The Roman Faunal remains from No 1 Poultry

Site code: ONE94

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THE ROMAN FAUNAL REMAINS FROM NO.1, POULTRY, LONDON EC2, CITY OF LONDON (ONE94)

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THE ROMAN FAUNAL REMAINS FROM NO 1, POULTRY

Chronological narrative

Period 2

Phase 1: earliest Roman occupation c. AD 48-53

Open Area 4

A small assemblage of wet-sieved bones was analysed from two pits (G105), situated in the NW area of the site, Terrace 1. The bones derived mainly from highly fragmented 'cattle-sized' and 'sheep-sized' longbone fragments although there was definite recovery of very small numbers of freshwater fish (carp family), marine/estuarine fish (herring family and cod family), chicken, ox, sheep/goat and pig.

Open Area 19

A series of dumps (G223, G231 and G312) situated in the SW part of the site respectively provided small numbers of hand-collected and wet-sieved bones. This material differed markedly from the Open Area 4 assemblage in that it derived almost entirely from the major domesticates; particularly ox with smaller components of sheep/goat and pig, with only one recovery of fish, a cyprinid (carp family), and no evidence of poultry. There was a single fragment of a large thrush (Turdidae) from G312; which may either represent a chance casualty or disposal of post-consumption refuse.

Structure 4: box revetment

A box revetment (G228) found in association with the OA19 dumps produced a small concentration of hand-collected animal bones. This was similarly dated to these dump levels and may also be contemporary within the stratigraphic sequence. The material was again dominated by ox, sheep/goat and pig but there was one fragment of chicken and six fragments of horse, the earliest definite recovery of this species from the site.

Period 2

Phase 2: the laying out and occupation of roadside building plots across the site

Building 2

Wet-sieving of soil from floor level (G116) from this building situated in the NW corner of the site produced only one fragment of sheep/goat.

Building 3 Room J

This overlay Building 2 and produced a sieved assemblage from a floor level (G140) within Room J. The bones consisted of ox, sheep/goat and pig with six unidentifiable fragments of ‘chicken-sized’ bird. One floor deposit, [15444], from this group, produced a pig lower fore-leg possibly deposited while still in articulation. This may represent either a ‘ritual’ deposit or routine post-consumption waste.
One bird bone was definitely identified as partridge, the earliest recovery of a wild, ‘game’, species from the site.

Building 8 Room C

Hand-collected bones were recovered from two make-up levels (G183) in Room C. These derived almost entirely from ox, wiith a few fragments of sheep/goat and horse. There was no recovery of fish, poultry or ‘game’.

Building 11

Group 205 produced only a single fragment of ox-sized bone.

Building 12

A few bones were hand-collected from make-up level (G250), and also make-up and occupation deposits within Room A (G248). The identified fragments derived almost entirely from ox, sheep/goat and pig although G246 produced an offcut of red deer antler. This represents working waste and does not have a dietary implication.

Building 13

Floor deposits G269 and G550 respectively provided very small sieved and hand-collected assemblages. Although G269 produced only a single identified sheep/goat fragment, G550 [12564] included small numbers of ox and pig fragments with a single recovery of chicken. The pig material derived from sub-adult foot bones probably indicating two individual animals. This small group probably represents post-consumption refuse.

Building 23 Room A

Group 397 produced a small assemblage of wet-sieved bone derived largely from ‘sheep-sized’ longbone fragments with smaller quantities of chicken, ox, sheep/goat and pig, with a single bone of a passerine bird.

Open Area 6

Four deposits, two each from Groups 114 and 118, were recovered from a well adjacent to Building 2 and below Building 3. These derived entirely from the major domesticates ox, sheep/goat and pig with the exceptions of single

fragments of frog/toad and chicken, and eight fragments of mouse from Group 118. One of the well fills, [15608], of G114/118, contained bones from the skull, ribs, and fore-limb of a foetal or neonate lamb. This may represent disposal of a still-born carcass, a chance casualty or even deliberate, 'ritual', deposition. Although it was not possible to identify the mouse species, recovery of frogs and toads and small mammals is very common from open features and probably represents chance casualties inflicted by what are effectively pit-fall traps.

Open Area 11

Hand-collected and wet-sieved bones were recovered from an external occupation level (G167) and a well (G172), within an area close to B8. These groups were dominated by cattle and sheep/goat, and, to a lesser extent, pig, with a small but significant component of fish from the wet-sieved material These derived from freshwater and marine species, and included clupeids, cyprinids, gadids, and the first recovery of pleuronectid flatfish, probably plaice and/or flounder, and mackerel from the site.

Phase 3: Boudican fire debris and post-destruction clearance

Open Area 22

Small numbers of hand-collected and wet-sieved bones were recovered from a series of deposits including make-up (G308), a pitfill (G309) and an external use deposit (G311). The bones derived mainly from cattle, with minor components of sheep/goat and pig. External use deposit G311 produced only a single horse bone.

Open Area 25

Group 305 produced only a single bone of ox.

Road 2

This produced a large group, 722 fragments, of hand-collected bone from G325**.** This group was completely dominated by cattle and 'cattle-sized' fragments with only occasional fragments of 'chicken-sized' bird, sheep/goat and pig. The cattle bones showed extremely severe fragmentation due to butchery, and probable subsequent further smashing and sub-division, perhaps for grease extraction. Contexts [15249] and [15285] from the associated ditch both produced cess-covered bone.

Period 3

Phase 1: Flavian reoccupation and development c. AD65-95

Building 22

Hand-collected and wet-sieved bones were recovered from the well (G371) situated within Room B. This material derived mainly from cattle and sheep/goat, and to a lesser extent, pig. A sheep from this group produced a withers ('shoulder' height of 0.54 m, one of the smallest sheep from the site as a whole. There was also significant recovery of plaice/flounder and a single fragment of eel, the earliest recovery of this species from the site. There was a fragment of chicken, and a single fragment of brown hare, the earliest recovery of this esteemed 'game' species from the site. As with earlier well deposits, there was some recovery of small mammals, particularly unidentifiable mouse/vole fragments, again probably 'pitfall trap' casualties.

Building 29

Wet-sieved bones from G445 derived mainly from 'sheep-sized' longbones with occasional fish bone from plaice/flounder and carp family.

Building 34

Wet-sieved bones were recovered from make-up and floor deposits (G543). These derived mainly from the major domesticates with single recoveries of clupeid and plaice/flounder.

Open Area 28

Group 336 produced a single fragment of ox bone.

Open Area 29

Hand-collected and wet-sieved bones from G645 derived mainly from ox and 'ox-sized' fragments with smaller components of sheep/goat and pig.

Open Area 32

Hand-collected and wet-sieved material from the external dumps G367 and G417 produced a few fragments each of ox, sheep/goat and pig plus a single recovery of goose. Rubbish pitfill [9068] in G367 contained ten bones of young adult cat, the fore and hind-limbs, derived from at least two animals, which made up the majority of the faunal content of the pit.

Open Area 33

Group 374 produced a single fragment of red deer.

Open Area 37

Pitfills G432 and external dumps G859 produced a small assemblage dominated by ox with smaller components of sheep/goat, including sheep, and pig. A complete sheep metacarpal indicated an animal with a withers ('shoulder') height of only 0.53m, the smallest sheep recovered from the site.

There were occasional fragments of chicken, goose and mallard/domestic duck, and occasional fragments of eel with cyprinid and clupeid fish. The external dumps G859 included a single fragment each of raven and red deer, and produced the earliest recovery of rat from the site together with a fragment of mouse; neither of these bones was identifiable to species level.

