size of these animals and possibly the prevailing cooking methods. Similar butchery, as well as dressing and halving cuts, were found in each of the larger phase assemblages (phases 4 and 5). One of the deposits associated with the latter phase in trench 6 (414), produced a number of horncores, all of which had been chopped through at the base. It is conceivable that these were removed with the skin, as indeed may have been the majority of the metapodials found in the pond backfill (663) (see Discussion). Knife marks noted around the base of one of these horncores and to seven of the metapodials may have occurred during the skinning process.

The knife may have been more readily used as a butchery tool with sheep/goat relative to cattle. Certainly there are more indications of its use, ranging from possible skinning through to jointing and defleshing cuts.

Pig

Relatively few butchered pig bones were found, and there are certainly too few to suggest any patterns of cut marks related to particular phases. However it is clear that the subdivision of this animal involved both the cleaver and the knife.

Age

The two main ageing methods employed are tooth eruption/wear, after Grant (1975 and 1982) and epiphysis fusion, following the age sequence shown in Schmidt (1972). Regarding the former data, the eruption sequence is used here to age both mandibular and maxillary tooththrow fragments. Though Grant's methods are restricted to the mandible tooth eruption sequence, it was thought necessary to apply the same method to the maxilla, in order to increase the relatively small quantities of teeth age data. The overall age estimates are based on the information taken from both the hand collected and sieved assemblages.

Throughout this section a number of terms are used to describe relative age, each of which are characterized by a certain stage of tooth eruption and/or epiphysis fusion, as follows:

- Foetal/neonate: no teeth erupted, or at least in wear, and all epiphyses unfused.
- Juvenile: second mandibular/maxillary molar unerupted and unfused early epiphyses, eg distal humerus and proximal first phalange.
- Immature: third mandibular/maxillary molar unworn and unfused mid term epiphyses, eg distal tibia.
- Mature: the latter tooth in wear and fusion of latter epiphyses.
- Adult: the same tooth well worn (Grant's stage 'g') and all epiphyses (with the exception of the vertebrae) fused.

The quantities of bone fragments corresponding to these age groups are shown in table 14, which is limited to the better represented assemblages, ie for cattle and sheep/goat from phases 4 and 5.

Cattle

The animals whose remains were found within phases 4 and 5 are composed principally of mature/adult individuals, with a small proportion which were juvenile, immature or foetal/neonate. It can be seen that each of the smaller phase assemblages is similarly dominated by older animals. This evidence suggests that most of the cattle were exploited for some secondary product prior to their eventual use for food. Unfortunately the sexing information is insufficient to allow for an estimate of possible exploitation methods. A few of the animals represented were clearly bred for their meat, many being culled at a very young age and indicating the use of veal. It could be that such young individuals represent infant mortalities, except that a number of their bones were butchered. However there are at least two infant mortalities represented ie the foetal/neonate individuals recovered from phases 4 and 5. Such mortalities may indicate that cattle breeding took place in the vicinity of the site.

These age estimates do not take the horncore evidence into account, owing to a likely age bias imposed on any collection of cores by a selection procedure that obviously favours the larger, and therefore older, horns. However these cores can give an idea of the age distribution of mature and older individuals. The horncores from phases 4 and 8 can be categorised as follows (using the method described by Armitage 1982): phase 4, one sub-adult and one young adult (possibly 2-3 years and 3-7 years, corresponding approximately to mature and adult respectively); and phase 8, three sub-adult, two young adults and one adult (the latter about 7 to 10 years).

TABLE 14 Age distribution of cattle and sheep/goat

	Mandibles/maxillae:				Epiphyses:		Phase 5	
	Phase 4		Phase 5		Phase 4		Phase 5	
	C	S/G	C	S/G	C	S/G	C	S/G
Foetal/neonate					1	2(2)	2	
Juvenile	2	1	2	4	7	79(78)	6	6
Immature	2				1	2(1)	2	10
Mature	6	6	3	21	28	38(2)	50	53
Adult	5	4	2	11	14	24(2)	33	49

Sheep/goat

Within phase 4 the ageing evidence is dominated by the large quantity of metapodials and phalanges found in the trench 6 pond backfill (663) (see table 14). The great majority of these (76 out of 86 bone fragments) are from very juvenile animals, as indicated by the fusion state of the proximal ends of these bones. Amongst the remaining metapodials there are a small number of foetal/neonate individuals (these bones characterised by a longitudinal division of the shaft corresponding to the unfused metapodials III and IV, see Amorosi 1989, 235, 299) as well as a few immature and mature/adult individuals. A portion of the younger assemblage is likely to represent stillborn or infant mortalities ie the foetal/neonate bones. Indeed the sample from this deposit produced a small number of similarly aged bones representing other parts of the skeleton. It could perhaps be envisaged that this age group is represented by the remains of a single whole carcass. This interpretation cannot be applied to the juvenile metapodials/phalanges, as no other body parts (within the same age group) were found and, significantly, a number of the metapodials have cut marks (seven cases showing knife marks to the posterior shaft surface). As very few juvenile individuals are represented amongst the bones making up the meat bearing part of the carcass (here referring to all the phase 4 deposits), it can perhaps be assumed that these animals (which provided the metapodials) were processed and probably consumed elsewhere.

The remaining age evidence from this phase, including that from 663, clearly shows the predominance of mature/adult individuals. This indicates, as with the cattle age data, the overriding importance of one or more secondary products.

