3. IRON AGE BURIALS

3.1 Introduction

Four Iron Age inhumation pits (058, 766, 799 and 880) were identified during the course of the excavation (Illus 2.1). One of the inhumation pits (058) had been stone-lined and covered over with large capstones to form a burial cist, but the other inhumation burials had simply been cut into the sand subsoil (002) and then backfilled using the same material. Pits 058 and 766 both contained two inhumation burials and Pit 799 contained a single inhumation burial. It is assumed that Pit 880 would also have contained a single inhumation, but the only surviving human remains consisted of a small quantity of tooth enamel. Radiocarbon dates obtained from three of the pits indicate that they were buried within a timescale ranging from 50 cal BC–cal AD 90 (SUERC-38434) at 95% probability through to 40 cal BC–cal AD 130 (SUERC-38433) at 95% probability. Although technically this could mean that the earliest died in 50 cal BC and the latest in cal AD 130, the broad similarity of the dates would seem to indicate that they were buried within a comparatively short time of each other.

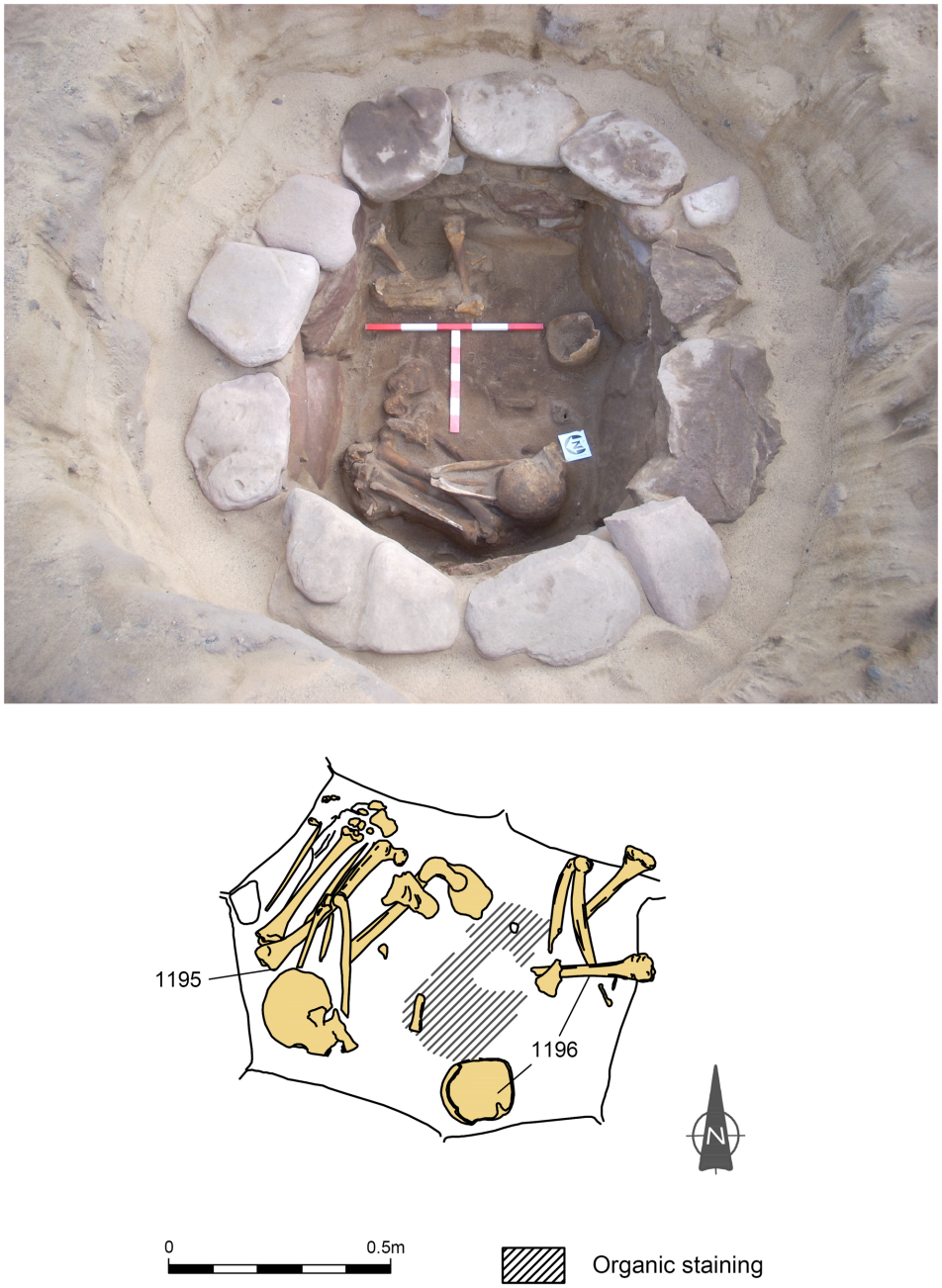
In addition to the single cremation from the evaluation phase of works (Robertson 2010), eight groups of cremated bone (190, 702, 703, 710, 711, 721, 723 and 725), a cremation pyre (066) and a possible redeposited cremation burial (539) of probable Iron Age date were identified. Seven of the cremation deposits (702, 703, 710, 711, 721, 723 and 725) were clustered within an area measuring *c* 8m by 3m towards the southern boundary of the site, with a single isolated cremation (190) located within close proximity of a cluster of Roman-period inhumations. Cremation Pyre 066 was situated towards the eastern end of the site near the single cremation uncovered during the evaluation phase of works. Redeposited Cremation 539 had been disturbed by a Roman-period horse burial (Pit 648).

Samples of cremated bone gave radiocarbon dates of 170 cal BC–cal AD 50 (SUERC-38424) at 95% probability through to 0–210 cal AD (SUERC-38423) at 95% probability. Only the latest of these dates falls within the Antonine-period occupation attributed to Inveresk fort, indicating that the cremation burials are most likely to be Iron Age. Cremation Deposit 539 was found in association with a Roman-period horse burial (Pit 648), which had resulted in the cremation deposit being dug out and then incorporated in the backfill material. This would indicate that the cremation deposit pre-dated the horse burial, but an absolute date for this cremation was not obtained.

