Chapter 6
Production, trade, transport and communication in the Thames Valley

INTRODUCTION (Fig. 6.1)

The principal concern of most Thames Valley communities throughout the first millennium was farming. In terms of understanding the economy of the region, therefore, 'production' is essentially agricultural, the raising of enough crops and animals to guarantee survival, to meet the requirements of levies and taxes imposed from above (whether by local 'chief' in the late Iron Age, Roman tribal and provincial authorities or late Saxon manorial lord), and provide a surplus to be traded or exchanged for commodities and (occasionally) luxuries not produced within the local community. It is relatively rarely, however, that excavated structures and artefacts shed direct light on the nature of agricultural practice, and documentary sources are of minimal significance for this subject until the late Saxon period. The great majority of the evidence therefore derives from detailed study of animal and plant remains themselves, which has only become routine in the last thirty years or so. Pioneering work in these areas was undertaken in the Upper Thames from the early 1970s, with the result that for the later prehistoric and Roman periods this is one of the best-studied regions of England from the point of view of integration of environmental and economic data with the more traditional components of the archaeological record. This evidence has been summarised in whole or in part on several occasions (eg Robinson 1981; Robinson and Lambrick 1984; Robinson and Wilson 1987; Robinson 1992a; 1992b; Lambrick 1992; Henig and Booth 2000, 154-159) and further detailed work and overviews undertaken more recently will add very significantly to understanding of the Upper Thames (eg Ingrem 2007; Robinson 2007). The evolving picture can now be supplemented with comparable data from sites in the Middle Thames, although these are generally fewer, but many questions and uncertainties remain, even for the Upper Thames. The middle Iron Age background to the agricultural regimes of the valley is set out in some detail below because of the basis that it provides for what follows.

The agricultural regimes of the valley, while falling generally within a recognisable southern British framework, nevertheless have their own character, reflecting in part the particular environmental conditions of the region. These in turn were not uniform, but related to topographical, hydrological and pedological characteristics which differed in broad terms between the Upper and Middle Thames, but could also exhibit marked local variation within these wider zones. Some of the resulting variation in agricultural practices may thus have been environmentally determined, but other aspects may have resulted from social and economic factors. Over the first millennium AD there were many elements of continuity in agricultural practice, in relation both to arable and pastoral regimes, but examination of the detailed evidence, where this is present in sufficient quantity (as for example in the area of the Cotswold Water Park and at Yarnton), suggests that gradual but more or less continuous processes of evolution were underway. There are no obvious closely-defined periods of radical change in the region in this period, but the long-term changes are such that late Iron Age, middle Roman and late Saxon farmsteads in the same general location (for example at Yarnton) would have exhibited some quite marked differences of character.

These differences reflected not only the cumulative processes of change in agricultural practice, but also chronological and, to a lesser extent, spatial variations in the underlying socio-economic structure. A feature of the agricultural regime in parts of the Upper Thames, for example, is the evidence for specialisation, particularly with regard to stock raising. The implication of even a moderate degree of agricultural specialisation is that its practitioners were integrated into an economic system operating beyond the level of simple subsistence (the evidence discussed below implies that such systems were already well-established in the pre-Roman Iron Age) – and it is of course likely that other farmers, although not obviously engaged in specialisation, were also operating at this level. Agreement on the nature of the Roman economy remains elusive (cf Scheidel and Von Reden 2002; also Gerrard 2002), but some understanding is important for interpreting the developments outlined below. Did these represent 'natural' processes of evolution consequent upon the availability of new technologies and techniques for improvement of plants and animals by selective breeding? Were they part of a range of reactions to the need to increase production simply in order to meet the requirements of taxation? Were there status-related stimuli (for example based on aspirations to emulation of Roman ways, of the sort inferred from 'face-value' readings of Tacitus' *Agricola* 21) to produce surpluses for investment in buildings of Romanised form and decoration or in other aspects of an integrated provincial lifestyle?

The distribution of coinage, a particularly distinctive facet of the Roman material culture 'package', is one index of the integration of settlements into wider socio-economic networks. Coins were of course circulated in the late Iron Age, but many of these were in precious metals and, despite some claims to the contrary, it is not likely that they were in routine use for market or other transactions. This situation did not change very rapidly in the early Roman period. Coins were used in military and urban communities from the conquest period onwards, but special measures were required in the conquest period to provide small change to the military at a time when appropriate denominations were not being struck by the main official mints. Even when this situation was remedied in the AD 60s coinage of any denomination was not particularly common (or at least, not commonly lost) in towns and villas, and was extremely rare outside these contexts for another 200 years, although Howgego (1992, 19-21) has argued that coin was widely used in the early Roman period as a means of exchange in the northern provinces.

A hoard of 126 gold aurei from Didcot, dated *c* AD 160 (Bland and Orna-Ornstein 1997), is quite exceptional in the region (Fig. 6.1). It represents a very considerable capital sum and suggests the level of prosperity to which at least some local landowners might aspire (though the identity and status of the depositor are of course unknown). Only after the middle of the 3rd century did low value coinage became relatively widespread for the first time. Nevertheless, issues of the later 3rd century are still significantly more common in major settlements than in rural contexts, although they do occur regularly in hoards, sometimes of considerable size, both in our region, as for example at Chalgrove, and beyond. It was not until the second third of the 4th century that coins became routine finds on contemporary lower status rural settlements. The hinterland of Cirencester, including the Upper Thames, then shows above average coin loss in the third quarter of the 4th century, suggesting particularly intensive activity and extensive coin circulation at this time, a pattern which seems to have continued to the end of the 4th century (Moorhead 2001, 95-6). After the 370s, however, absolute numbers of coins (as reflected by site finds) declined to the extent that it is not possible to be certain that the absence of coins of the last period of regular issue to Britain (AD 388-402) necessarily indicates the end of occupation on rural

Fig. 6.1 The Didcot hoard of 126 aurei (British Museum)

settlements, as opposed to the larger centres, where such coins are relatively well-represented. The significance of the distribution of these coins is therefore uncertain, but the distribution of hoards of this period in the valley has a striking gap between London and Reading (Guest 1997, 417, showing post-393 hoards) contrasting with the small cluster of such hoards at Dorchester (Reece 1984) and in neighbouring areas (cf Henig and Booth 2000, 181). This may support the view that an uneven distribution of these latest coins across southern Britain was not accidental.

Estimates of the date of deposition of the latest identifiable coins vary, but few would suggest that these coins remained in routine circulation for more than a generation or so after their period of minting. Occasional later pieces, particularly in precious metals, may have occurred, but it was their intrinsic value that was important; the concept of a fiduciary (token value) coinage seems to have been rapidly abandoned and did not re-emerge within our period (for a succinct summary, Archibald *et al*. 1997, 208-9). Roman coins are found in later contexts, particularly in Anglo-Saxon graves, but these occurrences almost certainly reflect a curiosity and/or amuletic value or, in a few cases, a specific but non-monetary function, for example as weights. Overall, the ability of Anglo-Saxon communities to survive without money seems to reflect the evidence from many rural settlements for much of the Roman period: the role of money was limited. Its principal importance probably lay in relation to the need to pay taxes – and it is unsurprising that if coinage was used mainly in this context it did not find its way into the archaeological record of rural sites. Beyond this, coinage seems not to have been a prerequisite for day to day exchange in many smaller communities – perhaps because sufficiently small monetary units did not circulate before the later Roman period. Once available, they were utilised, but only for a limited period. The disappearance of coins, as a longer term consequence of the cessation of movement of coinage into Britain to pay the army, probably resulted in the rapid collapse of the market based parts of the economy that were integrated into the monetary system, but need not have had a fundamental effect on daily life in the countryside. When late Roman rural settlement patterns were disrupted, it was for reasons other than the collapse of a partly monetary-based economy.

THE LATE IRON AGE

Agriculture

The middle Iron Age agricultural background

This section provides a brief overview of the background to late Iron Age agriculture. The evidence for early and middle Iron Age farming is considered in detail elsewhere (Lambrick *et al*. forthcoming). By the middle Iron Age, both the Upper and the Middle Thames regions had developed agricultural economies. Evidence for the crops grown comes from the study of plant remains, which can survive in charred or waterlogged condition. In the Upper Thames Valley the arable economy was based on the cultivation of spelt wheat (*Triticum spelta*) and six-row hulled barley (*Hordeum vulgare*), both of which had been major crops from at least the start of the Iron Age. Emmer wheat (*Triticum dicoccum*) forms a very small proportion of middle Iron Age assemblages in the region and may have been no more than a contaminant. A few rachis nodes of rye (*Secale cereale*) were found at Mingies Ditch (Jones 1993), but this crop is otherwise unknown in the Upper Thames Valley before the mid Saxon period. It is likely that remains of oats (*Avena* sp.) were from wild species, and there is no evidence for the cultivation of flax (*Linum usitatissimum*). Only limited use seems to have been made of wild food plant resources such as hazelnuts and berries, and there is no direct evidence for the management of woodland. The main domestic animals were cattle, sheep, pig and horse. Evidence suggests that pigs were the only domestic animal kept for meat alone, while cattle would also have been kept for milk, breeding and traction, and sheep for the production of wool and milk. Remains of edible wild vertebrates are uncommon and not from animals hunted for food.

The Upper Thames Valley agricultural landscape was well organised, with arable fields on the gravel terraces (particularly the higher terraces). It is likely that both autumn and spring sowing were practised, and fields were probably cultivated using a scratch ard. Cereal grain was stored on a large scale on higher gravel terrace sites in pits typically about 1.5 m deep and 1.0 m in diameter. On the floodplain, where the high watertable would have prevented the use of pits, four-post structures seem to have been used for above-ground storage. The charred waste from the heating of grain in order to dehusk it for final cleaning is commonly found on settlement sites. During the late spring, summer and autumn most of the floodplain would have been available for grazing for cattle and horses, and the drier ground of the upper terraces would have provided good pasture for sheep. There were extensive tracts of grassland on the higher terraces in at least some parts of the region.

In the Upper Thames Valley, some settlements on higher ground used subsidiary settlements to exploit the floodplain and it is possible that there was a high degree of interdependence between settlements. It is also possible that surpluses of grain or stock were produced for trade with other areas or to support elite sites. The gravels of the Upper Thames Valley were probably one of the more heavily populated and agriculturally productive areas of the British Isles during the middle Iron Age. Overall, however, the agricultural system in

the Upper Thames Valley was under some pressure, soil fertility was declining in some cultivated fields and the increasing wetness of the floodplain was resulting in pasture being damaged by overgrazing. Nevertheless, this was certainly not a system in crisis, and, as will be seen for the Roman period, retained potential for further agricultural intensification.

The evidence from the Middle Thames is much more limited. The same range of crops was grown and the same range of domestic animals was kept. The relative importance of the various plant and animal species was also probably similar. However, the scale of agricultural activity was probably less. This was in part perhaps because the soils of the Middle Thames terraces tended to be less fertile than those of the Upper Thames terraces. An island of 1st terrace at Dorney which supported some settlement showed no evidence for cultivation despite its topographical suitability.

The late Iron Age

Agricultural specialisation

In the Upper Thames the fundamental character of late Iron Age agriculture, in terms of the principal crop (spelt wheat and barley) and animal species raised, was broadly similar to that of the middle Iron Age, but there were developments in both pastoral and arable areas. The late Iron Age and early Roman period generally has been seen as one of innovation in arable agriculture (eg Jones 1981). This may be true for our region, but it is important to distinguish, where possible, pre-conquest developments from those that occur later and may only have been initiated as a consequence of post-conquest influences on south-eastern Britain. The evidence for change in this region relates more clearly to pastoral than to arable agriculture. This is perhaps most evident at sites such as Thornhill Farm. Here there were already indications of pastoral specialisation in the middle Iron Age, but further signs of intensification in the late Iron Age are identified in the environmental data, which indicate the existence of extensive dung-enriched grassland with an absence of arable (Robinson 2004a, 141). This is seen both at Thornhill Farm and at nearby Claydon Pike, to the extent that 'The primary, possibly the sole, purpose of the late Iron Age settlement complex of Thornhill Farm and Claydon Pike appears to have been the management of grazing in the valley bottom' (ibid., 143), although it is possible that this represented no more than a (fairly large scale) local development. In this area of floodplain and islands of the 1st terrace the heavily-grazed grassland with ill-drained tussocky areas in the floodplain hollows may have covered several square kilometres of the valley bottom. Clearly environmental conditions in this area were conducive to such use, but this is unlikely to be the only reason why the area developed in this way. The underlying social factors are not so easily identified, however.

Specialist traditions of pastoral use had been established in the middle Iron Age in the Windrush Valley at sites like Mingies Ditch and Watkins Farm on the floodplain and 1st terrace respectively, as well as on the Thames floodplain at Farmoor, but it is notable that none of these sites was occupied in the late Iron Age and into the early Roman period, though the last two both had evidence for activity from the 2nd century onwards. What is striking about late Iron Age Thornhill Farm and Claydon Pike, in contrast, is the extent of the settlement associated with the pastoral regime. Cereals were used on these sites, but probably supplied by parent settlements elsewhere. Given the relatively low-lying situations of these sites and the associated presence of *Lymnaea truncatula* (marsh snail, the intermediate host of sheep liver fluke), there is likely to have been an emphasis on the raising of cattle or horses rather than sheep, as was the case for floodplain settlements in the middle Iron Age.

This anticipates a change seen in the Roman period, in which cattle generally become more numerous at the expense of sheep, which had tended to dominate middle Iron Age animal bone assemblages. Sheep of course remained very important in the Roman period, particularly at sites on the Cotswold dip slope and on the Berkshire Downs, but in the valley the move towards concentration on cattle rearing seems to have been underway in the late Iron Age if not earlier. Despite this trend, the particular emphasis on cattle raising in the Thornhill Farm area appears exceptional. Other trends include an apparent increase in the frequency of domestic fowl, which were found in late Iron Age contexts at Ashville and Barton Court Farm (Bramwell *et al*. 1986). Three cat bones were also identified at Barton Court Farm, although at least one is more likely to have been from *Felis sylvestris* (wild cat) than *F. domesticus* (domestic cat) (Wilson 1986); it is not always possible to distinguish between bones of the two. The kill-off pattern of the domestic animals was typical of flocks and herds being exploited for secondary products.

There are further sites from which the quantities of plant remains (including cereals) are limited to the extent that they too suggest a strong pastoral emphasis, even when direct evidence for animals is also scarce. In the Middle Thames the latter can be a consequence of acidic soils which have militated against the survival of substantial animal bone assemblages, although not apparently at Cippenham (Slough) where a pastoral emphasis is thought likely, but with no clear indications of specialisation (Ford *et al*. 2003, 159).

Elsewhere in the Upper Thames there is more evidence for mixed agriculture. This was clearly the case in the late Iron Age (and later) at Barton Court Farm. At Gravelly Guy (Stanton Harcourt), for

example, it is likely that the edge of the gravel terrace was under arable at this time. The settlement seems to have been located between the arable and the main area of pasture, which lay on the (2nd) gravel terrace, continuing a long-established pattern (Lambrick 1992, 90; Lambrick and Allen 2004).

The relative importance of the different cereals was variable. For example, spelt was the dominant cereal at Gravelly Guy (supplemented here by emmer), Barton Court Farm and Thames Valley Park (Reading), at both of which emmer was also present but was less common than barley (Miles 1986, fiche 9:F4; Carruthers 1997, 76). A much smaller sample from Old Shifford contained a higher proportion of barley than of spelt (Robinson 1995, 165). Evidence that *Triticum aestivum* (bread-type wheat) was a minor crop comes from Barton Court Farm where both grain (named as *T. aestivo-compactum*) and chaff were identified (Jones 1986). At nearby Ashville this species, which had been present earlier in the Iron Age, had disappeared by the end of the Iron Age at the latest (Jones 1978, 103). Certain types of weeds indicate that some cereals (certainly spelt) were autumn sown at many sites (eg Robinson 1995, 165). At Gravelly Guy a considerable rise in leguminous seeds was noted in the late Iron Age/early Roman samples. This may indicate a change in the ecology of at least some of the crop fields, although whether this change was due to altered methods of husbandry or to a decline in soil fertility, or both, is unclear. It is possible that manuring and/or crop rotation including fallowing were practised as part of a generally increasing intensification of arable land management, comparable to what Jones (1978) suggests for the Roman period at Ashville (Moffet 2004/5, 445).

Trade

There is relatively limited evidence for trade at this time, but it is likely that some trends established earlier in the Iron Age were intensified. Long distance distribution of pottery is rare, but a few vessels of 'Roman' type imported from the continent can be identified. Before the conquest these include amphorae in the Upper Thames Valley – there is now evidence for a scatter of wine amphorae of Dressel type 1, for example – but the majority of Gallo-Belgic wares (principally cups and dishes, from north-eastern Gaul) are likely to have reached the area in the aftermath of the conquest. The Cirencester area and, to a rather greater extent, Silchester were the principal locations of consumption of imported pottery before the Roman conquest. Very little of this material occurred in the typical rural settlements of the valley. It is likely that when imported vessels are identified, such as the Dressel 1 amphorae from sites as diverse as Ashton Keynes and Little Lea Park, or a terra nigra cup fragment from Yarnton, they represent socially embedded distribution mechanisms (ie processes of gift-giving which enhance the prestige of both donor and receiver, rather than conventional trade; cf Fitzpatrick 2003, 22). Such distribution networks were perhaps ultimately based on the centres of Bagendon and Silchester (for Ashton Keynes and Little Lea respectively), but Abingdon and Dorchester, where Gallo-Belgic wares have also been found (Timby *et al*. 1997, 13; Frere 1962, 132-4), may have played a role, though it is uncertain if the material from these sites is of pre-conquest date.

Not only fine pottery and containers of exotic substances were distributed over long distances, however. By the late Iron Age there were long-established links between the Upper Thames and Worcestershire to the north-west. The most significant aspect of this connection was probably the movement of salt from the important source at Droitwich. The distinctive briquetage (ceramic) containers of this material are found in small quantities as far down the Thames as Yarnton, although it is not always clear whether this distribution was maintained right into the early Roman period. Malvernian pottery was, however, a regular (and sometimes quite significant) component of late Iron Age/early Roman assemblages in the Upper Thames in Gloucestershire, for example at Horcott (Timby and Harrison 2004, 60; cf Booth 2007) and it is thought likely that these vessels would have been traded alongside the salt, though their source areas are slightly different. There is less evidence for the long distance movement of non-imported pottery further down the Thames, but salt containers are again an indicator of such trade: briquetage of a type produced on the Hampshire coast has been found at Abingdon (Allen 2000, 26). It is associated there with quern stones from the well known source at Lodsworth in East Sussex. These stones were widely distributed in the early Roman period, but occur at Abingdon in demonstrably pre-conquest contexts as well. Together this evidence indicates a fairly strong southerly bias in Abingdon's trading connections at this time. In this context it is noticeable that Abingdon lies at the northern margin of the distribution of late Iron Age coins attributed to the Atrebates (ibid., 31; see also Chapter 7, below). Down river from this area, Lodsworth querns are quite common both in the late Iron Age (eg at Thames Valley Park, Reading; Barnes *et al*. 1997, 47-48) and early Roman periods, but there is still a lack of evidence for other relatively long distance late Iron Age trade.

Both north-westward and southward looking trade patterns reflect connections established earlier in the Iron Age – the links with the Malvern/Droitwich area of Worcestershire were of particularly long standing. The more or less mutually exclusive patterns of these distributions may relate to their character, rooted in social relations and perhaps already prefiguring the extents of later tribal 'territories'.

THE ROMAN PERIOD

Agricultural and horticultural developments: overview

The processes of development in agricultural practice already hinted at in the late Iron Age continued into the early Roman period and beyond, although it is often very difficult to distinguish between pre-conquest and post-conquest phases within the broader late Iron Age/early Roman period. In most cases the events of AD 43 will have had no immediate bearing on day to day agricultural practice. Some of the characteristics of late Iron Age agriculture discussed above may have been defined on the basis of samples that were in reality of early Roman date. Other developments do seem to be more clearly identified within the Roman period, however, as also is direct evidence of agricultural processes in the form of structures and implements.

The major cereal crops and the main domestic animals remained the same. Secondary products from the domestic animals continued to be of great importance. The settlements undertook mixed farming, with those on the higher gravel terraces placing an emphasis on arable agriculture. Those on the 1st terrace were involved in the management of floodplain grassland. As a result of rising flood levels, the specialised settlements on the floodplain did not continue into the Roman period. Despite the evidence for increasing specialisation in the late Iron Age (see above), there is relatively little indication that such trends were greatly intensified through the Roman period. Rather, what is seen appears to represent (usually) an enhancement of existing practices within the context of mixed agriculture. It is quite possible that in some cases enhancement processes were prompted by or resulted in 'specialist' production, but if so this is not readily identified from the existing archaeological record.

Exotic food plants were introduced with the conquering army. Initially, they were imported from the continent and only consumed by the invaders but before the end of the 1st century AD there was a market for them in the towns. Many of these plants were well-suited to local horticultural cultivation and were taken up on the rural settlements. The towns also saw various exotic crops which cannot be grown in Britain; dates, for example, were found in deposits of *c* AD 60 at Colchester (Murphy 1984). A greater range of food plants may have occurred in the early Roman small towns of the region but evidence is at present lacking. Diet also changed with greater use being made of wild mammals, fish and birds, possibly as a result of a relaxation of a taboo against their consumption, while better communications enabled marine oyster to be imported from the coast. By the mid 3rd century AD, it seems the diet of the inhabitants of the Upper Thames Valley had become very Romanised, with the consumption of spicy, oily food (Robinson 1992a, 58). The exotic horticultural crops, and perhaps oysters, were even being eaten on very low-status sites. Wheat beer may have been an innovation introduced from the Roman north-west provinces, although production of an alcoholic beverage in an Iron Age context using wet sprouted grain would not necessarily be evident from the archaeological record.

Changes also occurred in the organisation of the landscape related to increased arable production, with the extension of cultivation onto higher areas of floodplain and the ploughing up of grassland on the 2nd terrace. It is very likely that other geologies, such as the Oxford Clay, were part of the agricultural system which included the gravel terraces and that grazing was intensified on them. The management of grassland for hay was probably a Roman innovation. This enabled the wet areas of the floodplain to be more productively managed and some of the hay was probably used to overwinter more animals in settlements than in the middle Iron Age.

The early Roman period brought major economic changes. There would have been a ready market for agricultural produce in the towns but it is uncertain whether any crops were specifically grown as cash crops which were not also used on the settlements which produced them. The majority of rural settlements probably undertook mixed agriculture to provide for the occupants of the settlement and to generate a surplus. The improved transport system would have greatly facilitated long distance trade and it is possible, for example, that in addition to supplying the towns, surplus grain was exported from the region. Specialist production may have been carried out at sites such as Claydon Pike, where the biological evidence suggested an emphasis on the production of hay. The corresponding technological developments included the much wider use of iron for agricultural implements, such as ploughs and long-bladed scythes for reaping, particularly of hay. New technologies for storing and processing grain were also developed. The pastoral economy benefited from some improvements in livestock, particularly with regard to size, though this development was far from universal.

Agriculture in the early Roman Period

Early Roman impact

The Roman invasion of AD 43 had an immediate impact in terms of exotic food plants introduced with the Roman army. Waterlogged evidence has been discovered in the early sediments of the ditches of a fortress annex at Alchester which has a dendrochronological date of October AD 44-March AD 45 for the felling of the timber used for its gateposts (Sauer 2002). A fragment of a seed of *Coriandrum sativum* (coriander) was found in a deposit which contained many fragments of cereal bran and a fragmentary seed of *Agrostemma githago* (corn cockle) (Robinson 2000). Such material is characteristic of human sewage. Careful excavation of a bronze wine strainer from a waterlogged ditch

enabled sampling of sediment trapped between the sieve of the strainer and its spout. This contained 24 seeds of *Apium graveolens* (celery). Small quantities of charred cereal remains including glumes of *Triticum spelta* (spelt wheat) were found in the annex ditches. A charred grain of *Panicum miliaceum* (common millet) was identified from the very early silting of the outer ditch.

This range of plants is of considerable interest, particularly because of its very early date. Coriander is a Mediterranean herb which was valued in the classical world for the flavour it imparts to cooked dishes. Celery is a plant with a wide distribution in Europe including a few coastal marshes in Britain. Its seeds too were valued in classical cookery, but they were also used to sweeten wine which had deteriorated, a likely reason for their occurrence in the wine strainer. Spelt wheat could have been obtained locally, but millet never seems to have been a crop in Iron Age or Roman Britain although it was grown in Northern Gaul. It is unsurprising that food flavourings appear to have been brought by the army. The occurrence of the millet and the grain weevil *Sitophilus granarius* (see above, Chapter 2) suggests that grain had been imported to Alchester from the continent. This would have ensured that a failure to obtain sufficient grain from the Britons did not jeopardise the invasion in its earliest stages.

The animal bones from the military phase at Alchester included remains of the principal domestic species: cattle, sheep, horse, pig and dog (Grant 2000, 63). There was a relatively high proportion of horse bones, as would be consistent with the assumption that the garrison at Alchester included cavalry (Sauer 2000). It is likely that the horses would have been brought from the continent because of the time it takes to train a horse for military use. In contrast, the small size of the sheep suggested that they had been obtained locally. The butchery techniques used to dismember and divide up the sheep, however, were not in the British Iron Age tradition of careful butchery cuts made with a fine sharp blade but were rather haphazard cut marks made with a heavy tool.

In addition to the evidence for military diet, cone fragments and nuts of *Pinus pinea* (stone pine) were found preserved in the waterlogged ditch sediments. While the nuts are a delicacy, they need not have been imported in the cones. Cones of *P. pinea* were widely used in Roman ritual both in Italy and in Northern Europe (Robinson 2002a, 89). They were burnt in votive offerings and have also been found in cremation burials. The remains from Alchester are interpreted as from cones imported by the army for religious purposes.

Plants

While Alchester shows the immediate impact of the Roman conquest the pace of change in the rural settlements of the Upper and Middle Thames was more gradual. The same basic cereals were grown as in the middle Iron Age, six-row hulled barley and, particularly, spelt wheat, the latter dominating most assemblages from the top of the valley (eg at Neigh Bridge, Somerford Keynes) to the Staines area (eg Hurst Park, East Molesey and Thorpe Lea Nurseries, Egham). These species retained their importance throughout the Roman period. *Triticum dicoccum* (emmer wheat), which, like spelt, requires special processing to release the grains from the husks, probably occurs more frequently in early Roman than middle Iron Age charred assemblages. It is possible that emmer was grown as a crop in its own right but it is usually only found as a small component of mixed assemblages where it need have been no more than a volunteer in spelt crops. As with emmer, *Avena* sp. (oats) are somewhat more likely to have been a crop than in the middle Iron Age. Even so, most of the early Roman records are likely to have been of wild oats occurring as weeds. As such they might have been tolerated, along with other weed species, as boosting the volume of the crop. All these species, along with *Secale cereale* (rye) were identified from early Roman contexts at Staines (McKinley 2004, 28).

Free-threshing bread-type wheat is occasionally present in very small quantities but on most sites it need have been no more than a minor weed of other cereal crops. Jones (1984b, 123) placed a much greater emphasis on the importance of the cultivation of bread wheat in the late Iron Age and into the Roman period, suggesting it could have been linked to increased manuring. However, his evidence was largely based on a Saxon site in Buckinghamshire originally misdated as late Iron Age (cf Campbell and Straker 2003). Despite the appearance of bread wheat at sites such as Barton Court Farm, spelt wheat remained the dominant cereal in most of the samples examined there, including those from the late Roman villa phases of the site. It has been suggested that the presence of bread wheat is an indicator of particularly intensive agricultural regimes, such as might have been associated with villas, but this is not supported by the evidence from the Thames Valley. While it was present at Roughground Farm (Letts and Robinson 1993, 176), the samples from this site were far too small. It was absent from Gatehampton Farm and poorly represented at Claydon Pike. At the 'non-villa' site at Mount Farm, Berinsfield, bread wheat does seem to have increased in importance in the late Roman period, (Lambrick 1992, 97). It may have been regarded as a speciality crop – unlike spelt it was not used for malting. Elsewhere its occurrence is erratic although it was quite well represented in the early Roman period at Staines (McKinley 2004, archive S17-18). As will be seen below, bread wheat was the main wheat of the Saxon period.

Pulses present somewhat of a problem of interpretation. They were undoubtedly being grown in the region during the early Roman period, for example a single carbonised seed of *Vicia faba* v. *minor* (field or celtic bean) was identified from the

settlement at Yarnton in the Upper Thames Valley while carbonised examples of *Pisum sativum* (pea) were identified from the early Roman settlement at Dorney in the Middle Thames Valley. Rather larger quantities of peas and some field beans were found at Staines (ibid., 28, archive S17-18), perhaps a reflection of pulses being popular in towns. These crops tend to be under-represented in the charred record because fire need not be part of their processing prior to cooking and their seeds are not readily preserved by waterlogging. It is possible that both peas and beans were significant crops in the region during the early Roman period, although it is unlikely that they were grown on as large a scale as in the medieval period.

Flax (*Linum usitatissimum*) is another potential field crop which rarely enters the charred record, although it is readily preserved by waterlogging. Since processing of the plant for its fibres often involved the soaking of plants in water this probably explains why flax remains are found in waterholes and wells, even though these generally consist of seeds and capsules derived from threshing. Such remains are quite frequently found on settlements, especially in the Upper Thames Valley, including at some early Roman sites such as Claydon Pike (Robinson 2007). In addition to providing the fibres used to make linen, flax seeds are oil-rich. The capsule fragments were probably from the threshing of the harvested plants and the extraction of the seeds, which could either have been crushed and cooked with cereals to make a porridge or pressed and boiled to extract oil. The oil is edible but could also have been used for lighting.

The most evident impact of the Roman conquest on cultivated plants was the introduction of a great range of horticultural crops. For example, plants from the Phase 3 settlement at Claydon Pike, which began in the early 2nd century AD, included:

Brassica sp. (not *nigra*) ?cultivar (cabbage)
Coriandrum sativum (coriander)
Prunus domestica (plum)
Apium graveolens (celery)
P. avium (cherry)
Anethum graveolens (dill)
cf. *Pyraster pyraster* (pear)
Satureja hortensis (summer savoury)

All were probably Roman introductions, it being more likely that the celery was grown from imported seeds, rather than being domesticated again from plants in British saltmarshes. It is likely that the celery was grown for its aromatic seeds rather than its fleshy leaf petioles. Cherry is often thought of as a native member of the British flora and plum regarded as a pre-Roman introduction. However, all the pre-Roman records of these fruits quoted in Godwin (1975) are dubious (Moffet *et al.* 1989). Two other plants, *Papaver somniferum* (opium poppy) and *Brassica nigra* (black mustard), although plausible settlement weeds, were both grown by the Romans for culinary purposes. Seeds from a variety of *Brassica* species, not just *B. nigra*, could have been used as flavourings. Remains were also found of *Buxus sempervirens* (box) and *Pinus pinea* (Mediterranean stone pine) which served either ornamental or ritual purposes. Box is a native plant of chalk and limestone scarps in southern England which was widely grown for ornamental purposes in Roman Italy but some finds from Roman Britain, such as the occurrence of box leaves in coffins, suggest that it also had ritual associations and it could for example have been used for making wreaths or dressing representations of deities with garlands during ceremonies. Stone pine can be grown from seed to produce cones in profusion in the Upper Thames Valley in under 20 years, but whether imported or grown locally, the cone of *Pinus pinea* (stone pine) from Claydon Pike was probably used in a ritual of some sort.

Imported exotic foods were probably commoner in the towns. Some evidence for this was given by the discovery of calcium phosphate mineralised seeds of fig (*Ficus carica*) in a pit of AD 120-200 at Staines (McKinley 2004, archive S26). The presence of much mineralised cereal bran in the pit showed it to have been a latrine. There is also artefact evidence from the site for exotic foodstuffs; Spanish olive oil amphorae were found in early Roman contexts (ibid., 29).

The Phase 3 settlement at Claydon Pike shows a strong Roman influence in its layout, although there is no clear evidence that its occupants were other than Romanised Britons. The preceding phase of the settlement, which extended from the late Iron Age to the end of the 1st century AD, was 'native' in character and had no exotic horticultural crops. However, some of the new plants did reach early Roman settlements of low status on the Thames gravels before the end of the 2nd century AD. There was evidence from Farmoor, on the 1st terrace of the Upper Thames, that a tree of *Prunus domestica* ssp. *insititia* (bullace plum) grew adjacent to a 2nd-century waterhole (Lambrick and Robinson 1979).

Coriander illustrates the spread of the horticultural crops well. As noted above, it was introduced to Alchester with the conquering army. It continued to be used there although it is uncertain whether a seed from a later 1st-century AD ditch belonged to the military phase or the civilian town which developed on the site (Robinson 2000, 65). By the end of the 1st century AD, it was present at the Faccenda Chicken Farm site, a roadside extramural settlement just north of Alchester (Giorgi and Robinson 1984, 40). It is quite possible it was being grown locally to supply the Romanised occupants of the town rather than being imported. Subsequently, its cultivation became widespread. Coriander was also present on low-status sites in the Middle Thames Valley, for example at Thorpe Lea Nurseries (Robinson, forthcoming b).

Wild food plants do not seem to have been of great importance although charred hazel nut shell

fragments are still present. Charcoal from early Roman sites indicates that both scrub or hedgerow and woodland were being exploited for fuel, with Pomoideae (hawthorn, apple etc), *Prunus* sp. (sloe etc), *Quercus* sp. (oak) and *Corylus avellana* (hazel) all commonly being found. Charcoal of *Fraxinus excelsior* (ash) is more prevalent than previously, possibly because there were some standard ash trees in hedges. The wood used to revet wells shows how different types were selected for different purposes. An early Roman well at Farmoor had a lining of upright poles of *Quercus* and *Fraxinus* around which were woven horizontals of *Corylus* and *Fraxinus*. The *Quercus* uprights were fast-growing straight poles of the sort produced under coppice conditions. Confirmation of the management of woodland resources was given by the discovery in the well of part of a large *Quercus* coppice stool from which about ten poles had been cut. Some oak structural timbers survived amongst the remains of a late 2nd-century town house at Staines (McKinley 2004, 39).

Bracken was imported to settlements, although perhaps on a smaller scale than in the Iron Age. Another heathland resource, gorse, was found in quantity in a well at Thorpe Lea Nurseries, which is close to the edge of Bagshot Heath (Robinson forthcoming b). The young shoots can be used as fodder and dried gorse is a particularly good fuel for bread ovens. It has already been mentioned that some floodplain grassland in the Upper Thames Valley was managed as hay meadow. The importance of this is indicated by a variety of archaeological evidence. Remains of cut hay including pods of *Vicia* or *Lathyrus* sp. (vetch), flowers of *Trifolium* sp. (clover) and seeds of *Rhinanthus* sp. (yellow rattle), *Leucanthemum vulgare* (ox-eye daisy) and *Centaurea* cf. *nigra* (knapweed) were found in early Roman wells at Farmoor and Claydon Pike (Lambrick and Robinson 1988; Robinson 2007). Insect faunas indicative of old damp hay, straw or other plant material such as might have accumulated on the damp floor of a stable or barn came from a well at Thorpe Lea, in which this material had presumably been dumped (Robinson forthcoming b).

Animals

All the domestic animal species noted for the middle and late Iron Age continued to be kept and the range was expanded with the addition of donkey (*Equus asinus*), found in late Iron Age/early Roman contexts at Claydon Pike and Thornhill Farm, while mule was also probably present at Thornhill Farm. There was a general tendency for Roman domestic animals to be somewhat larger than their Iron Age counterparts. This trend was most evident for cattle at Barton Court Farm and probably began in the early Roman period (Wilson 1986). Some of the sheep at Barton Court Farm were polled (hornless). The increase in size could in part have been brought about by improved conditions of animal husbandry, including perhaps winter feeding with hay, but it is also likely that new breeds were brought in from the continent, which could account for the hornless sheep. Individual polled sheep have also been recorded at Roughground Farm (Jones and Levitan 1993, 172), Farmoor (Wilson 1979, 132) and Wantage (Maltby 1996, 161). The last of these was certainly of early Roman date, though the others may have been later.

Cattle was generally (but not always) the dominant species, followed by sheep/goat and then pig. Horse occurred in varying numbers and was sometimes more common than pig. Preservation of animal remains is quite variable across the valley, but is generally better in the Upper Thames than in the Middle Thames. Partly as a consequence of this there are very few substantial animal bone assemblages from rural settlements in the Middle Thames. The general Romano-British trend is that cattle increased in importance within the period at the expense of sheep/goat. Broadly this is true of the Upper Thames, where the particular emphasis on cattle rearing in the Cotswold Water Park sites of Thornhill Farm, Claydon Pike and others, already established in the late Iron Age, was maintained. The character of this area, with much evidence for damp pasture (see above) was well-suited to such use. Further downriver, in a slightly different setting on the 2nd terrace, sheep/goat were still numerically more important than cattle in the late Iron Age/early Roman phase at Gravelly Guy, for example.

The general trends can mask variation linked to the character or status of individual sites, and indeed intra-site variation. Consumer sites will show different patterns of animal remains from producer sites. The early military phase assemblages at Cirencester, for example, have high levels of cattle, and another Cirencester site with very high cattle representation, St Michael's Field, was located near the forum and a possible *macellum* and could represent specialist butchery waste (Maltby 1998, 354-5). The early and late Roman animal bones from Staines followed an urban pattern with a higher proportion of cattle and pigs than on most rural sites, while the absence of calves and aged cattle distinguished the assemblages from rural producer sites (McKinley 2004, 28). The difference between producer and consumer sites is rarely clear cut, however; most rural sites will have combined elements of both, and the same may be true of some of the larger nucleated settlements. The Cirencester groups often have a higher proportion of mature cattle than seen elsewhere, perhaps reflecting their use for meat after earlier exploitation for other purposes. This may be an extreme example of a wider pattern, because there is a clear change in cattle mortality between the late Iron Age/early Roman period and the Romano-British period, whilst the Saxon assemblages in turn resemble the earlier ones. Late Iron Age and Saxon assemblages are marked by a greater proportion of animals in the 18-30 month age range while in the Romano-British assemblages the kill-off is more evenly spread.

Overall, early Romano-British species representation shows more variability than in the late Iron Age. Despite the trend away from sheep towards cattle in this period, occasional high frequencies of sheep bones can occur on Roman sites that are not seen in late Iron Age assemblages. High frequencies of pig bones are also more characteristic of nucleated consumer sites – Yarnton is exceptional amongst lower status rural sites in having more than 15% pig in the early Roman period.

Yarnton also illustrates clearly a very different aspect of the evidence to be obtained from animal bones. Here, as at some other sites, there was continuity of the practice of making special deposits of animal remains, though admittedly in smaller quantities than in the Iron Age. This indicates the survival of the traditional attitudes of a community for whom animals provide both food and social meaning through time. The changing nature of British society and the assimilation of new developments in the settlement changed the emphasis of animal husbandry strategies but did not entirely exclude the role of 'special deposits' (Mulville *et al*. forthcoming; see also Chapter 5).

There is limited evidence for supplementation of the main components of the meat diet from other sources. Domestic fowl are found quite widely from the late Iron Age onwards, and as well as fowl, domestic duck and goose were found at Claydon Pike. Elsewhere it is less clear if bones of these species belong to domestic or wild birds. Quail and pigeon are also attested at Claydon Pike, and heron at Thornhill Farm, all in late Iron Age to early Roman contexts. In this period Barton Court Farm produced evidence for a rather greater variety of wild animals; these included red deer, fox, cat, duck and fish bones of pike, eel and cyprinid. In general, bones of edible wild vertebrates become more common on early Roman sites than previously and include bird and fish as well as mammal. This development is not, however, shown on sites which retained their Iron Age character, for example the 1st century AD Roman phases of Claydon Pike, and Thornhill Farm (Charles 2004, 133) – although relatively poor preservation might have been a complicating factor. Red deer (*Cervus elaphus*) is always present in the late Iron Age/early Roman assemblages where there is any wild mammal bone, while the next most commonly represented species (in terms of number of assemblages rather than number of bones) is roe deer (*Capreolus capreolus*). Fox (*Vulpes vulpes*) and weasel (*Mustela nivalis*) also occur. Marine molluscs make their first appearance as an imported food resource during this period. *Ostrea edulis* (oyster) is by far the most common, although shells of other edible species are occasionally found. The freshwater bivalves *Anodonta* sp. (swan mussel) and *Unio* sp. (duck mussel), which were probably abundant in the Thames and its tributaries, do not seem to have been exploited.

Workers of *Apis mellifera* (honey bee) have been found in early Roman contexts at Thorpe Lea Nurseries in the Middle Thames and at Claydon Pike in the Upper Thames Valley (Robinson 2007). Bee-keeping was practised in the Roman world and it is very likely that colonies were kept on some settlements.

Some of the best evidence for butchery from the regions was given by the early and late Roman bone assemblage from Staines (McKinley 2004, 29). The butchery, especially of cattle, followed a distinctively Roman pattern, with heavy-bladed implements being used for the separation of joints, de-boning and chopping into small pieces. A number of cattle vertebrae had been axially chopped, suggesting carcasses were hung up and split, a technique rarely seen on rural sites. Some cattle scapulae had perforations possibly from hanging and curing.

Land management (Figs 6.2-6.7)

Although there were changes to settlement layout on the gravels and the ditched trackways linking settlements possibly served to create land divisions in a landscape which had become more highly organised, much of the middle Iron Age system of land management probably continued throughout the early Roman period. Settlements on the higher terraces engaged in mixed agriculture but with a particular emphasis on cereal cultivation. Settlement had withdrawn from the floodplain, but floodplain grassland was exploited by settlements on the 1st terrace. The ratio of cattle to sheep on the 1st terrace was greater than for sites on the higher terraces. The importance of grazing in the area may be reflected in the plan of sites such as Old Shifford (Fig. 6.2).

The early Roman period, however, experienced an increase in intensity of agricultural exploitation. Some developments were related to using the landscape to its best potential. The rationalisation of farming in the Gravelly Guy area after the 2nd century, where what had been grassland on the 2nd terrace became cultivated, was probably part of this process. Likewise, the management of parts of the floodplain as hay meadow would have prevented the damage from the trampling by stock that had been occurring on some sites due to grazing when conditions were too wet. Indeed, once seasonal inundation began, the floodplain would have become ideal for hay production. The flooding and alluviation would have introduced nutrients from the river. The underlying gravel allows the floodplain soil to drain in the summer, when the water table is lower, reducing the problems that permanent waterlogging of the soil causes to grass growth. The floodplain is also dry enough for the aftermath which follows the hay cut to be grazed, thus preventing the establishment of coarse herbaceous vegetation which would otherwise reduce the value of the hay.

Other developments were occurring in opposition to changing environmental conditions. Just as the floodplain was becoming wetter, cultivation

was being extended onto its higher parts, for example at Drayton and Yarnton. The field at Yarnton was protected from floodwaters by a small embankment.

Spelt wheat and six-row hulled barley were probably grown as autumn and spring-sown crops over large areas of the gravel terraces but special provisions would have been needed for some of the new crops. Flax, which was probably not entirely absent during the Iron Age (despite a lack of present evidence) but which seems now to have been grown on a larger scale, would have been well-suited as a spring-sown field crop on the high areas of floodplain and the 1st terrace. It is uncertain whether pea and bean were grown on a large-enough scale to be field crops or whether they were only grown in horticultural plots around the settlements. The various herbs, spices and vegetables were probably grown in plots at the settlements. All can easily be cultivated in the region, with the exception of coriander, for which there is a relatively narrow window of opportunity for sowing in the spring between the soil being too cold, resulting in the seeds rotting rather than germinating, and the soil starting to dry out, which encourages seedlings to run to seed as small plants. The fruit trees could have been grown as standards, beneath which grass was grazed.

The botanical evidence for intensification of arable production suggests an increase in the volume of production in the Roman period. The implications of this have to be interpreted with caution, however. Intensification might well correlate with expansion of population, for example, but might only indicate aggregate growth in agricultural production rather than the significant 'per capita' growth which is a prerequisite for identification of economic 'development' (Saller 2002, 257-8). The latter scenario is possible, however, and would be in line with a general view that the period of the early empire saw 'modest, though significant, economic growth' (Hopkins 1995-6, 57), in agriculture as well as in trade.

