WINCHESTER
A CITY IN THE MAKING

Archaeological excavations between 2002 – 2007
on the sites of Northgate House, Staple Gardens and the former Winchester Library, Jewry St

Section 12

Fish Remains
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Introduction

This report details an assemblage of over 10,000 identified fish bones, from an assemblage of over 20,000 fragments recovered from Roman through to medieval deposits at Winchester Northgate House and the Discovery Centre (WINCM:AY93 and WINCM:AY220). The great majority of the assemblage was recovered from bulk soil samples, with very few fish bones being recovered by hand during the excavations. The reported assemblage includes material sorted from all significant periods of occupation.

During the excavations, a total of 447 soil samples were sieved to 0.5 mm (occasionally 1 mm) as part of the flotation process for the recovery of plant and animal remains. Residues were prioritised for sorting based on stratigraphic grounds and on an assessment of their likely richness in terms of numbers of identifiable bones. Occupation surfaces, cess pit fills and other distinct features such as hearths were generally prioritised. Mixed contexts or contexts of uncertain provenance were generally avoided, although samples from the Iron Age and Roman periods were sorted and recorded in their entirety unless there was significant evidence to suggest the presence of material of different dates. While complete standardisation of sample volumes was not possible, wherever practicable samples comprised 20 or 40 litres of soil before processing. Samples from excavations at Northgate House by Wessex Archaeology were generally of 1 -10 litres volume; only the fish remains from the pre-Roman and Roman samples from these are included in this report.

Methodology

All samples were processed either by wet sieving or by water flotation using a modified siraf style tank. Volumes of processed soil for samples producing reported fish remains are given in Table 1. Samples which were processed but were not

selected for further study are excluded. The residues from contextually secure bulk-sieved samples were routinely sorted to 4 mm and to 2 mm where residues were found to contain significant fish remains. In a small number of cases, where fine (4-2 mm) residues proved to be particularly large and/or rich in small bones and therefore very time-consuming to sort, a proportion (usually 50%) was fully sorted. Where residues contained fish bone in their finest fractions, 100 ml of the <2 mm residues was sorted with the aid of a microscope to enable the recovery of a proportion of these tiniest bones. All samples from the Iron Age and Roman phases were completely sorted to 2 mm, in order to avoid a perceived bias against the recovery of small fish deposits of these ages (see Barrett *et al.* 2004, 4). Fish bones and scales were also extracted from the flots taken for charred plant remains. Full details of sample sizes and volumes of material sorted (where less than 100%) are available, along with the full fish identifications and measurements, in the data archive. Where a proportion of the < 4mm residues have been sorted (only applicable to samples from the late Saxon and medieval periods) the results have not been artificially scaled up for general tabulation of identifications per phase (Tables 3, and 5-8), so inevitably small and tiny taxa in these samples may be under-represented. The results have, however, been scaled up to 100% in the discussions below concerning the proportions of herring and eel in the assemblages and for the tabulation of fish remains per litre of soil (Table 2). Tiny (<2mm) fish remains were not generally abundant in the samples and where present were recovered from mineralised cess pit fills. These assemblages are not directly comparable with those from other types of deposit, since tiny fish bones are likely to have been completely degraded in less favourable burial environments.

Bones and scales have been identified to species and anatomical element largely using the author's personal reference collection in conjunction with published guides (in particular Watt *et al.* 1997). Where identifications were uncertain the bones have been identified either to family level or have been classified as unidentified. Bones were identified to species where possible, otherwise to genus or family. Spines, ribs, rays cranial fragments and branchial bones were only identified when particularly diagnostic to species or genus, for example gurnard skull fragments and rays. Clupeid bones (herring/sprat/pilchard) were identified to species where possible; the great majority were classified as herring, based on their size and/or morphology. Small clupeid bones may be from sprat, but no positive identifications of this fish were made.

Fish scales were present in a number of samples, but can difficult to identify as they vary in appearance not only between taxa but also with position along the body. Fragmented scales are particularly problematic. Given these limitations, the majority of scales recovered were identified as sea bream or clupeid. Where many scales were present they have been counted as 1 where this was the only identification for the taxon in the sample, or 0 where other remains had been identified, to avoid taxa with many surviving and distinctive scales being grossly over-represented. Notes are provided in the archive record to indicate general abundance. Other dermal structures included the distinctive skin bucklers or thorns from rays; where quantities of small and tiny dermal structures were present, they have again been scored as for scales. Where dermal denticles could be identified to species, all were from the thornback ray or roker (*Raja clavata*). Dermal scutes from sturgeon, mackerel and gurnards were also recorded.

Fish sizes were estimated by a combination of bone measurements and direct visual comparison with bones from comparative modern fishes. Measurements were taken, using digital callipers to 0.01mm, on the premaxilla and dentary (following Wheeler and Jones 1989) and the atlas vertebra (following Morales and Rosenlund 1979) of cod family fish (Gadidae) as follows: premaxilla - width of the ascending process; dentary - depth from the tooth row to the base of the ridge, taken at the posterior margin of the nutrient foramen (M1) and depth at the symphysis (M2); atlas vertebra- length of the anterior articulating facet (M1), width of the anterior articulating facet (M2), and maximum centrum height (M3). Otolith maximum length (M1) and breadth (M2) were also measured as was the total length of eel cleithra. Where appropriate, the total length of fish was estimated using alogorithms established for gadid fish by Barrett (1995) , eel by Coy (1989) and by reference to modern comparative fish skeletons held by the author. Measurements and identifications are available in the site archive: where sizes are indicated for gadid fish (fish of the cod family, Gadidae) the following approximate sizes apply : tiny (under 0.2 m length), small (0.2-0.4 m), medium (0.4-0.7 m), large (0.7-1 m), extra-large (over 1 m). For flatfishes, small (under 0.3 m) medium (0.3-0.5 m), large (over 0.5 m).

