KING'S SEAT
ARCHAEOLOGY PROJECT

King's Seat, Dunkeld: Excavations of a Royal Centre of the Southern Picts, 2017-21

David Strachan, Cathy MacIver and Andy Heald

ARCHAEOPRESS

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with contributions by

Łukasz Banaszek, Daniel Bateman, Ewan Campbell, Rob Engl, Derek Hall, Mark A Hall, Amy Halliday, Dawn McLaren, Andrew Morrison, Oisín Plumb, Richard Tipping, and Lore Troalen.

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Front cover: *a view from the south with the King's Seat fort in the centre foreground on the hill occupying the bend in the River Tay (© Crown Copyright: HES).*

Back cover: *a reconstruction view from the south showing the fort complex with the summit 'citadel' and western, eastern and southern enclosures (artist: Chris Mitchell).*

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‘It is not easy to discover the origins of Early Historic kingdoms and dynasties. Indeed, it is no exaggeration to say that the ancestry of most of them has been lost in the mists of prehistory, or has foundered in the even more treacherous swamps of proto-history…’

Leslie Alcock: *Kings and Warriors, Craftsmen and Priests in Northern Britain AD 550-850* (2003: 40).

‘So ancient is Dunkeld that its origin is unknown, and its early history borders on the mythical.’

Elizabeth Stewart: *Dunkeld - An Ancient City* (1926).

‘The Gaelic language is spoken universally in this parish, though all the people, at the same time, understand more or less perfectly the English. It is a curious fact, that the hills of King’s Seat and Craigy Barns… have been for centuries the separating barrier of these languages. In the first house below them, the English is, and has been spoken; and the Gaelic in the first house, (not above a mile distant), above them.’

The Old Statistical Account of Scotland (OSA) XX, Dowally: 490.

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Acknowledgements

The excavations reported within are the result of a truly grass-roots community archaeology project, instigated by local resident Dave MacDougall of the Dunkeld and Birnam Historical Society (DBHS). Along with Dave Roberts, the DBHS developed the project with Perth and Kinross Heritage Trust (PKHT) that would muster volunteers from the local area to explore their local heritage, a heritage which is of national importance. However, the excavation, post-excavation research and publication is the combined output of a wide variety of individuals and organisations, to whom the authors are indebted. We are grateful to the funders: the National Lottery Heritage Fund (then HLF), The Gannochy Trust, the Scottish and Southern Electricity (SSE) Griffin and Calliachar Community Fund; Perth and Kinross Heritage Trust; and the Co-op Local Community Fund. We also thank the landowners for their permission to excavate: Arnold Schnegg, then Managing Director of Dunkeld House Hotel, and their estate manager Douglas Reader. We are also obliged to Oliver Lewis and Nicki Hall of Historic Environment Scotland (HES) for encouragement and aid in securing Scheduled Monument Consents.

The project was managed by David Strachan of PKHT, who co-directed the excavations with Cathy MacIver of AOC Archaeology. The AOC survey and excavation team were Andy Heald, Martin Cook, Yvonne Robertson, Katie Roper, and Dawn McLaren, while Charlotte Douglas delivered project outreach including leaflets and interpretation boards. PKHT staff who contributed included Sarah Winlow, Sarah Malone, Sophie Nicol, Grace Woolmer-White, and Findlay Young. This combined team extend our thanks to the many volunteers who contributed so much, learning new skills while exploring their local heritage, which is an important part of Scotland's story – the transition from prehistory to history. They are (alphabetically): Jane Anderson, Michael Ballantine, Beth and Jamie Beazley, Forbes Bradley, Duncan Cameron, Bob Carchrie, Charlie Cooper, Deely Cumming, Rachel Daniel, Irene Dayer, Anthea and Deryck Deane, Kevin Duncan, Charlene Forbes, Gordon Gerrie, Corrie Glover, Sam Golder, Anne Gray, Maggie Hand, Alan Harrison, Hayley Hartmann, Peter Heyes, Tabitha Hilliard, Barbara Hogarth, Tamzin Hutchison, Jeri Kelly, Dave MacDougall, Emma MacFarlane, Cameron Maxwell, Mary McDougall, Chris McNeill, Grant Muckart, Steve Ponsonby, John Robb, John Strachan, Suzanne Swan, Leonie Teufel, and Louise Thomson. Special thanks are extended to those who completed all three seasons with us: Michael Ballantine, Forbes Bradley, Duncan Cameron, Bob Carchrie, Gordon Gerrie, Dave MacDougall, Grant Muckart, and John Robb. In addition to engaging life-long learners, the project also involved primary and secondary school pupils from The Royal School Dunkeld, Breadalbane Academy and Pitlochry High School, and archaeology students from the University of the Highlands and Islands. We are also grateful to Ruth Brown at Dunkeld Community Archive for her support and their exhibition on the excavations, and to Jamie Beazley of SSE Networks who provided expert tree surgeons who cleared difficult to reach trees to afford the public a view from the hilltop once again.

