Chapter 6: The Ecofactual and Environmental Evidence

How doth the little busy bee
Improve each shining hour,
And gather honey all the day
From every opening flower!

Isaac Watts

ANIMAL AND BIRD BONE (Figs 6.1–6.6)

by Andrew Bates

Introduction

In total, 32,949 animal bone fragments came from the excavation, most of which were recovered by hand-collection, although some small bone was also retrieved from the sieved residues of bulk soil samples. The following text presents a summary of the analysis, which is quantified by site period in Table 6.1. Recording of the animal bone generally followed that set out in Dobney *et al*. 1999. The full results are available in the downloadable report (Specialist Download E1).

The overwhelming majority of animal bone in each period was excavated from rubbish pits and cess pits, the latter presumably used as rubbish pits when backfilled. This reflects the general frequency of these features at the site. Some larger collections of animal bones are present, in some instances producing large quantities of bone considered to have come from a small number of individuals. However, the deposition of most of the material was characterised by smaller quantities of bone per species per deposit. Much of this material, therefore, appears have derived from animal bone included in midden material, subsequently deposited in pits.

Table 6.1: Animal bones by site period (Number of Identified Specimens: NISP)

Period	*NISP*	*NISP identified to a species level*	*Weight*
Prehistoric	2	0	2g
Late Saxon	4941	1783	106.6kg
Anglo-Norman	7972	2776	129.1kg
Higher medieval	9397	3250	111.3kg
Late medieval	3313	865	50.3kg
Post-medieval	7301	2047	87.1kg

Abundance (Fig. 6.1)

In each period cattle, sheep and pig are the principal stock animals represented in the bone recovered from the site. It is frequently problematic to separate the skeletal remains of sheep and goat and the sheep/goat category – it is evident that goats are present, although in smaller numbers than sheep. While cattle and pig appear to decline in relation to the abundance of other animals in the late medieval

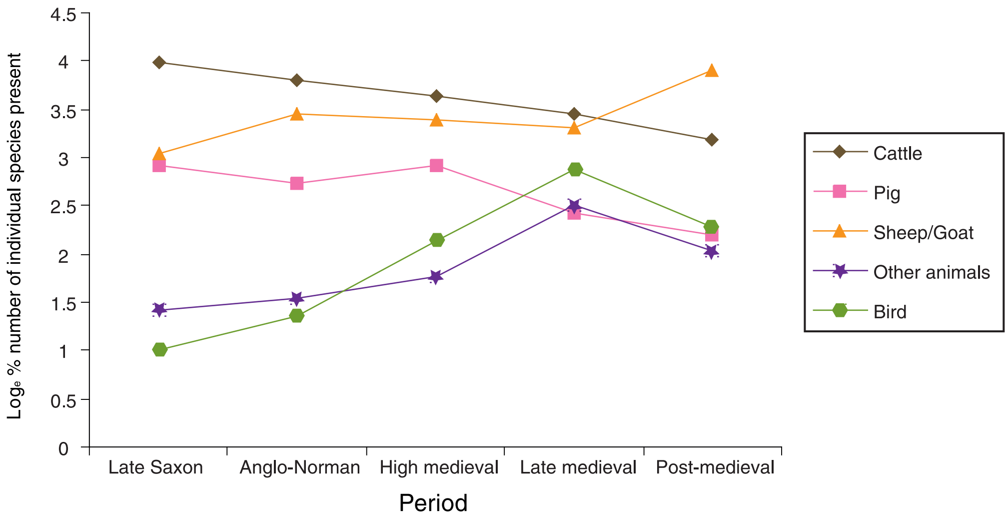

Fig. 6.1 The natural logarithm (Loge) of the percentage NISP of the principal stock animals, other animals and birds by period

and post-medieval periods (Fig. 6.1), the relative abundance of sheep/goat remains roughly constant until the post-medieval period, when an increase is recorded. The rising economic importance of sheep reflects the boom in British wool in the late medieval and early post-medieval periods (Maltby 1979, 47). Rabbit is far more common in the late medieval period than before, reflecting the increasing availability of this animal in the urban market. Unsurprisingly, however, when the hand-collected bone is compared to bone from soil samples, it is clear that in each period medium-sized and small mammals are under-represented in the former compared to larger animals such as cattle.

Livestock: carcass distribution and disposal by site period

Late Saxon (AD 900-1066)

Of the late Saxon bone, only pit 188 (Property H, later Tenement 173) produced sufficient cattle bone for statistical analysis. This pit contained significant numbers of skull and metapodial fragments from the initial butchery of cattle, with a distinct lack of fragments from the meat bearing fore- and hindlimbs. The remaining pits contained bone from most parts of the cattle carcass, although the meat-bearing parts of the forelimb do appear somewhat under-represented in comparison to the bones of the lower forelimb. Only pits 48 and 210 (both again at Property H) produced late Saxon sheep/goat bones in any numbers, but it is clear that pit 210 contained many metapodials, potentially a signature for butchery waste, although bones from the skull were rare, suggesting that they had been taken elsewhere for further processing. Pit 48, by contrast, appears to contain bones from all parts of the body, although the robust distal humerus appears under-represented here and from the site as a whole during this period. The upper forelimbs of pig were rather over-represented across the site as a whole, but no particular patterning within features was evident.

Anglo-Norman (AD 1066-1250)

Of the Anglo-Norman deposits, pit 6063 (Property 11, later Tenement 170) contained 148 sheep/goat bones (15 certainly sheep) as well as 78 cattle bones. There is a significant bias towards skull elements in both cattle and sheep/goat bones within this feature. A single sheep/goat horncore exhibited a chop mark from the removal of the horn from the skull, but the skulls are generally highly fragmented and it is likely that the horns of these animals have been removed. Limb bones were also under-represented, suggesting that the material represents the primary butchery waste from a minimum of five cattle and seven sheep. Two Anglo-Norman pit fills contained notable quantities of cattle bone, pit 266 (which originated as a late Saxon feature in Property 10, later Tenement 172) and pit 4612 (Property 2, later Tenement 237), each with bone recovered from four separate fills. One other pit (173) containing substantial quantities of animal bone was assigned to the Anglo-Norman phase, although there is some doubt to the phasing as it contained a mixture of Anglo-Norman and high medieval pottery. This feature yielded greater quantities of butchery waste from the heads and feet of animals in comparison with the assemblage from the other two features, which contained a greater mix of body part elements. Over a third of the cattle bone from pit 173 had evidence for the dismemberment, filleting and skinning of these animals.

High medieval (AD 1250-1350)

For the high medieval period, only eight of the 22 tenements produced animal bone in any real quantity. Generally, there was consistency in the distribution of species by feature type with limited variance between tenements, with the exception of Tenement 172. This is due to the contents of pit 172, within the latter tenement, which produced 163 sheep or goat bones of which five bones were positively identified as sheep. This represents butchery waste from a minimum of 14 animals, possibly from a single event. Notably, the skulls had been removed, presumably for further processing to remove meat, brains, and probably the horn.

Late medieval (AD 1350-1510) (Figs 6.2 and 6.3)

Only 9 of the 22 tenements produced animal bone from late medieval deposits in any real quantity. The distribution of body parts indicates some differences between the assemblages associated with, and not associated with, what was – by the late 14th century – known as Polymond's Hall at Tenement 237. Notably, the cattle bone associated with this property appears to include relatively more bones from the hindlimb and pelvis (Fig. 6.2). Where cattle forelimbs do occur at Polymond's Hall, they are more frequently represented by the humerus rather than the scapula or lower limb bones, suggesting that dismemberment of this joint took place elsewhere, presumably at the butchers. The sheep bones recovered from contexts associated with Polymond's Hall are dominated by limb elements (Fig. 6.3). Deposits not associated with the Hall have a similar bias, with some emphasis on the forelimb. There is also potentially some difference in the presence of the shoulder joint, with the scapula seeming to be represented more frequently in tenements not associated with Polymond's Hall. Metacarpals are generally scarce in relation to forelimbs, suggesting parts of the lower legs and feet had frequently been removed and deposited elsewhere, presumably with the butchery waste.

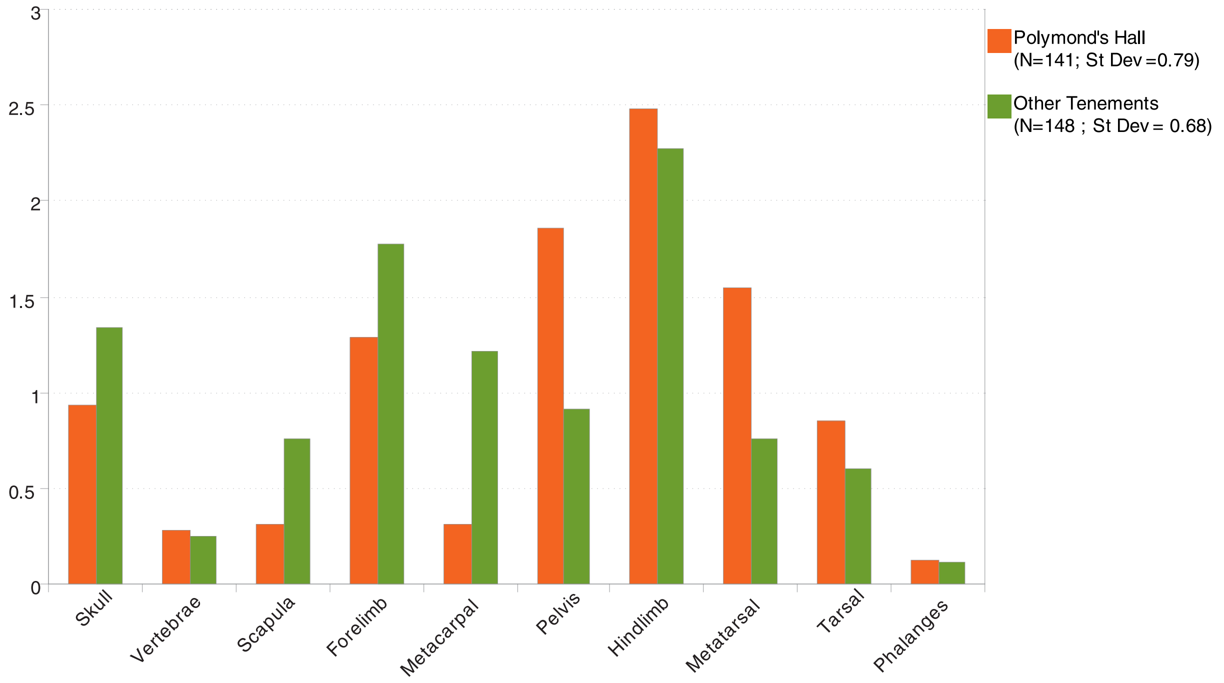

Fig. 6.2 Late medieval cattle from Polymond's Hall compared against other tenements, scaled to a mean value of 1

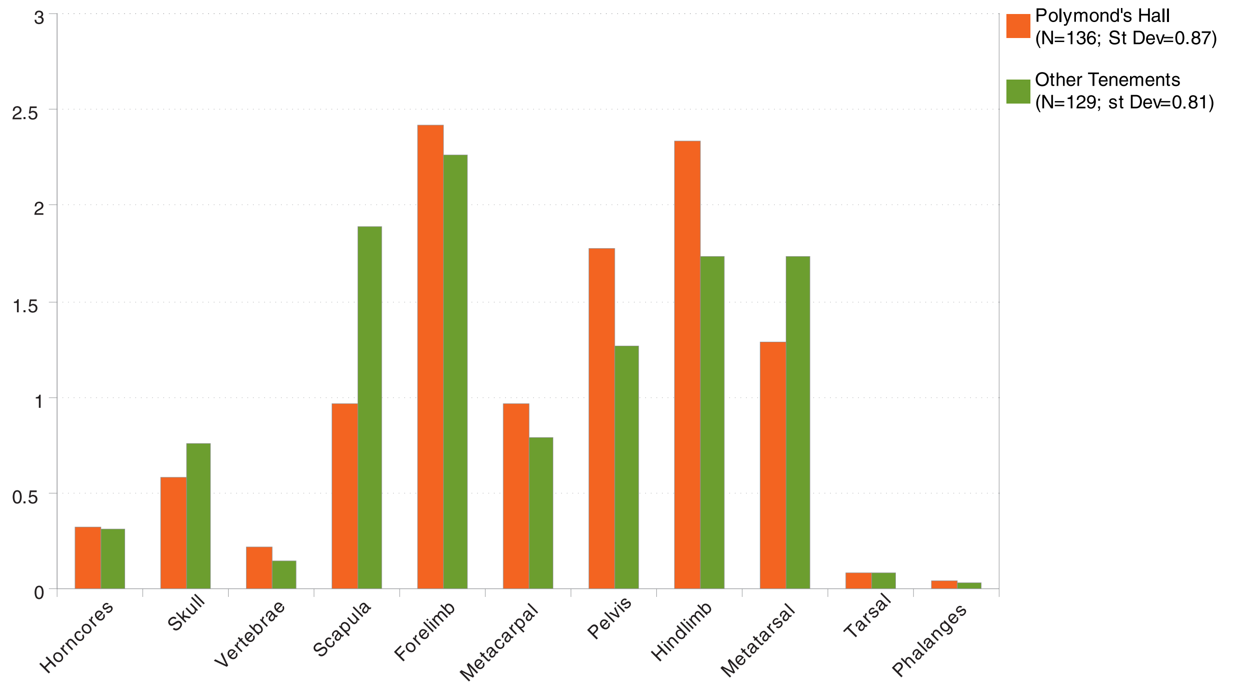

Fig. 6.3 Late medieval sheep and goat from Polymond's Hall compared against other tenements, scaled to a mean value of 1

Post-medieval (AD 1510-1750)

Tenement 237 also produced a large proportion of the post-medieval bone from the principal stock animals, with most of the remaining material excavated from Tenements 170 and 172. Cess pit 3169 and tank 3549 in Tenement 237, and pit 7364 in Tenement 170, account for half of the cattle bone recovered from the site. Pit 7364 contained exclusively metapodials and a single astragalus, discarded as butchery waste with evidence of both dismemberment and skinning of the cattle on the remains. It would be tempting to see these bones as having been removed from animal skins after being cured and tanned. If this were so, it might reasonably be expected that the phalanxes would be present, although these could feasibly be discarded elsewhere at a different stage of working. Documentary sources record one or possibly two leather workers at Tenements 170-171 in the early 15th century. Features 3169 and 3549 contained a wider range of skeletal elements.

Almost all of the post-medieval sheep and goat bones were excavated from just three features. These included cess pits 584 and 3169 in Tenements 172 and 237 respectively, and the stone tank (3549), also in Tenement 237, which again contained cess-like deposits. The latter two features in Tenement 237 contained a large number of sheep skulls and mandibles from the heads of these animals, whereas pit 584 in Tenement 172 exclusively contained bones from the lower legs and feet. The assemblages represent a minimum of 15 animals from pit 584, a minimum of nine animals from cess pit 3169, and a minimum of 53 animals from tank 3549. The butchery of the sheep skulls from pit 3169 included splitting the skull down the middle, at times with the mandible attached, to remove the brains of the animal. The horns of these sheep had also been removed.

Livestock: supply, butchery and consumption

Considering the meat weight per carcass, beef would have been overwhelmingly the principal source of meat in all periods (Fig. 6.4). Pork, however, probably made a greater contribution than suggested by the relative frequency of pig bones, and was probably more important than mutton in all periods prior to the late medieval. The growing importance of mutton in the later centuries is probably due to the expansion of the market for wool, and hence the increasing numbers of sheep in the hinterland (see below).

The great majority of the late Saxon to high medieval cattle were slaughtered as adult animals. There were notably more females than males, as evidenced both by inspection of the pelves and by metrical analysis of the metacarpals. There was little evidence in these periods for the younger fatalities expected in any herd. It is clear that the mammal remains deposited at the site through all

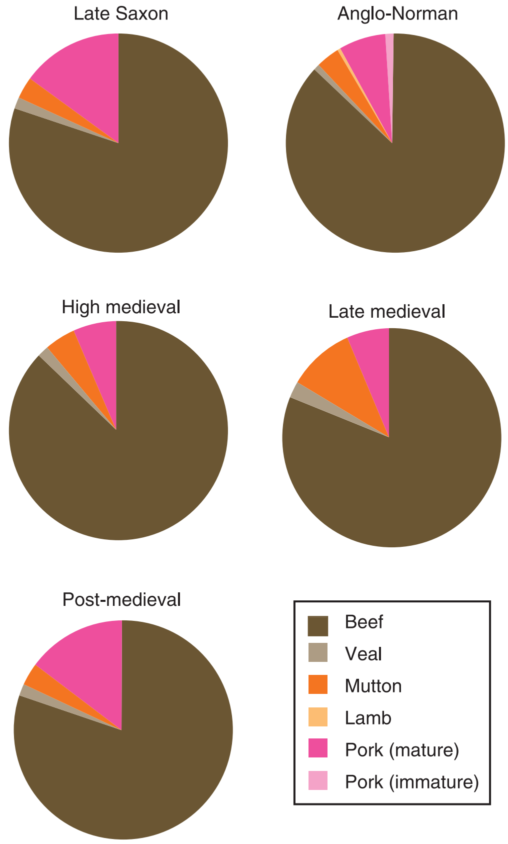

Fig. 6.4 Estimated meat weights

periods represent animals specifically chosen for slaughter, predominantly older dairy animals, a finding also reported from Melbourne Street (Bourdillon and Coy 1980, 106). The herds from which these animals were obtained, however, are likely to have been maintained in the surrounding hinterland, or in some cases possibly by other townsfolk. The late medieval assemblage proved difficult to assess due to the lack of ageable bones, but changes are evident by the post-medieval period, with the presence of much younger animals, slaughtered after reaching the optimal meat weight. A number of veal calves (animals under one year of age) were also evidently being consumed in the post-medieval period, but there is no evidence that veal or lamb were of any economic importance in other periods.

Wool was the staple of the medieval economy from the 13th century (Trow-Smith 1957, 133). However, between the late Saxon to high medieval periods most of the sheep/goats consumed were culled at between two and three years of age, indicating a husbandry strategy focused primarily on their meat. These may have been bred especially to supply the town, or alternatively were seen as animals surplus to the wool flocks. A survey of wool prices in 1343 states that Hampshire wool fetched an average price, at £6 per wool clip (Trow-Smith 1957, 163). The increase in the economic importance of wool in the later-medieval and early post-medieval periods (Maltby 1979, 47) appears to be reflected in the amount of mutton consumed, predominantly derived from older animals from which a number of clips had been taken. Sheep would also have been milked in each period, but this appears to be a secondary concern in the husbandry of these animals. Goats too may have been milked. Pig, unsurprisingly, was kept predominantly for its meat.

The skeletal element representation for each of the principal stock animals is consistent with entire carcasses being present at the site during the earlier periods. In the high medieval centuries all elements of the cattle carcass appear to be represented but for pigs, limb bones and to a lesser degree the pig's heads appear to be disproportionately abundant. A decline in the percentage of older breeding pigs at the site reflects a change in supply. There is also some evidence for the importing of additional meat from the hindlimbs of sheep or goats in the high medieval period. Significant changes appear to have occurred from the late medieval period onwards. The distribution of elements for both the late medieval and post-medieval assemblages shows little correlation between the fragmentation of bones and their frequency at the site. In these later centuries, the bones from fore- and hindlimb of sheep and cattle appear in significantly greater numbers than do bones from other parts of the body, which implies a change in supply with carcasses more frequently divided and sold as smaller joints of meat. A similar interpretation was suggested for high medieval animal bone elsewhere in the town (Noddle 1975, 332). There is, however, no evidence that the bones themselves were more fragmented by butchery, as suggested by Noddle (ibid.). Further change occurred in the post-medieval period in the butchery record of large mammal vertebra (predominantly cattle), with the majority of carcasses having been split down their centre. A similar increase in this practise is seen in medium-sized mammal vertebra (predominantly sheep), although as a lower percentage of the total vertebra.