Taphonomy

Interpretation of fish remains based on their relative frequency either between taxa or between archaeological deposits or phases is problematic, since different kinds of remains are likely to have been deposited in different ways. Some small fish may be eaten entirely, bones and all (for example whitebait) while other fish may be stewed, and others preserved with the majority of bones taken out (eg. dried stockfish, rollmop herrings). Fish remains may represent kitchen rubbish or be excreted in faeces. The taphonomic pathway will affect the relative preservation of the bones, making it difficult to compare directly assemblages which have accumulated in different ways. Using any means of quantification has inevitable limitations, and in this report only numbers of identified specimens (NISP) have been tabulated (Table 3 and Table 4). The relative significance of different groups of fish is discussed in broad terms, but variations in context type particularly between phases should be born in mind. Deposits from cess pits, in particular, are likely to be dominated by bones from small fish whose bones could be consumed. The probable incorporation of a cess component in other features, especially pits, does mean, however, that it is not practicable to separate completely the quantification and discussion of fish from cess.

The Assemblage

From an assemblage of over 10,000 bones identified to taxon, only 67 were retrieved by hand during the excavations, a stark indication of the problems encountered when comparing bones from sites where different collection methods were used. Unsurprisingly, at Northgate House and the Discovery Centre the volumes of processed soil varied significantly between the different periods of activity (Table 1), reflecting in part changes in density of occupation over time. Changes in the abundance of fish remains reflect to some degree these variations in the volumes of sieved soil (Table 2) but the overall trend is for the concentration of fish remains to increase over time. Phase 4.2 stands out as having a greater concentration of identified fish bones per litre of soil than phase 5, but this may be due to the excellent preservation of organic materials within some of the late Saxon cess pits. The increase in fish bone concentration between phases 4.1 and 4.2 may, however, be real since pits with mineralised fills were present throughout period 4. Serjeantson (2009, 11)

notes that in Winchester, as in other towns, the proportion of bones analysed out of those excavated diminishes from the late Saxon period as a result of increased levels of residuality observed in later deposits. Taken together with the increasing complexity in social organisation manifest in developing towns, it is clear that while broadly speaking the Saxon material may reflect the fish generally available to the local population, the deposits from later periods are more likely to reflect social demographics.

Of the few bones recovered by hand collection on site, most were, unsurprisingly, from large fish including cod, flatfishes (especially large plaice) and conger eel, the last often from fish of >1 m long. Occasional bones from bass, sea bream(s), gurnard, scad and eel were also collected, but the most significant find was a very large sturgeon scute from NH5185.

Iron Age and Roman deposits

The Iron Age and Roman deposits included a very small number of fish bones (Table 3) perhaps not surprising given the types of deposits encountered. Those Phase 1 deposits which produced fish remains (only four bones, from herring and eel) included post-hole fills, subsoil layers and gully fills, none of which are promising repositories for general rubbish, and the possiblility that these bones are intrusive can not be ruled out. Fish remains were found in pit fills from Phase 2, but were also found in trample layers and dumps. The fish represented most frequently, albeit by small numbers of bones, were eel and herring. Small flatfishes, mainly or exclusively from the plaice/flounder dab family Pleuronectidae, were also represented in a number of samples. Sea bream, including black sea bream, was identified in phases 2.2 and 2.3, while salmonids were present in three Roman samples and one sample from late Roman phase 2.4 (dark earth). Three of these bones were vertebrae from large fish, probably salmon while the fourth, a single tiny vertebra from context NH1739, was probably from brown trout. While salmon, trout and eels may have come from local rivers and streams, and flounders can be found in fresh water as far up the Itchen as Winchester, the herrings and sea bream, and probably also the flatfish, must have been imported, possibly pickled, smoked or salted at least in the case of herrings, which deteriorate rapidly once caught.

Cess pit sample NH554 (NH4743) in phase 2.4 mainly produced bones from eel (including elver) but also included an anal pterygiophore from a small flatfish and an unidentified tiny fish vertebra.

Late Saxon, AD 850-1050

Deposits from the late Saxon period (Phase 4) produced over 4800 identified bones, almost all from cess pit fills, pit fills and occupation deposits. The later part of this period (Phase 4.2) produced around 75% of this assemblage.

Herring, followed by eel, were the fish most commonly represented both by numbers of bones and the proportion of samples containing these taxa. Some of these bones were concreted in cess and some were corroded and deformed in a manner consistent with chewing and passage through the gut (Jones 1986; Nicholson 1993). Not all of the small and tiny clupeid and eel bones were altered in this way, however. Considerable numbers of bones from tiny, juvenile fishes were intact, which given the aggressive nature of digestive juices would indicate that these bones did not themselves derive from cess. It would seem likely that the cess pits also incorporated some spoilt or undersized fish or possibly guts from larger fish. Smaller flatfishes (mainly plaice, flounder or dab – particularly plaice) mackerel and thornback ray were also relatively common, but their remains were never nearly as numerous as those from herring and eel. Gadids were rare, and generally small; cod, whiting and hake were all identified. The larger bones must have been discarded together with other general kitchen waste.

Other fish represented included garfish, scad, sea bream(s), tub gurnard, bass, grey mullet, conger eel, small cottid(s), salmonids including trout and probably salmon, pike, cyprinids including dace, and gudgeon, and even 3-spined stickleback. A single vertebra was identified as sand smelt. All of the freshwater fishes were small individuals. Where eel cleithra were measureable, all came from fish of less than 400 mm, and usually between 25 and 35 mm. Although pike can grow to over 1 m the individuals represented here were only around 300 mm or less. The cyprinids were even smaller - most were 150 mm or less while the majority of the salmonid bones were from small brown trout.

