HAND-COLLECTED AND WET-SIEVED ANIMAL BONE FROM C257 FARRINGDON CHARTERHOUSE SQUARE, LONDON EC1, CITY OF LONDON (XTE12)

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Chronological narrative

Period 4: early post-medieval ditch neglect and backfill

Building 1

Group 58

Subgroup 134

External dump [235] included single fragments of cattle rib and first phalange (basal toe joint); sheep/goat skull, mandible (lower jaw), atlas (neck) vertebra, sub-adult radius (lower fore-leg) and femur (upper hind-leg); and pig tibia (lower hind-leg).

Open Area 5

Group 81

Subgroup 172

External dump [293] produced a large and diverse group of hand-collected and wet-sieved bone derived from fish, cattle and sheep/goat with single fragments of foetal or neonate kitten and juvenile rabbit. Cattle produced fragments of skull with single fragments of juvenile horn core, adult maxilla (upper jaw), rib, innominate (pelvis) and foetal or neonate calf scapula (shoulder blade); and fragments of sheep/goat adult horn core, skull, mandible (lower jaw), rib and first phalange (basal toe joint). Two fragmented skulls showed depressed fractures of the frontal bone (the 'forehead') indicating that the animals had been 'pole-axed', perhaps with a sledgehammer, during slaughter.
A large group of fish derived almost entirely from marine/estuarine species, particularly herring family Clupeidae, probably herring *Clupea harengus*, cod family Gadidae and plaice or flounder Pleuronectidae with occasional fragments of gurnard Triglidae and mackerel *Scomber scombrus*. Migratory species comprised single fragments of juvenile eel *Anguilla anguilla* dentary (lower jaw) and vertebra.
Non-consumed domesticates comprised two mandibles of foetal or neonate kitten *Felis catus*; game comprised fragment of juvenile rabbit *Oryctolagus cuniculus* tibia (lower hind-leg).

External dump [298] produced a large group derived mainly from cattle and sheep/goat with small groups of poultry, pig and non-consumed domesticates. The cattle group mainly comprised fragments of adult and juvenile skull, maxilla (upper jaw), mandible (lower jaw), rib and metapodial (foot) with sparser recovery of horn core and upper and lower fore- and hind-leg. Dental evidence from a cattle mandible indicates an adult in at least the fourth year. Two fragmented skulls showed depressed fractures indicating that the animals had been 'pole-axed', perhaps with a sledgehammer, during slaughter prior to primary processing. Preliminary horn preparation is indicated by two horn cores chopped transversely at the base. A rib fragment showed slight canine gnawing.
The sheep/goat group mainly comprised fragments of adult horn core, skull and mandible with limited recovery of upper and lower fore-leg and upper hind-leg, fore-

foot and phalange (toe joint). Dental data from nine sheep/goat mandibles indicated six fourth-year jaws and three from older animals in the fifth-to-seventh year range. Four horn cores showed transverse chops at the base indicating preliminary preparation for removal of the horn layer prior to further working. A humerus (upper fore-leg) showed moderate canine gnawing.
Pig produced single fragments of skull, humerus (upper fore-leg) and infant ulna (lower fore-leg); dental evidence from the skull indicates a third-year animal. The humerus had been calcined indicating a high combustion temperature of at least 700 degrees Celsius (Lyman 1994, 386).
Poultry comprised single fragments of juvenile chicken tibiotarsus ('drumstick'), juvenile goose metatarsal (foot).
Non-consumed domesticates were represented by young adult dog *Canis lupus familiaris* skull, mandible (lower jaw) and tibia (lower hind-leg) derived from at least two animals; and cat *Felis catus* adult hind-leg elements, all possibly from the same adult animal.
Recovery of game species comprised a single fragment of juvenile red deer *Cervus elaphus* metatarsal (hind-foot).

Group 82

Subgroup 164

External dump [282] produced a single femur (upper hind-leg) of adult rabbit *Oryctolagus cuniculus*.

External dump [283] produced fragments of cattle and sheep/goat scapula (shoulder blade) with single fragments of cattle femur and juvenile tibia (upper and lower hind leg); adult sheep/goat humerus infant pig scapula (shoulder blade); and adult chicken ulna (lower wing).