3.2 The burials

3.2.1 Inhumations

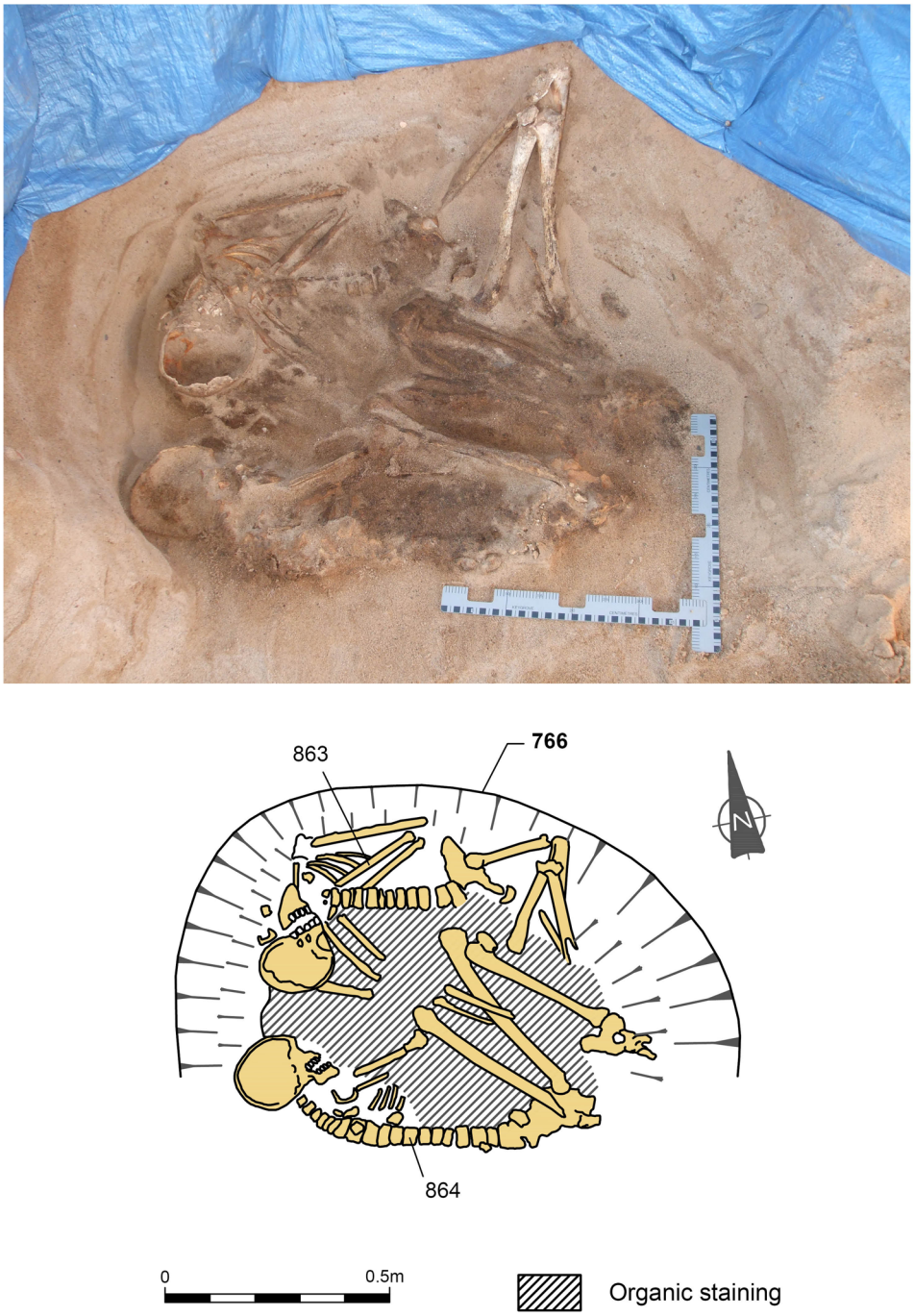
Cist Burial Pit 058 measured 1.75m north-west to south-east by 1.55m at the surface, narrowing down to 1.1mm by 1m at the base, and had been cut into the natural sand subsoil (002) to a depth of 0.96m. The lower sides of the pit had then been lined with up to four courses of angular and sub-angular undressed sandstone blocks (062) measuring up to 0.63m by 0.3m by 0.12m, creating a stone chamber measuring 0.92m by 0.86m by *c* 0.6m deep internally. Two human burials had been placed on the base of the pit (Illus 3.1). The surviving skeletons (1195 and 1196) were found in a tightly crouched 'foetal' position, indicating that the bodies may have been bound prior to deposition. An iron penannular brooch (SF8) of probable Iron Age date was found in association with Sk 1196, and Sk 1195 produced a radiocarbon date of 50 cal BC–cal AD 90 (95% probability; SUERC 38434). Following deposition of the burials, the pit had been backfilled with loose light yellow sand (063) and medium to dark brown silty sand (061). Originally, the pit is likely to have been stone-lined right to the surface, but a rough layer of stones (060) above the surviving structural elements is thought to represent the collapsed remains of the upper courses of lining together with the capstones. The probable collapsed upper courses (060) of the pit lining directly overlay Deposit 061 and included two large capstones measuring up to 0.6m by 0.58m by 0.08m thick. It is likely that there would originally have been a void between the upper surface of 061 and the base of the capstones into which this material had collapsed. A copper alloy knee brooch (SF1) of Roman date was recovered from the upper surface of Deposit 061 along with a Roman-period iron washer (SF106), seven iron hobnails and two iron



Illus 3.1 Iron Age Cist Burials 1195 and 1196 (copyright CFA Archaeology Ltd)

nails. These Roman-period artefacts within an Iron Age grave are considered to be intrusive and are likely to have entered by dropping down between the capstones into a void beneath. Following the collapse of the upper elements of the structure, the upper part of the pit had filled up with mid-brown silty sand (059). Roman-period finds consisting of a sherd of Roman pottery and a hobnail or tack were recovered from this deposit.