Open Area 41

Context [18225] in G458 yielded a complete roebuck antler. This had been sawn through the pedicle flush with the coronet and bore transverse knife cuts close to the distal tine point. The morphology of the antler suggests that the animal was in at least the third or fourth year of life. It is difficult to deduce the significance of this find; it could represent antler working waste, an improvised tool, or just a keepsake or curiosity. The antler was encrusted with cess suggesting that this feature may not have been used primarily for rubbish disposal.

Open Area 43

Sieved samples from G462, occupation G465, and external dump horizons (G493) G493 were dominated by ox with minor contributions from sheep/goat and pig and a few fragments of unidentified fish and chicken. Context [18144] produced an infant pig tibia chopped through the midshaft. This suggests the presence and use of 'suckling' pig, possibly an indication of local pig keeping or of a 'higher-status' meal.

Open Area 44

This area produced fills from pits and ditches/drains, G466, G467, G471 and G498. The assemblage derived mainly from ox with lesser components of sheep/goat and pig, a small number of chicken fragments a single fragment of mallard/domestic duck from G498 and a single fragment of horse from G471.
Sieved bulk samples from ditch/drain G467 also produced single fragments of eel, cyprinid and plaice/flounder.

Road 1

Hand-collected bones were recorded from one pitfill, G511, and two drain/ditchfills, G513 and 514; sieved material was also recorded from one drain/ditchfill, G514. These fills produced a very sparse assemblage of ox, and, to a lesser extent, sheep/goat and pig.

Road 2

Surface and make-up material from G331 produced a small assemblage of ox and 'cattle-sized' bones only.

Structure 21

A small group of hand-collected bones from G494 contained mainly ox, sheep/goat and pig, with a single find of chicken and two fragments of unidentified small mammal. This group also produced two fragments of dog, the earliest retrieval from the site.

Period 4

Phase 1: Trajanic/Hadrianic c.AD95-125/135

Building 19

Room C produced a red deer antler offcut fragment from G351.

Building 24

Group 378 produced a single fragment of mallard or domestic duck. Room B produced a fragment of deer and a few fragments of sheep/goat. together with a fragment of a large passerine bird. There was a small assemblage of fish bone composed of a single dermal spine of ray, probably thornback ray, and single fragments of smelt, clupeid including herring, and five fragments of eel. Finally, this deposit produced frog/toad and house mouse. An occupation horizon from Room C (G384) produced a very sparse assemblage of chicken, sheep/goat and ox with single fragments of eel and plaice/flounder.

Building 29

Room C produced a small group of wet-sieved bones from Group 447. These derived mainly from sheep-sized longbone with single fragments of chicken and 'goose-sized' bone.

Building 35

A small assemblage was recovered from pitfill (G558) adjacent to this building, plus the sieved contents of a floor (G556) and an occupation deposit (G555) from Room A. The faunal remains were confined to a few fragments of ox, sheep/goat, and pig with one fragment of chicken and two fragments each of eel and cyprinid fish.
Room A produced a single fragment of chicken and two fragments of sheep/goat.

Building 36

A few fragments of ox bone were recovered from from a destruction deposit (G562), within this building.

Building 38

Two deposits, a make-up level and an external dump deposit (G509) produced wet-sieved bone. This material produced a sparse group of cyprinid fish, chicken, ox, sheep/goat and pig with single fragments of goose and two

wild ‘game’ birds, lapwing and woodcock. There were five fragments of fish, two from carp family and three of grey mullet, the earliest recovery of this species from the site.

Building 44

Room D, Group 591, produced only a few wet-sieved fragments of unidentifiable mammal bone.
Room J, Group 610, produced mainly wet-sieved fragments of sheep-sized bone with a single fragment of pig.

Building 51

Sieved bones from G706 produced only a few fragments of chicken, ox, sheep/goat and pig with single fragments of clupeid and gadid fish.

Open Area 35

Hand-collected and wet-sieved bones from external dumps (G418) north of B24 contained only a small assemblage mainly of ox with a few fragments only of sheep/goat and pig. There were single fragments of large thrush, wild duck, dog and mouse.

Open Area 37

Hand-collected and wet-sieved material from pitfills G434, G435, G436, G437 produced small numbers of fragments mainly derived from ox, with smaller numbers of sheep/goat, pig and chicken; two fragments each of eel and clupeid fish and single fragments of cyprinid fish, goose and red or fallow deer.

Open Area 40

Bones were recorded from an external dump and a hearth (G450) just to the north of Building 29. This material derived mainly from ox with smaller components of sheep/goat and pig. There were a few fragments of chicken and single fragments of mallard or domestic duck, and also of woodcock, a widely-exploited wild, ‘game’, species.

Open Area 45

This area was situated over the Period 6 tank and incorporated a series of fills in G463 and G478. A large quantity of bones were recorded from the concentrated dumps within and overlapping this structure, particularly within G463, largely provided by context [18089]. This deposit was extensively sampled. The fills from G463 produced a large 1513 fragments, and diverse hand-collected and wet-sieved assemblage derived very largely from ox with very much smaller components of sheep/goat and pig. There was sparse recovery of horse, dog, chicken, goose, mallard/domestic duck, woodcock and raven, and the earliest recovery of crane from the site. This species is

esteemed both as a hunting quarry and as an occasional dietary item. The fish fauna was very sparse and consisted of single fragments of clupeid, cyprinid, and eel, with a few fragments of plaice/flounder and mackerel, the earliest recovery of this species from the site.
Group 478 produced only a sparse assemblage of ox, sheep/goat and pig with single fragments of chicken and goose.

Open Area 47

Bones recorded from a pitfill (G561) included only a few fragments of chicken, ox, sheep/goat and pig, with a single fragment of plaice/flounder.

Open Area 55

Hand-collected and wet-sieved bones were recorded from a destruction debris horizon (G433). This material was dominated by ox, sheep/goat and pig with occasional finds of chicken, mallard/domestic duck, large and small 'thrushes', horse, dog, mouse and frog or toad with a few fragments of unidentifiable small rodents, and a single fragment of red deer. There was a very small but quite diverse fish fauna derived from eel, plaice/flounder, clupeid, cyprinid and gadid fish.

Open Area 75

Various dumps and make-up levels (G482 and 836) were chosen from this area situated over the deposits described within Open Area 45 in Period 7. While this period essentially covers the entire 2nd century, the deposits within this open area would appear to be more contemporary with those from OA45 ie AD70-100/120. This assemblage was dominated by ox with much smaller but roughly equal components of sheep/goat and pig. Group 482 produced a single fragment of mallard/domestic duck; Group 836 also produced single fragments of chicken and dog, together with single fragments of a red or fallow deer metacarpal and a roe deer metacarpal.

Road 1

A sieved deposit from one of the associated ditch/drains (G388) produced a few fragments only of ox and pig.

Road 3

A few hand-collected bones from a ditch/drain (G524) derived mainly from ox with much smaller components of sheep/goat, including sheep and goat, and pig. Context [12529] also produced a single offcut of red deer antler.

Phase 2: Hadrianic fire horizon

Open Area 55

Groups 440 and 624 produced small groups of hand-collected and wet-sieved animal bone derived largely from ox but including small numbers of horse, sheep/goat and dog with single examples of herring family, eel and mouse.

Open Area 56

A small group of bones was recovered from the fill of a robber cut, G453. This derived almost entirely from sheep, with 'sheep-sized' longbones and ribs and one fragment of pig. The sheep bones were adult, from all carcase areas, and may have derived from one butchered individual.

Period 5

Phase 1: new buildings and road repairs AD125/135-220

Building 46

Bones were wet-sieved from two samples from a well (G646) associated with this building. The assemblage is very small and consists only of a few fragments of ox and sheep/goat with single fragments of chicken and plaice/flounder.