Open Area 6

Group 59

Subgroup 138

External dump [240] produced a small group mainly derived from marine/estuarine fish and chicken, with single fragments of cattle mandible (lower jaw) and adult female pig maxilla (upper jaw). The fish group included fragments of vertebrae from cod (family), gurnard and plaice or flounder with a cleithrum (gill area) of plaice or flounder. Chicken produced single fragments of adult and juvenile scapula (shoulder blade).

Group 67

Subgroup 149

External dump [257] produced a small diverse group derived mainly from cattle and sheep/goat with single fragments of chicken femur (upper leg); adult mallard or domestic duck ulna (lower wing), fallow deer tibia (lower hind-leg) and hare, probably brown hare, adult innominate (upper hind-leg). The cattle group comprised fragments of skull, juvenile cervical (neck) vertebra, humerus and femur (upper fore- and hind-leg) and phalange (toe joint). The sheep/goat group included adult horn core, vertebra, rib, scapula, humerus and radius (upper and lower fore-leg) and metatarsal

(hind-foot). Two horn cores had been chopped transversely at the base indicating preliminary preparation for removal of the horn layer for further working.

Group 78

Subgroup 163

External dump [279] included a small group of adult cattle skull and rib fragments with single fragments of vertebra and humerus (upper fore-leg) and foetal or neonate innominate (pelvis); and single fragments of chicken tibiotarsus (lower leg); and pig juvenile skull and adult mandible (lower jaw). Dental evidence from the pig mandible indicates a third-year animal.

External dump [280] produced a small group of sheep/goat with fragments of chicken, cattle, pig and game. The sheep/goat group included fragments of scapula (shoulder blade), humerus (upper fore-leg), innominate and femur (upper fore- and hind-leg). The remainder included single fragments of cattle rib; adult chicken radius (lower wing) and tibiotarsus (lower leg); and juvenile pig femur (upper hind-leg). Game species comprised single fragments of brown hare and juvenile rabbit femur (upper hind-leg).

Subgroup 176

External dump [297] produced a moderate group of cattle and sheep/goat with a single fragment of adult chicken tibiotarsus (‘drumstick’). The cattle group included fragments of adult mandible (lower jaw), sacrum (lower vertebral column) and ribs with single fragments of skull, vertebra, scapula (shoulder blade) and innominate (upper hind-leg); dental evidence from two mandibles indicates animals in at least the fourth year.
The sheep/goat group consisted largely of adult mandibles (lower jaws) with adult sheep horn cores and fragments of rib, scapula (shoulder blade) and tibia (lower hind-leg); dental evidence from ten mandibles indicates one animal in the third year, three animals in the fourth year and six in the fifth-to-seventh year range. Two adult sheep horn cores had been chopped transversely at the base indicating preliminary preparation for removal of the horn layer for further working.

Subgroup 177

External dump [304] included small groups of cattle and sheep/goat with single fragments of adult chicken femur (thigh bone); and pig adult and sub-adult innominate (upper hind-leg). The cattle group included fragments of vertebra and rib with single fragments of juvenile metacarpal (fore-foot) and innominate (upper hind-leg). Sheep/goat included single fragments of mandible (lower jaw), rib, scapula, humerus, radius and ulna (upper and lower fore-leg) and innominate (upper hind-leg); dental evidence from the mandible indicated a fourth-year animal.

Subgroup 178

External dump [308] included fragments of sheep-sized rib and a single fragments of adult chicken ulna (lower wing).

Subgroup 179

External dump [310] produced a moderate group of cattle and sheep/goat with two femora (upper hind-leg) of adult dog. The cattle group mainly included rib, scapula and humerus (upper fore-leg) with single fragments of skull, vertebra, metacarpal (fore-foot), femur, tibia and metatarsal (upper and lower leg and hind-foot). Single examples of scapula, humerus, femur and metatarsal derived from foetal or neonate calf. Sheep/goat included single fragments of rib, mandible (lower jaw), humerus, radius, femur and tibia (upper and lower fore- and hind-leg); dental evidence from the mandible indicated an animal in the fifth-to-seventh year range. A sheep skull showed transverse chops through the horn core bases indicating preliminary preparation for removal of the horn layer for further working.

Subgroup 180

External dump [312] included fragments of sheep/goat scapula (shoulder blade) with single fragments of calf and cat tibia (lower hind-leg).