Phase 4.1 (Table 5)

Only 310 identified bones dated to the earlier part of the late Saxon period were recovered by sieving, and of these the great majority were from clupeids, mainly

herring (68%) with bones from eel and smaller flatfishes also relatively numerous. Almost all the bones came from features within plots BW2, BW4 and BW5 - levels in BW3 were largely below the mitigation level. Three-spined stickleback and dace were identified in context 2515 within pit NH8598, from plot BW5, while a small salmonid (probably brown trout) was recovered from occupation deposit NH3494 in BW4.

Phase 4.2 (Table 6)

Almost 4000 bones were identified from the later part of Phase 4, many from cessy pit fills, where mineralisation of the organic fills had resulted in the excellent preservation of small and tiny bones as well as seeds, fly pupae, puparia and bones from frogs and mice. Herring represent around 60% of the recorded bone - 55% if the results are scaled up to take into account residues which were not fully sorted (see above). Eel represented some 28% of the recorded assemblage, but 33% if the results are scaled. Additional sorting of fine residues would undoubtedly have increased the proportions of both small clupeids and eels.

Plot BE2

Of the 1350 identified bones, 1133 were from herring. Had all 4-2mm residues been sorted this figure would undobtedly have been eaven greater. Eel, smaller flatfish and mackerel consitutes the majority of the remaining assemblage, while smaller gadids including whiting, thornback ray, bass and a salmonid were represented by one or several bones (dermal denticles in the case of the ray). Many of the bones from this plot derived from slumped occupation deposits CC1354 CC1408, CC1434 and CC1420 with bones also identified from pit fills CC1357, CC1361, CC1376, CC1380.

Plot BE4

A smaller but more diverse fish assemblage was recovered from BE4. Eel bones outnumbered those from herring and several bones from freshwater fish including trout and gudgeon were recorded. Most bones were recovered from pit fills, including CC1357, CC2010, CC2126, CC2178, CC2283, CC2448 and CC2449.

Plot BW1

A single herring vertebra was recovered.

Plot BW2

Herring and to a much lesser extent gadids, dominate this assemblage of 471 bones. Flatfishes, rays, eel and possibly scad were also present. Two pharyngeal bones from small dace provide evidence for freshwater fishing. Most of the fish remains were

recovered from floor/occupation deposits including NH4209, NH4212, NH4217, NH4226, NH4369 and NH4394.

Plot BW3

Only two clupeid bones were recorded.

Plot BW4

Herring and eel were similarly represented, a reflection of the cessy nature of the deposits, particularly the fills of pit NH2133. Flatfishes (including plaice and flounder), mackerel, thornback ray, sea bream, bass, whiting, garfish and cottid all demonstrate the imporation of sea fish, while dace, stickleback and trout suggest local river fishing. The bones were recovered from pit fills (including those from NH2133) but also many were found in occupation deposits: NH3106, NH3141, NH3168, NH3174, NH3175, NH3199, all from group NH8569.

Plot BW5

Of the 83 identified bones, salmon and scad augment the usual herring, eel, thornback ray and small flatfish. All were from pit fills NH2411 and NH2426.

Plot SE1

A very small number of identified bones included mackerel as well as eel, herring, ray and flatfish.

Anglo-Norman, AD 1050-1225

Fish remains from the Anglo-Norman period (Phase 5, Table 7) largely came from from pit fills, but within this category pits positively identified as cess pits were rare. The assemblage was dominated by clupeids, notably herring (80% of the recorded assemblage). Eel was much less frequent than in samples dating to the preceding centuries (6.5%). Gadids continued to be relatively rare and generally small, with bones from cod, whiting, haddock and hake identified. Flatfishes, particularly plaice/flounder/dab were particularly common in this period, overtaking eel by numbers of identified bones. Elasmobranchs, including rays, were again represented in many samples. Taxa represented by one or several bones were extremely similar to those identified in phase 4 deposits. Bass, conger eel, garfish, grey mulley, gurnard, mackerel and sea bream(s).

Plot BE3

Just under 200 bones were identified, almost all of which were herring. Eel, conger eel, small right-eyed (plaice/flounder/dab) and left-eyed flatfish (turbot/brill/megrim),

thornback ray, mackerel and small gadid were also recorded. Most of the bones came from pit fill CC1272.

Plot BE4

A very similar small assemblage to that from BE3. Additional taxa include garfish, sole, cod and pollack. Almost all the fish remains came from pit fills, including CC2027, CC2060, CC2095 and CC2302.

Plot BE5

A greater range of species was present in pits from BE5, a reflection of the larger numbers of identified bones (453). Again numerically dominated by herring, bass, sea bream, halibut, gurnard and trout were also present.

Plot BW1

Only 22 bones were identified, from herring, eel, small gadid(s), flatfish, mackerel and ray(s). A mixture of pit fills and occupation spreads were sampled from this plot, and the fish bones came mainly from occupation deposits CC2207, CC3084, CC3103, CC3104 and pit fills CC3180, CC3050, CC3017 and CC3029.

Plot BW2

Only 73 bones were identified, from herring, flatfishes, garfish, ray(s), eel, and mackerel. Almost all came from floor deposits.

Plot BW3

Of the 373 identified bones, herring bones again dominated numerically, followed by flatfishes, eel, gadids (including whiting and cod), ray and grey mullet. The fish were recovered from a range of context types, including pit fills (eg. NH3415), occupation/floor deposits (eg. NH3487, NH3617, NH4449, NH4458) and burnt spreads including NH3794 and NH4511.

Plot BW4

A very similar group of bones to those from BW3, scad, garfish and conger eel were also present. Sampled deposits containing fish remains included pit fills, well fills (NH2250), occupation deposits (NH3434) and levelling deposit NH3222.