Building 56

A small group of hand-collected bones were hand-collected from make-up level G737 and a posthole G738. Each of these groups produced only a handful of fragments of ox, sheep/goat and pig.

Open Area 76

Hand-collected and wet-sieved bones were recorded from a number of external dumps (G839). The dumps produced a sparse but diverse and distinctive group of hand-collected bones again dominated by the major domesticates particularly ox, and to a lesser extent sheep/goat and pig with a minor contribution of chicken. The assemblage also included the 'game' species, heron and brown hare and context [18020] produced a single metacarpal of fallow deer. This context also produced two fragments of red kite, the only recovery of this bird of prey from the site. Wet-sieving produced only a few scraps of chicken and pig, with a single fragment of plaice/flounder.

Phase 2: buildings and road maintenance c. AD170-220

Building 63

Bones were hand-collected and sieved from a pitfill (G784). The sieved group consists of a few fragments of ox, sheep/goat, and pig**,** with occasional recovery of clupeid fish, frog/toad, and mouse**.** There was one hand-collected fragment of unworked red deer antler.

Building 70

Wet-sieved samples from two floors, G886 and G887, produced only a few fragments of wet-sieved ‘sheep-sized’ bone with a fragment of frog/toad.

Open Area 65

A small group of hand-collected bone, Group 743, derived mainly from ox with single fragments of chicken, sheep/goat, pig and raven.

Open Area 74

This area produced a fragment of sheep/goat from pit G835.

Open Area 77

Bones were recorded from external dumps (G846, G851 and G852) plus a make-up layer (G854). This area produced a sparse assemblage dominated by ox and to a lesser extent, sheep/goat and pig with occasional fragments of chicken. Group 846 also produced a fragment of curlew, the first recovery of this wader from the site, and two fragments of raven, in each case the first recovery of these bird species from the site. Context [18001] in Group 852 produced two offcuts of red deer antler.
Group 854 produced one fragment of dog.

Road 2

Hand-collected bone from G944 derived mainly from ox and ‘ox-sized’ fragments with occasional fragments of pig and single fragments of mallard or domestic duck, and sheep.

Phase 3: early third century activity c. AD200-220+

Building 58

Bones were recorded from the sampled contents of two postholes (G751). This material was dominated by sheep, including ‘sheep-sized’ material, with relatively few ox fragments and only one, unidentifiable, fragment of fish bone.

Period 6

Phase 1: buildings AD220-270

Building 64

Hand-collected bone from Room F, Group 792, produced only a few fragments of ox and ‘ox-sized’ bone.

Phase 2: roads and buildings c. AD250-300

Open Area 74

Hand-collected bone from Group 834 derived mainly from ox and 'ox-sized' bone with smaller numbers of pig and sheep/goat with occasional recovery of chicken and goat and a fragment of red deer.

Road 1

Hand-collected and wet-sieved bone from G677 produced a small assemblage derived from small numbers of ox, sheep/goat and pig, with single fragments of cod, cyprinid fish, frog/toad, goose and mouse.

Road 2

Groups G922, G943, G945, G973 and G974 produced a small assemblage of hand-collected and wet-sieved bone derived from ox, sheep/goat, pig with two fragments of chicken and single fragments of wild duck, and dog.

Phase 3: occupation post AD300+

Building 64

Groups 818 and 819 from Room E produced a small group of hand-collected and wet-sieved bone derived mainly from cattle and pig with slightly fewer sheep/goat, three fragments of red deer and a single fragment of woodcock. There were a few fragments of frog/toad and a single mandible of field vole.
A very small number of bones, all derived from ox, was recorded from a floor level within Room F (G792).
The flot fraction of a bulk sample [3748] {410} from make-up dumps preparatory to the Room G extension to the building, produced four damaged ostracod valves. These derived from the freshwater genus *Herpetocypris*, probably *H. reptans.* This species is one of the largest British ostracods and occurs widely throughout freshwaters in southern England ranging from small ponds to large lakes (Henderson 1990, 174). Although it inhabits permanent waters, it can also exploit temporary waters and is able to produce drought resistant eggs (Henderson 1999, 21). It may be present in this context in association with sedges or rushes cut for use as flooring or animal bedding. This sample also produced fragments of caddis fly (Trichoptera) larval cases. The recovery of ostracod and caddis fly remains from this sample suggests that it derived from a water body not subject to gross pollution.

Road 1

Group 918 produced 154 fragments of hand-collected and wet-sieved animal bone derived mainly from cattle, with smaller numbers of sheep/goat and pig and single finds of cyprinid and plaice/flounder, chicken, red deer and mouse or vole.

Road 2

Group 947 produced a few hand-collected bones of ox, sheep/goat, pig, with a single fragment of chicken.

Structure 32

North-South drain between roadside properties draining into the large drain on the North side of Road 1

Flotation of a bulk sample from G681, [7527] {451), from this feature produced a small group of damaged adult ostracod valves. These derived from the freshwater taxa *Eucypris virens, Candona albicans* and *Candona neglecta* with unidentifiable fragments of *Eucypris sp.* and *Candona sp.* *E.virens* is one of the commonest and most widely distributed British ostracods. It inhabits ponds and small pools which may dry out during the summer (Henderson 1999, 159). *C. neglecta* is widely distributed throughout Britain. It occurs in freshwater ponds, lakes, marshes, and ditches, typically with soft, muddy substrates (Henderson 1999, 90). *Candona albicans* is widely distributed and common in Britain. It lives in a variety of habitats including streams, lakes, ponds and ditches but is most commonly found in periodically drying ponds with a muddy substrate (Henderson 1999, 68). Although damaged, some of the *C.neglecta* and *C.albicans* valves were still in articulation suggesting a 'low-energy', probably still or slow-flowing, depositionial environment. The presence and condition of these species suggests a periodically drying still or slow-flowing drain with a muddy substrate and without gross organic or inorganic pollution.

Phase 4: later 4th century decline: generally AD350-400

Open Area 58

Bones were recorded from a number of fills derived from robber cuts (G655 and 656) and one pit (G657) situated over the Period 17 masonry building (B48). Ox and 'ox-sized' provided the bulk of the assemblage, to a much lesser extent, sheep/goat provided the bulk of the assemblage with a minor component of pig The sieved material also yielded occasional fragments of gadid fish, chicken and dog. A single fragment of fallow or red deer antler was recovered from context [17610] (Group 656).

Open Area 63

A single deposit of destruction debris, [7918] in G688, produced a small wet-sieved assemblage derived from ox, sheep/goat and pig, with a few fragments of chicken and a single vertebra of clupeid fish. There was a single fragment of mouse or vole together with a small group of unidentifiable small mammal fragments.

Road 1

Deposits G914 and G972 produced a small hand-collected and wet-sieved assemblage dominated by ox with smaller components of sheep/goat and pig and a fragment of chicken.

Road 2

Hand-collected and wet-sieved bones were recovered from G950, G951, G959 and G976. Ox was the dominant species with comparatively minor contributions of sheep/goat and pig.

Road 3

Bones were analysed from a single ditch/drain (G932). This produced a small assemblage mainly of ox but with minor components of sheep/goat and pig. There was occasional recovery of unidentifiable fragments of bird and mouse or vole.

Period 7: late 4th century

Building 64

Room A

Group 820 produced only a few fragments of ox and sheep/goat with single recoveries of mallard/wild duck and a small corvid bird, probably jackdaw, jay or magpie.

Room F

Group 821 produced a small assemblage derived mainly from 'sheep-sized' longbone, with small numbers of ox, sheep/goat, pig and frog or toad, plus single fragments of eel, goose, chicken, mouse and rat.

Open Area 70

A single offcut of red deer antler was recovered from context [3342] within G771.