The Phase 5 deposits produced a good number of mandibles, mainly from 576, 32 of which could be aged using Grant's method (1975). The resulting mandible wear stages (MWS) were clearly divided into two groups consisting of just four mandibles between MWS 10 and 13, and the remainder between MWS 29 through to 42, this group with a peak at MWS 34. The larger group corresponds to animals which were at least mature, while the smaller age group represent juvenile individuals. This age distribution accurately reflects the

overall results of the mandible/maxilla and epiphyses fusion data from deposits dated to this phase. Clearly the importance of secondary products, as noted in phase 4, continued into the 17th century.

Though sample sizes are small, the other phases do tend to conform to the general bias towards mature and older animals.

Pig

Unlike the previous species, pig is essentially exploited solely for its post mortem products. The age distribution in any archaeological deposit will therefore inevitably be heavily biased towards the younger age groups. This site is no exception. In both phases 4 and 5, the great majority of the animals represented were within the immature and juvenile age groups. The small quantity of older animals probably represent retired breeding stock. It can perhaps be suggested that some pig breeding did take place within the vicinity of this site, at least within phase 5, as suggested by the foetal/neonate skeleton found in one of the rubbish pits. The few ageable bones recovered from the other phase deposits all represent immature or younger animals.

Size/type

All the measurements described below are taken from von den Driesch (1976), while withers heights have been calculated by using the factors described in von den Driesch and Boesneck (1974).

Cattle

The small quantities of size data from phases 4 and 5 suggest that cattle were approximately equal in size throughout this period. Two withers heights could be calculated, both from metacarpals ie 131.1cm (phase 4) and 129.1cm (phase 5). These heights, as well as the other size data, are within the range of corresponding measurements from a variety of earlier (medieval) and contemporary sites in London (archive data at MoLAS Environmental Section). There is some indication of an increase in cattle size within the later phases, as shown by the large scapula recovered from a phase 8 pitfill. In addition, five out of the six horncores found in the phase 8 trench 6 barrel were relatively large, all of which can be described as 'longhorns' in Armitage's classification system. It is perhaps significant, again in view of the possible difference in size through time, that the two horncores from phase 4 (from pond backfills) were both from 'mediumhorn' animals.

Sheep

All the measurable bones could be identified as sheep. The better represented measurements amongst these bones, from phases 4 and 5, as well as the calculated withers heights, are shown in table 15. These dimensions can be used to suggest the overall stature of the animals. Overall it would appear that the sheep represented in both phases are similarly small and gracile. Such animals typically constitute the great majority of the sheep found on medieval and early post medieval sites in London, as well as a large proportion of those found on later sites up to the 19th century (MoLAS archive data).

TABLE 15 Selected measurements of sheep bones
 All measurements in millimetres, except for withers heights which are in centimetres.
 Number equals the quantity of measurable bones.

Skeletal part	Measurement	Phase	Number	Range	Mean
Molar row of mandible	Length	4	8	44.0 - 49.2	46.6
		5	27	43.7 - 54.3	49.0
Distal tibia	Breadth	4	2	25.2 - 27.2	26.2
		5	3	25.2 - 28.3	26.7
Distal metatarsus	Breadth	4	7	23.2 - 26.2	25.1
		5	14	23.7 - 27.4	24.8
Whole limb bones	Withers height	4	8	54.1 - 62.4	58.8
		5	9	54.9 - 66.3	59.2

The similar dimensions of the sheep represented may indicate that just one type was exploited throughout the occupation period. It is conceivable that the ewes within this type were hornless, as shown by the presence of two hornless skulls from phase 5 (one of the pitfills). However it should be pointed out that the sheep used during this period may have included both horned and polled specimens within the same population (Maltby 1979, 51).

Pig

The relatively small quantities and the generally young age of the individuals represented, all conspired to reduce the number of measurable pig bones. However the few bones from mature/adult animals are all relatively small, suggesting that the presence of wild boar was, at the least, unlikely.

THE PLANT REMAINS

TABLE 16 Samples by phase and feature type

Phase/Date	Group/subgroup	Feature Type	nos. samples
2 / 11th-12th C	2.2 41.93	Waterlain ditch/channel fill Waterlain clay silt	1 1
4 / 14th-16th C	3.3a 3.4 3.4a 6.9 46.112 46.112a	Waterlain pit/pond fill Upper pond fill Waterlain pond fill Waterlain latrine fills Pond/ditch backfills Waterlain pond/ditch fills	1 1 1 2 5 2
5 / Late 16th-early 17th C	20.37 48.114 48.120 48.127 48.128	Waterlain fill of timber drain Well fill Barrel well fill Barrel fill Pit fill	1 1 1 1 1
6 / Mid-late 17th C	10.21	Trench fill	1
7 / Early 18th C	54.141	Pit fill 'horse manure'	1
8 / Mid-late 18th C	53.168	Barrel fill	1
TOTAL			22

Food plants

Cereals

These were mainly represented by 89 charred cereal grains, while several glume bases and a single rachis fragment of wheat (*Triticum* spp) were found in samples from contexts 149 and 53 respectively. Bran fragments, preserved by waterlogging, were also identified. The cereal grains were probably accidentally burnt while being dried before storage or hardened for milling into flour.