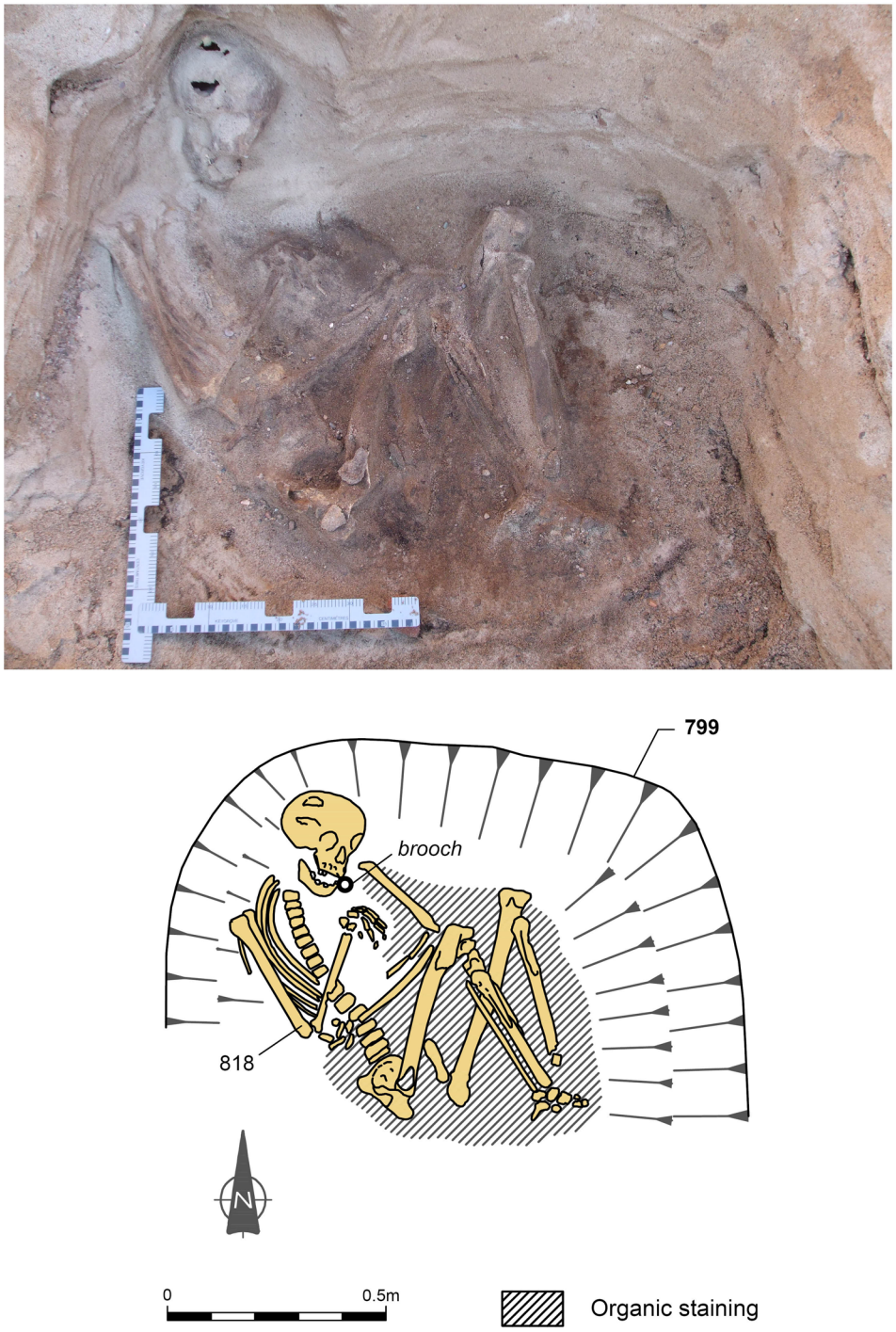
Burial Pit 766 was located 11.5m to the west of Burial Pit 058. It was roughly circular on plan, measuring 1.55m in diameter, and had been cut into the natural subsoil (002) to a depth of 1.25m (Illus 3.2). Two crouched inhumations (863 and 864) had been placed at the base of the pit. Skeleton 863 was lying on its back against the northern edge of the pit, with the legs drawn up towards the torso and resting on the side of the pit, the skull collapsed towards the right-hand side of the body and the arms folded across the chest. Skeleton 864 was lying on its left side, with the knees drawn up towards the torso and the hands placed beneath the skull.



Illus 3.2 Skeletons 863 and 864 (copyright CFA Archaeology Ltd)

The skeletal material was very damp and fragile and the survival of the bone was generally poor. Bone from Sk 864 produced a radiocarbon date of 40 cal BC–cal AD 130 (95% probability; SUERC 38433). Following the deposition of the bodies, the pit had been backfilled with mixed mid-brown and dark brown sand (879). A fragment of curved copper alloy rod (SF363), probably the remains of a finger ring, was found with the fingers of Sk 864.

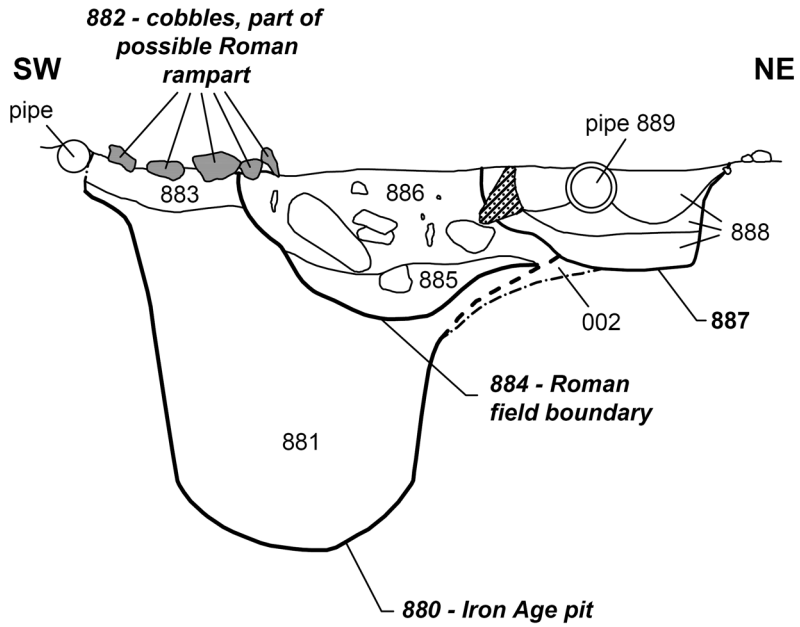
Burial Pit 799 was located *c* 2.5m to the west of Burial Pit 766. It was roughly circular (Illus 3.3), measuring *c* 1.45m in diameter, and had been cut into the natural subsoil (002) to a depth of 1.48m. A single crouched inhumation (818) had been placed at the base of the pit, with the head resting against the pit edge to the north-west, the knees drawn up towards the torso, and the forearms crossed over the stomach area with the hands resting by the pelvis.



Illus 3.3 Skeleton 818 (copyright CFA Archaeology Ltd)

The skeletal material was in very poor condition, and with the exception of the skull, it was not possible to lift it intact. Bone from the skeleton produced a radiocarbon date of 50 cal BC–cal AD 120 (95% probability; SUERC 38432). The pit had been backfilled using loose mid-yellowish-brown sand (800). An iron penannular brooch (SF40) recovered from the region of the left shoulder is likely to date to the 1st or 2nd century AD and showed evidence of Roman influence.

Burial Pit 880 was located 7m to the north-west of Burial Pit 799 (Illus 3.4). It was roughly oval in plan, measuring 1.39m east–west by 1.2m and had been cut into the natural subsoil (002) to a depth of 1.25m. Small quantities of human tooth enamel (881) were recovered from the base of the pit, but no further trace



Illus 3.4 Burial Pit 880 (copyright CFA Archaeology Ltd)

of the skeleton survived. The pit had been sealed by cobbling (882) associated with the base of the possible Roman rampart (693), and was cut by a later ditch (884). Ditch 884 also cut Rampart 693, providing a stratigraphic link between three of the main phases on the site. An iron nail tip and hobnail recovered from this pit are considered to be intrusive Roman material associated with the later field system.