External dump [317] produced a moderate group derived from cattle and sheep/goat with a smaller group of poultry and pig. The cattle group included fragments of radius (lower fore-leg) with single fragments of skull, adult and infant mandible (lower jaw), vertebra, humerus and innominate (upper fore- and hind-leg); dental; evidence from two mandibles indicates a calf in the first six months of life and a much older, fully-adult, animal in at least the fifth year. The skull fragment showed a depressed fracture indicating that the animal had been ‘pole-axed’ during slaughter, possibly by use of a sledgehammer.
The sheep/goat group mainly included fragments of rib and tibia (lower hind-leg) with single fragments of adult mandible (lower jaw), vertebra, scapula, radius (upper and lower fore-leg) and innominate (upper hind-leg); dental evidence from the mandible indicates and adult animal in the fifth-to-seventh year.
Pig produced a small group of sub-adult bones; fragments of juvenile skull with single fragments of infant mandible (lower jaw), juvenile metacarpal (fore-foot) and innominate (pelvis); dental evidence from the mandible indicates a very young piglet in the first months of life.
Poultry comprised two tibiotarsii (‘drumsticks’) of adult chicken and an innominate (pelvis) of adult goose.
Game species comprised only a single bone of wild duck, a humerus (upper wing) of adult teal *Anas crecca*.

Open Area 7

Group 55

Subgroup 129

External dump [227] included fragments of cattle vertebra and rib; with single fragments of sheep/goat scapula and humerus (upper fore-leg); young adult pig mandible (lower jaw); and goose humerus (upper wing).

Subgroup 133

External dump [231] produced a large and diverse group derived mainly from cattle and sheep/goat with sparser recovery of pig, fish, poultry and game. The cattle group included fragments of rib and adult horn core with single fragments of mandible, vertebra, scapula, juvenile radius (upper and lower fore-leg), femur and tibia (upper and lower hind-leg). The sheep/goat group comprised fragments of vertebra and rib, with single fragments of mandible (lower jaw), scapula, humerus (upper fore-leg), femur (upper hind-leg), metatarsal and adult phalange hind-foot and toe joint. Pig produced single fragments of juvenile metapodial (foot) and third phalange (terminal toe joint).
Poultry included fragments of chicken humerus (upper wing) and single fragments of sternum (breast bone), and juvenile tibiotarsus ('drumstick').
Game comprised a coracoid (upper wing) of snipe *Gallinago gallinago*; a metatarsal (hind-foot) of fallow deer *Dama dama*; and fragments of rabbit *Oryctolagus cuniculus* innominate, calcaneum and metacarpal (pelvis, lower fore- and hind-leg and foot) derived from at least three adult and juvenile animals.
The fish group included vertebrae of marine/estuarine species; cod family Gadidae including haddock *Melanogrammus aeglefinus*, gurnard Triglidae and plaice or flounder Pleuronectidae.

Group 75

Subgroup 158

External dump [270] produced a large group derived mainly from cattle and sheep/goat with a smaller group of pig and occasional recovery of poultry; chicken and goose. The cattle group mainly comprised ribs and adult and juvenile innominate and femur (upper hind-leg) with smaller groups of mandible (lower jaw), vertebra, upper and lower fore-leg and lower hind-leg and phalange (toe joint) including single examples of foetal or neonate scapula and infant ulna (lower fore-leg); dental evidence from a mandible indicates an adult animal in at least the fourth year of life.
Sheep/goat derived mainly from adult sheep horn core and adult rib and upper and lower fore- and hind-leg with smaller groups, of mandible (lower jaw) and metacarpal and metatarsal (fore- and hind-foot) and a single infant femur (thigh bone); dental evidence from a sheep/goat mandible indicates a fourth-year animal.
The slightly smaller pig group comprised mandible, upper and lower fore-leg and upper hind-leg and metapodial (foot) derived from infant, juvenile, sub-adult and adult examples; dental evidence from two pig mandibles indicates animals in the second and third years.
A single femur (upper hind-leg) derived from adult cat.
Poultry comprised three fragments of chicken; humerus (upper wing) and tibiotarsus ('drumstick'); with five fragments of adult goose humerus (upper wing), radius (lower wing) and tibiotarsus ('drumstick').