Plot BW5

Out of 800 identified bones, 750 were identified as clupeid, mainly herring. Eel, flatfish, ray, trout, mackerel and gadids were represented by very small numbers of bones. Most bones came from pit fill NH2342 and well fill NH2291.

Plot BW6

Again an assemblage dominated by herring (80% of bones), flatfishes (particularly plaice) accounted for 13.5% of the bones, while conger eel, elasmobranch(s) including thornback ray, and mackerel were also present. Tiny cyprinid bones from species including dace were recovered from NH7501, a fill of pit NH7500. This deposit produced almost all the fish bones from BW6.

Plot SE1

Contexts in property SE1 produced only 228 identified bones from sieving but also produced 17 identified bones by trowelling. Almost all of the identified bones came from the fill of pit NH5169. The sieved assemblage again included herring (45% of bones) but included a wide range of other taxa considering the total number of bones. Sea bream(s), scad, trout, garfish, cottid(s) and cyprinid(s) were recovered in addition to mackerel, rays, flatfishes and eel. Several gadid bones were also recovered, including a fragment from a large ling dentary. Ling were, together with cod, widely traded as dried stockfish in the middle ages. The presence of a dentary, however, suggests that this fish was fresh, since stored ling would have lacked the head. The hand collected bone included head bones from large (around 1 m) cod, large eel (of 700 mm or more), large plaice (of around 600 mm), conger eel, gurnard, garfish and notably fragments of at least one very large sturgeon scute. This scute, together with other fish bones, was recovered from NH5185, a fill of pit NH5169 from pit group NH8612 in property SE1. This property was located to the south of the archdeacon's residence, in an area known to be wealthy by and possibly part of a substantial capital tenement owned by Silvester in 1249 (Keen 1985 and Teague, pers. comm.).

Plots SE2 and SE3

No identifiable bones were recovered by sieving, but bones from scad, flatfish and gadid were hand retrieved.

Medieval, AD 1225-1500

Only a selection of samples from deposits assigned to the medieval period was included in this analysis, from plots BE1-5 (Table 8). Over 2000 bones were identified to at least family level. Again, most bones were recovered from pit fills, particularly from CC3276 (pit CC3283, BE3), CC1758 (pit CC1756, BE2) and CC1296 (pit CC1245, BE5). Because a number of samples contained abundant small bones (mainly herring) only a documented proportion of the finer residues were

sorted. While clupeids, especially herring, were still numerically dominant (52% of identified bones, 49% if the results are scaled, see above), gadids were evidently much more common in the medieval deposits than previously, representing around 25% of the identified bones in the sieved assemblage (23% if the results are scaled). Of the gadids, whiting averaging around 40-450 mm (but including smaller and larger fish) was particularly common, with cod, haddock and pollack also present. Pit fill CC3276 in plot BE5 contained a large number of whiting bones from at least nine complete fish, ranging in size from 250 mm to well over 500 mm but averaging 350 - 450 mm. Eel accounted for 12% of identified bones (13% if the results are scaled) and flatfishes just 2.5%. Measurements on the cleithrum indicated eels of 350- 420 mm long. Elasmobranchs including thornback ray, garfish, conger eel, bass, tub gurnard, mackerel, grey mullet and sea bream(s) were all identified. Freshwater fish were scarce but included occasional bones from small perch, pike, trout and cyprinids including roach.

Discussion

The fish assemblage from Winchester Northgate House and the Discovery Centre is the largest yet recorded in Winchester. Previous work has concentrated on the suburbs, while little bone has been recorded from intramural areas.

Although very small, the fish remains from the Iron Age and Roman deposits are significant and all derived from sieving. While odd herring bones in early deposits may, of course, represent some mixing and incorporation of later material, it is notable that herring were also recorded in low numbers from Iron Age samples at Staple Gardens (Hamilton-Dyer 2004). The Roman samples are interesting and fairly typical for fish assemblages of that date. With the exception of a small number of isolated deposits associated with preserved or preserving fish, Roman sites in England are generally typified by small numbers of fish bones and, at least for inland sites, by a predominance of freshwater and migratory taxa (see for example Enghoff 2000). Typically, salmon tend to be relatively more common on Roman sites than those of later periods. The Roman fish assemblage from Winchester is also very small, with only 37 identified bones from phases 2.1-2.3, among which both salmon and probably also trout feature, together with sea fish. An additional 30 bones were identified from phase 2.4. A similarly small assemblage (119 fish bones) was recovered from

Silchester (Hamilton-Dyer 2000) with taxa including salmon, bass, sea bream, grey mullet and cyprinids. Another similar although larger assemblage was recovered from Greyhound yard, Dorchester (Hamilton-Dyer 1993). Small numbers of Roman fish bones from Exeter included hake, conger eel, whiting, large gadid, salmon, sea breams, bass, gurnards, turbot and wrasses; the absence of sieving may here have prevented the recovery of smaller bones such as from herring (Wilkinson 1979, 79). Of the marine fish found in the Winchester samples, the presence of flatfish, sea bream and herring suggest the importation fish from the coast. Since Winchester can be reached from Southampton by boat up the River Itchen in a day, the importation of fresh fish, together with oysters and other shellfish, should not be considered remarkable, although it is possible that at least some of these fish were preserved. As an oily fish, herring go rancid very quickly, but can last many months if pickled in salt or brine. The Romans were fond of pickled fish products and salted and pickled fish, including (among other species) clupeids, anchovies, mackerel and sea breams, were transported in amphorae across much of Europe. While it is not possible to identify preserved fish from their bones alone, it would seem likely that preserved fish was sold in Roman Winchester. All the species represented could have been caught in the seas around southern England and importation of preserved fish from southern Europe need not be invoked. Evidence for late Roman fish sauce production based around the pickling of young herrings and sprats has been proposed at Peninsula House, London (Bateman and Locker 1982) and possibly in York (Jones 1988), perhaps as a response to declining trade from elsewhere in the Empire.