3.2.2 Cremation burials

Cremation deposits 702, 703, 710, 711, 721, 723 and 725 measured up to *c* 1.2m by 0.8m by 0.08m and consisted of fairly dense concentrations of material with diffuse fans of material extending away from them. This diffuse pattern, together with the lack of any kind of a pit and the deposits' position

directly overlying subsoil 002, might indicate that the cremation deposits had been poured into slow-moving water and had fanned out as they sank to the bottom. A sample of cremated bone taken from Deposit 702 gave a radiocarbon date of 170 cal BC–50 cal AD (95% probability; SUERC 38424), pre-dating the Roman occupation of the area. Two small fragments of iron were recovered from 702 and 703.

Cremation Pit 190 was roughly circular in shape with a diameter of 0.7m, and had been cut into the natural subsoil (002), surviving to a depth of 0.16m. It had steeply sloping sides and a concave base. The fill (191) of the pit consisted of dark blackish-grey sand containing burnt bone and a few stone inclusions. One of the stones appeared to show evidence of heat damage, but there was no evidence of in situ burning. A sample of cremated bone produced a radiocarbon date of cal AD 0–210 (95% probability; SUERC 38423). These dates suggest that it is most likely to pre-date the Antonine occupation of the fort, and in the absence of any real evidence of Flavian occupation on the site, the balance of evidence suggests that it is most likely to be non-Roman. However, the possibility of this being a Roman cremation cannot be ruled out. The penannular iron brooch (SF141) from the pit is dated to the 1st–2nd centuries AD (see Section 3.4).

The cremation identified during the evaluation phase of works carried out by Headland Archaeology (Robertson 2010) measured 0.28m in diameter by 0.05m deep and was located within an oval pit measuring 1.1m by 0.8m by 0.15m deep. The circular nature of the cremation deposit (Evaluation Context 016) has led the excavator to suggest that that it was probably deposited within an organic vessel which had not survived. Its close proximity to Cremation Pyre 066 makes it tempting to suggest that these two features were directly associated with each other, but the probable pyre material consisted of *Quercus* sp (oak) whereas the material from Pyre 066 consisted of *Betula* sp (birch) and *Corylus avellana* (hazel) (Section 3.7).

3.2.3 Cremation pyre

Cremation Pyre Deposit 066 measured 1m east to west by 0.6m and consisted of black charcoal containing cremated bone. It overlay/filled a pyre pit (070), which had a depth of up to 0.08m. Surrounding Pit 070 was an area of scorched pinkish red natural sand (067), indicating that the pyre material was still in situ. Several pieces of carbonised wood (068 and 069) were identified running transversely across the pyre pit material. These pieces of wood appear to have been surviving remains of part of the pyre construction. A hobnail or nail tip was found in the deposit. A sample of cremated bone produced a radiocarbon date of 40 cal BC–cal AD 130 (95% probability; SUERC 38422). The dating of this cremation pyre is somewhat ambiguous as the radiocarbon date suggests Iron Age, but the hobnail is considered to be Roman.

3.2.4 Redeposited cremated bone (Burial 539)

Burial 539 consisted of a pit measuring 1.5m by 0.96m wide by 0.3–0.4m deep. The extent of this pit was defined by scorched sand, suggesting in situ burning, possibly indicating that this had been the pyre site. At a later date, it would appear that the pit had been dug out and extended to the west by a further 0.5m and deepened to a total depth of 0.77m in order to accommodate a Roman-period horse burial (Pit 648). The backfill of the horse burial consisted of three fills (624, 545 and 544 from bottom to top). Deposit 624 contained a few fragments of cremated bone thought to be the contents of Burial 539, while the majority of the cremated material was contained within Deposit 545. Any cremation material with Deposit 544 was limited to the interface with 545. The implication of this is perhaps that the contents of Burial 539 were kept separate when they were dug out, with the initial backfilling of the horse burial consisting of the recently excavated material (624) from the pit extension. This was followed by backfilling with the removed contents of Burial 539 (Deposit 545) and finally by any material that had overlain the contents of the original pit (Deposit 544).

3.3 Radiocarbon dates

Radiocarbon dates were obtained from three (818, 864 and 1195) of the six pit-grave inhumations and three of the cremation burials (066, 191 and 702), as shown in Table 3.1.

The dates from the pit graves place them within the Late Iron Age. Cremation 702 and Cremation 066 returned dates which indicated that both pre-dated

Table 3.1 Radiocarbon dates from the Iron Age burials. Calibration was conducted using OxCal v4.1, using the IntCal09 calibration curve

Lab No.	Context	Type	Date BP	68% probability	95% probability	$\delta^{13}C$	$\delta^{15}N$	C/N ratio
SUERC-38432 (GU-26291)	818	human bone: right femur	1970±30	0–70 AD	50 BC–120 AD	−20.4‰	11.9‰	3.4
SUERC-38433 (GU-26292)	864	human bone: femur	1955±30	0–80 AD	40 BC–130 AD	−20.4‰	11.0‰	3.2
SUERC-38434 (GU-26293)	1195	human bone: femur	1975±30	20 BC–70 AD	50 BC–90 AD	−20.2‰	11.6‰	3.3
SUERC-38422 (GU-26284)	066	cremated human bone: femur	1960±30	0–80 AD	40–130 AD	−25.1‰	–	–
SUERC-38423 (GU-26285)	191	cremated human bone: tibia	1920±30	50–130 AD	0–210 AD	−23.8‰	–	–
SUERC-38424 (GU-26286)	702	cremated human bone: femur	2035±30	100 BC–20 AD	170 BC–50 AD	−25.2‰	–	–

the Roman occupation of Inveresk fort. With a date of cal AD 0–210 at 95% probability, cremation 191 is rather more enigmatic, although a date of cal AD 0–140 at 95% probability indicates that it is pre-Antonine. With no clear evidence of Flavian occupation relating to Inveresk, this cremation is considered more likely to relate to the native Iron Age population, but there is an outside chance that it may relate to the Antonine occupation of the fort.

3.4 Metal finds from the burials

Dawn McLaren and Fraser Hunter (with a contribution by Gemma Cruickshanks)

The iron penannular brooches (two of Fowler (1960) A1, one probably A3) are all associated with burials, two inhumations and one cremation. Penannular brooches have Iron Age origins, but these small knobbed examples are typical of the Romano-British period, in iron and copper alloy. Mackreth's recent analysis (2011: 211–15) emphasises a 1st–2nd-century AD *floruit*. There is evidence of type A4 in southern England in the early 1st century AD, and an A3 from Maiden Castle (Dorset) comes from a context which Mackreth dates to the later 2nd century BC (Wheeler 1943: 264, fig 86 no. 2), but this is an anomaly in the overall picture. It is most likely that the type emerges from Iron Age precursors (Fowler type A and Aa) in the 1st century AD, becoming a widespread Romano-British type. It is found locally in Iron Age burials from Dunbar Golf Course and Luffness (Baker 2002 (type A3); Society of Antiquaries of Scotland 1945–6: 152, fig 1 (A1 variant)), where the brooches are best seen as Roman imports; Luffness is undated, but radiocarbon dates from Dunbar confirm its Roman Iron Age date. The brooches are found at Inveresk with different burial rites: SF8 in a double burial in a cist; SF40 at the left shoulder of an inhumation; and SF141 with a cremation. A 2nd-century knee brooch was also recovered from the cist, but this came from the top of the backfill and is considered to be intrusive.