Open Area 77

Bones were hand-collected and sieved from well fills (G857). These produced a small assemblage mainly of ox with small components of sheep/goat and pig with occasional fragments of clupeid fish, probably herring, chicken, mallard/domestic duck, woodcock and a large thrush. There were two fragments of red deer.

Open Area 79

Small groups of hand-collected and wet-sieved bone were recovered from ditch/drainfills (G933 and G937) and an external dump (G938). Ditch/drain fill

G933 produced a small assemblage of ox with smaller groups of sheep/goat, including both sheep and goat, pig, dog and a single fragment of horse. The dog remains possibly derived from a single skeleton. There were also four fragments of chicken and single fragments of mallard/domestic duck and wild duck. There was a sparse small mammal auna including rat and mouse or vole. There was a small fish assemblage of smelt, cod, gadid, eel and cyprinid, in each case a maximum of four fragments. Ditch/drain fill G937 produced only six fragments of ox and a single frament of horse. The dump deposit G938 produced only ten fragments of ox and a single fragment of sheep/goat.

Open Area 83

Group 965 produced only one fragment of horse.

Open Area 104

Group 1004 produced a small assemblage derived entirely from cattle and sheep/goat.

Open Area 139

Group 1066 produced a single hand-collected bone of ox.

Thematic discussions/research aims

Were changes induced in the local ecological conditions as a result of human activity?

The chronological narrative indicates very clearly that virtually all the faunal evidence derives from human post-consumption waste with only a minor component of material of significance for true environmental indication. Such 'indicator' evidence from the site derives from amphibians, birds, and small mammals, particularly, although not entirely, those wet-sieved from open feature fills where there was a 'pit-fall trap' effect. It should also be stressed that the ecological requirements of the wild 'game' species recovered from the hand-collected and wet-sieved assemblages have implications for the interpretation of local, or at least accessible, exploited habitats. Amphibians were represented entirely by small numbers of fragments of frog and/or toad (Table 702). Their recovery was patchy in terms of both space and time and derived from Periods 2, 4, 5, 6 and 7 with the largest samples recovered from Periods 4 (19 fragments), and 7 (44) fragments). Common frog and common toad are both widespread and probably ubiquitous throughout mainland Britain (Arnold 1995, 9, 15); their occurrence on London archaeological sites as chance casualties in open features or, as prey items in owl pellets deposited in abandoned buildings, is very much to be expected, and it is surprising that the incidence of fragments from most periods is as low as shown. Recovery of amphibian remains from Building 24 in Period 4 and Building 64 in Period 7 suggests at least partial disuse of these building during these times.

Recovered wild birds include esteemed 'game' species (partridge, thrushes of several species, wild duck, woodcock, lapwing, curlew, and crane), together with species known to exploit carrion, slaughterhouse and butchery waste, and domestic refuse (red kite and raven), with unidentified small passerine birds, probably including house sparrow, *Passer domesticus,* able to exploit domestic refuse, weed seeds and spilt grain. Common partridge/grey partridge is distributed widely throughout SE England in a range of habitats including arable farmland, pastures, waste ground, moors and sand dunes; it would therefore have been available on agricultural land, probably even close to the urban centre. The thrush family (Turdidae) includes a range of species occurring as residents or seasonal migrants, often in large numbers, throughout SE England. They occupy a wide range of ecological niches and it is not possible to derive habitat information from their recovery without complete species identification.Woodcock is one of the most commonly recovered 'game' species from all Roman and post-Roman archaeological periods in the London area. It feeds by probing in soft ground, and prefers wooded regions, particularly with wet, overgrown rides and patches of evergreen. Recovery of this species from Periods 4, 6 and 7 implies presence of such conditions within economic exploitation range of London. Wild ducks, curlew, lapwing, and crane can occupy and exploit a variety of wetland habitats including freshwater marshes, the Thames margins and adjacent estuarine and coastal marshes. Although their abundance varies on a

seasonal basis, and they differ in their abilities to tolerate disturbance and pollution, they would all have been available for exploitation throughout the Roman periods. In general, it must be stressed that wild bird recovery is sparse in terms of both diversity and abundance throughout the Roman periods and, although it suggests that a variety of habitats including agricultural land, wetlands and woodland were accessible and exploited within the environs of London it does not allow any analysis of inter-period differences in the character of the urban or nearby landscape. The recovery of red kite from Period 5, raven from Periods 3, 4 and 5, and corvids from Period 7, mainly but not entirely from Open Areas, strongly suggests that there was some exposure of carrion and domestic refuse to scavenger activity rather than immediate, complete disposal into covered or otherwise inaccessible pits.

Recovery of wild mammal species was even more scanty, in terms of species diversity, than that seen in birds. Although the highly valued wild game species; brown hare, roe deer, fallow deer and red deer were retrieved, they occurred in such small numbers that it is obvious that hare and venison were very occasional dietary inclusions. Indeed, hare was only recovered from Periods 3, 4, 5 and 6 at a maximum incidence of three fragments per Period. This species is currently still widespread, but declining, throughout England (Arnold 1993,71) and can be expected to have been present on agricultural land during the Roman periods, further evidence for the accessibility of agricultural land to and from the city. Although some sources suggest that this species may have been an earlier, prehistoric, introduction into Britain, there are many definite British Iron Age and Roman archaeological records (Yalden 1999, 127).

With the exception of a red deer radius from a dump deposit in Period 3, Open Area 37, context [3782], all red, roe, and fallow deer remains derived either from antler or from metapodials, and are probably associated with antler or hide-working and do not necessarily imply consumption of venison. All three of these species prefer woodland as an ideal habitat and their recovery again suggests that woodland was available for exploitation within economic range of London. As the antler may have been gathered after shedding, rather than by deliberate removal from butchered carcases, they may have derived from woodland further afield. Finally, the small mammal fauna is also disappointing as a source of environmental information. The definitely identified taxa comprise only field vole, house mouse and rat, and are ubiquitous in suitable habitats throughout SE England. Field voles prefer open grassland but will occur in hedgerows and young plantations (Arnold 1993, 81), house mice and rats are very much human commensals, but will also occur out of doors (Arnold 1993, 93-97). Both rats and mice are major pests in terms of disease transmission, and damage to stored products, materials and structures.

In summary, the vertebrate fauna provides an extremely limited idea of the character of the urban and local environments during the Roman periods. It indicates that there was some degree of refuse exposure allowing exploitation by bird and mammal scavengers (red kite, raven, corvids, passerine birds, mice and rats) and that although there were farmlands, wetlands and woodlands in at least some degree of proximity to the city, they appear not to have made more than an occasional dietary input to the local population. The

recovery of amphibians and rodents from Buildings 24 and 64, for example, in addition to that from ditches, wells and pits suggests that there were periods when buildings were disused but still, at least partially, standing.

What were the dates of any changes?

The Roman vertebrate faunal material provides three records of interest with regard to inter-period change.
A deposit from Period 5, an external dump in Open Area 76, Group 839, context [18020] produced a single fragment of a fallow deer proximal metacarpal (forefoot). This species is known to have been introduced into the British Isles although there is no definite date yet available for the first occurrence. Certainly, there are occasional British records from the Roman period although it is not clear whether these represent menagerie specimens, venison imports or hides (Yalden 1999, 128). This fragment provides further evidence for the presence of this species in SE England during the Roman period.
Period 3 produced a single fragment of rat (*Rattus sp*.), with Period 7 producing another two fragments, one from Building 64, Room F, and the other from a ditch/drain in Open Area 79. Neither of these fragments was identifiable to species level. Although once widely thought to have been a medieval introduction into Britain, black rat, *Rattus rattus*, has been definitely identified from earlier archaeological deposits. Examples include a skull from a 4th century AD well infill in York (Rackham 1979) and an earlier recovery from a 3rd century AD site in Fenchurch Street in the City of London (Armitage, West & Steadman, 1984). These finds appear to confirm the presence of this species, and by implication, the potential significance to the health and economy of the city population by the 4th century AD at the latest.