The cereals included wheat, rye (*Secale cereale*), barley (*Hordeum sativum*), and oats (*Avena* spp). Free-threshing wheats were the most numerous grains although it was not possible to establish whether these were from hexaploid or tetraploid wheats; the one free-threshing wheat rachis fragment was too poorly preserved to be identified. A single grain of possible spelt wheat (*T cf spelta*), a glume based cereal, was also recovered from a waterlaid clay silt (148). This cereal, however, rarely appears in the archaeobotanical record after the Roman period and therefore is probably residual.

The cereals (free-threshing wheat, barley, rye and oats) were represented in all phases of the site, with no significant difference in the range of cereals between the medieval and post-medieval phases of the site. A similar range of cereals has been found on both medieval and on post-medieval sites in Southwark and the City, although seldom in large quantities. For

example, medieval sites along the Southwark waterfront which contained similar grains include Winchester Palace (Giorgi, forthcoming) and Fennings Wharf (Giorgi, in prep), while excavations at the site of Abbots Lane, to the east of Battle Bridge Lane, uncovered a layer of charred barley grain in a post-medieval warehouse (Giorgi & Sidell 1993). In the City these cereals have been recovered from many sites, including from 12th to 13th century deposits in the Fleet Valley (Giorgi 1993), and in 14th to 16th century samples from the Royal Mint, east of the Tower of London (Giorgi, in prep (a)). These are also the four main cereals found in samples from sites in southern Britain throughout the medieval period, albeit in variable quantities (Greig 1991, 321).

Historical sources from the 14th century show that a wide range of cereals, including all those found in the samples but in particular wheat, were grown in the London region. Owing to the cheap cost of river transport, large amounts of grain were imported into the City along the Thames from the upper Thames valley (Campbell *et al* 1993, 24) and from Kent, a particularly important grain growing area (Galloway & Murphy 1991, 8). Some of the grain in the samples, however, may have been grown locally; for instance, early 13th century episcopal pipe rolls show that barley, rye, wheat and oats were grown on the Winchester Palace estate in Southwark (Carlin, forthcoming).

All the cereals from Battle Bridge Lane may have been used on their own (with the exception of oats) or as mixes for bread in the medieval period; wheat and rye, however, were the main bread grains in the London region (Campbell *et al* 1993, 24). Bread was eaten by all sections of society (Wilson 1991, 246), with white wheat bread, eg *manchet* (small white loaves) being the preferred and most expensive bread and a sign of status, consumed by the better off (Wilson 1991, 238). The increasing importance of white bread is reflected in the growing number of white bakers as opposed to brown bakers in London by the end of the 16th century (Wilson 1991, 246). A mix of cereals other than wheat were used to make a cheaper dark bread known as *panis de omni blado* (Wilson 1991, 242), which like the dark and heavy rye bread, was mainly eaten by the less well-off (Campbell *et al* 1993, 26).

Wheat was also used for pies and pastries (Campbell *et al* 1993, 24) and oats for biscuits. A mix of cereals were often used in pottage (Wilson 1991). An important use of barley was for brewing although occasionally wheat and oats were also used for malting in medieval London (Campbell *et al* 1993, 25). However, none of the oat and barley grains showed signs of having germinated. Barley and oat grains could also have been used as animal feed. The consumption of cereals, either as human or animal feed, is supported by the recovery of the cereal bran fragments in five samples, with particularly large quantities in phases 5 and 6 (late 16th to late 17th century).

Pulses, vegetables

Very little evidence was found either for pulses or common vegetables. A single charred pea (*Pisum sativum*) was recovered from phase 4 (14th to 16th century), while seeds from the *Brassica/Sinapis* group, which includes cabbage, swede, rape, etc, were found in eleven samples but generally only in low numbers; these may represent either cultivated species or their wild relatives. A small number of carrot (*Daucus carota*) seeds were identified in three samples although again these may either be from the cultivated or wild carrot.

Common vegetables, including the pulses, are infrequent finds as archaeobotanical remains, partly because many are often eaten before they set seed. The historical records, on the other hand, show that legumes (albeit a minority crop) were widely cultivated in the London region, particularly in Kent, in the early medieval period (Campbell *et al* 1993, 135), while common vegetables were a feature of the rapid growth of market gardening from the

16th century onwards (Weinstein 1990). Legumes were used as food for humans (eg in pottage by the poor) and as animal fodder.

Fruits

Fruits were represented by waterlogged fruit stones, fruit seeds, and nut shell fragments, and were recovered from most of the sampled phases. The fruits included fig (*Ficus carica*), grape (*Vitis vinifera*), apple/crab apple (*Malus domestica/sylvestris*), apple/pear (*Malus/Pyrus* sp), blackberry/raspberry (*Rubus fruticosus/idaeus*), elder (*Sambucus nigra*), strawberry (*Fragaria vesca*), plum/bullace (*Prunus domestica* sl), cherry (*P avium/cerasus*), sloe/blackthorn (*P spinosa*), hazel (*Corylus avellana*), and walnut (*Juglans regia*). A peach (*Prunus persica*) stone was found in one sample from phase 4 (14th to 16th century).

Fruits are the most frequent botanical remains recovered from medieval and post-medieval sites in London, in particular the small seeded fruits, grape, fig, elder and blackberry/raspberry seeds. Along the Southwark waterfront, medieval samples from Winchester Palace (Giorgi, forthcoming) and Fennings Wharf (Giorgi, in prep) produced evidence of many of these fruits, including peach from the latter site.