By the late Saxon period it is clear that a range of fish was readily available to the citizens of Winchester. As elsewhere in Winchester, eels and herrings were particularly common, the former probably fished from local rivers or transported fresh from further afield, while the latter were probably largely preserved by salting or pickling in brine. As a shoaling, pelagic fish, herrings can be netted in large quantities. Some sources place the origins of the commercial herring fishery in England back to the end of the 5th century AD (Samuel 1918) and the Anglo-Saxon chroniclers documented '*Piscatores Angliae, Galli et Belgae*' fishing for herring in the waters off Yarmouth (Cutting 1955, 54). However, the inland trade in salted herring was probably not established until the 10th century (Fagan 2006, 94). Eels can be caught fairly easily in traps, particularly during spring when they migrate downstream. Eel fisheries were extremely important, to the extent that rents could be

paid in eels (Fagan 2006, 32) and there are many eel fisheries documented in Domesday (Darby 1976, 57). Eels were particularly common in the late Saxon and Saxo-Norman assemblages from the Winchester suburbs (Coy 1989; Serjeantson 2009, 172) and in general there are striking similarities between the taxa represented at Northgate House and the Discovery Centre and those recorded from late Saxon sites in the suburbs (Coy 1989). This in in itself suggests the operation of an urban fish market or hawkers travelling from a local port, probably Southampton.

Evidence to indicate that the majority of marine fish were obtained from ports in or around Southampton come both from the species of fish and from the similarity of the fish assemblage to those recorded from sites of similar date in Hamwic and Southampton (see also Coy 1996, 56). While most of the fish in the Winchester assemblages can be found in coastal waters and seas around much of Britain, several are much more common in the English Channel and in the Solent than elsewhere. Sea breams in particular generally prefer warmer waters; black sea bream is a summer migrant north of the English Channel while *Sparus* species (gilthead and Couch's sea bream) are very rare in Northern European waters (Wheeler 1978). Thin-lipped grey mullet and bass are typically found in these waters, while conger eel are also common. Hake and pilchard are more frequent in waters around Devon and Cornwall and their remains are commonly found in fish assemblages from south west England. Documentary evidence records the transport of fish from Southampton to Winchester in the 15th century (Coy 1996; Locker 2000, 83) and it is entirely plausible that this trade had much earlier origins. In turn, the scarcity of hake (only one bone was identified) contrasts with 13th century and later deposits from the western suburbs (Coy 2009, 51-54) but suggests that fish were not commonly imported from south west Britain.

The Anglo-Norman assemblage was dominated by herring (80% of the recorded assemblage); eel was markedly less frequent than in the preceding centuries. This pattern conforms to model proposed by Barrett *et al.* (2004), with a dramatic rise in herring occurring in the 11th-12th centuries, largely at the expense of eel which had been a dietary staple. This rise in the frequency herring at the expense of eel is also evident in the Northern suburbs (10th century compared with 13th-14th century deposits - Serjeanton and Smith 2009, 144). The great majority of the herrings would again have been preserved. In all other characteristics, the Anglo-Norman fish remains were markedly similar to those from the late Saxon period, indicating

continuity of trade and supply of marine and freshwater fish. Most of the apparent variation between plots could be explained by variations in sample size; while herrings were the principle fish eaten by the poor, they were also eaten by the wealthy, and there is little in the fish assemblage to indicate any differences in household status. While turbot and the closely related brill, as well as halibut can be indicative of status (Harvey 1993; Serjeantson 2009, 180), those present here were relatively small sized. The single exception to this observation is the sturgeon find from property SE1. Of all the fishes, sturgeon are most commonly associated with high status – archaeological finds are almost exclusively associated with aristocratic or religious establishments.

The similarity between the Winchester material and that from Anglo-Norman contexts from Southampton French Quarter (Nicholson 2008) is again striking. There, too many of the fish remains came from cess pits, and a very similar range and sizes of fish were represented. The only significant difference was in the number of tiny fish – greater in the Southampton deposits than in those from Winchester. The Southampton contexts included several waterlogged pit and well fills, and these contained fish such as gobies and sand smelt which were scarce or absent from the Winchester samples, as well as abundant juvenile clupeids and elvers. Similar tiny fish were also present in medieval cess pit fills from Lower High Street (Hamilton-Dyer 1997). It is possible that post-depositional conditions in the Winchester pits prevented the preservation of these tiny fish, but is likely that the tiny gobies and sand smelt represent a local catch and were not traded inland. Large gadids, mainly cod but including a fragment of large ling dentary, appeared in Phase 5 for almost the first time; elsewhere in Winchester earlier examples of cod are recorded (Coy 2009) but neither fish was common until the middle ages.

Fish had become an important and regulated part of the diet by the 13th century; in the 12th century Pope Gregory made fish eating a requirement not only on Fridays, but also on Saturdays and other special festivals (Littler 1979, 2), in addition to which many households seem to have observed Wednesdays as a fish day (ibid.). Household rolls document the adherence to fish days, with records showing the purchase of large quantities of fish and other seafood. Littler (1979, 6) records for the 13th and 14th centuries that, ‘expenditure on fish was often as great as, and in many cases surpassed, the amount spent on meat and could represent a substantial proportion of the total household expenditure’. The impact of the church may be

apparent by the rise of fishmongers in Winchester. While during the 12th century a survey of gilds and merchants recorded just one fishmonger, dealing mainly in herrings, compared to five butchers (Locker 2001, 85), by the 14th century three times as many fishmongers as butchers were recorded as property owners in Winchester (Keene 1985, 259, cited in Locker 2001, 85). Poorer families may, of course, have consumed less fish than wealthy ones, although preserved herrings were always cheap. Freshwater fish commanded a high price, and a great range of fish were available; even small fish we would now consider inedible commanded a price. As an indication, Dyer (1988, 31) lists herring at 1/4d, plaice/flounder at 1/2d, large eel at 1 1/2d, perch at 2d, chubb at 4 1/2d, pickerel (young pike) at 8d and pike at 12d each in 1461, while 15th century records from the River Severn show roach and dace priced at 1/4d and small eels even less (ibid., 33).