Whatever the wider context of arable intensification in the valley, however, there is no doubt that there were technical and perhaps also organisational developments in agriculture. The latter may be hinted at by the unusual find of a so-called dodecahedron from Gill Mill, Ducklington (Fig. 6.3). The function of these objects, of which about a dozen are known from Britain (Hill 1994), has been the subject of much speculation, but recent work, discussed by

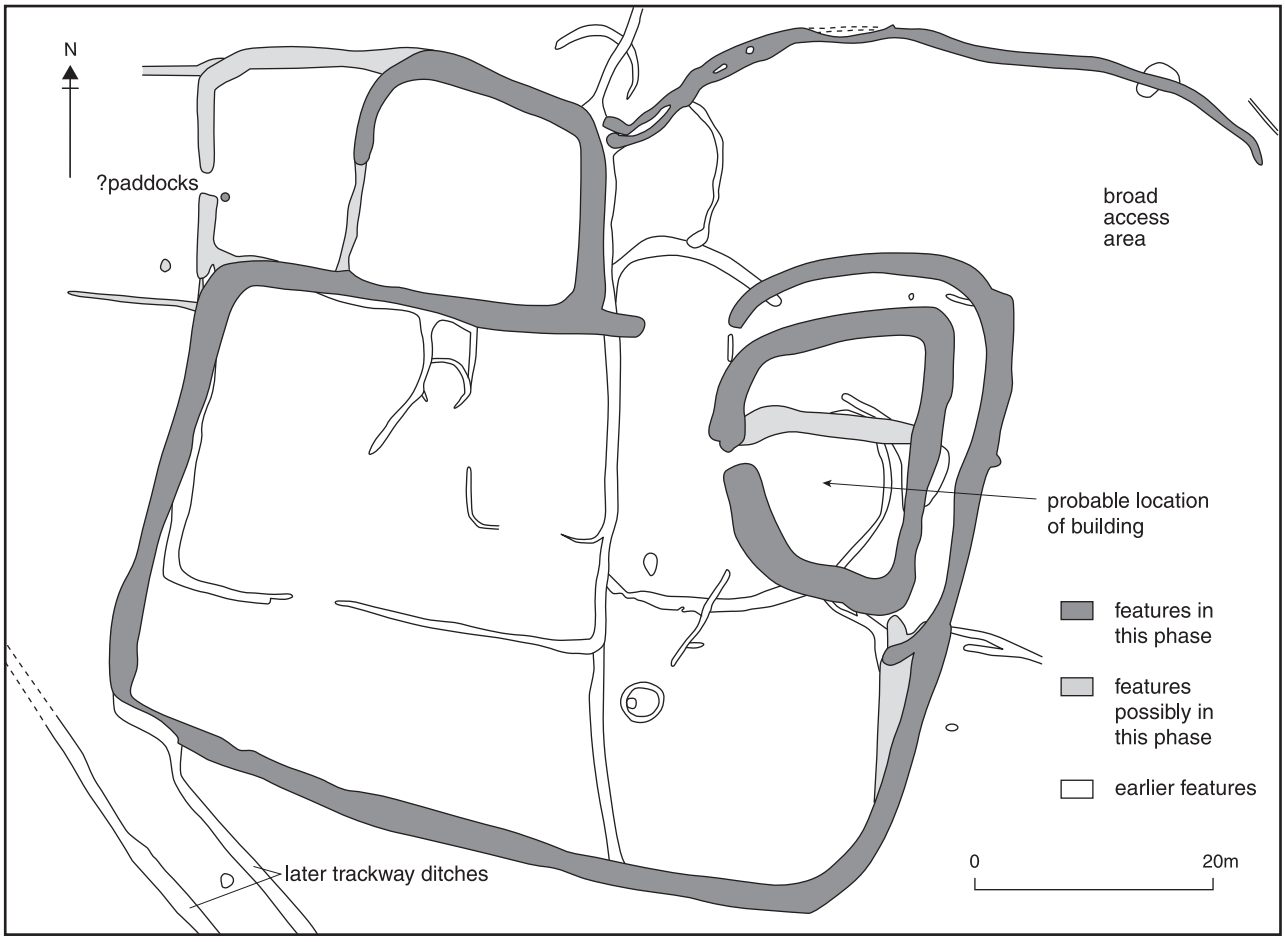


Fig. 6.2 Old Shifford, Oxfordshire, Phase 3 settlement, 1st century AD

Van Driel-Murray (2002, 98), suggests that they could have been used to measure the angle of the sun and thence to establish an agricultural calendar. The ability to calculate in advance the occurrence of equinoxes, for example, would have been very useful in predicting sowing times and suggests an interest in planning the agricultural cycle that extended beyond the requirements of subsistence farming. It might well also have been linked to cycles of religious observance connected with the agricultural calendar, in which case the occurrence of this object at Gill Mill, a site with some known religious associations, is probably not coincidental.

More tangible are developments in the technologies of cultivation and, particularly, of processing grain. The plough marks in the early Roman fields at Drayton (Barclay *et al*. 2003, 110-116) were in the characteristic criss-cross pattern produced by a simple ard plough (that pushed aside the soil rather than turning it over) of the type in use in the late Iron Age and earlier (Fig. 6.4). The same may have been true of plough marks from Anslow's Cottages, Burghfield (Butterworth and Lobb 1992, 97, 175), although the date of these seems less certain. Such a plough is represented by a wooden share from a 3rd-century AD well deposit at Ashville Trading

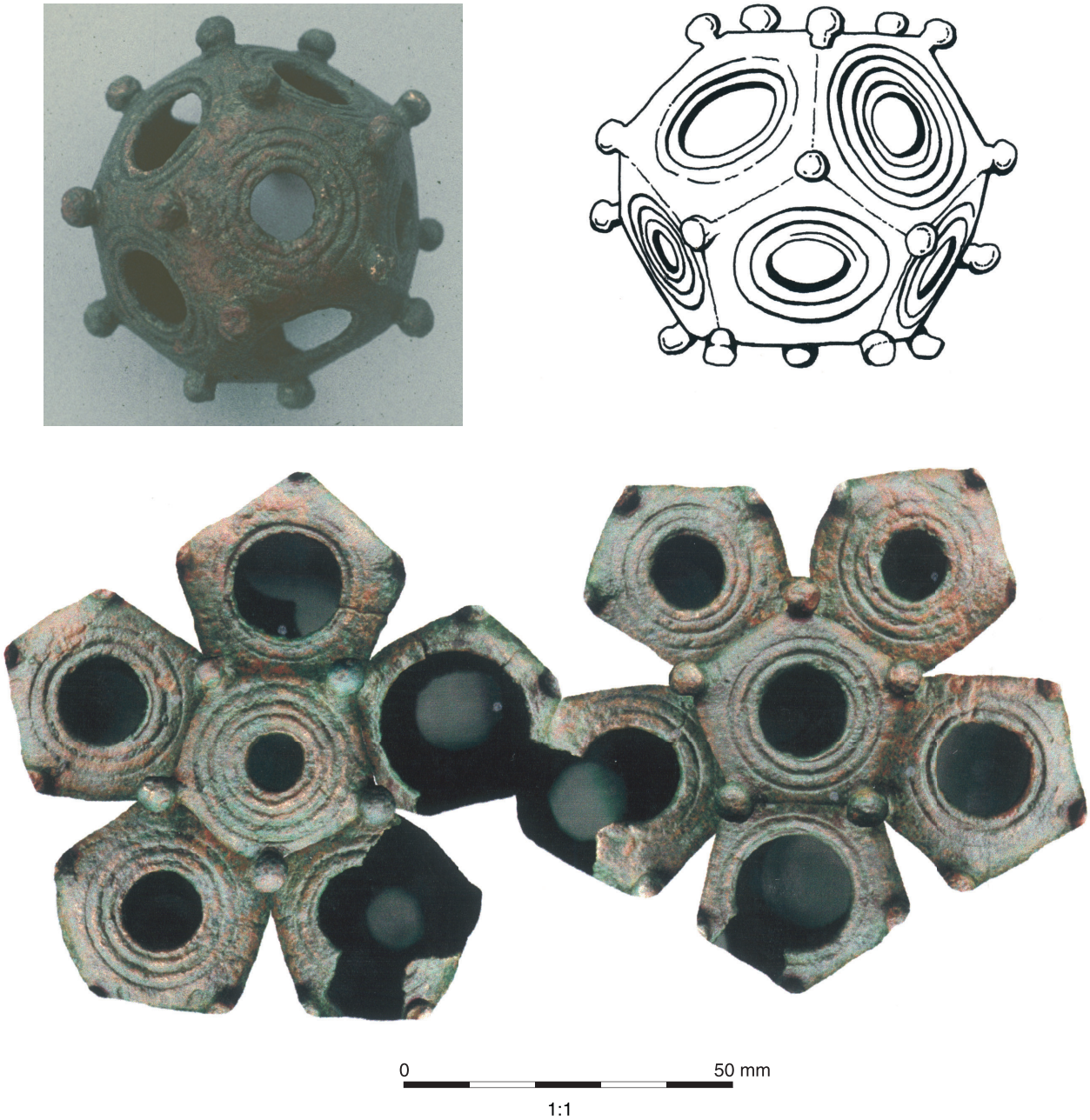


Fig. 6.3 Dodecahedron from Gill Mill, Ducklington. The 'unrolled' picture shows the variation in aperture size in all twelve sides

Fig. 6.4 Early Roman and ?late Saxon ploughmarks at Drayton, Oxon.

Estate, Abingdon (Fowler 1978), the date of which implies survival of some conservative farming traditions well into the Roman period. These practices might have been fairly widespread, however, since the evidence for more advanced plough types (Fig. 6.5), such as the coulter from a deposit of ironwork at Dorchester, is of late Roman date. An iron share from the same deposit, however, is essentially equivalent to the earlier wooden form (Manning 1984, 142-4), while iron plough share tips, known from Gatehampton Farm (Jennings 1995, 98-9) and from Thames Valley Park, Reading (Seager Smith 1997) could have been attached to wooden ploughs not dissimilar to the Ashville example. The more substantial share tip from Thames Valley Park is not certainly of Roman date, although this seems likely. While developed Roman ploughs marked an improvement on the simple ard, the development of the true mouldboard plough, that inverts rather than just pushes aside the soil, has generally been thought not to occur before the late Saxon period. Further ploughmarks from Drayton, suggesting a single instance of use of a mouldboard plough, are most likely of this date (see below; Barclay *et al.* 2003, 116). Conclusive evidence for Roman mouldboard ploughs remains elusive (contra eg Williamson 2003, 119-20).

Whatever the method of ploughing the fields, or the sowing season, there had to be provision for storage and then processing of grain, but the latter is always more clearly identified than the former. The classic middle Iron Age grain storage pits of the Upper Thames are almost entirely absent from the late Iron Age onwards. While the abandonment of below ground storage might be seen as making the grain more vulnerable to insect and rodent damage, there does not seem to have been a serious presence of these pests on rural settlements (see Chapter 2, above), possibly because surplus grain was sent to the towns. In terms of above-ground storage, however, post-built 'granary' structures, a standard Iron Age type, are less common in the early Roman period than previously in the Upper Thames. The only certain examples are a typical four-post structure at Eagle Farm, Standlake (Allen and Moore 1987, 96) and two six-post examples of the type from the early Roman phase at Barton Court Farm (Miles 1986, 9). The situation may have been a little different in the Middle Thames, however. Four-post structures of Roman date are known at Hengrove Farm, Staines and at Brooklands, both sites with occupation sequences from the Iron Age onwards, while at Thorpe Lea Nurseries at least six four-post structures were identified, five of which are dated to

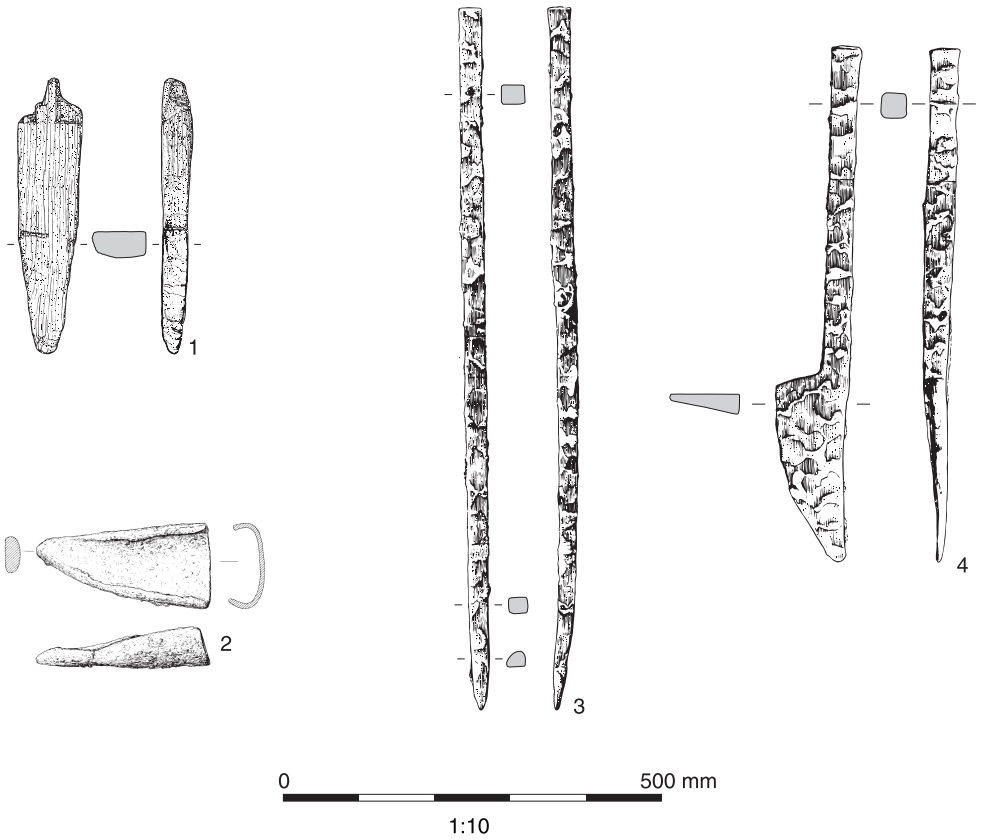


Fig. 6.5 Roman ploughs: (1) wooden ard share from Ashville, Abingdon, (2) share tip from Thames Valley Park, Reading, (3 and 4) bar share and coulter from Dorchester

the late Iron Age/early Roman period, while the sixth could possibly be of the 4th century. Such a late date would be unusual for a structure of this kind, but at Waylands Nursery, Wraysbury, where middle Iron Age to early Roman activity was absent, there might have been further late Roman examples. Three four-post structures here lay within, but were not certainly associated with, a triple ditched enclosure of late Roman date (Pine 2003, 133-5).

Rectilinear stone built barns and granaries are identified with varying degrees of confidence at a number of sites in the Oxford region (Henig and Booth 2000, 157-8) but none of these is in the Thames Valley. Such buildings almost certainly existed in the villa complexes of Roughground Farm and Hambleden, for example, but cannot be identified specifically. They need not have conformed to a specific and distinct structural type. Elsewhere it must be assumed that the factors that make domestic structures so hard to detect on farmstead sites apply equally to granaries and other ancillary buildings. Occasional larger post-built structures, such as the aisled or similar buildings at Somerford Keynes and Claydon Pike, Dorney and Hengrove (Fig. 6.6), could have been partly used as granaries, but in at least some cases a domestic function is also likely; the two could have been combined with yet other functions. The evidence for crop processing in these buildings is particularly clear at Dorney, while at Thorpe Lea Nurseries the environmental evidence suggests the existence of a timber store building even though no structures were identified on the site.

Crop processing activities are more evident in the archaeological record. So-called corn drying ovens are widely found across southern Britain and the Thames Valley is no exception (Fig. 6.7). These structures typically comprise a trench lined with stone and roofed with stone slabs. At one end of the trench is a stokehole and at the other end a flue, which was often divided into two, giving a T-shaped plan. They occur quite commonly at rural sites of all types, from small farmsteads to villas such as Claydon Pike, Roughground Farm, Barton Court Farm and Hambleden. The forms varied considerably from very simple single channel types (at Farmoor, perhaps at Crowmarsh and at Hurst Park, the only example from the Middle Thames) to 'typical' T-shaped examples and more complex structures. An example from Abingdon (Allen 1990) may have been of a circular form which is relatively uncommon in Roman Britain.

'Corn dryers' could have been used for many purposes (van der Veen 1989), and the distinct

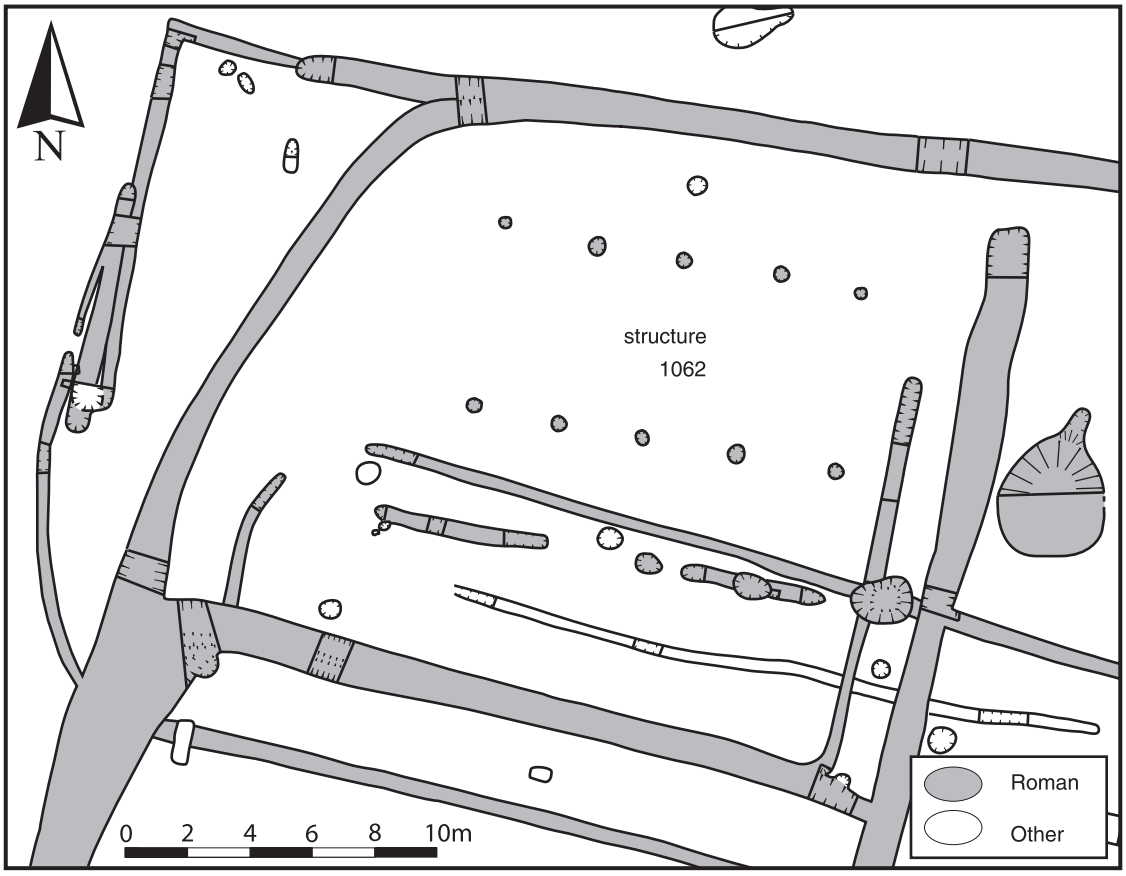


Fig. 6.6 The rectilinear timber building at Hengrove

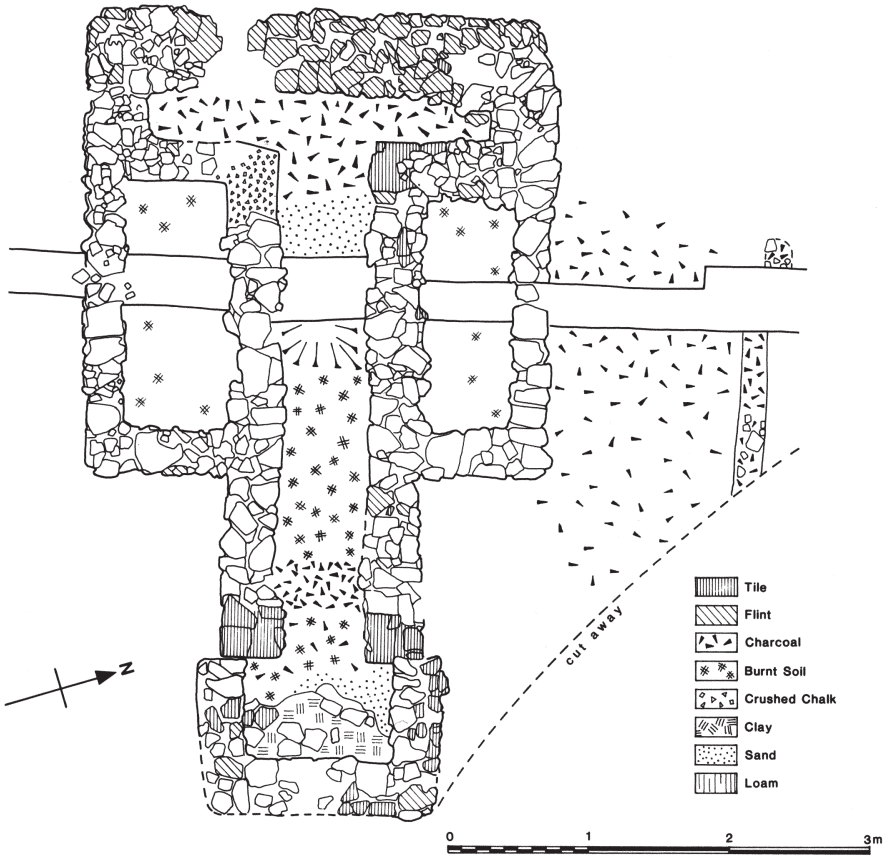


Fig. 6.7 'Corn dryers': above from Gatehampton Farm, Goring and below from Somerford Keynes, Cotswold Community. The double flues of the latter are seen partly excavated

composition of residues of charred material sometimes allows identification of the specific processes practised, although in many cases these residues become mixed once removed from their original context, making interpretation less straightforward. The simple drying of wet grain in these structures, implied by their common name, has been suggested to be relatively inefficient (Reynolds and Langley 1979) and the drying of freshly harvested grain for storage is unlikely to have been a significant (or even necessary) function. An example from the Phase 3 (2nd-3rd century) settlement at Claydon Pike, with a relatively simple oven-like structure, contained charred cereal remains, over 90% of which were glumes of hulled wheat, suggesting that it had been fuelled on the dehusking waste of spelt. The way in which corn driers were probably used is that they were fired to make the stone slabs hot, a thin layer of hulled grain was spread over the slabs and when it had been parched sufficiently to make the husks brittle, the grain was removed. In the case of spelt wheat, the spikelets of hulled grain would then have needed to be pounded, winnowed and sieved to give clean grain for milling or other uses.

It is thought that corn dryers were also used for the parching of sprouted grain as part of the malting process (van der Veen 1989, 304, 314-5). A particularly good example of waste produced by the malting of spelt wheat, consisting of charred cereal sprouts and glumes, was found outside the region at the Bancroft villa, Milton Keynes (Pearson and Robinson 1994). Spikelets of spelt wheat would have been steeped in water, left to germinate so as to generate diastase enzyme, parched to halt germination and to dry the grain, and then rubbed to dehusk the grain and remove the sprouts. The cleaned grain would next have been roughly ground and then placed in water, where the diastase would convert the starch into sugar which would then be allowed to ferment, giving spelt beer. The best evidence for early Roman manufacture of spelt beer in the Upper Thames Valley region is a large charred deposit of glumes, cereal sprouts and weed seeds from a shallow pit at Alchester which belonged to the early civilian phase (late 1st century AD) of the town. Overall there is evidence of use for both parching and in the malting process in Thames Valley corn dryers, although there is insufficient information to allow assessment of the relative importance of these (or any other) functions. The occurrence of corn dryers suggests that the later stages of cereal processing were often undertaken at settlement, rather than household, level.

Corn dryers are known at some 15 sites in the valley, usually with one or two examples at each. The two exceptions to this rule are of considerable interest. At the major pottery production site at the Churchill Hospital, Oxford, four T-shaped and five simple 'dryers' were found (Young 1977, 20-22). Comparable features are recognised as a regular component of other pottery production sites, suggesting that they were considered suitable to use for drying pots prior to firing. This was, therefore, probably the main function of the Churchill Hospital structures, but cereal chaff was used to fuel some of them (Robinson and Wilson 1987) and multiple uses cannot be ruled out. The most remarkable occurrence of 'corn dryers', however, is at the villa at Hambleden, where some 14 'furnaces' (in the original excavator's terminology) were found (Cocks 1921, 151-155), of which nine or ten can be identified on morphological grounds as 'corn dryers'; no biological evidence was recovered from them. Three of these, all double structures of various forms, lay within two substantial buildings inside the villa enclosure, while others were situated at various points within the enclosure and others again lay outside it; some examples of both these groups may have been located in timber buildings. Interpretation is difficult, given that Hambleden was occupied from the 1st century to the 4th and that there is very little dating for the individual structures. It is possible that only one or two dryers were in use at any one time, but the broad Romano-British trend indicates that these structures were more common in the middle and late Roman period and it is unlikely that many of the Hambleden structures belong to the early Roman phases of the site. Whatever the case, the total number of these structures, and the association of some of them with substantial buildings, while reminiscent of a number of other villa sites in Britain, stands out in comparison with all the other Thames Valley sites and demands explanation.

The annual grazing cycle for domestic animals in the Upper Thames Valley probably had much in common with that of the middle Iron Age. The loss of some floodplain grazing, as a result of parts of the higher areas of the floodplain being cultivated, could perhaps have been met by increased use of pasture on the Oxford Clay, but it is possible that available land on the Clay was already fully utilised before the end of the Iron Age. The military establishments of the 1st century AD and the subsequent rise of towns would have created a demand for fodder. It is possible that these factors provided the initial stimulus for hay production. It is also likely that some cereal grain was fed to military and urban animals. Some domestic stock might have been overwintered in enclosures at the rural settlements and fed on hay along with cleanings from cereal processing. Some of the insect evidence for a greater intensity of occupation on rural Roman, as compared with Iron Age, settlements would be consistent with this interpretation.

Domestic animals retained their importance for secondary products in the early Roman period, indeed there tended to be an increase in the average age at death of most species. The epiphyseal fusion data and tooth-wear data for the sheep from the early Roman phase at Barton Court Farm were appropriate for a flock kept for wool production, although the possibility could not be excluded that

young sheep were killed and eaten away from the site (Wilson 1986). Unfortunately, the early Roman assemblages of animal bones from the Upper Thames Valley are too small for detailed site reconstructions of kill-off patterns which would bring out differences between Iron Age and early Roman exploitation of domestic animals.

As in the middle Iron Age, the evidence from the Middle Thames Valley is much less detailed than that from the Upper Thames. Some evidence for organised land usage was given by charred remains from a 1st- to 2nd-century AD Roman settlement on an island of 1st terrace at Dorney. The weed seeds suggested the flora of a well-drained circumneutral soil, as might have been expected, on the island. There were very few seeds of wet ground plants. In particular there were only six seeds of *Eleocharis palustris* (spike rush) out of a total of about 800 weed seeds from all the samples. Seeds of *E. palustris* are often well-represented in charred assemblages from Roman sites on the gravels of the Upper Thames Valley. It is a plant of shallow water and marshes but has far-creeping rhizomes enabling it to invade arable fields adjacent to wet habitats. The evidence from Dorney suggested that the area under cultivation did not extend to the edge of the gravel island.

The results of the analysis of charred plant remains from the early Roman settlement at Dorney were in complete contrast to those from the Iron Age settlements there. The Iron Age settlements were certainly using six-row hulled barley and spelt wheat, but processing seems to have been on a very small scale. The processing of cereals was a major activity within the Roman settlement. There were rich deposits of grain, cereal sprouts, chaff and weed seeds. Grains of six-row hulled barley were being parched and de-husked both prior to milling and also as part of the malting process for beer-making. The waterlogged remains from the Roman settlement at Thorpe Lea Nurseries likewise gave evidence for the de-husking of spelt wheat.

Agriculture in the late Roman period

Most of the changes shown in the Upper Thames Valley in the late Roman period were the continuation of developments already under way in the early Roman period. They included some agricultural re-organisation consequent on increasing flood levels and possibly an increase in the area under cultivation. Although sedimentation on the Thames floodplain was probably the result of plough-induced erosion on the slopes of the Cotswolds, there is no evidence for environmental stress on the gravel terraces or floodplain. Their mixed agricultural economy appears to have been stable.

The evidence for the Romanisation of the range of foods eaten, even on very low-status settlements, raises the question of the extent to which the diet had changed since the Iron Age. Staples certainly remained the same, with spelt wheat and six-row hulled barley providing the main sources of carbohydrates. Beef generally became more important, at the expense of mutton, but in a diet which did not involve much meat. Dairy products were eaten in both periods although their importance is difficult to assess. The new animal component to the diet was probably slight. Oyster shells are robust bulky items which only yield a small quantity of meat. Despite their possibly widespread occurrence on late Roman settlement sites, oysters can only have been eaten infrequently (their presence, however, is not recorded consistently). There was an increase in the consumption of wild mammals, birds and fish in the Roman period but even in the late Roman period, these only contributed a small proportion of the meat eaten in comparison to that from domestic mammals. Likewise, domestic poultry were perhaps eaten on special occasions but were only minor sources of meat. The new cultivated plants, however, even if not making a major calorific contribution to the diet, were perhaps consumed on an almost daily basis. The umbellifer seeds used as flavourings, such as coriander, dill and celery, probably only entered the archaeological record when processing waste or seeds from escapees from cultivation reached waterlogged deposits. Although these seeds are rarely found in abundance on archaeological sites, their occurrence is sufficient to suggest frequent use. In the absence of latrine deposits, it is hard to give an estimate of the importance of fruit in the diet although plum stones are probably at least as frequent on late Roman rural sites as on medieval rural settlements. Late Roman latrines from the town of Silchester, outside the region, have produced evidence for the consumption of many apples (Robinson 2006b). Flax, whether eaten as seeds or oil, certainly made a much larger contribution to the diet than in the Iron Age. Vegetables such as cabbages were perhaps commonly eaten, being under-represented in the archaeological evidence because most plants are not allowed to set seed.

While the basic sources of nutrition may have remained the same from the Iron Age to the late Roman period, the diet enjoyed in the late Roman period, even on low-status settlements, was probably greatly enlivened and perhaps made more varied by the use of flavourings. Unless there was a significant consumption of fresh wild plants in the Iron Age, for which we have no evidence, the fruit and perhaps vegetables could even have made the late Roman diets more healthy. While poultry, fish and game may have been luxury items for the low-status members of the late Roman rural populace, they were probably more important in the diet of higher-status and (perhaps) urban individuals.

The evidence presented here is largely derived from the Upper Thames Valley but preliminary work on Middle Thames gravel terrace sites such as Heathrow Airport gives a similar picture. Some contrasts can be drawn between the Upper Thames Valley and the Roman villas on the limestone of the

Cotswold dip slope. In the latter region, perhaps because it was not so heavily occupied or intensively farmed, it was possible for landowners to build up large land holdings which developed into villa estates. Some of these villas were founded earlier, and were more substantial establishments, than those on the gravel terraces. Arable agriculture was certainly important to their economy. However, the exploitation or management of scrub or woodland communities at Shakenoak was marked by a much higher proportion of deer and goat bones than on the gravel terrace settlements (Robinson and Wilson 1987, 57). The changed husbandry of cattle herds resulted in altered ratios of the sexes in them, so care is needed to demonstrate a size increase in cattle from the Iron Age to Roman periods.

There is every reason to believe that the agricultural economy of the Middle and Upper Thames Valley remained successful throughout the late Roman period. The success of the towns and large nucleated settlements in the regions must have been underpinned by the agricultural productivity of the countryside. Presumably a surplus of grain was also produced for purposes of imperial taxation, although the question of whether tax impositions had a stimulating or ultimately a depressing effect on agricultural production has been widely debated, with the consensus broadly in favour of the former in the early empire and the latter in the later empire (Hopkins 1980; 1995-6; for a concise summary see Garnsey 1996, 149-150). The present evidence for sustained production in the late Roman period is, however, in line with a more optimistic view of late Roman agriculture generally (ibid., 138-147). On balance, therefore, taxation in this period may have had a less deleterious effect than has been thought, but there is still a wide range of views on this (for a recent negative view of late Roman taxation in Britain, Faulkner 2000, 112-114). While the diet of the majority of the population was probably cereal-based and only included a small proportion of meat, there was no evidence for deterioration in the Roman period. It has been argued that cultivation on the Cotswold slopes caused erosion and that this environmental degradation probably resulted in a reduction of yields, but although the increased alluviation on the Upper Thames floodplain caused changes in land usage in the valley bottom, it is unlikely to have reduced productivity. Indeed there seems to have been no reason why the late Roman agricultural system could not have continued until the end of the 5th century and beyond.

Plants (Fig. 6.8)

Spelt wheat and six-row hulled barley remained the major cereals although there was a rise in the cultivation of *Triticum dicoccum* (emmer wheat). This has been observed on several sites in the Upper Thames Valley but grain and glumes of *T. dicoccum* were major components of late Roman charred crop processing remains from a settlement on the 2nd terrace at Mansfield Road, Oxford (Pelling 2000a). A radiocarbon date of cal AD 70-380 (WZA-11598) confirmed that the emmer was of Roman date rather than residual from a pre-Iron Age deposit. Interestingly, many of the emmer grains were very short, probably a characteristic of the variety grown. The remains had probably resulted from the burning of spikelets of emmer wheat rather than being general processing waste. This might have been a single event, perhaps an accident, in which a large quantity of emmer was burnt, rather than indicating that the site concentrated on the production of emmer. The results do, however, confirm that emmer was being grown as a crop in its own right and was not just a volunteer amongst other cereals. Bread wheat and rye were also present at Staines (McKinley 2004, archive S17-18).

There is no stronger evidence for oats as a crop than there was in the early Roman period. Likewise, there are few late Roman records of field/celtic bean and pea although it is likely that both were minor crops, but a significant deposit of peas came from Mansfield Road, Oxford (Pelling 2000a) which, together with the emmer just mentioned, may suggest that this site was rather unusual in the emphases of its agricultural/horticultural production. Small quantities of peas and beans were also found in late Roman contexts at Staines (McKinley 2004, archive S17-18). Flax remained an important crop and processing remains are commonly found in waterlogged deposits on late Roman settlements, for example at Old Shifford, Farmoor and Barton Court Farm in the Upper Thames. The stems were used to produce fibres to make linen, being broken down by a soaking process known as retting. This activity has been tentatively identified at Old Shifford (Robinson 1995, 167) but is less clearly evidenced elsewhere at this time (see below for a discussion of the more extensive evidence from the Anglo-Saxon period). Because of its noxious character, however, the process may generally have been carried out at some distance from settlement foci and is thus less likely to be detected archaeologically.

Several other horticultural crops joined those plants already recorded from early Roman sites including *Malus* sp. (apple) from Farmoor (Lambrick and Robinson 1979), *Foeniculum vulgare* (fennel) from Claydon Pike (Robinson 2007) and *Juglans regia* (walnut) from the town ditch at Alchester (Robinson forthcoming g). There is no reason to believe that these plants were late Roman introductions to the Upper Thames Valley but there are more records of exotic horticultural crops from the late Roman period than from the early Roman period; perhaps some of these had only fully been adopted by low-status settlements on the Thames gravels in the 3rd century. Evidence from the 4th century phase at Farmoor (Lambrick and Robinson 1979) shows just how Romanised this aspect of diet had become even on low-status sites. In addition to

apple, the fruits eaten included cherry and plum while food was flavoured with dill and coriander. Clippings and fruit fragments of box were also found. The status of apple is interesting. It had been assumed that cultivated apple was derived from *Malus sylvestris* (wild crab apple), which was being exploited in the Neolithic (Moffett *et al.* 1989). However, genetic studies have shown cultivated apples to be derived from *M. sieversii* without any hybridisation (Harris *et al.* 2002; Juniper *et al.* 1998). This species occurs wild in Kazakhstan and it has been speculated that it was a Roman introduction to Western Europe. By the late Roman period, several varieties of plum were being cultivated in the Upper Thames Valley. The early Roman plum stones found at Farmoor matched those of small bullace-like varieties (*Prunus domestica* spp. *insititia*), while a larger, more globose, stone from a late Roman well at Appleford resembled that of the greengage group of plums (*P. domestica* ssp. *italica*) (Robinson 1980, 94). A larger, flatter plum-stone from a 4th century pit at Farmoor was similar to those of modern larger-fruited varieties (*P. domestica* ssp. *domestica*) (Lambrick and Robinson 1979). Waterlogged seeds of black mustard (*Brassica nigra*) from late Roman Staines appeared to have been deliberately harvested (and probably cultivated), rather than just being derived from weeds in the settlement (McKinley 2004, 54-5, archive S23).

The evidence for the collection of wild food plants is mostly limited to occasional charred hazel nut shells but *Fragaria vesca* (strawberry) was found in a late Roman waterlogged deposit at Claydon Pike. It is uncertain whether the seed was from the wild plant, which occurs in light woodland, or from the cultivar alpine strawberry, in which the runners are replaced by further flower stalks. (The modern cultivated strawberry is a hybrid between a North and a South American species.) The wood and timber supply apparently remained much as in the early Roman period, with both hedgerow and woodland sources being exploited. There was evidence from Northmoor, on the 1st terrace, for osiers lining the bank of a water-filled ditch (Robinson 1990, 69). It is likely that they were pollarded or coppiced for poles. A late Roman well at Barton Court Farm gave evidence for the gathering of woodland moss, on which the stones of the well were bedded, serving to filter the water entering the well (Dickson 1986). Some grassland continued to be cut for hay and improvements in processing technologies affected this aspect of Romano-British agriculture as well as arable production. The clearest evidence for this is in the form of iron blades of the large scythes particularly associated with haymaking, although they might have been suitable for harvesting other crops as well (Fig. 6.8). Such blades have been found at Hardwick and Farmoor (Rees 1979), and Caversham (Frere 1989, 319) with a further fragment from Appleford (Brown 1973a, 197-8). All are of late Roman date, in line with a more widely-observed trend, as also is a finely-detailed 'model' scythe from Gatehampton Farm, Goring (Jennings 1995). This object, over 200 mm long, seems rather large to have been a votive (although this may indeed be its function), but is equally many times smaller than the standard size – typically over 1.5 m (Rees 1979, 64).

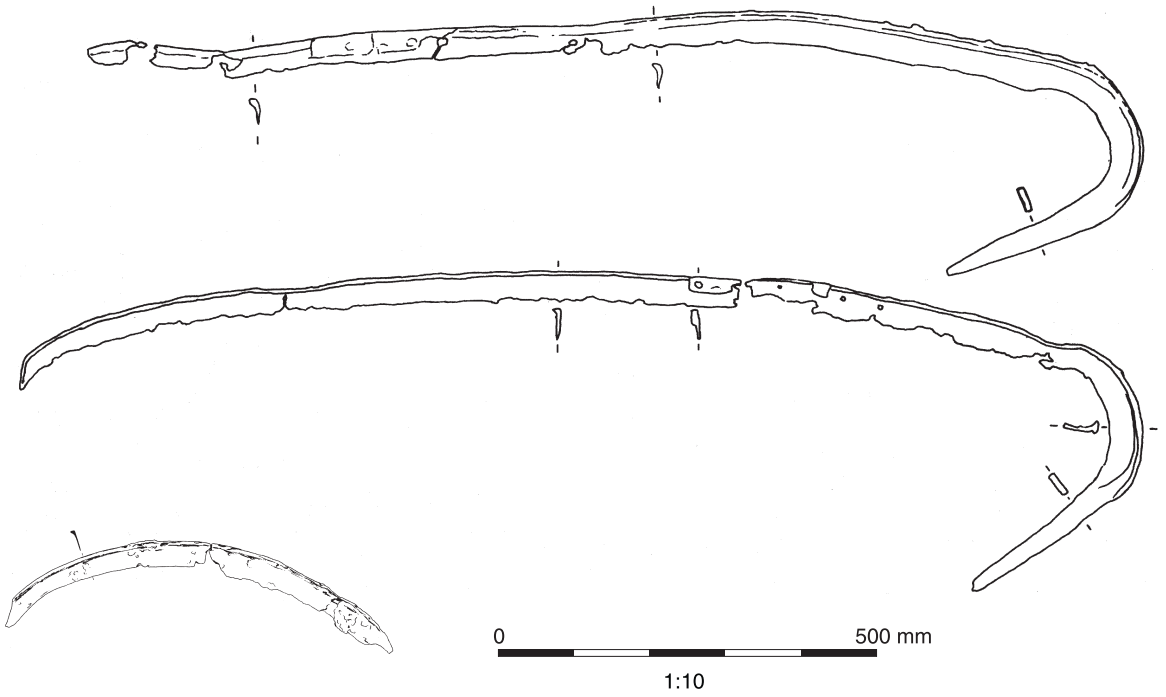


Fig. 6.8 Roman scythes from Farmoor, Hardwick and Appleford.

Animals (Fig. 6.9)

The range of domestic animals was very much as recorded in the early Roman period. Donkey, present at Claydon Pike in the early Roman period, was found there in the 4th century, and was also identified at Mount Farm (Robinson and Wilson 1987, 55). Bird bone is consistently more abundant in late Roman assemblages than earlier, both in terms of the proportion of sites which have bird bone and their frequency in those assemblages, though the sites which have most bone are particularly urban ones, such as Cirencester. Domestic fowl is noticeably more important than previously, usually comprising at least two thirds of bird bone assemblages. Goose and duck (domestic/mallard) are relatively common in urban and villa assemblages, but less so elsewhere. The majority of these bones appear to be from domestic varieties. Domestic pigeon (*Columba livia*) is rare before the Saxon period, but Romano-British examples probably or possibly of the domestic form are known for example from Cirencester, Barton Court Farm and Mount Farm. Domestic cat, for which there are few early Roman records, more commonly occurred on late Roman settlements, for example the villa at Barton Court Farm (Wilson 1986, fiche 8:A3). At Claydon Pike, metric criteria suggest that at least one specimen, a humerus from a late Roman pit, is from the wild species. Cat bones were also found at the Lowbury Hill shrine.

The broad pattern of animal exploitation was comparable to that seen earlier. Cattle tends to dominate assemblages and occasional groups from Cirencester. Here, a site at Chester Street, near the forum, with 92% cattle bones, must represent specialist butchery waste like the early Roman St Michael's Field group (see above) (Maltby 1998, 354-5). Species representation in the late Roman assemblages was still potentially variable and site type is not on its own an adequate guide to expected species frequency. For example there are general similarities in the major species composition between Barton Court Farm and Dorchester, but some urban assemblages from Cirencester are also similar in character to these sites.

All these groups were dominated by cattle. At Yarnton, exceptionally, the data show an increase in the importance of sheep at the expense of cattle, particularly in the later Roman period (Mulville *et al*. forthcoming), but the overall dominance of cattle was maintained even here. Sheep were usually less numerous than earlier. At the other extreme is the shrine of Lowbury Hill in Berkshire, with 22% cattle, 60% sheep and 19% pig. The high caprine component in the assemblage from this religious site is reminiscent of that from some temples, though short of the exceptionally high levels seen at Uley on the Gloucestershire Cotswolds (Levitan 1993, 257, 300), but the high representation of pig is more unexpected. However, the occurrence of pig in moderate quantities (over 10% of the assemblage) is more common across the valley than in the early Roman period, and these levels are found at a wider range of site types, including Watkins Farm and Appleford as well as some Cirencester sites, Dorchester and the villa at Roughground Farm. Nevertheless, pigs, although ever present, were never as common at this time as in subsequent periods.

Evidence for species improvement, in terms of animal size, requires substantial collections of bones to allow reliable trends to be identified, and such assemblages are not common. At Claydon Pike, however, there was a noticeable increase (about 100 mm) in the average withers height of cattle from the late Iron Age/early Roman phase to the later (2nd-3rd century) assemblages, and at Barton Court Farm there seems to have been a similar change between late Iron Age and early Roman phases on the one hand (see above) and the late Roman phase assemblage on the other (Wilson 1986, fiche 8:D2-D12). Parallel development may have occurred in sheep, but the size increases are much less readily perceptible. Elsewhere, most assemblage sizes are simply not sufficient to allow such trends to be traced, a problem exacerbated in the Middle Thames by the soil conditions on many sites, which result in poor survival of bones. Animal size, particularly in cattle, is also linked to sex so that without very large groups it can be difficult to distinguish sex-based size differences from those resulting from improved breeding.

Overall, the age and species data indicate the existence of general-purpose herds with little evidence of exploitation of animals for specialist purposes, though the main (urban) markets, which formed the principal centres for large scale butchery, may have drawn off groups of animals of more uniform character (indicated by particular age patterns, for example). On the rural settlement sites cattle were used for meat, hides and perhaps milk and also served as draught animals. Sheep may also have been exploited for milk, but meat and wool and perhaps also dung would have been the main products. Pigs were always a meat resource, reflected in the age data which show that animals rarely survived more than about 2 years.

In addition to the clear cut evidence for commercial scale butchery at Cirencester, extensive excavations of rural settlements reveal patterning in bone deposition reflecting the earlier indications of spatial organisation of butchery functions. For example the enclosure ditches from the Roughground Farm villa contained more cattle bones than the other areas of the site, consistent with differentiation between the material generated by the first stages of the butchery of larger animals, which tended to be deposited peripheral to the buildings, and kitchen waste of smaller bones, some of which tended to accumulate closer to the living area.

Many of the general trends outlined above are exemplified in the large assemblage of late Roman animal bones from the Barton Court Farm villa (Wilson 1986, fiche 8:A2-4). The cattle were short or

medium horned beasts of moderate size; each cattle sex was 5-10 cm taller than in the Iron Age, which was probably usual for the Roman period, but the species itself ranged greatly in height from 0.96 to 1.39 m at the shoulder (Robinson and Wilson 1987, 57). The sheep were a mixture of polled and horned individuals with more robust bones than Iron Age sheep. Goat could also have been present. The pigs also had more robust bones and some of the horses were larger than the Iron Age horses of the region. Overall the evidence shows the same trends noted for the early Roman settlement at the site (although there was a significant gap in the occupation sequence), which were argued as suggesting good conditions of animal husbandry and possibly the introduction of new breeding stock.

Dogs, which were well-represented at Barton Court Farm, showed a considerable range of size. The largest, with an estimated shoulder height of 0.60 m, was over twice as tall as the smallest, which had an estimated shoulder height of 0.24 m. This range of variation was very much greater than that shown by dogs in the Iron Age, a notable feature of the Roman period first noted in British dogs by Harcourt (1974). Small (terrier size), medium and large dogs all occurred at early Roman Alchester for example, and by the late Roman period toy size animals had appeared. Other sites with small dogs include late Roman Cirencester, Wantage and Horcott. It is very likely that distinct breeds of dogs were introduced in the Roman period and that they were maintained as separate breeding lines. The bones of several dogs of various sizes were recovered from early and late Roman contexts at Staines (McKinley 2004, 34). They included tall slender greyhound-sized animals, which, it was suggested, would have been suitable for recreational hunting, and small, stocky, terrier-sized dogs that could have been used to control vermin, or have been household pets.