Iron objects are otherwise rare in the burials. Grave 058 produced a number of items, but these were recovered from the surface of the backfilled material and are almost certainly intrusive, possibly representing material that had been deliberately pushed through gaps in the capstones into a void

beneath. The items recovered included seven hobnails, with traces of leather indicating the deposition of shoes rather than casually lost nails; the low number suggests the sole was only partly nailed. This grave also produced two nails (47mm and 68mm long), one with a clenched tip indicating it was set into wood when it was deposited, so there must have been a wooden item within this grave. Single hobnails from Graves 320 and 880 could be accidental losses during backfilling, but might also be seen as token deposits. Hobnails from pyre sites (one from 066 and four from 539) indicate some of the deceased wore shoes to the pyre, although none came from any of the cremation deposits (702 produced a tack or nail fragment). A tack or nail fragment was recovered from Pyre 066 and a single chain mail link, perhaps a casual loss, was recovered from redeposited Cremation Deposit 545 (Burial 539). The finds from 066 are at odds with the Iron Age radiocarbon dates obtained and may be intrusive. Burial 539 was undated and may be Roman, but there is a possibility that these finds were intrusive, having entered the deposit when it was re-excavated for the insertion of a Roman-period horse burial.

Of the copper alloy, one knee brooch (SF1) comes from Cist 058, but this overlay the backfill of the grave and probably represents an intrusive item that had dropped down into the void beneath the capstones. The iron penannular brooch from the same cist appears to have been a deliberate inclusion and was found along with Sk 1196. SF363 also came from a burial; it is probably a fine, simple finger ring, but is too fragmentary and corroded for detailed comment.

3.4.1 Catalogue (Illus 3.5)

Iron

▸ SF8 Intact penannular brooch of Fowler (1960) type A1

Circular-sectioned hoop (rod Diam: 3.5mm) with expanded terminals (Diam: 5.5–6.5mm). Intact humped pin (L: 43, Diam: 3.5mm) made from circular-sectioned rod, flattened into a narrow flat rectangular strip curved round the hoop. Diam: 33mm. (Fill 063 of Burial 058)

▸ SF40 Intact penannular brooch of Fowler type A1

Circular-sectioned hoop (rod Diam: 3mm) with plain expanded terminals (Diam: 5.5mm). The intact humped pin (L: 40mm, Diam: 3.5mm) is a circular-sectioned rod, one end flattened to form a narrow strip around the hoop. Diam: 32mm. (Burial 799, containing Sk 818)

▸ SF141 Penannular brooch, broken during excavation, probably of Fowler type A3

Approximately two-thirds of circumference of slightly ovoid hoop (rod Diam: 3.5mm) survives. The expanded terminals (Diam: 5mm) are separated from the hoop by a slight channel, suggesting it is an A3 rather than an A1 type. The circular-sectioned humped pin is intact (L: 40.5mm, Diam: 3mm), one end flattened into a rectangular strip which curves over the hoop of the brooch. Diam: 32.5–34mm. (S.49, Fill 191 of Cremation Pit 190)

▸ SF106 Washer

Corner fragment from a flat sub-square sheet, broken across a large, sub-square perforation (W: 7mm); broken ends distorted. L: 15, W: 14, T: 1.5mm. (Fill 061 of Burial Pit 058) Not illustrated.

▸ SF132 Approximately 50% of small ring

Diam: 1.5mm. S.121. (Fill 545 (539) within Horse Burial Pit 648) Not illustrated.

Copper alloy

▸ SF1 Intact knee brooch

Cylindrical spring case encloses a seven-coil spring with internal chord, held on an iron axis. Five-faceted bow, with a hole from a casting flaw; underside hollow. Snape (1993: 18–19) type B; Mackreth (2011: 190 and pl 130 no. 7522) type KNEE2.a1. A mid-2nd–early 3rd-century type. L: 34, W: 21, H: 18.5mm. (Fill 061 of Burial Pit 058)

▸ SF363 Very fine, worn, curved rod fragment, ends broken

Its fineness is consistent with an earring or finger ring; the latter is most likely as it was recovered with the finger bones of the skeleton. The condition is notably poor, but it is unlikely to be intrusive as the hands were placed under the head; it is thus likely to be a grave good, with most of the object destroyed by corrosion. 12.5 × 2 × 1mm. (Recovered with the finger bones of Sk 864 in Burial Pit 766)

3.5. Human skeletal remains from the pit graves

Sue Anderson

Five articulated skeletons were recovered from three Iron Age pit graves and a further grave contained only a few fragments of tooth enamel. The individuals were generally in fair to poor condition with a high degree of erosion and fragmentation.

3.5.1 Methodology

Recording follows the standards for UK assemblages as described in Brickley and McKinley (2004). Measurements were taken using the methods described by Brothwell (1981), together with a few from Bass (1971) and Krogman (1978). Sexing and ageing techniques follow Brothwell (1981), the Workshop of European Anthropologists (WEA 1980) and Buikstra and Ubelaker (1994), with the exception of adult tooth wear scoring, which follows Bouts and Pot (1989). Stature was estimated according to the regression formulae of Trotter and Gleser (Trotter 1970). All systematically scored non-metric traits are listed in Buikstra and Ubelaker (1994) and Brothwell (1981), and grades of cribra orbitalia and osteoarthritis can also be found in the latter. Pathological conditions were identified with the aid of Ortner and Putschar (1981) and Cotta (1978). Disarticulated bone was reunited with the individual to which it belonged as far as possible.