The post-excavation programme was managed by Dawn McLaren (AOC). In addition to contributing authors elements of the post-excavation was carried out by Jackaline Robertson (sample processing) and Ciara Clarke (PERD) from AOC and comments kindly provided by Fraser Hunter (NMS) on the Roman glass. Conservation was undertaken by Gretel Evans and her team (AOC).

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Notes

Chronology and terminology

All radiocarbon (^{14}C) dates mentioned in the text are calibrated (cal) unless otherwise stated.

The following chronological definitions are used, in line with the Scotland's Archaeological Periods and Ages (ScAPA) thesaurus: Bronze Age (2200 – 800 BC); Iron Age (800 BC – AD 400); early medieval (AD 400 – 1100); medieval (AD 1093 – 1603) and post-medieval (after AD 1603).

While historically labelled 'the Dark Ages' and since also termed Early Christian, the Long Iron Age, and Early Historic, the term early medieval period has been adopted throughout in line with both the Scottish Archaeological Research Framework Medieval Panel (ScARF), and Perth and Kinross Archaeological Research Framework (ScARF 2022).

While 'hillfort' is widely used and understood, it is problematic as while most sites occur on hilltops, they also occur in other locations (Lock and Ralston 2022: 77–9). The term is additionally problematic in Scotland where an independent tradition of recording, dating back to the late 19th century, has used 'fort' (Christison 1898: 111-12). As a result, Historic Environment Scotland's *Scottish Monument Thesaurus* notes 'hillfort' as a non-preferred term, and promotes 'fort', defined as 'an enclosure, often located on a hilltop, bounded by one or more banks, ditches, ramparts or walls'. The Scottish Monument Type Thesaurus (https://canmore.org.uk/thesaurus) has been adapted to describe monument types, in particular:

rampart: an earth embankment built around a site for defensive purposes.

outworks: a series of defensive features, such as walls, banks and ditches, which protect a building or settlement.

hut-circle: a roundhouse where above ground features, such as an earth or stone bank, survives

roundhouse: where no above ground remains survive, but a circular building has been identified as a cropmark, through geophysical survey, or by excavation.

Descriptions of contexts

Square brackets are used for all contexts, including deposits, cuts and structures [123], and rounded brackets retained for small find references (SF 123) and bibliographic references.

The initial character in the context number is the trench reference, for example [203] is Trench 2, [403] is Trench 4; the exception are contexts from Trench 1, which begin at [001]. Similarly, the initial character in the small finds number is the trench reference, for example (SF 406) is from Trench 4.

Use of Canmore references

Sites are occasionally referenced by their unique identifier in the Canmore National Record of the Historic Environment (see https://canmore.org.uk/) in the format ID 1234. These records provide descriptive records and more detailed bibliographic information.

Geographical terms

Sites within Perth and Kinross are located by a local placename only, while outside this they are generally accompanied by their modern local authority area, or historic administrative area where this brings more clarity.

Abbreviations

Keys are provided within the text. Select general terms are listed below.

ha	Hectare
HES	Historic Environment Scotland
m	Metre
NMS	National Museums Scotland
NGR	National Grid Reference
OD	Ordnance Datum
OS	Ordnance Survey
XRF	X-ray Fluorescence

Chapter 1
Introduction

David Strachan
With a contribution by Łukasz Banaszek

1.1 Background to the project

Dunkeld's early history and importance

The burgh of Dunkeld, Perth and Kinross, occupies a special place in Scottish history. It is set dramatically on the north bank of the Tay within the narrow valley of Strath Tay on the threshold between the Lowlands and the Highlands. This key geographical location, controlling one of the main terrestrial routes through the Highland Boundary Fault, may in part account for its important role in early Scottish history. That the wider area supported thriving populations in prehistory is attested in the local and national archaeological records, which contain evidence of earlier prehistoric funerary and ritual sites, including round barrows and cairns, standing stones and stone circles, and numerous rock art sites, the latter ranging from simple cup-marks to more complex cup-and-ring markings. Later prehistoric activity is also well-represented, with unenclosed settlement evidenced by hut-circles, field systems, clearance cairns and souterrains, enclosed settlement recorded as cropmarks, a crannog, and several forts. However very few of these sites have been excavated and dated. The brief Roman intervention is spectacularly represented by Inchtuthil legionary fortress on the north bank of the River Tay *c*. 10 km east-south-east of Dunkeld. Constructed in the late 80s AD to police the Caledonian tribes, and possibly as a springboard for further invasion further north, it was never completed. The visible remains of many prehistoric monuments survived into the early medieval and medieval periods, and many early ritual monuments were the focus of later activity, such as at Strathallan henge (Barclay 1983), while others no doubt retained some significance into much later periods.