External dump [272] produced a large group derived mainly from cattle with rather smaller groups of sheep/goat and pig and occasional recovery of poultry and game and a single lumbar (lower back) of dog. The cattle group comprised fragments of rib with skull and adult and infant mandible (lower jaw), foetal or neonate scapula (shoulder blade), infant and juvenile metatarsal (hind foot) and single examples of

vertebra, infant calf tibia (lower hind log) and phalange (toe joint); dental evidence from a cattle mandible indicates a calf in the second six months of life.
Sheep/goat produced adult sheep horn cores with sheep/goat rib and scapula (shoulder blade) and single fragments of humerus (upper fore leg) and femur and tibia (upper and lower hind-leg); dental evidence from a mandible indicates a fourth year animal.
Pig produced a small group derived from juvenile from vertebra, upper and lower fore-leg and upper hind-leg and hind-foot.
A small group of poultry comprised adult chicken humerus (upper wing), femur (thigh), tibia ('drumstick') and hen metatarsal (foot) derived from at least three birds; goose adult humerus (upper wing), innominate (pelvis) and metatarsal (foot); with a single humerus (upper wing of adult turkey *Meleagris gallopavo*, the only recovery of this species from the recorded dump groups.
Game comprised radius (lower fore-leg) and metatarsal (hind-foot) of adult fallow deer *Dama dama*; with a femur of adult rabbit *Oryctolagus cuniculus*.

External dump [273] included a small group of cattle with sparser recovery of sheep/goat and pig with a single tibiotarsus ('drumstick') of adult chicken. Cattle derived from rib fragments with single examples of skull, (lower jaw), vertebra, lower fore-leg, upper and lower hind-leg, phalange (toe joint) with infant calf mandible and metatarsal (hind-foot).
Sheep/goat produced three horn cores of adult sheep with fragments of rib and adult and juvenile tibia (lower hind-leg).
Pig produced single fragments of mandible (lower jaw), scapula (shoulder blade) and juvenile ulna (lower fore-leg); dental evidence from the mandible indicates an animal late in the second year.

Period 301: medieval cemetery phase 1, boundary ditch/Faggeswell Brook and barrel feature

Open Area 3

Group 3

Subgroup 3

Grave deposit [162] included single fragments of cattle skull and mandible (lower jaw); and sheep/goat rib.

Subgroup 6

Skeleton deposit [176] included single fragments of sheep/goat rib, humerus and metacarpal (upper fore-leg and fore-foot).

Subgroup 12

Skeleton deposit [194] included a fragment of cattle rib.

Group 4

Subgroup 14

Make-up deposit [161] produced a large group derived largely from cattle and sheep/goat with smaller groups of pig and poultry. The cattle group comprised

fragments of sub-adult femur (thigh bone) including single examples from foetal or neonate and infant calves; with adult metapodial (foot) and phalange (toe joint) and sparser recovery of scapula (shoulder blade) and fragments from the lower hind-leg. The sheep/goat group derived largely from rib and adult upper and lower fore- and hind-leg and fore- and hind-foot with adult sheep providing radius and metatarsal (lower fore-leg) and hind-foot.
Pig provided a much smaller group comprised of upper fore- and hind-leg and hind-foot. Poultry produced four fragments of femur (thigh bone); two each of adult chicken and two from adult goose.
Non-consumed domesticates comprised two metacarpals (fore-foot) and two phalanges (toe joints) of adult horse.

Thematic chapter

Introduction and methodology

This report quantifies, identifies and interprets the hand-collected and wet-sieved animal bones recovered from selected deposits, particularly dumps, at XTE12. Further to previous limited assessment work (Pipe 2014), all context and sample groups from this site have now been recorded onto the MOLA Oracle animal bone assessment database; all data are available for consultation.
Animal bones from each selected dump context and sample group were described and recorded directly onto the MOLA Oracle animal bone post-assessment database, each fragment being recorded in terms of species, skeletal element, body side, age, epiphyseal fusion, dental eruption and wear, sex, fragmentation, and modification. Identifications of species and skeletal element referred to the MOLA reference collection; with Cannon 1987; Cohen & Serjeantson 1996; and Schmid 1972. Evidence for age at death was derived from surface texture, epiphyseal fusion and tooth eruption and wear stages as appropriate, following Amorosi 1989; Grant 1982; Payne 1973; and Schmid 1972. Modifications such as tool marks, burning and gnawing were described using MOLA Osteology codes and conventions. In general, each bone fragment was recorded as an individual database entry unless this was impracticable due to extreme fragmentation and/or erosion in which case fragments were recorded, either as single or multiple records, at an approximate level of identification particularly ‘cattle-sized mammal’, ‘sheep-sized mammal’ and ‘sheep/goat’.
The chronological narrative gives a description of each context group in terms of fragment count, species, skeletal element, age-at-death and modification.
Where group and context sample size is sufficient to allow further comment, implications for diet and industrial activity are discussed in the chronological narrative and thematic text sections.