Vineyards were not uncommon prior to the Elizabethan period (Wilson 1991, 331) although the grapes were mainly used for verjuice (for pickling and cooking) rather than wine, which was imported cheaply in large quantities from France. Fig trees can grow in this country although they only produce immature seeds; thus, the fig seeds in the samples are probably from imported fruit. Both grapes and figs were imported into London as dried fruit in the medieval and post-medieval period from southern Europe (Cobb 1990).

Apples were one of the most extensively cultivated fruits in the medieval period and were used for cider and verjuice (Grieg 1988, 117). Pears were also grown but on a smaller scale. Documentary evidence suggests that some of the other fruits were cultivated in gardens and orchards during the medieval period. This includes plum/bullace, damsons, walnuts and hazels and strawberries (Wilson 1991, 331) although some of these fruits, together with elderberries and blackberries/raspberries, could have been collected from the wild when in season. Peach stones are not such common finds on medieval sites in London, although a peach stone was found in an earlier 13th century context from Billingsgate (Pearson, in prep). Peach trees are recorded as growing in the royal gardens at Westminster in the 13th century (Wilson 1991, 331).

All these fruits may have been used for food, drink, and other purposes; for instance elder was used for elderberry wine, in syrups, for jams, wines and as a dye. Fresh fruit, however, was rarely consumed as it was considered unhealthy, and instead was often cooked and mixed with other foods (eg cereals) for pottage (Wilson 1991, 334). Preservatives, such as jams and jellies, were also made from fruits. Figs, grapes and hazelnuts may have been stored for later consumption. Indeed, the complete hazelnuts, recovered from the fill (66) of a latrine pit (96) in phase 4 trench 3 may represent stored produce. Fruits represented in the archaeobotanical record, however, may be over-represented as the documentary evidence suggests that fruit was only eaten in limited quantities in medieval London, grain being the basis of the food supply (Campbell *et al*, 1993, 33).

Herbs

The following herbs were represented in several assemblages in phases 4 and 5, albeit by small numbers of seeds: coriander (*Coriandrum sativum*), caraway (*Carum carvi*), and fennel (*Foeniculum vulgare*). These have all previously been found in medieval and post-medieval

deposits in London although usually in small amounts. Herbs, in particular coriander and fennel, and spices were widely grown in gardens in the medieval period; caraway was both home grown and imported (Wilson 1991, 288). These herbs may have been used for flavouring, either dried or fresh. Coriander and caraway were used in 16th and 17th century cake and biscuit recipes, while fennel was used for seasoning fish dishes (Wilson 1991, 286). However, it is possible that the seeds could represent plants of waste ground.

Other potential food plants

Some of the wild plants represented in the samples, now considered common weeds of disturbed ground and waste places, may have sometimes been collected for food. For instance, the leaves of many plants, eg nettles (*Urtica* spp), docks (*Rumex* spp), goosefoots/oraches (*Chenopodium/Atriplex* spp), may have been picked from gardens/wild habitats and added to pottage or eaten as green vegetables. The seeds of these plants were recovered from many of the samples from Battle Bridge Lane, although they were mainly represented by low numbers of seeds. As these plants are high seed producers and were present in mixed assemblages, it is more likely that in this instance that they simply represent weeds.

Medicinal plants

Many of the wild plants found in the samples, eg henbane (*Hyosyamus niger*) and opium poppy (*Papaver somniferum*), could have had medicinal uses, according to the medieval herbals, although the difficulty once again is establishing whether such plants were ever used or simply grew as weeds on the site. A use could be implied when such plants are well represented in fairly clean (ie low species diversity) assemblages. For example, a large number of black nightshade (*Solanum nigrum*) seeds were found in the sample from the barrel fill 576 from phase 5 trench 6. This plant was used to cool hot inflammations and treat shingles, ringworm and ulcers (Culpeper, nd 251-2).

Commercial/industrial plants

A number of plants represented in the samples may be from the residues of commercial and/or industrial activities. Cultivated flax (*Linum usitatissimum*), hemp (*Cannabis sativa*), and weld/dyer's rocket (*Reseda luteola*) are all plants that could have been used in the textile industry and were present in most phases of the site. The fibres of flax and hemp were used for canvas and cloth and oil from the seeds of both plants used for cooking and lighting. Flax seeds were also used in bread and stews (Greig 1988, 122). Dyer's rocket produces a yellow dye and was also used in the textile industry. Large numbers of seeds of this plant were found in a pondfill (245) in phase 4 trench 2, which interestingly corresponds to a period when a dyer was living on the site.

These plants have been found at other Southwark medieval waterfront sites; for example, large quantities of flax seeds were found in medieval dumps/foreshore samples at Winchester Palace (Giorgi, forthcoming). However, both flax and hemp were represented by low numbers of seeds and therefore may simply represent weeds or escapes from cultivation.

Large numbers of hop (*Humulus lupulus*) seeds were found in nine samples from 14th to late 17th century deposits (phases 4 to 7). Hops were increasingly used in brewing for flavouring and as a preservative from the late medieval period onwards (Wilson 1991, 376). Indeed, documentary and cartographic evidence shows that this area was used for brewing from the 16th to 18th centuries and thus the large assemblages of hop seeds in the later

deposits may represent the residues associated with such activities. Excavations on an adjacent waterfront site to the east, Abbots Lane, also produced archaeobotanical evidence for brewing with an extensive deposit of barley, supported by documentary evidence for a brewery in the area (Giorgi & Sidell 1993).