The subject of this volume is the fort on the craggy hill called King's Seat, *c*. 1.5 km west of Dunkeld, which controls the River Tay and its strath at this important pass linking the Lowlands and the Highlands. There can be little doubt that this fort is the source of the name Dunkeld, which is derived from Scottish Gaelic *dùn* and *Cailleann*, and means 'fort of the Caledonians' (Watson 1926: 21-2; Márkus 2017: 24). It is recorded in the *Annals of Ulster* as *Duin Caillenn* in AD 865, *Duin Chaillden* in AD 873, and *Duine Caillenn* in AD 965; *Dúncallden* and *Dunkelden* in the 12th century; and in a variety of forms until the use of *Dunkeld* or *Dunkell* in the 17th century (Watson 1926: 21-2; McNiven 2017). *Dunkeld* has been in consistent use since Roy's Great Map of *c*. 1750 (Roy 1747-1755).

For a short period Dunkeld played a leading role in the history of the early church in Scotland, and its importance in this respect began when a church and monastery was founded between AD 807-818 (Fraser 2009: 134), and more fully established when Columba's relics were brought there from Iona in *c*. AD 849 (Bannerman 1997: 28-9; Taylor 2000: 113; Woolf 2007: 98-101). The Pictish kingdom or province of Atholl, in which Dunkeld was located, is first recorded in AD 739 (Taylor 1999: 41; Clancy 2010: 87). Atholl may mean 'New Ireland' (Watson 1926: 111; Clancy 2010: 84), which may suggest significant movement from the Gaelic kingdom of Dál Riata into the area before the 9th century AD. Indeed, it has been argued that Atholl, from Old Gaelic *ath* and *Fotla*, a poetic term for Ireland, implies a significant presence of Gaels 'long before the establishment of Gaelic power in Pictland in the ninth century' (Taylor 1999: 42), probably through the church established on Iona by St Columba. How long before the 9th century any such Columban influence began in the area remains a matter for debate (Plumb: Chapter 4.5). However, the association between Columba and Dunkeld came to be a cornerstone of the identity of its church. Columba was the patron saint of the royal kindred who claimed descent from the Cenél nGabrain, the dominant kin group of the kingship of Dál Riata until the late 7th century AD. The abbots of Dunkeld were descended from the aristocracy of Cenél nGabrain (Driscoll 2002: 45). It is reasonable to assume that there was a long-established Gaelic community in Dunkeld by the time a church was built there in the early 9th century. By AD 845 the Abbott of Dunkeld was also the chief bishop of Fortriu (Woolf 2007: 56, 99), now generally agreed to be in northern Pictland (not necessarily overlapping with Atholl), and the Abbott of Dunkeld being based in Dunkeld as chief bishop in Fortriu provides a clear link between northern and southern Pictland at this time. By the 10th century the abbotship had become hereditary, and while the bishopric appears to have been abandoned, it was revived in the early 12th century, perhaps with a Culdee

community forming the bishop's *familia* (Gifford 2007: 333). Bishop Gilbert established a college of canons at the cathedral in *c*. 1230 and the building saw several phases of remodelling over the 13th and 14th centuries.

The secular settlement was established as a burgh of barony under the superiority of the Bishops of Dunkeld (Gifford 2007: 333) and was in existence as such in 1511/12 (Pryde 1965: 33). Located to the north and west of the cathedral (RCAHMS 1994: 125; 145), the town was almost comprehensively destroyed following the Battle of Dunkeld in 1689, when Jacobite clans attacked Covenanters defending the town and the route to a weakly defended Perth. The town was rebuilt to the east of the cathedral along one main east-west street and was ineffectively erected as a royal burgh in 1704 (Pryde 1965: 57), failing to develop despite the construction of Telford's bridge in 1809. Much of the 18th-century historic core survives and was restored in the 1950s, while the modern town plan was created with the arrival of Telford's bridge (Ford 2004), which brought a cross-street running north-south. Whilst a bridge was first built during 15th-century remodelling of the cathedral, it was lost to flooding by the late 16th century and replaced by a ferry over the intervening period (Ford 2004: 15-17; 25). The late-17th-century Dunkeld House, seat of the Dukes of Atholl, was located to the north of the cathedral but was demolished in 1828. A new house begun to the west of this was never finished. It was demolished when a new villa was built in 1900 *c*. 0.5 km further west (Gifford 2007: 347), just to the south of King's Seat. On the south bank of the Tay opposite Dunkeld, Birnam developed after the arrival of the railway in 1856. This saw an increase in visitors to the area and the heritage on offer remains a significant attraction for visitors, supported by an active history society and community archives. The project presented in this volume was developed in partnership with the former group.