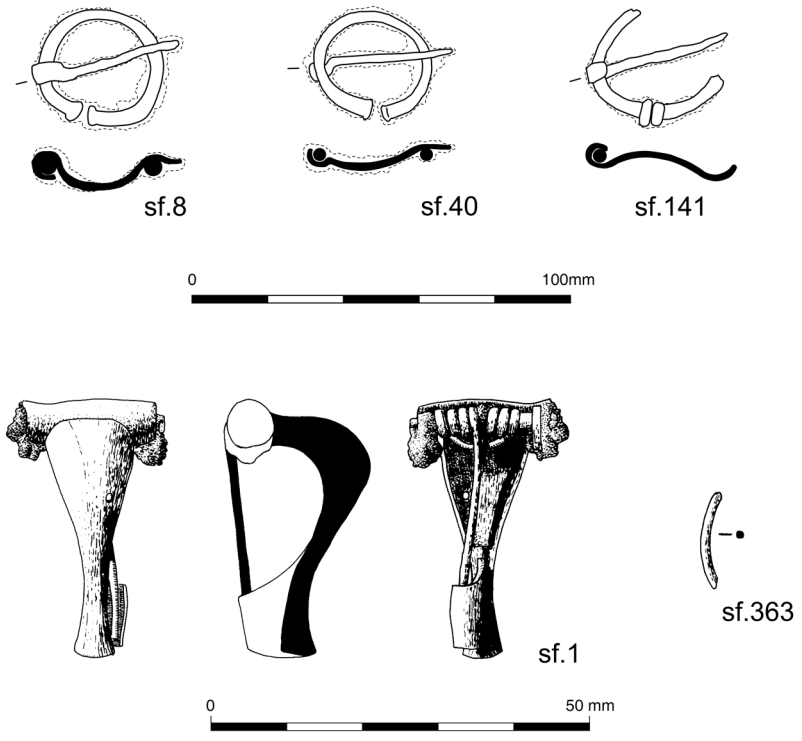
3.5.2 Demographic analysis

Table 3.2 shows the age and sex determinations for the six individuals. The Iron Age graves contained a single adult male skeleton, four possible females and an unsexed adult. The latter were all relatively young (*c* 18–35) when they died, while the male was in middle age (*c* 35–45).

3.5.3 Metrical and morphological analysis

Articulated skeletons were measured where possible and the results are included in the archive. Tables of systematically scored non-metric traits can also be found there.

Stature could be calculated for two ?females. They were 1.599m and 1.625m (5' 3" and 5' 4" respectively), which is comparable with the small groups from Lochend, Dunbar (Brothwell & Powers



Illus 3.5 Finds from the Iron Age burials (copyright CFA Archaeology Ltd)

Table 3.2 Age and sex of Iron Age skeletons

Grave	Sk no.	Male	Female	Unsexed
058	1195		*c* 20–3 (F?)	
058	1196		18–25 (F?)	
799	818	*c* 35–45		
766	863		*c* 18 (F?)	
766	864			*c* 20
880	881		*c* 25–35 (F?)	

1966: 191) and Winton House, Cockenzie and Port Seton (Lorimer 1991). A group of Iron Age skeletons from several sites in Yorkshire had an overall mean stature of 1.528m, based on 49 females (calculated from Stead 1991: table 12), but the Musselburgh females are within the range of means found at each of the six sites included there.

3.5.4 Dental analysis

Complete or partial dentitions were present for all of the skeletons. The group is too small for statistical analysis of disease prevalences, but a few general observations can be made.

The dentitions were generally in poor or fair condition: two were complete, one was near-complete and the other three comprised a few teeth each. The three most complete (Sks 1195, 863 and 864) showed no evidence of caries, abscesses or ante-mortem tooth loss, and none of the six surviving teeth of Sk 1196 or the 11 of Sk 881 were diseased either. The middle-aged male, however, had at least four abscesses of the upper and lower first and second molars, with periodontal disease on the upper left side and an infection of the palate (described further below). The unsexed adult, Sk 864, also had periodontal disease in the form of severe alveolar resorption around the lower left molars. Two individuals (Sk 1195 and Sk 864) had slight enamel hypoplasia, with lines in the enamel of their teeth suggesting that the condition had affected them between the ages of *c* 3 and 5, and *c* 2 and 3 years respectively; this condition may be associated with periods of malnutrition or illness during the formation of the tooth crowns.

3.5.5 Pathology

The skeletons were generally not well enough preserved to assess pathological conditions in any detail. Neither of the young ?females in Grave 058 showed any signs of disease. However, both young individuals in Grave 766 had cribriotic lesions in the orbits of their eyes, a condition known as cribra orbitalia and associated with iron deficiency anaemia. Sk 864 also had porotic changes in the maxillary sinuses, indicating that s/he had suffered from sinusitis.

The older male, Sk 818, was only assessable for cribra orbitalia in the left orbit, but was not affected, nor did he have any evidence of sinusitis. He did have an infection of the palate which appeared to have been caused by draining of an abscess at the upper right second molar, which had resulted in thickened new bone growth above the first molar on the palatal surface. He also appears to have suffered from osteoarthritis of the neck, with grade II lesions on the bodies of the third and fourth cervical vertebrae.

3.5.6 Summary and discussion

Four Iron Age pit graves contained skeletal remains representing six individuals. One of the pairs (Sk 1195 and Sk 1196) comprised two young women and the other pair was a young female (Sk 863) and a young unsexed individual (Sk 864). One single burial was of a middle-aged man (Sk 818) and the other was a young to middle-aged ?female (Sk 881). The remains were generally in relatively poor condition and few observations could be made. Two of the females were within the normal range for the period in

terms of their stature. Two individuals (Sk 818 and Sk 864) suffered from periodontal disease and one of these (Sk 818) had abscesses and a palate infection. Two of the young adults (Sk 863 and Sk 864) had cribra orbitalia and may have had a diet deficient in iron. The older individual (Sk 818) had osteoarthritis.

Other Iron Age burials excavated in the area have produced small groups of individuals, the largest assemblage being *c* 21 individuals from a cist at Dunbar (Brothwell & Powers 1966). This group comprised mainly adult remains, only one child being identified. Eight individuals were reported from Winton House, Cockenzie and Port Seton, and included males, females and juveniles with a range of ages at death. The females in this group had a similar height range to the Musselburgh group, although the male at Winton House was much taller than the average for the period at 1.83m (6ft) (Lorimer 1991). Two males from Belton Farm, Dunbar, ranged between 1.65m and 1.73m (5' 5" and 5' 8") (Lorimer 1992). Unfortunately the stature of the Musselburgh male could not be calculated.

3.6 Cremated bone

Sue Anderson

Groups of cremated or calcined bone from a 'pyre', a scattered group, two discrete burial pits, and a redeposited fill were examined. This includes one cremation burial recovered during the evaluation (C016).

3.6.1 Methodology

All bone groups were collected as samples and later sieved to >4mm, <4mm and <2mm fractions. In addition to the cremated bone, the <2mm samples contained pea grit, charcoal fragments and shell, so the bone was hand-separated from this residue for weighing (in some cases only a sample was sorted, the remaining bone weight being estimated from the weight of the sub-sample). The bone from each context was sorted into five categories: skull, axial, upper limb, lower limb and unidentified. All fragments within each category were counted and weighed to the nearest tenth of a gram, with the exception of the unidentified material, which was simply weighed. Measurements of maximum skull and long bone fragment sizes were also recorded. Observations were made, where possible, concerning bone colour, age, sex, dental remains and pathology. Identifiable fragments were noted. Methods used follow the Workshop of European Anthropologists (WEA 1980) and McKinley (1994, 2004). A catalogue of burials is included in the archive.