Miscellaneous uses of the plants

Some of the plants represented in the samples, may be from the residues of garden plants. For instance, box (*Buxus sempervirens*) leaves, found in a sample from a pond/ditch fill (741) from phase 4 trench 6 (14th to 16th century), was grown as an ornamental garden hedging plant (Grigson 1975). Box leaves were also found in medieval waterfront samples from Winchester Palace (Giorgi, forthcoming). During the medieval period, most garden flowers were the unimproved wild varieties, and several species, found in the samples, eg violet (*Viola* sp),ampions (*Silene* spp), mallows (*Malva* spp) and ‘buttercups’ (*Ranunculus acris/repens/bulbosus*), are present in Harvey's (1981) list of garden plants. These may have been growing in the gardens of tenements along Tooley Street and Battle Bridge Lane, shown on the Agas woodcut of c1550.

A number of the grassland and wetland plants, eg rushes (*Juncus* spp), sedges (*Carex* spp), represented in the samples by seeds and stems, could be the residues of hay fodder crops, bedding, or thatching/flooring materials for timber framed buildings on the site, or used to dampen the smells of cess/rubbish pits. Rushes and sedges are particularly well represented at other Southwark waterfront sites, eg Fennings Wharf (Giorgi, in prep), although these could be simply a reflection of the local environment. The collection of wood, presumably for a variety of purposes, such as for building and fuel, is indicated by charcoal fragments in all samples and wood fragments in several samples.

The environment

A high seed abundance and species diversity was present in both the late medieval and post-medieval samples from the site, plants from a wide range of habitats being represented. The use of urban plant assemblages for information on the character of the local environment is limited by the problems of distinguishing the residues of used plants and imported weeds from plants growing on site or close-by, and the variation in seed production and dispersal of species; for example, many disturbed ground weeds and also some wetland plants, such as rushes, sedges, being high seed producers, may be over-represented in the samples, while grassland plants, usually low high seed-producing plants, are often under-represented.

An interpretation of the assemblages is best approached on a sample by sample basis in association with any other available environmental or archaeological data, for information on the nature of the local habitat and the possible function of the sampled features. This is done within the main body of the text. However, a general overview of the range of species present and the habitat categories that they represent shall be given to avoid species repetition.

Wetland plants

These were well represented in the samples by aquatic plants, eg stonewort (Characeae), water-plantain (*Alisma* sp), duckweed (*Lemna* spp), pondweed (*Potamogeton* spp), horned pondweed (*Zanichellia palustris*), bulrush/reedmace (*Typha* sp), celery-leaved crowfoot (*Ranunculus sceleratus*), spike-rush (*Eleocharis palustris/uniglumis*), and bankside/

marshland species, eg rushes, sedges (both very well represented), gipsy-wort (*Lycopus europaeus*), and a number of *Ranunculus* species.

The good representation of such species is indicative of the close proximity of the site to the river, the damp nature of the site and the character of some of the sampled features, eg pond fills. Some of the damp meadow plants, however, eg sedges, rushes and ‘buttercups,’ may have been incidentally imported onto the site along with hay crops or for building/flooring purposes. A similar range of wetland plants was found in various sampled features from medieval deposits excavated along the Southwark waterfront, in foreshore/dump deposits at Winchester Place (Giorgi, forthcoming) and Fennings Wharf (Giorgi, in prep).

Disturbed ground plants

This covers a large number of the wild species represented in the samples. These plants can grow in a range of disturbed ground habitats, eg in waste places, gardens, and arable fields, and are often well represented because they are from high seed-producing plants. Stinging nettles (*Urtica dioica*) and goosefoot/oraches (*Chenopodium/Atriplex* spp) are characteristic of nitrogenous waste ground (eg rubbish tips) associated with human activity. Some of the disturbed ground plants may represent arable weeds, harvested and imported with the cereal crops, eg corncockle (*Agrostemma githago*), corn marigold (*Chrysanthemum segetum*), and stinking mayweed (*Anthemis cotula*). Other weeds of waste places and disturbed ground include chickweed (*Stellaria media*), various species of *Polygonum*, eg knotgrass (*P. aviculare*), *Sonchus* spp, docks (*Rumex* spp), and thistles (*Carduus/Cirsium* spp). Disturbed ground plants are frequently found in medieval and post-medieval samples in London, including the Southwark waterfront sites mentioned above.

Grassland plants

These were represented by a small range of plants characteristic of grassland/meadow environments. This includes ‘buttercups’, self heal (*Prunella vulgaris*), hawkbit (*Leontodon* sp), grasses (Gramineae) and possibly some of the wetland plants, eg rushes. Some of these plants may have been growing in grassy clearings around the site, while others may have been imported along with, or as part of, hay crops.

Scrub/hedgerow/woodland plants

This includes many of the fruit species such as apple/pear, elder, strawberry, blackberry/raspberry, hazel, and some of the *Prunus* species, which, however, may not be an indication of local vegetation, but the residues of food consumption. Other shrub/hedgerow plants were bryony (*Bryonia dioica*), hemlock (*Conium maculatum*), and agrimony (*Agrimonia* sp), with the presence of leaves of box (*Buxus sempervirens*) presumably representing garden waste (see above).