Can distinct ecological zones be identified spatially as well as temporally, and if so, what do they represent?

Although the vertebrate faunal remains include a moderately diverse assemblage of wild species - fish, amphibians, birds and mammals, this material is so sparse that no real ecological zonation or temporal variation in species diversity can be detected. Period 4 provided the most abundant and diverse groups of wild fauna although this is likely to reflect the larger fragment count.

The Roman diet/period based considerations

Although more than 10,000 fragments of animal bone were hand-collected and wet-sieved from Roman contexts, it should be stressed that the material was not uniformly distributed with respect to archaeological period and land-use. Tables 701 and 702 respectively indicate the fragment counts of hand-collected and wet-sieved animal bone recovery by period. It can be clearly seen that although Periods 2-7 all produced animal bone, the material from Period 5 is too sparse to justify further consideration beyond that given in the chronological narrative. This section amalgamates the Period assemblages in order to illustrate the characteristics of Roman dietary and other faunally-

related activities and to suggest, wherever justifiable, any significant temporal or spatial changes.

The pre-Boudican faunal assemblage/general summary of Period 2, phases 1 and 2

Period 2 includes the earliest pre-Boudican activity and essentially represents terracing and road construction, with property development just before the Boudican revolt of AD60. Both phases are represented by a large number of contexts, the majority of which provided very few bones. However, there were concentrations of bones within various open area dumps and pit and well fills from both phases. In addition, the analysis included a variety of occupation and floor deposits from a selection of the Period 3 buildings.

The faunal remains represent a diet generally based on cattle and to a lesser extent, sheep/goat and pig with very much smaller components of fish, chicken, and wild 'game' birds (Tables 701 and 702). Although the quantities are small, there is a notable increase in the relative abundance of cattle bones from Period 201 (28% with phase total = 130) to Period 202 (38% with phase total = 176). However, even Period 202 has a somewhat low percentage of cattle, in comparison to the post-Boudican levels; pre-Boudican values clearly show an overall incidence of cattle by fragment count markedly lower than that seen in any later group. These values may reflect the rate of general 'Romanisation', often related to a high proportion of cattle bones (King 1984), or perhaps the subsequent establishment of a military camp or increased military presence near this site after the Boudican uprising. It should also be stressed that there appears to be a general correlation between a higher incidence of archaeological cattle remains in material from Roman military, rather than civilian, bone assemblages (King 1984).

The recovery of other species begins to show the general character of the entire Roman period assemblage with generally minor representation of marine/estuarine fish and domestic poultry indicated by fragment count. There is only very sparse recovery of wild 'game' from all Periods (Tables 701 and 702) with little definite indication of higher-status consumption on the basis of species selection. Finally, there is a single fragment of red deer antler tine from [12757], Building 12, Period 202, but this is probably clearly evidence of antler-working, and not food waste, and there is no evidence for consumption of venison.

Tables 704-711 indicate the skeletal recovery of ox, sheep/goat and pig for the pre-Boudican period. They clearly show that, although recovery is generally sparse for this period, there was recovery of all major carcase areas and therefore no evident bias towards use or disposal of areas of selected meat-bearing value; carcases were probably butchered, used and disposed of on-site. Consideration of the evidence for age-death of ox (Tables 712, 714 and 717) shows the use mainly of at least sub-adult animals with recovery of only a single foetal/neonate fragment, from Road 2. although this does not imply rearing of cattle on-site, ageing evidence from sheep/goat (Tables 718, 719, 721, 723) shows a somewhat wider spread of ages with animals in the first to at least the third year of life. The recovery of a partial skeleton of a newborn lamb from one of the wellfills (G114/8) in OA6, adjacent to Building 2 on the north-west part of the site could indicate that there was some local

stock keeping.but may also have other implications such as 'ritual activity' or chance 'pitfall trap' effects. The recovery of mouse from the well in Open Area 6 demonstrates that the latter is at least a possibility. The pig remains also show some spread of ages-at-death with recovery mainly of animals in the second and third years of life (Tables 724, 725) with no foetal or neonate examples. This does not suggest pig-rearing on site although the floor of Building 3 also provided the partial remains of a pig, entirely composed of foot skeletal parts.
The recovery of foetal/neonate domesticate remains may suggest some degree of local stock-keeping and allow speculation on the extent to which the local occupants of the site were self-sufficient. Comparisons can be made with pre-Boudican levels at sites such as Leadenhall Court and Whittington Street where the faunal evidence would appear to suggest that the buildings were actually small farmsteads. The central, urban location of the Poultry site may tend to reduce the likelihood of such activity and the small size of the available sample does not allow a definite conclusion.

The post-Boudican revolt to Hadrianic fire faunal assemblage/general summary

The bone deposits from Period 301 pre-date the Flavian fire, and were possibly formed towards the end of the 1st century AD, and the dating of the associated material confirms, in general, this division as at about AD70-100. This period witnessed major development, with a sequence of buildings fronting onto Roads 1 and 2. Bones were recovered from various features associated with all these buildings, but rarely were the quantities more than a handful of fragments. Several floors and some external dumps were sampled, and it is these that provided most of the bones mentioned in the analysis. Greater quantities were recovered from features within the areas between the buildings, and in particular from Open Area 32, behind Building 50 on Terrace 2, and Open Area 44, the easternmost part of the site, on Terrace 4.

In Period 401, postdating the Flavian fire, the building sequence continued following a brief hiatus. Again, several of these buildings provided small quantities of bone only. Several occupation spreads and some associated deeper features ie pits, produced some reasonable amounts of bones either by hand collection or from samples. In common with Period 301, most of the Period 401 bones were recovered from open areas, and in particular from Open Area 35, situated behind Building 24 (Terrace 3); Open Area 32 and Open Area 37, both on Terrace 2; and, a major contributor, from Open Area 45, this overlying Open Area 44 (Period 301) on Terrace 4. The dating is generally mixed, with several deposits within AD70-100, although also with a concentration, particularly within the open areas, of deposits dated AD120-160.
The overall dominance of cattle bones shown in each of the major phases is best shown in this and the following grouped period (see Table 703); here cattle provided 78.8% of the domesticate fragment count with sheep/goat and pig providing only respectively 8.7% and 12.5%. Within this phase the highest proportions of cattle were found within the roadside ditches (G331) in Period 301 and the dump deposits in Open Area 45, especially within the timber tank

(G463), where cattle provided 89.4% and 86.3% of the fragment count in the major mammalian domesticate assemblages. It should be mentioned that the former assemblages appear to be somewhat unusual, in that they are almost entirely represented by cattle longbone fragments, a large proportion of which show butchery marks, particularly splitting and grazing cuts presumably for marrow extraction and meat removal respectively. This assemblage could also possibly partially represent the waste from grease extraction, as suggested for a larger, similar assemblage from Hooper Street, Tower Hamlets dated to the 3rd/4th centuries AD. At Poultry, however, the pieces were generally smaller. An alternative explanation is that they represent working waste, although unlike other such assemblages found for example at Lloyds Register, dated to the 2nd century AD, there was no sign of saw marks. Although all carcase parts are represented within the large concentration of cattle bones from the tank deposits, there is very significant recovery of head and foot parts; this may imply a major proportion of the tank infill derived from primary butchery waste.