Relatively few bones showed evidence of butchery: between 10% and 20% of the bones from each period exhibited cuts or chops. Cattle limb bones were the most frequent elements to exhibit butchery marks; predominantly knife marks resulting from filleting and chop marks evidence for dismemberment. Butchery marks on the cranial elements provide evidence for the decapitation of the animal and for the separation of the mandible from the skull by cutting the masseter (cheek) muscle. Cuts demonstrating removal of the tongue are also present, but only in small numbers in each period. One high medieval cattle skull exhibited a chop mark on its dorsal aspect, where an attempt to split the skull longitudinally had been made. Removal of horncores, prior to removal of the horn by soaking, was evident in the late Saxon and high medieval periods. Similarly, the removal of the animal's hide was evident in every period apart from the late medieval.

Some cattle metapodials had been split to remove the marrow. Where this occurs the butchery associated with it was located at just one end of the bone. Examples of longitudinally split metapodials with the butchery mark potentially lost to the archaeozoological record were also recorded, but even so there are few examples in each phase and the practice appears to decline after the Anglo-Norman period.

The frequency of butchery marks on sheep and goat bones was also relatively low. On the limb bones, knife marks are more frequently the result of filleting the carcass and chop marks the result of their dismemberment. The same pattern of butchery on the skull seen in cattle was present on the sheep/goat skulls as well. Some post-medieval mandibles had chops through the diastema suggesting marrow removal, although there was no evidence of heating the bone to aid this. Removal of horncores was evident in the late Saxon to high medieval periods. Similarly, skinning was identified in the late Saxon, high medieval and post-medieval periods. Both the horn and the skin of the sheep and goats would, however, have been utilised in each period.

Butchery marks on pig bones were again relatively scarce. Knife marks account for the majority of butchery evidence in most instances. Only eight acts of butchery were recorded on elements of the skull, all relating to its dismemberment and the removal of the tongue. In one post-medieval example, the skull had been split to remove the brain.

Other mammals

Horse

Horse bones were recovered in small numbers from each period. Six horse bones exhibited evidence of butchery: there were cut marks consistent with filleting on both a late Saxon humerus and a high medieval pelvis, and there were dismembering marks on a Anglo-Norman scapula and femur. Skinning marks were present on a Anglo-Norman metatarsal. Horse is unlikely to have been consumed in Britain except as a famine food, although its meat would have been fed to dogs and its skin was evidently utilised. No newborn or neonatal horse bones were recovered from the site, although young animals are represented. Two pathologies were identified on horse bones. An Anglo-Norman animal had evidence of spavin, probably from the stresses to the joint of a working animal or faulty shoeing (Baker and Brothwell 1980, 118-23). Modifications to a high medieval second phalange was evidence of an infection in the second inter-phalange joint, probably caused by a wound to the foot (ibid.).

Dog

Dog formed a small percentage of the assemblage from each period. Wither heights demonstrate the presence of both smaller and larger breeds. A single pathological specimen was present, a pelvis with a small amount of exostoses around the illial section of the acetabulum (the socket of the hip joint), signifying damage to the cartilage of the joint, most likely a degenerative problem that would increase with age. A high medieval tibia from cess pit 811 at Tenement 173 was evidently from a bandy-legged breed of animal. No articulated remains were excavated, although both mandibles of the same animal were recovered from pit 3552 at Tenement 237, and both femurs of an animal were excavated from pit 7199 at Tenement 241. Otherwise dog bones were found mainly in pits with bones from other species. No butchery marks were recorded on dog bones. Most of these animals would have served as working animals, as hunting dogs, in agriculture, or as guard dogs, although at least the three smaller animals may have simply been pets.

Cat

Several cat bones were recovered from each period, and their remains were frequently more numerous than those of dog. Six articulated skeletons or partial skeletons of cat were recovered from pits. These animals would have been kept for vermin control, although some may have been pets. No butchery marks were recorded, although the skins of these animals are likely to have been utilised.

Deer

Deer form a small part of the assemblage from each period, the animals presumably taken in the highly ritualised pastime of the élite, hunting. In the high medieval period the distribution of deer bones between tenements appears fairly evenly distributed, with the exception of Tenement 173 which, despite having quantities of animal bone, produced none. In the late medieval and post-medieval periods deer was most commonly recovered from deposits associated with Tenements 170 and 237. In the pre-tenement period, the most abundant species is red deer, declining after the Anglo-Norman period with fallow deer being the most frequently occurring species by the late medieval period. A single fallow deer proximal femur fragment was excavated from deposit 219 within pit 753 (Property H, later Tenement 172) attributed to the late Saxon period. This is an unexpectedly early date for fallow deer, which are traditionally thought to be a Norman introduction. While instances of earlier finds have been recorded, an investigation by Sykes (2004) concluded that many are mis-identifications and that the only specimens which can be confidently ascribed to the Saxon period are antler. Visual inspection of this bone by Sykes (pers. comm.) has confirmed the identification. Recent work by Sykes (*et al.* 2006) on deer bones excavated from Roman Fishbourne, near Chichester to the east of Southampton, has identified introduced fallow deer of the 1st century AD. Although these animals may have all been culled, it is not unfeasible that a population continued in this area.

The rise in fallow deer numbers probably reflects the rise in keeping deer enclosed in parklands, an environment to which this species was more suited, being hunted 'by bow and stable' (hunting on horseback with a bow) as opposed to *par force* in the open forest (Cummins 2001, 87). The butchery of deer was ritualised in the 'unmaking' of the animal, within which specific body parts would be gifted to specific members of the hunt, reflecting their status and role in the hunt (Sykes 2007). The selection of fore- or hindlimbs, and also the side of the forelimb, has been shown to reflect social status and role in society (ibid.). The total number of deer bones at this site is, however, too small to make such analysis feasible.

Lagomorphs

Rabbit and hare comprise a small number of the bones recovered within each period and would only have made a small contribution to the meat diet. Hare would have been hunted both by falconry, using larger falcons such as a lanner falcon, coursing with hounds, and the setting of snares (Cummins 2001, 110-21). The high medieval period produced the most hare bones, 13 individual specimens, of which nine were excavated from Tenement 237 and two from Tenement 173. In the high medieval period, hare occurs in slightly smaller numbers than rabbit, but by the late medieval period it had evidently declined in favour of rabbit. No butchery marks were recorded, although these animals would certainly have been consumed and their skins utilised.

Rabbits are thought to have been introduced to Britain by the Normans (Yalden 1999, 138; Maltby 1979, 61), and in the 13th and 14th centuries cost four to five time the price of chicken (Davis 1995, 194). They were husbanded in artificial burrows in warrens, but had established wild populations certainly by the post-medieval period (Almond 2003, 22), although some areas report rabbits being a nuisance to agriculture as early as the 14th century (Hammond 1995, 17). The number of rabbit bones recovered from the site rises in the high medieval period, and peaks in the late medieval period, which is in keeping with the expansion in warrening. Much more notable is the presence of single rabbit bones in secure late Saxon pit fills (pits 6139, 3462 and 4050) from what later became Tenements 237 and 170 (Properties B and H).

The finds from pit 4050 included French imported pottery, making it is possible that the rabbit was also imported, though whether dead or alive can not be verified. Rabbit bone was also recovered from a middle Saxon pit at *Hamwic* and from two late Saxon contexts from the Lower High Street (Hamilton Dyer 1997). Given the evidence for strong connections with France and the continent, it is likely that rabbits were imported into Southampton before the traditionally accepted Norman date, although as above, it is not certain that these animals were imported alive or that they were bred in England at this date.

Rodentia

Relatively small numbers of rodent bone fragments were recovered; including bones from rats, and mice or vole as well as possibly shrew. Most of the rat bones could not be identified to species, and in most instances they have therefore been identified as of the genus *Rattus*, either brown rat or black rat; however the black or ship's rat *Rattus rattus* was identified from high medieval pit 598 at Tenemant 173, late medieval pit 5003 at Tenement 178 and post-medieval levelling layer 5073 at Tenement 180. Given the 18th-century introduction of the brown rat (*Rattus norvegicus*) (Yalden 1999) the great majority of rat bones are likely to be from *R. rattus*. Rats are commensal animals, whose presence is not unexpected in association with food waste. All rat bones came from deposits dated to the high, late or post-medieval periods. Despite the soil sieving programme and the ubiquity of rubbish deposits, none were recovered from late Saxon or Anglo-Norman contexts. Based on the absence of rat at Melbourne Street, Bourdillon and Coy (1980, 114) suggest that rats were not present in Southampton at this time, but subsequently rat has been recorded in early post-Conquest deposits at Lower High Street (Hamilton-Dyer 1997).

Marine mammal

A single fragment of marine mammal, probably a vertebra fragment from a larger dolphin or whale, was recovered from an Anglo-Norman upper fill of late Saxon pit 266 (Property 9, later Tenement 173). Whale was caught and eaten, whales and porpoises being seen as royal 'fish'. However, others also consumed whale meat when available, the tongue being particularly seen as a delicacy (Hammond 1995, 21-2).

Bird bone

Birds evidently formed a minor part of the diet in comparison to the principal stock animals. Domestic birds were clearly the most commonly represented species, of which domestic fowl (chicken), including the smaller bantam, were the most frequent, bantam declining after the high medieval period. Bones from a range of wild birds were also recovered, but in smaller numbers (Table 6.2).

Geese comprise the second most frequent bird bone group at the site within each period, consistent with the middle Saxon bird bone excavated from Melbourne Street (Bourdillion and Coy 1980, 117), although there is twice the amount of meat on goose compared to domestic fowl (Davis 1995, 188).

Identification of mallard, teal and wigeon in the bone assemblage was made with reference to skeletal material and biometric data published in Woelfle (1967). Each identified species would have been available locally in the estuary and environs of the rivers Itchen and Test, although wigeon would have been available in the winter months only (Heinzel *et al.* 1974, 52). Mallard or its domestic form is the most commonly occurring duck species, albeit found in smaller numbers than goose bones. Although wild species of geese and duck are evident, it seems likely that domestic examples comprise a significant percentage of the goose and duck bones. The meat, feathers, grease and eggs would have been utilised from these birds. Indeed, eggshells were noted in many of the heavy residues and flots from Southampton, although these have not been separately reported (Wendy Smith, pers. comm.).

Small numbers of swan were excavated from Anglo-Norman to post-medieval deposits. Swan was consumed at festive times, and is regarded as a high-status symbol (Dobney *et al.* 1996, 52); typically associated with the English aristocracy (Albarella and Thomas 2002). Swans were kept in a state of semi-domesticity in the medieval period, with young swans removed from their parents at 'swan-upping', to be fattened for the table (Allison 1985). Mute swan would have been present in the estuaries of the Itchen and Test all year, with Whooper and Berwick swan being winter visitors. A swan vertebra was recovered from Anglo-Norman pit 3303 in Property 2 (later Tenement 237) and swan bones were also recorded from high medieval contexts in Tenements 237 and 170. Additionally, three swan bones came from from a late medieval pit in Tenement 237/238, one bone from a late medieval pit in Tenement 167, and two from post-medieval pits in Tenements 170 and 172. Although swan bones are small in number, consumption of the species was evidently not restricted to the higher-status occupants of Tenement 237/238.

Other galliformes, including pheasant, partridge, red-legged partridge and red grouse, are recorded from Anglo-Norman to post-medieval periods in relatively small numbers. Their contribution to the table was evidently smaller compared to that of domestic fowl and geese, but as wild birds these are likely to signify wealth (Albarella and Thomas 2002). These birds would have been trapped, or dogs used to flush out the birds to be taken by a falcon (Almond 2003, 34), although in the latter period the falcon would eventually be replaced by the gun.

Wood pigeon and dove would have been present in the surrounding woodland and fields throughout the year (Heinzel *et al.* 1974, 170) but would also

Table 6.2: Bird bones by species and phase

Species	*Late Saxon*		*Anglo-Norman*		*High medieval*		*Late medieval*		*Post-medieval*	
	NISP	*%*	*NISP*	*%*	*NISP*	*%*	*NISP*	*%*	*NISP*	*%*
Bantam	29	20.0	43	14.5	136	16.3	21	3.6	41	6.2
Domestic Fowl	10	6.9	35	10.6	91	10.8	126	20.4	113	17.0
Pheasant			3	1.0	4	0.5	5	0.8	1	0.2
Partridge			2	0.6	1	0.1			2	0.3
Red Legged Partridge					1	0.1			2	0.3
Red Grouse					1	0.1			2	0.3
cf. Domestic Goose							1	0.2	2	0.3
Domestic/ Greylag Goose	2	1.4	1	0.3	3	0.4	6	1.0	2	0.3
Greylag/Pink footed Goose	16	11.0	5	1.6	18	2.3	25	4.1	22	3.3
cf. Pink Footed Goose			1	0.3			1	0.2		0.0
Brent Goose	1	0.7			1	0.1	1	0.2	2	0.3
Swan			2	0.6	1	0.1	4	0.7	2	0.3
Woodpigeon	1	0.7			2	0.2			2	0.3
Rock/Stock Dove									1	
Mallard	4	2.8	1	0.3	6	0.7	17	2.8	6	0.9
Teal					2	0.2	4	0.7	3	0.5
Wigeon			5	1.6	1	0.1	1	0.2	5	0.8
Heron									1	0.2
Cormorant			1	0.3						
Coot							1	0.2	7	1.1
Curlew					4	0.5				
Godwit			1	0.3	2	0.2				
Woodcock					6	0.7	2	0.3	3	0.5
Snipe					2	0.2				
Dunlin					1	0.1			1	0.2
Red Shank					1	0.1				
Golden Plover	1	0.7	1	0.3	3	0.4				
Guillemot/ Razorbill					1	0.1			1	0.2
Great Auk									4	0.6
Common/ herring gull			1	0.3						
Lesser Black-Backed Gull					1	0.1				
Red-/Black-throated diver									1	
Starling							1	0.2		
Magpie							1	0.2	1	0.2
Dunnock			1					0.2		
Raven	1	0.7			1	0.1				
Crow							2	0.3	4	0.6
Jackdoor					1	0.1			3	0.5
Gyrfalcon							1	0.2		
Peregrine Falcon							1	0.2		
Domestic Fowl/Bantam	2	1.4	4	1.3	14	1.7	9	1.5	23	3.5
Domestic Fowl/ Pheasant	18	12.4	36	11.6	76	9.1	46	7.5	79	11.9
Galliform	10	6.9	21	6.8	44	5.3	26	4.2	38	5.7
Duck					4	0.5	3	0.5	11	1.7
Goose	1	0.7	6	1.9	6	0.7	3	0.5	5	0.8
Gull					2	0.2			2	0.3
Thrush	1	0.7	4	1.3	7	0.8	1	0.2	4	0.6
Passerine			3	1.0	7	0.8				
Unidentified bird	48	33.1	134	43.1	383		303	49.5	268	40.4
Total	145		311		834		612		664	

have been maintained in dovecotes. However, only a small number of the bird bones derive from these species, which were almost certainly eaten. Doves were considered a delicacy, and in the medieval period peasants were (unsuccessfully) forbidden to eat them (Hammond 1995, 17).

Curlew, godwit (black-tailed or bar-tailed), woodcock, snipe, dunlin, red shank, golden plover and coot were all recovered from high medieval deposits, with a smaller range of wading species present in other periods. All of these birds could have been found in the estuaries of the Itchen and Test, procured through wild fowling expeditions, although golden plover would also be found on farmland and heaths. Curlew, woodcock, snipe and coot could have been taken from the wild all year, with godwit, dunlin, red shank and golden plover available as winter visitors (Heinzel *et al.* 1974, 116-40). Albarella and Thomas (2002) argue that waders were probably less highly prized than other wild birds in the medieval period. Heron was identified from a post-medieval pit associated with Polymond's Hall (Tenement 237).

Seagulls, attracted by the rubbish of the town, may have been an incidental inclusion, but were also eaten in the medieval period (Hammond 1995, 130) although bones from sea birds are rare finds from medieval sites in southern Britain (Albarella and Thomas 2002). Razorbills and guillemots, identified in several contexts, breed on cliffs including those of the Isle of Wight as well as the east coast of England and Scotland (Heinzel *et al.* 1974, 164). Far more unusual, and of particular interest, is the presence of several bones from the now extinct and flightless great auk, or garefowl as it was known. This larger relative of puffins, guillemots and razorbills became extinct in the mid-19th century (Gaskell 2000). In historic times the bird had a northerly distribution, spent most of its time at sea and seems to have had few suitable nesting sites including Newfoundland,

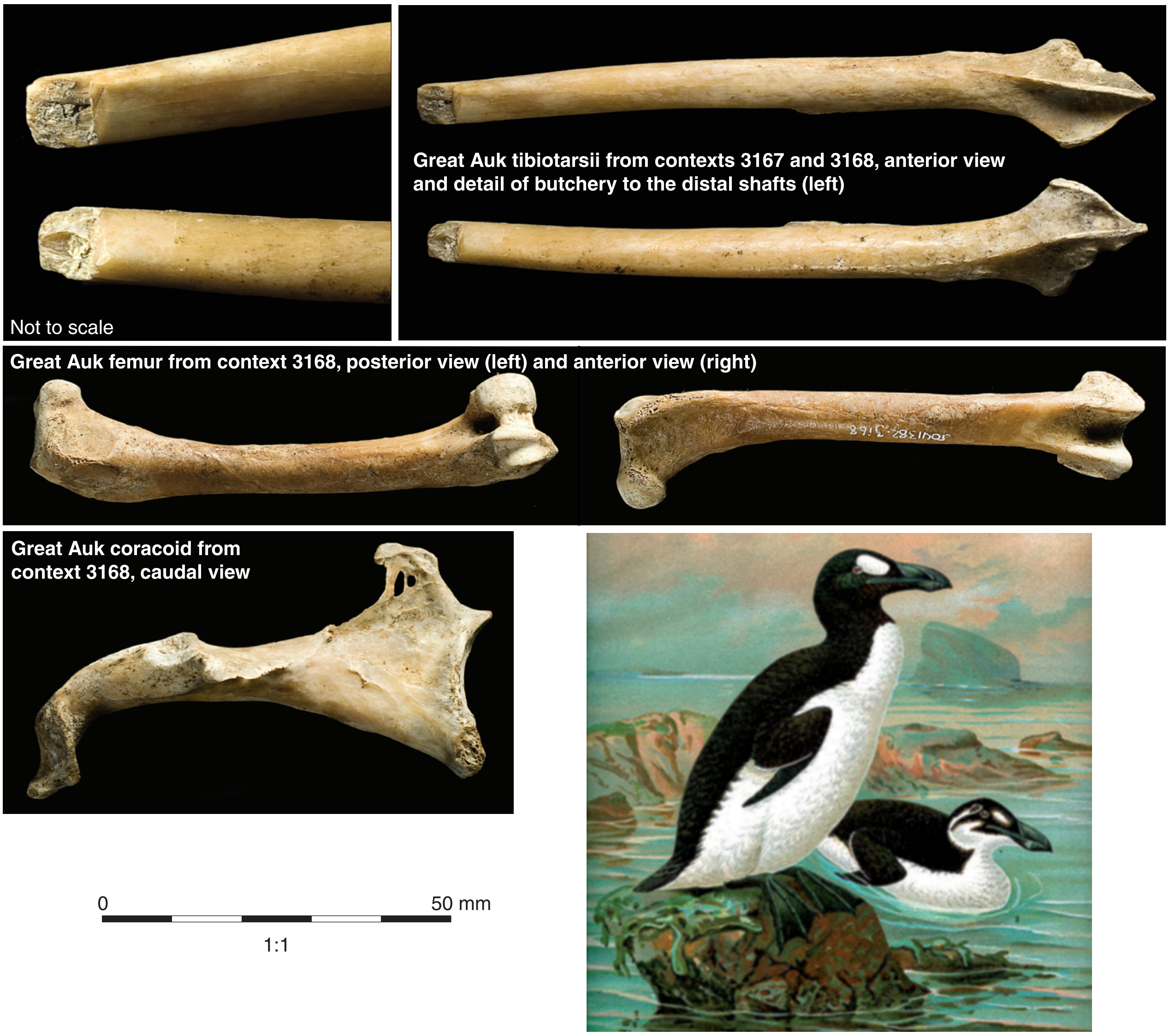

Fig. 6.5 Great auk bones from a late medieval cess pit (3169) in Tenement 237. The painting is by J.G. Keulemans, c *1912*

Greenland, Iceland and the Faroes; those known to have existed around the coast of Britain include Papa Westray – Orkney, St Kilda and probably the Scilly Isles (Serjeantson 2001). Archaeological finds are most commonly from Scottish prehistoric coastal sites; later finds from Britain, especially from outside Scotland, are extremely rare. The three records from the French Quarter comprise a femur, coracoid and two butchered tibiotarsii from contexts 3167 and 3168, the fills of late medieval cess pit 3169 at Polymond's Hall (Fig. 6.5). Great auks were particularly easy to capture, being flightless, and could even be driven onto the boats for slaughter, after which the eggs were collected. Their down, the finer feathers below the larger outer feathers, was also utilised for its insulating properties. Although in the 1530s records of tens of thousands (possibly hundreds of thousands) of birds are described, their population suffered a swift decline, followed by their eventual extinction, with the increase of maritime traffic (Gaskell 2000). It seems very probable that the great auks and possibly also the razorbill/guillemots found in pit 3169 were imported as preserved (dried and salted) birds, a product of Southampton's international trade.