TABLE 17: The plant remains

	Habitat															
	Phase	2	4													
	Gp/Subgp	2.2	41.93	3.3a	3.4	3.4a	6.9	19.37	46.112							
	context	7	148	9	245	246	66	66	747	663	702	710	714	741	711	745
	sample no.	1	5	2	11	12	3	23	44	31	32	33	35	37	34	50
Charred remains																
<i>Triticum cf. spelta</i>	FI		1													
<i>T. aestivum</i> type	FI		1									8				
<i>Triticum</i> sp.	FI		2													
cf. <i>Secale cereale</i>	FI		1													
<i>Hordeum sativum</i>	FI		2					1				1		1		
<i>Avena</i> sp.	AFI		2											1	10	
Cerealia	FI		8									5	2	7		
<i>Pisum sativum</i> L.	FI													1		
Leguminosae indet.	-	1														
<i>Lolium</i> sp.	BI							1								
<i>Bromus</i> sp.	ABD											1				
<i>Avena/Bromus</i> sp.	ABCDFI											1				
Gramineae indet.	ABCDEFHI				1									1		
indeterminate	-												+++			
indeterminate (wood frags)	-	+++	+++		++	++	++	++	++		++			+++		++
Waterlogged remains																
Cerealia	FI								++							
Characeae	E					+										++
<i>Ranunculus acris/repens/</i> <i>bulbosus</i>	ABCDEG	+		++++	++	+	+	+	+	+	+	+	+	+	++	++
<i>R.flammula</i> L.	EG			++												
<i>R.scleratus</i> L.	E		+	+		+										
<i>R.subgen. Batrachium</i> (DC)A	E															+
<i>Thalictrum flavum/minus</i>	DE			+												
<i>Ranunculus</i> spp.	ABCDEG			+++	++	+	++	+	+	+	+	+	+	+	++	++
<i>Ceratophyllum demersum</i> L.	E															+
<i>Chelidonium majus</i> L.	BC			+								+				
<i>Fumaria</i> sp.	ABC								+							
<i>Brassica</i> spp.	ABFI															+
<i>Brassica/Sinapis</i> spp.	ABFGHI			++	+				++	+		++	++	+		
<i>Raphanus raphanistrum</i> L.	A				+											

TABLE 17 (contd)	context	7	148	9	245	246	66	66	747	663	702	710	714	741	711	745
	sample no.	1	5	2	11	12	3	23	44	31	32	33	35	37	34	50
Waterlogged remains (contd)																
<i>Reseda luteola</i> L.	ABGHI			+	++++	++		++				+		++		
<i>Viola</i> spp.	ABCDG					+	++	++++		++		+				
<i>Silene</i> spp.	ABCDF			+						+		+	+			
<i>Agrostemma githago</i> L.	AB			++	+	+			+			+		+		
<i>Stellaria media</i> gp.	ABCDE		+	+		++	+	++	+			+		++		+
<i>S. graminea</i> type	CD			++				+		+++				+	++	
<i>Stellaria</i> sp.	ABCDEG				+					+						
<i>Spergula arvensis</i> L.	ADF								+							
<i>Montia fontana</i> ssp.	AE	+								++						
<i>chondrosperma</i> L																
<i>Chenopodium</i> spp.	ABCDFH	+	++	++	+	+	++	++	+	++		+	+	+	++	++
<i>Atriplex</i> sp.	ABFGH						+	+	+			+			+	+
<i>Linum cf. usitatissimum</i>	HI								+							
<i>Buxus sempervirens</i> L.	CI													+		
<i>Vitis vinifera</i> L.	FI	+			+		+		++	+		+	+	+		
<i>Medicago arabica</i> (L.)Huds.	BD								+							
<i>Medicago/Trifolium</i> sp.	ABDI															+
<i>Rubus fruticosus/idaeus</i>	CFGH		++	+		+	+	+	++	+					+	+
<i>Potentilla</i> sp.	BCDEFGH	+						+								
<i>Fragaria vesca</i> L.	CDF								++							
<i>Potentilla/Fragaria</i> spp.	BCDEFGH				+		+		+			+				
<i>Agrimonia</i> sp.	C			+					+	+						
<i>Prunus spinosa</i> L.	CFG							+						+		
<i>P. domestica</i> L.	CFI			+			+		++							
<i>P. persica</i> (L.)Batsch	FI							+								
<i>P. avium</i> type	CFG					+		+								
<i>Prunus</i> sp.	CFG					+		+								
<i>Pyrus/Malus</i> spp.	CFI				+			+					+	+		
<i>Coriandrum sativum</i> L.	FGI								++						+	
<i>Oenanthe</i> spp.	DE			+												
<i>Aethusa cynapium</i> L.	A			+				+								
<i>Conium maculatum</i> L.	CEG	++++							+							
<i>Apium</i> sp.	EFI				+											
cf. <i>Carum carvi</i>	BFGI								+					+		
<i>Torilis</i> sp.	ACD												+			
<i>Daucus carota</i> L.	ADFGI							+							+	