Development of the project and preliminary work

The project originated as a 'grass roots' community-led initiative led by Dunkeld resident Dave MacDougall, of the Dunkeld and Birnam Historical Society (DBHS), who was concerned by the dense vegetation cover and lack of understanding of the much-neglected fort on King's Seat. On approaching Perth Museum in November 2015 to identify an archaeologist who could advise on possible clearance and excavation, he was referred to the author at Perth and Kinross Heritage Trust (PKHT), who had successfully delivered community archaeology projects over the previous decade (Strachan 2013; Strachan *et al.* 2019 and 2023). Initial site visits confirmed that the central summit of the hilltop was extremely overgrown by poor quality woodland and dense rhododendron cover, seriously limiting access and preventing even basic field assessment (Figure 1.1 and 1.2). PKHT advised on securing landowner permission and Scheduled Monument consent to remove the rhododendron cover and, with permissions in place, Dave MacDougall organised a group of volunteers including members of the DBHS. Over February 2016 a small team of five to six people carried out over 100 hours of work, cutting back the rhododendrons and treating their stumps with herbicide (Figure 1.2). This highlighted the potential threat to archaeological deposits posed by the rhododendron root systems, and early signs of regeneration confirmed the scale of this issue. Following the clearance work, PKHT provided a guided walk and evening talk to promote a community archaeology project. This was subsequently developed in partnership with the DBHS and had three main aims. The first was to improve intellectual access, as while designated as nationally important little was known about the date, use or development of the fort; the second was to improve physical access; and the third was to assess the impact of rhododendron and tree cover on the condition of the site.

The King's Seat Archaeology Project was delivered over 2017-2020, funded by the National Lottery Heritage Fund, The Gannochy Trust, and the SSE Griffin Windfarm Community Fund. AOC Archaeology were contracted to work with PKHT to deliver three main seasons of excavation over 2017-19 and these alone engaged 114 local volunteers, 9 archaeology students from the University of the Highlands and Islands (UHI), 107 school students and 7 Young Archaeologists' Club members (Figure 1.3). Some elements of the project were extended until 2021 due to Covid-19 restrictions, and a small-scale excavation was carried out in 2021 with students from the UHI in response to features first identified by the author on LiDAR in 2019 (section 1.4 below). The wider project included community archival research in 2017, promotion of the excavations through the 'Picts in the Park' living history fair in 2018, on-site interpretation, leaflets and school-packs, and an exhibition at Dunkeld Community Archives, including 3D-printed, hand-painted replicas of key finds courtesy of AOC Archaeology (Figures 1.4-1.6). Finally, Scottish and Southern Electricity Networks (SSE), contributed specialist tree clearance to once again afford key views from the hilltop. In addition to the community benefit outlined, the impact of vegetation cover on buried deposits was recognised and the site has been included in the woodland management plan of the landowner, Dunkeld House Hotel. However, through delivering the research objectives presented below in Section 1.5, the project's most important contribution has been to increase the understanding of the fort in the local community and to establish its significance in a wider historical and archaeological context.

Figure 1.1: The author and Dave MacDougall inspect the dense Rhododendron cover in 2015.

Figure 1.2: Dave MacDougall within the summit enclosure, cleared of vegetation, in March 2016.

Figure 1.3: Volunteer Mary McDougall excavating the main hearth in 2019.

Figure 1.4: Archival research by the local community in 2017 (© PKHT/Bart Masiukiewicz).

Figure 1.5: The Picts in the Park living history fair in 2018 (© PKHT/Bart Masiukiewicz).

Figure 1.6: The display of 3D-printed, hand-painted replicas of key finds at Dunkeld Community Archive.