3.6.2 Quantification, identification, collection and survival

Table 3.3 shows the bone weights, percentages of identified bone from the six features containing human remains, and the proportions of bone identified from the four areas of the skeleton (skull, axial, upper limb, lower limb). Expected proportions (based on the study of modern cremated bodies; McKinley 1994: 6) are provided in the first row.

Table 3.3 Percentages of identified cremated fragments out of total identified to area of skeleton (*expected proportions from McKinley 1994, 6)

Context	Total wt(g)	% ident	% skull	% axial	% upper limb	% lower limb
Expected*			18.2	20.6	23.1	38.1
Burial 190	831.2	45.6	37.8	27.1	13.0	22.1
Burial eval 016	435.0	51.5	24.3	12.2	10.8	48.9
'Pyre' 066	300.3	39.3	6.0	6.5	7.0	80.5
Burial 539	126.1	42.5	50.2	8.4	13.1	28.3
Group 702–725	410.1	60.5	19.0	14.2	9.8	57.0

In the most complete burials, skull and lower limb fragments are generally over-represented amongst the identifiable material, and other areas of the skeleton are generally under-represented, although axial fragments were also over-represented in one case. It has been suggested that 'it should be possible to recognise any bias in the collection of certain areas of the body after cremation' (McKinley 1994: 6). However, there is also some bias inherent in the identification of elements. McKinley notes the ease with which even tiny fragments of skull can be recognised, and conversely the difficulty of identifying long bone fragments. These figures can therefore provide only a rough guide to what was originally collected.

Mays (1998: table 11.2) notes that the combusted weight of an adult skeleton has a mean of around 1,500g for females and 2,300g for males. The largest quantity of bone in this assemblage came from Burial 190 and is less than half the average weight of a male. All quantities in these burials are too low to represent complete skeletons.

3.6.3 Discrete burials

Two cremation burials were recovered from circular pits, summarised in Table 3.4. Both were unurned, but the circular nature of the deposit within Evaluation Pit 016 caused the excavator to speculate that it may have been buried in an organic container (Robertson 2010: 6). Both were probably truncated, either through ploughing or during soil stripping. Nevertheless, they are the two largest deposits of cremated bone from the site. Each of the burials appears to have contained the bones of a single individual with no evidence for duplication.

Pathological changes were noted in the mature male. He had signs of degenerative joint disease such as osteophytic lipping of some rib facets and vertebral bodies. From the surviving dental remains, it appeared that no significant dental disease had affected either of these individuals.

The degree of fragmentation was quite high. Perhaps surprisingly, some of the largest and most intact pieces were from the axial skeleton, notably the vertebrae and the ilium of the pelvis. The largest long bone fragment was 60mm long in Cremation Pit 190 and 57mm long in Evaluation Pit 016. Few pieces showed signs of abrasion, although it did affect some powdery white fragments, particularly of the skull.

The majority of bone in this group was fully oxidised and white to grey in colour. The presence of a high proportion of white bone indicates firing temperatures in excess of *c* 600°C (McKinley 2004: 11). In this group, many fragments of the easily broken cancellous or 'spongy' bone were present, suggesting that the material was very well cremated and little had been lost through post-mortem decay. The abrasion of fragments which had been heavily oxidised to a powdery white may indicate that higher fired pieces were more susceptible to post-depositional changes in the sandy subsoil.

3.6.4 'Pyre' and scattered deposits

Table 3.5 summarises the human remains from a 'pyre', an area of scattered deposits and a redeposited burial.

Table 3.4 Summary of cremation burials

Burial	Deposit	Age	Sex	Notes
190	191	mature	male	Good condition; some degenerative changes may indicate older age group; sexing based on finger bones and brow ridges, which appear relatively large.
Eval 016	Eval 015	??young adult	female	Good condition; age based on size, tooth eruption, complete fusion of vertebral bodies; sexing based on smooth glabella, small nasal bones, small ribs, sciatic notch seems wide. No evidence of degenerative changes on surviving joints, possibly young?

Table 3.5 Summary of scattered cremated remains

Burial	Deposit	Age	Sex	Notes
066	066	adult	male	Good condition, some large fragments; tooth roots fully formed and iliac crest fused; distal thumb phalange large.
539	544, 545, 624	sub-adult	?	Good condition; unfused posterior calcaneus suggests an age between 16 and 20 as the size is close to adult; no sexing evidence.
–	702, 703, 710, 711, 721, 723, 725	?mature adult	male	Good condition but most fragments small, particularly tiny pieces from 703, 710 and 711; fragments of skull generally of similar thickness in all contexts where present; radius head, finger phalanges and teeth large, suggesting male; one vertebral fragment shows possible osteophyte.

'Pyre' 066 was close to Evaluation Burial 016, and the possibility that it was the remains of the pyre for that burial was considered, but the two groups of bone appear to represent a male and a female and are therefore unrelated. The pyre was excavated in six sections. The majority of the leg bone fragments were recovered from sections 1–2, while most of the axial and upper limb fragments came from sections 3–4 (with smaller amounts in 5–6). Only small quantities of skull were recovered, and these were from sections 3 and 6. The fragments of bone appear, therefore, to have fallen into the pit in roughly anatomical order. This is what would be expected for the contents of a pit underlying a pyre, but it is also typical of *bustum* burials, in which a cremated skeleton was simply left in situ and the grave pit backfilled after the pyre had burnt out. However, the quantity of bone is small in comparison with other *busta* (eg examples from Colchester which produced in excess of 1.3kg each; Anderson 2010), and the pit is irregular, so on balance a pyre site is perhaps more likely. If so, the incomplete collection may suggest a lack of care in the collection of the remains, which could indicate that the rite was not carried out by family or friends, or that token removal to another burial place was enough.

Redeposited Burial 539 overlay and was included within the fill of Horse Burial Pit 648. Collection of this group of bone was also carried out in segments but there was no clear pattern of deposition.

The other seven 'burials' were located in a loose group of deposits towards the south-west of the site. The largest single groups were from 702 (179.7g) and 725 (159.2g) with the other contexts producing between 1.4g and 51.2g. There is no obvious duplication of elements between the contexts, and it is possible that they could represent a single, scattered burial. All identifiable fragments appear to be adult and in at least three of the contexts the sex was identifiable as male. Alternatively the group could represent pyre debris from several episodes of cremation, if the area was set aside for that purpose.

All groups of bone are in similar condition, with a high proportion of small and unidentifiable fragments, and are generally cream or white in colour.

3.6.5 Summary and discussion

The five groups of bone represent a minimum of five individuals. These comprise three adult males (one middle-aged or older), a ?young female and a sub-adult of unknown sex. If the scattered group of cremated bone represents seven individual pyre sites, then there could be a further six individuals, of whom at least one was male.