TABLE 17 (contd)	context	7	148	9	245	246	66	66	747	663	702	710	714	741	711	745
	sample no.	1	5	2	11	12	3	23	44	31	32	33	35	37	34	50
Waterlogged remains (contd)																
Umbelliferae indet.	-							+	+				+			
Bryonia dioica Jacq.	CG															
<i>Euphorbia peplus</i> L.	AB								++							
<i>Polygonum aviculare</i> agg.	ABG			++	+	+	+	+	+			+	+		+	
<i>P. persicaria</i> L.	ABEH					+			+							
<i>P. lapathifolium</i> L.	ABE							+						+		
<i>P. hydropiper</i> /mite	E							+								
<i>Fallopia convolvulus</i> (L.) A. Love	ABF			+					+							
<i>Polygonum</i> sp.	ABCDEFGF					+										
<i>Rumex acetosella</i> agg.	AD			+++	+			+								
<i>Rumex</i> spp.	ABCDEFGF			+++	+	++	++	+	+			+	+	+	+	+
<i>Urtica urens</i> L.	AB							+								
<i>U. dioica</i> L.	BCDEFGH	++	++	++		++	+	+	++	+				+	++	+
<i>Humulus lupulus</i> L.	CGHI				+++	+			+++					+	+	
<i>Cannabis sativa</i> L.	BGHI		+	+					+					++		
<i>Ficus carica</i> L.	FGI			+		+	+	+	+++	+		++		++	+	
cf. <i>F. carica</i>	FI												+			
<i>Juglans regia</i>	FHI			+									++	++		+
<i>Corylus avellana</i> L.	CF		+	+			++	++	+					+		
<i>Hyoscyamus niger</i> L.	BDG		+													
<i>Solanum nigrum</i> L.	BF				++		+	+						+		+
Solanaceae indet.	-				+											
<i>Verbena officinalis</i> L.	BG							++				+			+	+
<i>Lycopus europaeus</i> L.	EH			++++	+	++									+	+
<i>Prunella vulgaris</i> L.	BCDG			++++										+	+	
<i>Lamium</i> sp.	ABC					+										
cf. <i>Marrubium vulgare</i>	BG			+	+	+	+	++	+							
Labiatae indet.	-			+		+	+	+	+							
<i>Plantago major</i> L.	ABC	+					+									+
<i>Galium</i> sp.	ABCDE			+												
<i>Sambucus nigra</i> L.	BCFGH		++	+	+	++	++	+	++	++					++	++
<i>Calendula</i> sp.	GHI					+	+++									
<i>Anthemis cotula</i> L.	ABGH			++	+				+	+			+	++		
<i>Chrysanthemum segetum</i> L.	AHI				+	+								+		
<i>Carduus/Cirsium</i> spp.	ABDEG			+		+	+	+				+	+	+	+	+
<i>Centaurea</i> cf. <i>nigra</i>	BDG			+												

TABLE 17 (contd)	context	7	148	9	245	246	66	66	747	663	702	710	714	741	711	745
	sample no.	1	5	2	11	12	3	23	44	31	32	33	35	37	34	50
Waterlogged remains (contd)																
<i>Centaurea</i> sp.	ABDGH			+					+							
<i>Lapsana communis</i> L.	BCF					+	++	+								
<i>Leontodon</i> sp.	BDF			++	+		+									
<i>Sonchus oleraceus</i> L.	AB		+		+	+	+	++								+
<i>S. asper</i> (L.) Hill	AB			+	+	++		++		+				+		+
<i>Sonchus</i> sp.	ABE	+					+	+	+							
<i>Taraxacum officinale</i> Weber	BDFGH				+	+	+									
<i>Alisma</i> sp.	E				+		+									
<i>Potamogeton</i> spp.	E				+								+	+	++	
<i>Zannichellia palustris</i> L.	E				+											
<i>Juncus</i> spp.	ADEH	+		+	+	+				+++		++++		++	++	++
<i>Lemna</i> sp.	E			+	+++								+		+	
<i>Typha</i> sp.	E								+							
<i>Eleocharis palustris/uniglumis</i>	E			+	++				+			+				
<i>Carex</i> spp.	CDEH	+	++	++++	+++	++	+++	+++		+++		+++	++	++	+	++
Gramineae indet.	ABCDEFHI					+			+				+			+
indeterminate	-	++	+	+	+	+	+	++	++	+		+	+	+	+	
indeterminate (leaves)	-	+					+++	++					+	++		
indeterminate (buds)	-						++									
indeterminate (stems)	-	++				++		+++				+++	+++	++	++	+++
indeterminate (vegetative frags)	-	++				+++		+++		+				+++	++	
indeterminate (thorn)	-						++		+							
indeterminate (wood frags)	-	++		++++	+++	++	+++	+++	++++				+++	++		+
Bryophyta indet.	-			+	+++	+++	+		++			+++	+++	++++	++	+++