1.2 Location: geology, topography and rivers

Solid and Drift Geology

Dunkeld is located on the great Highland Boundary Fault, the major fault-line that extends from Stonehaven in the north-east to the Isle of Bute in the south-west, forming the south-eastern boundary of the Grampian Highlands (Figure 1.7). Marked by the escarpment that forms the north-western side of Strathmore, the geology to the north-west of this is dominated by hard metamorphic rocks, while to the south-east Devonian period sandstones are predominant. The northerly aligned watershed for eastern Scotland is to the west

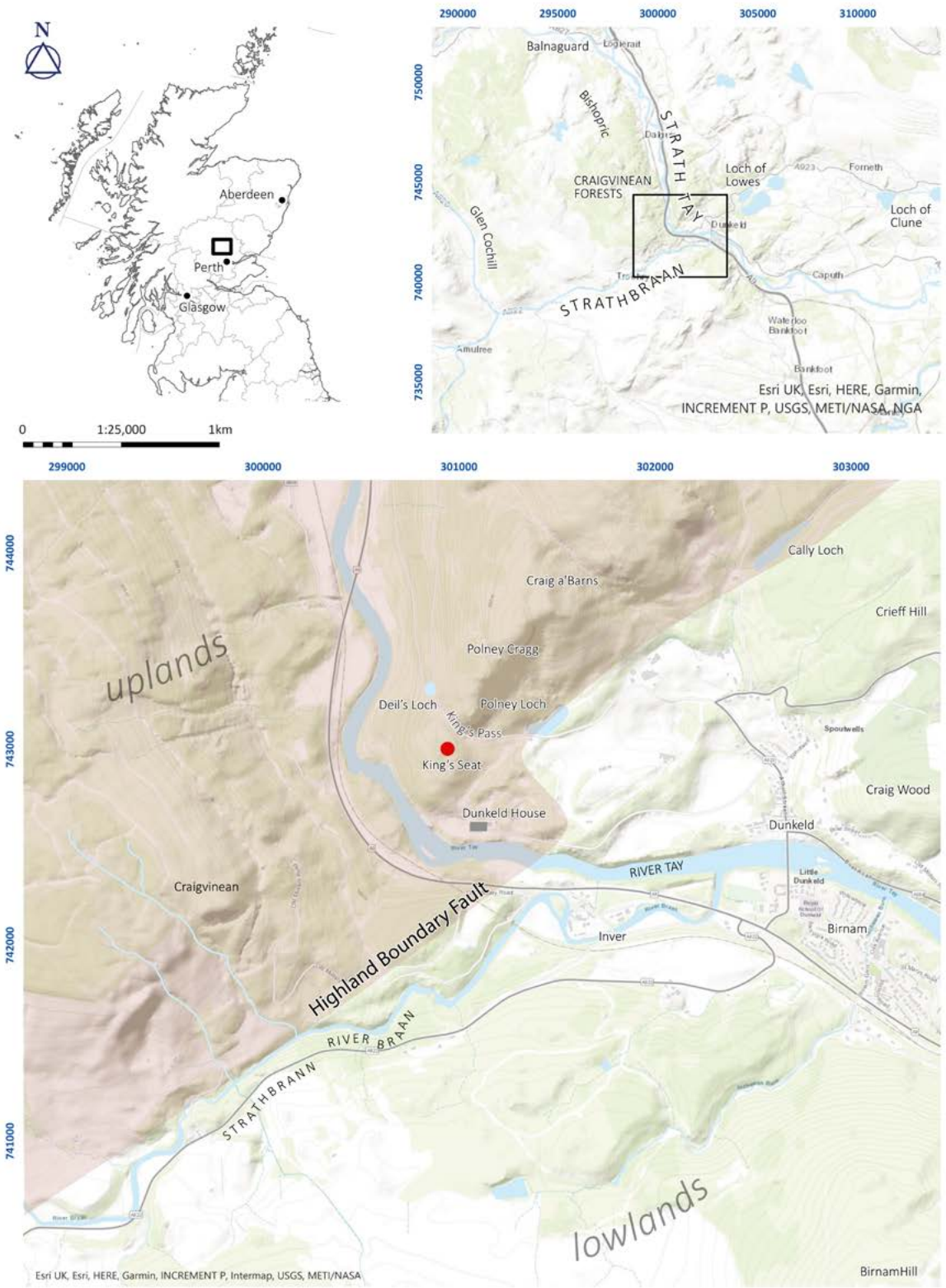

Figure 1.7: The location of King's Seat and the environs of Dunkeld showing keys sites mentioned in the text.