Gadid bones, though never particularly numerous in the Winchester samples were noticibly more common in phase 6 than in the preceding periods. Bones from large cod (fish of 0.6 m to >1 m) were almost exclusively confined to Phases 5 and 6. The trade in dried cod and related species was well established by the 13th century, often under the control of Hansa merchants, who were active at many English ports including Southampton (Littler 1979, 212). The dried product was known by a number of names depending on the size and type of fish and the preservation method used. These dried 'stockfish' can be recognised in fish bone assemblages by the lack of head bones and dominance of those bones which would have been left in the cured product, notably the appendicular bones (including the cleithrum, supracleithrum and post-temporal) and parts of the vertebral column. Surprisingly, there was no clear evidence for stockfish in the Winchester fish assemblage although documentary records indicate it was brought to the town.

While conger eel can live out of water for a considerable time, its meat was also salted and dried. Freshwater eels too can be transported fresh, but were commonly traded as preserved fish (Cutting 1955, 55). Court rolls and brokage books from the 14th and 15th century indicate the movement of a range of fresh and stored fish from Southampton to Winchester, including barrels of herring, ling, conger eel, salmon, hake, sprats, 'mulwelle' and stockfish - the last two both dried cod (Keen 1985; Coy 1996; Locker 2001). Bass, (sea) bream, mackerel and mullet are also documented as sold in Winchester (Locker 1997). There also appears to have been some fish traded between London and Winchester (Keen 1985). The sturgeon

recorded in Winchester were probably imported. Sturgeon are now very rare visitors to British waters, any caught are due to the crown. Sturgeon were imported in barrels by Hansa merchants (Littler 1979, 211). Elsewhere in Winchester, sturgeon has been recorded from Sussex Street in the Western suburbs and from St. Mary's Abbey (Coy 2009, 44; Serjeantson 2009).

Conclusions

The fish assemblage from Northgate House and the Winchester Discovery Centre contains remains dating from the Iron Age to the medieval period. While marine fish were present in all periods, the increase in the concentration of fish in soil samples from the late Saxon period (Phase 4.2) onwards appears to support the model proposed by Barrett *et al*. (2004) for significant expansion of fishing in the decades either side of AD 1000, at least for herring. Gadids only really appear to form a significant part of the fish assemblage in Phase 6, and there was no clear evidence for the dried and salted stockfish which were extensively traded from the 11th century and throughout the medieval centuries. While it is not yet possible to identify preserved from the condition of individual bones alone, it is likely that both fresh and preserved fish were eaten regularly. Documentary records from Southampton indicate that pickled, salted and smoked (red) herrings were traded, and eel and stockfish were also sent to Winchester. The similarity in fish assemblages from the sites in Winchester and published assemblages from contemporary sites in Southampton also provides support for the suggestion that the primary source of sea fish available in Winchester, probably from the time of Roman settlement, was Southampton Water and the Solent. While freshwater fish were consumed, apart from the migratory eel, their dietary significance never appears more than minor. These findings are in keeping with the results from other sites in Winchester, suggesting that a similar range of fish was eaten by many of the Winchester townsfolk, at least from the late Saxon to the mid thirteeth century. Although sturgeon, found in plot SE1 (Phase 5), demonstrates that some very expensive fish were available to the most affluent, there is very little else in the assemblage from these Winchester sites to suggest the high status which could be expected given the significance of Winchester throughout these periods of its history.

Acknowledgements

I owe a debt of gratitude to Dale Serjeantson, Alison Locker and Sheila Hamilton-Dyer for access to their unpublished reports.

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Table 1. Volumes of processed soil (in litres) for samples considered in this report, by phase and plot (secure contexts only).

Phase/ Plot	1	1.1	1.2	1.3	2.1	2.2	2.3	2.4	4	4.1	4.2	5	6	Total
BE1									420			20	10	450
BE2									27		253	75	100	455
BE3									110			290	2	402
BE4										20	539	477	418	1454
BE5											20	409	182	611
BW1											40	30		70
BW2										373	182	112		667
BW3										10	40	317		367
BW4										185	146	200		531
BW5									10	156	101	304		571
BW6									20			80		100
SE1										20	230	304		554
No plot	11	381	249	67.5	396	192.5	318	304		60				1979
Total (litres)	11	381	249	67.5	396	192.5	318	304	587	824	1551	2618	712	8211

Table 2. Numbers of identified fish remains by phase and plot. Note that counts of bones have been scaled to 100% for samples where only a proportion of the 4-2mm residue was sorted.

Phase/ plot	**1**	**1.1**	**1.2**	**1.3**	**2.1**	**2.2**	**2.3**	**2.4**	**4**	**4.1**	**4.2**	**5**	**6**
BE1									507				9
BE2											1350		542
BE3									372			189	582
BE4										5	932	224	329
BE5												442	905
BW1											1	22	
BW2										104	471	73	
BW3											2	466	
BW4										178	1650	344	
BW5										26	83	832	
BW6												747	
SE1										2	37	267	
no plot	4	1	5	5	21	1	13	30					
Total	**4**	**1**	**5**	**5**	**21**	**1**	**13**	**30**	**879**	**315**	**4526**	**3606**	**2367**
Bone/litre soil	**0.4**	**0.003**	**0.02**	**0.07**	**0.05**	**0.005**	**0.04**	**0.1**	**1.5**	**0.4**	**2.9**	**1.4**	**3.3**

Table 3. Numbers of identified fish remains recovered from bulk-sieved samples.