The Barton Court Farm data give a good picture of the late Roman animal economy of the settlement. Sheep were slaughtered at an older age than in the late Iron Age phase of the site or at the middle Iron Age settlement of nearby Ashville, although it is possible that some (younger) sheep were sent to market. Assuming the bones to have been representative of the herd structure, about 90% of animals were overwintered once and 60% overwintered at least twice. The evidence for sex suggested a ewe-dominated flock rather than a wether flock. This would enhance breeding potential and milk

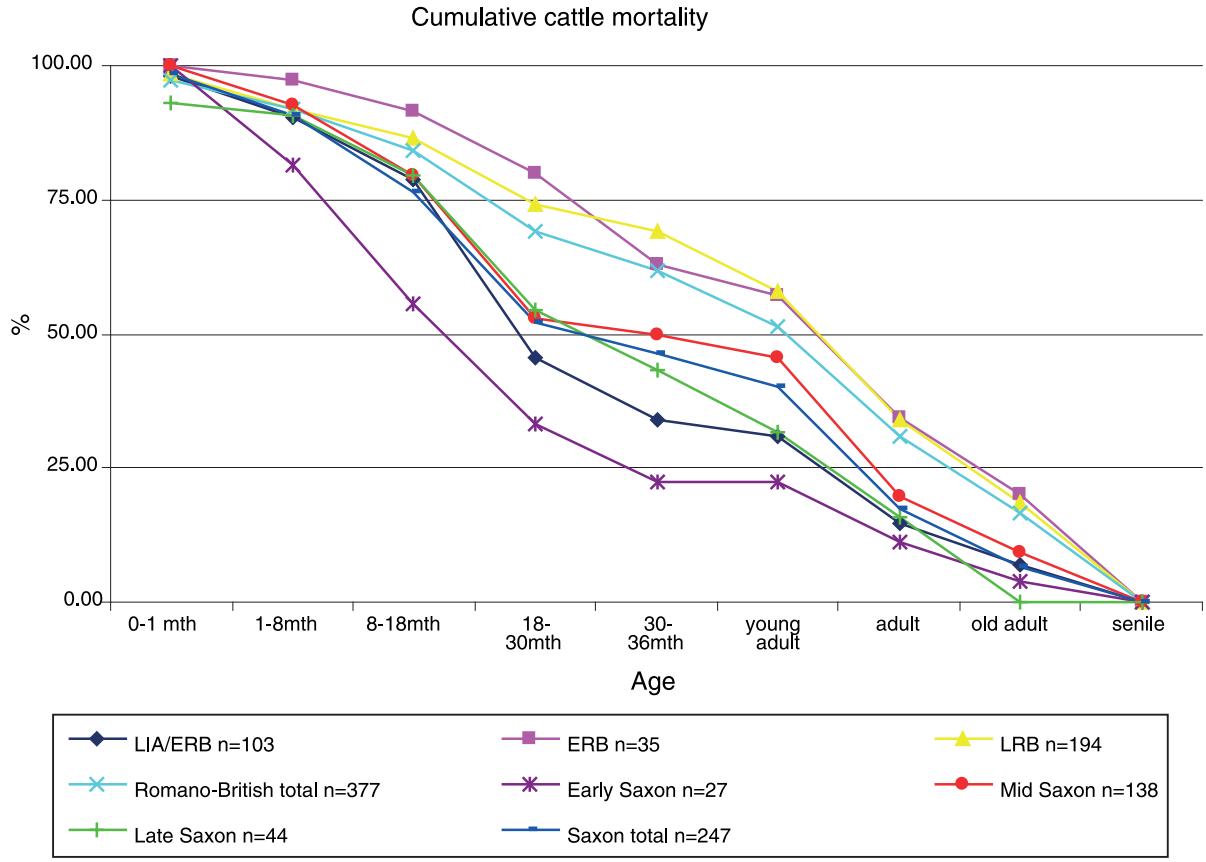


Fig. 6.9 Graph of cumulative cattle mortality at a sample of Upper Thames Valley sites compared by period (compiled by J Mulville and A Powell)

production in addition to giving a yield of wool. However, such a flock could also have been used for meat production if young males or wethers were exported.

Bulls, castrates and cows were all represented amongst the cattle bones. A major proportion of bulls and possibly steers (castrates) were slaughtered during their period of growth, representing animals raised for meat production. However, interpretation was complicated because there was an under-representation of female animals in the assemblage; the bones of slaughtered animals may not have represented the overall cattle population around the villa. Some input of male cattle into the husbandry system was thought probable, possibly of steers or oxen from dairying herds elsewhere, for example on the 1st terrace. Only small assemblages of bones have so far been published from late Roman settlements on the 1st terrace of the Upper Thames, for example Farmoor (Wilson 1979), Appleford (Wilson 1980) and Watkins Farm, Northmoor (Wilson 1990). However, the evidence from these sites complements that for Barton Court Farm, the kill-off patterns and sex ratios suggesting herd structures appropriate to dairying, with a preponderance of older cows (Fig. 6.9). At Barton Court Farm pathology of cattle metatarsal bones suggested that around half the animals which passed the age of 36 months (distal epiphyseal fusion stage) were used for traction. Around 7% of the cattle born in any one year could have been trained as plough oxen and given that these animals would have been allowed to live to around 12 years so as to obtain the maximum usage from them, perhaps 15% of the population were oxen. The main emphases of cattle management at late Roman Barton Court appeared to have been the provision of oxen for arable farming and the raising of beef cattle. Breeding calves and dairying seem to have been of less importance.

Approximately 50% of pigs were slaughtered for meat by the age of 12 months, a considerably higher proportion than at nearby Iron Age Ashville, for example (Wilson 1986, fiche 8:E3). Horses ranged from 2-3 years to 9 years old; pathology in the hock, hoof and along the backbone confirmed their use for draught purposes. The butchery evidence suggested that horsemeat was at least occasionally eaten. The considerable variation in the size of dogs suggested that they could have served several purposes. The larger animals could have functioned as guard dogs or have been used to manage stock. The small animals were perhaps pets. Two dog heads or skulls had been used for ritual purposes, being buried with human infants. Finds of eggshell suggested that domestic fowl were perhaps for egg production as well as for meat and possibly sport.

The bone data for domestic mammals from the late Roman phase of Barton Court Farm are given below both as percentages of the total identified fragments and as percentages of the minimum number of individual animals (MNI) represented by them (ibid):

	Late Roman Barton Court	
	Frag %	*Min No Indiv %*
Cattle	53	36
Sheep/goat	25	29
Pig	8	16
Horse	10	9
Dog	3	8
Cat	0.1	2
Total Fragments or Individuals	4601	173

The Barton Court Farm figures show a trend which is generally shown by Roman settlements on the gravels of the Upper Thames Valley, an increase in the proportion of cattle and a decrease in the proportion of sheep. The main source of meat during the Roman period was from cattle. It is not surprising that horses were well-represented, given the relatively high status of the site. However, Wilson (1986, fiche 8:C3) noted that horse meat could possibly have played a greater role in the diet of the majority of the occupants of the site than meat from sheep, albeit in a diet low in meat. Geese, duck and dove bones were all found in late Roman contexts (Bramwell *et al.* 1986).

Barton Court Farm also demonstrated the rise in the proportion of bones of edible wild mammals, fish and birds. Wild mammals likely to have been hunted for food included red deer, roe deer and hare (Wilson 1986, fiche 8:C2). The wild bird species identified are typical of those which tend to be found on Romano-British settlements. Wild duck and golden plover are likely to have been taken for food but some of the other species, such as buzzard, kestrel and jackdaw could have been killed in defence of poultry or crops (Bramwell *et al.* 1986, fiche 8:C6-7). Freshwater fish from Barton Court included eel (*Anguilla anguilla*), pike (*Esex lucius*), bleak (*Alburnus alburnus*) and perch (*Perca fluviatilis*) (Wheeler 1986, fiche 8:C8-10). Honey bee was not recorded here, although it has been found on other sites in the region such as the late Roman villa at Claydon Pike (Robinson 2007). The late Roman villa which replaced the earlier establishments at Claydon Pike also had possible evidence for the live storage of fish (ibid). A rectangular tank cut below the water table contained insect remains which included examples of water beetles from the family Elmidae. These beetles require clean flowing well-oxygenated water and it is unlikely that they would have colonised the tank of their own accord. It is possible that fish were brought from the Coln or Thames wrapped in water weed and put in the tank, accidentally introducing the beetles.

King (1991) has suggested an increase in the significance of wild mammals in the late Roman period but the supporting evidence from Thames Valley assemblages is mixed. With Barton Court Farm, Claydon Pike produces the clearest evidence for the increasing popularity of hunting, fowling and fishing in the middle (to late) Roman period. A

relatively extensive wild species list includes red deer, roe deer, hare, badger, fox, field vole, mole, duck, coot, grey heron, dunlin, snipe, blackbird, song thrush, crow and eel, although not all of these would have been hunted. Such indirect indications of hunting may reflect its altered social significance in the Roman period (including changing perceptions of taboos relating to some animals), rather than a simple desire for a more diverse diet. Red deer was less ubiquitous in wild mammal assemblages of this period than in those of the late Iron Age-early Roman period, but was still present in *c* 70% of assemblages with wild mammals. Roe deer and hare were found in about half of these assemblages and fox and badger were a little less common. While hunting is most clearly seen in the Roman world as a high status activity, however, the food value of hunted animals could be significant for the inhabitants of the smaller farmsteads. Wild boar and red deer are represented at Thorpe Lea, for example – the latter with evidence for an antler being sawn off presumably for bone working, while in addition to these Yarnton produced evidence for roe deer, fox and hare. This last was the most common wild species at Yarnton; absent in the earliest periods, its numbers increased throughout time. The implication from the Claydon Pike material that wildfowling could have been a significant activity is borne out elsewhere, and the range of birds from Cirencester (Maltby 1998, 368-9) included wigeon (*Anas penelope*), teal (*Anas crecca*), woodcock (*Scolopax rusticola*), plover (*Pluvialis* sp), moorhen (*Gallinula chloropus*) and redwing (*Turdus iliacus*), perhaps even suggesting a trade in caught items. Wigeon and woodcock were amongst the birds hunted at late Roman Staines (McKinley 2004, 54).

Landscape management (Figs 6.10-6.12)

There do not seem to have been major changes to settlement layout on the gravel terraces. A few settlements developed into small villas such as Barton Court Farm (Fig. 6.10) and Claydon Pike. Their creation possibly involved some consolidation of land holdings but there are no clear examples of large villa estates comparable to those of the Cotswolds on the Thames gravels. The main changes to the agricultural system were possibly the result of rising seasonal floodwaters extending over the entire area of the floodplain. Cultivation was abandoned on the floodplain at Yarnton and Drayton. Weed seed evidence from charred crop processing remains on settlements such as Yarnton suggests that this loss of arable could have been compensated for by the extension or expansion of cultivation onto the clay. Otherwise the agricultural regime was possibly very similar to that of the early Roman period. Technological developments in relation to cereal processing continued, however. It is likely that a majority of the identified corn dryers from the valley were of late Roman date (see above), although there were certainly some 2nd-century examples. Complementary evidence comes from grinding stones. These are more or less ubiquitous on rural settlement sites in the region (Fig. 6.11), and are of considerable value as indicators of trade since they can often be assigned to known sources. In the present context, however, it is their form that is of interest. In a sample of 18 Thames Valley rural sites, of which 16 produced grinding stones of various kinds, some 7 or 8 included certain or probable millstones (Fig. 6.12), distinguished from hand-powered quern stones on the basis of size and/or weight (eg Spain 1986). Some of these could have been from mills driven by animal rather than by water power, and none are from sites that have produced any other direct evidence of mill installations that would clarify this question (cf Spain 1984). However, in view of the later importance of the river for milling it is likely that some and perhaps most of these finds indicate the presence of watermills at or near the sites from which they derive, whether they stood by the Thames or by its tributary streams and rivers. It is unclear if there was any meaningful difference between the rural and the larger nucleated settlements in this respect. Unfortunately Dorchester has not produced good evidence for grinding stones, while at Staines none of the relatively large collection of greensand and lava stones from the County Sports site, for example, was larger than *c* 500 mm in diameter; all could therefore have been from hand-powered querns.

Mills, either animal or water powered, are another aspect of the intensification of processing of grain and therefore, by inference, of arable production. There are limits on the inferences that can be drawn from this, however, and it is interesting to note that the development of watermills is only thought to have made a moderate contribution to dealing with improved arable output (Saller 2002, 265; Wikander 1984). Nevertheless, water mills could have been substantially more productive of flour than hand or animal milling, so in those places where they were employed they may have had the effect of creating time for other tasks. The issues are to do with the volume of production and the need to provide more than just the daily requirements of individual farmers' families, on the one hand, balanced against the level of investment needed to provide and maintain the mill structure (Wilson 2002, 12). In view of the latter it is therefore unsurprising that there are hints, more so than in the case of corn dryers (with the obvious exception of Hambleden), that millstones may have been particularly associated with villas, since they occur at Claydon Pike, Roughground Farm and Barton Court Farm. Other examples come from sites with (by Thames Valley standards) unusually substantial rectilinear timber buildings, as at Somerford Keynes and Dorney, in both cases in contexts probably of 2nd-century date. The majority of dated occurrences of millstones are likely to have been late Roman. Proportionately, therefore, relatively few of the millstones come from what seem likely to have been the humbler farmstead sites, as defined on simple

structural criteria. A wider study of grinding stones in Old Red Sandstone reveals a similar correlation between millstones and villas (Ruth Shaffrey pers. comm.). It is unfortunate that the Hambleden report provides no information on grinding stones (known to have been found on the site), as these might have shed further light on this and other questions.

Plots for the cultivation of horticultural produce around settlements retained or even increased their importance given the frequency of the discovery of fruit and seeds of herbs used as flavourings. Some of the plots probably had bee hives or skeps in them while orchards, as well as farmyards, would have been suitable for keeping the increased numbers of poultry. A possible insight into the supply of horticultural produce to the town of Dorchester was given by remains from a late Roman waterhole on the nearby settlement at Mount Farm. There was a high concentration of waterlogged seeds of *Apium graveolens* (celery) but also some carbonised ones, suggesting that the crop was undergoing some sort of processing. The prime consumer sites would have been the cities of Cirencester and London. At London, the diverse variety of exotic species probably included numerous overseas imports, but local cultivation of some of the required market garden produce is likely, even if this was hardly on the scale of the provision of early imperial Rome, or of London itself in later times.

The only attempt to produce a coherent account of the agricultural economy of a Thames Valley settlement is the analysis of the Barton Court Villa estate by Jones (1986, 38-42). A combination of geographical modelling, topographical boundaries, archaeological features and surviving old boundaries was used with the biological evidence to postulate the best fit model for the estate. This comprised a unit of land of some 162 ha extending from the 2nd terrace of the Thames, down the inter-terrace slope of Gault Clay, across the 1st terrace and floodplain up to the river. Within this area was a second Roman settlement, on the 1st terrace at Thrupp, which was interpreted as a subsidiary farm. It was suggested that the 2nd terrace was used for the cultivation of cereals and the over-wintering of animals, particularly sheep. The system included the rotational use of land through a cycle of arable, fallow and grass leys. While there is no evidence for the rotational use of land in the Roman period, it is an entirely plausible system for good land management at that date. Further cultivated land is assumed to have been present on the 1st terrace, with cereals being grown in rotation with crops which prefer moist conditions such as flax and beans. The clay slope, the remainder of the 1st terrace and the floodplain were interpreted as grassland, with some of the floodplain used for hay. Such a system would have enabled a stocking level of up to 200 sheep. Some cattle were assumed to have been raised at the Thrupp settlement, taking advantage of the ready supply of water and lush riverside pasture for dairying.

This model is consistent with the bone evidence for herd structure. There would have been sufficient oxen from a self-sustaining herd to plough the 30-40 ha which would have been under cultivation. The bone data suggested that some of the cows were kept elsewhere, which is why dairying at Thrupp was postulated. It is also clear that there was the potential to export young male or wether sheep. The charred weed seeds gave no evidence for declining soil fertility levels, as for example noted at the nearby Iron Age site of Ashville so there was presumably a satisfactory system of manuring and possibly fallow or rotation. There is every reason to believe that the villa economy was able to generate a sustainable surplus of both arable and pastoral products.

Trade and Industry

In the Roman period there is more visible evidence for 'economic' activity beyond the sphere of agricultural production, but even so relatively little of this activity can be described as industrial, rather than representing craft production by individual workers or, at most, small workshops. Even for the latter, much of the activity has to be inferred from the end products rather than being indicated by direct evidence for manufacturing processes. Pottery is one of the few exceptions to this and, in the case of the Oxford potteries, perhaps the one activity (in this region) in which the term industry can be justified on the basis of present evidence. In addition, the likely appearance of the building trade, drawing on the products of many individual craftsmen, represented a significant development away from established traditions and a movement towards the provision of specialist services. As already discussed, the archaeological evidence for buildings on many rural settlement sites is extremely poor, but widespread continuity of existing late Iron Age traditions is likely there. The construction of towns and villas, with their very different building types, however, required some skills and components that either did not exist before the Roman period or were needed in greatly increased numbers. Regular supplies of building stone, tile, window glass and suitable timber had to be arranged (see below) and in villas and the larger town houses the skills of plasterers, painters and mosaicists might be called upon. Within these and in many more humble buildings there was widespread use of structural ironwork, nails and a variety of fittings, requiring a completely different scale of production from that seen previously.

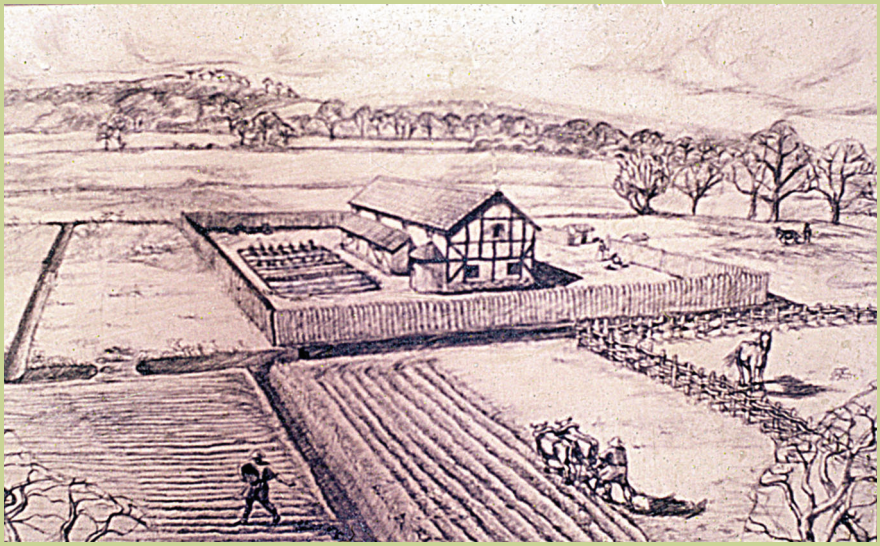
The concentration of new styles of building construction may have been a factor in encouraging a corresponding concentration of some craft activities and trading functions in the larger nucleated settlements. Even so, it is only in Cirencester and

Fig. 6.10 (overleaf) Feature: Barton Court Farm

BARTON COURT FARM OXFORDSHIRE

Barton Court Farm lies on the second gravel terrace just east of Abingdon (Oxon) and less than 1 km north of the Thames. The site, excavated from 1972 to 1976 in advance of housing development (Miles 1986), was of four main periods. In the earliest a trapezoidal enclosure contained a small circular post built structure and hints of a further, possibly larger, structure in the extreme corner. A smaller rectangular enclosure was aligned eccentrically within the main one and had a group of pits just outside it. Further possible structures, one surrounded by a gully, lay just south of the main enclosure.

A 2nd-1st century BC origin is likely for some of the features within this settlement, but most were associated with pottery of 'late Iron Age' date, similar to material in use in the succeeding settlement. This again was defined by a slightly trapezoidal enclosure, directly overlying its predecessor. Double-ditched on the east side, the enclosure was subdivided by another ditch. In its southern part a large rectilinear timber building (perhaps 28-30 m long and 8.5 m wide), probably with plastered walls and a thatched roof, was presumably the main domestic unit, though no internal features (other than possible structural post positions) were identified. Between this building and the enclosure entrance to the south were two six-post structures of a type commonly interpreted as raised granaries.



Top:
Phase plans of the site
Above:
Reconstruction drawing of the 4th century villa

This settlement probably directly succeeded the earlier one, perhaps around the middle of the 1st century AD, and was occupied into the early 2nd century AD - this is one of many Upper Thames sites affected by the settlement hiatus at that time. The large building and aspects of the finds, including the presence of iron keys and a few coins, unusual in an early Roman rural settlement context, suggest that this was a relatively high status farmstead.

When the site was reoccupied, after a gap of some 150 years, the new farmhouse, a modest villa building, overlaid the east end of the second period house. It was set within a small ditched compound in turn within a larger rectilinear enclosure complex about three times as large as the early Roman one. These ditch systems may belong to a secondary phase of late

BARTON COURT FARM
OXFORDSHIRE

Roman development in the first half of the 4th century AD, at about the same time as a cellar was added at the north end of the house and a further small stone-founded building constructed to the east within the large enclosure.

Other features included two 'corn-dryers' and two wells, one set within a square stone-walled well house. The farmhouse was very poorly preserved, but had some tessellated floors, painted wall plaster and a roof of tiles and limestone slates. The presence of a tessellated floor in the 'cellar' is notable; this may have been a cult room, perhaps related to a fertility cult (Perring 1990).

Clockwise from top left:
**Phase plans;*
**A group of metalwork from the well*
**A locally-made pottery jug from the well*
**Late Roman well and surrounding well-house*
**The sunken 'cellar' room, showing the tessellated floor*

BARTON COURT FARM
OXFORDSHIRE

Other aspects of interest in this period include the presence of over 40 infant burials, mostly in the eastern part of the main enclosure, a small hoard of very late Roman date (consisting principally of coins dated 388-395, but very worn, indicating deposition well after AD 400) from the smaller building, and several mill stones. The agricultural regime was mixed. Detailed consideration of all the environmental evidence in relation to topography and other characteristics identified an area of a little over 160 ha for the potential extent of the estate which offered the best fit with the biological data (Jones 1986).

The site survived into the 5th century, but the final phase of Roman activity probably included systematic demolition of the main farmhouse (Miles 1986, 16), perhaps while the smaller building was used as a domestic structure. A significant early Saxon settlement concentrated in the areas east and south of the main house. Seven sunken featured buildings and as many as eight possible posthole structures (in addition to fences) were present. The former, in particular, produced considerable quantities of finds, including pottery, animal bone and decorated bone combs, ceramic and lead loomweights, spindle whorls and other items related to textile production. At least four Saxon burials were recovered, two of which were of women, accompanied by infants. It may be significant that all four burials were placed within the former Roman buildings, two in each.

The majority of the finds were of the 5th-6th centuries. Very close dating is not possible, but some of the pottery could be as early as the mid 5th century. On this basis Miles (1986, 52) proposed a 'butt joint' between the late Roman and early Saxon occupations of the site. A single bone comb was the only indicator of possible mid-late Saxon activity.

Top left:
Anglo-Saxon sunken featured building in the course of excavation
Top right:
The early Anglo-Saxon settlement plan, showing the relationship of these features to the main elements of the late Roman villa
Above:
One of the numerous late Roman infant burials

Fig. 6.11 Quern stones. A top stone of Upper Greensand and a Lodsworth bottom stone from Eton Rowing Lake, with a second Lodsworth bottom stone from Abingdon to the right

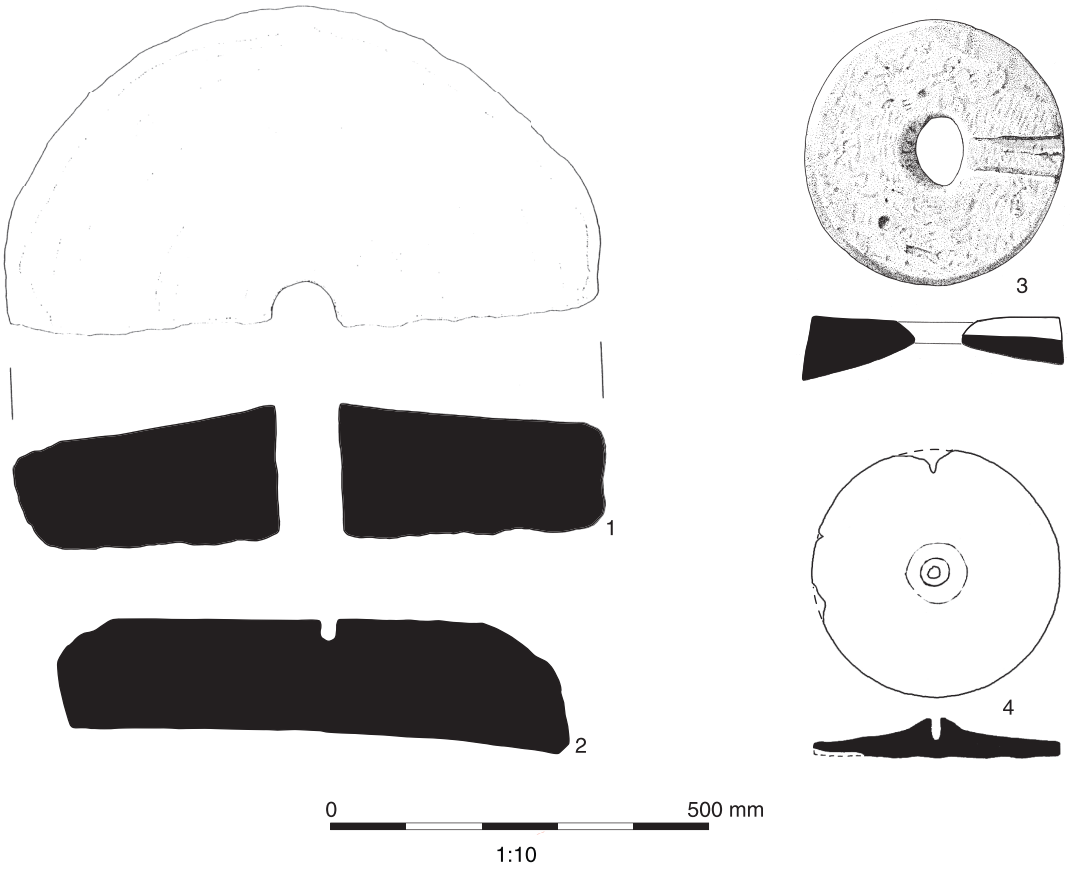


Fig. 6.12 (1 and 2) Millstones from Barton Court Farm, with hand querns from Appleford (3) and Staines (4) for comparison

London, at the very extremities of the region, that there are buildings which can be identified with some confidence as shops, or workshops related to activity other than pottery production, although very recently-excavated structures adjacent to the temple precinct wall at Frilford are plausibly interpreted as shops/workshops providing goods for visitors to the site. London, as the premier port of Roman Britain, inevitably produces a wealth of evidence for traded goods (eg Miller *et al*. 1986) as well as for the installations (Milne 1985; Brigham 1990) and shipping (Marsden 1994) associated with that trade. Shops and workshops are less clearly evident, but are still present in numbers in the early Roman period, at least. Overall the evidence from London can hardly be regarded as typical, and although it will have served as a centre for redistribution of a very wide range of traded commodities it is unclear how far such trade will have affected the daily lives of the inhabitants of the Thames Valley.

At Cirencester excavation of probable shops has concentrated in a central area of the town immediately south and south-west of the forum (Holbrook 1998, 177-245). Here lay a possible *macellum* or market hall – though perhaps more likely a row of shops fronting a courtyard associated with the main town baths (ibid., 188) – and rows of individual shop units fronting some of the most important roads in the town. Identification of the functions of these buildings is in some cases based on their form rather than upon more direct evidence. The latter, however, does include evidence for metalworking of lead, copper alloy and gold (Bayley 1998). Activity in a number of these buildings, but not in all, seems to have continued right up to the end of the Roman period. However, it is usually not possible to determine if there had been any change of function (eg to non-commercial use) with the passage of time, and therefore we cannot be certain that this area remained a focus of economic activity throughout the life of the late Roman town, although there are indications that this is likely.

Identification of commercial or even craft-related activity is particularly difficult away from the major towns. At Dorchester the site of a house in the north-west quarter of the defended enclosure was converted to 'industrial' use indicated by a dozen hearths and ovens. This activity, dated to the late 3rd or early 4th century and later, was interpreted as being for the manufacture of lime, probably for agricultural use (Rowley and Brown 1981, 8-10), though it is unclear why such an activity should have been located within the defences. A more likely context for large scale lime production in this location might have been the construction of the town walls themselves, but this would have been a relatively short term process, whereas the use of the hearths and ovens seems to have continued well into the 4th century. It is not certain that lime production was the function of these features, however (no samples were taken), and overall their role in the economy of the town remains unclear.

Evidence for craft and industry from Staines suggests that both ferrous and non-ferrous metalworking were carried out there, as would be expected, such activities being more or less ubiquitous in larger settlements. Leather-working was also important, evidence coming from waterlogged deposits in which both artefacts and offcuts were preserved (Bird 2004a, 58-9), and is logically associated with the systematic butchery of animals. The latter activity was a regular feature of Romano-British town economies and there is good evidence for it at Staines (McKinley 2004, 28-9) as well as at Cirencester. Analysed samples from Dorchester are too small for specialised butchery practices to be confidently identified, however, although it is very likely that they were carried out there.

Pottery production (Figs 6.13-6.16)

One activity that was associated with the Dorchester area is pottery manufacture. Sites such as Allen's Pit just north of the town formed part of the Oxford industry, and material from a well at Dorchester Abbey, immediately east of the town defences, probably also represents production waste. Ceramic production is one of the most easily recognisable industrial activities of the Roman period and there is plentiful evidence for it in the Thames Valley. The scale of this activity varies considerably, however, and in some case the evidence relates to small-scale local craft production which cannot be characterised as industrial.

All the earliest evidence for pottery manufacture is of this small-scale character. Single kilns, or small groups of kilns, of 1st-century date are known from a number of locations in the Oxford area (Long Hanborough, Cassington, Yarnton and the Churchill Hospital, among others; Fig. 6.13). All produced coarse pottery, mainly jars, of types related to the late Iron Age 'Belgic' style, for domestic use. Such small scale, localised production was typical of many areas in the early Roman period. Larger centres, some including specialist potters, did exist at this time, but not within our region. First-century specialist fine ware production is postulated in the Dorchester/Abingdon area, but its exact location is unknown and its scale was probably modest. By the early 2nd century there had been some changes to this pattern and a number of substantial industries that were to be significant suppliers to the region over an extended period were established, though only one of these, the Oxford industry (see Fig. 6.15) lay within the valley itself.

The principal supply of local coarse wares in the Upper Thames came from sites in the Swindon area, south of the valley. These were certainly important through the 2nd and 3rd century, but the extent of 4th century production is less clear. This area was also important for tile production, kilns at Minety (Wilts) supplying many sites in the upper part of the valley. Between the north Wiltshire and the Oxford

Fig. 6.13 Early Roman pottery kiln from Yarnton. The kiln has a flue at each end of a central pedestal and is shown partly excavated

industries a further significant, but unlocated, source of coarse wares, with some similarities to the north Wiltshire potting traditions, served sites on Akeman Street and down the Windrush and Evenlode into the Thames Valley. The Oxford industry dominated pottery supply in its immediate area, but its fine and specialist products were distributed much more widely than the everyday coarse wares, and other kilns maintained low level production of such wares to serve local needs. In the 2nd century sites of this type were located at Maidenhatch Farm, Pangbourne (Swan 1984, fiche 1, 217) and probably at Sonning Common, where the character of surface finds suggests pottery production (Henig and Booth 2000, 171).

Further down the valley pottery production, including that of lead glazed and mica-coated fine wares in the late 1st and early 2nd centuries, has been claimed in the Staines area (eg Arthur 1978, 298-308; Fig. 6.14). Present understanding of the distribution of these wares perhaps suggests a source a little north of Staines, however (Bird 2004a, 128). Locally important sources of coarse wares for this area were kilns at Fulmer and Hedgerley, in the Gerrards Cross area, at some distance from the Thames. These formed part of a 'lower Colne valley' industry which remained in production up to about the mid 3rd century. Major regional coarse wares suppliers lay even further distant. The most important of these was the Alice Holt/Farnham industry, located in east Hampshire and west Surrey, in the upper part of the Wey valley at least 25 km south of the Thames. Its products were particularly widely distributed in the late Roman period, reaching as far north as Oxford and occasionally beyond, but were especially important for the Middle Thames and London. It has been suggested that water transport down the Wey was a significant factor in the distribution of Alice Holt/Farnham pottery, particularly to London (eg Lyne and Jefferies 1979, 52, 54), but it is unclear how viable this would have been in the Roman period (Bird 2004a, 47). London was itself

the site of some pottery manufacture in the early Roman period, though it is likely that most of this was for relatively local consumption. Other important pottery industries serving London lay a little further distant, in particular those to the north and north-west at Highgate Wood and Brockley Hill. Both of these lay well outside the Thames Valley, but their products reached a number of sites in the valley upriver from London in the 1st and early/mid 2nd centuries, after which their importance declined markedly.

There is a broad tendency towards a reduction in the number of individual pottery producing sites in later Roman Britain, with a corresponding increase in the importance of a small number of major industries (although minor producers did not disappear altogether). By the late 3rd-4th century the Oxford and Alice Holt/Farnham industries were working on a very large scale and most of the smaller Thames Valley region producers were no longer in operation. An interesting exception to this is found at Compton. This site lies on the Berkshire Downs some 6 km west of the Thames at Goring (Harris 1935; Hardy 1937). One of the two excavated kilns (the presence of more may be suspected) was certainly of 4th-century date and its products included distinctive dishes of a form exactly paralleled at Overwey, Surrey and elsewhere in the Alice Holt/Farnham industry, as well as in one part of the Oxford industry. The latter connection is strengthened by the presence at Compton of grey ware copies of stamp-decorated beaker forms from the Oxford colour-coated ware repertoire. Compton products, of which the dishes are perhaps the most readily recognisable, may have been an important element of 4th century assemblages in the Thames Valley in the Dorchester area and therefore, presumably, further down river as well.

Of the industries in or immediately adjacent to the valley that based around Oxford is the best known (Young 1977), though understanding of many aspects of it is still quite deficient (Figs 6.15, 6.16). To date the physical remains of approximately 58 kilns have been encountered at various time from the late 19th century onwards (the most recent is a single kiln from Boars Hill, west of the Thames; R Scott 2002). These must represent only a small proportion of the original total, since geophysical survey has suggested the existence of perhaps 40-50 kilns at a single site, Lower Farm, Nuneham Courtenay (Henig and Booth 2000, 166-167), which was but one of numerous foci of production within the industry. The survey also shows the relationship of clusters of kilns to a series of enclosures alongside a trackway, giving a good impression of the overall layout of the site and of its very considerable extent. It is the latter, albeit without any real indication of development of the complex through time, that suggests that the impact of the industry on the local landscape must have been very significant. The nature of local agricultural activity is poorly understood, but there is little indication that it was

Fig. 6.14 Early 2nd-century lead glazed bowl, perhaps from a production site in the Staines area

intensive. The correlation of the kiln sites in the east Oxford area with soil types suggests that this was not prime agricultural land and moreover that much of it could have been wooded – the advantages of situating the industry adjacent to a significant fuel source are obvious. Indeed it is likely that the availability of this key resource, combined with the (relatively rare) presence of an iron-free white firing clay, was a primary consideration in the location of the industry. Analysis of charcoal from Blackbird Leys does not suggest the practice of woodland management techniques, but rather the opportunistic use of available resources (Challinor 2003, 256). If this was typical of the industry it would make sense for it to have been located close to extensive woodland to allow for natural regeneration of the resource over an extended period. Evidence for coppicing, whether to ensure sustainable supplies of fuel or for other, specialist purposes, is relatively rare in the Thames Valley as a whole. Coppicing of hazel is indicated at Roughground Farm (Allen *et al*. 1993, 191), and of oak at Farmoor (Lambrick and Robinson 1979, 81) but there is at present no indication that these examples are indicative of a widespread practice. Its importance was probably in relation to structural requirements, rather than the provision of firewood.

Other crafts (Fig. 6.17)

The Oxford pottery industry appears to be exceptional within the region in terms of the scale of its impact on the wider landscape. The other ceramic industries within and near the valley, already mentioned, were on a significantly smaller scale. Activities such as iron production, which also potentially have major implications for use of woodland, are barely attested in the region as suitable raw materials were scarce. Other extractive industries, in particular stone quarrying, must have been locally important, but are extremely poorly documented in the archaeological record. The best known examples are probably the quarries that underlay the amphitheatre at Cirencester (Holbrook 1998, 147, 149). The larger villa sites would have used substantial quantities of stone. Local quarrying can be presumed where this was an option, but the builders of the villas on the gravels, such as Roughground Farm, must have imported their materials at some cost. Despite the well-known qualities of various Cotswold limestones, however, there is relatively little evidence that they were traded in significant quantities down the Thames. In the Middle Thames the prevailing chalk geology resulted in the widespread use of flint for foundations and perhaps also for superstructures, although at Hambleden, for example, it was suggested that the flint walls supported timber-framed superstructures (Cocks 1921, 164-5). Quarries for flint and chalk (indeed flint is probably largely a by-product of chalk quarrying) specifically assignable to the Roman period are not easily identified, however. Gravel itself was widely dug, principally for the surfaces of roads, tracks and yard and floor surfaces. Most such activities would have been relatively small scale and ad hoc, but could on occasion, as in the context of road construction, have been organised more formally, as perhaps at Staines.

A notable characteristic of the largest scale productive activity in the valley, such as pottery manufacture, is its rural location – some important pottery industries were more closely linked to urban centres in the early Roman period, but this does not apply to our region. Craft activities such as specialist metalworking were probably concentrated in the nucleated settlements, but their scale is difficult to assess on present evidence and none of the known sites can be characterised in any sense as 'industrial'. Other craft activities are identified in smaller rural settlements: again metalworking is amongst the most readily recognised of these. The context of such work was of course the provision of the necessary equipment of daily life in agricultural communities, so iron slag derived from smithing occurred most commonly. Other more specialist activities are also sometimes indicated, however, for example by the occurrence of barrel making tools at Claydon Pike and a metal-working file from Somerford Keynes, in addition to the more typical smith's punches, carpenter's chisels and saws from the same site (Cool in Miles *et al*. 2007).

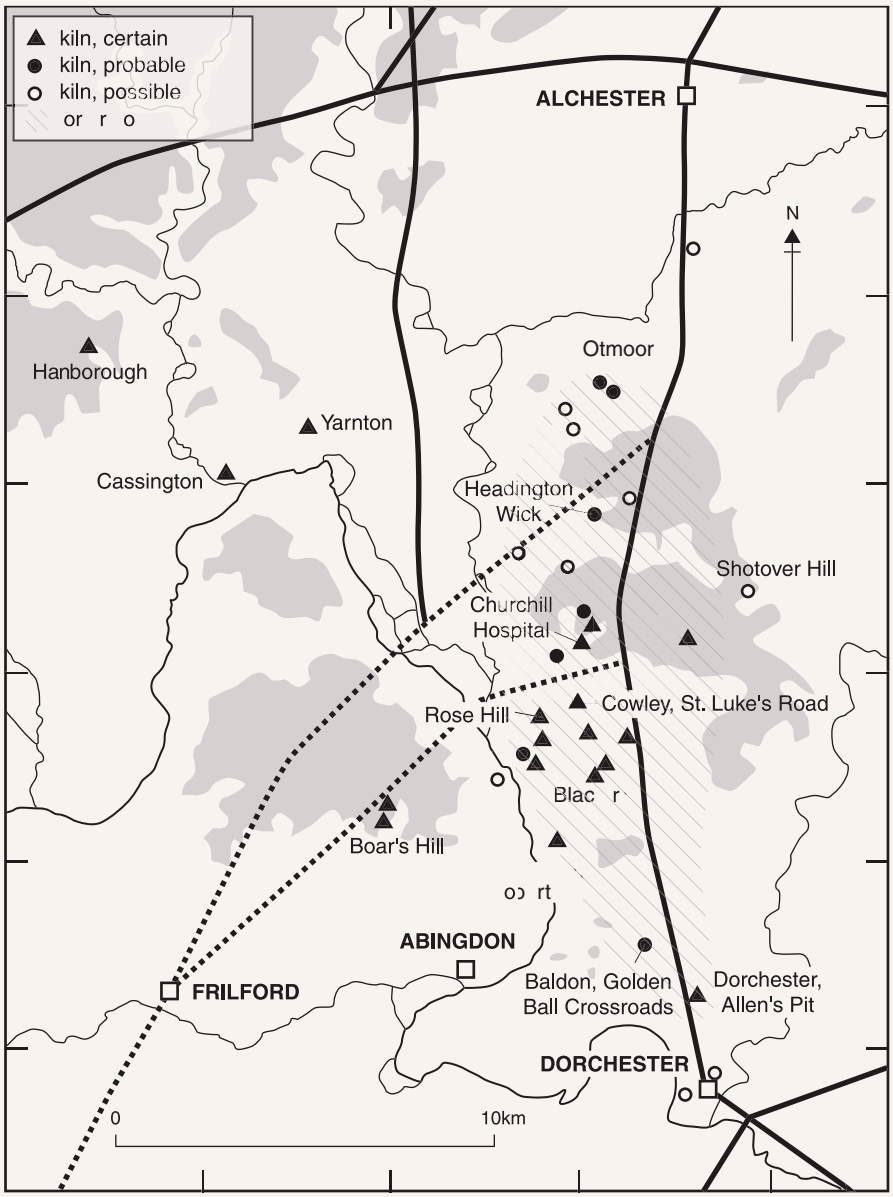
In general, however, a list of basic activities identified for the Iron Age and early Roman settlement at Gravelly Guy – spinning, weaving, sewing, grain grinding and butchery, as well as (probably) leather-working, bone-working and salting down meat – can be considered characteristic of most settlements, even if direct evidence does not always survive. Smithing may have been carried out on the site, and there are also indications of the manufacture of objects from molten bronze in moulds, with a distinct concentration of waste materials from this processes in one of the later Iron Age/early Roman enclosures (Lambrick and Allen 2004, 215). Such localised activities, which leave relatively little debris, could have been more widespread than appears, and are indicated at sites such as Hambleden by the presence of a bronze-working crucible. Working of bone, leather and wood must have been widespread at settlements of all kinds. Bone or antler working is indicated by the presence of sawn or cut pieces of antler at Thorpe Lea (above) and at Appleford, which also produced a sawn cattle horn (Wilson 1980, 89). Occasional waterlogged items attest to the skill of woodworkers, but this activity is more often indicated by finds of tools (see above; Fig. 6.17).

Fig. 6.15 (overleaf) Feature: the Roman pottery industry at Oxford

THE OXFORD ROMAN POTTERY INDUSTRY

There is direct evidence for local coarse ware production in the Oxford area in the 1st century AD. By the end of the century this tradition was combined with two other strands to form a more wide ranging industry which ultimately became one of the most important in Roman Britain (Young 1977). The first of the new strands was fine ware production - probably in the Abingdon-Dorchester area (Timby et al. 1997) - some utilising iron free clays which when fired would result in vessels that were white - a preferred colour for certain types of pottery such as mortaria and flagons. This knowledge was exploited for these vessel types from the beginning of the 2nd century by potters from the important industry based near Verulamium - with their arrival the industry was set firmly on a new course.

The white firing clay was found at Shotover, on the high ground just east of Oxford. Kiln sites using this material were, however, widely spread in a north-south zone from the fringes of Otmoor to Dorchester. Other kilns lay west of the river on Boars Hill, but there is no evidence of white ware production there. The early mortarium and flagon forms were derived directly from the Verulamium repertoire, though features such as the use of potters' name stamps were less widespread than in the parent industry - and literate stamps were notably rare. Complementary coarse ware forms -



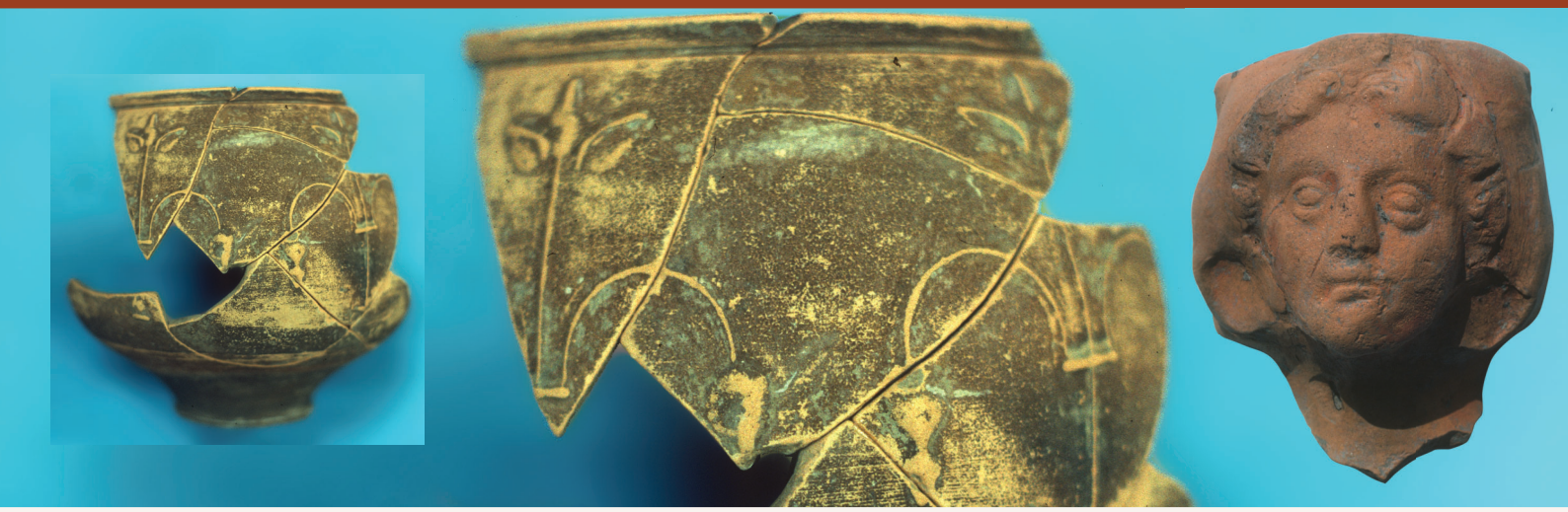
THE OXFORD ROMAN POTTERY INDUSTRY

the utilitarian jars, bowls and dishes made in the widely available iron rich clays that fired red or grey depending on the way that the kilns were operated - developed from the local regional tradition. There was also some experimentation with 'exotic' technologies (eg the use of glaze) in the early 2nd century at Nuneham Courtenay (Booth *et al.* 1993, 165, 170-1) and colour-coated beakers were produced at the same site in the later 2nd century. None of these products was widely-distributed, however.