Figure 1.8: A view from the south with the King's Seat fort in the centre foreground on the hill occupying the bend in the River Tay (© Crown Copyright: HES).

of the area, and the River Tay evolved as a south-easterly draining river that breached the Highland Boundary Fault within the last 55 million years. Over the last two million years, active glaciation processes (both erosion and deposition) have significantly modified the landscape. Quaternary, or drift deposits are relatively simple and consist of glacial till preserved on some slopes, laid down at the base of an ice sheet flowing south and east down the River Tay valley. The valley floor preserves deposits of sand and gravel of glacial meltwater origin, either in mounds or in terraced deposits. The last ice sheet to occupy this part of the Tay valley developed about 30,000 years ago and finally melted about 15,000 years ago. Extensive floodplain alluvial deposits of gravel, sand and silt have since accumulated, and major flood events are part of the history of the Dunkeld area. King's Seat itself is an exposed outcrop of bedrock of the Ben Ledi Grit Formation, being Metasandstone, rising from alluvium and river terrace deposits of clay, sand, and gravel, at the foot of the hill (British Geological Survey 2023).

Topography, rivers, and other features

Dunkeld is sited in a key topographical feature in the area, the break in the Highland Boundary Fault created by the River Tay, the principal river in the region. King's Seat occupies a distinctive bend in the River Tay as it cuts through the hills of the Highland-Lowland boundary, and is set dramatically within a low-lying, bowl-shaped valley surrounded by the steep, wooded slopes of Craig a Barns, Crieff Hill, Craig Wood, Birnam Hill and Craig Vinean. To the north, the River Tay flows broadly south for *c.* 9.5 km from its confluence with the River Tummel at Logierait but diverts between Craig Vinean and Craig a Barns to flow east at Dunkeld. The River Braan, which is fed by Loch Freuchie and various tributaries along Strathbraan, flows from the south-west to join the Tay at Inver, on the south bank of the River Tay to the west of Dunkeld. The Tay then meanders east-south-east for *c.* 14 km to join the River Isla before flowing south-west and then south-east to the Tay estuary (Figure 1.7).

The prominent hilltop called King's Seat on which the fort is set at *c.* 150 m OD, sits within this distinct and key bend in the River Tay as it flows south out of the Highlands and crosses the Highland Boundary Fault. The river flows (at *c.* 50 m OD), around the foot of the hill to the south, west and north-west of the hill (Figure 1.8). The steep slopes dropping down to the river protect the fort on three sides, but topographically King's Seat is overlooked on the north-east by Polney Crag, which rises to the summit of Craig a Barns at 337 m OD. Separating King's Seat from Polney Crag is the narrow ravine called King's Pass (at *c.* 125 m OD), which is sufficiently steep and precipitous to afford considerable protection to the fort on what would otherwise have been its most accessible side. Other natural features in the immediate area include Polney Loch, the Deil's Loch, and a small natural cave on the

face of Polney Crag called Duncan Ogg's Hole (Figure 1.7).

1.3 King's Seat fort

Early Records: depictions through time

A view of King's Seat hill from the south-east is depicted, albeit exaggerated in both height and steepness, in Slezer's *Theatrum Scotiae* of 1693, which also shows the original Dunkeld House to the north of the cathedral, with both buildings surrounded by the rooftops of the burgh. While the area was first mapped in any detail by Roy's *Military Survey of Scotland* (1747-1755), the earliest depiction of the site with the name King's Seat is on Patrick McNaughtan's *Plan of Dunkeld* of 1759 (Figure 1.9). Drawn for the estate, it shows the hill as wooded and details a path network across the site, some of which survives today. The paths may be part of what Pennant noted as 'the Duke of Athol's extensive improvements' (1776: 429) and accessed the hilltop, presumably to provide viewpoint. Pennant is also the first to account for the origin of the King's Seat name: as the location of a royal hunting reserve, noting it was 'the place where Scottish monarchs placed themselves, in order to direct their shafts with advantage at flying deer driven that way for their amusement' (1776: 430). It is common for names containing Scots *set* or Scottish English *seat*, with an aristocratic or royal element, such as king, queen or earl, to be related to hunting (Taylor and Márkus 2012: 489). While it is not known which king is being referred to in this case (McNiven 2017), the wider area was clearly well established for hunting with the forest of Birnam and Strathbraan being let to the bishop of Dunkeld (Gilbert 1979: 45), probably giving rise to the 'Bishopric' hills to the west of Strath Tay between Craig Vinean and Balnaguard.