This period, particularly the material from Period 401, provided the most diverse group of fish remains from the Roman site as a whole (Table 702) Although the material is sparse in terms of abundance and species diversity, it provides clear evidence for exploitation of at least the tidal Thames and possibly adjacent marine habitats, and to a lesser extent local freshwaters also. Species represented include definite surface and mid-water fish (grey mullet, mackerel, smelt, gadids) together with definite demersal (bottom-dwelling) forms (thornback ray, eel, plaice and, possibly, flounder) suggesting that a range of fishing techniques were in use. Where fish are generally represented by no more than one to three bones in each context or group assemblage, it is noticeable that plaice/flounder is well represented in two features, the tank, with 11 bones, and the well (SG371) associated with Building 22, Room B in Period 301 with 21 fragments. Although there are generally too few bones to provide groups suitable for detailed comment, these two assemblages stand out. The wellfill assemblage rerepresents the remains of at least two plaice (as shown by the presence of two left cleithra), with recovery of head and postcranial elements. Period 401 also provided the most substantial groups of domestic poultry, particularly of chicken but with minor components of goose and mallard/domestic duck. As with all other Roman periods at this site, there was no evidence for exploitatiion of dove or pigeon. There is also quite a diverse range of wild game species, with red deer radius from [3782] Open Area 37, Period 301, brown hare from the Period 301 well and Open Area 45 tank; an unidentified small wader, probably a lapwing, from Period 401 Building 38; some large and small passerine birds, which could represent food waste, from several Period 401 buildings as well as from OA32 and the tank in OA45; and then exclusively from the tank, crane (featuring a partial articulation) and woodcock. There is undoubtedly a link between the quantity of bones and the frequency of species identified, which holds true for most archaeological sites. This may diminish the significance of the tank assemblage, but it is clear that, in this feature, at least, there is a notable quantity of food waste derived from consumption of wild ‘game’. The absence or much smaller quantity of such species elsewhere, on the other hand, could be related more to the lower number of bones rather

than dietary preference of the consumers. The group also shows evidence for disposal of carcases from scavengers and domestic pets.
A notable feature of the cattle assemblages from the various open area dumps (in Periods 301 and 401), is that a large proportion of the bones display extensive butchery marks indicative of splitting, disarticulation, transverse division and de-fleshing invariably inflicted by cleaver, rather than by knife. This is very similar to the butchery observed on the contemporary cattle bones from Regis House and generally reflects the techniques in use for all periods at the site and those generally recorded from Roman Southwark (Pinney 1999). This type of butchery has been linked to the activity of professional butchers; the method and extent of this butchery indicating a type of production akin to the modern age where the butchery used is related to demand rather than carried out by individual consumers or households (Maltby, 1981).
Following on from the pre-Boudican periods, there is a sparse scatter of antler waste, suggesting some local antler working. Most fragments were identified as red deer, but there was also one piece of unworked roebuck antler from Open Area 41 in Period 301, from below Open Area 44 in the same period on Terrace 4. There is also minor evidence for hornworking, as shown by a pair of cattle horncores from a destruction deposit (G562) within Building 36 (Period 401). Both had been sawn through at about one third up from the base. This is clearly too high to an effect of skinning, and cannot be seen as an efficient method to remove the horn from the skull. In addition, evidence from several tons of butchered cattle bones found in London indicates that the saw was very rarely used by Roman butchers, so these examples are more likely to represent hornworking waste, although this method would not have removed the entire horn sheath. Regarding the industrial use of bone waste, the highly fragmented possible oil extraction or bone-working waste from the Period 203 roadside ditch does suggest preparation and treatment of the bone to a degree beyond that required for domestic consumption.

Amongst the non-food waste, there are a few horse, dog and cat bones. One horse humerus, from an external dump (G471) associated with B30 in Period 301, was rather small and may just possibly belong to a donkey. A nearly complete horse skull was recovered from one of the Period 401 tank deposits, which showed very clear skinning marks. In the absence of either the butchery or the fragmentation related to jointing and meat removal (eg as found on cattle bones), it can be assumed that horses were not used for their meat. This skull, however, clearly shows that, at least occasionally, these animals were used for their skins. Cat is represented by a partial articulation within a pit (G367) in OA32 (Period 301). These bones formed the major part of the assemblage recovered from this feature. As the deposit was not sieved, it is unknown whether it oroginally contained a complete skeleton. It may be that this feature formed a convenient means of disposal of an unwanted whole or partial carcass, or perhaps that it represents a deliberate burial.

Finally, it is necessary to consider the potential significance of a possible single rat bone, an axis vertebra, from an external dump (G417) in Open Area 32. This could not be positively identified to species and was recorded as an unidentified rodent. Black rat, as far as is currently known, was introduced

during the Roman administration; the earliest definitely-identified black rat bones from the City of London date to the middle of the 3rd century AD at Fenchurch Street. Clearly, this single bone suggests that the introduction may have taken place much earlier although it is impossible to state this on the basis of such slender evidence and this record should be regarded very much as a very tentative suggestion of earlier introduction.

Skeletal represntation of the major domesticates, ox, sheep/goat, and pig suggests that complete carcases were butchered and disposed of on-site. There is good recovery of all carcase areas including those of poor and good meat-bearing quality (Tables 704 – 711). Dental and epiphysial evidence (Tables 712-730) for age-at-death of ox, sheep/goat and pig indicates a more complex slaughter pattern than that seen from the pre-Boudican materal, possibly a reflection of increased sample size. Ox remains derive from animals in the second, and particularly the third and fourth years of life with two fragments of foetal/neonate age from Open Areas 43 (Period 301) and Open Area 45 (Period 401). This may suggest some dairying and stock rearing on site. The overall age distributions of sheep/goat and pig resemble that seen in the earlier material but show definite recovery of foetal/ neonates from Open Areas 32, 43, 44 and 45, further suggestions of stalling on-site.

The faunal assemblage from the post-Hadrianic fire to mid 3rd century AD - general conclusions

Generally this grouped period (Periods 402 - 502) shows an considerable reduction in abundance and species–diversity compared with that from the earlier material in Periods 203 - 301). The dominance of cattle remains over the whole period assemblage is again obvious (Table 703) with a remarkably similar species balance to that seen earlier, 79.9% cattle, 8.3% sheep/goat and 8.3 % pig. Evidence for exploitation of fish (clupeids only), domestic poultry (chicken and mallard/domestic duck only) and wild game species generally is minimal, comparing closely to that seen from the pre-Boudican material.

Bones were recorded and analysed from a number of large and minor assemblages. There were very few bones from the Terrace 2 and 3 sequences, and also relatively few from Periods 402 and 501, most of which were from well G646 adjacent to Building 46 in the north-west of the site. Larger quantities were available from the Terrace 4 dumps. There were notable retrievals here of roe deer (from Period 401, Open Area 75, G836) and also fallow deer from Period 501 (Open Area 76, G839). The latter period also provided other high-status food species including curlew, heron and brown hare. Of interest too are the presence of facultative scavengers around human occupation, particularly raven and red kite. The recovery of fallow deer deserves further comment; very few examples of this species have been found in Roman Britain although many authorities regard it as a Roman introduction. The status of this species in Roman Britain is still uncertain and retrieval is generally confined to very small numbers of bones from any given site. It is impossible to specify whether such retrieval indicates park or menagerie animals, or waste from consumption of venison (Yalden 1999, 128), even, in the case of metapodials, bones associated with hide processing Serjeantson 1989, 136-139). Generally, however, the range of wild game is

certainly indicative of greater dietary diversity in the vicinity, perhaps a reflection of personal preference or affluence. Game species all appear to date to the early part of the second century (all but the curlew were found in Open Area 76, Group 839) contemporary with the rich underlying deposits recovered from the Period 401 tank in Open Area 45.
Skeletal representation of ox, sheep/goat and pig again indicates disposal of all carcase areas with no real indication of biased presence of particular areas rather than processing and use of complete carcases. The evidence for age-at-death of the major domesticates indicates the same overall pattern of use as seen in Periods 203 –301 foetal/neonates are seen only from Open Area 75, Period 401 (ox), foetal/neonate sheep/goat from Open Area 75, Period 401, infant lambs from Open Area, Periods 401 and 501 infant pigs from Open Area 76, Period 501. In all cases, these recoveries consist of a maximum of only two fragments.
Overall, there is again a dominance of cattle bones throughout these levels. Plus a scattering of worked antler fragments, probably all from red deer. The samples are generally very disappointing, with the exception of the fill of a robber cut in Period 402, G453 in Open Area 56. This was, rather unusually, entirely composed of sheep/goat and sheep-size fragments. It can be conjectured that these bones may represent the remains of a single meal. In all samples, fish are either absent or very poorly represented.