From the late 2nd century the industry developed its own range of mortarium forms which were increasingly widely-traded. A major change in the character of the industry came in about the middle of the 3rd century, however, when large-scale red and brown colour-coated fine ware production was initiated. These vessels were intended to replace samian ware, the import of which, principally from Germany in the previous half century or so, had more or less ceased. Many of the most important colour-coated ware

***Above left**: Early Roman fine wares from Abingdon*
***Above**: Part of 2nd century waster dump at Lower Farm, Nuneham Courtenay*
***Left**: Location of the main elements of the Oxford Industry*
***Right**: A late Roman pottery kiln from the Churchill Hospital*

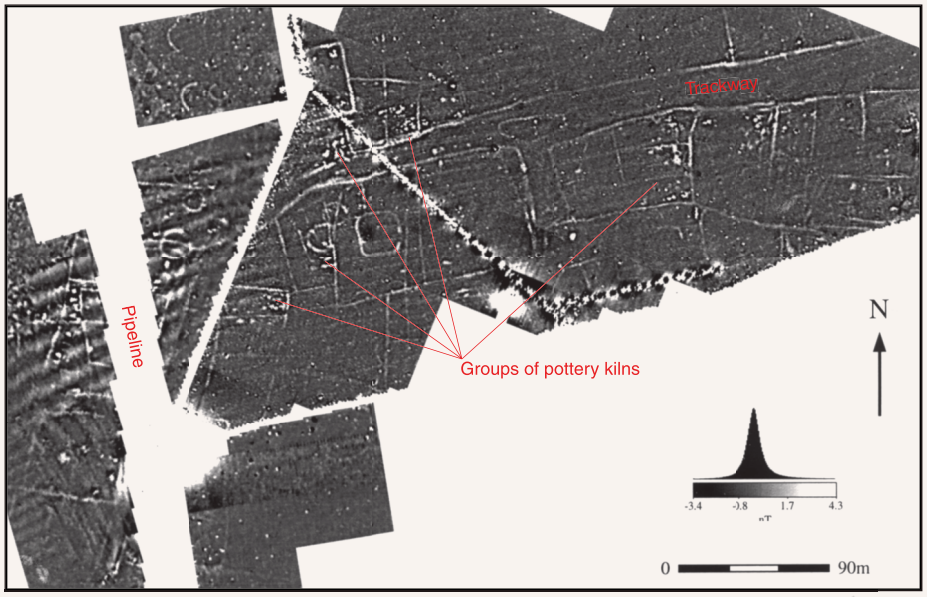
THE OXFORD ROMAN POTTERY INDUSTRY

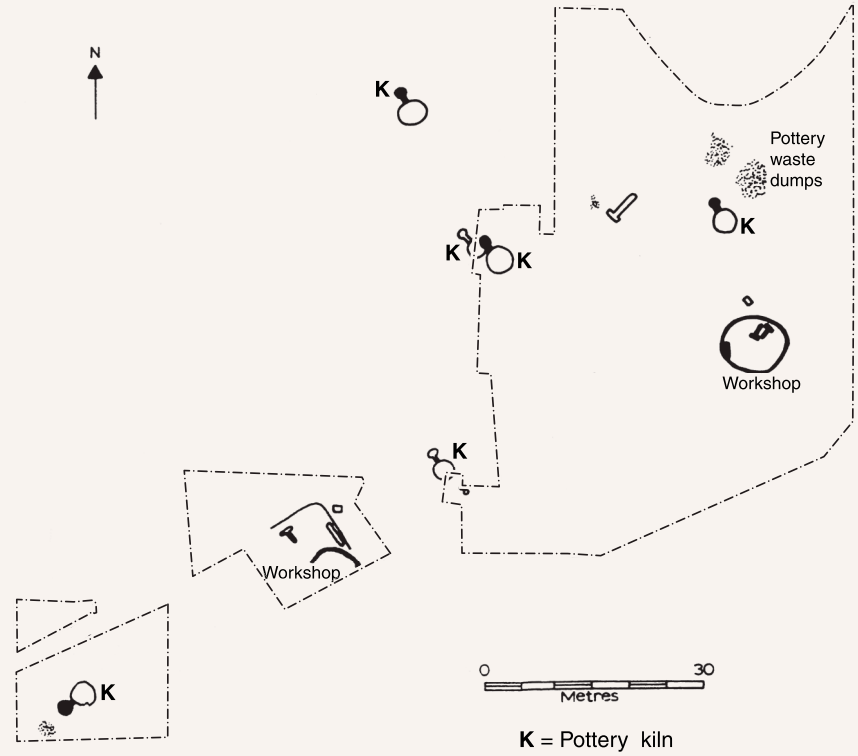


vessels in the Oxford repertoire were direct imitations of samian ware forms - mostly bowls, but including distinctive mortarium types. The use of potters' stamps was also imitated at this time but the practice probably did not outlast the 3rd century.

In tandem with fine ware production the range of white mortaria was transformed again. It was supplemented with similar forms in oxidised fabrics but with a white slip, and by an expanded range of white ware vessels including so-called 'parchment ware' - typified by bowls with red-painted decoration. All these types were widely distributed across southern Britain and the scale of production and distribution makes this perhaps the most significant single industry in late Roman Britain. At the same time, the distribution of 'standard' oxidised and reduced coarse wares never extended beyond regional confines. A number of minor offshoot industries generally do not seem to have had more than local importance (Bird and Young 1981). Most imitated the fine ware repertoire, but one, at Compton in Berkshire, did this in grey fabrics.

At about the end of the 3rd century the range of white mortaria was simplified. Thereafter a few new colour-coated ware types were introduced

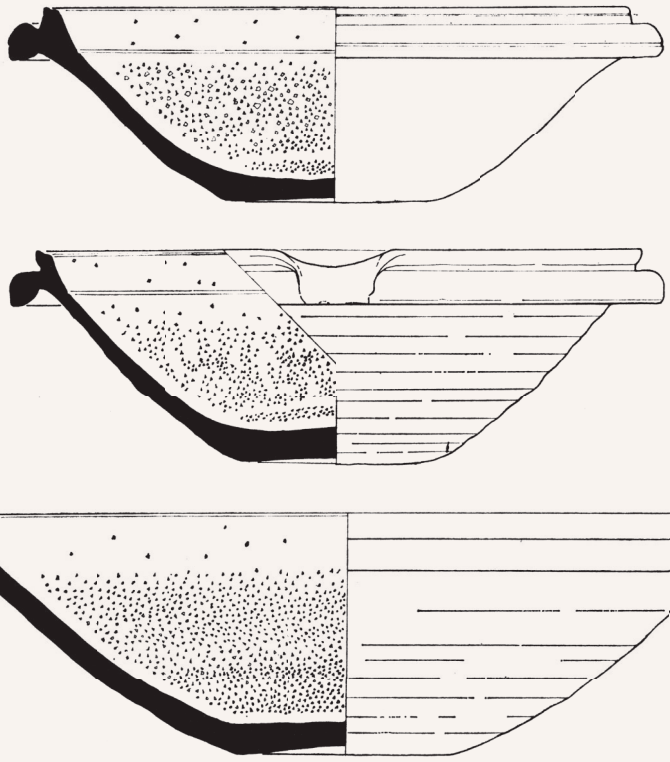


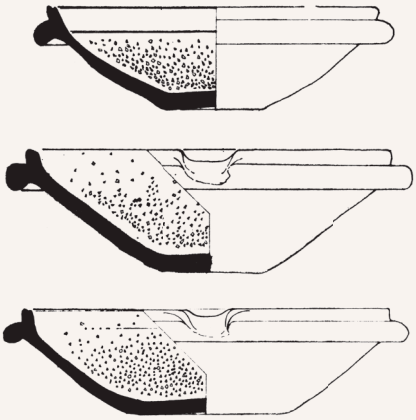


THE OXFORD ROMAN POTTERY INDUSTRY

but the character of production did not change significantly. There was a tendency for stamped and white painted decoration to become more common on colour-coated wares in the later 4th century.

One of the most striking features of the late Roman period, in particular, is the consistency of products across a wide area, which raises interesting questions about the organisation of the industry. The most extensively-known production sites consist of clusters of kilns set in arrangements of small ditched enclosures (eg at Lower Farm and Blackbird Leys; Booth *et al.* 1993; Booth and Edgeley-Long 2003). Workshop structures, however, are only certainly known at the Churchill Hospital, one of the most important late 3rd and 4th century production centres (Young 1977, 24-9, 46-50). The intensively exploited focal area of the industry, which extended from Headington to Nuneham Courtenay, has been described as a semi-industrialised landscape and the association of production with the probable villa site at Headington Wick has prompted speculation about the nature of investment in the industry. The extent of vessel distribution in the 4th century, if not earlier, implies an organisation that goes well beyond local and socially-embedded distribution networks.





***Top left to right**: 2nd century colour coated beaker from Nuneham Courtenay, mask from oxidised face flagon, late Roman colour coated flagons and bowl from Nuneham Courtenay*
***Above left**: Part of a geophysical survey at Lower Farm, Nuneham Courtenay, showing tracks, enclosures, and groups of kilns. The excavation was at the point marked 'pipeline'*
***Left:** Churchill Hospital workshop area in the 4th century*
***Right:** Late 3rd-4th century white ware mortaria from the Churchill Hospital*

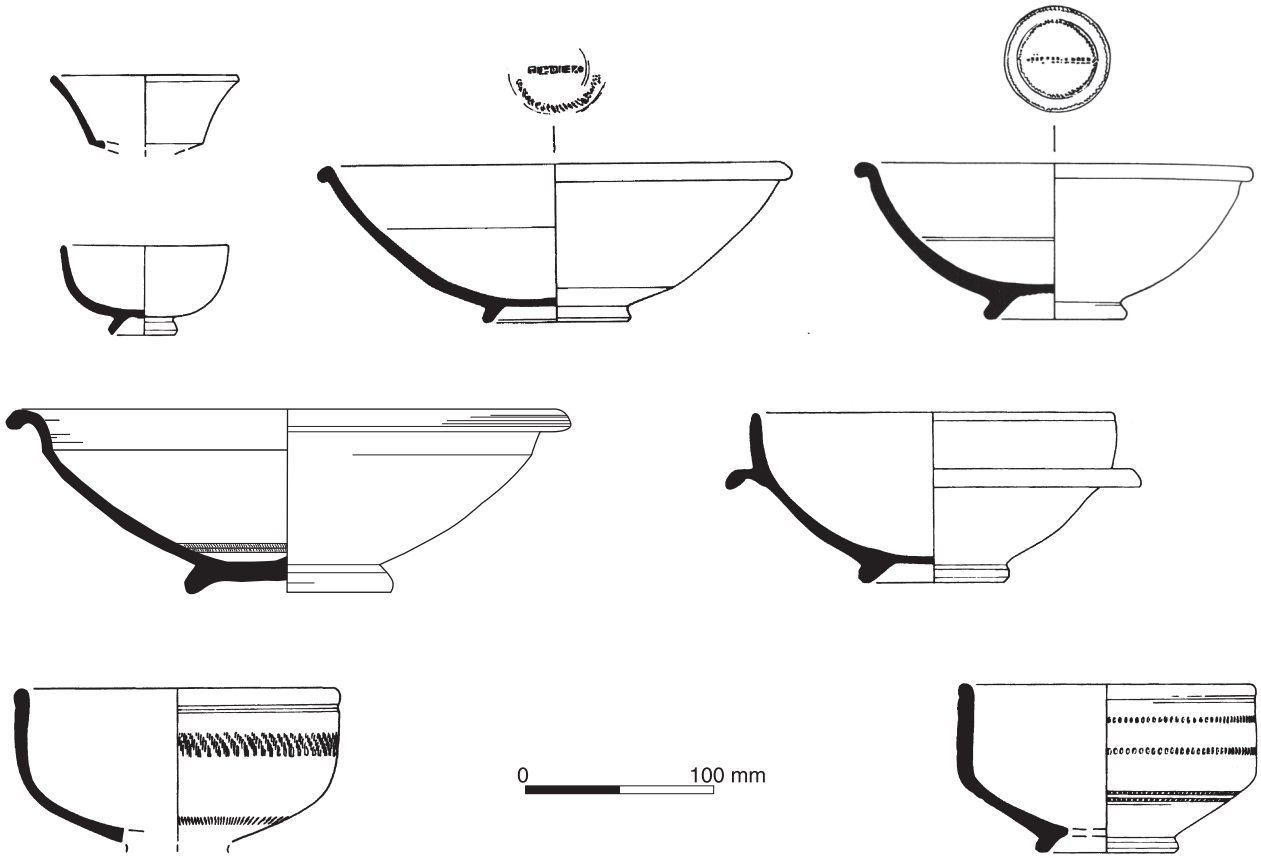


Fig. 6.16 Late Roman Oxfordshire colour-coated ware vessels from Lower Farm, Nuneham Courtenay and Blackbird Leys, Oxford. Most of these vessels imitate samian ware forms

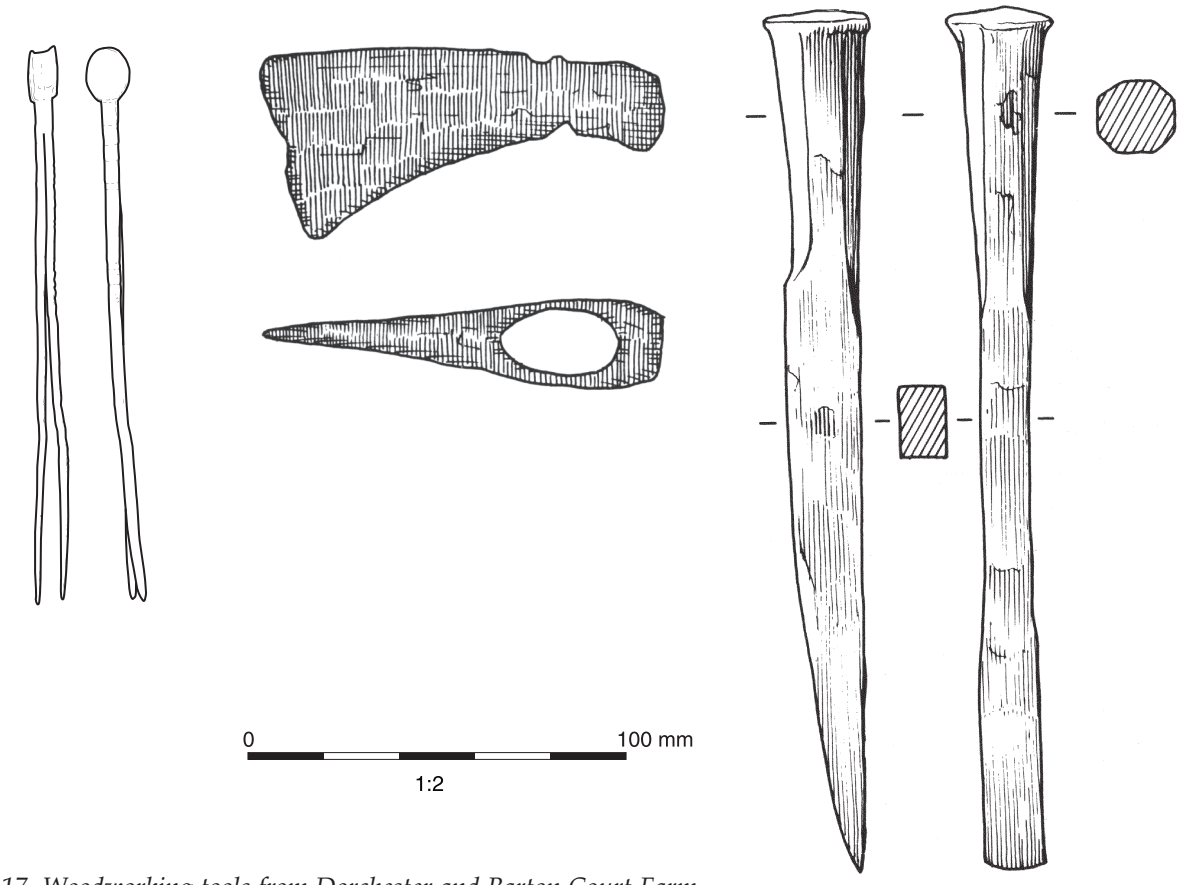


Fig. 6.17 Woodworking tools from Dorchester and Barton Court Farm.
Left to right dividers from Barton Court Farm, small axe and chisel from Dorchester

Communications and trade (Figs 6.18-6.19)

Evidence for trade is often more readily identified than that for manufacture, though generally a few categories of objects that can (sometimes) be assigned to known sources, such as pottery and stone, have to stand proxy for a much wider range of materials that may have been traded. Even with these categories of material, however, there can be problems. The mechanisms for distribution of most goods that were not locally produced are simply unknown. It is presumed that nucleated settlements served a key market function for Romano-British rural communities, but this can rarely be demonstrated with direct archaeological evidence. A large open gravelled space at Dorchester, for example, is plausibly interpreted as a potential market place (Frere 1984a, 98-100), but lacks associated finds that might substantiate such a function.

A major precondition for the successful development of the trade aspect of the economy of Roman Britain, as well as for political and strategic military considerations, was the existence of an effective communications network. The main features of the road network in the Thames Valley were outlined in Chapter 3 (above). It was noted there that the valley was not followed by major roads, initially at least because its line was of limited strategic significance. Nevertheless the skeleton of major roads was fleshed out over an extended period taking account of the gradual growth of settlements across the region. In the course of this process Dorchester developed into a significant junction, with secondary roads running from it to north-east, east and south-east (Malpas 1987), the last of these heading to another crossing point of the Thames, at Henley. There may have been more than one crossing of the Thames in the Oxford area as part of another north-south route through the county, west of the Dorchester to Alchester route. Second rank roads seem to be less well known further down the valley, but networks of minor roads and trackways, often unsurfaced, will have existed everywhere. Excavation and (in particular) cropmark evidence from the gravels allows these to be traced (usually as paired ditches) for considerable distances in some locations, for example at Long Wittenham (Oxon). In contrast, a short stretch of a paved road or track can be seen from the air running west from the villa at Hambleden. This could have been part of a more extensive road running up the valley but on present evidence it was only of local significance. A length of trackway recently examined at Gill Mill was also unusual in having a compacted limestone surface. Another road at Gill Mill crossed the floodplain of the river Windrush and had a row of oak piles along it to support a walkway to enable pedestrians to cross in the dry during times of flood.

The minor roads and tracks may not have carried a large volume of traffic, but they provide evidence of a highly organised landscape through which it was possible to access not only neighbouring farms but also more distant settlements, markets, religious centres and so on, with animals and vehicles as necessary. Archaeological evidence of the latter is sometimes recovered, most commonly in the form of iron linch pins from the ends of axles. A much more notable find is of part of an oak cart wheel *c* 1 m in diameter from a waterlogged pit at Gill Mill, Ducklington (Fig. 6.18). This may be representative of a fairly common class of simple agricultural vehicles for which evidence rarely survives. Further waterlogged remains, possibly from the side of a cart, have been excavated at Dorney (Allen and Welsh 1996, 29; Fig. 6.18).

The extent to which the river developed as an important communication line in its own right is less clear. The importance of the river as a transport route in more recent times may make it surprising that there should be doubt about this in the Roman period, but above London the evidence is consistently poor. It is difficult to determine if the apparent lack of exploitation was because of the physical characteristics of the river or because it was felt to be unsuitable for other reasons, or indeed simply reflects the lack of examination of the sort of sites that might produce relevant evidence.

It is likely, however, that the river would not have been suitable for long distance transport using craft of any size. Without improvement in the form of features such as weirs, for which there is no evidence whatsoever in this period, there would have been rapids at a number of points. Stretches of the river may have been negotiable by larger craft, and longer stretches by smaller, punt-like vessels, but whether these were used for long distance transport of traded items is unknown. Where the development of the river has been examined closely, combining archaeological and environmental data, as at Oxford, it is clear that in the Roman period it was characterised by 'large areas of shallow water with little flow' and increased alluvial deposition into the bargain (Robinson and Wilkinson 2003, 78).

The clearest indicators of the use of the river for trade are likely to be commodities such as pottery, stone and perhaps ceramic building material, the bulk movement of which by water will have been significantly more cost-effective than road transport. As already indicated, however, there is little evidence for the use of Cotswold stone in places like London, where it might be expected (see also Henig and Booth 2000, 162). In contrast, the identification of Corallian limestone or (less likely) Forest Marble in the Silchester amphitheatre (ibid.; Sellwood 1989, 139-141) might reinforce the picture of middle distance exploitation of the valley, perhaps within the socially constrained framework suggested above for the late Iron Age, though it does not absolutely prove that water transport was used to convey this stone, or other materials. Forest Marble from an unknown source in the Cotswolds was, however, identified as a significant component of the stone from the forum basilica at Silchester (Wooders 2000, 87). The scale of exploitation of Stonesfield Slate, also potentially identified at

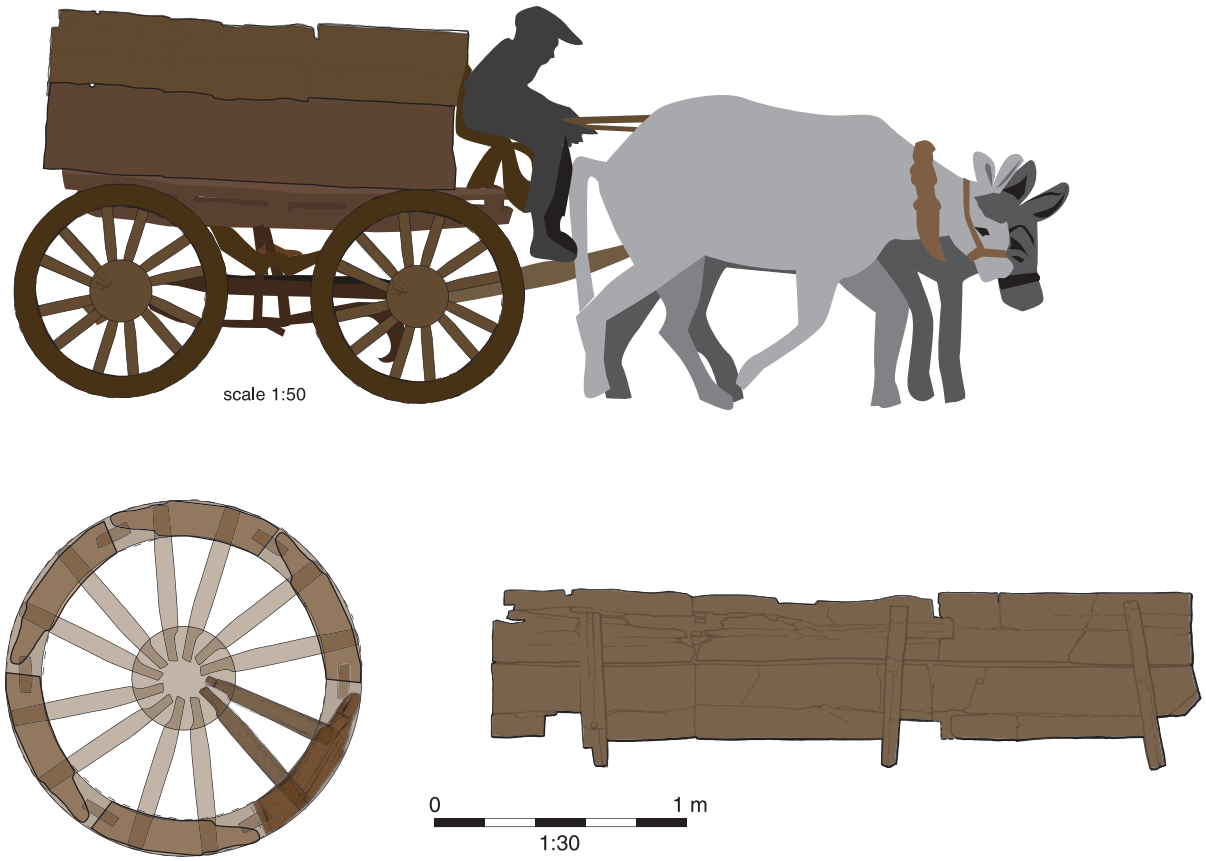


Fig. 6.18 Fragment of cartwheel from Gill Mill, Ducklington and part of a cart side ('greedy-board') from Eton Rowing Lake. The composite reconstruction, based on a relief from Langres (Eastern France), shows how these pieces could have related to a complete vehicle

Silchester, remains uncertain, however (ibid., 99; Henig and Booth 2000, 162-3), and it is notable that the majority of the considerable variety of identified stone types from the Silchester basilica, and the physical bulk of these, derived from sources to the west rather than to the north, with oolitic limestone from the Bath area forming the majority material.

Specialist stones used for grinding were drawn from a wide range of sources of which some, such as greensand from Lodsworth, had been exploited before the Roman period. The same may have been true of the Old Red Sandstones of the Forest of Dean, but this material became much more widespread after the conquest and was the dominant stone type for querns on most Upper Thames sites. In the Middle Thames, Lodsworth and a number of more local stones, including other greensands and sarsen, were widely used. In addition there were two widely-distributed stone types from outside the region; lava and Millstone Grit. Lava from the Niedermendig area of the Eifel occurred across the region but may have been more common in the Middle Thames. In particular it dominated quern assemblages from Staines – perhaps reflecting the transport of stones upriver from London, which was presumably a main point of entry into Britain for this material. Millstone Grit, from the southern Pennines, was also quite widespread and was especially preferred for millstones; where it is known, the stone type for millstones in the valley is almost invariably Millstone Grit or Old Red Sandstone, the sole exception being a fine sandstone probably from the Bristol area found alongside Millstone Grit and Old Red Sandstone millstones at Ashton Keynes.

The Oxford pottery industry was ideally located to take advantage of the Thames for distribution of its products. Thirty years ago a pioneering study of the distribution of Oxford pottery concluded that the river was an important element in this distribution, and that this was consistent with an economic framework governed by market forces (Fulford and Hodder 1974). There are substantial areas of Oxford pottery distribution, however, to the north, east and particularly west of the production centre, that have no relationship with the river at all and Millett (1990, 171-4) has suggested that the general shape of these distributions is more likely to have been influenced by the enduring pattern of civitas boundaries. This may be so in part, but the overall distribution is sufficiently wide for it to be clear that it was not totally constrained by such factors. Moreover,

whatever the precise nature of such constraints, the distribution of Oxford products in some quantity to places such as London and Kent has to be explained – and some use of water transport seems to be implied. Whether this was used continuously from the production sites, or whether pottery was initially transported by road and then transhipped, is unknown, however.

The evidence of pottery and other goods traded into the Middle and Upper Thames does not provide much indication of the specific directions of that trade. Pottery, as in many areas of Roman Britain, was drawn from a wide variety of sources, though the Upper Thames, at least, produces little material that can be regarded as particularly exotic. The range is likely to have been widest at the larger nucleated settlements, although setting aside the exceptional cases of Cirencester and London relevant evidence is only really available for limited assemblages from Staines, early Roman Abingdon and Dorchester, few of which have been published. For most sites, including the variety of rural settlements, samian ware was the only numerically significant continental pottery in use, and this almost never amounted to more than *c* 5% (by sherd count) of assemblages, and commonly only totalled half this amount. Samian ware was supplemented by much smaller quantities of fine wares (usually beakers) from a variety of French and German sources, and also by a variety of amphorae. The great majority of these were olive oil amphorae from southern Spain, but fish sauce and various wine containers also occurred. These were usually very rare or absent on the lesser rural settlements, however (Booth 2004, 49).

Some of the most important sources of the coarse pottery in use in the valley were relatively local (see above). They were supplemented with vessels from a variety of sources located at greater distance (Fig. 6.19). In the Upper Thames these included the Savernake (Wiltshire) and Severn Valley industries (Timby 2001; Webster 1976), both of which were particularly important in the 1st and 2nd centuries. A later arrival in both Upper and Middle parts of the valley was pink grogged ware, from near Stowe in Buckinghamshire. Characteristic large, rounded jars from this industry were particularly widely distributed, suggesting that they may have been traded with specific contents, though if so it is not known what these were (Booth and Green 1989). At Dorchester, one such jar had been patched with lead and was then used to contain a cremation burial, including glass vessels (Harden 1939, 293 and plate XIII).

Some of the other pottery reaching the valley was from industries with even wider-ranging distributions. From the early 2nd century onwards (and probably from the very beginning of the century in the Cirencester area) black-burnished ware from the Poole Harbour area of Dorset was a significant component of assemblages in the region. It was more common in the Upper Thames than lower down the valley (cf Allen and Fulford 1996), although it did reach centres such as London in some quantity in the late 3rd and 4th centuries (Symonds and Tomber 1991), probably by a rather different sea-borne route. In the 4th century shell-tempered vessels in a similarly limited range of forms were widely (but usually thinly) distributed across the region, but for the Middle Thames the Alice Holt/Farnham industry was the principal source of coarse wares in this period. Some production there continued as late as conventional dating can demonstrate – ie probably into the early 5th century. For much of the valley the Oxford kilns produced the majority of fine wares and specialist products such as mortaria in the later 3rd and 4th centuries, but these were supplemented by colour-coated vessels from the New Forest and Lower Nene Valley industries and, in the Upper Thames, by a less well-defined producer in Gloucestershire (Young 1980). There were interesting differences in the repertoires of these industries. All produced colour-coated beakers, but these seem to have been less important in the Oxford industry than in the other three. Thus New Forest vessels found in the Upper Thames, for example, are invariably beakers rather than other forms. The Nene Valley colour-coated ware range was quite wide and included 'fine ware' versions of coarse ware vessel forms such as the classic late Roman suite of jar/cooking pot, flanged bowl and simple straight-sided dish, the mainstays of the black-burnished ware repertoire. Because these forms were only rarely produced in the Oxford kilns, Nene Valley wares occur more frequently than would otherwise be expected given the distance from the source (though they are never particularly common).

Although the main outlines of pottery supply across the valley are reasonably clear, however, it remains the case that some pottery derives from sources that are not yet identified. Local production, often small scale, was particularly important in the early Roman period and a number of such industries doubtless remain to be defined and located. The same probably applies to ceramic building material – for which there are no certainly located production sites within the valley, despite the fact that the nucleated centres of Dorchester and Staines, as well as the villas and some other sites, would have required substantial quantities of tile and brick at various times. Waste material from tile production has, however, been noted at two sites in the Staines area, Thorpe Lea Nurseries (Egham) and Matthew Arnold School (Laleham), suggesting manufacture in their vicinity. At Staines itself such material was relatively widespread (McKinley 2004, 26, 28); while its exact source is unknown, production in the immediate vicinity of the town seems certain.

One certain source of tile is known on the fringes of the region in Surrey at Ashtead Common, some 8 km south of the Thames. This site is of considerable interest because it is one of the few known production centres of decorated relief-patterned tiles in Roman Britain. Such tiles were quite widely distrib-

Fig. 6.19 Major regional sources of Roman pottery supply and local production centres

uted, particularly in south-eastern England. The distribution of tiles with patterns distinctive to Ashtead is interesting, however, as it lies north and south of the production area (ie in Surrey and parts of Sussex, in London and in Hertfordshire to the north, with few outliers and a notable absence of examples in the Thames Valley above London). Another interesting feature of Ashtead is an apparent absence of kilns, the tiles seemingly being fired in clamps (Lowther 1927; 1930; 1931; Bird 2004a, 120-122), although a tile kiln is known relatively close by at Horton near Epsom (Bird 2004a, 122). At the upper end of the valley, uniquely, was another source of relief-patterned tiles (amongst a large output of other types), at Minety, here identified on the basis of the fabric as well as the occurrence of particular dies at the production site (Betts *et al*. 1997, 23-4). The readily-identified decorated products of this industry have a distinctive Wiltshire, Gloucestershire and Oxfordshire distribution, including Cirencester and sites in the valley at Claydon Pike, Roughground Farm and Cotswold Community.

Use of the river

As already indicated, direct evidence of the transport function of the Thames in the Roman period is absent above London. The presence of a miniature votive anchor at Barton Court Farm might be a clue to such a function, but interpretation within the wider framework of religious activity relating to the river and evidenced by deposition of votive material and finds such as the altar from Bablock Hythe might be just as likely (see Chapter 5, above). It is commonly assumed that the resources of the river in terms of fish and fowl would have been widely exploited. The animal bone evidence has been discussed above and is relatively meagre, particularly with regard to fish bones, even allowing for the fact that many excavations have not implemented the sampling policies that might have recovered such material. 'Netting needles', one from the early Roman site at Barton Court Farm (Miles 1986, 30) and others from Hambleden (Cocks 1921, 195), are among the few other potential pieces of evidence in this direction. A fragmentary stake-built structure from Anslow's Cottages, Burghfield, in the lower Kennet valley, has been interpreted as a possible fish trap (Butterworth and Lobb 1992, 175), but is far less convincing than the probable eel trap, of late Saxon date, from the same site (Watson 1992).

THE EARLY ANGLO-SAXON PERIOD

Agriculture from the early 5th to the mid 7th century (Fig. 6.20)

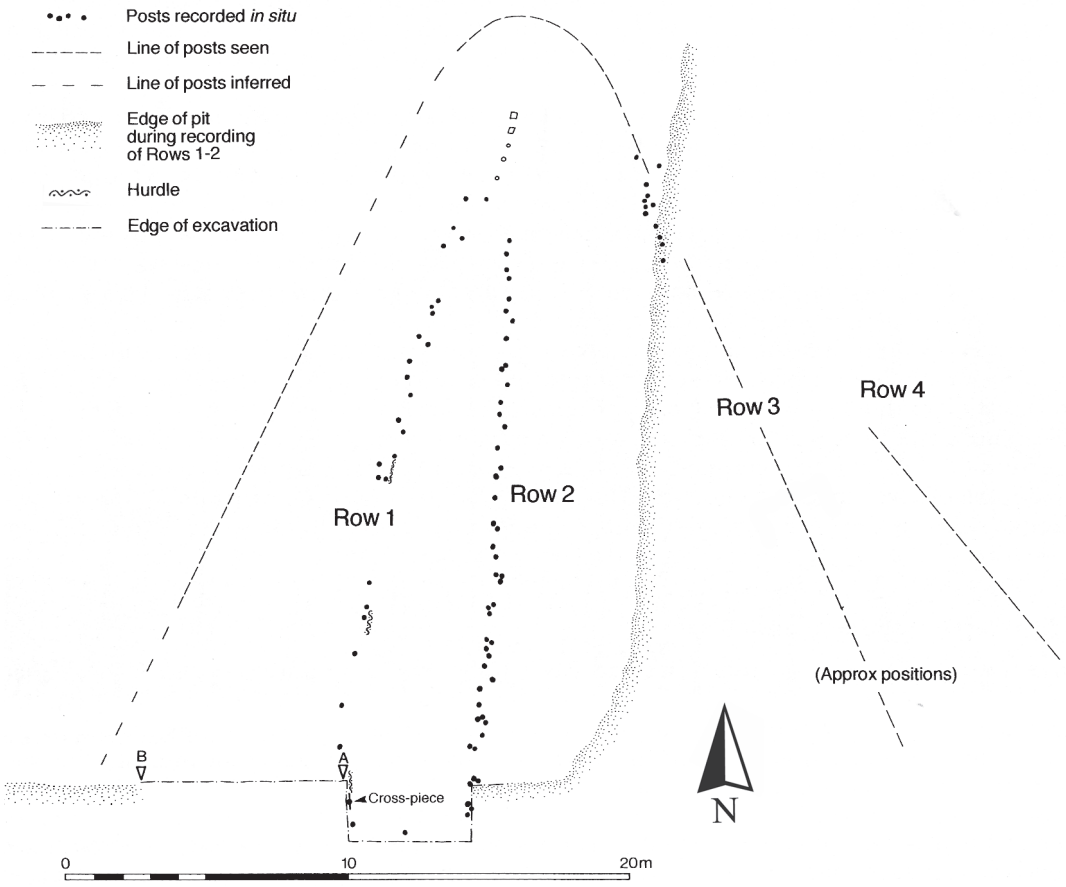
Until recently direct evidence for agriculture in the early Saxon period was slight, but this situation is changing rapidly. The most wide-ranging survey of agricultural practice in the region is that for Yarnton, though much of the evidence there relates to the middle and later Saxon periods. Data from several other sites (below) now supplement the longer-known material from Barton Court Farm.

The general picture from these recently examined sites is of some continuity of agricultural practice from the late Roman into the early Anglo-Saxon period. Broad trends seem to include maintenance of a fairly open landscape, albeit with a reduction in the scale of arable production alongside changes in crops and an increased emphasis on pastoral activity. Characterisation of early Anglo-Saxon agriculture in the wider region is almost entirely reliant on this information from the valley sites – there has been little significant examination of settlements of this date outside the valley. On present evidence, therefore, the question of the extent to which the valley sites are representative of a wider pattern cannot be addressed.

It is uncertain how long the late Roman agricultural system survived beyond AD 410. On the very edge of the gravels of the Upper Thames Valley at the extramural settlement to the town of Alchester, a corn dryer apparently remained in use (Booth *et al.* 2001, 202-7). A layer of charred material probably from the corn dryer and of similar character to remains within it had been deposited in a nearby boundary ditch. The material contained many glumes of *Triticum spelta* (spelt wheat), some grain of *T. spelta*, cereal sprouts and a little grain of hulled *Hordeum vulgare* (hulled six-row barley) (Pelling 2001a). These remains are characteristic of Romano-British crops and agricultural practices, but sherds of early Saxon pottery were found stratified beneath the layer of corn dryer waste. It is unclear if the presence of Anglo-Saxon pottery at the base of the sequence of destruction layers in the corn dryer at Gatehampton Farm, Goring (Allen 1995, 44) also indicates continued use of the structure into this period, or simply its disuse before destruction.

Barton Court Farm provided evidence for the unbroken continuity of flax cultivation from the Roman period into the early Saxon period (Chapter 2, above). The early Saxon waterhole which contained flax remains and a weed of flax cultivation also contained a waterlogged rachis of *Hordeum vulgare* (six-row barley) but unfortunately waterlogged remains of wheat were absent. It would have been most interesting to know whether spelt wheat continued in cultivation at Barton Court Farm. Very small quantities of charred grain of both *T. spelta* and free-threshing grain of *Triticum* sp. (under the name of *T. aestivocompactum*) (rivet or bread wheat) were identified from Saxon contexts but the contexts contained residual Roman pottery so it is possible that the grain was also redeposited.

No other sites that have any evidence for continuity of occupation from the late 4th into the 5th century and show the transition from late Roman to early Saxon artefacts have been investigated for crop remains. However, such remains have been recovered from a number of early Saxon settlements


Posts recorded *in situ*
Line of posts seen
Line of posts inferred
Edge of pit during recording of Rows 1-2
Hurdle
Edge of excavation
Row 1
Row 2
Row 3
Row 4
(Approx positions)
B
A
Cross-piece
N
0
10
20m

on the gravel terraces of the Upper Thames Valley, including Lechlade (Stevens 2003), Yarnton (Stevens 2004), Littlemore (Pelling 2001b), Barrow Hills, Radley (Moffett 2007), Spring Road Cemetery, Abingdon (Robinson forthcoming c), Sutton Courtenay (Robinson forthcoming d), Bishop's Court, Dorchester (Robinson and Wilson 1987, 59), Mount Farm, Berinsfield (ibid.; Robinson forthcoming e) and Benson (Robinson 2003c). Quantities of charred crop remains are very much less than at the Roman or Iron Age settlements in the region, the largest amounts being from Lechlade and Yarnton. Only very small numbers of grains were recovered from the fills of sunken huts at Littlemore and Benson, for example, and hardly more came from Barton Court Farm, but waterlogged remains were also present at Mount Farm and Bishop's Court. The most abundant cereal from these sites was hulled *Hordeum vulgare* (hulled six-row barley) although it was not possible to identify the barley this closely on all the sites. Free-threshing *Triticum* sp. (rivet or bread wheat) was found on most of these sites. Although so far only confirmed from rachis fragments, at Lechlade this is likely to be *T. aestivum* (bread wheat) although the grains are shorter in relation to their width than those of modern varieties of either rivet or bread wheat. Free-threshing wheat was certainly the most common cereal at Barrow Hills, Radley, alongside six-row hulled barley and possibly oats *(Avena sp.)* although here, as elsewhere, it was not possible to tell if the oats were wild or cultivated, a problem also encountered in the Roman period. However, oats generally form a higher proportion of the grain than on Roman sites and the identification of an impression of *A. sativa* (cultivated oat) in a sherd of early Saxon pottery from Abingdon (Jessen and Helbaek 1944, 23) raises the possibility that the majority of the *Avena* grain was from cultivated oat. There was a slight presence of charred remains of *Triticum spelta* (spelt wheat) on some of those sites with Roman activity but this could have been residual. Interestingly, however, three waterlogged glumes of *Triticum dicoccum* (emmer wheat) were found in an early Saxon well at Mount Farm. Their state of preservation means they were not residual and there is middle Saxon evidence for the cultivation of emmer (see below).

Charred seeds of *Vicia faba* (celtic or field bean) and possibly *Pisum sativum* (pea) were also more prevalent amongst charred assemblages than on Roman sites. *V. faba* seeds were found at Lechlade and Barrow Hills, but only in tiny quantities. In contrast, a well at Mount Farm contained abundant waterlogged stem and pod fragments.

Capsule fragments and seeds of *Linum usitatissimum* (flax) are as abundant in early Saxon waterlogged deposits as they are in Roman ones. Evidence comes from Yarnton and Barton Court Farm, while carbonised seeds were found at Lechlade. A calcium phosphate mineralised seed of *Brassica* or *Sinapis* sp. (mustard, cabbage etc) was found in a pit at Sutton Courtenay. Such preservation is characteristic of cesspits so it is likely that the seed was from a cultivar used for flavouring, for example *Brassica nigra* (black mustard). Nut shell fragments of *Corylus avellana* (hazel) have been found on several sites. With the exception of the possible mustard seed, there was no evidence for the continued cultivation of the various culinary herbs and spices found in the previous period (see above). Fruit remains were also absent although it is possible that plum trees survived in the region from the Roman period because plum readily suckers, so perpetuating itself beyond the lifetime of perhaps 100 years for a single tree trunk.

Middle Thames Valley evidence comes from the probable 7th-century Saxon re-occupation of an Iron Age hillfort at Taplow (Robinson forthcoming f). Preliminary indications are that the same range of charred cereals, legumes and oats was found as on the Upper Thames Valley sites, with the addition of *Secale cereale* (rye), but without any hulled wheat (*Triticum dicoccum* or *spelta*). The free-threshing *Triticum* grains were extremely well preserved, being small and short, but although rachis fragments of free-threshing wheat were present it has not been possible to identify any of them to ploidy level. Further down the valley, barley was again important, associated at Prospect Park, Harmondsworth with bread wheat and oats, though spelt wheat still occurred here (Hinton 1996a, 47) as it did at nearby Holloway Lane (Rackham 1994, 126-7). Rye was absent from these sites but was found at Hurst Park (East Molesey) where it was a minor component of the charred grain assemblage along with bread wheat and barley, while spelt survived as the dominant cereal, as it had been in the Roman period here (Hinton 1996b, 98).

The occurrence of spelt on some of these sites suggests that, unlike the Upper Thames Valley, it remained a significant crop in the Middle Thames Valley during the early Saxon period. However, the dating of the material is by no means certain. At Prospect Park, free-threshing wheat was the only wheat found in some 5th- to mid 6th-century sunken huts, whereas much *T.* cf. *dicoccum* and *T.* cf. *spelta* chaff was found in a pit (Hinton 1996a). However, the pit only contained a few Saxon sherds along with residual late prehistoric material (Andrews 1996a, 25). Not enough information is available about Holloway, but at Wickhams Field in the Kennet Valley near Reading, a little spelt grain was reported from a Saxon pit (Scaife in Crockett 1996, 157-63). However, the pit was described as resembling a late prehistoric grain storage pit; the

Fig. 6.20 (opposite) Shepperton, Surrey: photograph and plan of wooden stakes revealed in gravel extraction that formed part of a late Roman or early Saxon fish weir

pottery from it was tentatively attributed to the early/middle Saxon period but its potential for being early Iron Age was noted (Crockett 1996, 153). In contrast, there is no doubt about the 6th- to early 7th-century date of a sunken building at Hurst Park, which yielded much grain and chaff of *T.* cf. *spelta* (Hinton 1996b), but it was close to a Roman corn dryer that contained similar material. Radiocarbon dating is necessary to establish the status of spelt on these sites.

Charcoal assemblages from early Saxon settlements in the Upper Thames Valley are usually diverse, with the same range of woodland and hedgerow/scrub trees and shrubs that were exploited for fuel in the Roman period. *Fagus sylvatica* (beech) charcoal is present at Taplow, which was possibly due to the proximity of the site to the Chilterns beech woods; indeed Taplow provides some of the earliest evidence to suggest the large-scale establishment of beech in the region. Waterlogged evidence suggests that *Pteridium aquilinum* (bracken) continued to be imported to settlements in the Upper Thames Valley, while cut rush stems (*Juncus* sp.) were brought to the settlement at Lechlade (Stevens 2003).

Overall, the quantities of recovered cereals do not suggest that arable production was particularly intensive in either the Upper or Middle Thames. Evidence for animal husbandry occurs more consistently, at some sites in reasonable quantity (for example Barrow Hills, Radley, which produced a relatively large animal bone assemblage of some 15,000 identified fragments of early Saxon date). The assemblages are dominated by the principal domesticated species kept in the Roman period, all of which, with the possible exception of donkey, were present. It is not yet possible to give detailed morphological comparison with Roman animals although it seems that early Saxon cattle and sheep were of comparable size, or slightly larger (Robinson and Wilson 1987, 61). Again there is also evidence to indicate supplementation of diet from hunting, fowling and fishing. This pattern is substantiated by stable isotope analysis of human remains from the cemetery at Berinsfield, which indicated that animal products, probably including fish, were consumed on a regular basis (Privat *et al*. 2002).

At Barrow Hills and Barton Court Farm, and in the smaller assemblage at Eynsham, sheep/goat (numbers of animals certainly identified as goat are very small) was the dominant domestic species. At most of the other Upper Thames sites cattle were more numerous than sheep, although assemblages were quite small, so conclusions derived from relative proportions of the species may be invalid in these cases. However, cattle predominated, followed by sheep/goat, pig and horse in a rather larger assemblage from Sherborne House, Lechlade (Maltby 2003, 71-6).