A single ulna from a red or black-throated diver was also recovered from pit 3169. Again, these birds have a northerly distribution, although occasional visitors have been seen inshore at various locations along the coastline of southern England. These birds breed in freshwater lakes, on moorland and forested areas of northern Britain, Scandinavia, Greenland and Artic Canada, spending the remainder of their time at sea (Heinzel *et al.* 1974, 20). The species presence in late medieval deposits in Southampton is undoubtedly the result of the town's maritime history. Interestingly, the larger great northern diver was identified at Melbourne Street (Bourdillon and Coy 1980, 118).

A single bone from a peregrine falcon was recovered from Tenement 172 and one of a gyrfalcon from Tenement 237, both late medieval in date. The ownership of birds of prey was linked to social status within medieval society. The *Book of Saint Albans*, *c* 1486, lists birds of prey with people of appropriate rank, and the Peregrine is described as belonging to an earl. The gyrfalcon, however, is one of the most prestigious birds of prey (Fig. 6.6), which is recorded as belonging to the king, second only to birds suitable for an emperor (Almond 2003, 43). Gyrfalcon are found in Scandinavian countries, Greenland and Iceland, and would have been purchased at considerable cost (Cummins 2001, 191). The birds were not always used for hunting, but sometimes were kept as decorative accoutrements (ibid.), a symbol of status and wealth to be shown off as much as used in hunting. Alternatively, the bird may have been raised with the intention to sell. In either case, its loss would have been seen as a significant financial blow and is more evidence of the extremely high status of the occupants of Tenement 237 at this period.

Fig. 6.6 Gyrfalcon, an example of which was found in late medieval deposits at Tenement 237. This species is polymorphic and the colour of its plumage varies greatly. The painting comes from J.A. Naumann c *1905 Naturgeschichte der Vögel Mitteleuropas*

Thrushes, including blackbird, dunnock, and starling, could be caught either with snares or the use of a falcon such as a sparrowhawk (Almond 2003, 91; Cummins 2001, 194) and eaten. Species of crow, including raven, carrion crow, magpie, and jackdaw, as well as starling, are commensual birds. Their presence as incidental inclusions is not unsurprising, although they may also have been taken as a food resource or simply killed as pests (Maltby 1979, 73).

Conclusions

Analysis of the animal bones from the French Quarter site has demonstrated a number of changes in the supply of meat to the urban market. This is reflected in the body parts represented by the bones excavated from the site and the butchery marks upon them. Although some changes were noted in the high medieval period, associated with the procurement of pork and mutton, in the late medieval period significant changes appear with greater processing of the animal carcasses, presumably in the butcher's shops. Beef was overwhelmingly the primary meat in all periods, but the late medieval and early post-medieval boom in the English wool industry is reflected in the consumption of mutton. These animals may have been bred specifically to feed the urban market, or were simply surplus to the wool flocks of the surrounding hinterland. In addition, the townsfolk evidently procured a smaller percentage of their meat intake from hunting, wildfowling and snaring. In addition, the consumption of marine birds, including great auk, razorbills, guillimots and divers, reflects the town's maritime history.

Polymond's Hall is historically known as a property of higher status than its surrounding tenements, and in the 15th century was the residence of the Venetian consul. The choice joints of meat consumed at the property in the late medieval period reflect this higher status, as do the bones of a gyrfalcon, a highly valued bird of prey.

FISH BONE *by Rebecca Nicholson*

Introduction

At least 45 species are represented in the fish bone assemblage of almost 7500 recorded and identifiable fish bones retrieved from the French Quarter excavations and unsurprisingly, given the coastal location, marine fish were dominant in all periods. The great majority of bones were recovered from the sieved soil samples (Table 6.3). Large fish were relatively uncommon, except in the hand-collected material (Table 6.4), which would suggest that local, inshore fishing was probably responsible for most of the fish represented in the samples. The dominance of large gadids (Gadidae) and conger eel (*Conger conger*) in the hand collected group is typical for sites in the region (Coy 1996), while in the sieved assemblage the increased range of taxa in the Anglo-Norman and later periods when compared with the late Saxon assemblage is also reflected at other sites in the city (ibid.). In general the fish remains were well preserved, but this finding must be qualified in that those assemblages from the waterlogged and cess-rich features are exceptionally well preserved while those from late Saxon and later medieval deposits (generally pit fills) are in poorer condition, meaning that the assemblages from these deposits are liable to favour of fish with larger or more robust bones.

Species represented

Tables 6.3 (overleaf) and 6.4 (p. 239)

Fish bone by site period

Late Saxon (AD 900-1066)

In terms of the numbers of identified bones, fish were least frequent in the late Saxon deposits, a reflection of the concentration of fish bone in the samples rather than just the volumes of processed soil. The majority of late Saxon fish remains derived from pits 48 and 210 at Property H (later Tenement 172) and pit 5303 (Property F, later Tenement 180). Pit fills from this period also contained quantities of marine shell. Pits 210 and 48 in particular included very large amounts of crushed mussel (*Mytilus edulis*) and cockle (*Cerastoderma edule*) shell.

Only 494 bones were identified in the sieved assemblage, of which just over one third were from tiny, small and medium-sized flatfishes including: plaice (*Pleuronectes platessa*), flounder (*Platichthys flesus*) and left-eyed flatfish (Scophthalmidae); at least one quarter were from eel (*Anguilla anguilla*) and one fifth were from clupeids (mainly herring), including some juvenile fish. Measurements taken on the cleithrum indicated eels of 250-350 mm long, but smaller eels and elvers were also present. Less frequent taxa included rays (Rajiidae), salmonids (including probable trout, *Salmo trutta*), mackerel (*Scomber scombrus*), conger eel (*Conger conger*) and small gadids, the last represented by only 25 bones and three otoliths from small individuals including whiting (*Merlangius merlangus*) and poor cod (*Trisopterus minutus*). Juvenile grey mullet (Mugilidae) were identified from tiny vertebrae. Only three identifiable fish bones were recovered by hand, including a medium-sized shark vertebra identified as tope (*Galeorhinus galeus*) and two large indeterminate gadid bones: a poorly preserved quadrate and a vertebral centrum.

Bone assemblages recorded from mainly Middle Saxon contexts in *Hamwic* include very similar suites of fish: eel, salmonids, bass, grey mullet, gurnard(s), flatfish, mackerel, conger eel, sea bream, rays, scad, whiting, cod (*Gadus morhua*), pollack (*Pollachius pollachius*) and herring have all been identified (Bourdillon and Coy 1980, Bourdillon and Andrews 1997, Hamilton-Dyer 2005). Late Saxon and Saxo-Norman contexts at Lower High Street produced these fish as well as others including: wrasse (Labridae), hake (*Merluccius merluccius*), gobies (Gobidae), sand smelt (*Atherina presbyter*) and small cyprinids (Hamilton-Dyer 1997).

Anglo-Norman (AD 1066-1250)

Many of the Anglo-Norman features contained abundant fish remains, with the cessy fills of well 3145 at Tenement 237 being especially rich (this feature originated in the Anglo-Norman period and continued in use into the high medieval period). The fact that most of the Anglo-Norman features were cess pits or pits/wells with evidence for cess (see also W. and D. Smith and Tetlow, below) is likely to explain the large quantities of herring and eel bones, since these often appear together in features containing human cess, and would appear to have been consumed bones and all. The only bone identified as probably from red mullet (*Mullus surmeletus*) came from sample 141 (pit 3115, Property 2, later Tenement 237) dated to this period, and the tiny dragonet (*Callionymus lyra*) was also identified in the same sample.

Based on measurements from modern comparative fish, the herrings represented here were generally from 240-300 mm in length, although numerous bones from tiny, juvenile clupeids were also present in the finest residue fractions and flots. Sprats (*Sprattus sprattus*) and pilchards (*Sardina pilchardus*) were also identified and may be more frequent than the figures suggest, since many of their bones are

Table 6.3: Numbers of identified fish remains recovered from bulk-sieved samples

SPECIES	*Late Saxon*	*Anglo-Norman*	*High Medieval*	*Late Medieval*	*Post-Medieval*	*Total*
Elasmobranchs nfi.	6	28	7	2	3	46
Sharks nfi.		4	2			6
Tope		2				2
Dogfishes		2				2
Rays nfi.*	1	13	3	2	9	28
Thornback ray	11	58	16	5	6	96
Eels nfi.			1			1
Conger eel	3	15	19	8	2	47
Common eel	117	434	278	141	148	1118
Clupeids*	28	380	311	60	302	1081
Pilchard		10	3	6	11	30
Sprat		2				2
Herring	76	1454	228	95	40	1893
Shads		1	1			2
Smelt					1	1
Salmonids nfi.	4	5	2	1	1	13
Salmon		1				1
Trout	2	4				6
Cyprinids nfi.		7	1	1	6	15
Chub/dace			1		2	3
Tench					2	2
Gadids nfi.	22	202	40	49	31	344
Cod		25	8	8	122	163
Cod or Pollack			4			4
Cod or Whiting		20			1	21
Pollack		1	1			2
Saithe or Pollack		1		1		2
Whiting	1	49	16	15	15	96
Haddock		2	2	2	2	8
Bib or Poor cod or Pout	5	23	1			29
Bib		1				1
Poor Cod	1	4				5
Ling		6	5	10	1	22
Hake		2	4	2		8
5-bearded rockling		2				2
Garfish		4	1	1	11	17
Gurnards nfi.		11	5	5	1	22
Tub gurnard		4				4
Cottids nfi.				1	1	2
Sea Scorpion or Bullrout		1				1
Sea Bass*		13	1		3	17
Perch		2	1	1	1	5
Perch or Ruffe		1			2	3
? Sciaenid nfi.			1			1
Scad		2	1		1	4
Sea Breams nfi.*		31	7	1	2	41
Gilthead or Couch's Sea Bream		1				1
Gilthead Sea Bream		1				1
Red Sea Bream		1				1
? Red Mullet		1				1
Grey mullets nfi.*	11	28	3	4	1	47
Thin-lipped grey mullet		1				1
Thick-lipped grey mullet					2	2
Sand smelt		22	89			111
Wrasses nfi.	1	4	1		2	8
Ballan Wrasse					1	1
Corkwing wrasse			1		1	2

Table 6.3: Numbers of identified fish remains recovered from bulk-sieved samples (continued)

SPECIES	*Late Saxon*	*Anglo-Norman*	*High Medieval*	*Late Medieval*	*Post Medieval*	*Total*
Sandeel		1	2			3
Dragonet		1				1
Gobies*		46	112	3		161
Mackerel	1	24	29	2	15	71
Flatfishes nfi.	50	132	79	73	17	351
Left eyed flatfishes nfi		1				1
Turbot		1				1
Turbot or Brill	1		1			2
Right eyed flatfishes nfi	107	216	72	95	73	563
Plaice	8	26	23	3	1	61
Plaice or flounder	1	2	10	1	1	15
Flounder	2	2	1			5
Dab		1				1
Lemon sole		1				1
Soles nfi.		1				1
Dover sole	1	41	3	7	12	64
Unidentified	34	64	65	42	19	224
Total	494	3446	1462	647	872	6921

* - where samples contained many tiny dermal denticles, teeth or scales these items have been scored as 0 or (if no other remains) 1 per sample. Only a proportion of the fine residues were sorted. Nfi - not further identified.

difficult to distinguish from herring. In all, over 50% of the identified bones were from clupeids, while eels represented 7% and gadids 10%. Most of the gadid bones were from small fish, particularly whiting, although bib (*Trisopterus luscus*) and poor cod (*T. minutus*) or pout (*T. esmarkii*) were also consistently present in the samples. Although small fish were clearly relatively abundant, it is also worth noting that since only a proportion of the finer residues were sorted from these exceptionally rich samples, inevitably smaller fish such as herrings and eels will be under-represented numerically in relation to larger fish. Flatfishes were again common, representing 13% of identified bones. Other fish included: conger eel, rays – particularly thornback ray (*Raja clavata*), sharks including tope (*Galeorhinus galeus*) and dogfish (Scyliorhinidae), salmonids (Salmonidae), garfish (*Belone belone*), gurnards, sea breams, sea bass, grey mullet, mackerel and, rarely, shad (*Alosa* sp.), cottids (Cottidae), scad, sandeel (Ammodytidae), small wrasses and even gobies and sand smelt. The last were found in the fills of well 3145 in conjunction with numerous tiny fish bones from juvenile clupeids, eels and grey mullet, abundant fish scales and tiny ray dermal denticles. At least two sea breams were identified; the red sea bream (*Pagellus bogaraveo*) and gilthead (*Sparus aurata)* and many samples contained abundant sea bream scales. Giltheads are now only occasional summer visitors to the south coast, but this fish was also found at Melbourne Street (Bourdillon and Coy 1980, 120) and at Townwall Street, Dover (Nicholson 2006). Flatfishes included plaice, flounder, and sole (*Solea solea*) as well as rare finds of lemon sole (*Microstomus kitt*) and turbot (*Scophthalmus maximus*), the last identified only from one dermal tubercle. Exclusively freshwater fish included perch (*Perca fluviatilis*) and cyprinids, although the bones from these fish indicated surprisingly small individuals of under 150 mm.

The hand-collected assemblage included a number of hake (*Merluccius merluccius*) bones, together with conger eel; this fish is more typical of sites in south-west Britain. Hake were also found at Lower High Street (Hamilton-Dyer 1997) and are documented as being imported into Southampton from Brittany and south-west England in the late medieval period (Coy 1996).

Using the tentative property divisions of this early period, some interesting patterns can be observed. Most immediately, it is clear that the largest fish assemblage was recovered from the area of Property 2 (later Tenement 237), a reflection of the exceptional preservation and abundance of fish remains within well 3145. Pit 3462 was notable in that it contained over 20 hand-collected head bones from large hake, from a minimum of two fish. Pits within the area of Properties 7 and 12 (later Tenements 177 and 178 and 167) also contained more than one hundred identifiable fish bones, while features from across the rest of the site proved to contain very sparse fish remains. A fill of pit 5172 (Property 7, Tenement 177) contained numerous bones from small and very small fish together with bones from a cod of 456 mm (based on Barrett's formula for the premaxilla measurement P1, Barrett 1995, 231).

High medieval (AD 1250-1350)

A very similar range of taxa, in rather similar proportions to those recovered from the Anglo-Norman period, was identified in the high medieval samples. In terms of their relative contribution to the assemblage, eel bones are rather more numerous and those from clupeid rather less so. Measureable eel cleithra indicated fish ranging from 140 mm to over 500 mm in length. Several small wrasse bones – including one pharyngeal from corkwing wrasse (*Crenilabrus melops*) – were found in surface 3357 in Tenement 237. A single pharyngeal from a small chub (*Leuciscus cephalus* or dace *Leuciscus leuciscus*) represented one of the very few exclusively freshwater fish from this phase, however small cyprinids were also found in the garderobe of Southampton Castle (Hamilton-Dyer 1986). As in the Anglo-Norman cess-rich fills, tiny gobies and clupeids were common in the cessy fills of pits 813, 5237 and 5160 (Tenements 173, 177 and 180), as they also were from a stone-lined cess pit (4800), dated to around AD 1350, at Lower High Street (Hamilton-Dyer 1997). In contrast to the sieved assemblage, bones recovered by hand from deposits dating to the Anglo-Norman and high medieval periods differ significantly: hake are absent from the high medieval contexts, but mature cod and ling are much more common than they were before.

Considering the fish remains by tenement, it is again clear that the most diverse and numerous assemblages were recovered from pit fills within Tenement 237, with samples from features from Tenements 176, 177, 180 and 243 also containing varied groups. Pit 813, from Tenement 173, contained abundant bones from tiny fish including clupeids, sand smelt and gobies, which may have originated in the guts of larger fish or may have been deliberately caught as food (see below).

In contrast to the sieved samples, the hand-collected fish bones largely derived from pits within Tenement 173, with bones from large cod and ling being common. Large cod bones from pit 104 at this property probably derive from a single cod's head; large conger eel head bones were also identified in the fills of this feature. Head bones from mature cod and ling were also recovered from pit 680 and a recut of pit 165, both again in Tenement 173. The almost complete dominance of head bones from these large gadids is likely to have resulted from the preparation of complete fish rather than an imported dried and salted product (stockfish), since the latter are typified by bone assemblages dominated by appendicular bones including the cleithrum, supracleithrum and post-temporal as well as anterior precaudal and posterior caudal vertebrae (Barrett 1995, 237; Locker 2001, 160). Using the formula established by Barrett (1995, 231) for the premaxilla, three of the cod in pit 104 would have measured 1.02 m, 1.26 m and 1.33 m respectively, while cod in pit fills 624 and 680 would have measured 0.92 m, 0.93 m and 1.11 m. A ling from pit 165 would have measured 1.35 m.

While the quantities of fish bones varied between different features, no clear pattern emerged to distinguish individual tenements in term of the fish consumed. This is perhaps not surprising, since household status appears to have been defined more by the quantity of food consumed than by the types of food (Mennell 1992, 280-81). There were no particularly expensive kinds of fish, such as sturgeon (*Acipenser sturio*), large turbot or large freshwater fish represented in the assemblage, but the prevalence of bones from large cod family fish within Tenement 173 may indicate a preference for whitefish and possibly for cod cheeks. Particularly notable in this phase was a single very large tooth from hearth fill 5227 at Tenement 176 identified by J. Harland (pers. comm.) as probably sciaenid. The only member of the Sciaenidae likely to be caught around the coast of southern Britain is the meagre (*Argyrosomus regius*), which can grow to 2 m, although a fish of this size would be unusual.