The faunal assemblage from the late Roman building sequence/general conclusions (Periods 601-604)

The bulk of this material derived from Periods 602, 603 and 604 (Tables 701 and 702). Although the sample size is generally comparable with that from, Period 401, the abundance and species-diversity are markedly poorer. The majority of the fragment count derives from ox, sheep/goat and pig with a considerable component of unidentifiable ‘cattle and sheep-sized fragments. There are very small fragment counts of fish (clupeid, cyprinid, cod, gadid, and plaice/flounder), and domestic poultry (chicken and goose) and single fragments of wild game red deer and brown hare. Although the sample is lacking in species diversity, the overall balance between the major domesticates closely resembles that frion the other post-Boudican groups. Ox represents 74.2% of the fragment count with sheep/goat at 13.7% and pig at 12.1 % of the total (Table 703). Skeletal representation and age-at-death distributions from Period 18 closely followed that seen in the earlier material, although the recovery of foetal/neonate and infant material was confined to foetal/neonate ox (Road 1, Period 602-604), infant ox (Road 2, Period 602-604); and foetal/neonate pig (Road 2, Period 602-604).
An interesting further addition to the generally uniform major mammalian domesticate assemablage is given by the analysis of metrical data. Calculation of ox withers (‘shoulder’) height from Periods 201-502 (‘early Roman’) with that from Periods 602-604 (‘late Roman’) shows an increase in mean height from 1.11m to 1.15 m where sample numbers were respectively eight and six. This demonstrates a very small increase with time and may be accounted for by individual difference rather than a real increase in staature as a result of deliberate selective breeding (Table 7XX). Similar analysis for

sheep/goat grouped using the same 'early/late Roman' periods shows a small reduction in stature with time although, again, the sample size is small.
Large concentrations of animal bones were noted from the ditches in Open Area 58 and also from the ditches/drains associated with Roads 1 and 2. Smaller concentrations of bones occurred within various features on Terraces 2 and 3 in Period 602. Examples include an occupation deposit and a make-up level within the overlying building 64. Once again, cattle were the major component of the period assemblage, even in the minor assemblages from Period 601. Note the near total absence of smaller species from the road samples. However, as found throughout this site, the quantities of bird and fish bones from Open Area 58, are very small. The usual bird domesticates and fish species (clupeid, cyprinid, and gadid) are represented. Some worked antler was recovered, and wild 'game', perhaps indicative of dietary preference, was represented by a single find of brown hare from a Road 1 drain/ditch.
One of the road ditchfills, [12575] in Group 944 Road 2, provided a large number, seven pairs and 18 single, ox horncores. This could represent either hornworking waste or perhaps butchers' waste. Of interest is the very similar size and shape of these cores, signifying (comparing these two characteristics) a shorthorned 'Jersey-type' of cattle. This type/breed has been recorded at several other Roman sites in the city, suggesting it was commonly used (*eg* Pipe*, in prep*.)

Very late Roman activity (Period 700)/general discussion

A variety of features covered by the earlier medieval dark earths produced animal bone. Bones were analysed from floor deposits within two rooms, E and F, in Building 64, as well as numerous levels/fills particularly in Open Areas 77 and 79. Although there were relatively sparse bone groups from within the buildings, there were some points of interest; particularly red deer antler off-cuts from Building 64, Room E. The same room also produced a fragment each of wild duck and woodcock, a possible indication of consumer affluence allowing occasional consumption of 'game' species. The open area bones derived essentially from ditches/drains and a well (Open Area 77 - G857). The numerical dominance of cattle continues, although at a slightly smaller percentage compared to the earlier periods (Table 7XX) but with a higher proportion of pig relative to sheep/goat. Again, there were some possible economic indication from consumption of wild 'game' species, the woodcock and thrush from the well, plus a few worked red deer antler pieces. There was a notable recovery of rat, and the apparent continuation of the generally very poor site-wide representation of fish in terms of both abundance and species diversity. There was a sparse fish assemblage derived from clupeids, cyprinids and eel, with a sparse representation of gadids. Ditch/drain fill G933 from Open Area 79 produced the most diverse assemblage of freshwater and marine/estuarine fish including clupeids, cod, gadids, cyprinids, eel and smelt although each taxon produced a maximum of only four fragments.
As with all previous assemblages, this Period is dominated by the major domesticates with very small contributions of fish, domestic poultry and wild game (Tables 701 and 702). Table 703 indicates an interesting varaiation in

the relative contributions of ox, sheep, and pig. Here, ox provides 69.6% of the fragment count with sheep/goat and pig respectively providing 11.2% and 19.2 %. Although the domesticate sample is small, compared to the larger recoveries from the post-Boudican/Hadrianic fire and late Roman groups, this apparent decline in the incidence of cattle may correspond with a declining local Roman military influence. Although the distribution of skeletal areas resembles that from earlier groups, there is a noticeable decline in the recovery of foetal/neonate and infant animals (Tables 7XX, 7XX, and 7XX). There are no neonate or infant oxen, one fragment of infant lamb from each of Room A and Room E of Building 64; and a single fragment of foetal/neonate piglet from Open Area 77.

Evidence for craft and industry

The assemblage produced a small group of tool-marked material indicative of industrial or craft activity rather than butchery alone. Although small in terms of fragment count, this material provides definite evidence for a range of, at least small-scale, craft activity in and around the site. The species definitely utilised are ox, sheep/goat, red deer and cat. Throughout all periods there was recovery of small numbers of horncores of sheep/goat and ox showing chop and saw marks indicative of removal of the horn sheath for further manufacture (see chronological narrative). The scattered nature and small scale of this material does not allow specification of a definite industrial area rather an indication that horn removal and subsequent horncore disposal had occurred at the site throughout Roman occupation.
Table 731 shows the complete recovery of deer remains from the site as a whole. It can be clearly seen that only one bone, a red deer radius from [3782] (Period 401, Group 417, Open Area 32) derives from an area of reasonable meat-bearing quality and suggests the consumption of venison. Three deer metapodials from roe deer [18079] (Group 836, Open Area 75, Period 401), red or fallow deer from [18066] (Group 836, Open Area 75, Period 401) and fallow deer [18020] (Group 839, Open Area 76, Period 501-502) may indicate waste from primary carcase preparation, or possibly suggest hide processing (Serjeantson 1989, 139). The majority of the deer remains derive from antler fragments and it is impossible to specify whether these were from shed or unshed antlers. Antler fragments were recovered from P 202, 301, 401, 501, 502, 601, 602, 603, and 700). With the exception of an unworked roebuck antler from [18225], all the antler remains were either identified as red deer or were too damaged to be accurately identified to species but were considered to be red or fallow deer on the basis of thickness. Much of this material had been neatly sawn through transversely immediately below the tines, below beam/tine junctions or at the antler base. These fragments represent off-cuts rather than discarded blanks and would have been produced during trimming of the antler to obtain straight sections of beam suitable for further manufacture into finished artefacts such as combs or knife handles. There was little potential for study of the tools and techniques in use as there were no blanks discarded after accidental damage during manufacture (see Pipe, *in prep.)* and it was therefore difficult to comment on blade thickness or direction of cut. One fragment however did produce interesting evidence; a red deer antler from [18001], Group 852, Open Area 77, Period 502) had been sawn

through just below the junction of the terminal tines, the 'tops' (Page 1971, 56) and showed evidence of an initial, first attempt, incomplete cut. This indicated that the saw was of fine quality and gave a straight accurate cut of 1.0 mm thickness, very much an indication that the action was purposeful and that care was taken.