At both Eynsham and Yarnton, with longer Saxon sequences, the importance of cattle can be seen to decline slightly from the early to the middle Saxon period. Cattle were always dominant at Yarnton but outnumbered by sheep at Eynsham, indicating significant differences in the pastoral regimes (or at least the patterns of consumption) of these quite closely adjacent sites. Except perhaps at Eynsham, however, cattle were always potentially the most important contributor of meat in the diet of individual settlements because of their greater mass. At Barrow Hills the sample was large enough to permit speculation about some intra-site variability in terms of utilisation of the main species. It is suggested that animals culled for meat were butchered and consumed on an *ad hoc* basis within the settlement, but that older animals, kept primarily as breeding stock and for by-products such as milk and fleeces, were butchered separately, with the hides and horns being removed for preparation elsewhere and the long bones broken up for marrow and fat rendering. Thus the general butchery residues accumulated in one set of features (particularly the incompletely filled ditches of extant Bronze Age barrows), while the more specifically 'table' refuse became incorporated in the fills of sunken huts (Barnetson 2007). This evidence emphasises the difficulties of interpreting animal remains from excavations of limited scale, in which such patterning would not be apparent (cf Wilson 1996).

Elsewhere in the valley there is far less evidence for animal remains, largely because of the greater acidity of the soils at many sites. However, bones of cattle, sheep, pig, horse and dog survived at Prospect Park (Hamilton-Dyer in Andrews 1996a, 42-3). At Saxon County School, Shepperton, there was good bone preservation in midden deposits and the three main species, cattle, sheep/goat and pig, were almost equally represented. Here and in the Upper Thames assemblages, the representation of pig was generally higher than it had been in the Roman period, so that it was consistently the third most important species, whatever the relative proportions of cattle and sheep/goat. As before, pig was almost always slaughtered young, for meat, while the age patterns of the other major species are more variable, indicating exploitation in a variety of ways. Nevertheless, there seems to have been a generally increased emphasis on meat production rather than other uses of animals. There are hints of a trend towards earlier slaughter of cattle, comparable to that seen for pigs. At Lechlade a marked preponderance of immature cattle was noted – it is possible that the overall numbers of animals present were too small for this to be significant, but it is suggested that the figures reflect in part the slaughter of immature males in herds that were also exploited for milk (Maltby 2003, 74). At Barton Court Farm cattle were also killed at younger ages than in the Roman period. Most of these young animals were bulls and steers, and the slaughter of relatively young sheep similarly may have included a sizeable proportion of wethers. The representation of domestic mammals at early Saxon Barton Court

Farm is shown below, both as percentages of the total identified fragments and as percentages of the minimum number of individual animals (MNI) represented by them (Wilson 1986):

	Early Saxon Barton Court Farm	
	Frag%	*MNI%*
Cattle	28	20
Sheep/goat	43	51
Pig	27	23
Horse	1	3
Dog	0.5	1
Cat	0.5	1
Total Fragments or Individuals	1332	70

Pig and sheep/goat were both more important than in the late Roman period – to the extent that pigs were now as numerous as cattle. Horses, dogs and cats were all less common than in the Roman period, dogs noticeably so; several sites lack dogs altogether and where present they are almost always less than 1% of the assemblage, in contrast with higher and more consistent representation in the Roman period. However, dog burials do occur in this period (as previously), being found at Audlett Drive (Abingdon), Dorney and Wraysbury. The size range of dogs noted in the Roman period is less apparent in the Saxon assemblages and only the Audlett Drive dog was noted as being 'small' (Levitan 1992, 75).

In contrast, domestic fowl and probable domestic geese had become proportionally more than twice as common, and therefore perhaps more important, with poultry bones at Barton Court Farm amounting to 8% of the total fragments of domestic mammal bones. Although not usually numerous, domestic fowl and geese occur consistently at other early Saxon sites, including Lechlade, even in the smaller assemblages, in contrast with the evidence for the Roman period, in which their presence is more erratic. At Barton Court Farm, and probably elsewhere, the meat diet changed from one with a predominance of beef in Roman times to one with a greater emphasis on mutton, pork, poultry and fish, despite the evidence for slaughter of cattle at a younger age than previously. The proportion of horse bones is generally low on early Saxon settlements, suggesting that horses did not have a major agricultural role, but Mount Farm, Berinsfield, was exceptional, with 9% of the animal bone fragments being of horse (Robinson and Wilson 1987, 61).

A range of wild animal resources continued to be exploited, although the quantities of bones recovered sometimes suggest that this may have been on a lesser scale than in the Roman period. As before, red deer was the most frequently occurring wild mammal, with roe deer and hare the next most frequent. All of these were identified in early Saxon contexts at Barton Court Farm (Wilson 1986). The bird bones from this site included wild goose, several species of wild duck including possible mallard, pochard and red-breasted merganser, golden plover, sparrowhawk, white-tailed eagle, hawfinch and bunting (Bramwell *et al.* 1986, fiche 8:C6-67). The goose, ducks and plover are obvious possible instances of birds hunted for food but even the small birds could have been netted for eating. The hawk and eagle were perhaps killed in the defence of, respectively, poultry chicks and lambs. However, Bramwell *et al.* (1986, fiche 8:C6) noted that the sparrowhawk bones included those of a female, the sex more commonly used in falconry. In later periods, this species tended to be associated with commoners rather than nobility.

Barton Court Farm also produced evidence for fishing; *Anguilla anguilla* (eel) bones were most common, followed by those of *Esox lucius* (pike) and *Perca fluviatilis* (perch), and in contrast to wild mammals were proportionally considerably more significant than in the Roman period. The fish, including also *Rutilus rutilus* (roach) and *Scardinius erythrophthalmus* (rudd), were all freshwater or migratory species. One of the pike was very large, with an estimated length of 1.0 m and weight of about 10 kg (Wheeler 1986). Marine fish are absent from early Saxon sites and the only shells of marine oysters are likely to have been residual. Evidence of a different kind comes from the Middle Thames at Shepperton. Here wattle structures are thought to have formed parts of fish weirs. Excavation during the course of gravel quarrying revealed the remains of two rows of wooden stakes curving inwards into a V-shape; it is suggested that the structure probably pointed downstream and would have had an eel basket positioned at the point of the V (Fig. 6.20). A late Saxon eel/fish trap is illustrated in Figure 6.31. Nets to form a larger fish trap may have been attached to other parts of the structure, and a number of weights or net-sinkers were found nearby. The dating depends on a single radiocarbon determination from a stake, which suggests either a late Roman or (perhaps more likely) an early Saxon date (Bird 1999). In an area of complex river topography the weirs could have been placed in a subsidiary channel of the Thames or have related to one of its tributaries, the Bourne or the Wey.

It has already been suggested that there was not a complete abandonment of agricultural land to scrub vegetation in the Upper Thames Valley in the post-Roman period (Chapter 2 above). The indications of open landscape in the Upper Thames come most clearly from radiocarbon dated pollen sequences at Yarnton (Greig 2004) and from Sidlings Copse, to the north-east of Oxford (Day 1991). Part of a sequence of peat deposits at Littlemore contained Roman pottery and was of this period and/or Anglo-Saxon date (J Moore 2001, 177-8), but its precise chronology is unclear. Instead, the intensity of agriculture on the gravel terraces was relaxed and some arable land probably reverted to grassland, although cultivation continued from the Roman period at Barton Court Farm. Early Saxon

agriculture was organised on a smaller scale than that of the Roman period. Two of the crops, flax and field beans, would have been suitable for cultivation under horticultural as well as field conditions. Poultry and pigs could plainly have been kept in the settlements themselves. The range of carbonised weed seeds from the Saxon phase at Yarnton (Saxon Phase 1, *c* AD 500-700) was argued as suggesting light cultivation, and/or short-term ploughing up of grassland (Stevens 2004, 362). It is possible that with less pressure to maximise arable production, soil fertility was maintained by periods of fallow without recourse to the folding of sheep or manuring. It is likely that the agricultural system in the Upper Thames Valley involved using parts of the floodplain and clay slopes for summer grazing but with some well-drained pasture on the gravel terraces for the overwintering of animals. The keeping of goats at Yarnton possibly reflected some concern to prevent scrub from invading pasture, although positively identified remains of goat were very rare here (Mulville and Ayres 2004, 349). It is uncertain whether any floodplain grassland continued to be used for hay meadow.

Charred cereal remains occur in much lower concentrations on early Saxon sites in the region than in the Roman period. There are two possible explanations. The first is that the processing of cereals was on a much smaller scale than previously. The second is that the nature of the crops or the processing methods was different, so less material was becoming charred. The replacement of spelt wheat with a free-threshing wheat would have removed the need to parch and pound the spikelets to release the grain. Grain could have been separated from the ears by beating sheaves on a hard surface without resort to heat. Early Saxon settlements did not have the centralised structures of corn dryers which generated large quantities of cereal de-husking and malting waste on Roman settlements. However, when grain is stored under primitive conditions, it absorbs moisture from the atmosphere and sometimes needs to be heated to harden it sufficiently for grinding. It is possible that this was the process which generated much of the early Saxon charred cereal remains. When a comparison is made with middle and late Saxon charred crop processing assemblages, for example at Yarnton, it is clear that considerably more material was being burnt then than in the early Saxon settlement (Stevens 2004, 351). It is therefore argued that although changes in cereal processing methods took place, there was also a substantial decline in the scale of cereal processing on settlements in the early Saxon period.

The overall impression gained from early Saxon settlement in the Upper Thames Valley, such as Barton Court Farm and Yarnton, is of a small-scale, relatively self-contained agricultural and pastoral economy. The range of crops and domestic animals was consistent with subsistence agriculture, with no evidence for the production of a large surplus and perhaps only limited local exchange. The agricultural activities and the exploitation of wild resources were appropriate to the potential of the surrounding landscape. The evidence for much smaller-scale cereal processing on settlements than in the Roman period and the increased importance of meat in the diet suggests that less agricultural pressure was placed on the landscape than previously, indeed that the human population had perhaps dropped back to a pre-Iron Age level. The evidence emerging from the Middle Thames Valley settlement at Taplow, which has a higher concentration of charred crop processing remains than the early Saxon sites in the Upper Thames Valley and the presence of an additional cereal crop, rye, possibly shows the beginning of an agricultural resurgence. However, the high status of the site complicates the issue.

It was argued above that although the landscape was being exploited intensively in the late Roman period, there was no evidence that the agricultural system was unsustainable and was in imminent danger of collapse. Other factors need to be considered to explain the considerable reduction in agricultural activity which occurred in the 5th century. The 5th century also sees one of the greatest changes to have occurred in cereal crops grown in Britain: the replacement of spelt wheat by a free-threshing variety of wheat, probably bread-type wheat. There is still argument as to whether this was an abrupt transition, which occurred throughout the area of Saxon colonisation in England, finds of spelt wheat in early Saxon deposits being material residual from Roman activity, or whether spelt wheat at least briefly remained in cultivation alongside bread wheat (Murphy 1994, 37). It had taken spelt wheat very much longer to displace emmer as the main wheat in the Thames Valley in the period from the middle Bronze Age to the early Iron Age. The significance of this change is discussed further in Chapter 8, below.

Crafts

Evidence for craft activity is seen most clearly in the context of agriculture. The most widely recognised activity of this type is textile production, identified most commonly by the presence of ring-shaped weights from vertical looms, but also on the basis of other distinctive equipment such pin beaters (for consolidating the weft on the loom) and combs, although the association of the latter specifically with textile manufacture rather than other purposes can be problematic. Numerous finds of spindle-whorls, and perhaps a pair of shears from Yarnton, the latter identical to late Roman examples from sites such as Barton Court Farm (Miles 1986, fiche 5:A2), demonstrate the earlier stages of gathering and preparing the wool. These activities are often associated with sunken huts, a number of which have been interpreted as weaving sheds. The main uncertainty in this context relates to the probable

secondary and tertiary nature of much material from the fills of these buildings, particularly if it is accepted that the majority (at least) of these structures originally had raised wooden floors and did not accommodate activities situated on their bases (eg Tipper 2004, 92-3). Despite this, the likelihood that some occurrences of loomweights in sunken huts reflect their function is accepted (ibid., 168-9). As discussed in this most recent general survey (ibid., 164-8), loomweights, in particular, are widely encountered, being found at all the larger settlement sites known in the Upper Thames (except at Littlemore; J Moore 2001, 175-6) and many of the minor ones. They are usually ring-shaped and made of fired clay, but lead examples are known from Barton Court Farm and the adjacent site at Audlett Drive, Abingdon (Miles 1986, fiche 4:A2-A10; Keevill 1992a, 65). Their appearance in the Middle Thames seems to be less consistent, but they did occur at Prospect Park, Harmondsworth (Andrews 1996a, 50), while at Hurst Park, East Molesey, textile production was indicated by the presence of spindlewhorls and teeth from iron heckle combs, again occurring in the fills of sunken huts (Andrews 1996b, 70, 74-5).

The regular occurrence of evidence for textile production in early Saxon settlements is striking in comparison to the situation in the Roman period. In the latter, spinning is indicated by spindlewhorls, usually ceramic, but there is little or no tangible evidence of weaving once the characteristic Iron Age triangular loomweights disappear from the archaeological record, which they seem to do in the very early Roman period at latest. There is certainly nothing to compare with the occurrence of weaving evidence seen in association with sunken huts (whether or not this is in primary contexts).

In contrast with the balance of evidence for textile production, quantities of pottery recovered from early Saxon settlement (and, to a lesser extent, cemetery) sites are considerably less than in equivalent Romano-British rural settlements, although the use of pottery in this period was nevertheless widespread. Pottery production was probably generally local in scale. The technology was exactly the same as that used in the pre-Roman period, so where local clays were exploited the resulting fabrics have many points of similarity with the pottery of the middle Iron Age, in particular. The often simple vessel forms were also quite similar and the difficulty of distinguishing pottery of the two periods, in some cases at least, is a well known archaeological problem, not confined to this region. One widespread early and middle Saxon pottery tradition, involving the addition of large quantities of organic material to the clay body (known as 'chaff tempering'), is distinctive, however, and may have become more important in the 6th and 7th centuries, being rare in the earliest assemblages in the region. Alternatively, Blinkhorn (eg 2007) prefers a cultural rather than a chronological explanation of the differential appearance of this material.

Given the similarity of technology with that of an earlier period it is unsurprising that the production sites are equally elusive, but at Cassington (Oxon) two pottery kilns of 'early Saxon' date have been identified (Arthur and Jope 1962-3), although only one of these had pottery associated with it. This kiln was very similar in form to early Roman ones known from the same area and in the absence of any other evidence for early Saxon kilns from the region it is most likely that this was an early Roman structure (cf Blinkhorn 2004, 77). The proposed potter's workshop interpretation of 'House XXI' at Sutton Courtenay (Leeds 1947, 81-84) can also be discounted; this feature was a waterhole and had nothing to do with pottery production.

There is some evidence that pottery production was not always only on a local scale, although the claim by Vince that the majority of the large assemblage from Barrow Hills, Radley, was obtained from 10 km away or more (Vince 1989, 168) cannot be substantiated, because significant deposits of Greensand, the principal tempering agent in this pottery, occur no more than 4 km from the site, well within the range of community-based potters (Arnold 1985, 54-5; cf Blinkhorn 2007). Pottery from Goring (Oxon), however, also included sherds in a Greensand-tempered fabric very similar to those from Barrow Hills, some 30 km upstream (Allen 1995, 96). More remarkably, analysis of pottery from a site at Padworth in the lower Kennet Valley has shown that chaff-tempered pottery there was from two sources, one local and one that is unlikely to have been closer than the Abingdon area (Allen 1998-2003). At Benson, too, probable non-local pottery was identified (Timby 2003b, 154), including sherds that are most likely to derive from Charnwood Forest in Leicestershire (Vince 2003). Pottery from this source was distributed quite widely in the east midlands (Vince and Williams 1997) and is also known at Prospect Park, Harmondsworth, (Laidlaw and Mepham 1996, 37) as well as (probably) in London. Clearly therefore, purely local household production even of plain utilitarian pottery cannot be taken for granted and at Prospect Park it was suggested that this became the trend only after a phase in which 'non-local' fabrics were dominant. This was in turn linked to a suggestion that non-local fabrics on early Saxon sites in the London area reflect the arrival of vessels with an immigrant settler population (ibid.). The principle that some decorated vessels might be more widely distributed is better known, and an 'Upper Thames workshop' was identified by Myres (1977, 63-64 and fig. 360) on the basis of distinctive decorative characteristics shared by vessels from Frilford, Long Wittenham and Sutton Courtenay. These are all quite closely adjacent: but not so Wehden, in north Germany, which also produced a vessel with the same decorative elements (ibid.)! The significance of this remains uncertain.

As with pottery it is likely that much craft production took place at household or community level, though some craftsmen, for example metalworkers, may have been peripatetic. The (unusually wide) range of craft activities indicated at Purwell Farm, Cassington, for example, consisting of weaving, bone comb-making (bone working is also attested at Barton Court Farm), iron smithing and bronze-working (Arthur and Jope 1962-3, 3), may reflect both approaches. The evidence for casting 'an elaborate bronze saucer-brooch' (ibid.) is particularly important. There is a notable concentration of such brooches in the Upper Thames and even without the Cassington evidence it was likely that some were produced here. Iron-working is likely to have been rather more widespread, but the evidence is always small scale, as for example at Lechlade (Keys 2003), Yarnton (Salter 2004, 308 table 16.1) and even at the large settlement of Barrow Hills, Radley, where the quantity of ironworking slag was minimal. It does not allow us to determine the nature of smithing in these communities, although there is no clear evidence for smelting (primary iron production). Were smiths permanently resident but (presumably only) part time specialists at the larger sites, or were they engaged full-time in metalworking and therefore probably peripatetic, each serving a number of agricultural communities according to their needs?

Metalworking at most levels, even including basic ironsmithing, was to some extent always a specialist activity. The contrast in evidence for other craft activities between the Roman and early Saxon periods suggests different patterns of development. Pottery manufacture, which in the late Iron Age was probably mostly locally based – although direct evidence for production in any location at this time is effectively non-existent – became more of a specialist undertaking in the Roman period. The Thames Valley region seems to have followed a general trend towards a gradual concentration of pottery production in a relatively small number of centres by the late Roman period. It is often assumed that these industries were linked to a monetised economy in the late Roman period and that the collapse of the latter after the end of the 4th century resulted in the demise of the relevant industries (eg Young 1977, 240-241). These assumptions are not universally accepted, but provide a plausible explanation for the apparently rapid disappearance of the late 4th-century ceramic repertoire. The fact that pottery production had ceased to be widely practised at individual site level may have enabled the gap left by the disappearance of the more centralised industries to be filled by very different technologies and ceramic styles. These are usually thought to have operated at local level, representing a reversion to the household or community based mode of production characteristic of the Iron Age. The early Anglo-Saxon evidence, however limited, for more widely distributed products, even of a technologically simple character, argues against this simple assumption. It remains to be established, however, whether this evidence indicates the residual survival of late Roman long-distance pottery supply (the suggested patterns are so different that this seems very unlikely), or the introduction of completely new traditions of specialist potting, with continental antecedents. Notwithstanding the indications of specialist production, the present evidence still suggests that a majority of Anglo-Saxon pottery was locally produced. Did this, and the styles of vessels produced, result from a rapid process of acculturation on the part of local communities, or was the necessary expertise imposed in some way ? On the whole, the former seems more likely.

The situation with regard to textile production presents interesting similarities and differences. This activity is quite visible in the later Iron Age – attested principally by the presence of loomweights – and, as has been shown, is identified particularly clearly in the early Saxon period, to the extent that sunken huts have sometimes been identified specifically as weaving sheds. The contrast with the Roman period is marked. Although spinning is archaeologically attested there is no meaningful evidence for weaving. Either the equipment used for this was substantially different from that of preceding and succeeding periods, or the process was largely removed from the household sphere. On balance, the latter seems more likely. It can be suggested that, in parallel with pottery manufacture, the production of textiles became largely (but not entirely) a specialist concern, in a manner consistent with the archaeological evidence (though not from our region) for trade in exotic fabrics and the epigraphic evidence for official textile manufacture and for British cloth products. Again this picture changed dramatically at the end of the Roman period, with a clear reversion to production at the level of individual communities, if not households – albeit that the high-status traffic in exotic materials might perhaps have continued through this period.

Trade and exchange

Transport of goods within the region is exemplified by the pottery evidence discussed above. This is the only commodity in a domestic context that can be recognised as having been subject to movement, with the possible exception of quernstones of Niedermendig lava. It is likely that most of the (limited) evidence for these belongs to the middle Saxon period and later, rather than the 5th-7th centuries, but at Waylands Nursery, Wraysbury, a fragment of this material from a sunken hut was associated with pottery assigned to the 5th century (Pine 2003, 123, 135-6) and its occurrence at Taplow may also belong to the 6th-7th century rather than later. This might reflect the high status associations of Taplow, also suggested by the unique (in Thames

Valley terms) appearance there of a fragment of a late Roman amphora of eastern Mediterranean origin, but such an argument would not apply in the case of Wraysbury.

Apart from this relatively limited range of object types the evidence for non locally derived objects comes from cemetery assemblages and includes a wide range of material, if not a large number of objects. The origin of many of the items of metalwork, particularly brooches, from the graves of the region is of course closely tied up with the complex questions of identity discussed in part in Chapter 4, above. The processes of distribution of many of these objects, and particularly for those of demonstrably exotic origin, are likely to have been complex and for the most part may not have involved trade networks of a conventional kind.

Only in the movement of day to day objects such as pottery is it likely that 'trade routes' such as the river itself might have been in use, and the scale of movement along it is likely to have been very small at best. In broader terms the valley may have served as a corridor for movement of people, although arguments about the scale and pace of early Saxon settlement will affect views of how regular such movements might have been. Either way, movement along the banks rather than on the river itself is likely to have been the preferred method of reaching the Upper Thames.

THE MID TO LATE SAXON PERIOD

Management and economic use of the river
(Figs 6.21-6.24)

The evidence suggests that the Thames, its tributaries, and their channels were an increasingly important economic resource during this period, as a source of food, water and power. How far the Thames itself was navigable has long been a subject of debate. The presence of imported goods, clear cultural links between Upper Thames communities and those downstream in Surrey and Kent, known long-distance trading routes such as those for salt, and the patterns of loss of 8th-century coins all combine to provide a good deal of circumstantial evidence that the river valley was a corridor for movement and exchange during the early and mid Saxon periods (Dickinson 1976, 416; Blair forthcoming). How far this had any of the characteristics of regular long-distance trading, however, remains unknown, as does the proportion of land- as opposed to water-based travel. R H C Davis (Davis 1973, 262-7) and Robert Peberdy (1996, 333) have argued that long-distance navigation along the Thames between London and Oxford was markedly improved by the spread of water-powered milling. Evidence for the spread of water-powered milling increases from the 11th century onwards (Fig. 6.21),

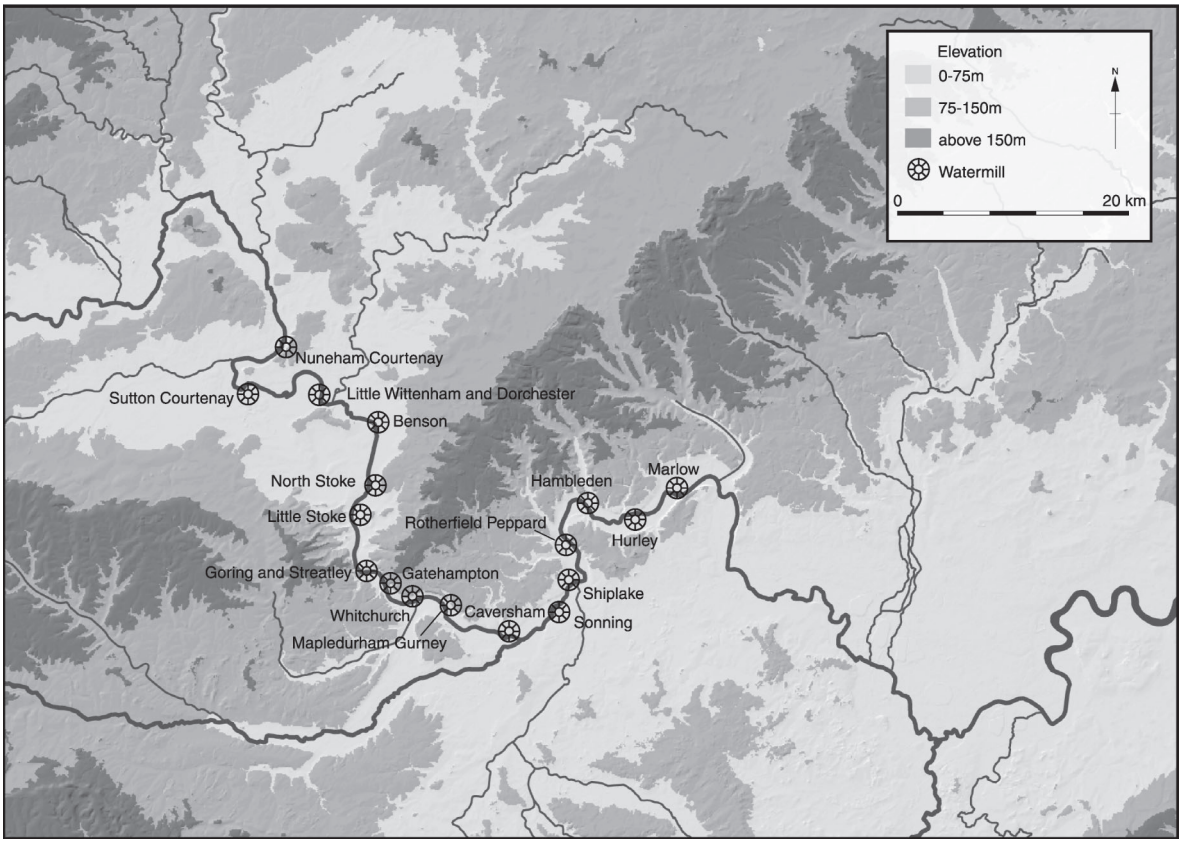


Fig. 6.21 Domesday mills on the Thames (after Peberdy 1996 fig. 2)

but it is clear that there were water-powered mills in the study area at an earlier date, even if (perhaps) only at first associated with the most important landowners (see below). The construction of mill-weirs along the river would have created deep pools of water at places that had previously been unnavigable shallows, and boats would have been able to pass (albeit at great risk) when narrow gaps in these weirs ('flash locks') were periodically opened. Although direct evidence for the late Saxon period remains very scarce, the balance of current opinion appears to favour the view that the river would have been used for a mixture of local and long-distance transportation, and that where there was economic benefit in doing so, there was the capability to clear obstructions and improve navigability (Blair forthcoming; see below). The convergence of Droitwich salt routes at Lechlade suggests that places like this were significant trans-freighting points, where goods brought by road were transferred to boats (and vice versa). How such goods made their way down the difficult stretches of the Upper Thames remains barely perceptible in the historical and documentary record, although evidence increases downstream of Oxford. There is now good reason to believe, however, that the river (in combination with land routes) was used to move bulk commodities downstream (perhaps salt, cereals, wood, fleeces, stone). The difficulties of navigating the river upstream, however, are likely to mean that the boats returned empty or with only light cargoes, one of which may have been the fish we find in increasing quantities in the late Saxon towns, and which the citizens of Oxford owed as a toll to the monks of Abingdon for the use of their new navigation channel.

Recent place-name, topographical and documentary research is revealing new evidence for the digging and maintenance of bypass cuts or canals to facilitate passage along difficult stretches of the river (Blair forthcoming; see also below). The balance of evidence suggests that most significant river engineering of this kind dates from the mid 10th century onwards (ibid.). The chronicle-cartulary of Abingdon Abbey (see Chapter 5, above) recorded that the monks had dug a mill stream to power a double mill in Æthelwold's time (954/5-963); it was apparently during this operation that the 'Black Cross' was discovered (see Chapters 4 and 5, above). The same source relates that the monks created a new channel for the river itself in the mid 11th century, to facilitate downriver traffic from Oxford. John Blair has recently argued that the terms in which this operation is described in the medieval sources must imply that the monks enlarged a minor natural channel of the river now called the Swift Ditch in order to divert the main course of the river around the south side of the meadow of Andersey Island. Subsequently the main course has reverted to the north side of the island, leaving the Swift Ditch as little more than a rivulet (ibid.). Significantly it was said that this was undertaken at the request of the citizens of Oxford, who complained that the river often ran dry at Abingdon and caused their oarsmen no little difficulty. In return for the new cut, they paid the abbey 100 herring a year for each boat (Davis 1973, 263; Blair forthcoming). The Abbey River at Chertsey is a channel carrying water from the Thames at Penton Hook around a loop past Chertsey Abbey, to rejoin the Thames at what is now the site of Chertsey Lock. It is said, like the Thames at Abingdon, to have been engineered by the monks. Gravel quarrying at the Abbey Meads site in Chertsey in the 1980s led to the discovery of close-set timber piles that appeared to have been placed in order to stabilise an adjacent river bank. One of the piles was radiocarbon dated to the period cal AD 970-1170. The alignment of the row of piles suggests that the flow of Thames water from the nearby Burway ditch was being captured in order to increase the head of water to the Abbot's Mill, close to the Abbey (Jones forthcoming). Chertsey Abbey was refounded as a reformed Benedictine house in 964, and it is interesting to note that it was initially staffed with monks sent by Abbot Æthelwold from Abingdon. Is the likelihood of major river engineering at both sites in the late Saxon period something that can be associated with the close links between the two houses? Elsewhere, recent research suggests that an artificial canal was cut linking the Shill Brook and Highmoor Brook, to create a navigable watercourse from Black Bourton via Bampton to the Thames at Shifford (see Chapter 3, above; Blair forthcoming), and recent research suggests that a stream west of Wallingford was artificially diverted in King Alfred's time to supply water to the ditch surrounding the *burh* (Grayson 2004, 29-35).

Less ambitious attempts to manage the river, to control flooding and to protect or extend waterfronts, are evident at Oxford and Staines. At Oxford, a series of alluvial islands in the Thames floodplain were being exploited as a river crossing. One had been artificially heightened by the 9th century, and a timber bridge was constructed to cross the water channels in between (Fig. 6.22). A timber pile from the bridge gave a radiocarbon date range of cal AD 660-900 (Dodd (ed.) 2003, 14-16). A ford, in use in the 10th and 11th centuries, has also been excavated in this area (ibid., 32-3). By the end of the 11th century this had been replaced by a great bridge, the 'Grandpont', a stone causeway at least 700 m long, with intermittent flood arches, running across the floodplain south of Oxford (ibid., 53-4 and fig. 3.2). At Staines, several excavations have revealed evidence for the construction of flood defences. Here gullies were cut into the bank side, and may have held timbers; there also appears to have been a slipway down to the river (Fig. 6.23). At Oxford, the banks of the river channels were retained with timber and wattle structures, and numerous of these revetments have been excavated, dating from the 9th century through to the Norman period (Fig.

6.23). At Anslow's Cottages, Burghfield, there was evidence for deliberate control of water from channels of the Kennet, perhaps in order to operate a type of watermeadow system (Butterworth and Lobb 1992, 168-9). Here, the banks of a narrow channel were revetted with post and stake structures, and timbers found at the east end of the channel seemed to form a sluice gate to control water flow. This consisted of upright stakes pegged into a horizontal beam, the stakes presumably forming a framework for wattle or wickerwork, which could be lifted or dropped as required. The environmental evidence suggests intensification of grazing on the damp grassland.

Robert Peberdy (1996) has identified a series of 25 places where there were mill weirs in the later medieval period on the Thames itself between Oxford and Maidenhead; of these, the mills at Marlow, Hurley, Hambleden, Rotherfield Peppard, Shiplake, Sonning (2), Caversham, Mapledurham Gurney, Whitchurch, Gatehampton, Goring and Streatley, Little Stoke, North Stoke (2), Benson (2), Little Wittenham and Dorchester, Sutton Courtenay (3) and Nuneham Courtenay are mentioned in Domesday Book (Fig. 6.21). Upstream of Oxford, and downstream of Maidenhead, the relatively low gradient of the Thames makes it less suitable for mills and here mills tended to be sited on the faster-flowing tributaries such as the Hogsmill at Kingston, for example, or on side channels, as at Old Windsor and Chertsey (ibid., 316-8; Darby and Campbell 1971, figs 60, 73, 86, 116; see also Prior 1982, 107-8; Blair forthcoming). The best archaeological evidence in the study area, which remains unpublished, derives from the excavations at Old Windsor, which found a water mill with three vertical wheels, served by what seems to have been an artificially created leat, and datable to the 9th century (summary from Astill 1978, 70). At Reading, six mills are mentioned in Domesday Book (four on the king's manor, and two on the manor of Battle Abbey; Darby and Campbell 1971, 278-9). Recent excavations have demonstrated the presence of at least two mills on channels of the Kennet south of the town that may have been in existence in the late Saxon period (Ford *et al*. forthcoming). Work on the site of the Minster Mill on the Minster Mill stream suggests that the mill was well established by the 12th century, and was therefore possibly of earlier origin; a large deposit of germinated oats and barley suggests the preparation of malt at the site. A mill pond silting up from the late 11th century was excavated at the site of the later St Giles Mill, also implying the presence of a mill here during the late Saxon period. At Oxford, Domesday Book notes a mill within the town, a mill belonging to Robert d'Oilly, and two mills belonging to Sawold close to the wall (Darby and Campbell 1971, 229). These are probably to be associated with the Castle Mill and the mills on the Trill Mill stream south of the town,

Fig. 6.22 Artist's reconstruction of the mid Saxon bridge at Oxford

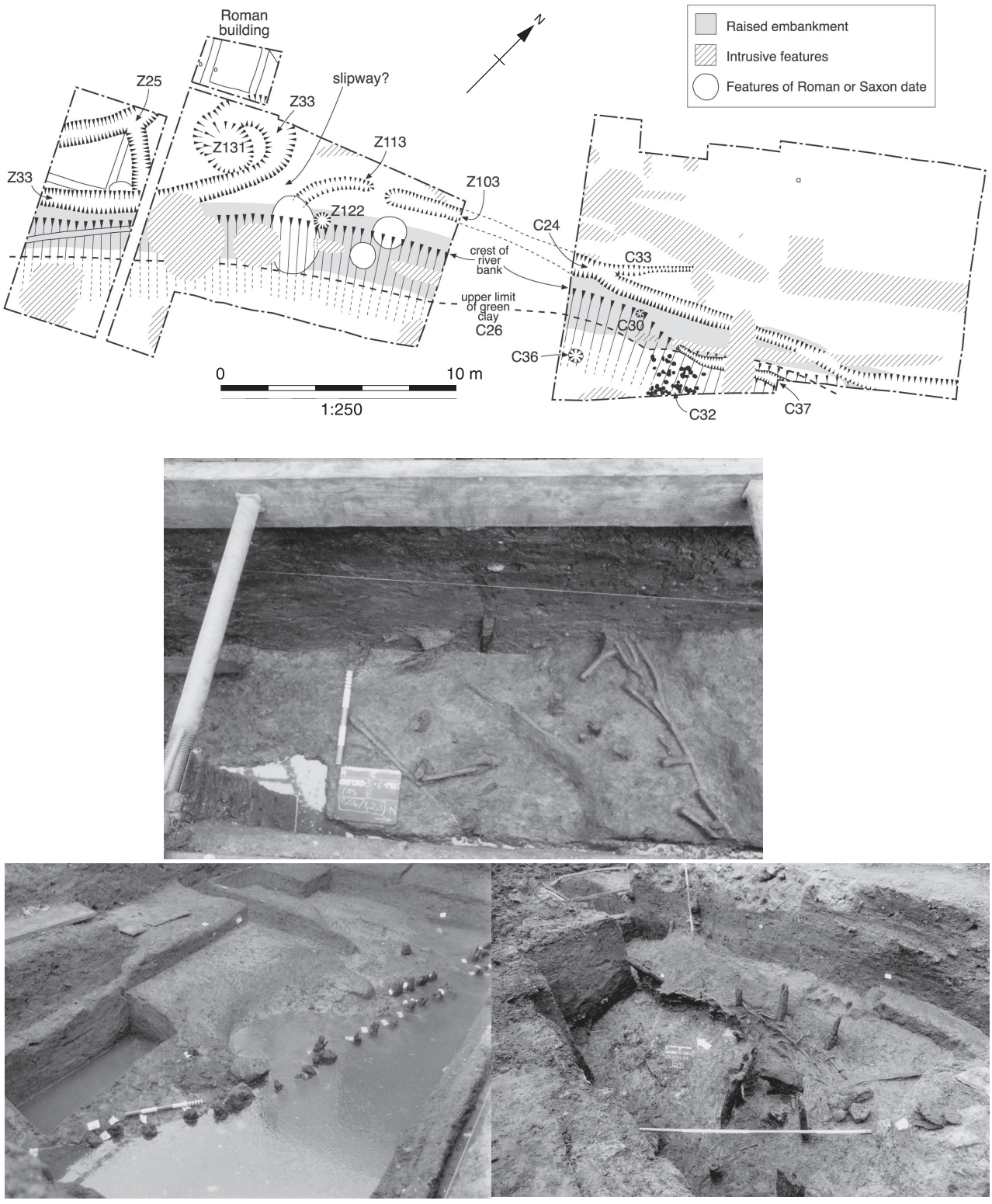


Fig. 6.23 Waterfronts. Top, Staines, Surrey: plan showing the sub-Roman and Saxon features in trench Z of the Elmsleigh Centre excavations. They include the river bank of 4th- to 5th-century date, a subsequent clay embankment, and other features related to Saxon use of the river frontage. Centre and below, St Aldate's, Oxford: excavated waterfront structures of post and wattle build at (centre) the Trill Mill stream, (bottom left) the Police Station and (bottom right) 56-60 St Aldate's

which are all identifiable in documentary sources in the early 12th century (Munby 2003c, 86). At present, however, no certain archaeological evidence for these mills has been found and their true date remains unknown, although a fragment of a possible waterwheel paddle was recovered from early levels in the Trill Mill Stream at Oxford (Fig. 6.24). The presence of large deposits of clean grain in the newly discovered late Saxon rampart and associated structural features at the Oxford Castle site on the west edge of the late Saxon town raises the possibility that the Castle Mill may have been established here rather earlier than the conquest period (Norton 2006, 33-4). The widespread presence of quernstones at settlement sites suggests that many ordinary people continued to grind their cereals by hand. A small millstone of Triassic sandstone was found at the mid Saxon site at Dorney. There was a notable assemblage of high-status and imported goods at this site (see below), which might prompt us to ask whether mills and their components would have remained the preserve of only the greatest landowners at this time? Niedermendig lava, one of the stones most commonly used for grinding, is often found in a very fragmentary state so that it is impossible to tell if the pieces derive from querns or from larger millstones.

Water was used for many production processes including brewing, tanning and dyeing, although structural evidence for these is not known within the study area until the post-conquest period. Indirectly, however, the regular finding of flax remains testifies to the use of water in the production of linen (see below). This and a range of other processes is indicated at Oxford. In addition, considerable quantities of leather waste were found dumped into the channels of the Thames at Oxford, and must suggest that tanners were using the water resources of the area.

Agricultural economy

The middle to late Saxon period was a time of agricultural recovery in the Upper and Middle Thames Valleys, as over much of England. There was a return to a larger-scale organisation of the landscape and cultivation again became extensive on the gravel terraces. The rise of towns provided a market for agricultural products, and cereals, legumes, hay and domestic animals likely to have been raised on the gravel terraces and floodplain were all reaching Oxford. A wider range of foods was being eaten and fruit-tree horticulture seems to have been revived.

While agricultural productivity by about AD 1000 perhaps began to approach the level of the early Roman period in the Thames Valley, this development ought not to be seen as a return to the Roman pattern. Traditions would have been different. In both periods, the agricultural units of management probably extended well beyond the gravel terraces and the clay hinterland was coming under cultivation. However, there was no revival in the cultivation of spelt wheat in the late Saxon period, it having been entirely replaced by bread-type wheat. Systems of fallow, crop rotation and whether there was common ploughing of large

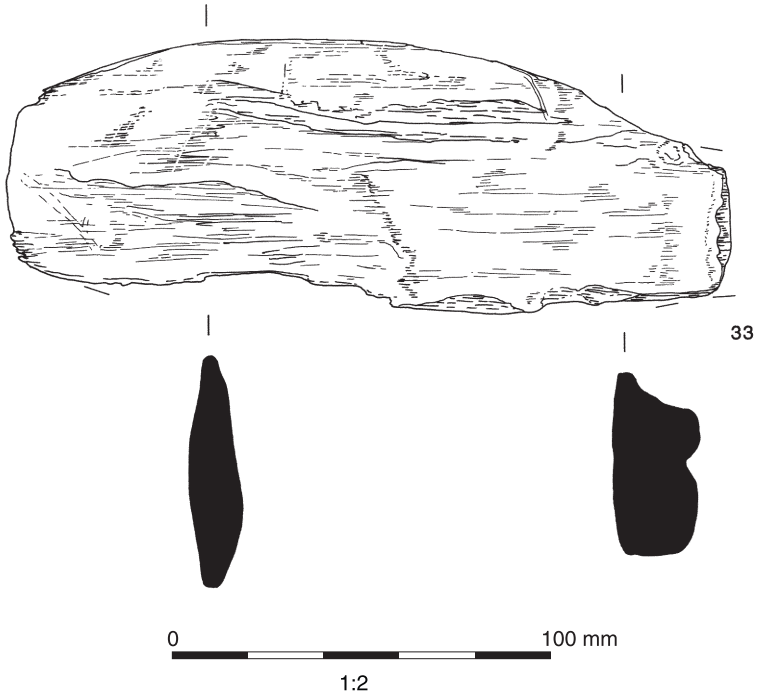


Fig. 6.24 A possible waterwheel paddle from the late Saxon Trill Mill Stream at Oxford

blocks of the gravel terraces in both periods remains unknown, but without the continuity of tradition they are unlikely to have been the same.

Although calculations of the extent of arable from Domesday figures for ploughlands and plough-teams remain highly conjectural, the distribution proposed by Darby (1977 fig. 43) shows that a relatively high concentration of arable had been achieved in many parts of the study area by 1086, compared with other areas of England. The most extensive research in the study area into changing farming practices in the mid to late Saxon period has been undertaken in conjunction with the major excavations at Yarnton, which revealed a substantial farming settlement of the 8th and 9th centuries (Hey 2004; see also Chapters 2 and 3 above). It seems very likely that Yarnton gradually became a more specialised arable farm during the course of the mid and late Saxon period, and it offers fundamental insights into the chronology of this change in the study area. The significance of the Yarnton results is considered in more detail below, and the wider context of ownership and control of the estate is discussed in Chapter 7. Elsewhere, evidence for mid Saxon farming practice is more limited, but a few sites have produced very useful results, suggesting that a degree of specialisation was developing in other places in accordance with the natural resources of the area.

Major crops

In broad terms, all the crops recorded for the early Saxon period remained in cultivation. Rye (*Secale cereale*), which made its first appearance in the Upper Thames Valley in the mid Saxon period at Yarnton (Stevens 2004, 363), became more widespread, but free-threshing *Triticum* sp. (rivet or bread wheat) followed by *Hordeum vulgare* (hulled six-row barley) and *Avena sativa* (cultivated oat) were the main cereal crops. Significant quantities of *Triticum dicoccum* (emmer wheat) were identified from two mid Saxon settlements, Yarnton in the Upper Thames Valley and Lake End Road in the Middle Thames Valley (Pelling 2000b, 54-55). It is possible that the cultivation of emmer wheat was a tradition brought by continental migrants to the Thames Valley which seems to have persisted into the mid Saxon period, although emmer also occurred in the study area in the Roman period (see above). Radiocarbon dates of cal AD 670-900 and cal AD 435-663 were obtained on emmer glumes from Yarnton and Lake End Road respectively, although the remains at Lake End Road were associated with pottery usually regarded as 8th century. Pea and bean were joined by some possible examples of *Lens culinaris* (lentil) at Yarnton (Stevens 2004, 351). Waterlogged capsule fragments and seeds of *Linum usitatissimum* (flax) remained common in waterlogged deposits. Pollen of another fibre crop, *Cannabis sativa* (hemp), was tentatively identified from a palaeochannel at Yarnton (Greig 2004, 377). Some cultivated fruit were present from the mid Saxon period onwards, with carbonised seeds of *Vitis vinifera* (grape) and a waterlogged stone of *Prunus domestica* ssp. *insititia* (plum, bullace) being found at Yarnton (Robinson 2004b, 409). A greater range of horticultural crops was identified from waterlogged late Saxon deposits at the Trill Mill Stream, Oxford, which dated to around AD 1000, including *Apium graveolens* (celery), *Prunus domestica* (plum), *Malus* sp. (apple) and *Satureja hortensis* (summer savory). Wild food plants were also exploited. Nut shells of *Corylus avellana* (hazel) are occasionally found on late Saxon sites and seeds of *Rubus fruticosus* agg. (blackberry) were present in a sewage deposit in the Trill Mill Stream, Oxford (Robinson 2003b, 372). Charcoal assemblages from mid and late Saxon settlements continue to be diverse with both thorn scrub and woodland trees and shrubs being used for fuel. There were no significant changes in the range of domestic animals kept.

Local specialisation? (Fig. 6.25)

The economy of Iron Age Thornhill Farm and Romano-British Claydon Pike was based on cattle farming (see above), and it seems very likely that this remained the source of the area's evident prosperity in the early to mid Saxon period. The 7th-century settlement at Sherborne House, Lechlade (see Chaper 3, above) has striking evidence for land division and the creation of droveways and enclosures, which is very reminiscent of the cattle farming landscape of the Iron Age and Romano-British periods. Evidence suggests that the settlement was engaged in only limited arable farming, concentrating on raising cattle on the well-watered local pasture. The proportion of immature individuals among the cattle at the site is reported as almost unprecedented. Sheep were also present at the site, although in smaller numbers and, unusually, few if any pigs seem to have been kept. Domestic fowl and geese seem to have been reared at the site, and flax was being grown; there was virtually no evidence for the exploitation of wild food sources, and none at all for fish. The inhabitants of the settlement were almost certainly buried at the adjacent cemetery at Butler's Field, which, unlike the excavated settlement remains, suggests a community with access to considerable material wealth.