Late medieval (AD 1350-1510)

The taxa present in the late medieval deposits are markedly similar to those identified from earlier periods. A total of 25% of fish remains were identified as clupeid, 22% as eel, 13% as gadid and 28% as flatfish. As in the preceding period, large cod and ling were almost as frequently identified as whiting. Together with hake, many of these large fish are likely to have been imported as preserved dried fish since almost all of the represented skeletal elements in the sieved samples are the posterior caudal vertebrae, clethrum, post-temporal and supracleithrum. The presence of an occasional ling or cod head bone does, however, suggest that some fresh fish may have been eaten, although cod's heads are also known to have been imported in the 15th and 16th centuries (Locker 2001, 79).

Post-medieval (AD 1510-1750)

Only in this phase does cod become a significant component of the fish assemblage. The significance of large cod and to a lesser extent ling, can be seen in the hand-collected assemblage, which includes many more bones from these fish than were recovered in the preceding periods. Notably, head bones were common, although cleithra continue to be over-represented, suggesting the presence of at least some imported stockfish. While a range of fish are still represented, gadids, clupeids (especially herring) and eels dominate numerically, although small and medium-sized flatfishes are still represented by around 12% of the bones. Although rare, a greater number of freshwater fish bones occur in this period when compared to the earlier ones, with tench (*Tinca tinca*) occurring only in this period. This fish would have measured approximately 300 mm, and while freshwater fish did command a higher price than sea fish in the later medieval period (Dyer 1988), a fish of this size can not be considered to have been particularly valuable.

The hand-collected assemblage is again dominated by bones from large cod, ling and conger eel. Cod cleithra were particularly common in the fills of cess pit 3169 at Tenement 237; a minimum of eight cod were represented. Other bones from this fill included the post-temporal and supra-cleithrum; taken together, these elements are typical for stockfish. A similar range of cod bones was recovered from pit 6200 (Tenement 170), while pit 3186 (Tenement 237), contained cod head bones from at least one fish in excess of 1 m long.

Discussion

Representation of taxa

Unsurprisingly, given the coastal location, most bones were from sea fish. Of the freshwater taxa, tench (*Tinca tinca*), small chub or dace (*Leuciscus cephalus/leuciscus*) and perch (*Perca fluviatilis*) were the only identified species, and then only a few bones were present. Migratory taxa including eel (*Anguilla anguilla*), salmon (*Salmo salar*) and shad (*Alosa sp.*) were identified in a number of samples; eels were present in virtually all samples. The bones identified as trout may be from either the brown trout or the sea trout, although the small size of the bones is suggestive of the former. Other fish which can be found in both salt, brackish and even the lower freshwater reaches of rivers include flounder (*Platychthys flesus*), bass (*Dicentrarchus labrax*), grey mullet (Mugilidae) and sand smelt (*Antherina* sp.). Grey mullets and sand smelts are typically found in lagoons and estuaries and close to the shore (Wheeler 1978, 270-74) and along with flounders are frequent in the inshore waters around the Solent.

As is typical for most medieval sites, clupeids (here including abundant bones from extremely young individuals of herring/sprat – *Clupea harengus/Sprattus sprattus*), eel (including elvers as well as more mature individuals), smaller flatfishes and gadids dominate. However, the regular inclusion of bony dermal denticles from rays (Rajidae), especially the thornback ray (*Raja clavata*) indicate the frequency with which these fish were utilised – their cartilagenous skeletons are inevitably under-represented archaeologically. Small and medium-sized sharks (Pleurotremata) were also occasionally identified, most probably dogfishes (Scyliorhinidae) and tope (*Galeorhinus galeus*). Together with bones from juvenile clupeids (Clupeidae) and elvers, bones from tiny grey mullets and gobies (Gobidae) also featured in a number of Anglo-Norman and high medieval cess-rich samples where organic preservation was particularly good. Similar suites of bones have been found elsewhere in Southampton, and Hamilton-Dyer (1997) has suggested that these small and tiny fish together constitute a sort of 'whitebait', these days a term usually applied only to small clupeids. The fact that the tiny fishes seem to be particularly abundant in cessy deposits should come as no surprise, since these deposits in general contain the best preserved bone. It may also indicate that these fish were consumed 'bones and all' – and in fact it would be difficult to eat such small individuals any other way. Rather perplexing, however, is the notion that these bones survived the human digestive process. Experiments by Jones (1986) and Nicholson (1993) have demonstrated the destructive nature of the human digestive system on fish bones. Assemblages of small clupeid bones which have passed through the human digestive system tend to be dominated by certain elements, notably the otic bullae and, less frequently, vertebrae, although these often show characteristic erosion and/or distortion. While some of the herring and eel bones recovered from the cess pits did indeed appear chewed, the tiniest bones survived in particularly good condition and there was no obvious over-representation of otic bullae, although these elements were particularly frequent in cess pit 813 at Tenement 173. It is possible that these tiny fish represent spoilt fish, or the contents of larger fish guts, and the latter suggestion may explain their abundance in pit 813 which has been dated to the high medieval period, when large gadid fish become a more frequent component of the fish assemblage. However, the fact that the same range of species repeatedly occur together would suggest that they were sold or prepared as a single unit, and this would support Hamilton-Dyer's suggestion of 'whitebait'.

Fish capture

The range and size of fish represented in all periods from the French Quarter implies a substantial input from local, coastal fisheries. Many of the fish would have been available year-round inshore in the Solent, Southampton Water and in the mouth of the River Itchen. Fish likely to have been caught seasonally include eels, which could have been captured in large numbers during their migration downsteam to the sea in autumn, and elvers, which swim upsteam in spring, although many eels also remain in the lower reaches of rivers and estuaries. Eels could have been effectively caught in fish weirs or traps, devices which could also have caught grey mullets, flounders and bass, fish which may also be found in the lower reaches of rivers. Both plaice (*Pleuronectes platessa*) and flounders can now be found in the lower reaches of the Itchen, although they are more usually caught in coastal waters and could have been captured by fishermen using fixed nets, traps or baited hooks. Other fish represented in the assemblage which come inshore seasonally to spawn include gurnards (Triglidae), sea breams (Sparidae), scad (*Trachurus trachurus*), mackerel (*Scomber scombrus*), garfish (*Belone belone*) and wrasses (Labridae). These fish, as well as rays

(Rajidae) and smaller sharks and dogfishes are all recorded as being caught by anglers in waters around Southampton (Hamilton-Dyer 1997). The use of fine nets positioned in shallow water is likely to explain the presence of tiny fish such as gobies, sand smelt, tiny mullets and flatfishes. The ubiquity of these fish, together with juvenile clupeids, in cessy deposits from at least the Anglo-Norman period (and from late Saxon features at Lower High Street, Hamilton-Dyer 1997) indicates a long-lived and deliberate strategy to target small and tiny inshore fish.

Apart from red (*Pagellus bogaraveo*) and black (*Spondyliosoma cantharus*) sea bream, which are native to British waters, other sea breams represented included gilthead (*Sparus aurata*) and possibly Couch's sea bream (*Pagrus pagrus*), fish which visit the south coast only during the summer months. Conversely, herring (*Clupea harengus*) and whiting (*Merlangius merlangus*) are more often found inshore in winter, but these fish were commonly preserved and traded long distances. In the case of herring this trade was well-established by the medieval period in East Anglia and further afield (Barrett *et al.* 2004, 625) and hence while herring are found along the southern coast of England and it seems likely that the late Saxon fish were caught locally, the presence of these fish in later periods can not be interpreted purely in terms of local fishing.

The fish trade

Although less numerous than the assemblages from subsequent periods, the fish remains from the late Saxon deposits accumulated at a time before this part of Southampton became densely settled, yet show many similarities with those from the Anglo-Norman and high medieval periods. Since the trading settlement at Southampton was established in the medieval period, it could be anticipated that the earlier assemblage would reflect local, small-scale fishing while the later assemblages would include a range of commercially fished taxa, some of which would have been preserved. Barrett *et al.* (2004) have placed the rise of commercial fishing, and the market in fish as a traded commodity, in the years around AD 1000. This bulk trade in fish was focused particularly on herring and gadid fishes (principally cod), items which could be caught in quantity and preserved. Their investigation concluded that, with a few exceptions, eels and cyprinids dominate pre-11th-century fish assemblages while herrings increase fourfold in the 11th to 12th centuries when compared with their relative abundance in 7th to 10th centuries (ibid.). Gadids, most notably cod (*Gadus morhua*), appear as a significant catch only from the 11th century, having been rare to that point. In the light of these general trends, it is instructive to look at the data from Southampton French Quarter for the periods either side of AD 1000 – in this case by comparing the late Saxon with the Saxo-Norman and high medieval assemblages. The clupeids, most of which are likely to be herring, comprise 20% of the late Saxon assemblage, some 55% of the Anglo-Norman assemblage and 36% in the high medieval period (only 17% if tiny clupeids are excluded). Hence, there would seem to be some indication of an increase in herring occurring somewhere around AD 1000, conceivably as a result of the importation of preserved fish. It remains unclear quite to what extent the trend is affected by the different types of deposits in each period. Herrings are clearly relatively more abundant in rich, cessy fills.

Considering the gadids, and in particular, cod, while all gadids together constitute only 6% of the identified assemblage in the late Saxon period at the French Quarter, they still comprise less than 10% of the identified sieved assemblage in the Anglo-Norman and high medieval periods. Within these statistics, the great majority of bones derive from small fish, including whiting, poor cod (*Trisopterus minutus*) and bib (*Trisopterus luscus*), species typical of local fishing and, certainly in the case of the last two, unlikely to be traded far. If cod alone is considered, while these fish first appear in the sieved assemblage in the Anglo-Norman period, they then constitute less than 1% of the identified bones. Hake (*Merluccius merluccius*) makes its first appearance in this phase, and is possibly an indication of the importation of stored fish caught off the south-west coast, where these fish are plentiful (Locker 2001, 47). The ling (*Molva molva*) too are likely to have been imported (ibid.), since these fish generally have a more northerly distribution but were an important part of the later documented trade in stockfish. By the high medieval occupation, the fish trade had become well-established in Southampton (Coy 1996) yet still only 6% of identified bones derived from gadids. By the late medieval period 13% of identified bones were from gadids, 25% were from herrings and 22% were from eel, which compares with 20% gadid (most of which were from cod), 40% herring and 17% eel in the post-medieval centuries. At the possible medieval fish market of St Michaels, Southampton, samples processed to 1 mm produced an identified fish bone assemblage within which roughly 10% of bones were from gadids in the high medieval deposits, increasing to 11.5% in the later medieval period (Coy and Hamilton-Dyer 1987) again indicating limited local consumption of these widely traded fish.

By the 13th century, Southampton was an established trading port for fish. A valuable discussion by Coy (1996) lists the main port books and other documents which detail fish entering the port of Southampton in the Middle Ages. The earliest of these is the Oak Book, dated to 1300, which provides information on fish markets, fish sizes and prices as well as customs and privileges afforded to the Guild merchants of Southampton. The

Oak Book mentions several types of fish not recorded at the French Quarter, including: lampereys (lampreys), sturgoun (sturgeon), and 'gobettes' (unknown translation). The cartilagenous skeleton of lampreys means that they are extremely rare archaeologically, although a common item in medieval records. Other fish mentioned in the Oak Book include congres (conger eel), harange (herring), sardeyn (sardine/pilchard), salmoun (salmon) stockfisshe (stockfish), moreau/mulwell (cod), haddok (haddock), leeng (ling), coignes (grey mullet) and makerel (mackerel). Fish documented as having been imported into Southampton in the Middle Ages include: congres, heryng, heryng sore (salted herring), salmon, sperlynge (smelt), meluel (cod), codling (young gadids), whiting, poullok (pollack), lyng (ling), stokfische (stockfish), haake (hake) and makerel (mackerel). The source of these fish included: Suffolk and Norfolk (herrings), Guernsey, Brittany, Normandy, Holland, Devon, Dorset and Cornwall. Hansa merchants and merchants from Holland were active in importing fish into Southampton in the 14th century (Littler 1979, 212). By the 15th century fish were being imported from Irish waters, and in the 16th century from Newfoundland. Many of the cod, saithe (*Pollachius virens*) and ling entering Southampton in the later medieval and post-medieval centuries are likely to have come from waters around Scotland or from even further afield.

Archaeological evidence indicates that while those fish listed as traded and imported in medieval Southampton were indeed consumed in the town (all apart from lampreys and sturgeon (*Accipenser sturio*) were represented in the French Quarter assemblage) many other fish were eaten as well. Most of these additional fish, including sharks, rays, bass, sea breams, gurnards, scad, garfish, wrasses and flatfishes were probably caught locally, and the ubiquity of these taxa throughout the history of the French Quarter would suggest continuity of fishing practice and the enduring popularity of a range of fish in the diet.

Conclusions

The varied nature of the fish remains from Southampton French Quarter has been made apparent, to a large extent, by the comprehensive programme of soil sieving and by the sorting of fine residues, making it possible to demonstrate the consumption and probable popularity of mixed small fish. Consumption of these fish does not seem to have been confined to the French Quarter, as sieved assemblages from the Lower High Street have also revealed similar material (Hamilton-Dyer 1997). Although the quantity of fish remains and range of identified species increases in the Anglo-Norman period, it is not entirely clear to what extent this may be a product of preservation, the Anglo-Norman pits and wells containing a wealth of mineralised and anaerobically preserved material. While the well-documented rise of the fish trade in the medieval period, in particular relating to stored cod and herrings, can not be seen clearly in the assemblages from the French Quarter,

Table 6.4: Numbers of identified fish bones in the hand-collected fish assemblage

SPECIES	*Late Saxon*	*Anglo-Norman*	*High Medieval*	*Late Medieval*	*Post-medieval*	*Unphased*	*Total*
Elasmobranchs nfi.	1						1
Rays nfi.			3				4
Tope	1						
Conger eel		5	22	8	3	2	40
Salmonid nfi.					4		4
Gadids nfi.	2	6	15	4	10		37
Cod		5	33	7	47	1	93
Cod or saithe				1	18		19
Saithe					2		2
Whiting					10		10
Haddock			3				3
Ling			18	2	2		22
Hake		27			1		28
Grey mullet nfi.					2		2
Mackerel					1		1
Flatfishes nfi.		2	3		1		6
Right eyed flatfish nfi		26	2		5		33
Plaice	1		2				3
Plaice or flounder		4					4
Unidentified	1	60	81	8	35	4	189
Grand Total	6	135	182	30	141	7	501

Nfi - not identified to genus/species

the presence of large cod and ling certainly seems to date from the high medieval period, these fish being virtually absent in the earlier deposits. Herrings were represented at all periods and were the subject of an important fishery from at least early medieval times (Cutting 1955, 54). A locally-based fishery for smaller, inshore fish, seems to be a feature of all the periods at the French Quarter, and it is likely that fish traps or weirs and fixed or seine nets positioned in shallow water were utilised to catch coastal fish and herrings, eels, mackerel and garfish, which come inshore during their annual migrations.

MARINE SHELL *by Greg Campbell*

Introduction

An assemblage of approximately 4500 marine shells was recovered and examined, the great majority deriving from wet-sieving of bulk soil samples taken specifically for the recovery of shells, or for recovery of charred plant remains by flotation. The French Quarter site provides a considerably more objective sample for analysis of the range of shell varieties, the size ranges of a variety, and the range of shell density in the deposits than was previously available for Southampton (or indeed for most English historic towns). Part of the analysis included a detailed examination of the metrical data, which is available as a downloadable report (Specialist Download E3).

Species represented (Fig. 6.7)

Consumed shellfish

The common mussel *Mytilus edulis* L., the most common edible shellfish, formed the overwhelming majority of the shells in some deposits, such as the fills of Anglo-Norman pits 210 (Property 9, later Tenement 173) and 8200 (Property 6, later Tenement 243) and the entire deposit in one case – a late Saxon or possibly Anglo-Norman fill (5313, Fig. 6.7) of pit 5303 (Property F, later Tenement 180). Mussels, common shellfish of coastal waters, can attach to most bare stable surfaces, and often form dense mats, large beds and reefs. The native, common or flat oyster *Ostrea edulis* L. made up 15% of the assemblage sieved from soil samples (Table 6.5). Oysters can be common on stable low-tidal and shallow sub-tidal beds to about 50 m depth, where they can form extensive beds and reefs when not disrupted by harvesting. Cockles (*Cerastoderma* sp.) made up 11% of the shells, and were notably common in the late Saxon phase. Almost all were common cockles *Cerastoderma edule* (L.), with only six valves identified as lagoon cockle *C. glaucum* (Poiret). Cockles live in sandy or muddy beds from mid-tide to a few metres depth, where they can be densely packed, and are harvested easily by hand-raking or digging at low tide. Common or edible periwinkles *Littorina littorea* (L.) made up 9% of the shells. A widely distributed and often very common grazer of sheltered or moderately wave-beaten shores, and easily harvested by hand, it is common on inter-tidal solid shores among seaweed, on muddy beds in harbours and estuaries, and among mussels. Some 53 shells of common whelk *Buccinum undatum* L. were found, usually from deposits with other shells, more commonly in the later phases. This sub-tidal carnivore-scavenger of muddy sands and stony beds is a modern-day delicacy, fished by dredging or potting. Some 38 valves of carpet-shells, principally chequered carpet-shell *Tapes decussatus* (L.) were also recovered. While seldom consumed now in Britain, these bivalves of near-shore gravels were the prized 'butterfish' harvested in Victorian Hampshire (Davidson 1999, 139-140). Some 33 shells of the common dog-whelk *Nucella lapillus* (L.), which is a carnivore common on inter-tidal and shallow sub-tidal rocky shores, typically as bye-catch with other shellfish. However, 11 dog-whelks were recovered from a single Anglo-Norman sample (from pit 8322, Property 5, later Tenement 242), suggesting that they were probably consumed. All these shellfish are common on the modern shores near Southampton, and have been eaten in the town since Saxon times (Winder 1980).

Shellfish collected but not consumed

Several species of gastropod were found in numbers or sizes too small for them to have been consumed. The 27 netted dog-whelk *Nassarius* cf. *reticulatus* (L.), are scavengers on inter-tidal or shallow sub-tidal mud or muddy sand. The single sting-winkle *Ocenebra erinaceus* (L.), from late medieval deposit 5009 (pit 5003, Tenement 178), is a carnivore of sedentary molluscs from mid-tide to 150 m depth; it is found regularly on oyster beds. The small dog-whelks, and small numbers of common dog-whelks, seemed most common in mussel-rich deposits. Therefore the small dog-whelks and some of the common dog-whelks were probably incidentally collected with the mussels (mussel by-catch).

The 76 small winkles were from three common British species, *Littorina obtusata* (L.), *L. mariae* Saachi & Rastelli, and *L. saxatilis* (Olivi). There was also one flat top shell *Gibbula umbilicalis* (da Costa) and two shells of common limpet *Patella vulgata* L. Limpets are usually a grazer of inter-tidal bare rock areas but can be found in small numbers on solid sections of muddy shores. Most small winkle species and limpets were from oyster-rich deposits, even though these species are not commonly found together on the same shores. Since the small winkle species are common in inter-tidal sea-weed, especially wracks, it is likely that most of the small winkle species were in oyster-rich deposits because these oysters were packed in sea-weed. Those few deposits which had small winkle species but no oysters included edible periwinkles; in these few cases the small winkles were probably periwinkle by-catch.