The total weight of bone indicates that the entire skeleton was not present in any of the burials, and in all five burials the quantity of bone was well below the average quantity which would be expected for individuals of the relevant age and sex. This may

be due to incomplete collection, poor preservation of incompletely cremated material following burial, or possibly retention of some fragments by the mourners. In the case of the possible pyres, presumably further remains were removed for burial elsewhere, but it seems unlikely that the two more complete pit burials are the same individuals as the pyre deposits.

Very little pathological evidence was present in these remains, although lesions which were present indicated that one individual may have suffered from joint pain.

Some insight into the cremation ritual can be gained based on the evidence of the colour of the bone and the degree of fragmentation. Most of the bone from this site indicates that firing probably reached the high temperatures normally associated with cremation. Although there is evidence for a degree of fragmentation, there were many large fragments and the breakage could simply be the result of post-depositional changes.

3.7 Charcoal associated with cremated bone

Mike Cressey

The charcoal assemblage included samples recovered from Cremation Pyre Deposit 066, and Cremation Pit 190. Several pieces of carbonised wood (Cremation Pyre Deposits 068 and 069) were found to run transversely across the pyre pit material and it was surmised that these were the remains of either supporting elements of the pyre structure itself or surviving elements of the pyre fuel. Charcoal recovered from Cremation Deposits 702, 703, 710, 711, 721 and 725 was also examined to assess the species and character of the wood selected for cremation. A Roman horse burial pit (Pit 648) was backfilled with cremated material (Burial 539, Fills 624, 545 and 544).

The condition of the charcoal varied across the assemblage, with a large proportion being amorphous, which is attributed to taphonomic process following its deposition. Charcoal derived from large-diameter branchwood was well represented. Vitrified charcoal was also present but was low in frequency. Vitrification occurs at temperatures over 800°C and reduces the cell structure of the wood to a glass-like appearance and as a result it cannot be identified. Some of the charcoal had maintained a block-like shape which is a result of the stature of the wood (ie possibly larger branch wood or structural wood) and pyrolysis. The best-preserved charcoal was that derived from oak (Burial 539) and from heather stems (*Calluna vulgaris*), which are some of the most robust taxa when carbonised.

3.7.1 Methods

Charcoal was retrieved from bulk soil samples using a flotation tank with flots captured in a 4–1mm nest of sieves (Kenward et al 1980). Flotation samples were then air dried before being sieved into 2mm- and 4mm-sized fractions. Charcoal identifications were carried out on only the >4mm-sized charcoal fragments but the 2mm fraction was scanned for the presence of any interesting carbonised inclusions. Fragments below this size (2mm) are considered to be below the limit of identification (BLOI) due to the amorphous shape of the charcoal and problems encountered in obtaining a transverse cross-section on such small fragments. Identifications were carried out using bifocal microscopy at magnifications varying between ×50 and ×400. Anatomical keys listed in Schweingruber (1992) and in-house reference charcoal were used to aid identifications. Asymmetry and morphological characteristics were recorded using standard in-house methodology. An inventory of the identified material is available in the archive.

Table 3.6 Species composition from the >4mm charcoal assemblage

Species	No. of IDs	Weight (g)
Quercus sp	315	394.4
Corylus avellana	169	97.1
Betula sp	161	59.6
Calluna vulgaris	169	9.9
Alnus glutinosa	1	1.1
Straw	5	0.2
Amorphous plant material	7	42.7
Total	827	605.0

3.7.2 Results

A summary of the results is presented in Table 3.6. A total of 827 individual identifications were possible, providing a total weight of 605g of charcoal. Oak charcoal (*Quercus* sp) dominates the assemblage by weight. Hazel (*Corylus avellana*) is less frequent, followed by birch (*Betula* sp). Heather charcoal (*Calluna vulgaris*) was also present. Alder (*Alnus glutinosa*) was present but extremely rare.

The results of the identifications from the cremation deposits are listed in Table 3.7 and described below.

The charcoal from redeposited Burial 539 included Contexts 544, 545 and 624 that were redeposited in a horse burial. Oak, hazel and heather are represented. Oak is only present in C545, with two identifications providing a total weight of 165g. This assemblage comprised large fragments of roundwood oak, one of which measured 68mm × 44mm × 41mm. The other fragment also had an oblique facet made by an axe and may have been derived from carpentry waste. Heather stems were present in Contexts 545 and 624, the latter context also contained fragments of cereal stems.

Cremation Pit 191 contained both birch and hazel charcoal, but in low amounts. The assemblage was dominated by small amorphous fragments. A single fragment was vitrified.

Birch charcoal dominated Pyre Deposit 066 (58.4g), with slightly lower amounts of hazel (52.9g). The charcoal assemblage was dominated by blocky fragments possibly representing charcoal derived from large branchwood.

The scattered cremation deposits (702, 703, 710, 711, 721, 723, 725) all contained oak and hazel. The oak charcoal from 702 was block-like in shape and may represent the remains of large branchwood. Heather was present in Contexts 702, 703 and 721. The latter and C723 also contained amorphous plant material classified as animal dung.

Table 3.7 >4mm charcoal identified from the features containing cremation deposits

Feature	Species	No. of IDs	Weight (g)
Redeposited Group 539 (544, 545 and 624)	*Quercus* sp	2	165.0
	Corylus avellana	78	34.2
	Calluna vulgaris	25	1.5
	Alnus	1	1.1
	Straw (cereal stem)	5	0.2
Total Redeposited Group 539		111	202.0
Cremation Pit 191	*Betula* sp	16	1.2
	Corylus avellana	21	1.2
Total Cremation Pit 191		37	2.4
Pyre Deposit 066	*Betula* sp	145	58.4
	Corylus avellana	41	52.9
Total Pyre Deposit 066		186	111.3
Deposits 702, 703, 710, 711, 721, 723, 725	*Quercus* sp	313	229.4
	Corylus avellana	29	8.8
	Calluna vulgaris	144	8.4
	Amorphous plant material	7	42.7
Total scattered cremation deposits		493	289.3
Total		827	605.0

3.7.3 Selection of cremation fuels

Oak, birch and hazel have been exploited for use for the cremation ritual. Heather and straw appear to have been used, probably as kindling. Cremation Deposits 721 and 723 contained amorphous carbonised material that is interpreted as animal dung. It is presumed that this may have been incorporated into the ritual deposit as either a starter fuel or as part of the pyre fuel itself. Experimental research on pyre structures has demonstrated that approximately one tonne of wood is required to consume an adult human body (McKinley 1994). Traditional methods of construction employed the use of substantial billets/poles of wood to form a rectangular platform. Such larger statured roundwood might be represented in the redeposited Cremation 539, from which C545 produced the largest diameter roundwood in the whole assemblage. Such stout poles would afford far greater support to the body and produce a longer-lasting fire. This could also imply that such material was not in short supply in the vicinity.