In contrast the late 9th- to 12th-century settlement at Wraysbury had a mixed economy, studied in some detail from the animal bone and environmental remains (Astill and Lobb 1989). Arable production was geared towards bread wheat, although a significant quantity of barley was also present, and G Jones (in Astill and Lobb 1989, 124-8) suggests the two crops may have been grown together as maslin (deliberately mixed grain). Barley can tolerate poorer growing conditions than wheat, and this may have been some form of insurance against crop failure due to bad weather. The wheat and barley remains found on the site had

been processed elsewhere, the proportion of chaff and weed seeds being low, and the author suggests that this took place away from the main settlement site (where there was a risk of fire). Similar results were evident at Yarnton (see below). By contrast, oats had not been so carefully processed, and it seems likely that they were used for animal fodder. Domesday Book records that Wraysbury had *pratum v carucis et fenum ad animalia curiae* ('meadow for five ploughs and hay for the animals of the court'), so we can assume that both hay and oats were being produced for animal feed. Cattle were the most important of the common domestic species, and the kill-off pattern probably reflects the maintenance of plough teams, with cows for breeding and dairying, and the culling of surplus animals for meat (Coy in Astill and Lobb 1989, 111-24). At the time of Domesday Book, Wraysbury had enough woodland for 500 pigs; many of the estates along the Chiltern dip slope had woodland capable of supporting very large numbers of pigs, reflecting the abundant woodland resources of the area (Darby and Campbell 1971, 167). There was a markedly high ratio of pigs to sheep amongst the excavated animal bone assemblages, and the presence of young animals suggests that cattle and pigs were being bred on the site. Pigs would have been fed in woodland (Fig. 6.25), but the beechmast and acorns were a seasonal resource, and other sources of food would also have been needed. Further evidence for the exploitation of woodland around Wraysbury comes from the plentiful hazelnut shells, although fruit was notably absent. The presence of some horse bone from immature individuals suggests that these too were bred nearby, and were probably kept for riding and hunting. The oats grown on the site may well have been principally for feeding to horses, which require oats as well as hay (Williamson 2003, 196). At nearby Dorney, Domesday Book records meadow for horses as well as for oxen (Darby and Campbell 1971, 170), and the Domesday record for Wraysbury may imply something similar. The proportion of seeds of vetch, tare or vetchling (*Vicia* or *Lathyrus* sp.) greatly increased in the final phase at Wraysbury, which was possibly a reflection of the cultivation of fodder vetch. However, this development probably occurred well after AD 1000. Pig was also well represented among the animal bone remains at the Middle Thames site at Dorney, where sheep bone was rare (Powell 2002, 44-9). The function of this site remains unclear (see Chapter 3, and this chapter, below), and the animal bone remains are suggestive of a consumer rather than a producer site. Evidence points to joints of pork, bacon and ham being brought to the site, as well as live animals on the hoof. Does the prominence of pig bone at this site suggest that it was being supplied from local settlements such as Wraysbury where pigs were bred in large numbers?

Indications of specialised sheep farming have been identified well to the north of the Upper Thames Valley at Shakenoak, where over half the animal remains found were of sheep, and numerous finds of weaving equipment suggest that the site may have specialised in the rearing of sheep and the production of wool (Blair 1994, 20, 22). The 7th- to 8th-century settlement at New Wintles Farm is reported as showing similar evidence, although only interim reports have been published. A single goat bone was identified from Wraysbury.

Arable intensification: the evidence from Yarnton (Figs 6.26-6.28)

The resources of Yarnton and its neighbouring townships in the medieval period are shown in Figure 6.26. Although we do not know how far this field system had developed by the end of the Anglo-Saxon period, the main changes thereafter are likely to have been the location of the settlement itself, and the expansion of arable at the expense of common

Fig. 6.25 Feeding hogs. September, from an Anglo-Saxon calendar probably produced at Winchester in the second quarter of the 11th century (BL Cotton Tiberius B. V, Part 1, f. 7)

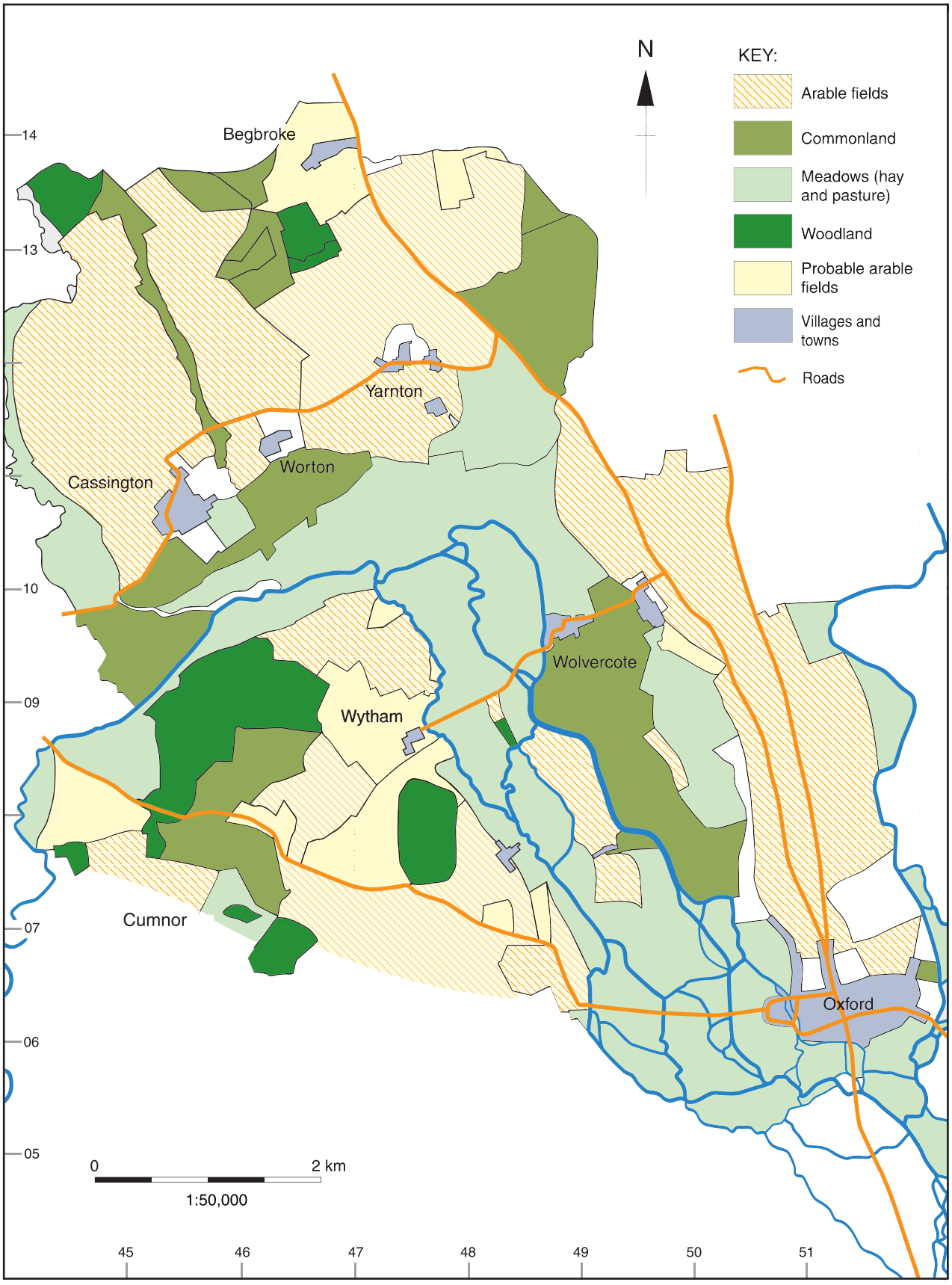


Fig. 6.26 The resources of medieval Yarnton and neighbouring townships

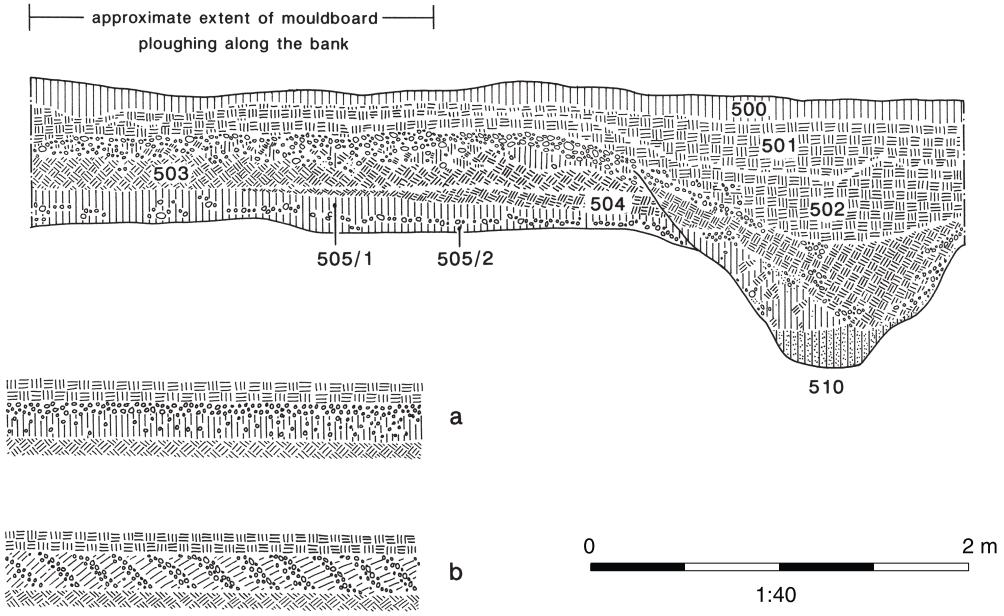
land. The type and location of other resources, woodland and meadow, are unlikely to have changed greatly, and the sizeable acreages of meadow along the Thames channels are particularly striking. Yarnton shows particularly clearly some of the changes that are thought to be most closely associated with the spread and intensification of arable farming. There was good evidence that the area under crops was being extended from the 8th century onwards. Cereal remains were more abundant than in the early Saxon period, and a high area of floodplain that had been abandoned since the late Roman period was brought back into cultivation (Hey 2004 48-9; Stevens 2004, 82). A striking change in weed seeds was seen in Phase 3 assemblages (later 8th to 9th century), with an increasing dominance of annual species at the expense of less plough-tolerant biennial and perennial weeds. This suggests either that fallow was being regularly ploughed to reduce perennial weeds, or that they had been suppressed by the use of a more efficient mouldboard plough (Stevens 2004, 82). The latter interpretation is supported by the fact that the same assemblages showed an increased presence of weeds such as stinking mayweed (*Anthemis cotula*) associated with the cultivation of heavy clay soils. This suggests that part of the clay land in the north of the estate was being brought into cultivation (Hey 2004, 48). Such soils could not easily be cultivated without the use of heavier ploughs with coulters or mouldboards pulled by teams of oxen (Williamson 2003, 120-22). The use of such ploughs, which were difficult to turn, is thought to have encouraged the practice of ploughing in long strips, although direct Saxon ploughing evidence was not recovered by the excavations at Yarnton.

Evidence for mouldboard ploughing datable to the late Saxon period has been recovered by excavation at Drayton, where a series of up to 16 broad parallel stripes of clayey material were seen cut into the crest of a Roman field bank (Fig. 6.27; Barclay *et al*. 2003, 115-16, figs 5.1, 5.3a, 5.5 and plate 5.4). On excavation, it was clear that the original alluvial clay and gravel layers had been sliced vertically by the plough, with each segment turned and displaced against the next. In section, this produced a very distinctive sandwich of inverted alluvial clay, gravel and redeposited soil. Mouldboard ploughing disturbs the soil more thoroughly than more primitive ploughs, and it is likely that the ploughing here was a single episode to break up an area of compaction. Archaeomagnetic dating of the alluvium suggested that the evidence was consistent with a late Saxon date (ibid., 116 and fig. 4.28).

Medieval arable farming was utterly dependent on animal resources. Teams of up to 8 oxen pulled each plough, and these animals had to be provided with food from the estate's own resources (Fig. 6.28). The extension of arable entailed the conversion of former pasture (grassland and scrub) into fields for crops, thus creating a need for more plough oxen while simultaneously reducing the resources to feed them. One of the most effective ways of increasing fodder and arable at the same time was the use of hay. Thus, within a two or three field system of crop rotation, animals could be fed on pasture (if available) and the fallow field in the early part of the year, on stubble after the harvesting of the cereal and hay crops, and on hay in the winter. Tom Williamson has recently drawn attention to the fundamental importance of hay resources to the expansion of arable, and suggests that by the late Saxon period there was a clear correlation between districts with abundant meadow land, and areas of nucleated villages and well-developed open-field agriculture (2003, 169). The Thames floodplain, with its alluvial and gravel soils, was an area where good hay meadow could be created with relative ease (ibid.), and large acreages of meadow are evident in many parts of the study area by the time of Domesday Book (ibid., fig. 52). The extent of nucleation of settlement in the study area by this time, however, remains unquantifiable on present evidence. At Yarnton hay cultivation resumed in the mid Saxon period (Fig 6.28). In samples datable to the period cal AD 650-850, a decline in dung beetles indicative of grazing animals was matched by an increase in weevils associated with hay meadow plants, which strongly indicates a change in the use of the grassland at Oxey Mead from pasture to hay meadow at this time (Hey 2004, 47). Part of Oxey Mead survives and is still managed according to the regime traditional for flood meadow in the Thames Valley. The mead is shut up for hay at the end of February, mown in early July and then the aftermath grazed until winter flooding makes conditions too wet. It is entirely plausible that Oxey Mead has been managed in this way since late Saxon times although Saxon late winter grazing is less likely because flood water used to linger much longer before early 20th century river improvements. By 1086, Domesday Book records a total of 10 ploughs at Yarnton, implying that the village's fodder resources were supporting something in the order of 40-80 plough oxen, as well as other animals.

Within an intensive arable regime, animals were also essential as a source of manure to maintain the fertility of the fields. This was achieved by various means, including the spreading of manure from middens. At Yarnton, mid Saxon charred seed assemblages included henbane (*Hyoscyamus niger*), a plant of middens whose seeds had probably been introduced to the arable fields in manure and then collected with the crops. Pottery collected in field-walking surveys confirms that fields were being manured from the late 9th century. The abundance of vetch or tare amongst weed assemblages of the late 8th to 9th centuries at Yarnton suggests that declining soil fertility may have been a real problem (Hey 2004, 48-9).

A wider variety of plants was grown at Yarnton in the mid Saxon period than earlier (Chapter 2,



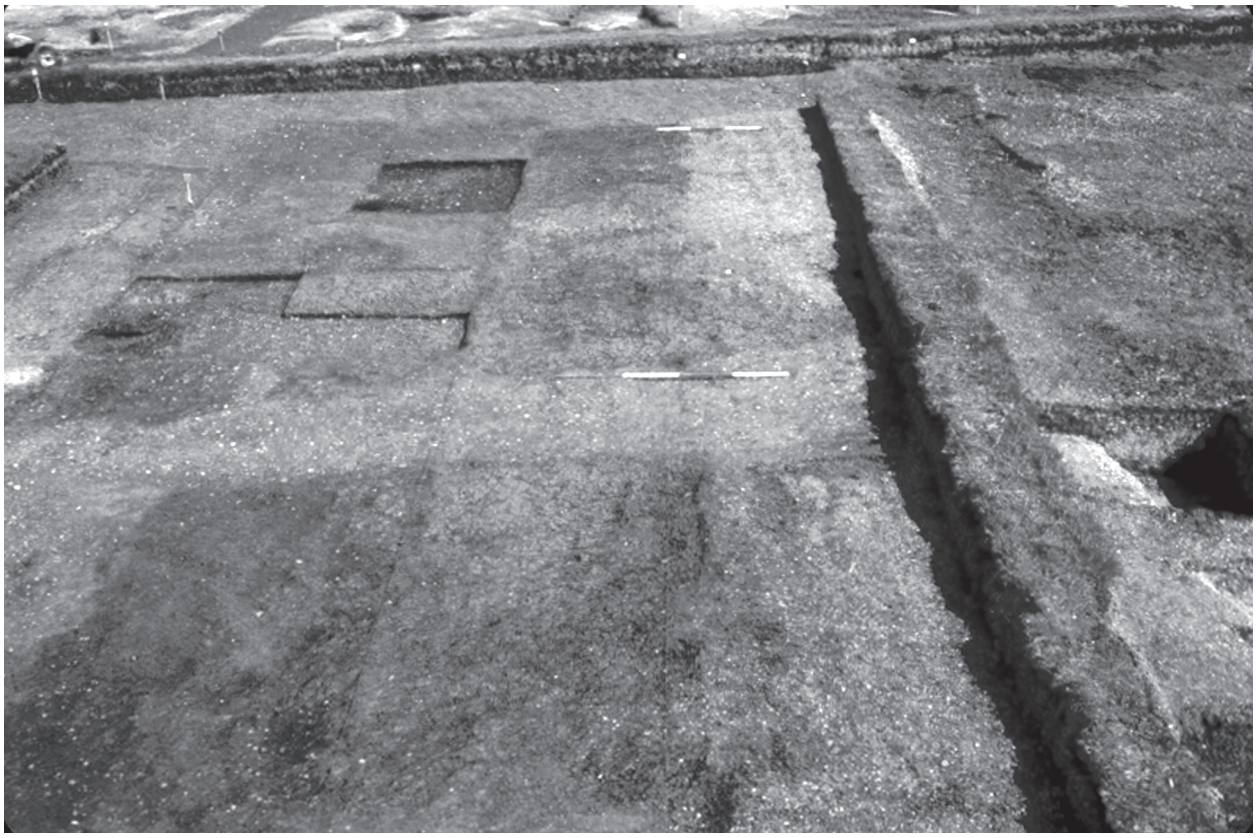


Fig. 6.27 Mouldboard ploughing at Drayton. (Above) the schematic sections (a) and (b) demonstrate the effects of mouldboard ploughing on the stratigraphic sequence through the bank. (Below) the photograph shows the mouldboard ploughmarks cutting the Roman ditch bank

Fig. 6.28 Activities of the agricultural year. From an Anglo-Saxon calendar probably produced at Winchester in the second quarter of the 11th century. (Top) January, ploughing and sowing; (centre) June, haymaking; (bottom) August, harvesting (BL Cotton Tiberius B. V, Part 1, f.3, f.5v, f.6v)

above; also Hey 2004 48-9; Stevens 2004, 81-3). The most abundant were free-threshing bread wheat and hulled barley, with smaller quantities of oats and lentil (possibly grown as animal fodder). Rye, although present, was probably less important than on poorer soils elsewhere, and there is evidence that emmer wheat was also cultivated. Evidence for broad bean, pea, grape and plum may point to a resumption of horticulture; flax and possibly hemp were cultivated for textile fibres, and opium poppy may have been grown for medicinal or culinary purposes. The evidence suggests that both spring and autumn sowing were practised. Crops were probably harvested by sickle, and left in the fields to dry. The earlier stages of processing, including threshing, raking, winnowing and coarse sieving seem to have been carried out away from the main settlement area, as characteristic by-products were very rare among the environmental samples. The semi-cleaned grain would then have been put into storage, possibly in the multiple post-built structure interpreted as a granary (see Chapter 3, above). Equally, grain could have been stored in the roof space of a house, where smoke from fires would have kept insects at bay and promoted drier conditions that reduced fungal attack. The final stages of processing were probably carried out at the settlement site itself, and would have included fine sieving and hand sorting of the grain, possibly parching to aid hand milling, and subsequently grinding into flour. The concentration of charred cereal remains at mid and late Saxon Yarnton had returned to a level more similar to that from the Roman phases of the settlement. Numerous quernstone fragments found at the site suggest that grain was still being hand milled at this time.

Animal resources at Yarnton

Animal bone assemblages at Yarnton suggest a return to an emphasis on secondary products. Data, although presented for the Saxon period as a whole, largely derive from bones of middle to late Saxon date (Mulville and Ayres 2004, 345). Most cattle survived past two years of age and the majority were killed as mature animals more than 3-4 years old. This suggests that they were being kept for traction or milk and were only eaten after a useful life. The age at death for sheep showed a gradual kill-off pattern suggestive of husbandry both for meat and secondary products. Two-thirds of the mandibles were from adults older than 2-3 years. The older animals were probably kept for both milk and wool. As might be expected, the majority of pigs were killed as sub-adults and young adults for meat. The bone data for the main domestic animal species at Saxon Yarnton are given below both as percentages of the total identified fragments and as percentages of the minimum number of individuals represented by them (ibid, 325, 331).

	Saxon Yarnton	
	Frag%	*MNI%*
Cattle	52	32
Sheep / goat	27	32
Pig	13	23
Horse	6	10
Dog	3	4
Cat	<1	
Total Fragments or Individuals	1289	73

These figures show a substantial increase in the proportion of cattle in comparison to early Saxon settlements on the Thames gravels. Cattle were the main source of meat in the middle and late Saxon period followed by sheep and pig. Poultry, however, retained their earlier importance although they would only have comprised a small part of the diet. Horse returned to the level of abundance seen on Roman settlements. Cattle and geese, both well represented among the animal bone assemblage at Yarnton, would have been particularly suited to the rich floodplain grassland at the site. The presence of a few bones of very young cattle shows that they were being bred there (Mulville and Ayres 2004), while geese could have used the floodplain when it was too wet for other stock. The number of ploughs recorded at Yarnton in Domesday Book implies that by the 11th century, if not before, cattle husbandry at this manor must have been chiefly directed towards the maintenance of the plough teams. Animals surplus to requirements, and those that had reached the end of their useful life, were presumably sold or slaughtered for meat, hides and horn. It is unlikely that sheep would have been grazed on the low-lying grassland, but the estate may have had more suitable pasture elsewhere. Areas of rough pasture in the north-west of the parish, presumably on acid plateau gravel, are evident from a number of post-enclosure field names including 'gorze' and 'furze' (Munby 2004, 219), although in the mid Saxon period the estate may have had rights in more remote grazing. Pigs, evident in smaller numbers than usual at Yarnton, might have been fed on the settlement's small area of woodland as well, presumably, as from domestic waste. Evidence for pens and enclosures shows that animals were also kept on, or close to, the settlement itself. A lack of evidence for very young sheep and pigs may suggest that the settlement was not involved in breeding and rearing these animals to any great extent, although it is possible that this apparent absence is a reflection of waste disposal practices (Hey 2004, 83). Horses were present in small numbers. It is unlikely that they were used for ploughing, but they may have been used for lighter agricultural work such as harrowing (Williamson 2003, 120-21), as packhorses, for riding and perhaps also to pull carts, but the majority of haulage work seems to have been undertaken by oxen at this time (ibid.). The only bird remains present were those of domestic fowl and geese, all probably raised at the

settlement itself. A circular building has been interpreted as a fowl house (see Fig. 3.34); contemporary documentary sources suggest that buildings of this type were used for hens and geese (Hey 2004, 69). Evidence for the exploitation of wild food resources and fish was virtually absent, which provides a strong contrast with contemporary evidence from Eynsham, and late Saxon evidence from Oxford. The remains of a single worker bee were also identified.

Yarnton in the late Saxon period

The evidence from Yarnton shows the development of a more organised mixed agricultural economy during the mid Saxon period that continued into the late Saxon period, supporting larger-scale settlement. During the 10th century the mid Saxon farmstead was abandoned, and seven small enclosures were laid out on the site. Their function was almost certainly agricultural, but they did not form part of the 10th-century fields (Hey 2004, 55). Quantities of Saxo-Norman pottery were recovered from the fields to the north-east during gravel working, excavation in the 1940s and recent fieldwalking surveys. This, together with continuing environmental evidence for cultivation of clay soils, suggests that the arable was now focused on fields in the northern part of the township, and the peasants' houses may have been around the site of the present village church (ibid., 51-2). In a charter of 1005 (see Chapter 7, below) Yarnton is described as *x mansionibus terrae communis* (ten hides of common land). Does this imply that Yarnton was by this time a place where the arable was farmed as common land (Munby 2004, 22)? It is possible that some of the changes noted in the charred weed assemblages were related to the origin of the open field system. Ridge and furrow cultivation became widespread on the Thames gravels; indeed it was possibly the normal medieval means of ploughing on the gravel terraces although the surface undulations have almost invariably been removed by more recent cultivation. Whether this form of cultivation extended back prior to AD 1000 is uncertain. It would be misleading, however, to see the economy of Yarnton as based on the gravel terraces and floodplain alone. Throughout the study area there is evidence for the existence of long, thin estates extending from the river up to higher ground, providing a mix of resources. The medieval parishes of Dorney and Burnham, for example, extend up to 10 km away from the river up onto the Pleistocene sands and gravels on the dip slope of the Chilterns (see Chapter 3 and Fig. 3.38; Munby 2002, 16-18). In some cases parishes retained detached outliers regarded as reflecting distant grazing rights.

Flax cultivation (Fig. 6.29)

By the end of first millennium the range of consumers of agricultural products was augmented by the growing towns such as Oxford. One crop whose processing, unusually, is evidenced equally in town and country is flax. Flax cultivation was widespread by this time. Seeds were identified at Sherborne House, Lechlade (Maltby 2003, 79), a few cultivated flax capsule fragments were identified in channel samples at Anslow's Cottages, Burghfield in the lower Kennet (Carruthers 1992, 156) and a large deposit of charred flax capsules was found at Dorney (Pelling 2002, 55). Waterlogged flax remains found in a well at Yarnton had possibly been derived from the threshing of flax capsules to extract its seeds for oil or consumption. However, the discovery of a twisted bundle of flax plants with roots, in a palaeochannel of the Thames at Oxey Mead radiocarbon dated to the late 7th to early 9th century, showed that flax was also being retted at the site (Fig. 6.29; Hey 2004, 48; Robinson 2004b, 408). Flax is traditionally processed as follows (Pals and Dierendonck 1988). The crop is pulled (not cut) and twisted into bundles (beets). The beets are dried and then the seed capsules should be removed, which is done either by beating or by rippling, that is drawing the ends of the beets through a coarse comb. The fibres in the flax stems are then freed with the aid of bacterial action, a process known as retting, achieved either by spreading the beets on the ground so that the dew moistens them or more usually weighing or pegging the beets under water in retting pits or channels. When the retting is complete, the beets are spread out to dry. The woody parts of the stem and other debris are then removed by beating and dressing with various special tools. The fibres are finally combed with a hackle, after which they are ready for spinning. It is possible that the meadow provided an area of grass upon which the retted flax could be spread to dry without disturbance from domestic animals.

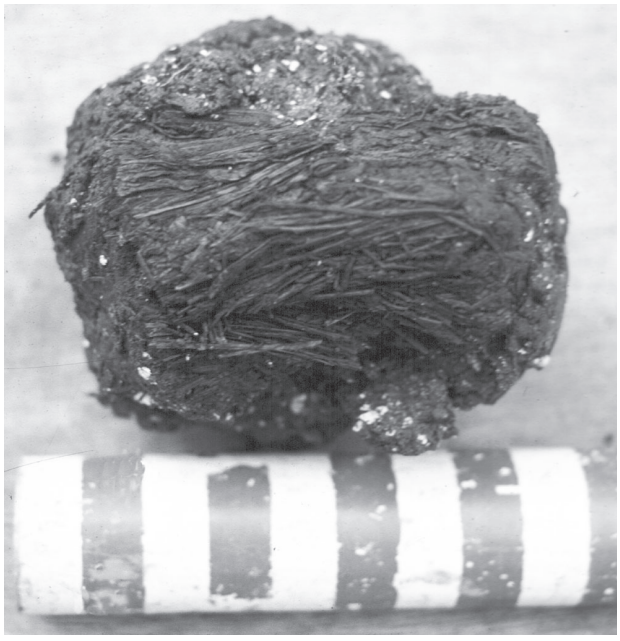


Fig. 6.29 Flax preserved by waterlogging at Yarnton

Flax retting was common in the many mid and late Saxon channels of the Thames at Oxford (Robinson 2003b, 378; Robinson and Wilkinson 2003, 93). A mid Saxon ditch at 79-80 St Aldates contained a high concentration of stems, capsules and seeds from flax that was being retted in it (Brown 1977). The seeds of flax are not only the source of linseed oil and a useful animal feed, they will give a foul stench in the retting process if not removed. It might therefore seem surprising that they had not all been removed, but it appears usual for capsule fragments and some seeds to be present in Saxon flax retting deposits including the flax beet from Yarnton. This is possibly because flax grows late, short, flowering stems from the base, in addition to the main tall flowering stems, which would have been difficult to thresh once the plants had been twisted into beets. Another fibre crop which was possibly retted in the Yarnton channel was hemp, which was represented by pollen.

Fishing, hunting and trapping (Figs 6.30-6.33)

Fishing, hunting and trapping provided means of supplementing food supplies or income, while hunting was also an important social activity related to status display, as it had almost certainly been in the later Roman period and perhaps in the early Saxon period as well. Of these activities, fishing produces the most tangible remains in the form of fish traps which, like mill weirs, formed a very widespread obstruction to navigation (see above). These had probably been in use in the study area since at least the early Saxon period. Fish-weirs were of two types: wooden bridges or frames from which baskets or nets were lowered into the river, and V-shaped lines of posts and wattles set in the river channelling fish (particularly eels) into a wicker basket set at the point of the 'V' (Peberdy 1996, 314). A late Roman or early Saxon fish trap excavated during gravel quarrying at Shepperton is discussed above (see Fig. 6.20, above), and the type changed little over time. Domesday Book reveals a large number of fisheries along the Thames and its tributaries (Fig. 6.30). Fish and eels were also caught in smaller channels and in mill streams. Excavations some 3 km south-west of Reading, at Anslow's Cottages, investigated an area of river channels south of the Kennet (Butterworth and Lobb 1992, 79-169). Environmental evidence suggests that this was an area of damp open grassland during the mid Saxon period, with some evidence for regeneration of alder (perhaps along the river), hazel and woodland or scrub. Groups of wooden stakes found

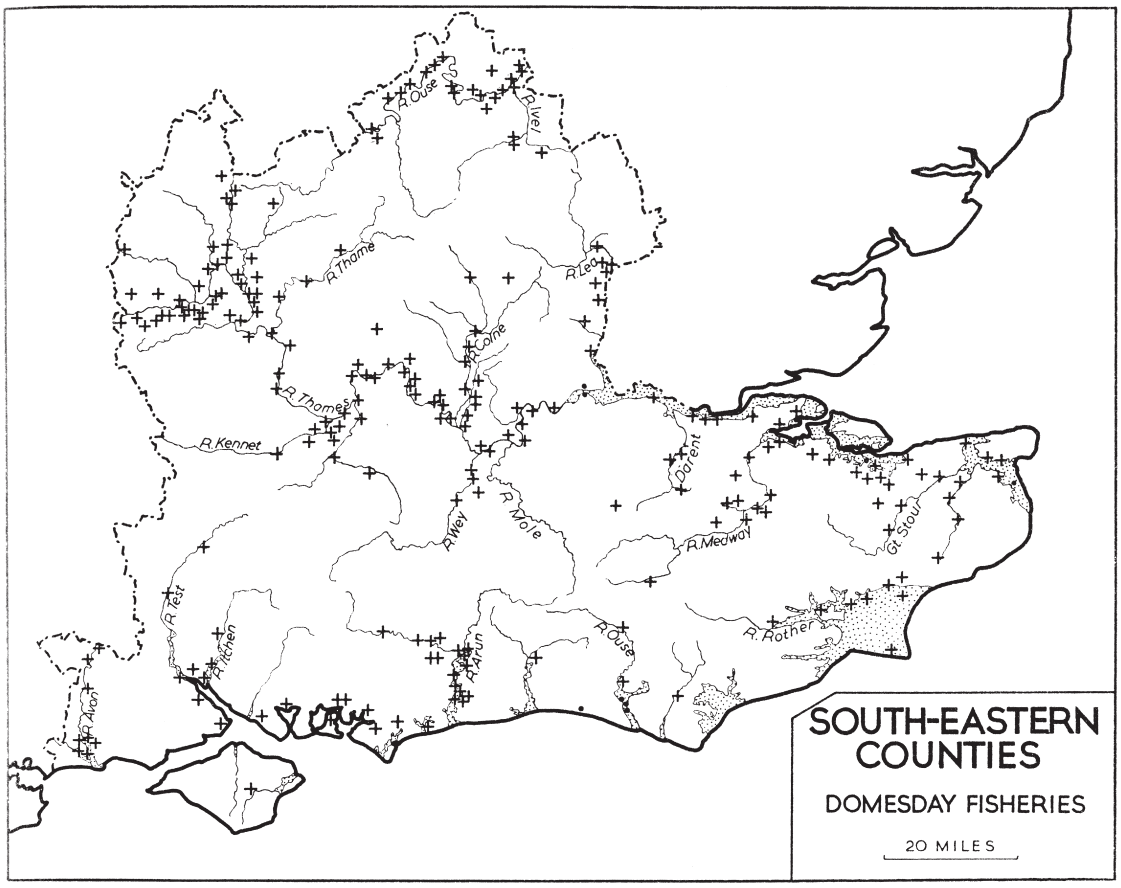


Fig. 6.30 Domesday fisheries

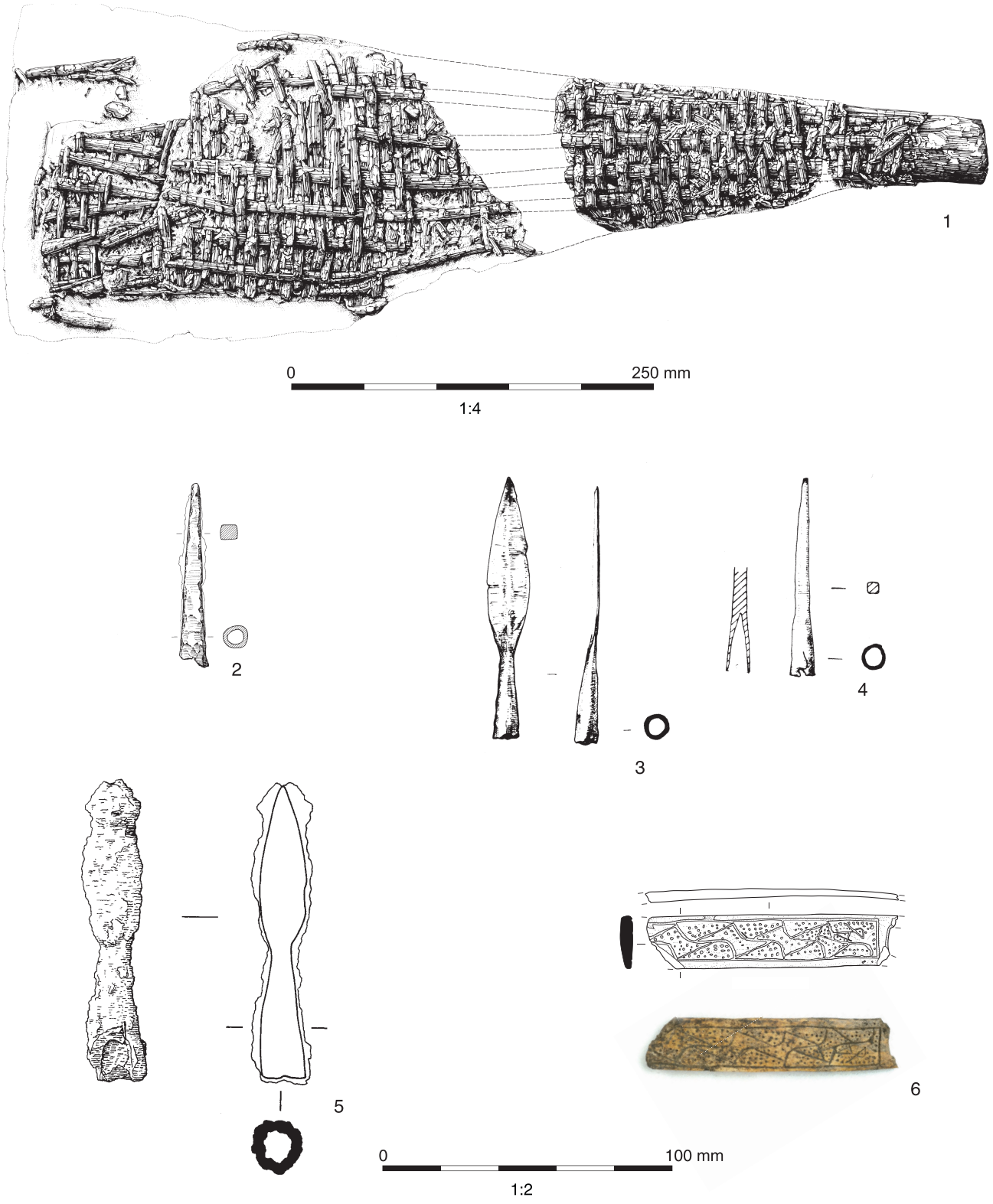


Fig. 6.31 Fishing and hunting: (1) a late Saxon eel basket or fish trap from Burghfield; arrowheads from (2) Eynsham, (3, 4) Oxford and (5) Yarnton; (6) a decorated antler bow guard from Dorney

in a stream and a possible pool nearby are interpreted as the remains of traps, probably for wild fowl. A number of radiocarbon dates from timbers suggest that this activity is datable to the 7th and 8th centuries. A second phase of activity was also evident, dated by radiocarbon to the 10th and 11th centuries. A wicker basket, probably a fish trap, was found in what may have been a backwater at the edge of the stream channel (Fig. 6.31).

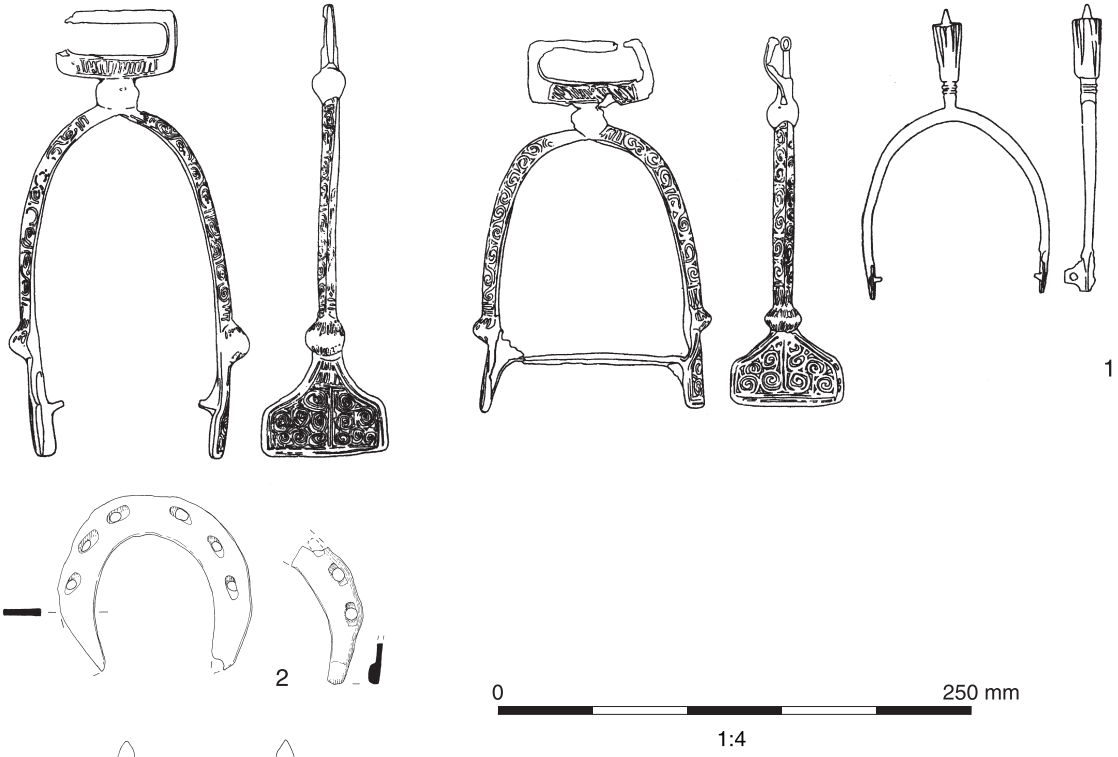
Hunting was a favourite pursuit of the Anglo-Saxon aristocracy, and probably played a much more significant role in day to day life than is evident from the relatively meagre archaeological remains. Kings such as Alfred, Edmund and Edward the Confessor are mentioned as keen huntsmen (Loyn 1962, 355). Æthelred II may have been responsible for developing the royal hunting grounds near Woodstock, where he issued two law codes; he may also have had a hunting lodge at Islip, where his son Edward the Confessor was born between 1002 and 1005 (Blair 1994, 108-10). Services connected with hunting such as building temporary lodges, repairing deer fences, feeding hounds and horses and the king's hunt servants, and driving and carrying game were an essential part of royal tribute, as were payments due for hawks and dogs (Faith 1997, 102; Blair 1994, 110). Rosamond Faith has suggested that, in peace time, the royal circuit may have been partly a matter of going from chase to chase, and many Anglo-Saxon halls were in good hunting country (Fig. 6.32; 1997, 102). The remains of red and roe deer are known from numerous sites in the study area, including Oxford, Wraysbury, Dorney and Eynsham Abbey, where the evidence suggests that whole animals were brought to the site for butchery (Mulville 2003). Hare seems, perhaps, to have been less exclusive, and bones were found at Oxford, Wraysbury, Dorney, Yarnton and Eynsham. Wild boar was found at Dorney; as well as meat, boars may have been valued for other body parts as their tusks appear to have had an amuletic function (see Chapter 5, above). Bone from one of the most prestigious of hunting birds, a peregrine falcon, was found at Oxford, and the remains of a sparrowhawk at Eynsham (Hardy *et al*. 2003, 479). The peregrine falcon could catch sizeable prey and was much prized for hunting in historical times; the sparrowhawk was also much used, although regarded as inferior, since its prey is restricted to small birds, blackbirds, thrushes and sometimes larks (Hooke 1998, 180). Goshawk, found at Wraysbury (Coy in Astill and Lobb 1989, 117), was valued for its agility in catching birds. The remains of a variety of wild birds that were probably hunted or trapped for food occur at sites in the study area. Barnacle goose, which occurs at Dorney and Oxford, is a winter visitor and suggestive of winter fowling in local field and riverine habitats. Cranes are known from Sherborne House and Eynsham, partridge from Wraysbury, Oxford and Eynsham, woodcock and golden plover from Wraysbury, Dorney and Oxford, wild pigeon from Wraysbury, Dorney and Eynsham, mallard, wigeon and teal from Dorney, lapwing from Oxford and Eynsham, bittern and snipe from Oxford, and redwing and water rail from Eynsham. Small birds such as thrushes, starlings and other small passerines occur at some sites, and may have been hunted or trapped for food; small birds formed a substantial part of a luxury diet in the Middle Ages (Hooke 1998, 180). Occasional finds of arrowheads from sites such as Eynsham, the Thames Crossing in St Aldate's and Cresswell Field were probably hunting weapons (Fig. 6.31). The decorated antler bow guard, which was found at Dorney (Riddler 2002), may have been an item of a hunter's equipment.

Fish remains present interesting contrasts in the study area. Fish bones were not recovered from Sherborne House, Lechlade and at Yarnton only a single eel bone was identified despite an intensive programme of sieving. Gill Hey has suggested that this could reflect methods of refuse disposal rather

Fig. 6.32 Hunting with the falcon. October, from an Anglo-Saxon calendar probably produced at Winchester in the second quarter of the 11th century (BL Cotton Tiberius B. V, Part 1, f.7v)

than consumption (2004, 83). Fish were similarly rare at Dorney; small numbers of eel and pike were recovered, and single examples each of perch and of a marine flatfish, perhaps caught in the Thames Estuary. More fish were recorded at Eynsham, and included freshwater species (eel, pike and perch) and marine species (ray, bullrout and cod in very small quantities) from 8th- to 10th-century contexts, and eel, pike and perch, cod, bullrout, flat fish and oyster from early 11th-century contexts. The late Saxon settlement at Wraysbury, much further downstream, has a much larger and more varied fish assemblage, comprising eel (82% of the total), herring (9%), brown trout, salmon and flounder (possible identifications), chub, barbel, gudgeon, bream and perch (Coy in Astill and Lobb 1989, 111-24). By the time of Domesday Book, Wraysbury had four fisheries, an exceptional number for the area, and this may reflect a long-standing tradition of river fishing at the estate. Late Saxon Oxford clearly had access to a variety of freshwater and marine resources, including eel, herring, pike, cod, flatfish, salmonid, chub, oyster and mussels. Eel seems to have been much the commonest fish in the mid to late Saxon diet, reflecting the relative ease with which eels could be caught in the river using traps and baskets of the type noted above. Evidence for fishing is rare amongst finds assemblages of the period. Lead weights used as net sinkers were noted at the Thames Crossing at Oxford (Allen and Durham 2003, 278) and at Dorney (Scott 2002, 37), and a common type of worked bone implement found at many sites is thought to have been a needle used for coarse work, including netting (for example, at Shepperton County School 1986, Poulton forthcoming b, and at Dorney (Riddler 2002)). It is interesting that herring, so common in the later medieval period, appears only at Oxford and at Wraysbury, and only in the late Saxon period, suggesting that trade in these fish was growing only slowly. It is genuinely surprising that no herring was present in Anglo-Saxon contexts at Eynsham, although this could reflect the areas of the late Saxon abbey that were located within the excavation trenches. The farming of oysters did not become widespread in Britain until the 11th or 12th century (Light 2003, 431), and a large 11th- to 12th-century sample of oyster shells from Eynsham appears to have been a specially selected batch from a managed population, probably from the south coast. Modern experiments have shown that oysters will keep for up to three weeks out of water if stored correctly, suggesting that a freshly collected and carefully wrapped batch could have been transported to Oxfordshire from the coast in good condition (ibid., 431-2), as must have happened in the Roman period. Whelk (*Buccinum undatum*) and common periwinkle (*Littorina littorea*) also occurred at Eynsham in the mid Saxon period. Their significance was presumably different from that of the shells of panther cowrie found in the cemetery at Lechlade Butlers Field. These shells, imported from the Red Sea area, are thought to have had an amuletic function connected with fertility, and are not uncommon finds in the graves of girls and women of child-bearing age in the 7th century.