Preservation and quantification

Table 1 Hand-collected and wet-sieved animal bone from dumps at XTE12/fragment counts

A total of 921 fragments of identifiable hand-collected and wet-sieved animal bone were recorded from Periods 4 and 301; respectively 815 and 106 fragments.
Preservation was at least moderate, usually good, in all contexts, with surface damage generally insufficient to prevent identification of species, skeletal element, dental characteristics, epiphysial fusion and modification.

Faunal composition

The assemblage consisted largely of cattle *Bos taurus,* sheep/goat including sheep *Ovis aries,* pig *Sus scrofa* and poultry; chicken (domestic fowl) *Gallus gallus*, goose, probably domestic goose *Anser anser domesticus* with single examples of mallard or domestic duck *Anas platyrhynchos* ulna (lower wing) Period 4 Open Area 6 Group 67 dump [257] with a single humerus (upper wing) of adult turkey *Meleagris gallopavo* from Period 4 Open Area 7 Group 75 dump [272]. A substantial assemblage of fish was recovered from Period 4 although none were recovered from Period 301. The fish comprised almost entirely marine/estuarine species; roker or thornback ray *Raja clavata*, herring family Clupeidae including herring *Clupea harengus*, cod family Gadidae, including cod *Gadus morhua* and haddock *Melanogrammus aeglefinus*, gurnard Triglidae and mackerel Scomber scombrus with substantial recovery of flatfish within the family Pleuronectidae, probably plaice *Pleuronectes platessa* or flounder *Platichthys flesus*. Migratory species comprised only two fragments of eel *Anguilla anguilla* from Period 4. No freshwater fish were recovered.
Game birds comprised only teal *Anas crecca* and snipe *Gallinago gallinago* with at least one species of very small 'sparrow-sized' passerine bird; game mammal species were slightly more diverse, with red deer *Cervus elaphus*, fallow deer *Dama dama*, brown hare *Lepus europaeus* and rabbit *Oryctolagus cuniculus*.
Very small vertebrates were virtually absent; with no recovery of amphibians and only a single fragment of mouse or vole from Period 4 Open Area 5 Group 81 dump [293]; there was no definite identification of rats, mice, shrews or other very small mammals, and therefore no real potential for comment on local habitats or conditions.

Meat diet

Table 1 Hand-collected and wet-sieved animal bone from dumps at XTE12/fragment counts

Table 2 Animal bone from selected dump deposits at XTE12/dental eruption and wear; age estimates (after Grant 1982; and Payne 1973)

For both periods, the bone assemblage is numerically dominated by cattle and sheep/goat, with slightly smaller groups of pig and considerable recovery of fish, game and poultry, particularly chicken (domestic fowl), and to a lesser extent, goose, with single recoveries of mallard or domestic duck and turkey. Age-group representation of the major domesticates indicates predominance of young adult and adult cattle, sheep/goat, pig and poultry with the larger context assemblages showing a range of age-groups, typically, adult cattle in at least the fourth year; sheep/goat predominantly in the fourth and fifth-to-seventh years; and pigs in the second and third years. The major domesticates also occasionally produced younger animals; a very young calf in the first six months from Period 4 Open Area 6 Group 78 dump [317]; and first year cattle in Period 4 Open Area 5 Group 81 dump [298] and Open Area 7 Group 75 dump [272]; and a pig in the first six months from Period 4 Open Area 6 Group 78 dump [317]. This range of ages represents some consumption of livestock purpose-reared for beef, mutton and pork production as well as cattle and sheep/goat slaughtered after use for primary functions such as dairying and wool production although there was no evidence for sick or aged animals. Some dump groups also included occasional fragments of foetal or neonate calves suggesting some relatively limited consumption of veal; examples are seen in Period 4 dumps [270], [272], [293], [279] and [310]; and Period 301 make-up [161].