Some small bivalves were also recovered in small numbers. The 38 Baltic tellins *Macoma balthica* (L.) and 28 peppery furrow-shell *Scrobicularia plana* (da Costa), are species found regularly in the same muddy beds as some cockles (Elliott *et al.* 1998, 53), and were most common in deposits with cockles (especially inedibly small cockles), indicating that they were probably brought to site accidentally along with un-washed cockles. A single trough-shell (*Spisula* sp.), usually from sand-rich sub-tidal beds, could have been brought to site accidentally with either un-washed cockles or oysters from a sandy bed. There were only two examples of saddle-oyster *Anomia ephippium* L., a shellfish of hard substrates including oysters. This small number, given the number of oysters, suggests most oysters were cleaned and sorted before being brought to the site.

Shellfish by site period

Late Saxon (AD 900-1066)

The late Saxon phase saw the greatest amount of shellfish brought to the French Quarter (Table 6.5). Mussels were the bulk of the shells, with cockles common and oysters slightly less so. Far from seeming primitive and low-key, the harvesting of oysters in late Saxon Southampton appears to have been an established and intensive oyster fishery, already quite similar to that of much later centuries. Both natural reefs and more dispersed beds were being harvested, but dredging seems to have fished-out most reefs and most of the large old oysters. At least some beds were being managed by the spreading of cultch (mainly mussel shells) and probably the re-stocking of depleted beds. Under-sized oysters and by-catch (such as saddle oysters and sting-winkles) were rare, suggesting that oysters were being cleaned and sorted off-site.

The small winkle species were associated more with the oysters than the edible periwinkles, indicating that sea-weed (accidentally including some small winkles) was probably used to pack some shellfish such as oysters, even for the short journey from dock to kitchen within Southampton. In contrast, the cockles were brought home to be cleaned of under-sized cockles, furrow-shells and tellins, making it likely that individual households were gathering cockles (and probably carpet-shells) for their own needs. The inhabitants also seemed to be knowledgeably exploiting the shore for these cockles, as well as for periwinkles (from the greatest range of habitats exploited at any time in the French Quarter's occupation), and for dog-whelks (collected where they were known to grow large and fast).

Fig. 6.7 Mussel shell deposit (5313) in a late Saxon pit (5303, Property F, later Tenement 180)

Anglo-Norman (AD 1066-1250)

In the Anglo-Norman phase shellfish were slightly less exploited than in the previous phase, but the impact of the Conquest on shellfish consumption was not dramatic, at least in this part of the town. Mussels were still the most common, but oysters and periwinkles were increasingly favoured, and cockles less so. Cockles, dog-whelks and periwinkles continued to be harvested from about the same range of tidal levels and bed types as in the late Saxon phase. The cockles continued to be brought home to be cleaned and sorted, suggesting that individual households probably continued to gather cockles for their own needs. The relative increase in the percentage of periwinkles in the Anglo-Norman phase at the expense of cockles probably meant the periwinkle supply was still ample.

Mussel deposit 5313, forming an upper fill of Anglo-Norman date within late Saxon pit 5303 (at Property F/7, later Tenement 180) had shells in proportions more like the late Saxon than the Anglo-Norman phase (Table 6.5), but its richness (at 71 shells per litre of soil, Fig. 6.7) was unique for the site, and quite rare in historic period excavations. Deposits of this density are usually considered to be the by-product of shellfish preserving (eg Winder 1991, 213; Campbell 2007, 46), indicating that a cottage industry in mussel-preserving may have begun in Southampton during late Saxon or Anglo-Norman times.

High medieval (AD 1250-1350)

In the high medieval phase the use of shellfish was markedly reduced over that of the earlier phases. While sieved assemblages are rare, making inter-site comparisons difficult, the concentration of shells appears comparable to contemporary towns (eg Campbell 2002). Oysters overtook all other shellfish, and periwinkles became as common as mussels; periwinkle harvesting seemed similar to the late Saxon pattern, with a wide range of sizes and shore types being harvested. Cockles were almost absent, and there was little evidence of households supplying their own shellfish. Whelks, which are usually a dredge or pot fishery, rather than hand-gathered, also become notable in this phase. The small winkle species continue to be associated mainly with oysters, probably as part of sea-weed packing. The contrast between this phase and the earlier phases may therefore be due to shellfish having become primarily purchased commodities from established fisheries, in a town which had developed a more 'urban' economy.

Late medieval (AD 1350-1510)

In the late medieval phase, oysters were yet more favoured, but more shellfish and a wider range of species were again being consumed than in the preceding phase. Small numbers of small bivalves of cockle beds showed there was some shellfish gathering by individual households. Perhaps the site had an influx of those familiar with shellfish and how to gather them. Oyster reefs still seemed present but rare. Periwinkles were consistently small, despite coming from a range of shore types, so periwinkles might have been over-exploited locally.

Post-medieval (AD 1510-1750)

In the early post-medieval phase, importation nearly ceased, and almost all were oysters. Hand-retrieval showed a similar picture, with only three deposits rich in shells, all dominated by oysters.

Conclusions

Retrieval of shells down to a consistent and small size from a fairly large number of deposits at the French Quarter site has led to a better understanding of the associations of the various species within a sample and phase, and of the changes in those associations over time. This pattern of associations has allowed the drawing of some inferences about the way in which the people of Southampton made use of the shore in the past. Perhaps the most

Table 6.5: Composition by phase of the marine shell assemblage over 4 mm from soil samples (context 5313 excluded)

Phase	*Samples in the phase (as % of all samples)*	*Shells in the phase (as % of all shells)*	*Number of shells in phase*	*Percentage of the phase's shells made up by* mussels	oysters	cockles	periwinkles	whelks	carpet-shells	small gastropods	small bivalves
Late Saxon	26.4	49.2	1711	41.3	18.7	23.0	10.2	0.8	1.0	3.9	1.2
Anglo-Norman	31.4	30.8	1072	38.6	22.3	9.7	24.0	0.8	0.4	2.7	1.5
High medieval	24.8	7.9	270	24.8	31.5	1.9	24.1	10.7	~	7.0	~
Late medieval	11.6	10.7	371	21.6	42.6	7.8	15.4	0.3	0.5	11.9	1.1
Post-medieval	5.8	1.5	52	1.9	92.3	~	5.8	~	~	~	~
Ctx 5313			2825	90.0	2.8	5.0	0.3	~	0.6	0.5	1.0

interesting inference is that most of the small species of winkles were probably brought to site in wracks used to pack oysters. Another is that cockles were being brought directly home from the mud-flats and cleaned of under-sized cockles, tellins and furrow-shells on site. Wet-sieving also greatly improved the understanding of the relative importance of mussels, a wine-glass-delicate shell which breakage renders almost invisible in hand-retrieved assemblages.

PLANT REMAINS *by Wendy Smith*

Introduction

A total of 188 samples were collected from the site for the recovery of charred, mineralised and/or waterlogged plant remains. Of these, 34 were identified as being appropriate for full analysis, presented and tabulated in detail in Specialist Download E4. The archaeobotanical assemblage augments the bulk of published archaeobotanical analyses from Southampton, which primarily date to the Saxon phases of *Hamwic*. In addition to late Saxon plant remains, this project also provides material from Anglo-Norman, high medieval, late medieval and post-medieval deposits, which were previously relatively under-represented in published reports. The overall impression gained from this analysis is of remarkable stability of plant use, especially in the main categories of cereals and pulses between the late Saxon and high medieval periods; however, the range and quantity of fruits, nuts and spices retrieved from the Saxon period appears to be quite limited and this gradually increases over time.

Full tabulated data on all plant remains is available in the on-line specialist report. In this volume, tabulated data on the charred and mineralised plant remains is restricted to the presence/absence of cereals and economic plants (Tables 6.6 and 6.7), and a quantification of the waterlogged remains (Table 6.8).

Charred and mineralised plant remains by period

Late Saxon (AD 900-1066)

Six late Saxon pit samples with charred and mineralised plant remains produced a total of 1669 quantified identifications from Properties H and F (later Tenements 172, 173 and 180). The majority of plant remains were charred (N = 1194 or 72%), with a range of mineralised, or possibly dried-out waterlogged plant remains (N = 475 or 28%) also being recovered. Cereal grain and pulses were primarily recovered from the charred component of these samples. Barley (*Hordeum* sp.), rye (*Secale cereale* L.) and indeterminate free-threshing type wheat (*Triticum* sp.) are the main cereals present. One broad bean (*Vicia faba* L. var. *minor*) and two indeterminate vetch/garden pea (*Vicia* spp./*Pisum sativum* L.) were recovered and charred hazel nutshell fragments were also found. Charred weed/wild taxa primarily occur as weeds of crop. One weed/wild taxon identified here is noteworthy: weld or dyer's rocket (*Reseda luteola* L.) was frequently recovered from all three Tenement 180 pit samples. Although weld can occur as a weed of crop or waste places, especially as an urban weed, it is also a dye plant. Interpreting seed remains of weld as an indicator for dyeing is not straightforward (Greig 1981, 273; Hall 1996), especially since weld seeds prolifically: conclusive identification of its use as a dye plant requires other forms of corroborating evidence for dyeing/textile working (Hall 1996; but see also approach to different lines of evidence for textile working at 16-22 Coppergate in Kenward and Hall 1995; Rogers 1997). These same deposits also produced a large numbers of nettle (*Urtica dioica* L.) seeds, which again may simply be a weed of cereal crops/waste ground, but also is a useful plant. In particular, the high potash content of common nettle means that it could have been used as a source of lye, to assist cleaning of fleeces (Hunter 2005, 171–2).

Anglo-Norman (AD 1066-1250)

Sixteen samples were studied from the Anglo-Norman deposits. The majority were pits/cess-pits (N = 12), but plant remains from a discrete burnt layer, a well, a floor layer and a posthole were also studied. A wider range of properties is represented: Properties 12, 10, 9, 7, 2, 5 and 6 (later Tenements 167, 172, 173, 174, 179, 180, 237, 242 and 243). In total, 9149 identifications were made from these samples; 6294 or 69% of which were charred. The mineralised component (N = 2855 or 31%) encompassed a much wider range of taxa. Three waterlogged deposits are discussed separately below.

The cereal crops cultivated remain largely the same as the preceding phase; however, in addition to the barley, free-threshing type wheat and rye grains recovered, cultivated oat (based on the identification of 14 floret bases in sample 138, from pit 4325, Property 2, Tenement 237) is also present in the charred assemblage. Broad bean, garden pea and indeterminate vetch/garden pea also occur in this phase. The range of fruits and nuts is greatly increased. In addition to charred hazelnuts, the Anglo-Norman samples also produced charred indeterminate blackberry/raspberry pips, elder seeds, grape pips, indeterminate sloe/plum/damson/bullace stones, sweet cherry stones and strawberry seeds. A possible charred opium poppy (*Papaver* cf. *somniferum* L.) seed was noted and a tentative identification made of a charred garden parsley (?*Petroselinum crispum* (Mill.) Nyman ex A. W. Hill) seed. Mineralised fig (*Ficus carica* L.) pips, blackberry/raspberry seeds, pear/apple (*Pyrus* spp./*Malus* spp.) pips and elder seeds were also found. The weed/wild plants recovered from the

Table 6.6: Presence/absence of charred plant macrofossils recovered from all phases (cereals, fruit, nuts and other economic plants)

Phase	*LSAX*	*AN*	*HMED*	*LMED*	*PMED/*	*HABITAT(S)*	
Number of samples	*6*	*16*	*9*	*2*	*2*		
Latin Binomial							*English Common Name*
CHARRED PLANT REMAINS							
Cereal Grain							
Avena cf. *sativa* L.		x	x			Cu	possible cultivated oat
Avena spp./ *Secale cereale* L.		x	x			Cu	indeterminate oat/ rye
Hordeum sp. - hulled	x	x	x	x	x	Cu	hulled barley
Secale cereale L.	x	x	x			Cu	rye
Secale cereale L./ *Triticum* sp.	x	x	x	x		Cu	indeterminat rye/ wheat
Triticum cf. *spelta* L.	x	x				Cu	possible spelt
Triticum sp. - possible glume wheat	x					Cu	glume wheat
Triticum sp. - free-threshing type	x	x	x	x	x	Cu	free-threshing wheat
Triticum sp. - indeterminate	x	x	x		x	Cu	indeterminate wheat
Cereal/ POACEAE - indeterminate	x	x	x	x	x	Cu	indeterminate cereal/ large grass
Embryo/ Coleoptile							
Cereal/ POACEAE - detached coleoptile	x	x	x	x	x	Cu	indeterminate cereal/large grass
Cereal/ POACEAE and - cf. Cereal/ POACEAE detached embryo	x	x	x	x	x	Cu	indeterminate cereal/large grass
Cereal Chaff							
Avena sativa L. - floret base		x				Cu	cultivated oat
Avena cf. *sativa* L. - floret base		x	x			Cu	possible cultivated oat
Hordeum sp. and - cf. *Hordeum* sp. rachis node		x	x			Cu	indeterminate and possible barley
Hordeum sp./ *Secale cereale* L. - indeterminate rachis node	x		x	x		Cu	barley/rye
Secale cereale L. - rachis node	x	x	x			Cu	rye
Triticum aestivum L./ *compactum* Host. - type rachis node		x		x		Cu	bread wheat/club wheat
Triticum sp. - rachis node		x	x	x		Cu	indeterminate wheat
Cereal - indeterminate rachis node		x	x	x		Cu	indeterminate cereal
Cereal - indeterminate rachis internode	x	x				Cu	indeterminate cereal
Cereal/ POACEAE - basal rachis node, culm node and/or base	x	x	x	x		Cu	indeterminate cereal/large grass
cf. Cereal/ POACEAE - culm base		x	x			Cu	possible indeterminate cereal/ large grass
Pulses							
Vicia faba L. var minor	x	x		x		Cu	celtic/field/horse bean
Vicia cf. *faba* L. var. minor		x				Cu	celtic/field/horse bean
cf. *Vicia* cf. *faba* L. var. minor		x				Cu	possible celtic/field/horse bean
Vicia spp./ *Pisum sativum* L.	x	x	x	x		?Cu	vetch or garden pea
cf. *Vicia* spp./ *Pisum sativum* L.				x		?Cu	possible vetch or garden pea
Pisum sativum L.		x	x	x		Cu	garden pea
Pisum sativum L. – detached hilum		x				Cu	garden pea
Fruit/ Nut							
Juglans regia L.			x			Cu	walnut
Corylus avellana L. – nutshell	x	x	x	x		H/ Wo/ Sc	hazel
Rubus section *Rubus*		x				TWa	blackberry/raspberry
Fragaria vesca L.		x				H/ Wo/ Sc	wild/alpine strawberry
Prunus spinosa L./ *domestica* ssp. insititia (L.) Bonnier & Layens		x				H or Cu	sloe/plum/ greengage/damson
Prunus cerasus L.		x		x		H or Cu	dwarf cherry
cf. *Prunus avium* (L.) L./ *cerasus* L. – stone fragment			x			H or Cu	possible bird/dwarf cherry
Vitis vinifera L.		x				Cu (?Ex)	grape
Vitis vinifera L. – immature		x				Cu (?Ex)	grape

Table 6.6: Presence/absence of charred plant macrofossils recovered from all phases (cereals, fruit, nuts and other economic plants) (continued)

Phase	*LSAX*	*AN*	*HMED*	*LMED*	*PMED/*	*HABITAT(S)*	
Number of samples	6	16	9	2	2		
Latin Binomial							*English Common Name*
Sambucus nigra L.		x	x			H/ Wo/ Sc	elder
cf. *Sambucus nigra* L.		x	x			H/ Wo/ Sc	possible elder
Unidentified nutshell/ fruit stone	x	x	x	x	x	-	unidentified fruit/ nut
Other Economic Plants							
Papaver cf. *somniferum* L.		x				A/Wa or Cu	opium poppy
Linum usitatissimum L.			x			Cu	flax/ linseed
? *Petroselinum crispum* (Mill.) Nyman ex A. W. Hill		x		x		G/ Ge/ W	tentative identification of garden parsley
Tree/ Shrub							
Rosa spp. – rosehip				x		H/Wo/Sc or Cu	rose

Habitat Codes (based on Stace 1997): A = weed of arable cultivation, , Cu = cultivated plant, G = cultivated garden plant, Ge = frequent garden escape, H = hedgerows, He = heath, Sc = scrub, W = wet places (either waterside or water plants), Wa = waste places, Wo = woods. T = typically occurs. (Ex) = exotic and (?Ex) = possible exotic. 'x' shows presence within one or more samples.

charred and mineralised component of these samples frequently occur as weeds of crop. Taxa specific to wetland habitats, such as sedge and rush seeds, only occur in the mineralised component. Although this may mean that domestic debris (such as floor coverings and thatch) may have been entering the pits/cess pits, it is also possible that this may be related to the incorporation of vegetative matter into these features to keep them dry.

High medieval (AD 1250-1350)

Nine samples were studied from the high medieval phase, seven of which are from Tenement 237; these results are therefore likely to be biased by the range of activities associated with this tenement. In total, 3505 identifications were made; 2339 (or 67%) were charred and 1166 (or 23%) were mineralised. In terms of cereal crops, the range of charred and mineralised plant remains identified from earlier periods remains the same, although by this date it is clear that free-threshing wheat is much more abundant than other cereals. Notably, the range of weed/wild taxa has greatly increased; these typically occur as weeds of cereal crops, several of which are typical of damp to wet conditions.

A pit from Tenement 177 and a burnt surface from Tenement 241 were also analysed. These samples produced abundant charred cereal remains with weed/wild taxa, which typically occur as weeds of crop. Tenement 177 (sample 96); however, produced abundant mineralised remains, primarily of fruit (blackberry/raspberry, elder fig, grape and sloe/plum/damson/greengage). A possible mineralised quince (?*Cydonia oblanga* Mill.) seed was also recovered. Most notably, this sample produced a fragment of a cumin (*Cuminum cyminum* L.) mericarp (see below).

Late medieval (AD 1350-1510)

Two samples from late medieval deposits in Tenements 170 and 243 were studied. Cess pit 6144 (sample 155 from Tenement 170) contains abundant mineralised plant remains, especially fig. A sample of a burnt layer (sample 182) from Tenement 243 primarily contains charred cereal remains and accompanying weeds of crop, especially barley and free-threshing wheat, but also includes broad bean, garden pea and indeterminate vetch/garden pea. Fifteen charred mericarps have tentatively been identified as possible garden parsley (?*Petroselinum crispum* (Mill.) Nyman ex A. W. Hill) from this deposit.

Post-medieval (AD 1510-1750)

One sample from the post-medieval phase at Tenement 237 was analysed and produced a fairly even mixture of charred (N=187) and mineralised (N=175) plant remains. The charred component is primarily comprised of cereal (especially barley and free-threshing wheat type) grains and weed/wild plant remains. The mineralised component is dominated by elder seeds, accounting for 84 of the 175 mineralised identifications made.