Specialist appendices

The animal bones

Methods

The hand-collected animal bones were washed, air-dried at room temperature and then bagged and labelled as context groups.
Bulk samples were washed on a modified Siraf-type flotation tank using 1.0 mm flexible nylon mesh to retain the residue fraction. Each residue was then visually sorted for floral, faunal and artefactual material.
The hand-collected and wet-sieved animal bones were then described and recorded directly onto the MoLAS/MoLSS Oracle 7 animal bone post-assessment database. Whenever possible, each fragment was recorded in terms of species, skeletal element, handedness, sex, fragmentation, and modification. Evidence for age at death was recorded from surface texture, epiphysial fusion or tooth eruption and wear stages as appropriate. Species and skeletal element were determined using the MoLSS animal bone reference collection together with Cannon 1987; Cohen & Serjeantson 1996; chmid 1972, Wheeler & Jones 1989. Interpretations of age at death were made using data cited by Amorosi 1989. Pathological modifications were identified, described and interpreted using Baker & Brothwell 1980. Fragmentation was described using the numerical zone method of Rackham 1986. Butchery, working, burning and gnawing were described using standard codes and conventions devised by the MoLSS Environmental Archaeology Section; butchered and worked bones were also sketched to record examples of particular tool and technique use. All fully fused, skeletally adult bone were measured using the techniques of von den Driesch 1976. In general, each bone fragment was assigned to species and skeletal element and recorded as an individual database entry; when this was impracticable due to extreme fragmentation and/or erosion, fragments were recorded at an approximate level of identification including unidentified fish, unidentified bird, or unidentified mammal, 'ox/cattle-sized mammal', 'sheep-sized mammal' and longbone/long-bone fragment. Such heavily damaged material was entered as multiple records when appropriate.

Results

The hand-collected bone fragments were generally in moderate to good surface condition with little difficulty experienced in the identification of species, skeletal element, handedness, modification, ageing evidence or measurement points. Nevertheless, it was found necessary to allocate considerable quantities of bone to the approximate categories 'cattle-sized and sheep-sized' mammal and, to lesser degrees, 'chicken-sized' bird,

unidentifiable fish, bird and mammal (Tables 701 and 702). The wet-sieved bones were usually in only moderate surface condition with considerable damage noted on the more fragile material, particularly the fish bones. As a result, there was more limited success in identification to species-level with this material.

A total of 5090 fragments of animal bone were hand-collected from Roman contexts. Table 701 shows the hand-collected species and fragment counts for each period.

A total of 5409 fragments of animal bone were recovered from wet-sieved bulk samples from Roman contexts. Table 702 shows the species and fragment counts for each period. The chronological narrative describes the faunal recovery with reference to period and land-use.

These fragments derived from a rather narrow range of domestic and wild species which was heavily dominated by ox with smaller contributions of sheep/goat and pig with a generally very sparse recovery of poultry and wild species. The fish derived from true freshwater and marine species with some euryhaline species tolerant of a range of salinities. The fish were largely represented by small groups of eroded vertebrae and accurate identification to species-level was often impossible as a result. The taxa recovered were ray (probably thornback ray or roker, *Raja clavata*, herring (*Clupea harengus*) and herring family (Clupeidae), smelt (*Osmerus eperlanus*), eel (*Anguilla anguilla*), grey mullet (Mugilidae), cod (*Gadus morhua*) and cod family (Gadidae), plaice *(Pleuronectes platessa*), plaice/flounder (Pleuronectidae), carp family (Cyprinidae), and mackerel (*Scomber scombrus*).

Birds were mainly represented by chicken (*Gallus gallus*) with very much smaller contributions of goose, probably domestic goose *Anser anser*, and mallard/domestic duck (*Anas platyrhynchos*). There were occasional recoveries of wild 'game' species including wild duck (not mallard), common/grey partridge (*Perdix perdix*), thrushes (Turdidae), woodcock (*Scolopax rusticola*), ?plover (Charadriidae), probably lapwing *Vanellus vanellus*, crane (*Grus grus*), and curlew (*Numenius arquata*). The bird fauna also included carrion and refuse feeding 'scavenger' species such as red kite (*Milvus milvus*), raven (*Corvus corax*) and other Corvidae, possibly including carrion crow *Corvus corone*.

Mammals were mainly represented by the major domesticates, particularly ox (*Bos taurus*) with smaller contributions of sheep (*Ovis aries*), goat (*Capra hircus*), and pig (*Sus scrofa*). There was very sparse recovery of wild 'game' species including red deer (*Cervus elaphus*), fallow deer (*Dama dama*), roe deer (*Capreolus capreolus*), and brown hare (*Lepus europaeus*) although it should be stressed that the prevalence of antler and metapodial fragments in the deer remains provides little real evidence for consumption of venison. There was also only sparse evidence for disposal of carcases of working animals with small fragment counts of horse (*Equus caballus*), dog (*Canis familiaris*) and cat (*Felis catus*).

The recovery of frog/toad (probably common frog, *Rana temporaria* or common toad, *Bufo bufo*) and small mammals was also very limited in terms of abundance and diversity. Much of the small mammal material was unidentifiable longbone fragments of small rodents with definite identification of only field vole (*Microtus agrestis*), house mouse (*Mus musculus*) and rat (*Rattus sp.*).

The ostracods

Methods

A range of selected soil samples were submitted for ostracod analysis. These derived from pre-Roman deposits, and Periods 2, 3, 4, 5 and 6 and were taken from a range of features including wet/marshy ground, wells, roadside drains and possibly waterlain deposits (Corcoran 2000). Each of these roughly 0.3 kg (wet weight) samples was wet-sieved/floated on a modified Siraf-type tank fitted with 0.25 mm flexible nylon meshes to retain the flot and residue fractions. The flot and residue fractions were then combined and allowed to air-dry at room temperature. Once dry, the combined fractions were visually inspected under a low-power binocular microscope for ostracod valves. Ostracod valves recovered from the flot fractions of wet-sieved/floated bulk samples were identified under a binocular microscope and using Henderson 1990, and then interpreted in terms of their ecological significance following the same source.

Results

None of the selected samples produced ostracods. Small numbers of battered ostracod valves were, however recovered from the flot fractions of two bulk samples processed for floral and vertebrate remains. Ostracod valves were recovered from Period 603; S32 feeder drain on the north side of Road 1, context [7527] {451}, and make-up dump in 4th century Building 64 Room G, context [3748] {410}. Whenever possible, the species were identified using Henderson 1990. Due to the incomplete nature of the recovery from these two samples, no comments are justified on species relative abundance.
Period 603 S32 feeder drain fill [7527] yielded the freshwater taxa *Eucypris virens and Candona albicans.*
Period 603 4th century make-up layer [3748] in Building 64 Room G yielded the freshwater genus *Herpetocypris*, probably *H.reptans.*
The ecological implications of these recoveries are discussed in the appropriate passages of the chronological narrative.

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