The remains of a number of wild creatures have been found that were probably exploited for fur, skin, teeth or feathers rather than food. Some of these must have been imported. The most unusual is the bone from a brown bear claw found in a probable late Saxon context at Eynsham. The brown bear is thought to have been extinct in England by the 10th century, and the claw may have arrived at Eynsham still attached to an imported bearskin (Hardy *et al*. 2003, 482). King Alfred records an account given him by a Norwegian seaman called Ohthere of Scandinavian hunting, whaling and tribute payments of skins, whalebone and bird feathers (*Orosius*; trans Swanton1975, 32-5). Ohthere had apparently given the king a gift of highly prized walrus 'teeth', perhaps in reality tusks of the kind used in mid and late Saxon ivory carving. Badger and beaver remains were found in pits at Dorney and were almost certainly from utilised carcasses rather than natural casualties. A milk tooth fragment from a beaver was also found at the late Saxon settlement at Wraysbury. Beaver pelts were highly valued, and it is likely that the animals had been captured for their fur rather than their food value. Beaver teeth apparently had an amuletic function in the 7th century, and mounted beaver teeth were found in the cemetery at Lechlade Butlers Field (see Chapters 4 and 5, above). Badger meat and fat was highly regarded, although the animal's skin would probably also have been used (Powell 2002, CD-ROM). Badger body parts seem to have been regarded as having magical powers, and badgers may have been captured to obtain organs and hide. The liver of a badger was considered to have protective powers if buried at the corners of land boundaries, while badger hide worn in the shoes was thought to cure painful feet (Meaney 1981, 106). Hares, cats and foxes were skinned for fur, and characteristic skinning marks have been found on cat bones at numerous sites in the study area, and on fox bones from sites in Oxford. Bones from two white-tailed eagles were found at Dorney and an example from early Saxon Barton Court Farm was noted above. Both birds could have been killed for bothering livestock, but one of them had clear knife-cut marks suggesting it had been skinned. Bones of a red kite, probably a scavenger, were also identified, as well as crow bones. Crows may have been utilised rather than simply natural casualties; knife marks have been identified on crow bones at *Hamwic*, and crow fat has been used into recent times. Birds such as crows and pigeons would also have been a significant nuisance on newly sown fields. An almost complete skeleton of a young corvid (a crow, rook or jackdaw) was buried with a man at Lechlade Butler's Field, but the significance of this remains unclear.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Cats, dogs and horses are found at many, but not all, sites in the study area, although never in large numbers. Cats were valued as mousers, and dogs had numerous functions, in hunting, management and guarding of flocks and herds, and as guard dogs within settlements. Oxen were almost universally used for ploughing (Williamson 2003, 120-21), but horses were kept for riding and hunting, for racing (Blair 2005, 176 and n 182), and as pack-horses to carry goods. Specialised stud farms are mentioned in documentary sources, and then, as now, horses were kept on the Berkshire Downs (Hooke 1987, 134). Horseshoes are found on numerous sites, for example at the Thames Crossing in Oxford (I Goodall 1977 fig. 29 nos 56-8; Allen and Durham 2003, 318 fig 6.19 nos 36-7), although shoes of definitely pre-conquest type remain quite rare in the region. These typically have broad but thin arms and countersunk nail holes (ibid.). They were fixed with 'fiddle key' nails, which are occasionally found still attached. A prick spur of late Saxon date was found at All Saints Church, Oxford (Ellis 2003 fig. 6.19 no. 38, of 10th- to 11th-century date) and a second example of late Saxon or slightly later date was identified at Church View, Bampton (Mayes *et al*. 2000, 284, not illustrated).

Horses were, of course, an essential part of the aristocratic and warrior lifestyle and a number of finds from the study area suggest that considerable money and effort was expended on the creation of horse fittings of appropriate magnificence (Fig. 6.33). A probable strap distributor found at Orchard Farm, Brighthampton (Ford and Preston 2002, 306) is of a leaded brass most commonly used in the Viking Age, and the closest parallel for this object comes from the Isle of Man (ibid.). The object was probably used to allow bridle straps to cross at right-angles. Two highly decorated mounts found at Eynsham Abbey (Hardy *et al*. 2003, 310-12) were probably for stirrup straps. One, of copper alloy with the figure of a lion, is of a kind found in (and possibly originating in) south-east England. It is of mid 11th-century or slightly later date. The other is of iron with a coating probably of silver, and engraved decoration of late Viking inspiration. An enamelled copper alloy stud found at Yarnton may have been a bridle fitting (Hey 2004, 286). An exceptional group of horse equipment was recovered from the river Cherwell near Magdalen Bridge in Oxford in 1884; two ornate stirrups and a prick spur seem likely to have been deposited with a Viking burial here around the year 1000 (see Chapter 5; Blair and Crawford 1997). The fate of horses beyond their useful life, however, seems to have been the common one. Evidence for butchery marks on horse bones is widespread, and it is hard to avoid the conclusion that horse meat was eaten, despite papal prohibition of the practice, although it could also have been fed to dogs.

Clothing, footwear and personal accessories

Textiles (Figs 6.34-6.35)

The provision of food and shelter were the main preoccupations of most Anglo-Saxon people, but the production of clothing and footwear was probably the next most time-consuming activity. The preparation of yarn and the weaving of cloth was a ubiquitous domestic occupation during this period, largely undertaken by women. Archaeological evidence for textile production occurs widely throughout the study area, and a typical range of objects is illustrated in Figure 6.34. The first stage of the process that is normally visible in the archaeological record is the combing of fibres to make them lie straight and parallel ready for spinning (Walton 1991, 324). This was undertaken

Fig. 6.34 Textile equipment. (Above) wool comb fragment from Lechlade, Butler's Field; (below) loomweights, bone weaving tools and a broken spindlewhorl from Dorney

Fig. 6.33 (opposite) Late Saxon and Viking horse equipment: (1) Viking stirrups and spur of c AD 1000 from the bank of the river Cherwell at Oxford, (2-3) two late Saxon horseshoe fragments and a prick spur from All Saints Church, Oxford, (4) two mid 11th-century stirrup-strap mounts from Eynsham Abbey, (5) 9th-century enamelled stud from Yarnton, (6) leaded brass strap-distributor from Brighthampton

with flax heckles and woolcombs; the iron teeth from these are fairly common archaeological finds and have been recovered from Oxford and Eynsham within the study area. The best group to date was discovered at Dorney, where a woolcomb fragment survived consisting of 13 iron teeth set into a wooden block, with an iron binding (Scott 2002, 37); 17 heckle teeth fragments were also found at the same site. Wool combs were also found in a 7th-century adolescent girl's grave at Lechlade Butler's Field (Grave 14; Fig. 6.34). After combing, flax and wool were wound onto distaffs or into rolls, and then spun into yarn. The fibres were drawn by hand and twisted by means of a free-hanging spindle, a short wooden stick weighted at one end by a whorl, which also acted as a fly-wheel (Walton 1991, 325; two typical spindlewhorls, from the early Saxon settlement at Radley Barrow Hills, are shown in Fig. 3.24, above). A polished bone fragment found at Eynsham, with repeated series of minute striations across its surface, was probably a spindle (Hardy *et al*. 2003, fig. 9.26 no. 202). The striations would have been caused by the winding of the yarn around the bone. Spindlewhorls are common finds on archaeological sites; the materials from which they were made varied, apparently because different weights were used for different types of yarn, the warp being spun with a heavy whorl, and the weft with a lighter one (Walton 1991, 325). Stone spindlewhorls are known from Sherborne House, Oxford, Drayton Manor Farm and Dorney; fired clay spindlewhorls were presumably lighter, and have been found at Oxford, Yarnton Cresswell Field and Dorney. The lightest of all were presumably the spindlewhorls of bone, examples of which are known from Oxford and Eynsham. Spindlewhorls were also buried in the graves of women and girls, and numerous examples are known from Lechlade Butler's Field (see Fig. 4.27).

The yarn would then be woven (see Walton 1991, 327 for what follows). Prior to the 11th century, cloth was usually produced on the warp-weighted loom, which consisted of two uprights, with an upper cross beam and a lower cross bar. The loom could lean against a wall, or be set upright in the ground. The warp threads were suspended from the upper beam and weighted with heavy fired clay loomweights. The weft thread was woven through them, and beaten upwards. Loomweights are another common find on sites within the study area and are known from Sherborne House, Eynsham, Yarnton, Yarnton Cresswell Field, Oxford, Dorney (Fig. 6.34 shows fragments of seven loomweights from Dorney) and Staines (Duncroft). The beating up of the weft could be undertaken with a long weaving sword or batten, but these may have been quite rare objects, and are often taken as a sign of status when found as grave goods (see Fig. 4.33 grave 95; Fig. 4.35). More common, perhaps, was the use of bone or antler points for this purpose, and these 'pin beaters' are found on many sites, including Wraysbury (Astill and Lobb 1989 fig. 11 nos 6 and 8), Staines (Duncroft), Shepperton, Dorney (Fig. 6.34), Eynsham and Yarnton Cresswell Field.

Needles made from pig fibulae were found at Dorney (Fig. 6.34) and pins and needles were also found at Sherborne House, Eynsham and at Shepperton. Shears and tweezers may have been used at various stages in the cloth production process, and examples have been found at Eynsham and at Yarnton Cresswell Field. Smoothers or rubbers have been found at Yarnton, Dorney and at Oxford. Mineralised remains of woollen and linen cloth have been found at cemetery sites. At Field

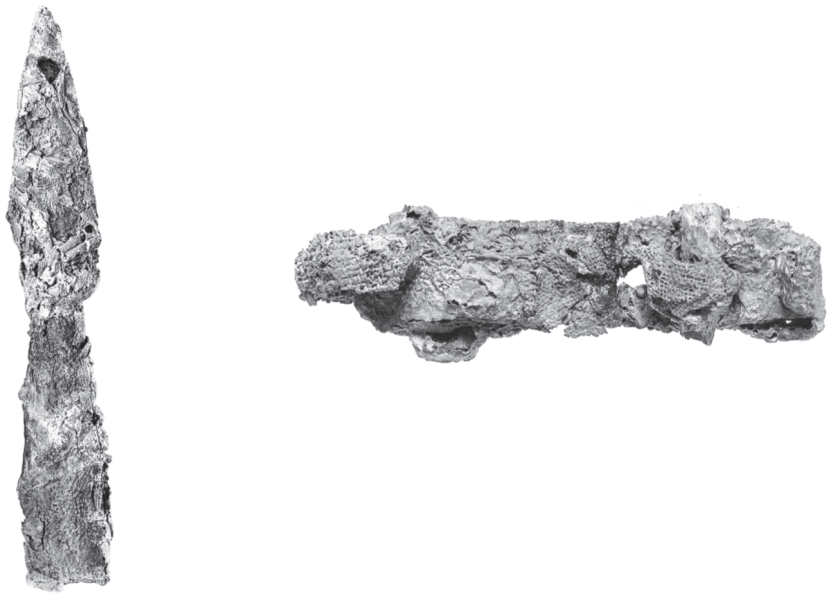


Fig. 6.35 Mineralised textiles from the 7th-century cemetery at Field Farm, Burghfield

Farm, ten identifiable fabrics were found, representing the types of tabby and twill weaves characteristic of the Saxon period in linen and wool (Fig. 6.35; Brooks 1992). Most of the fabrics were plain tabby weave, including some fine linen, probably the remains of shirts. A fine spun cloth in linen may have been the remains of a woman's veil or head covering. Twill weaves from the same site may have been from a blanket or cloak and from a dress or tunic, the latter with fine threads that gave a decorative surface effect. A spearhead (Fig. 6.35) had been wrapped in linen cloth with a self pattern or possibly a check. A short length of sewing yarn was visible on the torn edge of the wrapping, and the cloth had been bound around the spearhead with neatly tied yarn. Textile remains at Lechlade Butlers Field (see, for example, Fig. 4.27) suggested that there could have been a change from twills to tabby weaves between the 6th and 7th centuries. The tabby weaves ranged from coarse blankets or shrouds to very finely woven good quality clothing fabric. The grave of an adolescent girl (grave 14) had preserved remains of tablet weave around the ankles, probably the lower border of a dress. A tablet weave cuff was preserved in grave 81, and grave 159 had the remains of a decorative braid with what were probably originally coloured threads.

Footwear and leather (Fig. 6.36)

Archaeological evidence for leather working in the study comes chiefly from occasional finds of leatherworking tools, from leather remains in graves, and from the remains of leather offcuts and discarded objects found in waterlogged conditions. Awls and punches for leatherworking are reported from Sherborne House, Wraysbury, Staines (Duncroft) and Eynsham, and an awl was found in a grave at Lechlade Butler's Field. The remains of leather knife sheaths, bags and possible shield board covers occurred in graves at Burghfield, Field Farm and Lechlade Butler's Field, and fragments of calf leather offcuts were found at Yarnton. Evidence from Lechlade Butler's Field suggests that sheaths may have been lined with sheepskin (Cameron forthcoming). The largest quantities of leather in the study area have come from waterlogged levels of sites along the Thames Crossing in Oxford. Leather from silting against the causeway at 79-81 St Aldate's included the buckle-end of a strap, and numerous offcut fragments, but the most numerous finds were shoes, a selection of which are illustrated (Fig. 6.36; Thornton 1977). Bone skates made from cow metacarpals have also been identified in late Saxon levels at Oxford.

Jewellery and clothes fasteners (Fig. 6.37)

Jewellery of the 7th century has been found in many graves within the study area, and further detail can be found in Chapters 4 and 5 above. Buckles, of simple or elaborate form, are also quite common finds in graves of men, women and children, and were used to fasten belts and shoes. Once the Anglo-Saxons abandoned the practice of burying the dead with grave goods, evidence relating to jewellery and the ways in which clothes were worn and fastened becomes much scarcer, and we are reliant on the information provided by chance losses. The most characteristic finds of the mid Saxon period in the project area are round-headed pins, sometimes decorated, which were probably used to fasten clothes and possibly headdresses (Fig. 6.37). Surviving examples are usually in copper alloy, although an unusual pin from Yarnton had an iron shank and a lead head. Examples have been found at Yarnton, Staines (Duncroft), and Dorney, with a more unusual form from Wraysbury. A disc-headed pin found by the medieval monks of Abingdon Abbey no longer survives but is known from a marginal illustration in the 13th-century manuscript of the abbey's chronicle-cartulary. Some of the bone pins and points from numerous sites in the study area may have served a similar function. The characteristic mid-shaft swelling seen on some of these may have been designed to prevent them from slipping out of place. By the late Saxon period, the emphasis amongst finds from the study area shifts to belt ornaments. A simple iron buckle and strap slide were found at All Saints Church at Oxford; a characteristic D-shaped buckle was found at Staines (Duncroft), and may have been coated in white metal (tinned) for a more decorative effect. Elsewhere, a magnificent buckle-plate of late 9th-century Insular Irish tradition was found at Eynsham (Thomas 2003 251-4; Fig. 5.31), decorated with a cross, roundels and interlace knotwork motifs. Elaborate strap ends were also worn, and form perhaps the most characteristic of late Saxon metalwork finds in the study area and elsewhere (Fig. 6.37). Typically, they are decorated with stylised animal heads although interlace decoration has also been found, and the use of silver wire and niello in silver-on-black decoration is quite often seen. Examples of strap ends are known from Drayton, from Staines (one excavated and one metal-detected), from Yarnton, from St Sampson's churchyard at Cricklade (Hinton 1974, 15-16), from Chalgrove (Goodall 2005, 86 and fig. 3.8 nos 15 and 16) and from Abingdon (Tim Allen pers. comm.). More utilitarian clothes fasteners are represented by the group of hooked tags found at Eynsham, although a silver example of the type was found at the Trill Mill Stream site in Oxford.

Brooches of the mid to late Saxon period are represented by finds of a small penannular brooch of a long-lived tradition at Eynsham (Hardy *et al.* 2003, fig 9.1) and of equal-armed brooches at Oxford and Yarnton (Dodd (ed.) 2003, fig 6.17.1; Hey 2004, plate 15.1b reproduced in Fig. 3.34 of this volume). Equal-armed brooches are generally rare in England, although they may have been commoner at the time than the archaeological record now suggests. Finger

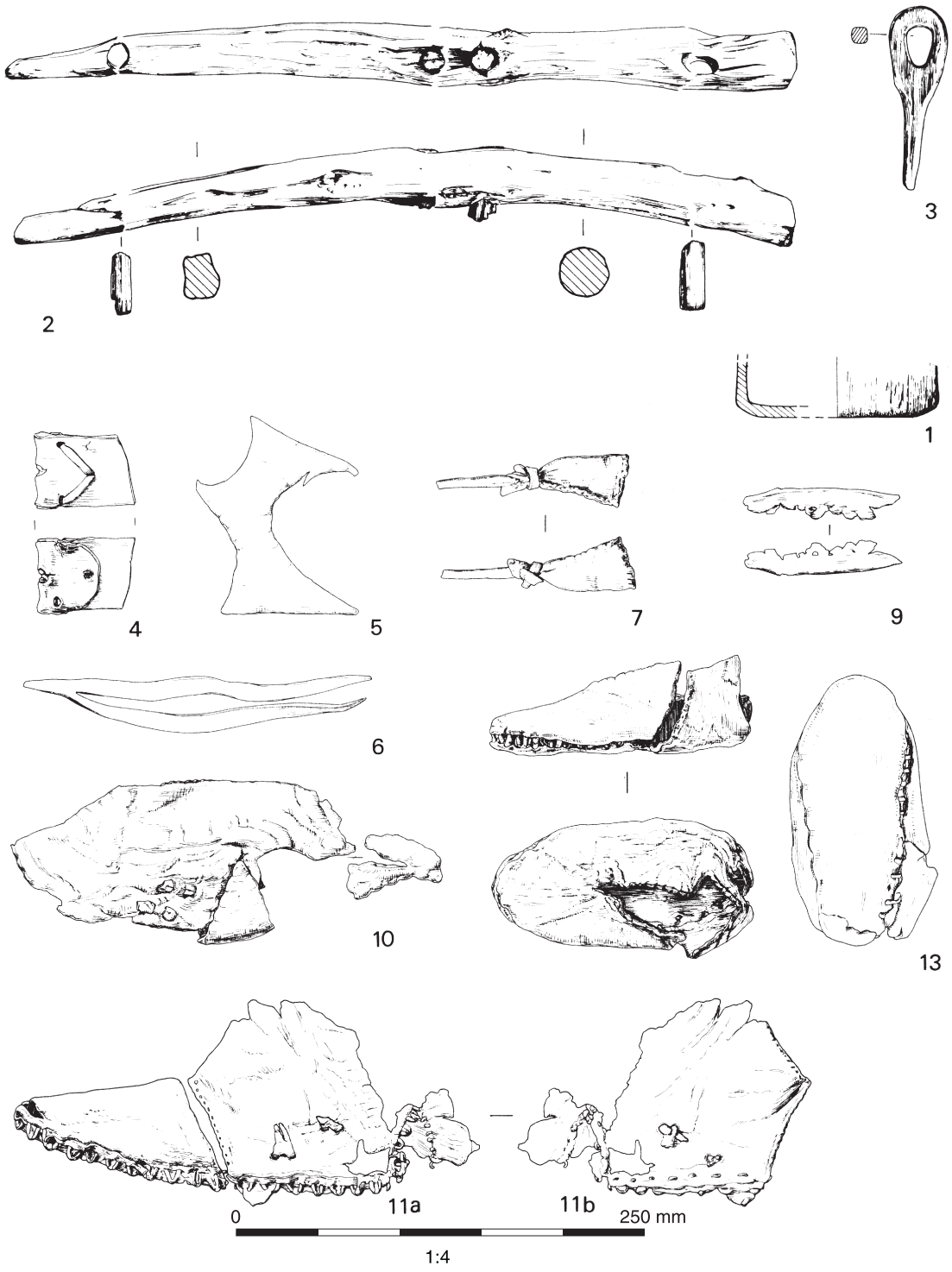


Fig. 6.36 (above and opposite) Late Saxon wooden and leather objects from the Thames crossing in St Aldate's, Oxford: (1-3) wooden bowl, pole and peg, (4-7) fragments of straps, (9-18) shoes and shoe fragments

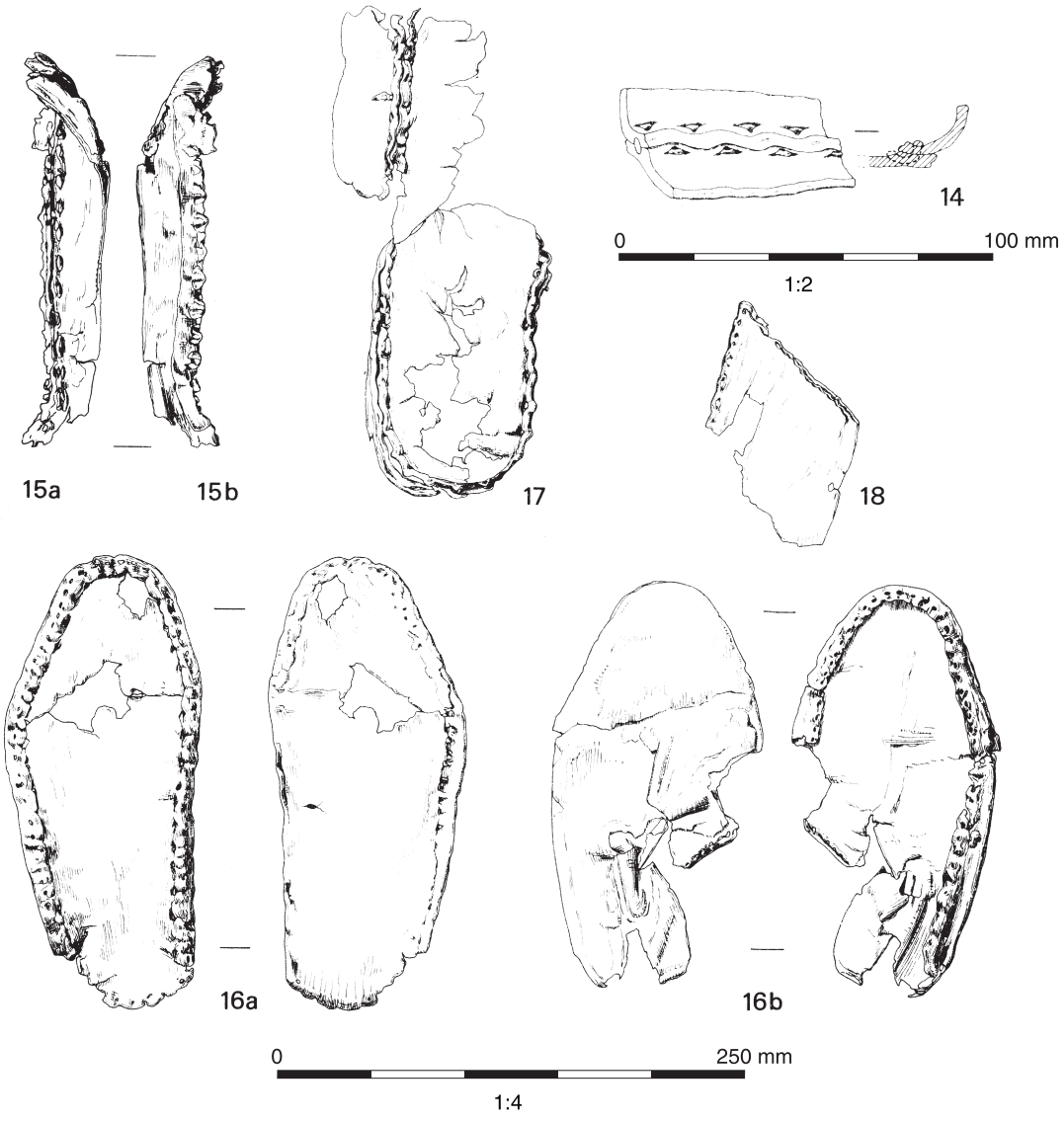
rings seem to have been worn and excavated examples are made from bone or ivory, at Sherborne House and Eynsham, and copper alloy at Lincoln College, Oxford. The most magnificent ring found in the study area is a gold ring of elaborately plaited rods, found about 1890 in a stone coffin in St Aldate's, Oxford (Fig. 6.37; Graham-Campbell 1988, 263-6). The fashion for wearing rings of plaited wire is thought to have been introduced by the Vikings, and elaborate gold examples are generally of 11th-century date (ibid., 263). A single earring is known, from Eynsham, where a very corroded pendant in the form of a cross was also found.

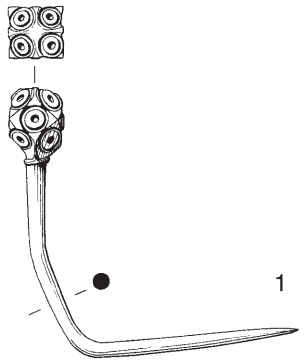
Mention should be made of a fine object found at Wraysbury, whose function remains unclear. This is an iron disc overlaid on both sides with embossed silver sheets forming a cross with interlace between the arms, of late 7th- or 8th-century date (Fig. 6.37; Hinton 1989, 90-94). David Hinton comments that this object, although valuable, could as well have belonged to a prosperous peasant as to someone of higher status.

Tools and trades

Metalworking (Figs 6.38-6.40)

The remains of iron working, slag and smithing hearth bottoms, are ubiquitous on sites in the study area. In most cases this appears to represent small-scale and intermittent blacksmithing although the smelting of local bog ore seems to have been undertaken at Wraysbury (McDonnell 1989, 94-6). Relatively large quantities of smithing slag were found at Dorney, and a substantial assemblage of smithing hearth bottoms at 113-119 High St, Oxford, is likely to derive from a smithy nearby where fairly substantial pieces of iron had been worked (Walker and King 2000, 428). Remains from the working of other metals are less often encountered, although copper-alloy working debris has occurred at a number of sites in Oxford (Dodd (ed.) 2003, 42-3) and copper wire and casting waste was found at Dorney (Scott 2002, 37). Lead strips, offcuts and melted waste were also found here, and splashes of molten lead were also found at 55-58 Cornmarket

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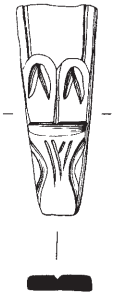

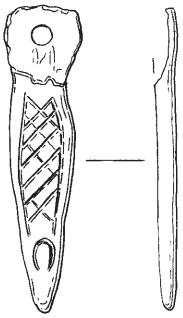

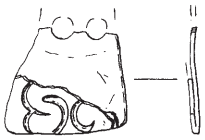
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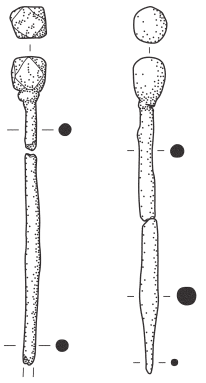
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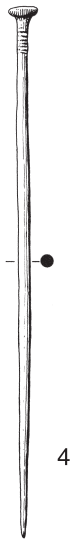
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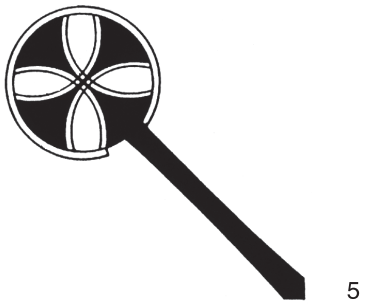
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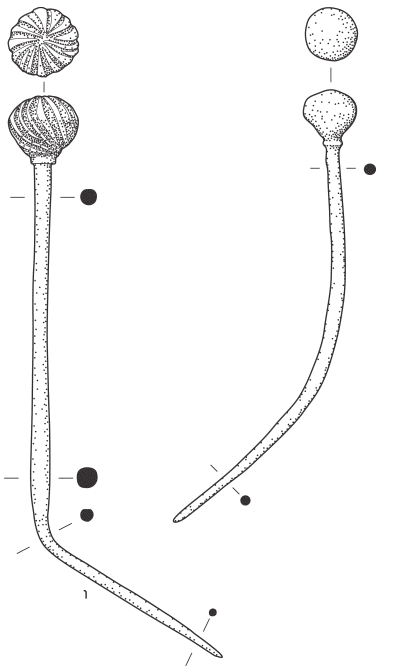

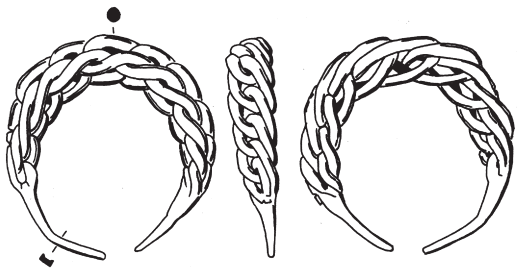

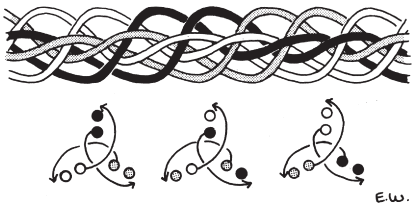
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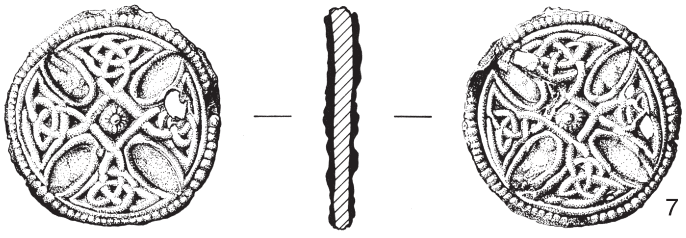
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St, Oxford. A mould for the casting of silver ingots was found in Oxford at the Clarendon Hotel site (Jope and Pantin 1958, 72). A smithy was identified at Yarnton, constructed in the corner of an enclosure after the main settlement had shifted to the north-east some time during the 10th century (Fig. 6.38; Hey 2004, 79,167-172). It had been placed over the top of a mid Saxon enclosure ditch, perhaps to take advantage of the hollow. The superstructure seems to have been quite flimsy, probably a roofed space with windbreaks. Inside was an oval limestone hearth, reddened by heat, and next to it the square limestone base of what seems to have been a working platform or anvil base. Smithing hearth bottoms were found spread over a wide area, and seem to have been carried away from the smithing site. The structure seems to have been used infrequently as a short-term forge. Metal finds from the forge included a possible pivoting knife, a strainer, a buckle plate and a broken pin or needle, all of which might have been brought for reworking. Several objects had evidence of white metal coating, and a fragment of a file found nearby had traces of white metal and copper/zinc in its teeth. A fragment of grindstone of Coal Measures sandstone from the Pennines was also found in the smithy. Iron for working in the smithy would have been brought to site as trade iron billets, although the source is unknown. Part of what was probably a trade iron bar was found with debris from a brief period of smithing at Staines (Robertson 1999); the smith had cut pieces from this to make objects.

The smith's products are also found everywhere within the study area. The most common types of utilitarian objects on settlement sites are nails and knives, of which large numbers of examples are known. Horseshoes and nails are occasionally found, and smiths must also have manufactured and repaired large numbers of agricultural tools (including ploughs) that have not survived in the archaeological record. Building ironwork and fittings for doors, boxes and chests are relatively common, and numerous sites have produced remains of padlocks and keys. Numerous small iron bells and bell clappers are also known from the study area, and may be the remains of animal bells, or (in the case of the slightly larger bell clapper at Eynsham) bells rung for church services. Two bells were also found with burial assemblages at Lechlade Butlers Field. A selection of ironwork from the study area is shown in Figure 6.39.

Metallographic analysis was carried out on a group of Anglo-Saxon and medieval knives from Eynsham (Fell and Starley 2003). The manufacture of knives involved the use of both iron and steel. Steel gives a good cutting edge, but was harder to manufacture, and more expensive, and iron and steel were fire-welded together in such a way as to provide a good steel cutting edge on a low-carbon iron back. One of the Anglo-Saxon knives had been pattern-welded, a technique in which the blade back was built up of alternating layers of steel and iron, welded together. The finished blade, when ground, polished and etched, would have been pleasingly decorative, and this object was the product of a skilled craftsman (ibid.).

A second pattern-welded object, in this case a seax, was found at Yarnton (Fig. 6.40; Gilmour 2004). The seax is a large single-edged knife or short sword, of 9th- or 10-century date. Three different layers of pattern welding, of contrasting appearance, were welded onto a plain back, the cutting edge being composed of a sandwich of two low carbon outer iron pieces, with a piece of medium carbon steel between them. The choice and combination of materials used for the pattern-welded pieces were clearly designed with the final etched appearance in mind. Not all the raw materials can have been found or made locally, and some, such as the high phosphorus iron, may have been the specialised product of a distant bloomery. All the carefully chosen iron alloys may have been brought in from specialised iron producers, or alternatively, the object itself may have been made elsewhere.

In the same period some high quality swords were marked with specific makers' names; examples from Shifford and Chertsey (see Fig. 5.23) have the name Ulfberht in iron inlay on the blade. Ulfberht and Ingelrii, both continental makers, are the two most commonly occurring names. Inevitably these were copied, literately and illiterately, by other makers, to the extent that a sword from Wisbech has one name on each side. An example from Wallingford, which has given its name to the type, has symbols that link it to Ingelrii swords and appears to be an early example of 'brand counterfeiting'. A majority of examples of the general type (with or without names) come from the Thames, mainly downstream from Staines (Evison 1967).

Whetstones and grindstones used for sharpening knives and tools are also quite common finds on sites in the study area. They are a mixture of local and imported stones; of the seven found at Dorney, two were of Lower Calcareous Grit from the Corallian Ridge at Oxford, two could have been collected from the local river gravels, while another two could have been continental imports. Fragments of purple phyllite whetstone, probably imported from Norway, were found in contexts of *c* 1000 at Eynsham. Four others were of Coal Measures Sandstone from the Pennines, while two were of the Lower Calcareous Grit available near Oxford, and

Fig. 6.37 (opposite) Mid and late Saxon jewellery and belt fittings: (1-2) pin and strap-ends from Yarnton, (3) four pins from Dorney, (4) an unusual pin from Wraysbury, (5) the 'Black Cross' of Abingdon, probably a disc-headed pin, redrawn from the medieval chronicle-cartulary, (6) a ring made of plaited gold wire from St Aldate's, Oxford, (7) iron disc with overlay of embossed silver sheets, late 7th or 8th century, from Wraysbury

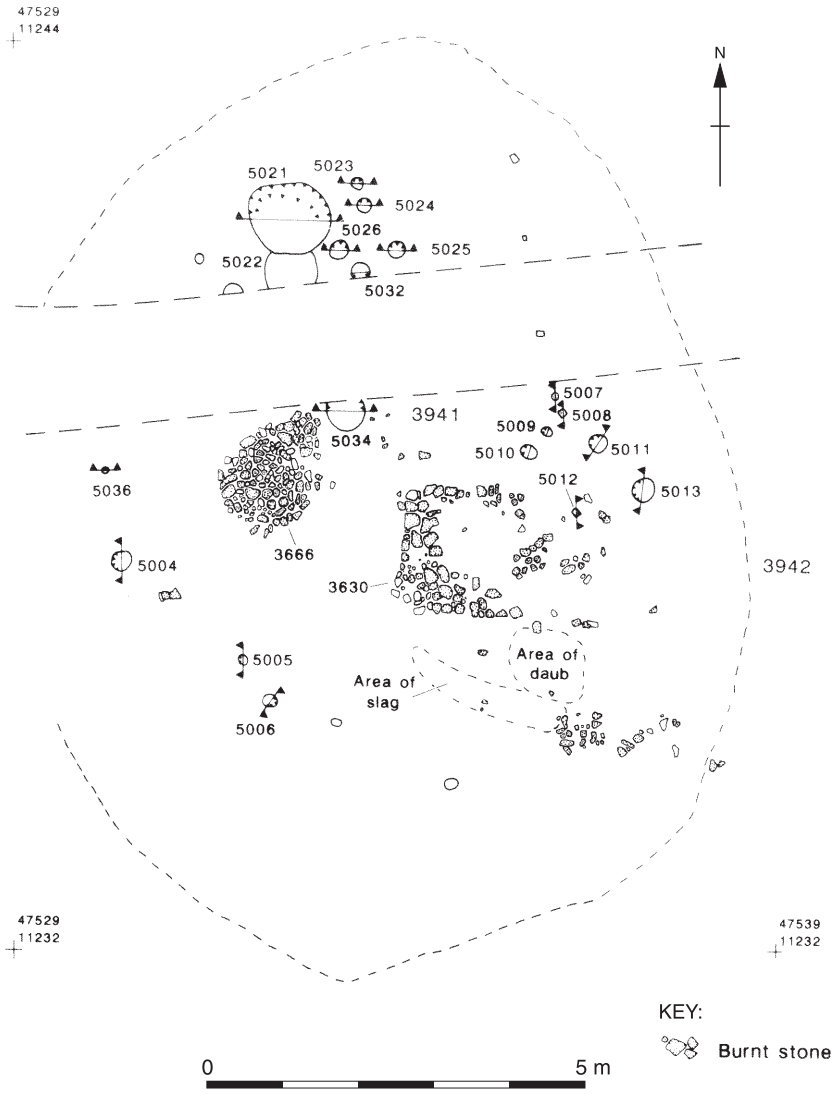


Fig. 6.38 The late Saxon smithy from Yarnton: (above) plan of the smithy, (below, left) the stone hearth, (below, right) the stone platform

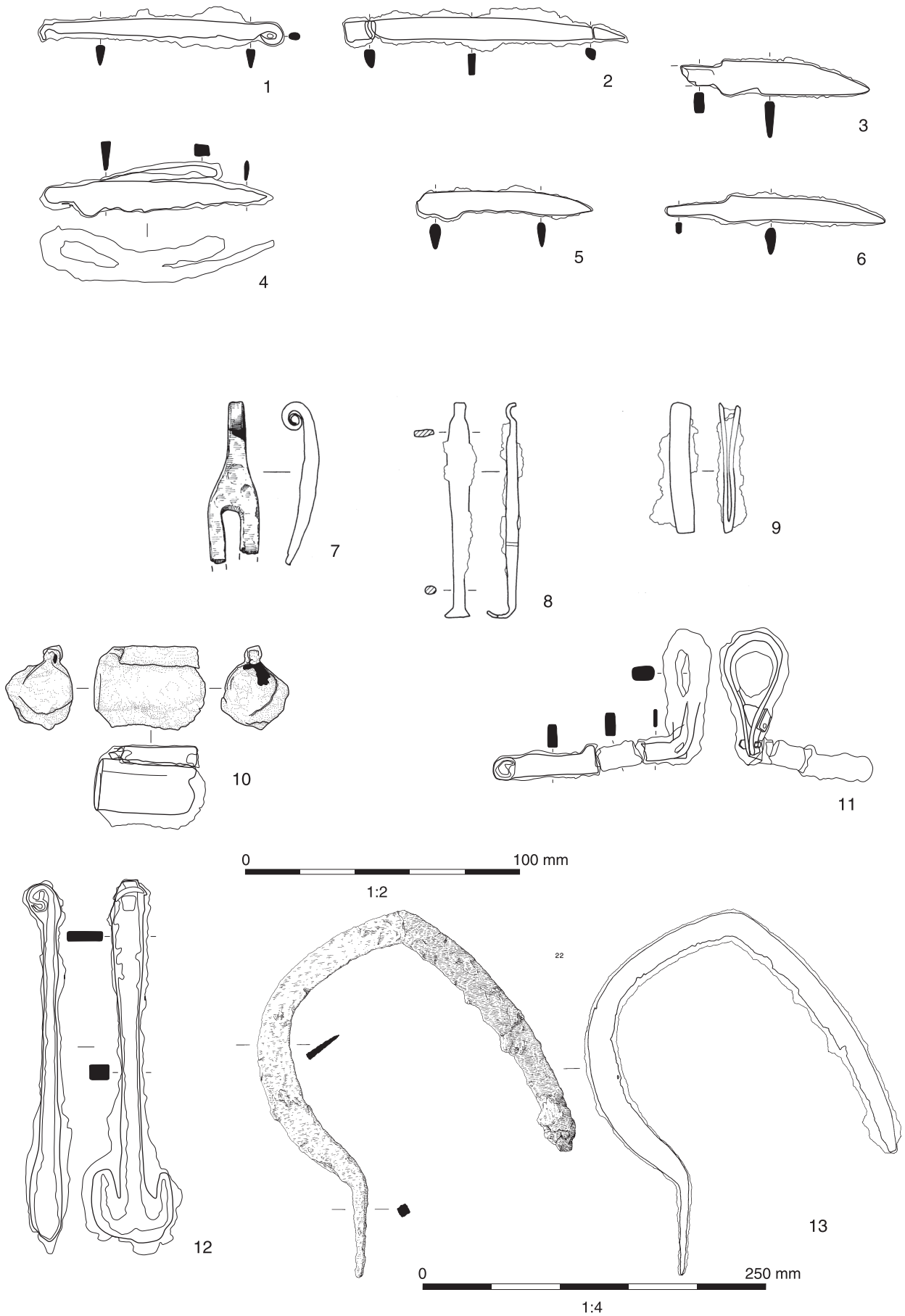


Fig. 6.39 Iron objects from mid and late Saxon sites: (1-6) knife blades from Dorney; lock furniture from Eynsham Abbey (7) key, (8) padlock key, (9) padlock spring; lock furniture from Dorney (10) padlock case, (11) part of a barb-spring padlock bolt, (12) T-shaped lift key; (13) sickle or reaping hook from Yarnton Cresswell Field

from the river gravels locally (Roe 2003 290-2). A whetstone of Eidsborg schist, also a Norwegian import, was found in cellar-pit backfill at 113-119 High St Oxford, and the same site produced a possible grindstone fragment. Spatulate tools buried in some grave assemblages may have been sharpening steels (see Chapter 4, above).

A number of knives identified in the study area are 'pivoting' knives, allowing the user a choice of two blades. These are thought to have been used by scribes, or for craft working.

Other crafts and trades (Figs 6.41-6.42)

Bone and antler working was probably carried on at a rudimentary level at most rural and urban settlements for the manufacture of pins, needles, skates and weaving implements (see above). Combs made

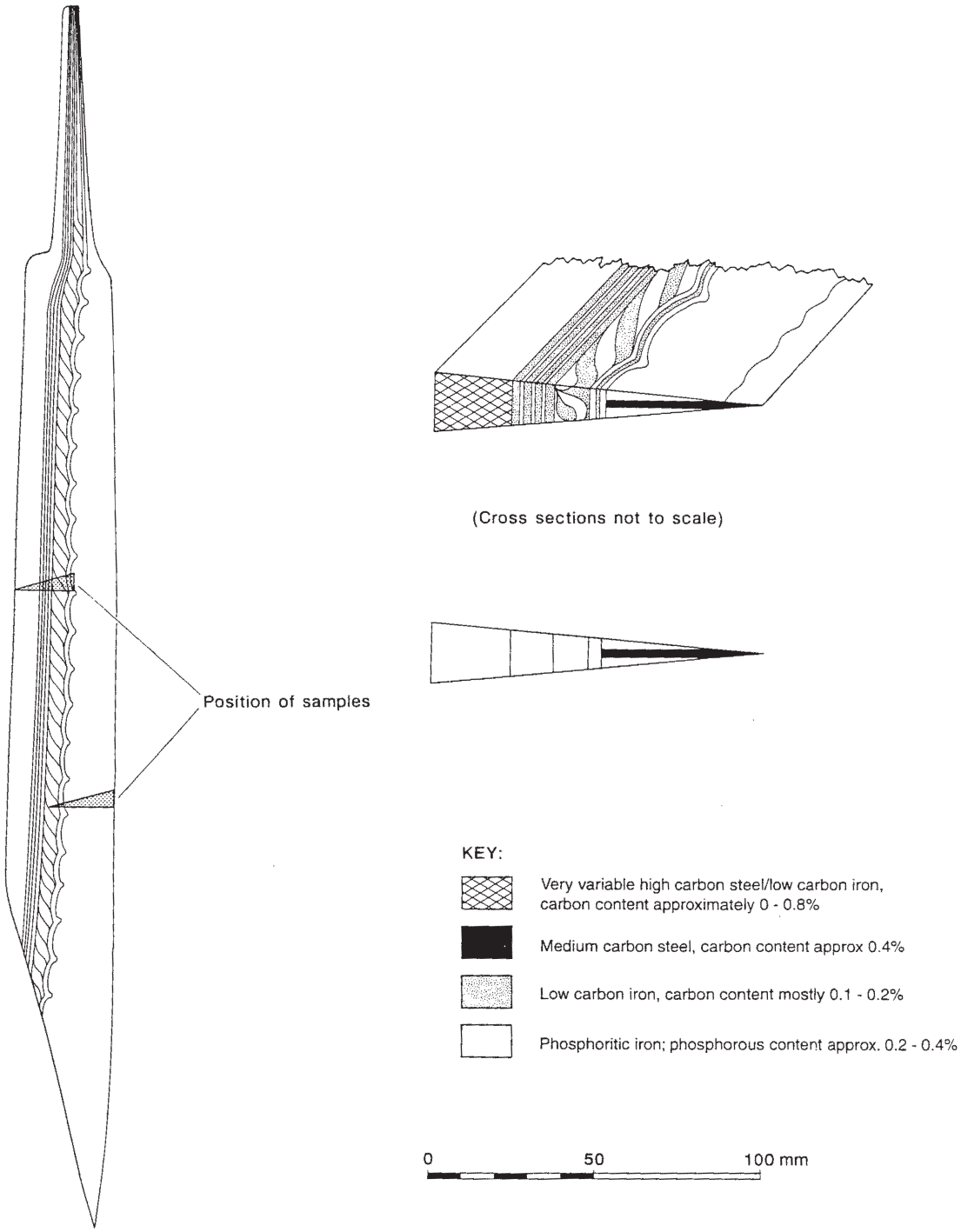
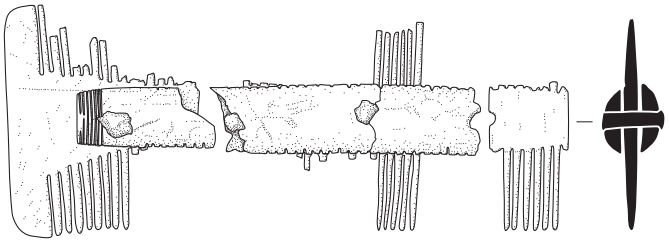
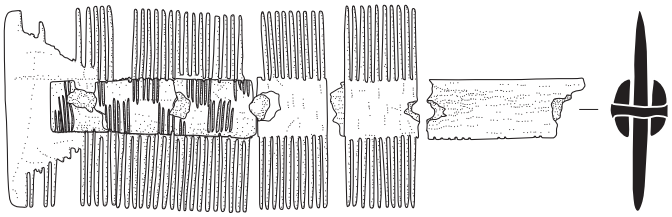


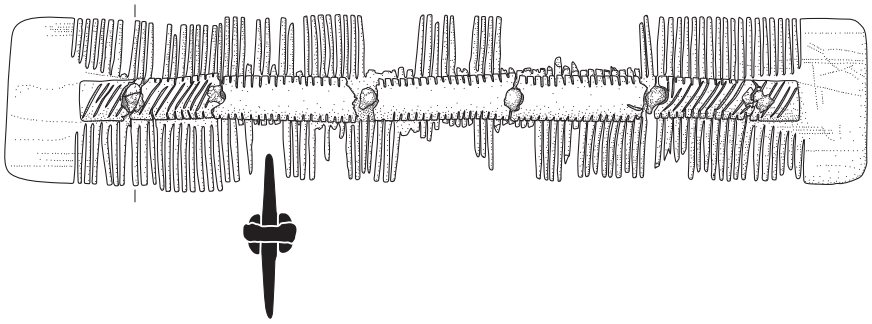
Fig. 6.40 The Yarnton seax



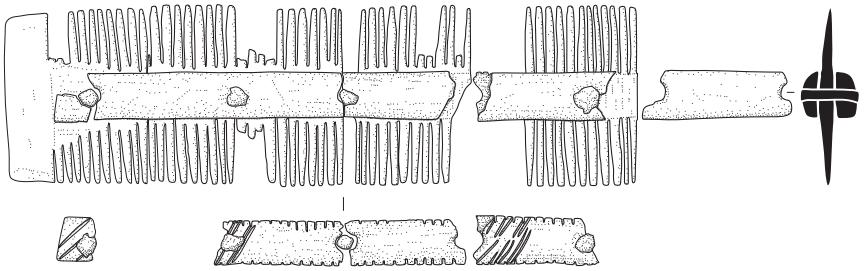
1. Fragment of a double sided composite comb.