Fish were recovered from Period 4 Open Area 5 Group 81 dumps [293] and [298]; Open Area 6 Group 59 dump [240], Group 78 dump [280]; and Open Area 7 Group 55 dump [231]. No fish were recovered from Period 301 contexts. With the exception of two fragments of eel, a migratory species, from Open Area 5 Group 81 dump [293], all the fish fauna derived from a range of marine species available from the outer Thames estuary or adjacent coastal waters; the bulk of the fragment count was provided by fish of the herring, cod and plaice families.
Poultry were recovered from Periods 4 and 301 with the bulk of the fragment count contributed by chicken and goose from Period 4. Poultry were identified from Period 4 Open Area 5 Group 81 dump [298] and Group 82 dump [283]; Open Area 6 Group 59 dump [240], Group 67 dump [257], Group 78 dumps [279], [280], [297], [304], [308] and [317]; Open Area 7 Group 55 dump [227] and [231]; Group 75 dump [270], [272] and [273]; and Period 301 Open Area 3 Group 4 make-up deposit [161].
Game species were recovered only from Period 4. Game birds comprised only teal *Anas crecca* from Period 4 Open Area 6 dump [317] and snipe *Gallinago gallinago* from Period 4 Open Area 7 dump [231] with at least one species of very small 'sparrow-sized' passerine bird from Period 4 Open Area 7 Group 55 dump [231]. Game mammal species were slightly more diverse with red deer *Cervus elaphus* from Open Area 5 Group 81 dump [298]; fallow deer *Dama dama* from Open Area 6 Group 67 dump [257]; Open Area 7 Group 55 dump [231] and Group 75 dump [272]; brown hare *Lepus europaeus* from Open Area 6 Group 67 dump [257] and Group 163 dump [280]; and rabbit *Oryctolagus cuniculus* from Open Area 5 Group 81 dump [293], Group 82 dump [282]; Open Area 7 Group 55 dump [231] and Group 75 dump [272].

Non-consumed domesticates

Non-consumed domesticates comprised horse *Equus caballus* Period 301 Open Area 3 Group 4 make-up deposit [161]; dog *Canis lupus familiaris* Period 4 Open Area 5 Group 81 dump [298]; Open Area 6 Group 78 dump [310]; Open Area 7 Group 75 dump [272]; and cat *Felis catus* Period 4 Open Area 5 Group 81 dumps [293], [298]; Open Area 6 Group 78 Group 78 dump [312]; and Open Area 7 Group 75 dump [270].

Modification and industrial activity

Table 3 Animal bone from selected dump deposits at XTE12/ slaughter, working, gnawing and burning

Clear tool-mark evidence of butchery, particularly with use of cleavers and knives, was present on cattle, sheep/goat, pig and poultry throughout the assemblage, indicating splitting of vertebrae and main limb long-bones down the midline, with disarticulation and subsequent transverse sub-division of vertebra and long bones. By contrast, tool-mark evidence for industrial activity was rather sparser throughout and was effectively confined to occasional transverse chop marks on horn cores of cattle, sheep and sheep/goat representing primary preparation for removal of the horn layer for further working of cattle sheep and goat horn. There was no evidence for working of antler or bone. Period 4 dumps [298] included chopped cattle horn cores; Period 4 dumps [257], [293], [297], [298] and [310] included chopped sheep/goat horn core with definite identification of sheep from [257], [297], [298] and [310] but no recovery of goat.
Period 4 Open Area 6 Group 67 dump [257] produced a complete tibia (lower hind-leg) of an adult wild carnivore, probably a pine marten *Martes martes*, perhaps

representing local utilisation of the decorative fur of this species. Recovery of metapodials (feet) and phalanges (toe joints) of cattle, sheep/goat, red deer and fallow deer suggests local primary carcase processing; fragments of 'pole-axed' cattle skulls from Period 4 Open Area Group 81 dumps [293] and [298] and Period 4 Open Area 6 Group 78 dump [317] provide evidence of local slaughter and disposal of primary processing waste.

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Tables