In the 1790s, the local minister noted in the *Old Statistical Accounts* that the Duke of Atholl 'has a tract of 100,000 acres reserved chiefly for [red deer], and it is computed that not less than 4000 feed there constantly...It would not be difficult for the Duke to furnish a royal hunt, more splendid than that given by one of his predecessors in former times' (OSA 20, Dowally: 470), however little else is said of the site, other than 'the rocky hills of King's Seat...springs with a very sudden and steep ascent from the brink of the river' (OSA 20, Dowally: 461). McNaughtan's map appears to have been revised in 1819, perhaps to include the turnpike road through the King's Pass, which is highlighted in ochre (Figure 1.9). Stobie's *Map of the Counties of Perth and Clackmannan* (1783) shows only the low road running along the riverbank to the south and west of 'Kingseat' (Figure 1.10), while John Wood's map of 1823 depicts the 'Atholl Turnpike' planned by Telford and linking directly to his bridge of 1809 (Figure 1.11).

In *c.* 1840 the only find reported in the immediate environs of the fort was made (ECMS: 284-5), 'not far from St Colme's Well and the King's Seat' (Stewart 1926: 12): a sandstone slab bearing an incised Pictish figure of a man on horseback drinking from a horn and with a spear in his right hand (Figure 1.12). It has proved

Figure 1.9: Patrick McNaughtan's Plan of Dunkeld of 1759 (Courtesy of Dunkeld Community Archive: original held by Blair Castle).

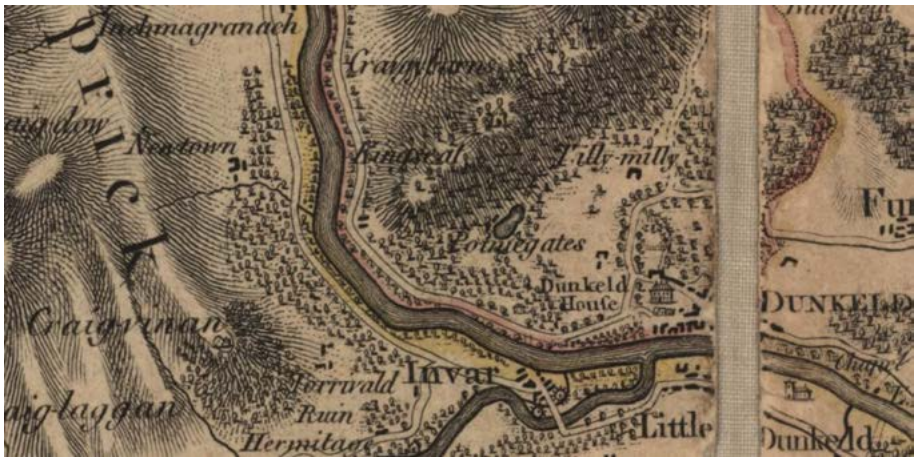

Figure 1.10: James Stobie's map of 1783 (Reproduced by permission of the National Library of Scotland).

Figure 1.11: Extract of the inset from John Wood's Plan of Dunkeld, 1823 (Reproduced by permission of the National Library of Scotland).

Figure 1.12: Dunkeld Cathedral Pictish symbol stone (D1) with the incised horseman carrying a spear and drinking from a horn. The top face has a sunken equal-armed cross with expanded terminals (© Crown Copyright: HES).

to be a significant discovery considering the results presented in Chapters 2 and 3 and is discussed further in Chapter 4.

About 5 years later the Rev. John MacKenzie wrote in the *New Statistical Account*:

> Prior to the fifth century, the Caldones or Caledonians has a stronghold situated, it is supposed, upon a knoll called the King's Seat, at the entrance of the vale of Atholl, near to the city of Dunkeld. The stronghold, from its position, had the effective command of the passes leading into Atholl. It appears to have been at the time an important feature in the country, for Hollingshed, in speaking of the sanguinary battle of Monteith, between the Scots and Picts, adds, for geographical direction, that the field of engagement, although near to the county of Stirling, was "not farre from Calidon Castell, otherwise called Dunkeld" (NSA 10, Dunkeld: 958-9).

He also developed the site's importance as a base for royal hunting, and interestingly noted the survival of a 'building' on the summit, though this may refer to the entire central enclosure on the summit rather than any structure within it:

> Dunkeld was visited by one of our early kings, William the Lion, for deer hunting, it is reported that he took his station for shooting the deer, on a small knoll now called the king's seat. It is a small, terraced hill, on the summit of which is the remains of a building and the outworks of an ancient fort. The road which runs between that knoll and Craig-y-barns is called King's Pass. Mary Queen of Scots also visited the locality for a similar amusement. On one of her hunting excursions, she narrowly escaped serious bodily injury from the leader of a herd of deer, who ran in the direction where she stood, and which she selected contrary to the advice of her attendants. (NSA 10, Dunkeld: 979).