* - 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 to genus or species

Species	1	1.1	1.2	1.3	2.1	2.2	2.3	2.4	4	4.1	4.2	5	6	Total
Elasmobranchii (elasmobranchs)									3	1	4	29	6	43
Rajidae (rays)										1	10	7	1	19
Raja clavata (thornback)									8	3	8	22	17	58
Conger conger (Conger)											1	15	21	37
Anguilla anguilla (eel)		1			7		5	19	202	36	1063	230	267	1830
Clupeidae (herring family)							2	5	79	150	76	355	297	964
Clupea harengus (herring)			4	5	3		4	3	348	64	2251	2473	770	5925
Sardina pilchardus (pilchard)												3		3
Salmonidae (salmon family)					1			1	2		4	3	8	19
Salmo salar (salmon)					1		1							2
Salmo trutta (trout)									2	4	4	3	6	19
cf. *Salmo trutta*											2			2
cf. *Osmerus eperlanus* (smelt)													3	3
Esox lucius (pike)									4				3	7
Cyprinidae (carp family)									1		8	14	2	25
cf. Cyprinidae													1	1
Leuciscus leuciscus (dace)										1	5	2		8
Leuciscus/Gobio (dace/chub/gudgeon)											1			1
Rutilus rutilus (roach)													1	1
Gobio gobio (gudgeon)											2			2
Gadidae (cod family)									13		21	35	244	313
Gadus morhua (cod)											21	11	30	62
Pollachius pollachius (pollack)												1	9	10
Gadus /Merlangius (cod/whiting)											17		36	53
Merlangius merlangus (whiting)											12	12	200	224
Melanogrammus aeglefinus (haddock)												1	19	20
Molva molva (ling)												1		1
Merluccius merluccius (hake)												1		1
Trisopterus sp. (bib/poor cod/pout)												1		1
Belone belone (garfish)											1	18	48	67
Antherina presbyter (sand smelt)									1					1
Gasterosteus aculeatus (3-spined stickleback)									1	4	7			12
Triglidae (gurnard family)												1	9	10
Trigla lucerna (tub gurnard									1				6	7
Cottidae (cottid family)									3		3	4		10
Dicentrarchus labrax (sea bass)											2	1	6	9
Perca fluviatilis (perch)													1	1
Trachurus trachurus (scad)											4	5		9
cf. *Trachurus trachurus*											1			1
Sparidae (sea breams)						1			1		1	6	19	28
cf. Sparidae										1			1	2
Sparus sp. (Gilthead/Couch's bream)													2	2
Pagellus boragaveo (red sea bream)													3	3
Spondyliosoma cantharus (black sea bream)							1						1	2
Mugilidae (Grey mullet)												1	1	2
cf. Mugilidae									1					1
Liza sp. (thin-lipped/golden grey mullet)									1				1	2
Scombridae (mackerels)									1		8	3	2	14
cf. Scombridae									2					2
Scomber scombrus (mackerel)									3	8	66	23	26	126
Flatfishes nfi			1		1		1		6	7	33	54	18	121
Scophthalmidae (turbot/brill/megim)												3	1	4
cf. Scophthalmidae												3		3

Pleuronectidae (right-eyed flatfishes)					7			2	20	17	76	149	51	322
Pleuronectes platessa (plaice)									39	1	18	31	5	94
Platychthys flesus (flounder)											2	2		4
Limanda limanda (dab)					2						2			4
Limanda/Platychthys (dab/flounder)											1	1		2
Glyptocephalus cynoglossus (witch sole)									1					1
Hippoglossus hippoglossus (halibut)											1	2		3
Solidae (soles)									2		1		6	9
Solea solea (dover sole)												5	8	13
Unidentified	5		2	8	26	1	3	4	148	299	956	1269	6841	9562
Grand Total	**5**	**1**	**7**	**13**	**48**	**2**	**17**	**34**	**893**	**597**	**4693**	**4800**	**8997**	**20107**

Table 4. Numbers of hand collected bones

Species	**1.3**	**2.3**	**2.4**	**4**	**4.1**	**4.2**	**5**	**6**	**Total**
Accipenser sturio (sturgeon)							1		1
Raja clavata (thornback)					1				1
Anguilla anguilla (eel)							1		1
Conger conger (conger)						4	7	4	15
Gadidae (cod family)							5	2	7
Gadus morhua (cod)						1	4	4	9
Belone belone (garfish)							2		2
Triglidae (gurnards)							1		1
Dicentrarchus labrax (sea bass)							1		1
Trachurus trachurus (scad)							1		1
Sparidae (sea breams)							1		1
Scomber scombrus (mackerel)							1		1
Flatfish						1	4		5
Pleuronectidae (right-eyed flatfish)				3		2	10		15
Pleuronectes platessa (plaice)				1		2	3		6
Unidentified	1	8	1	3		10	41	7	71
Grand Total	**1**	**8**	**1**	**7**	**1**	**20**	**83**	**17**	**138**

Table 5. Numbers of identified fish remains recorded from sieved samples, phase 4.1, by plot (Nfi - not further identified)

Species	BE4	BW2	BW4	BW5	SE1	Total
Elasmobranch nfi.		4				4
Ray nfi.			1			1
Thornback ray	1		2			3
Eel		11	21	7		39
Clupeid nfi.		40	98	10	2	150
Herring		28	39	3		70
Trout		3	1			4
Dace				1		1
cf. Sea bream			1			1
3-spined stickleback				4		4
Mackerel	3	2	3			8
Flatfish nfi	1	1	4	1		7
Plaice/flounder/dab		10	7			17
Plaice			1			1
Unidentified	10	197	112		9	328
Grand Total	**15**	**296**	**290**	**26**	**11**	**638**