Waterlogged plant remains

Five primarily waterlogged samples were analysed, which are all derived from pits, wells or cess pits. These come from some of the deepest deposits on

Table 6.7: Presence/absence of mineralised plant macrofossils recovered from all phases (cereals, fruit, nuts and other economic plants)

Phase	*LSAX*	*AN*	*HMED*	*LMED*	*PDMED*	*PDMED MODERN*	*HABITAT(S)*	
Number of samples	6	16	9	2	1	1		
Latin Binomial								*English Common Name*
MINERALISED PLANT REMAINS								
Cereals								
Cereal - unidentified bran			x		x		Cu	cereal
Cereal/ POACEAE - indeterminate straw fragments (unquantified)		x	x	x			Cu	cereal/ large grass
Pulses								
Pisum sativum L. - intact hilum			x				Cu	garden pea
cf. FABACEAE - internal structure of pulse/ vetch			x				Cu	possible Pea Family
Fruit/ Nut								
Ficus carica L.	x	x	x	x	x		Cu (?Ex)	fig
Corylus avellana L. - nutshell fragmnet	x						H/ Wo	hazelnut
Rubus section Rubus		x	x	x	x		H/ Wo/ TWa	blackberry/ raspberry
Fragaria vesca L.					x		H/ Wo/ Sc	
Prunus domestica ssp. *insititia* (L.) Bonnier & Layens - kernel			x				Cu	sloe/ plum/ bullace/ damson/ greengage
Prunus spinosa L./ *domestica* ssp. *insititia* (L.) Bonnier & Layens - indet. stone fragment		x	x	x			H or Cu	sloe/ plum/ bullace/ damson/ greengage
Prunus spinosa L./ *domestica* ssp. *insititia* (L.) Bonnier & Layens - rounded stone fragments			x				H or Cu	sloe/ plum/ bullace/ damson/ greengage
Prunus spinosa L./ *domestica* ssp. *insititia* (L.) Bonnier & Layens - kernel			x	x			H or Cu	sloe/ plum/ bullace/ damson/ greengage
? *Cydonia oblonga* Mill.			x	x			Cu	tentative identification of quince
Pyrus sp./ *Malus* sp. - indeterminate		x					Cu	pear/ apple
Vitis vinifera L.			x	x	x		Cu (?Ex)	grape
cf. *Vitis vinifera* L.		x	x				Cu (?Ex)	possible grape
Sambucus nigra L.	x	x	x		x		H/ Wo/ Sc	elder
Sambucus nigra L. (part charred)			x				H/ Wo/ Sc	elder
cf. *Sambucus nigra* L.				x			H/ Wo/ Sc	possible elder
Other Economic Plants								
Cuminum cyminum L.			x				Cu	
Mineralised/Dried out Waterlogged/?Desiccated								
Bertholletia excelsa Humb. et Bonpl.							Cu (Ex)	Brazil nut

Habitat Codes (based on Stace 1997): A = weed of arable cultivation, , Cu = cultivated plant, G = cultivated garden plant, Ge = frequent garden escape, H = hedgerows, He = heath, Sc = scrub, W = wet places (either waterside or water plants), Wa = waste places, Wo = woods. T = typically occurs. (Ex) = exotic and (?Ex) = possible exotic. 'x' shows presence within one or more samples.

site, which may explain their partial waterlogging. It is likely that they all contain mixtures of cess and other rubbish.

Anglo-Norman pit 7109 (Property 11, Tenement 170), which only produced 67 quantifiable remains, is of particular interest. This sample contained thousands of fragments of unidentified cereal bran, which is unquantifiable, and nearly 40% of the quantified plant remains were highly fragmented corncockle (*Agrostemma githago* L.) seed coat fragments. Cereal bran recovered from such deposits is frequently interpreted as remains of bread or other processed cereal products from human excrement (Hall *et al*. 1983; Carruthers 2005b, 184). Cereal bran was also relatively abundant in the Anglo-Norman well at Property 2 (sample 146, well 3145, later Property 237); however, this sample included a large number of amorphous mineralised remains (N = 190). Mineralised remains and cereal bran from this feature both indicate the re-deposition of cess into this feature, if indeed, the feature was not itself

Table 6.8: Waterlogged plant remains (cereals, fruit and nuts and other economic plants) from Anglo-Norman, high medieval and post-medieval phases

Sample Number	*159*	*146*	*150*	*48*	*148*	
Context Number	*7169*	*4574*	*4817*	*1107*	*3168*	
Feature Number	*7109*	*3145*	*4823*	*813*	*3169*	
Tenement Number	*168*	*237*	*238*	*173*	*237*	
Context Type	*Pit*	*Well*	*Well*	*Pit*	*Cesspit*	
Phase	*AN*	*AN*	*AN*	*HMED*	*PMED*	
Latin Binomial						*English Common Name*
WATERLOGGED PLANT REMAINS						
Cereal Grain						
Cereal - indeterminate, bran*	++++E	++++	-	-	-	
Pulses						
FABACEAE - large-sized hilum (likely to be a cultivar)	2	-	-	-	-	pea Family
Fruit/ Nut						
Ficus carica L.	-	2	-	5	300E	fig
Rubus section Rubus	10	-	162	23 E	60	blackberry
Rubus section Rubus (smaller than other Rubus seed, and more beaked)	-	-	-	-	13	blackberry (although possibly raspberry)
Rubus section Rubus - internal structure	-	-	-	-	2	blackberry
Fragaria vesca L.	1	1	-	-	167	wild/ alpine strawberry
cf. *Prunus amygdalus* Batsch. - nutshell fragments (est whole nut)	-	-	-	2 E	-	possible almond
Prunus spinosa L./ *domestica* ssp. *insititia* (L.) Bonnier & Layens	-	-	-	-	1	sloe/ plum/ bullace/ greengage/ damson
Prunus domestica ssp. *insititia* (L.) Bonnier & Layens - stone	2	-	23	-	1	plum/ bullace/ greengage/ damson
Prunus domestica ssp. *insititia* (L.) Bonnier & Layens - kernel	-	-	-	22	-	plum/ bullace/ greengage/ damson
Prunus cerasus L.	-	-	5	-	-	dwarf cherry
cf. *Malus* sp. - endocarp fragment	10	-	1	-	-	possible apple (core fragment)
Vitis vinifera L.	-	1	-	-	2	grape
Vitis vinifera L. - immature	-	1	-	-	-	grape
Sambucus nigra L.	1	1	6	65 E	-	elder
Other Economic Plants						
Papaver cf. *somniferum* L.	-	7	1	-	-	opium poppy
Linum usitatissimum L.	-	-	1	-	-	flax/ linseed
Linum usitatissimum L. - capsule fragments	-	2	-	-	-	flax/ linseed
Tree/ Shrub						
cf. *Cornus sanguinea* L.	-	-	1	1	-	dogwood

* Sample 159 has super-abundant unidentified cereal bran remains - easily several thousand fragments.

*all results are only for that portion of the flot which was sorted , E = estimated count, N† = items from heavy residue included in count,

Key: + = < 5 items, ++ = 5 - 25 items, +++ = 25 - 50 items, ++++ = 50 - 100 items. Shading of scores indicates those scores where a different portion of heavy residue was sorted than flot and the scores have been factored upward or downward accordingly (e.g. if 8 plum stones were recovered from a 100% of >10 mm heavy residue fraction but only 1/4 of the flot was sorted, the score reported will be 2 plum stones (e.g. 8 * 1/4).

converted into an outhouse at some late stage of its use. The final Anglo-Norman sample (sample 150, pit 4823, Property 3) did not produce bran, but contained abundant seed coat fragments of an unidentified Caryophyllaceae (N = 250 estimated whole seeds). These fragments were extremely minute (all < 0.2 mm) and identification to species level was not possible. Notably this sample also produced 64 corn marigold (*Chrysanthemum segetum* L.) achenes. It is possible that this represents weeds of cereal crop. Mineralised sloe/bullace/ damson/greengage/plum (*Prunus spinsoa* L./

domestica ssp. *insititia* (L.) Bonnier & Layens) stone fragments and kernels were recovered from the heavy residue fraction of this sample, suggesting the possibility that cess was also deposited into this feature.

High medieval pit 813 at Tenement 173 (sample 48) produced bramble and elder seeds, which could be consumed foodstuffs deposited in cess, but also could result from these plants growing around an abandoned wellhead. A post-medieval cess pit (3169 at Tenement 2337) produced a large quantity (N = 167) of strawberry pips. Notably, mineralised sloe/bullace/damson/greengage/plum (*Prunus spinsoa* L./*domestica* ssp. *insititia* (L.) Bonnier & Layens) stone fragments and kernels and grape (*Vitis vinifera* L.) pips were also recovered.

The assemblage

Cereals and pulses

Cereal crops and pulses from all phases include barley (*Hordeum* sp.), rye (*Secale cereale* L.) and free-threshing type wheat (*Triticum* sp.) grains, broad bean (*Vicia faba* L. var. minor) and indeterminate vetch (? cultivated)/garden pea (*Vicia* spp./*Pisum sativum* L.). Cultivated oat (*Avena sativa* L.) was found in the Anglo-Norman to late medieval phases, usually in fairly small quantities, with none being recovered from the post-medieval period. An Anglo-Norman sample (sample 143, from pit 4494, Tenement 237) produced 118 charred possible cultivated oat grains and six securely identified charred cultivated oat floret bases. From the Anglo-Norman period onward, secure identifications of garden pea (*Pisum sativum* L.) occur frequently, but like the late Saxon period, only small numbers of pulses were recovered in any mode of preservation.

Cereal chaff

Rachis nodes of any of the cereals discussed above are relatively scarce from the site; however, culm nodes (the articulations along the stalk of a cereal plant) were frequently recovered, suggesting that straw was a material commonly in use on site. Obviously, thatching, bedding, matting and basketry utilising cereal straw would be quite typical of late Saxon to high medieval settlement. Unquantifiable cereal straw fragments (often without the quantifiable feature of a culm node) were frequently noted in the mineralised component of pit and cess-pit samples. Carruthers (2005, 161) has suggested that cereal straw, as well as rush and sedge stems, would have been used in pits, especially cess pits, to soak up liquid and, possibly, damp down odours.

Germinated grain and detached sprouts

Small quantities of germinated cereal grain and detached sprouts (coleoptiles) and embryos were recovered from nearly all of the archaeobotanical samples. Four samples (Anglo-Norman posthole sample 198; floor layer sample 193; and high medieval occupation layer/deposit samples 101 and 102, from Tenement 237) produced relatively rich assemblages of detached sprouts. Detached cereal grain sprouts either indicate spoiled or intentionally malted grain (van der Veen 1989). Malted grain (the intentional germination of cereal grain, which is then arrested through heating grain; Corran 1975) is the prime ingredient for the manufacture of ale (beer without flavouring from hops). A key stage in some malting processes was the removal of the 'roots' or 'rootlets' (ie the sprouts or coleoptiles) from the dried malt product, just before brewing (Briggs 1998, 8 and 10; Glamann translated by French 2005, 23). The ubiquitous recovery of charred germinated grain and detached sprouts (coleoptiles) from the site, albeit usually in very small quantities, does suggest that small-scale brewing may have taken place in this area of Southampton during the Anglo-Norman to the high medieval periods.

Small-scale ale brewing is well documented in England, and there is evidence for increasing concentration of whole-sale ale manufacture in urban centres such as Southampton (Bennet 1996, 46). In addition, kiln floor tiles typically associated with malting kilns have been recovered from medieval contexts at the site (see Poole, Chapter 5). Notably, 61 hearth tiles and 5 kiln floor tiles are associated with the high medieval phase at Tenement 237 where large quantities of charred, detached sprouts were recovered. It is likely that the abundance of charred, detached sprouts in association with these hearth and kiln floor tiles is linked to regular, probably regulated, production of ale. By the 16th century, guilds would have controlled brewing in Southampton (Bennet 1996, 50). Post-medieval and early modern brewing is represented archaeologically, and documented at this tenement – a brewhouse was included in the inventory of possessions of tenement resident John Combes in 1661 and by 1881 the Hampton Court Brewery occupied part of the site. The recovery of archaeobotanical and ceramic building material evidence for brewing at Tenement 237 strongly suggests that brewing occurred in this area of the town since at least the high medieval period.

Fruit

Late Saxon fruit remains from the site are restricted to relatively small assemblages of elder (*Sambucus nigra* L.) seeds. These seeds can be collected as a useful fruit or dye plant, but are also a source of food for animals (such as birds and rodents) and frequently occur in waste places (Hall 1996, 635; 2000, 32). Other sites in the Southampton area (see below for site comparison) have exhibited a much wider range of fruits associated with the middle to late Saxon periods, including blackberry, cherry

(*Prunus avium* (L.) *L/cerasus* L.), fig (*Ficus carica* L.), grape, variously indeterminate bullace/damson/ greengage/plum, indeterminate pear/apple (*Pyrus* spp./*Malus* spp.) and raspberry (*Rubus idaeus* L.). From the Anglo-Norman period onward all of these fruits are recorded frequently at the French Quarter, with the addition of wild/alpine strawberry (*Fragaria vesca* L.)

The size and shape of the Prunus fruit stones from the French Quarter site varies considerably (Fig. 6.8A and B) and the level of identification of primitive varieties of plums is not straightforward (eg Greig 1996, 215–16). Separation of sloes (*Prunus spinosa* L.) from early varieties of bullace/ damson/greengage/plum, for example, is technically difficult especially if the stones are rounded, when they can resemble cherries (Pollman *et al*. 2005, 1476, fig. 3). Moreover, there is clearly imprecision in the use of 'plum' in English, since the word can also be applied to raisins (dried grapes – *Vitis vinifera* L.) as well as various members of the genus *Prunus*. Plum pudding was initially a savoury fruit bread, often served with beef and eaten year-round (Ayto 1994).

There is some question as to whether all of the fruit found in the excavations was cultivated locally. Grape and plums can happily produce fruit with seeds in Britain, but there clearly is also a long tradition of trade in dried fruit with the continent, as is suggested for some of the evidence from the Mary Rose (Smith and Green 2005). There is some doubt as to whether figs could have be grown successfully in the past and most specialists view them as an import, most likely in dried form (Dickson and Dickson 1996). Roach (1985) has suggested that apples were probably cultivated in the British Isles before the Norman Conquest. Certainly van der Veen and colleagues (2007a, 205; 2007b, 13) have recently suggested that they were a Roman introduction, and apples clearly thrive in the British climate meaning that there is no reason to presume they are not of British origin.

Dried fruits are important ingredients with strong flavoured meats, adding sweetness to otherwise savoury dishes. Perhaps these fruits, along with spices (such as the cumin and garden parsley found at the French Quarter; caraway, coriander, dill, fennel and lovage have been recovered elsewhere; Biddle n.d.; Clapham 2005; Hunter 2005) suggest that diet may not necessarily have been as bland or monotonous as might be generally thought. Although it is tempting to view the late Saxon and medieval diet as an endless round of peas porridge (Carruthers 2005, 162), perhaps there also is scope to envision nourishing and tasty fruit-enriched stews or cold cuts of meat whose flavour is lifted with some accompanying fruit-pickles.

Nuts

Hazel nut (*Corylus avellana* L.) was recovered from all periods of the site, but typically in very low numbers. A few walnut (*Juglans regia* L.) shell fragments came from two of the high medieval samples (sample 51 from oven fill 3228 and sample 143 from pit 4494, both from Tenement 237), this evidence being supplemented by walnut charcoal of late medieval date (Challinor below) which may suggest the presence of a walnut tree within the property's garden. Possible almond (cf. *Prunus amygdalus* Batsch.) nutshell fragments were also recovered from a high medieval deposit (pit 813) at Tenement 173.

One hand-retrieved assemblage of Brazil nutshells (*Bertholletia excelsa* Humb. et Bonpl.) was collected from a 17th-century garderobe at Tenement 180. This property was, however, used in the modern period as a greengrocer and the possibility cannot be ruled out that the Brazil nutshells are a subsequent intrusive deposition (i.e burrowing by

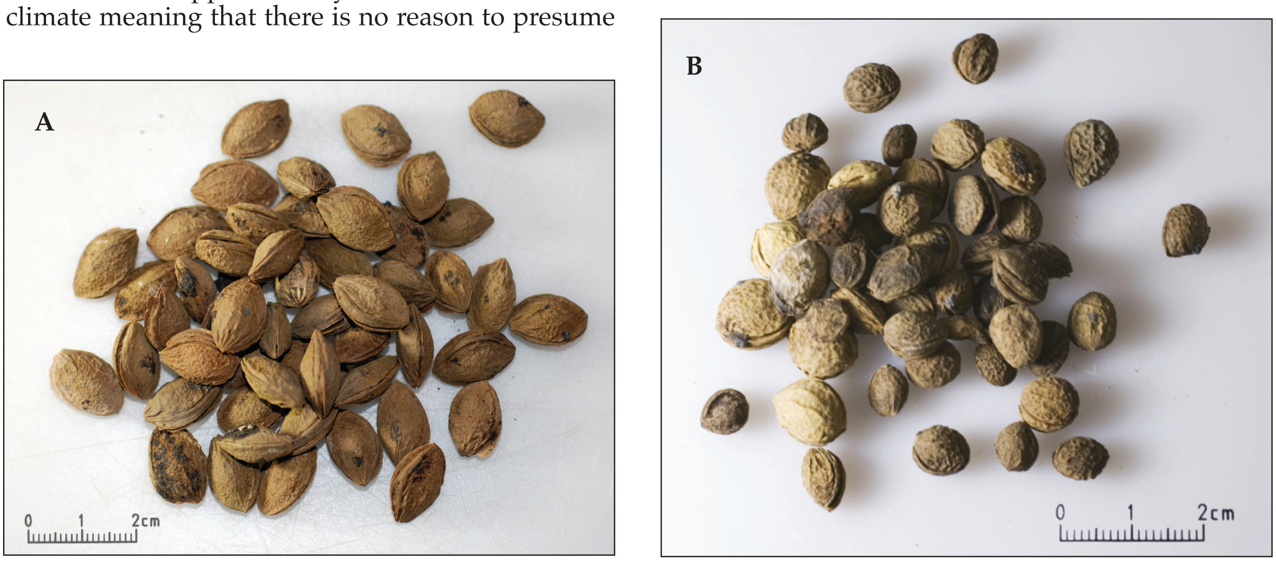

*Fig. 6.8 A) Plum (*Prunus domestica *L. type), large-sized stones. B) Variously indeterminate plum/ greengage/ bullace/ damson (*Prunus domestica *ssp.* insititia *(L.) Bonnier & Layens) smaller-sized fruit stones*

rats) into an otherwise 17th-century fill. This species grows in South America and has only previously been recovered in archaeological terms from post-medieval deposits in London (Giorgi 1999). Brazil nuts are not nuts at all, but are actually seeds with a hard outer coat. They are ~65% oil (or fat) and have one of the highest fat contents of any 'nut' consumed and, therefore, can go rancid quickly. As a result, they cannot be stored for long and are best stored in cool (eg refrigerated), dark conditions – not easily achieved, even in the 18th and 19th centuries (Prance and Mori 1990).

Other economic plants

A small quantity of other economic plants were recovered from the site. These include a few flax/linseed (*Linum usitatissimum* L.) seeds. Although grown as a fibre crop (using stems) or oil seed (Bond and Hunter 1987), it is also possible that linseeds were added to bread to enhance flavour or for decoration (Hall 2000, 29).

An extremely tentative identification of charred seeds of garden parsley (?*Petroselinum crispum* (Mill.) Nyman ex A. W. Hill) has been made from both the Anglo-Norman and late medieval deposits. Garden parsley may have been grown for seed, but is more likely to have been grown for foliage; therefore, this identification should be treated with some caution. Finds of garden parsley are relatively common on mainland Europe (Greig 1996, 225) and, the 'French' character of the area may possibly suggest more European tastes in food.