TABLE 18: The plant remains

Species	Habitat phase gp/subgp	5				6		7	8
		48.114	.120	.127	.128	10.21	50.141	53.168	
	context	659	523	576	501	53	624	718	
	sample no.	25	15	16	13	4	22	38	
Charred remains									
<i>Triticum</i> cf. <i>aestivum</i> type	FI					1			
<i>T. aestivum</i> type	FI					15		2	
cf. <i>Secale cereale</i>	FI					2			
<i>Triticum/Secale</i> spp.	FI					3			
<i>Avena</i> sp.	AFI	1							
Cerealialia	FI					14		1	
Gramineae indet.	ABCDEFHI			1					
indeterminate	-	+	+	++	+	+		+++	
Waterlogged remains									
Cerealialia	FI	+++	++++	++			+++		
<i>Ranunculus acris/repens/bulbosus</i>	ABCDEG		++	+++	++				
<i>R. flammula</i> L.	EG		+						
<i>R. sceleratus</i> L.	E	+							
<i>Ranunculus</i> spp.	ABCDEG	++	++	+					
<i>Chelidonium majus</i> L.	BC				+				
<i>Fumaria</i> sp.	ABC	+							
<i>Brassica/Sinapis</i> spp.	ABFGHI		+	+	++			+	
<i>Raphanus raphanistrum</i> L.	A				+				
<i>Nasturtium officinale</i> R.Rr	EFI			+					
<i>Reseda luteola</i> L.	ABGHI			+			+	+	
<i>Viola</i> spp.	ABCDG		++	+				++	
<i>Silene</i> spp.	ABCDF	+				++	+	+	
<i>Agrostemma githago</i> L.	AB			++	+++				
<i>Stellaria media</i> gp.	ABCDE	+++	++	+					
<i>S. graminea</i> type	CD	+	+					+	
<i>Stellaria</i> sp.	ABCDEG							+	
cf. <i>Spergula arvensis</i>	ADF				+				
Caryophyllaceae indet.	-			+					
<i>Montia fontana</i> ssp. <i>chondrosperma</i> L.	AE	+		+	++		++	+	
<i>Chenopodium</i> spp.	ABCDFH	+		+	++		+	+	
<i>Atriplex</i> sp.	ABFGH		+					+	
<i>Malva</i> sp.	BCDF		+						
<i>Linum</i> sp.	ADHI				+				
<i>Vitis vinifera</i> L.	FI	++		+	+	+		+++	
<i>Medicago arabica</i> (L.) Huds.	BD			+					
<i>Medicago</i> sp.	BD				+				
<i>Rubus fruticosus/idaeus</i>	CFGH	+	+	+	+			++	
<i>Potentilla/Fragaria</i> spp.	BCDEFGH	+	+					+	
<i>Prunus spinosa</i> L.	CFG	+							
<i>P. domestica</i> L.	CFI	+	+	+	+			+	
<i>P. avium</i> type	CFG			+	+			+	
<i>Prunus</i> sp.	CFG	+						+	
<i>Malus domestica/sylvestris</i>	CFHI			++					
<i>M. domestica/sylvestris</i>	CFHI			+++					
<i>Pyrus/Malus</i> spp.	CFI			+	++				
Rosaceae indet.	-		++						
<i>Chaerophyllum</i> sp.	CD				+				
<i>Aethusa cynapium</i> L.	A		+		+			+	
<i>Foeniculum vulgare</i> Miller	BDFGI			+	+				
cf. <i>Apium</i> sp.	EFI			+					
cf. <i>Carum carvi</i>	BFGI			+					
<i>Daucus carota</i> L.	ADFGI			+					
Umbelliferae indet.	-		+	+					

TABLE 18: The plant remains (contd)

	context	659	523	576	501	53	624	718
	sample no.	25	15	16	13	4	22	38
Waterlogged remains (contd)								
<i>Bryonia dioica</i> Jacq.	CG				+			
<i>Euphorbia peplus</i> L.	AB		+++	+	+			
<i>Euphorbia</i> sp.	ABCDEFGH			+				
<i>Polygonum aviculare</i> agg.	ABG			+++	++			
<i>P. persicaria</i> L.	ABEH	+			+			
<i>P. lapathifolium</i> L.	ABE	+			+			
<i>Fallopia convolvulus</i> (L.) A. Love	ABF	+			++			
<i>Polygonum</i> sp.	ABCDEF						+	
<i>Rumex acetosella</i> agg.	AD			++	+			++
<i>Rumex</i> spp.	ABCDEFG	+	+	+	++			+
<i>Urtica dioica</i> L.	BCDEFGH	+		+				+
<i>Humulus lupulus</i> L.	CGHI	++++		+++	++++		+++	
<i>Ficus carica</i> L.	FGI	++	+	++	+			++
<i>Corylus avellana</i> L.	CF	+	+	+		+		
<i>Solanum nigrum</i> L.	BF		++	++++				
Solanaceae indet.	-	+						
<i>Verbena officinalis</i> L.	BG							+
<i>Calamintha</i> sp.	D				+			
<i>Prunella vulgaris</i> L.	BCDG			+				
<i>Lamium purpureum</i> cf. <i>Marrubium vulgare</i>	AB		++					
Labiatae indet.	-		++		+		+	+
<i>Sambucus nigra</i> L.	BCFGH	+	++	+	+	+		+
<i>Anthemis cotula</i> L.	ABGH				++			
<i>Chrysanthemum segetum</i> L.	AHI			+				
<i>Carduus/Cirsium</i> spp.	ABDEG	+		+	+			
<i>Centaurea</i> sp.	ABDGH				++		+	
<i>Lapsana communis</i> L.	BCF		++++	+	+			
<i>Leontodon</i> sp.	BDF		+		+			
<i>Sonchus oleraceus</i> L.	AB	+		++				
<i>S. asper</i> (L.) Hill	AB	+	+	+	+			+
<i>Juncus</i> spp.	ADEH	+	++			+		+
<i>Lemna</i> sp.	E	+						
<i>Typha</i> sp.	E			+++				
<i>Eleocharis palustris/uniglumis</i>	E				+			
<i>Carex</i> spp.	CDEH	++	++	++	+++	+	+	+++
Gramineae indet.	ABCDEFHI	+						
indeterminate	-	+	+	+	+	+	+	+
indeterminate (stems)	-		++	++	+++			++
indeterminate (vegetative fragments)	-	+++		++				
indeterminate (thorn)	-		++					
indeterminate (wood fragments)	-	+++	+++	+++	+++		+++	+++
Bryophyta indet.	-			++				++

key: A=weeds of cultivated land; B=weeds of waste places and disturbed ground; C=plants of wood, scrub and hedgerows; D=grassland plants; E=plants of damp or marshy land; F=edible wild plants; G=medicinal plants; H=wild plants with other economic uses; I=cultivated plants