2. Fragment of a double sided composite comb.



3. A near-complete double-sided composite comb.



4. A near-complete double sided composite comb.

Fig. 6.41 8th-century combs from Dorney

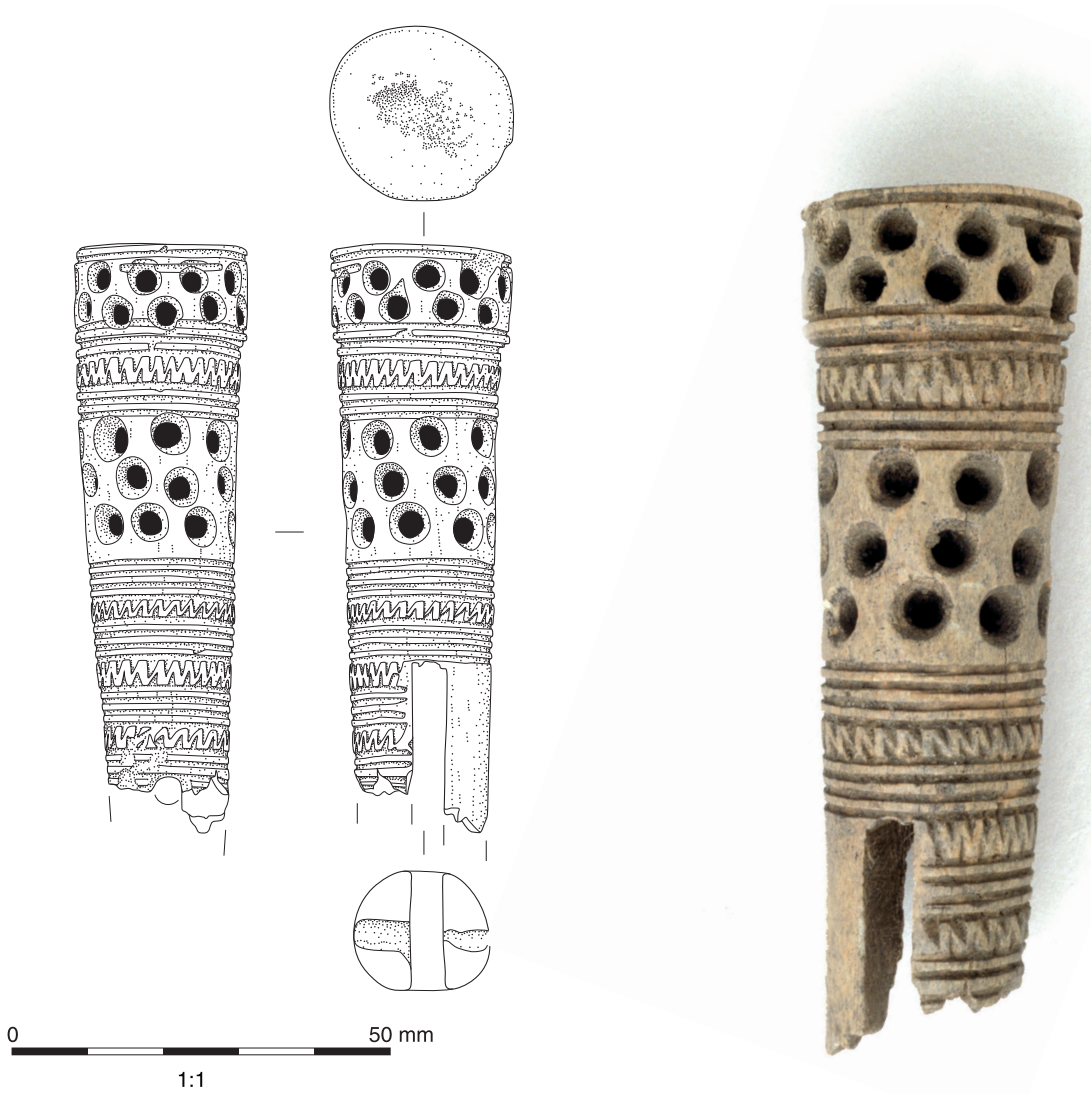


Fig. 6.42 Mid to late Saxon decorated comb handles from (above) Dorney and (below) Barton Court Farm

of bone or antler are ubiquitous on sites in the study area, and a selection are shown in Figures 6.41 and 6.42. An example found in the backfill of a sunken hut at Yarnton Cresswell Field has been radiocarbon dated to the period cal AD 640-810. Combs are typically double-sided, with a riveted connecting plate, and occasional decoration of patterns of incised lines, or ring-and-dot ornament. It is perhaps unlikely that they were manufactured in the home, but the skills were probably fairly common at a local level. The finely crafted bone comb handles found at Dorney and Barton Court Farm (Fig. 6.42) are probably more specialist products and are of a type usually dated to the 9th or 10th century (Riddler 2002, 40-41). Animal bone evidence at Eynsham suggested that antlers had been removed fairly unskilfully from a deer carcass (Mulville 2003, 354). From the same site comes a small piece of bone with a few holes punched through it, perhaps a practice piece (Hardy *et al*. 2003, fig. 9.31.247), and a miniature socket that perhaps held a very fine point for delicate work (ibid., fig. 9.31.237), perhaps bone or ivory working. Evidence for hornworking was seen at 44-46 Cornmarket St, Oxford, where four sawn cattle horn cores were found in a cellar-pit backfill (Hassall 1971, 30-31). The horn tips had been removed in three cases, and may have been used to make horn tips for bows. Sawing and cutting marks around the base of the horns suggest that the horn coverings may have been cut off for use as cups, or for the manufacture of small objects. Similar evidence for chop and knife marks was also noted on horn cores at Yarnton (Hey 2004, 79). Evidence from grave goods, especially at Lechlade Butler's Field and Field Farm suggests that horn was widely used to make handles for knives (Cameron forthcoming; Butterworth and Lobb 1992, table 8).

Construction and carpentry (Figs 6.43-6.44)

Most Anglo-Saxon buildings were made of timber, although here, as elsewhere, there is evidence for the use of stone for particularly high status building, especially associated with the church. The excavated minster church at Cirencester, which is thought to date from the first half of the 9th century, is the earliest known stone building. It may be significant that this church was constructed using stone from the ruins of Roman buildings in the vicinity. Whether other stone buildings existed in the project area by this date remains unknown, but the Cirencester evidence at least demonstrates the possibility. The fortresses of the Burghal Hidage in the study area (see Chapter 3, above), however, show that Anglo-Saxon building skills elsewhere were not restricted to carpentry. The construction of the ramparts and ditches around Cricklade, Oxford and Wallingford involved excavation and earth-moving on a large scale, and the stabilisation of earthworks by the use of timber lacing and clay and turves. Stone walls were added to the ramparts of all three *burhs* during the late Saxon period. At Oxford, roads within the *burh* were initially carefully surfaced with small stones, and resurfacings were undertaken throughout the late Saxon period. There is also some evidence that a drain may have been laid along the centre of the High Street at Oxford prior to the Norman Conquest (Dodd (ed.) 2003, 258-67). By the early 11th century, cellared buildings were being constructed at both Oxford and Wallingford (see Chapter 3, above). Many of these were large, involving the excavation of substantial pits, and the construction of sometimes very elaborate timber walls and floors.

Wood rarely survives in the archaeological record, and Anglo-Saxon carpentry can usually only be studied on waterlogged sites. Evidence for timber waterfronts, and even a timber bridge, has been recovered at a number of sites (see Figs 6.22-23 above). Three detailed studies of carpentry have been carried out in recent years within the project area. The first was on timbers recovered at Burghfield, Anslow's Cottages (Butterworth and Lobb 1992, 94-101, 168-9; Mepham 1992, 116-129). Here, a number of stakes of willow/poplar, birch, ash and alder, and planks of ash and alder probably formed part of a structure, perhaps a wildfowl trap, set into a pool or cut-off remnant of a channel of the Kennet. The stakes had been worked to a pencil point and driven into the ground. During the late Saxon period, a possible barrage or sluice was constructed, whose remains consisted of a horizontal beam into which upright stakes had been pegged (perhaps the supports for a wattle gate) (Fig. 6.43; Butterworth and Lobb 1992).

Two wells were found at Wickhams Field (Crockett 1996). One may have been lined with a re-used barrel, while the other appears to have had a form of box-frame lining that can be reconstructed as measuring 1.6 x 0.55 x 0.4 m. It is suggested that a framework of horizontal members or internal upright corner posts would have held the sides of the box in place. Most of the wood was oak, and the structure was radiocarbon dated to the period cal AD 650-870. A study of the timbers (Gale and Mepham 1996) suggested that all were planks of varying kinds, one with a triangular section. Two were radially split, and the others appeared to have been tangentially split. Five showed oblique cuts at one end.

The third study was on a wooden object recovered from the backfill of a well at Yarnton (Figs 6.43 and 6.44; Taylor 2004, 295-7), whose original function is uncertain. Maisie Taylor has suggested that this may have been a framework for a structural feature such as a window; although it has the appearance of part of a ladder, the 'rungs' would have been set too close together for it to be functional. Two squared pieces of oak form the outer part of the frame; these have been split and hewn square, and the wood appears to have been cut from a substantial coppice. A number of holes appeared to have been cut into these using a gouge,

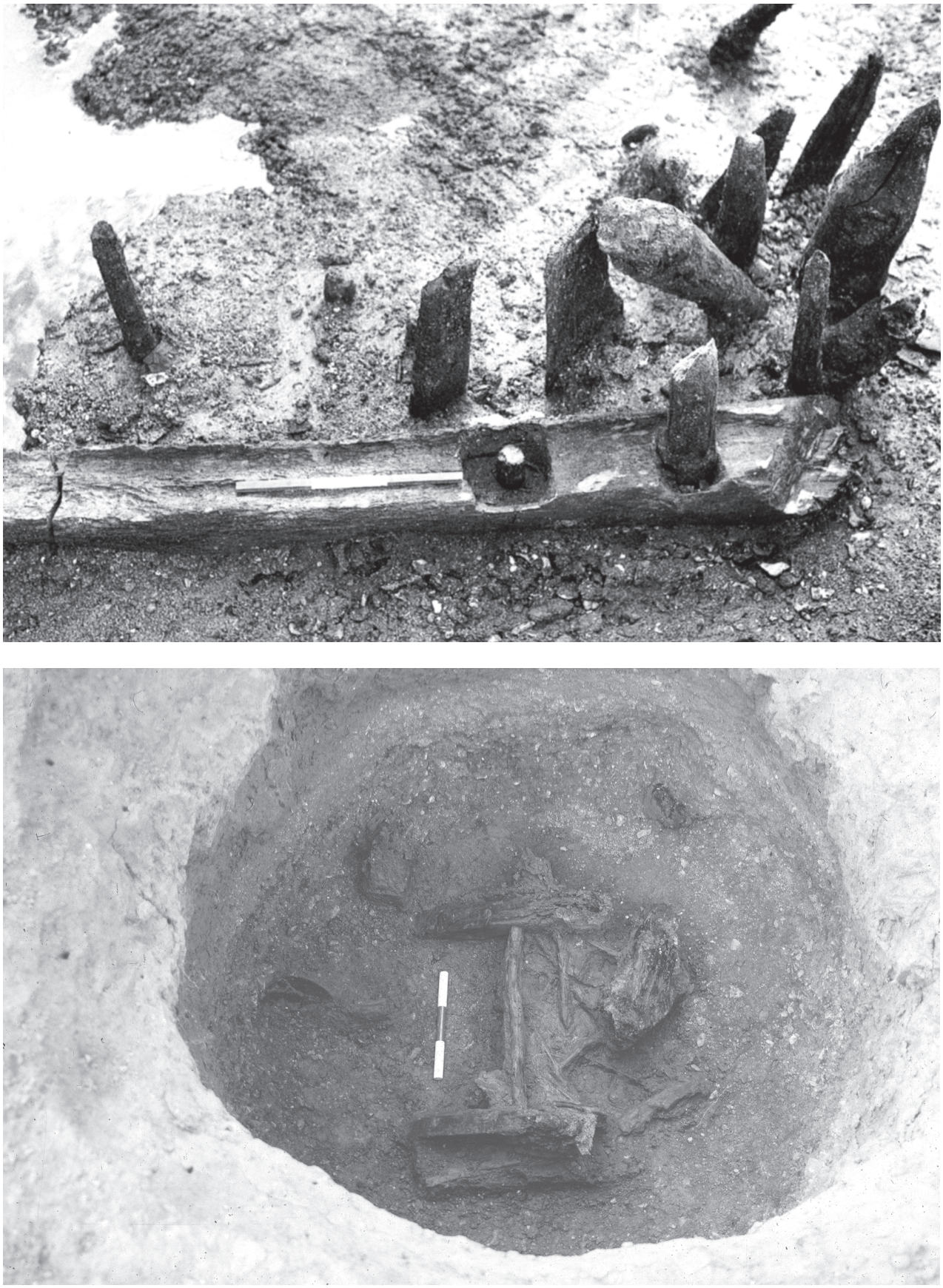


Fig. 6.43 Woodworking: (above) detail of a possible wooden sluice gate from Burghfield; (below) a wooden frame from a well at Yarnton

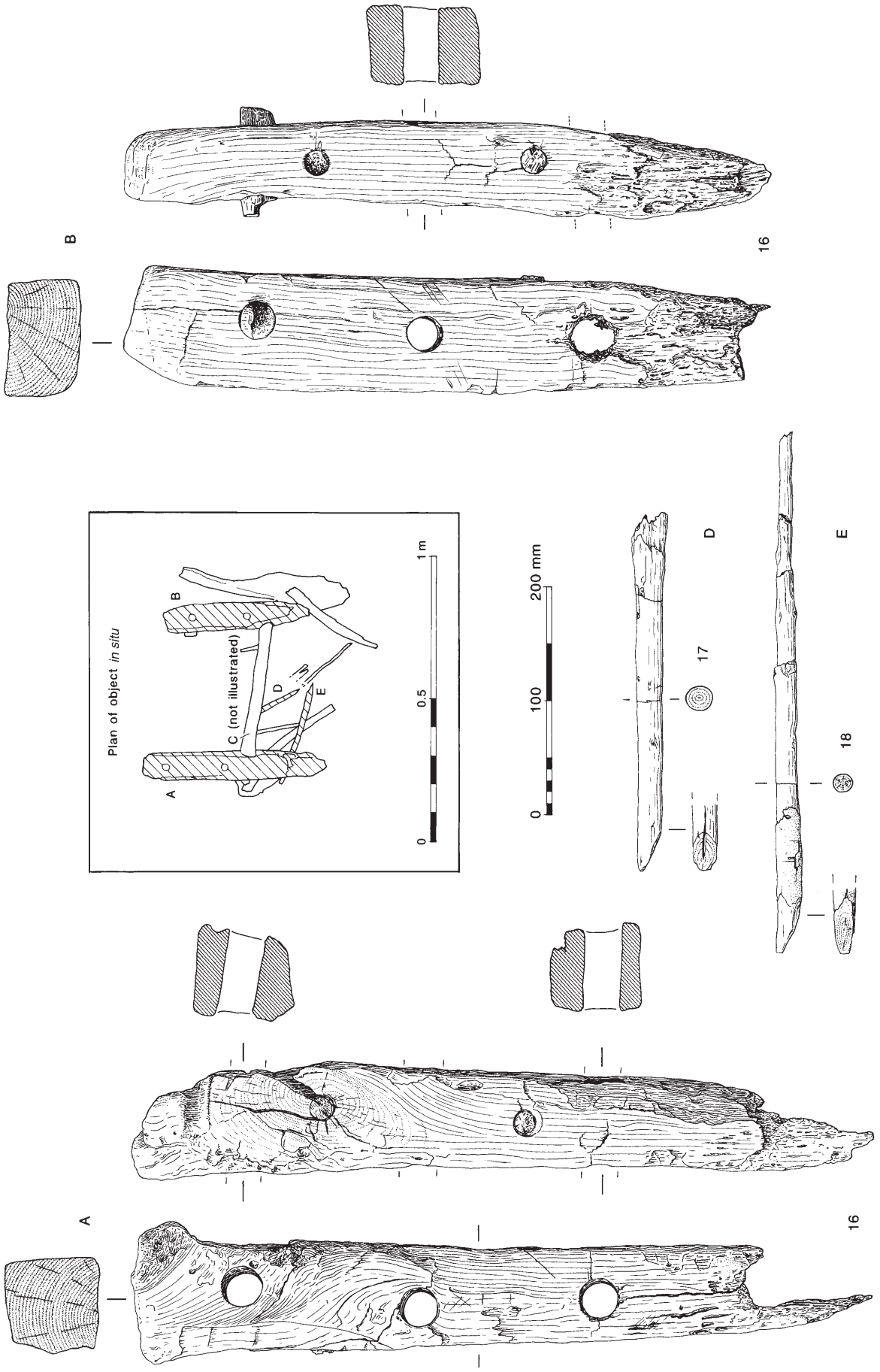


Fig. 6.44 Woodworking: the construction of the wooden frame from Yarnton

and one contained a substantial oak dowel, and there are also substantial remains of two other cross-pieces, both of which are roundwood with bark still attached. Two pieces of roundwood with cut ends were also found, although they do not appear to be associated with the main object. Hazel, alder and ash were used for the roundwood pieces.

Identifiable carpenters' tools are rare, although carpenters must have been the prime users of the ubiquitous nails and other structural metalwork found at most sites. A probable saw found in an early level at the Trill Mill Stream site in Oxford (Dodd (ed.) 2003, fig. 6.1 no. 12) may have been for wood, although it could have been a tanner's slicker, used to force dirt out of hides. Two wooden pegs were recovered from the same site (ibid., fig 6.3.32), and a possible axe head was found at Eynsham (Hardy *et al*. 2003, fig 9.27.206). A spoke-shave found in grave 40 at Lechlade Butler's Field was associated with a high status burial (Fig. 4.31), which may suggest that skills associated with woodworking were highly valued in the 7th century.

Remains from burial assemblages also provide an insight into the types of wood that were used in the 6th and 7th centuries for a variety of purposes. Lime, alder, birch, ash and oak or chestnut were used for shield boards at Lechlade Butler's Field, and alder, ash, oak, hazel or holly were used for spear hafts. Alder was the most commonly occurring wood at the site (Cameron forthcoming). At Field Farm, ash, willow or poplar, hazel and possibly holly were used for spear hafts and maple wood was used for a wooden casket. The most surprising evidence was for the use of pine for the hafting of four spears, and the handle of the weaving batten, at Lechlade Butler's Field. Pine is unlikely to have been growing locally, and may have been imported from some distance (ibid). Evidence from Oxford suggests that oak was the preferred timber for major structural work from at least the mid Saxon period onwards. Six piles from the mid Saxon bridge at the BT Tunnel site in St Aldate's were of oak; oak had been used for the lacing timbers of the *burh* rampart, and oak timbers had been used for the 10th-century channel revetment at the nearby Police Station site (Dodd (ed.) 2003, 388, 390). A 10th-century wattle fence had been constructed of oak uprights, with hazel used for at least some of the wattle in between; decayed oak was identified in the timber voids of the late Saxon cellar lining at All Saints Church (ibid., 389). Mid 10th-century buildings constructed along the line of the Thames crossing in St Aldate's, Oxford, had been constructed from good quality oak timber, straight-grained and free from knots, probably derived from trees that were over 300 years old when felled (Hillam and Miles 2003, 390). The trees appeared to derive from different woodlands, and had perhaps been brought from a timber yard. Similarities with timber from London and Winchester suggests that the same woodland areas were being exploited to produce timber for all three towns.

The church (Fig. 6.45)

Evidence for building in stone, and for the use of glass and ceramic building materials, is largely, although not exclusively, found at minster and church sites. Architectural stone of the late Saxon period survives in a small number of churches in the study area (see Chapter 5, above, and Fig. 5.36). A mortar mixer found in recent excavations at Wallingford was used for the construction of St Martin's church at the central crossroads of the *burh* in the 10th or 11th century (pers. comm. Iain Soden, Northamptonshire Archaeology). Two mortar mixers were found at Eynsham Abbey, and had been used in the early 11th-century construction of the reformed Benedictine monastery there (Fig. 5.34). The production of glass for windows has been identified at two sites. At Eynsham, three fragments of window glass can probably be associated with the refounded abbey of the early 11th century (Hardy *et al*. 2003, fig. 9.35.298 and 315). These comprised two fragments of a mid-royal-blue colour, strikingly similar to the group 3 durable blue glass identified from Winchester. The third fragment is of a lighter blue, and could be later. Pieces of stone with glassy deposits from the same site are probably to be associated with glass production (ibid., 292-3). A late Saxon ditch associated with buildings on the site of the present Dorchester Abbey contained a small group of material related to glass making, comprising a piece of cullet (melted-down glass waste), several fragments of slag, and a crucible sherd with a vitrified inner surface where blue and green glass had formed (Keevill 2003, 346).

A rare Anglo-Saxon floor tile was recovered from Christ Church, Oxford, during the 19th century (Biddle and Biddle 1988, 259-63, figs 102 and 103). The tile is in a dense, hard and well-fired cream-coloured fabric, with decoration of circles filled with 'crosses pommy', separated by quatrefoils. The tile has traces of two different types of mortar, showing that it had been used, and then re-used at least once. It is probably datable to the early 11th century, and is likely to have been used in the minster church of St Frideswide.

Evidence for the sculpted free-standing crosses that are widely known in the north of England is rare in the project area, although two examples have recently come to light through excavation. A fragment of interlace from a cross shaft was found at Eynsham (see Fig. 5.34), and a re-used 10th-century cross-shaft fragment was found at St Aldate's Church in Oxford (Fig. 6.45; Tyler *et al*. 2001, 386-9). A fragment of blind arcading found at Eynsham may be a unique survival of a late Anglo-Saxon liturgical furnishing, and is possibly from the plinth of a small-scale stone screen, perhaps an altar enclosure (Fig. 5.34; Blair 2003, 217-222).

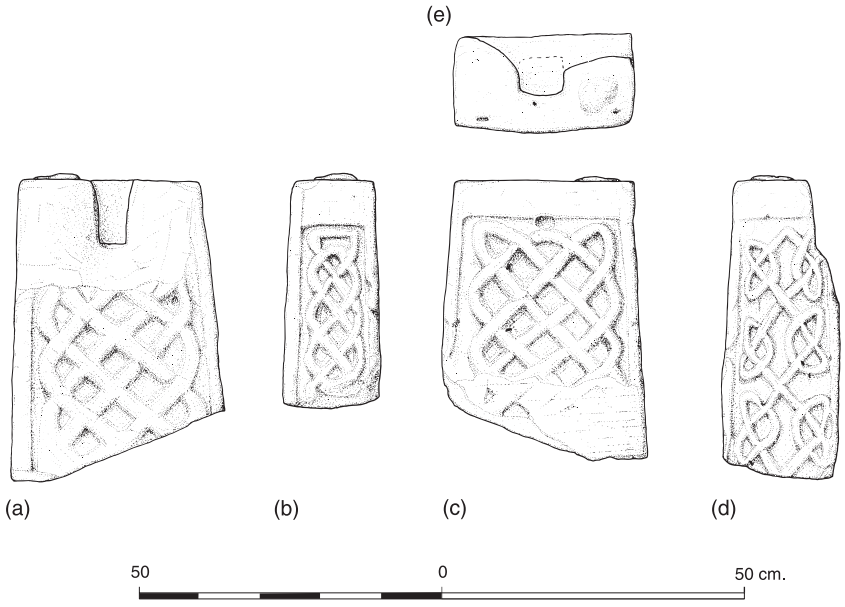


Fig. 6.45 A 10th-century carved cross shaft from St Aldate's Church, Oxford

Two ivories were found at Eynsham Abbey (see Fig. 5.34). One, made from walrus ivory, is an unfinished carving of a figure, perhaps from a Crucifixion scene, for mounting on a reliquary or portable altar. The fact that this piece is unfinished strongly suggests that the work was being undertaken at Eynsham itself. The second piece is, unusually for the period, made from elephant ivory. It is the broken end of a panel decorated with arches, within which it is likely that single figures of saints, angels, Christ or the Virgin Mary would have stood. It may have been made for a book cover, a reliquary or perhaps a portable altar (Raw 2003; Riddler 2003).

A very few finds associated with writing include a copper alloy stylus and a possible stylus or pin (Fig. 5.34) from Eynsham Abbey.

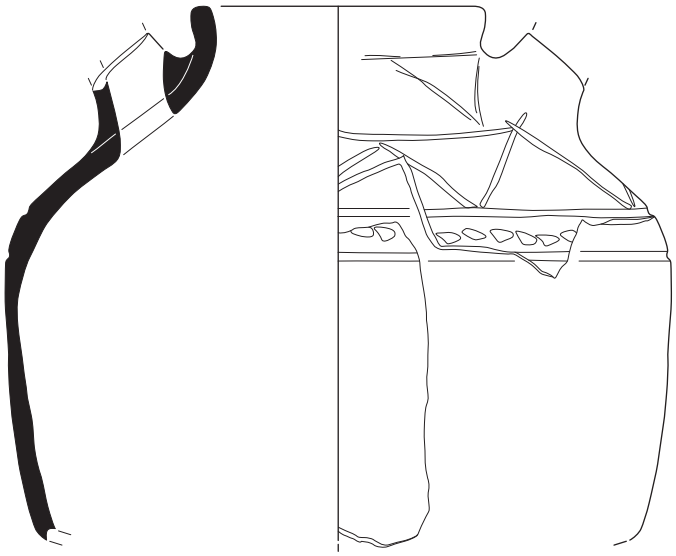
Trade (Figs 6.46-6.47)

Evidence for trade in the study area in the mid Saxon period remains difficult to assess. For the 7th century, grave goods are our most abundant source of evidence for items that must have been imported from elsewhere, although how they were obtained remains virtually unknown. Gold, silver, amber, garnets, amethysts and panther cowrie shells are all items that must have come from outside the region. The grave of a woman at Lechlade Butler's Field contained nearly 200 uncut and unpolished garnets, providing certain evidence for the form in which these objects could be traded, and it is possible that she was herself a trader in these semi-precious stones (see Chapter 4, above). Chris Scull (1990) has drawn attention to the presence of scales and weights in late 6th-and 7th-century graves. In the study area evidence for these objects has been found at Long Wittenham, Watchfield (see Fig. 7.11), Lechlade Butler's Field, Abingdon Saxton Rd, and Wheatley and it is suggested that they were used to weigh coins and uncoined bullion. The concentration of the finds in the Upper Thames Valley and in Kent emphasises the close links that existed at the time between the aristocracies of Kent and the Upper Thames Valley. Their presence at these cemeteries may indicate that these were communities of considerable importance.

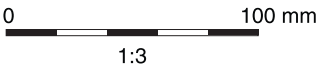
Trade becomes much more archaeologically visible from the late 7th century, with the establishment and growth of specialised trading places and a silver *sceatta* coinage that was in apparently quite extensive circulation. However, the study area has no known major trading *emporia* of the type recognised at coastal locations such as *Hamwic*, *Lundenwic* and Ipswich. Nor are there currently any known major 'productive' sites, in the sense of places where large quantities of coins and metal objects have been recovered by excavation and metal-detecting (Ulmschneider and Pestell 2003, 3; Blackburn 2003, 35-6; however, see below for recent work in the Drayton/Sutton Courtenay area). The presence of *sceatta* coinage in the study area is probably one indicator that something resembling formal trade was taking place, although how this was articulated remains barely perceptible in the archaeological record. John Blair has drawn attention to a striking pattern in the distribution of mid Saxon coinage in the Upper Thames region (1994, 81-3, fig. 53). This suggests that during the first ('primary') phase of the *sceatta* coinage (*c* 680-710), the greatest numbers of coins were coming into the area from the East Midlands, along the Thame

Rim and handle from North French-type pitcher.

Tating Ware jug body.



Rim, spout and upper body of large pitcher.



Not to scale

Valley and the Icknield Way; the largest hoard of *sceattas* yet known was found here, at Aston Rowant. Interestingly, many of the coins in this hoard were coming from the Rhine mouth area, which is indicative of Frisian trade networks. Slightly later, the 'secondary' *sceatta* coins, of *c* 710-60 are evident over a much wider area. Michael Metcalf has recently suggested that the marked local concentration of *sceattas* such as the primary 'porcupine' and secondary 'Hwiccian' Type 15 is very likely to be a sign of trade, perhaps in wool as well as other commodities, along the Thames Valley between the Cotswolds and *Lundenwic* (2003, 43-5, figs 4.2 and 4.3). A growing concentration of *sceattas* is becoming apparent from metal detector activity at the high-status site at Drayton/Sutton Courtenay, where 14 separate finds have been reported from 1991 onwards (Metcalf forthcoming). The coins, which are of diverse types and include both primary and secondary issues, are of varying origins, a pattern that is normal throughout the Thames Valley and the midlands. The evidence suggests that the Drayton/Sutton Courtenay complex may have been the major trading site within a 20 km radius during the period *c* 710-730, possibly beginning as early as 690. Michael Metcalf suggests that, rather than seeing the relatively modest number of coins as indicative of a 'secondary' trading site, it may reflect the fact that the further one goes from the south and east coasts (where many of these coins were minted), the less intensive was the monetization of the regional economies. *Sceattas* are known from other places within this area, although in smaller numbers, as, for example, at the probable minster site of Eynsham where three examples of this period were found (one of which is illustrated in Fig. 5.31).

Were sites like these places where produce from the Upper Thames Valley, perhaps particularly wool and woollen cloth, was bought for money and exchanged for imported goods? Some goods were undoubtedly arriving in the area as imports at this time. The ubiquitous Rhineland Niedermendig lava querns provide the most consistent evidence from settlement sites in the study area for the presence of non-local goods, and Rhineland pottery, in the form of Badorf Ware, has been identified at Dorchester (Frere 1962, 126) and Tating Ware at Dorney (Blinkhorn 2002b). Some 18 sherds of sand-tempered, wheel-thrown North French wares including the handle of a pitcher were also identified at Dorney (Fig. 6.46; ibid.). Quernstones were obtained from the Pennines and the Forest of Dean as well as from the Rhineland, and it is tempting to speculate whether lead and iron were coming into the study area along the same trade routes. Ipswich Ware is increasingly being recognised within the study area, and is now known from Black Bourton (Hart 2003, 60-61), Eynsham, Yarnton, Oxford (Blinkhorn 2001), Reading (Blinkhorn forthcoming c) and Dorney. Chemical analysis has suggested that the only manufacturing source of Ipswich Ware is the East Anglian town of the same name, and its distribution suggests that the sites where it occurs were part of the extensive exchange network of southern and eastern England, and probably within the catchment area of the emporium at *Lundenwic*, where large quantities of this pottery have been noted (Blinkhorn 2004, 268). It is likely that the Rhenish imports reached the study area by the same route. Two objects found in the study area have their closest known parallels at the Frisian trading site of Domburg: an equal-armed brooch from Yarnton (Fig. 3.34; Hey 2004, 286-8) and a copper alloy pin with a discoidal head from Wraysbury (Fig. 6.37; Hinton 1989, 92 and fig. 7 no. 2). Whether such objects were imported from Domburg along with other traded goods is impossible to say on such limited evidence, but the presence of numerous English *sceattas* at Domburg suggests that such trade did take place. Glass, such as that found at Dorney (Fig. 6.47; see Chapter 7, below), may have

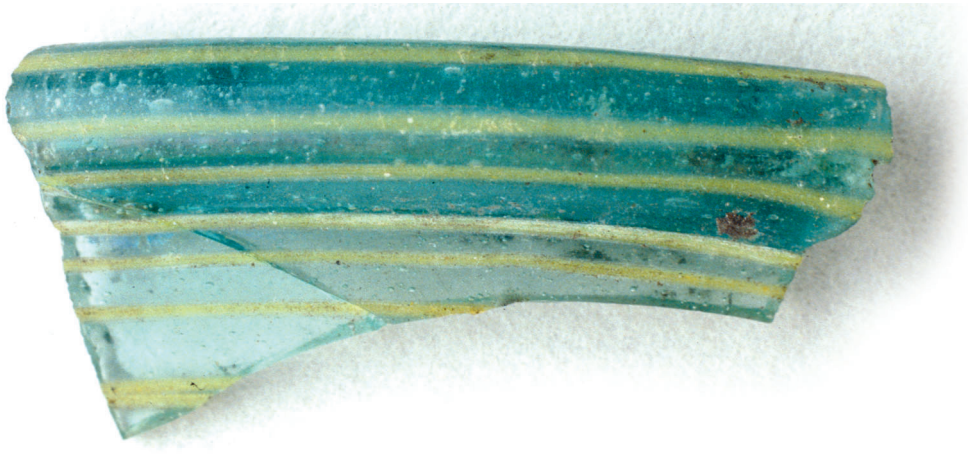


Fig. 6.47 Rim fragment from a mid Saxon glass palm cup or funnel beaker from Dorney

Fig. 6.46 (opposite) Imported pottery from the 8th-century at Dorney, with a reconstruction of a Tating ware vessel

reached the area via Kent. The development of the Thames crossing at Oxford has long been seen as an integral element in a trading route from Mercia to *Hamwic*, on the south coast, but direct evidence of this remains very slight. Recent work on the archaeologically identifiable hinterland of *Hamwic* suggests that its influence was much more localised than the networks spreading out from Ipswich and *Lundenwic* (Palmer 2003, 58). The assumption that the main trade route through mid Saxon Oxford was heading for *Hamwic* rather than *Lundenwic* would bear re-examination, particularly in the light of the increasing evidence for goods such as Ipswich ware in the study area, and the coin distributions suggestive of contact with London and the east coast. Given the evidence that the study area was generally under the control of Mercia from the mid 7th century to the early 9th century, it may be more probable that trade was directed towards the emporium under the control of the kings of Mercia, rather than that under the control of the kings of Wessex. The evidence for mid Saxon traded goods found at the unusual site at Lake End Road, Dorney (Foreman *et al*. 2002) is considered in more detail in Chapter 7, below.

Throughout this period, the social organisation of production and exchange was articulated through a rural structure of multiple or complex estates and its associated settlement hierarchy (Scull 1997, 291-2), and this introduces many uncertainties into our interpretation of what exactly can be seen as evidence of trade. Agricultural produce and more specialised commodities such as salt were collected at the estate centres of the landholders. It was presumably principally the landholders who then controlled the way in which such goods entered the exchange and marketing networks, whether traded in raw form (fleeces, iron bars, animals on the hoof, hides), or processed (yarn, cloth, clothing, iron goods, horn, bone and antler goods, leather goods). It was also presumably the landholders who were the principal recipients of coinage and imported goods coming back in return. The evidence from Lechlade Butler's Field, however, might alert us to the possibility that free farmers are quite likely to have had surplus additional to the requirements for render, which they may well have disposed of themselves at periodic fairs or markets. How, for example do we imagine an Anglo-Saxon farmer obtaining a spear and shield? Would these have been gifts from his lord, who had access to the iron necessary to make them? It is hard to know, for example, whether a prestigious item such as the Yarnton seax was commissioned for money locally, or further afield, or whether it was given as a gift to a loyal follower, or even acquired as booty in war. A minster or a royal estate centre would have collected goods due as renders, and also commodities to which the estate had rights, for example in woodland, or salt pans, or fisheries, which were often given as part of a grant. Many precious objects in the church's possession may have been gifts, rather than acquired through trade. Exotic pottery recently found at Dorchester, for example, has not been paralleled in this country, and it is difficult to see it as traded. Here, four sherds of a very thin-walled fine white ware bowl or cup have been found, with green glaze and thick white slip decoration of standing arches or circular swirls. The pottery is thought to derive from an east Mediterranean source of the 7th century or later (Keevill 2003, 343-4) and it is perhaps more likely that it arrived at Dorchester through personal contact rather than trade.

Evidence suggests that there was a downturn in trade during the late 8th and 9th centuries, and most of the *wic* sites had been abandoned before the end of this period. In a recent review, Grenville Astill suggests that this was probably hastened by the effects of the Viking attacks, although not necessarily initiated by them. The circulation of coinage fell well below the levels that had been achieved in the early 8th century, and remained low until the later 10th century. There is considerable evidence from places in the north and east of England (such as York and Thetford) for a revival in trade and economic activity from the early 10th century onwards. However, in the south it is not until the later 10th century that we see convincing evidence for a resumption of economic growth, in the form of denser occupation within towns, increasing evidence for craft working and trade, and increased output and use of coinage (Astill 2000, 34-42; Britnell 2000, 119). This chronology is strongly supported within the study area by the evidence from Oxford. Late Saxon towns had a number of different functions, which included the provision of regulated markets and the minting of coinage (see Chapter 3, above). Numerous attempts were made by kings to confine trading in major commodities to the towns, partly to ensure that transactions were properly witnessed (as a precaution against theft, cattle rustling and so on), but chiefly, we assume, because markets provided a source of revenue through tolls. Clearly these attempts were not altogether successful, because by 1086 it is clear that markets were being held in numerous places that did not have the formal status of towns (see Chapter 3). The growth of economic activity in early towns was probably closely linked to the presence of large households with their demand for goods and services, of which monastic communities such as Abingdon Abbey are the clearest example (Britnell 2000, 106, 109). The importance of royal, ecclesiastical and aristocratic patronage is also suggested by the evidence from Oxford. A recession apparent in the decades following the Norman Conquest may reflect the fact that the town's spectacular growth in the early 11th century had been stimulated by the regular presence of very important people, but was unsustainable once their interest was withdrawn (Dodd (ed.) 2003, 53). However, the single most general source of urban growth in the late Saxon period

must have been the increasing capacity of a town to supply goods and services to its neighbours that they could not obtain from their own resources (Britnell 2000, 110). This is probably linked to the general increase in the standard of living and cash incomes of rural landlords and wealthier peasantry, and their increasing demand for commodities such as cheap woollen cloth, leather goods, salt, tar, iron and fish (ibid.). We might also add pottery and cheap metal goods on the basis of archaeological evidence from the study area, and it seems likely that the late Saxon peasants of Drayton and Wraysbury obtained coins, pottery and metal belt-fittings through the sale of produce at the local market. Wealthy households would create demand for luxury manufactures and exotic foodstuffs; the majority of rural consumers bought a narrower range of goods and services, though the aggregate demand permitted a high degree of occupational specialisation (Britnell 2000, 121).

Can we see these forces operating in the archaeological evidence from the study area: was a town like Oxford a supplier of luxury goods to large households, a servicer of long-distance and overseas trade, and a provider of markets and more modest goods and services to the local population? Archaeological evidence shows that butchers and fishmongers were trading within the town, and some of the remains suggest the existence of a luxury market, with veal and good quality mutton being consumed (see Dodd (ed.) 2003, 35-46 for much of what follows). Cattle, sheep and pigs dominated the animal bone assemblages. There was good evidence that pigs, pigeons and chickens were kept on tenements within the town itself, and cattle and geese could have been raised by the townspeople on their nearby floodplain pasture. It is unlikely that all the cattle, or any of the sheep, were reared around the town itself, however, and they were presumably brought in from local estates for butchery and consumption. What we cannot tell at present is what proportion of the animals, birds, grain, fruit, river fish and so on was coming to the town houses of local landowners direct from their local estates (or their hunting expeditions), and what proportion may have been surplus brought to market for sale. It would, however, only have been a small step from delivering estate produce to a town house, to bringing in surplus for sale. As demand grew for the goods and services of the town, we can perhaps imagine a growing population of people who did not have rural ties, and their needs must have stimulated the sale of agricultural surplus. Archaeological evidence suggests that there were leatherworkers, shoe-makers (see Fig. 6.36), metalworkers and hornworkers present in the town, and Domesday Book suggests a small community of market gardeners in the eastern suburbs. Evidence for textile working in the town is, however, still limited. There is widespread evidence for building, in both timber and stone, during the 11th century, although we cannot know whether the builders and carpenters were necessarily based in the town itself. One clue may be the widespread appearance of substantial timber-lined cellars in Oxford during the early 11th century, which may have formed the lower storey of two-storey dwellings. Perhaps evidence of this kind argues for the regular presence of builders familiar with the design and construction of such buildings. Buildings of this kind have been interpreted as merchants' houses incorporating secure below-ground storage, and the pottery assemblage from the example at All Saints Church was suggestive of a mercantile quarter. A rare find of balances from an 11th-century context at the same site may be evidence of the weighing of very valuable traded goods such as spices, or perhaps even coin. The main street frontages were built up with long, narrow tenements that frequently incorporated large cellared buildings towards the rear, smaller buildings towards the front, and small 'cellar pits' suggesting vending stalls on the street front. The appearance of these buildings must suggest the presence of a substantial community of traders, although the sale of food and drink would leave little evidence in the archaeological record.

The presence of imported continental pottery in Oxford suggests that the town did have a role in servicing long-distance trade. Maureen Mellor has recently published a summary of late Saxon wheel-thrown continental imported pottery found at Oxford (2003, 330-31 table 6.7), which includes numerous North French and Belgian blackwares and greywares, including those from the Pas de Calais and Andenne. Mid 11th-century Pingsdorf-Rhenish type ware is also present, as pitchers. Pottery of this type may have reached the town in connection with trade in wine or other imported commodities. However, continental pottery is quite widespread within the study area, and there is little to suggest that the towns had any particular control of the trade. Red-painted Pingsdorf Ware has been found at Staines (Jones 1982, 190), North French Blackware at Bampton (Blinkhorn in Mayes *et al*. 2000, 282), and a possible late Saxon North French Greyware at Shepperton (Jones in Poulton forthcoming b). The same is true for other foreign imports, whose distribution at present offers few clues as to the mechanisms by which they arrived in the study area. Niedermendig lava quern continues to appear on late Saxon sites in the area, as well as imported whetstones: whetstones of purple phyllite, probably of Norwegian origin, were found in deposits of *c* 1000 at Eynsham, and whetstones of Norwegian Eidsborg schist were found in mid to late 11th-century cellar pit backfill at 113-119 High St, Oxford. Other imports from abroad must include the walrus and elephant ivory used for carvings at Eynsham Abbey, and a brown bear skin, the claw from which was found at the same site in a probable 10th-century layer.

There is also evidence for the growth of regional pottery industries, and for an increase in exploita-

tion of regional resources. A handmade coarse shelly fabric (Oxfordshire Fabric B) was probably manufactured slightly to the west, and upstream, of Oxford, and it had a widespread distribution along the Thames, which may reflect an association with riverborne trade (Mellor 1994, 40). Late Saxon shelly ware has been identified at Yarnton, Eynsham, Oxford, Abingdon, Dorchester and Wallingford, although whether it reached London remains uncertain (Jones 1992). By the middle of the 11th century, it had been replaced at Oxford by fabric AC, a handmade calcareous gravel-tempered ware, possibly manufactured locally at Bladon. The second dominant regional pottery industry evident in the study area in the late Saxon period was the superior wheel-thrown St Neot's type ware (fabric R), probably from an east midlands source, and perhaps distributed by cart or packhorse (Mellor 1994, 55). This also occurs widely throughout the study area, and Mellor has noted that it does not seem to have the bias towards riverside settlements of fabric B within Oxfordshire (ibid). St Neot's type ware has been recorded at Eynsham, Yarnton, Oxford, Dorchester, Wallingford, Wraysbury, Old Windsor, Staines (Jones 1999) and Shepperton (Jones in Poulton forthcoming b). A total of 73 sherds of Stamford ware were found in the recent excavations at the site of Oxford Castle (Blinkhorn 2006). Another regional import, Thetford ware, is generally rare in the Upper Thames Valley, but occurred at Manor Farm, Drayton, and also at the site of Oxford Castle (Blinkhorn 2006; 2003, 291-4). Paul Blinkhorn suggests that Thetford ware is likely to have come to the area via London. Thetford ware was also present in small quantities at Duncroft House, Binbury, Staines (Jones 1999).

Stone for the walls of the 11th-century tower of St Michael at the Northgate in Oxford was quarried locally, from the Corallian hills around the city, while the dressings are of superior stone from the Taynton Limestone Formation, from Taynton itself, or from nearby Burford and other localities in the area (Powell 2003, 305-7).

A number of objects found in the area in the late Saxon period reflect an Irish or Hiberno-Norse background (see above), and items such as the enamelled stud from Yarnton, or the buckle plate from Eynsham, may even have been made in Ireland. Whether these were traded, or whether they arrived in the area as personal possessions, is impossible to say; all that is certain is that they must reflect the growing availability of such material.