A few warped and/or slightly fragmented seeds, which compare favourably to opium poppy (*Papaver* cf. *somniferum* L.) seeds, were identified from Anglo-Norman deposits in the charred and waterlogged components. As Hall (2000, 29) points out, opium poppy seeds are likely to have been

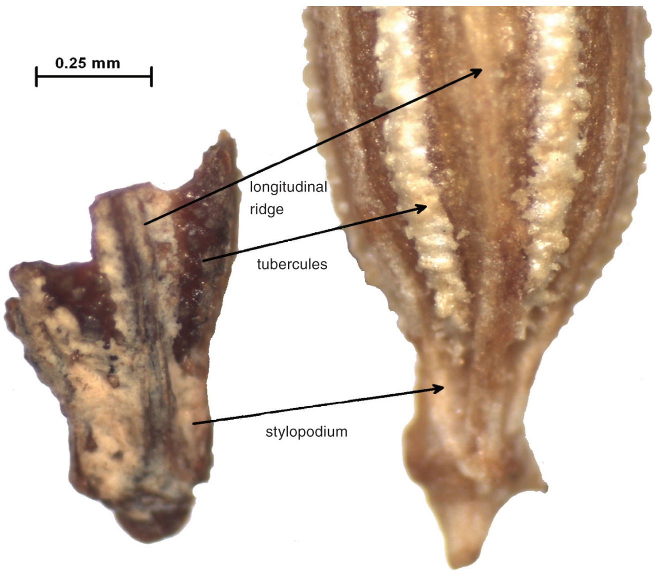

*Fig. 6.9 Mineralised cumin (*Cuminum cyminum *L.) mericarp fragment and modern cumin seed*

used to decorate/flavour breads and other baked goods; however, they frequently escape cultivation, quickly establishing as a weed, and prolifically produce seed.

A mineralised fragment of a cumin (*Cuminum cyminum* L.) mericarp (Fig. 6.9) was recovered from high medieval pit 5237 in Tenement 177. This sample contained the largest concentration of mineralised plant remains and amorphous mineralised concretions, which are probably derived from cess. Cumin is recorded in historic documents and recipes from the medieval period (Greig 1996), but to date this is the only known archaeobotanical find of cumin. There is a record from 1307 for the payment of 1lb of cumin in rent by a Walter Upryt for the nearby High Street Tenement 169 (see Chapter 2). Cumin is a spice that frequently is ground before use and like many umbellifers is extremely fragile and unlikely to survive charring. There are historical records for the use of cumin in cooking (Mead 1967, 71; Pynson 1500) and, indeed, maintaining flaxen hair colour (Tudors website 2009).

Discussion

Comparison with other results from Southampton

The published reports for the late Saxon material in the locality include a number of older reports, which do not have very comprehensive lists of weed/wild plants. As a result, only the economic plants are compared for the late Saxon period. The range of cereal crops recovered in the charred assemblage is broadly similar elsewhere (eg Melbourne Street and Anderson's Road); however, both of these sites also have indeterminate wild/cultivated oat present. Peas/beans are present but in relatively low numbers; this is likely to be a factor of preservation (pulses are known to be under-represented in the archaeobotanical record; Greig 1981, 281) and possibly also due to the lack of recognition of highly fragmented material (mineralised testa of pulses are often difficult to recognise; Carruthers 2005, 161). Although the range of fruits is limited for this site to just fig and elder in the late Saxon period, elsewhere at Southampton blackberries, cherries, crab apple, grape, elder, plums (including bullace/damson/greengage) and raspberries have been identified from Saxon deposits. In terms of flavouring only a few dill (*Anethum graveolens* L.) seeds are known from St Mary's Stadium (mid-late Saxon phase only). Those weed/wild plants reported for late Saxon phases of Southampton include a broadly similar range of crop weeds, plants of grassland/meadows and weeds of waste places to that recovered from the French Quarter.

The Anglo-Norman assemblage can only be compared against one sample studied by Green (1986) from Southampton Castle ditch (Upper Bugle Street). The French Quarter material is dominated by charred plant remains, whereas only a few cereal grains and accompanying weeds of crop were preserved by charring at Southampton Castle. The range of fruits recovered is broadly similar, although the weed/wild flora is markedly different. This may reflect the specific context studied from Southampton Castle – a ditch – which is likely to include waste/wayside plants which otherwise would not occur in the densely populated tenements.

Like the Anglo-Norman period, the ten high medieval samples from the site have abundant charred plant remains, which are not represented at other high medieval deposits at Quilter's Vault, Cuckoo's Lane/High Street B & C sites. This is also the case for waterlogged plant remains, but due to the lack of specification it was not possible to ascertain how material was preserved at Cuckoo Lane/High Street B & C (Dimbleby 1975). The range of fruits recovered is broadly similar, although cherry, raspberry and strawberry are also identified at Cuckoo Lane/High Street B & C). The recovery of a fragment of cumin from Tenement 177 is unique to the British Isles, let alone Southampton, illustrating that we are only recovering a portion of the plant component of ancient diet. There is variation in the weed/wild taxa – but given the limited numbers of samples discussed here it is not possible to ascertain if this represents different inputs into these deposits or possibly different depositional histories (eg seeds from wasteland plants overgrowing these features after they fall out of use).

Differentiating wild from useful plants

Several of the plants recovered from the site could be cultivated or collected or may simply occur as weeds of crop. Weld (*Reseda luteola* L.) and many of the berries (eg blackberry and elder) recovered can be used as dye plants, but also occur in waste places and are prolific seed producers (Hall 1996, 635–6). Useful flavourings from the cabbage family (eg black mustard – *Brassica nigra* L. or white mustard – *Sinapis alba* L.) belong to genera where even if the seed is well-preserved, distinguishing cultivars from weedy varieties is problematic (Carruthers 2005, 162). Other plants such as opium poppy (*Papaver somniferum* L.) or linseed/flax (*Linum usitatissimum* L.) may have been used as flavourings, especially on breads or cakes; however, they are cultivated for other reasons and certainly opium poppy is a frequent escape from cultivation/gardens (Hall 2000, 29). As a result, these taxa have been classified as weed/wild plants for the purposes of this report, in the absence of other corroborating evidence for other uses (for example, culinary, medicinal or in the textile trade) from these deposits.

Mineralisation in the cess pits

Mineralisation is likely to be some form of phosphate (PO_4) or calcium-phosphate ($Ca(PO_4)_6(OH)_2$) replacement (Green 1979), although proximity to metal objects cannot be ruled out in some cases. Mineralised fly (Diptera) puparia were frequently recovered from pit fills in large quantities at various stages between pupa to adult (see D. Smith's report below). This suggests that mineralisation was rapid, possibly as a result of adding something caustic to the cess/rubbish pit – such as lye. The result is a flash preservation, which produces highly variable or even partial mineralisation of seeds, from well-preserved remains (with many diagnostic features) to remains which are largely indeterminate amorphous fragments. D. Smith's analysis of the flies suggests that this was a very fluid environment and one can imagine that as temperatures began to rise in the spring/summer such conditions would rapidly have become extremely foul.

Conclusions

The French Quarter assemblage greatly extends our understanding of diet in late Saxon, Anglo-Norman and high medieval Southampton. Previous published archaeobotanical work has largely focused on Saxon material, although unpublished results from medieval (as well as Saxon) phases are in preparation (Biddle in prep.; Green in prep.; Monk in prep.). Tantalizing recovery of exotica, such as the high medieval cumin (*Cuminum cyminum* L.), attest to Southampton's strong overseas contacts as one of Britain's major ports. One notable result is the consistently abundant recovery of fruits in late Saxon to high medieval deposits. Of these, figs (*Ficus carica* L.) are also likely to have been imported, as is possible for grapes and plums.

CHARCOAL *by Dana Challinor*

Introduction

A group of ten samples were fully analysed for charcoal. Although the dataset was relatively limited, there are as yet relatively few publications on medieval charcoal from Southampton and the French Quarter site therefore offered the possibility to examine issues such as the use of fuelwood in an urban context, woodland resources and management, the presence of any exotic woods and temporal differences in species utilisation.

Charcoal by site period

Late Saxon (AD 900-1066)

Three samples from pits dating to the Late Saxon period were examined. A sample from pit 5192 at Property F (Tenement 176) was dominated by oak trunkwood (*Quercus* sp.), with two small (<20 mm diameter) stems; one a 7-year-old hazel (*Corylus avellana)* stem and the other a 3-year-old broom/gorse (*Cytisus/Ulex)* stem. This differs from the other two pits (210 and 287 both at Property H, later Tenements 173 and 172) which produced more mixed assemblages, including hazel (*Corylus avellana*), alder *(Alnus glutinosa*), blackthorn (*Prunus spinosa*), purging buckthorn (*Rhamnus cathartica*), alder buckthorn (*Frangula alnus*), hawthorn group (Maloideae), field maple (*Acer campestre*) and ash (*Fraxinus excelsior*). A single fragment of pine (*Pinus* sp.) was identified in pit 210. The provenance of the pine is interesting since it is thought that the native Scots pine (*Pinus sylvestris*) had died out from England and Wales by this period (Rackham 2006), in which case the wood must have been imported. Despite the fragmentary nature of the archaeology for late Saxon Southampton, the town was a functioning port at this time and the pine wood may have come from an imported artefact.

Anglo-Norman (AD 1066-1250)

The samples dating to this period from pits 7572, 6528 and 3453 (at Properties 12, 11 and 2, Tenements 167, 170 and 237), were mostly dominated by oak (*Quercus* sp.), although a range of other species was present including beech *(Fagus sylvatica*), birch (*Betula* sp.), alder (*Alnus glutinosa*), cherry type (*Prunus* sp.), hawthorn group (Maloideae), holly (*Ilex aquifolium*), field maple (*Acer campestre*) and ash (*Fraxinus excelsior*). The samples contained mixed mature and young roundwood; for instance most of the alder, in all three samples, was from narrow roundwood, including one *c* 3 years old when cut. Pit 3453 was notable for the massive quantity of charcoal in the sample and the large sizes of the pieces (more than 40 mm in diameter). The oak was dominated by mature heartwood, including many large fragments with more than 60 years growth. The wood was obtained from slow-grown trees, which might suggest that the tree was under some stress, such as competition from dense woodland. The use of such valuable wood suggests there may have been a specific function for the fire; at least it indicates that a mature timber tree had been burned. This is different from the other samples, which produced a mix of roundwood, sapwood and heartwood oak fragments. Where possible to count, it appeared that the oak roundwood was 7-20 years old. This is consistent with the use of coppiced oak supplies.

Pit 7572 contained cess material and the charcoal was covered in fine oyster fibres. It has been posited that charcoal from middle Saxon cess pits in Southampton was deliberately dumped into the pit to absorb the odours of the sewage (Gale 2005). Certainly there was a significant quantity of largish-sized charcoal in pit 7572 which would be suitable for this purpose.

High medieval (AD 1250-1350)

Samples from pit 5194 in Tenement 176 were analysed. Oak (*Quercus* sp.) is common, but beech *(Fagus sylvatica*) is also well represented, along with other species including birch (*Betula* sp.), alder (*Alnus glutinosa*), cherry type (*Prunus* sp.), hawthorn group (Maloideae), purging buckthorn (*Rhamnus cathartica*), ivy (*Hedera helix)* and ash (*Fraxinus excelsior*). The ivy probably entered the assemblage accidentally, attached to the firewood. The majority of the oak and beech fragments came from largewood, but the other species were frequently from small diameter roundwood.

Late medieval (AD 1350-1570)

Oven 4163 from Tenement 237 and pit 5003 from Tenement 178 produced similar assemblages with probable elm (*Ulmus* sp.) oak (*Quercus* sp.), beech *(Fagus sylvatica*), birch (*Betula* sp.), alder (*Alnus glutinosa*), poplar/willow (*Populus/Salix*), holly (*Ilex aquifolium*), alder buckthorn (*Frangula alnus*), field maple (*Acer campestre*) and ash (*Fraxinus excelsior*). Both samples also contained taxa not noted in the earlier assemblages, of which the most interesting are walnut (*Juglans regia*) and wild privet (*Ligustrum vulgare*). Walnut is the only confirmed identification of a non-native taxon in the charcoals from Southampton French Quarter and its shells were also identified among the plant remains (see Smith, above). It is generally thought to have been introduced to Britain by the Romans, and was probably planted as a garden tree for harvesting for nuts, since there is little evidence for it from wood or charcoal prior to the medieval period (Gale and Cutler 2000). The walnut charcoal was recovered from an oven in Tenement 237, which at this time was Polymond's Hall. By the late 14th century John Polymond maintained a garden in part of Tenement 238 and it is plausible that the walnut derived from a tree which grew here. The privet came from a pit filled with rubbish in Tenement 178 and could have derived from several sources, but it is worth noting that privet was traditionally popular for ornamental hedging and is not often used as fuel (ibid. 2000).

Post-medieval (AD 1510-1750)

No samples were fully analysed for this period, but assessment revealed the presence of a similar range of species to the earlier periods, most frequent of which were oak (*Quercus* sp.) and beech (*Fagus sylvatica*). Other taxa provisionally identified included birch (*Betula* sp.), alder/hazel (*Alnus glutinosa/Corylus avellana*), poplar/willow (*Populus/Salix*), hawthorn group (Maloideae) and ash (*Fraxinus excelsior*). The presence of exotics was possible but not confirmed at the assessment level. A number of the fragments came from small diameter roundwood. The samples appeared to contain mixed assemblages of species, which is consistent with the earlier fuelwood collections. However, further analysis would no doubt have extended the species list and may have revealed exotic species, such as the 'pitch pine' noted among the assemblage of worked wood (Goodburn, Chapter 5).

Discussion

While some structural or artefactual remains may be represented in the samples, the provenance of most of the retrieved charcoal is likely to be from firewood. It is not surprising, therefore, that most of the species identified were native to Britain. Timber may have been imported, for construction or industrial uses, but firewood for domestic use was generally gathered from local resources. The charcoal from the French Quarter site indicates that a wide range of species were utilised for fuelwood, oak being notably dominant among the assemblage. A range of habitats are represented; wetland is indicated by alder and alder buckthorn; heathland by gorse/broom; scrub by purging buckthorn, blackthorn and hawthorn-group. Birch is a pioneer tree, which grows in open woodland or heaths. This suggests that the inhabitants of Southampton were drawing firewood from a broad region and exploiting different habitat types. This appears to be fairly consistent throughout the phases represented, although there are some interesting differences. For instance, there is an apparent rise in the use of beech wood in the later phases, and hazel is not recorded after the late Saxon period.

Evidence for woodlands from the Domesday Book suggests that this region was not heavily wooded in 1086 (Rackham 1997). One of the sources of firewood for Southampton would have been the New Forest, which was made into a royal forest by William I, with some concessions for fuelwood supplies granted to locals. The New Forest at this time was not entirely woodland, but what is termed wood pasture; a system of land management that uses the same area for trees and grazing animals. Wood pasture is characterised by areas of scrub, grassland and scattered trees within the wider area of more dense woodland (Fay & Robinson 2002). This type of environment is consistent with the fuelwood evidence from Southampton French Quarter where a variety of habitat types are represented. Interestingly, the charcoal record also reflects changes that occurred in the New Forest over the medieval period. Hazel declined and was replaced by oak, which was succeeded more gradually by beech. It is thought that these changes, which are also apparent at other forests, were brought about over time, by the practices of woodland management (Rackham 1996).

Although it is difficult to determine woodland management from fragmented charcoal residues, the narrow diameter stems and growth ring patterning observed in some pieces from the French Quarter are appropriate for coppiced stems (further evidence for coppicing comes from the fired clay; see Poole, Chapter 5). By the Norman Conquest, all the woodlands were in known ownership (Rackham 2006); this was one of the reasons that William I's decision to create royal forests, thereby taking any timber rights under his control, was not popular. Within woodlands the trees were carefully managed to provide firewood, along with timber requirements for construction and fencing. Commonly the underwood trees were those coppiced or pollarded on a regular cycle to supply fuel and fencing, while a scatter of large timber trees, usually oak, were allowed to grow to a larger size for construction. It is suggested that there was little selection in the composition of the underwood species (and by association the type of firewood), although there may have been discrimination in the choice of wood for making charcoal (Rackham 1996). The general picture from the charcoal evidence at Southampton French Quarter is consistent with this picture and some interesting similarities between the charcoal record and the New Forest suggest this was a likely source for the town's fuel supplies.

INSECTS AND ARTHROPODS

Insects *by Emma Tetlow*

Introduction

Insect remains were retrieved from four samples taken from the fills of an Anglo-Norman well and cess pits of Anglo-Norman and post-medieval date. The insect assemblage suggests that material was being dumped into these features from a number of sources. The dumps included drier material thought to be derived from human housing, spoiled foodstuffs (including granary pests), rotting organic material and possibly human faeces. The largest component of the assemblage is characteristic of general human habitation and domestic waste. Waste specifically associated with stabling, such as dung or manure, is limited.

Insects by site period

Anglo-Norman (AD 1066-1250)

Pit 4823 at Property 3 (Tenement 238) produced a large, well-preserved and readily interpretable assemblage. Several species recorded from this feature form part of Kenward's 'house fauna', such as the ptinid, *Ptinus fur*, and the lathridiids *Enicmus minutus*, and *Corticaria* spp. The scarabaeid *Trox scaber*, while not strictly part of the house fauna group, is often allied with it (Carrot and Kenward 2001; Kenward and Hall 1995).

A relatively large number of taxa from this pit are associated with fouler, rotting material. Among this group are the scarabaeid 'dung beetles' *Aphodius sphacelatus*/*A. prodromus*. These species are often encountered in animal dung, though recent work by Kenward (Kenward *et al.* 2004) suggests that they may well have brad in suitably foul deposits associated with human settlement in the past. The small scarabid *Oxyomus sylvestris*, is also found in decomposing organic material and abundant in dung heaps (Jessop 1996). The histerid *Paralister* spp., the hydrophilid *Cercyon analis*, and the rove beetles

Phyllodrepa florialis, *Omalium rivulare*, *Oxytelus rugosus* and *Oxytelus sculpturatus* are all associated with accumulations of damp, rotting organic material (Koch 1989a, Tottenham 1954). *C. analis* and all four staphylinids are part of Kenward's 'generalist' decomposer group 'RT' (Kenward and Hall 1995).

Taxa associated with seasoned wood are restricted in this sample to a single specimen of the anobid, *Grynobius planus*. Granary pests were also absent, although the bruchid, *Bruchus rufimanus* (the 'bean weevil') is a pest of large legumes and particularly broad beans (*Vicia faba*) and has been used in the past to suggest either the disposal of spoilt legumes or the presence of cess and consumption of infested food (Osborne 1983). A further bruchid, *Bruchidius fasciatus* is found on common broom (*Cytisus scoparius*) (Koch 1992). Other monophagous phytophages suggest disturbed and waste ground. *Apion hydrolapathi* is associated with docks (*Rumex* spp.), *Cidnorhinus quadrimaculatus* is found on the common nettle (*Urtica dioica*), while *Ceutorhynchus contractus* feeds upon comfrey (*Symphytum officinale*) (Bullock 1993).

Also recovered in large numbers from this sample were fly puparia of the species *Thoracochaeta zosterae*. This taxon, discussed further below, is particularly abundant in organic material in the later, fouler stages of decay, and with cess pits, and was common in pit fills at Coppergate (Kenward and Hall 1995). Belshaw (1989) suggests that *Thoracochaeta zosterae* exploited a niche similar to its usual ecological range which is among rotting seaweed. The salts, nutrients and semi-fluid consistency of the cess pit would have been similar to that of its coastal habitat (Belshaw 1989).