Table 6. Numbers of identified fish remains recovered by sieving from Phase 4.2, by plot.
(Nfi - not further identified)

Species	BE2	BE4	BW1	BW2	BW3	BW4	BW5	SE1	Total
Elasmobranch nfi.	1			1		1		1	4
Ray nfi.		3				1		6	10
Thornback ray	2	2		1		1	2		8
Eel	121	353		34		525	9	21	1063
Conger eel		1							1
Clupeid	1	19		34	2	20			76
Herring	1133	200	1	326		523	63	5	2251
Salmon/trout		2					1		3
Trout	1	3				1			5
?Trout		1		1					2
Cyprinid nfi.		3				5			8
Dace				2		3			5
Dace/chub/gudgeon		1							1
Gudgeon		2							2
Gadid nfi.	7	3		3		8			21
Cod				21					21
Cod/whiting				17					17
Whiting	5			5		2			12
Garfish						1			1
3-spined stickleback						7			7
Sea bass	1					1			2
Scad		3					1		4
cf. Scad				1					1
Cottid nfi.						3			3
Sea bream	2	6		1					9
Mackerel	25	18				22		1	66
Flatfish nfi	6	2		6		13	5	1	33
Right-eyed flatfish	34	14		4		20	2	2	76
Plaice	8	6		3		1			18
Flounder						2			2
Dab		2							2
Dab/flounder	1								1
Halibut	1								1
Soles	1								1
Unidentified	220	154	1	245	17	301		15	956
Grand Total	1570	798	2	749	19	1462	83	52	4693

Table 7 Numbers of identified fish remains recovered by sieving from Phase 5, by plot.
(Nfi - not further identified).

SPECIES	BE1	BE3	BE4	BE5	BW1	BW2	BW3	BW4	BW5	BW6	SE1	Total
Elasmobranch nfi				1	1	2	1	2	1	20	1	29
Ray nfi.			1					2			4	7
Thornback ray		2	5	1	1		1	3	2	4	3	22
Eel		5	8	82	3	8	46	25	9	9	35	230
Conger eel		1		2				1		11		15
Clupeid nfi				111	11		77	121	12	1	22	355
Herring		177	186	184	1	50	293	155	750	593	84	2473
Pilchard				2			1					3
Salmon/trout				1					1		1	3
Trout				1					1		1	3
Cyprinid nfi.										2	12	14
Dace										2		2
Gadid nfi		1	5	7	3		6	6	1		6	35
Cod			1	2			2	1	1		4	11
Pollack			1									1
Whiting				2			2				8	12
Haddock				1								1
Bib/poor cod/pout				1								1
Ling											1	1
Hake								1				1
Garfish			1	5		3		7			2	18
Gurnard				1								1
Sea bass				1								1
Cottid nfi.											4	4
Scad								3			2	5
Sea bream				1							5	6
Grey mullet							1					1
Scombrid nfi.		1	2									3
Mackerel			2	3	1	1		2	1	1	12	23
Flatfish nfi			3	16		5	6	6	3	5	10	54
Turbot/brill/megrim		1		2								3
cf. Turbot/brill/megrim										3		3
Right-eyed flatfish		1	3	11	1	4	27	9	14	72	7	149
Plaice				1			3			24	3	31
Flounder				1							1	2
Dab/flounder			1									1
Halibut				2								2
Dover sole			5									5
Unidentified	7	1	69	28	77	54	151	149	41	355	337	1269
Grand Total	7	190	293	470	99	127	617	493	837	1102	565	4800

Table 8. Numbers of identified fish remains recovered by sieving from Phase 6, by plot
(Nfi - not further identified)

SPECIES	BE1	BE2	BE3	BE4	BE5	Total
Elasmobranch nfi.	1	2	2	1		6
Ray nfi.					1	1
Thornback ray		4	4	3	6	17
Clupeid nfi.	1		33	262	1	297
Herring		198	267	23	282	770
Eel		59	128	5	75	267
Conger eel	1	2	8	3	7	21
Salmon/trout		3			5	8
Trout		2			4	6
cf. Smelt					3	3
Cyprinid nfi.					2	2
cf. Cyprinid					1	1
Roach					1	1
Gadid nfi.		9	12	7	216	244
Cod		6	8		16	30
Pollack					9	9
Cod/whiting			34	2		36
Whiting		11	10		179	200
Haddock		1	3		15	19
Garfish		4	39		5	48
Gurnard nfi.		3	2		4	9
Tub gurnard		1			5	6
Sea bass		4	1	1		6
Perch					1	1
Sea bream nfi.		9	3		7	19
cf. Sea bream					1	1
Gilthead/Couch's sea bream			2			2
Black sea bream					1	1
Red sea bream			3			3
Grey mullet nfi.					1	1
Thin-lipped/golden grey mullet				1		1
Pike					3	2
Scombrid nfi.				2		2
Mackerel			9	6	11	26
Flatfish nfi	4	3	1	6	4	18
Turbot/brill/megrim					1	1
Right-eyed flatfish	1	10	10	7	23	51
Plaice	1		1		3	5
Soles nfi.			2		4	6
Dover sole					8	8
Unidentified		236	505	87	6013	6841
Grand Total	9	567	1087	416	6918	8997

WINCHESTER
A CITY IN THE MAKING

Archaeological excavations between 2002 – 2007
on the sites of Northgate House, Staple Gardens and the former Winchester Library, Jewry St

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ISBN 978-0-904220-62-9