Cess pit 7109 at Property 11 (Tenement 168) produced an assemblage more akin to that of the Anglo-Norman well than that of pit 4823. Once again, species associated with the 'house fauna' were recovered and included Cryptophagidae, *Ptinus fur*, *Anobium punctatum*, and *Trox scaber*. Several specimens of the granary pests *Oryzaephilus surinamensis* and *Sitophilus granarius*, were recovered. The sample also contained a small number of puparia of *Thoracochaeta zosterae*, taxa which would suggest that large quantities of dung or rotting material were absent.

High medieval (AD 1250-1350)

The assemblage from the upper fill of well 3145 in the courtyard at Tenement 237 (a feature which originated in the Anglo-Norman period) was predominantly composed of taxa associated with foul rotting material such as the Staphylinidae, *Oxytelus sculpturatus* and *Oxytelus tetracarinatus*. These species typically live among accumulations of damp, foul, rotting material (Tottenham 1954), while the lathridiid, *Enicmus minutus*, is associated with drier material such as mouldy hay and straw (Kenward and Hall 1995). A single specimen of the grain weevil, *Sitophilus granarius*, was also recovered. It is found on lightly spoiled grain and can be a serious pest of grain stores and granaries (Koch 1992). The sample also contains two species associated with seasoned wood. The anobiids, *Anobium punctatum* and *Xestobium rufovillosum*, are serious pests of woodwork, furniture and timber structures (Koch 1989b). A further species associated with living trees is the curculionid, *Polydrusus cervinus*, which is usually found on the leaf of birch (*Betula* spp.) and oak (*Quercus* spp.) (Koch 1992).

Post-medieval (AD 1510-1750)

The assemblage from a stone-lined cess pit (3169) at Tenement 237 was restricted to species of Kenward's 'house fauna' and the 'generalist' decomposer group. The 'house fauna' component was relatively small, but included large numbers of *Ptinus fur*, and several individuals of the cryptophagid, *Cryptophagus sctellatus*, and the anobiid, *Anobium punctatum*. The remainder of this fauna was species associated with rotting organic material, such as *Oxytelus tetracarinatus*, *Acritus nigiricornis*, *Gnathoncus nanetensis*, and *Paralister puperascens*. *Oxyomus sylvestris* is also often associated with accumulations of dung and foul, rotting organic material (Jessop 1996b). A single specimen of *Anthonomus pomorum*, the 'apple blossom weevil' was also recovered.

Discussion

The dominant groups in the assemblages are the synanthropic and decomposer taxa, associated with a number of Kenward's 'indicator groups' (Carrot and Kenward 2001; Hall and Kenward 1990; Kenward and Hall 1995; Kenward and Hall 1997). The most apparent are those which belong to the 'house fauna'. Taxa from this group form a substantial component of the assemblages from all four samples. The incorporation of such large numbers of these creatures clearly suggests that a substantial constituent of these deposits is derived from an anthropogenic source.

The 'house fauna' group is commonly associated with unheated earthen-floored dwellings and wooden or wattle and daub structures and is also associated with relatively dry 'hay-like' material in the early stages of decay (Hall and Kenward 1990; Kenward and Hall 1995). Further species from the present site associated with human habitation are *Enicmus minutus* and *Sitophilus granarius*. Both species have been recorded in assemblages from thatched structures at several sites (Robinson 2007, Smith 1996, Smith *et al.* 1999). A further, significant component is the 'generalist' decomposer taxa, which includes families such as the Scarabaeidae, Histeridae and Staphylinidae. Overall, Scarabaeidae are relatively sparse in all four samples, which may suggest that large numbers of animals were not stabled at the site during either the Anglo-Norman or post-medieval periods. In addition it has been recently suggested that several species of *Aphodius* 'dung beetles' probably were able to breed in various, rather foul, deposits around human settlement and that their occurrence in low numbers should not be taken to indicate the presence of stabled animals by themselves (Kenward *et al.* 2004).

The foul nature of the infill of pit 4823 at Anglo-Norman Property 3 implies that the feature had fallen into disuse and was being used to dump settlement waste and cess. This is clearly indicated by the large numbers of *Thoracochaeta zosterae* which were recovered. Since this species requires foul conditions to breed (Belshaw 1989), it is highly unlikely that the water would have been fit for human consumption by the time this fly colonised the feature. The fill appears to have formed under a variety of conditions and would suggest that formation was a result of the dumping of domestic waste and cess. This may have included spoiled foodstuffs and other detritus associated with human occupation, such as rotting organic material similar to compost, and the cut may have acted as a natural 'pit-fall trap' for the 'yard' surrounding it.

Well 3145 within the courtyard at Polymond's Hall contained a much smaller fauna, primarily composed of house fauna taxa, which would suggest that domestic waste was being dumped into this well after it fell into disuse. The presence of *Xestobium rufovillosum* ('death watch' beetle) can probably be attributed to accidental incorporation. This species is associated with substantial, structural timbers, generally oak (Koch 1992).

Large numbers of Staphylinidae and Histeridae associated with damp, rotting organic material were also recovered from the Anglo-Norman cess pit (7109) noted above. This group probably indicates an accumulation of material more akin to compost or the detritus of food preparation such as a midden, than any substantial manure or dung heap. Various Coleoptera associated with spoiled or infested foodstuffs were also particularly abundant in this pit. The grain pest *Sitophilus granarius*, is as its name suggests, common in granaries, where both the larvae and the adults feed on tainted, whole grain (Coombs and Woodroffe 1963, Hunter *et al.* 1973). When such infestations occur, they can become, if unchecked, extremely destructive. Evidence of catastrophic infestations of granaries have been recorded at a number of Romano-British sites, including granaries at Coney Street in York (Kenward and Williams 1979) and Inveresk Gate (Smith unpublished a). A further granary pest is *Oryzaephilus surinamensis* (saw-toothed granary beetle), a 'secondary' pest of granaries which have often already been infested by *Sitophilus granarius* (Coombs and Freeman 1956, Hunter *et al*. 1973, Smith undated). An assemblage with some similar characteristics was recovered from cess pit deposits from Ramsey Abbey, Cambridgeshire (Tetlow 2007a, 2007b) where the presence of granary pests was interpreted as a by-product of food preparation rather than indicating the proximity of an infested granary nearby or that weevil-infected material was being dumped in large quantities.

Considering the nature of the Southampton deposit, it is quite possible that in this instance the grain pests were transported to the site accidentally, either by man or beast (Kenward and Hall 1997, Osborne 1983). Both species of weevil are commonly found in cess pit deposits; apart from Ramsey Abbey, they have also been identified from Malton (Buckland 1982) and The Magistrates Court, Kingston-upon-Hull (Hall *et al*. 2000a, 2000b, Kenward and Carrott 2006) and a single *Sitophilus granarius* was identified in a medieval latrine pit from The Brooks, Winchester (Jones *et al.* 1991). The presence of small numbers of *S. granarius* found in deposits at Viking York may have resulted from transportation via an equine gut (Kenward and Hall 1995) although the authors also consider the possibility of contamination. A further taxon associated with infested foodstuffs is *Bruchus rufimanis*, sometimes called the 'broad bean weevil'. The larval stage of this beetle is found in the seeds of large beans. Once again, this species was found in large numbers in Viking York, at Coppergate (Kenward and Hall 1995), Tanner Row (Hall *et al*. 1983) and Ramsey Abbey (Tetlow 2007a, 2007). M. Robinson (2005) suggests that this beetle is likely to be an indicator of sewage, since it is found in beans used for human consumption but can only infest a bean during its development on the plant, after flowering. Small numbers of 'grain pest' such as these two species are commonly found in archaeological cess pits were they are thought to represent the consumption of mildly spoilt grain which then passes through the human dietary tract (eg Osborne 1983).

The insect assemblage from the feature interpreted as a post-medieval cess pit (3169) indicates deposit formation under conditions similar to those recorded in pit 4823. Once again, it seems likely that this fill represents a mix of domestic waste, and decomposing organic material and dung. This would broadly support the hypothesis that this feature was indeed used as a cess pit, and also subject to the occasional dumping of domestic waste.

Assemblages such as these have been recovered from cess pits excavated in middle Saxon Southampton (Robinson 2005) and also from a variety of 10th- and 11th-century sites around the British Isles, including Coppergate and other deposits from Viking York (Kenward and Hall 1995), Kingston-upon-Hull (Hall *et al*. 2000a, 2000b) and Ramsey Abbey (Tetlow 2007a, 2007b). The archaeo-entomological data-set from the last site has many characteristics in common with the assemblages from the French Quarter and suggest the dumping of domestic waste and foodstuffs (Tetlow 2007a, 2007b). Further parallels exist between both the Anglo-Norman and the post-medieval assemblage at Southampton and other, contemporary, sites including the multiphase Shrewsbury Abbey site (Smith 2002), St John's Clerkenwell (Smith and

Chandler 2004), Witters Place, Chester (Tetlow and Smith, unpublished) and Finsbury Park Avenue (Smith and Tetlow, unpublished).

Conclusions

The well and cess pit deposits from the site clearly indicate that material from human activity was dumped in all four features. Much of this waste appears to have been generated as a result of domestic activity, probably from a midden or compost heap which was later dumped into both the Anglo-Norman and post-medieval features when they had fallen into disuse. The insect fauna indicate that the nature of this waste is commensurate with the type of material which would have accumulated in a midden and as a result of daily use of the tenement yard. There is no direct evidence in the insect assemblage for any industrial activity or prolonged stabling of animals, despite the known presence of stables at Tenement 237 from the late medieval period (Chapter 4).

Fly pupae, other insects and arthropods
by David Smith

The insect and arthropod faunas from the French Quarter samples were often preserved by mineralisation. This did make the identification of some of the fly pupae, where some external features were missing, problematic. The exceptions to this were sample 108 (from a post-medieval fill 3640 of tank 3549 at Tenement 237), sample 143 (from an Anglo-Norman pit 4494 at Tenement 237) and sample 146 (from fill 4574 of the courtyard well (3145) at Tenement 237) where the material was partially preserved by waterlogging.

For a number of the samples examined the only arthropod or insect remains encountered consisted of the exoskeletons of Diplopoda centipedes and of a wood louse (probably the common rough woodlouse, *Porcello scaber*). These taxa are often encountered as relatively recent 'contaminants' in dry sites, particularly where there is 'made' or porous ground, some disturbance and slight traces of organic matter. The contexts that these samples came from are mainly a range of hearth and destruction layers of Anglo-Norman and high medieval date. However, a number of other samples, mainly from a range of well or pit deposits, contained relatively large populations of fly pupae and sometimes the cuticle remains of adult beetles. Given the ecology described below, it is clear that these are contemporary with the deposition of material into these features as the archaeological record was formed.

A range of Anglo-Norman pit and well fills and high medieval cess pit fills all contained substantial faunas, often hundreds of individuals, of a range of dipterous pupae. In the case of sample 96, from a high medieval rubbish pit (5237, Tenement 177) this consisted of several thousands of individuals. The large population of pupae suggests that these rubbish/cess pits at Southampton must have been particularly 'fly blown' in the later stages of their depositional history.

The fly pupae identified from these deposits are typical of the insect life that develops in archaeological cess pits and, often today in septic tanks (Skidmore 1999; M. Robinson 2005). By far the most abundant of these is the small fly *Thoracochaeta zosterae* which occurred in almost all the samples examined often in large numbers. This is a species that Skidmore (1999) suggests is typical of archaeological cesspits. Today it is only found in accumulations of seaweed at the high water mark on the shore (Belshaw 1989; Skidmore 1999; Smith K.G.V. 1989; Webb *et al*. 1998). Belshaw (1989) holds that its presence suggests that archaeological cess pits often contained water and other substances with a highly 'saline' nature and that this probably resulted from the inclusion of both faecal material and stale urine. Webb *et al*. (1998) are less clear but suggest a similar environment.

Another fly found in two features (pit 5237 and well 3145) is *Eristalis tenax*, 'the rat tailed maggot' or the 'drone fly'. Larvae of this species are rather specialised inhabitants of water and wet compost containing high concentrations of faecal material and other foul matter. It floats just below the surface or on the bottom of shallow ponds of faecal material and uses its 'rat tail' as a snorkel (Skidmore 1999: Smith K.G.V. 1973, 1989; Robinson 2005). A similar environment is also utilised by the larvae of the appropriately named 'latrine fly' *Fannia scalaris* which uses the prominent air filled spikes on its body to float on the surface of liquid cess and waste (Skidmore 1999: Smith K.G.V., 1973, 1989; Robinson 2005). Pupae of the 'common fruit flies' *Drosophilia* spp. were also recovered from sample 72 from Anglo-Norman cess pit 5090 (Property 7, later Tenement 178). Species of this genus are normally associated with rotting fruit, vegetable waste and rubbish (Smith K.G.V. 1989; Robinson 2005).

Sample 108 from post-medieval fills of a stone tank (3549) forming part of the well house at Tenement 237 contained a very different insect fauna to the rest of the material examined: on the basis of the clay pipe, this deposit dates to *c* 1640-80. The insects present had been preserved through waterlogging and consisted of fragments of a range of adult beetles. These species are also very ecologically specific. Between 10-20 individuals of the 'granary weevil' *Sitophilus granarius* and 5-10 individuals of the 'saw toothed grain beetle' *Oryzaephilus surinamensis* were recovered. Both species are pests of stored grain, warehouses and flourmills (Freeman 1980; Hunter *et al.* 1973). Their presence probably indicates that either rotting grain had been deposited directly into this feature or that the faecal material present contained a large amount of poor quality and infested grain. Several studies of cess pit faunas have suggested that grain pests can commonly enter cess pits via this route (Osborne 1983; Smith D. 1997; 2002b; 2006). In addition, dumps of infested grain are not unknown for this period (Smith D. 1997).

The insect fauna studied here are typical of medieval cess pits and are directly comparable with those from 12th-century Worcester (Osborne 1983) and 12th- to 14th-century London (Smith 1997; 2002a; 2006). It is clear from the species of insect recovered that these deposits are primarily from the fills of cess and rubbish pits, which had been allowed to become very foul with material in an exceptionally advanced state of decay and often with standing water. The number of fly pupae recovered also indicates that the pits must have been 'fly blown', unsanitary and particularly smelly. The human population of Southampton may have taken periodic remedial measures to lessen this problem. Many of the faunas of fly pupae recovered clearly show that the adult flies had failed to emerge and that the pupae had been killed suddenly. This is clearly seen with some of the specimens of *T. zosterae*, particularly in the high medieval rubbish pit 5237 at Tenement 179, where the 'shadow' of the near adult flies was clearly to be seen within the pupae. This indicates a 'sudden kill-off' event. Skidmore (1999) suggests that intentional 'liming' of cess pits is one form of behaviour that could result in this pattern (see also Smith W. above).

INTESTINAL PARASITES *by Andrew R.K. Jones*

Thirty-one samples from various pit fills assigned to each of this site phases were examined for intestinal parasite ova and included 16 samples of concreted material from sieved samples which resembled coprolites. On closer inspection these proved to contain inclusions such as small splinters of large mammal bones, indicating they were dog droppings. Parasite eggs were found in 50% of the samples of the concretions and approximately 25% of the earth samples (Fig. 6.10). Ova with two polar openings were identified to the genus *Trichuris* and larger ova

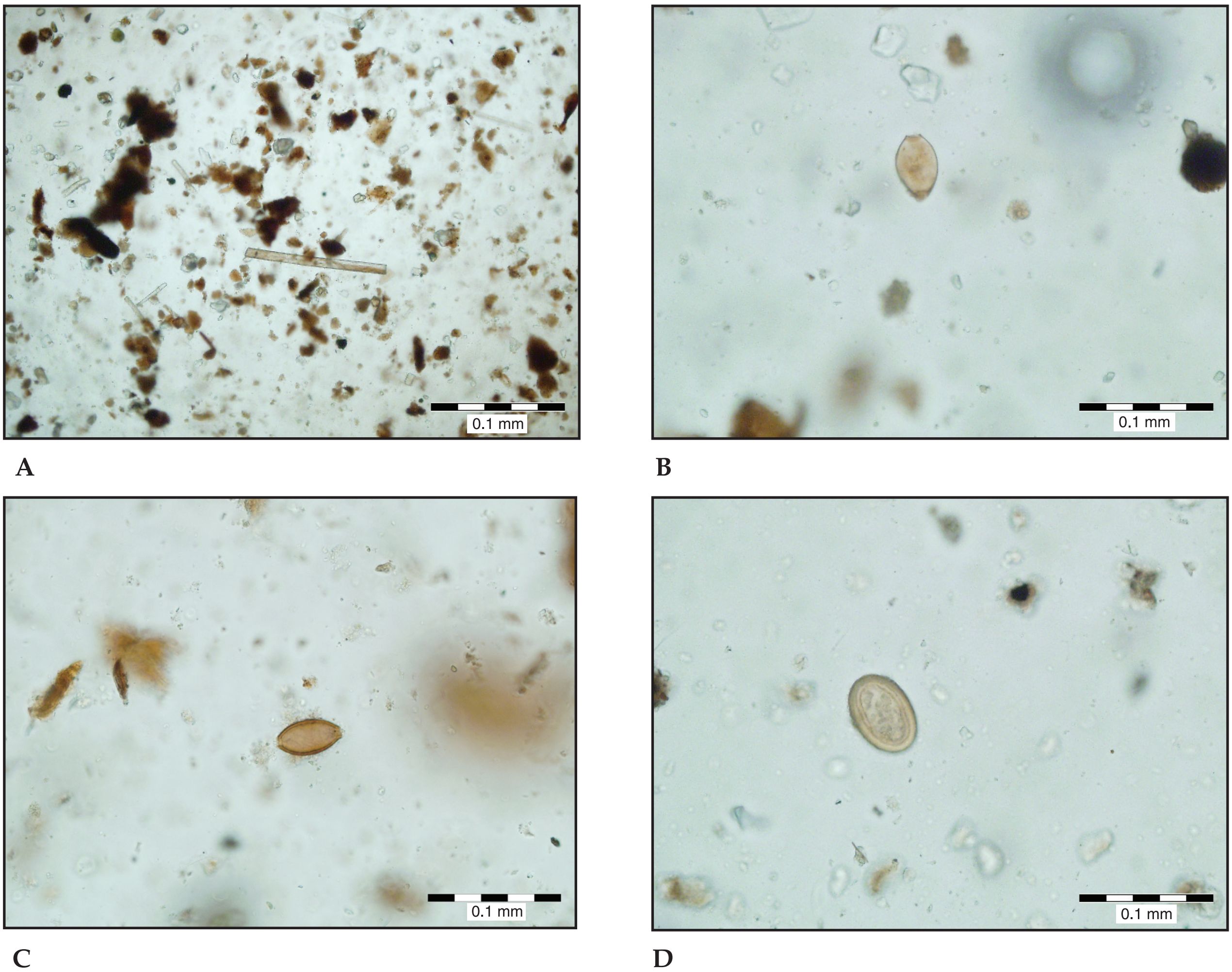

Fig. 6.10 A) Overview of an assemblage of parasite ova from Anglo-Norman cess pit fill 3736 (pit 3733) at Property 7 (Tenement 176). It shows the presence of a ?rod-form phytolith, charcoal fragments, amorphous organic particles and mineral particles B) Fill 3736: thin walled trichurid ovum lacking polar plugs C) Fill 3736: thick walled trichurid ovum D) Fill 3736: possible parasite ovum, ?decorticated Ascaris lumbricoides

with characteristically mammilated outer shell were attributed to the genus *Ascaris*, an intestinal roundworm. Measurements of trichurid ova were taken, the size of the overall eggs and their association with *Ascaris* ova indicate that the species present is *Trichuris trichiura*, the human whipworm.