The OS 1st edition 25-inch map of 1867 provides no detail of the site, which is annotated as 'Site of Castle', but confirms the extent of woodland cover and sets the site amid other local features described in the *New Statistical Account* including St. Colme's Well, Deil's Loch and Duncan Ogg's hole (Figure 1.13). The revision of 1900 (Perth and Clackmannan, sheet 61.8) provides no additional information, but the annotation is changed to '(site of) fort' as the OS began to standardise terms (Halliday 2019: 58). Unfortunately, the OS *Name Book* for Dunkeld, produced in the mid-1860s, has been lost, probably in the bombing of the OS headquarters in 1940 (McNiven 2017: 4).

While around this time William Marshall erroneously claimed the Gaelic origins of Dunkeld as *Dun-ghail-dhuin* meaning 'stronghold of the rough mountainous country' he can at least be credited with an early claim regarding a permanent royal presence at King's Seat:

> In the Pictish period (A.D. 446-843), Dunkeld was frequently the seat of Royalty. It was honoured with the presence of the kings and their courts;

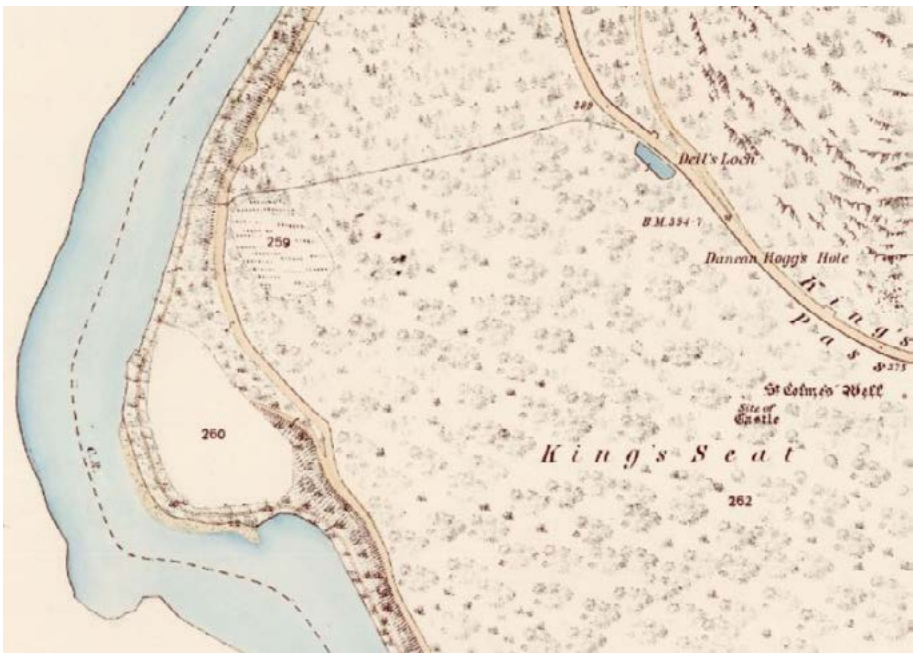

Figure 1.13: 1st edition OS 25-inch map published in 1867 (Reproduced by permission of the National Library of Scotland).

> the royal residence being, it may be presumed, the Dun, or Fort, or Castle, as it was likewise called, on the top of the King's Seat... (Marshall 1880: 149).

Local historian Elizabeth Stewart took this further in her account of 'ancient' Dunkeld, suggesting:

> This Castle of Caledon was probably one of the first civic centres in Scotland. It was the capital of a Pictish State, and a residence of kings... tradition also avers that a skirmish of some kind took place near it. (Stewart 1926: 5).

Given this recognition of the importance of the site, it received surprisingly little attention from antiquaries and early archaeologists, being omitted from Christison's regional study of forts, which did include nearby Duncan's Camp on Birnam Hill (1900: 107). It is possible the site was largely unknown, and effectively lost to archaeology, because it had been wooded since at least the mid-18th century and may have become more heavily overgrown early in the 19th century. Remarkably, it would not be until the mid-20th century that the first archaeological survey of the site was carried out.

RCAHMS survey and legal protection

In October 1957, the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) carried out a plane-table survey of the surviving earthworks as part of their unpublished Survey of Marginal Lands. The site was designated as a Scheduled Ancient Monument in October 1960, and the RCAHMS plan was subsequently published by Feachem (1966: 75, fig 11; Figure 1.14), who noted that around half of the Strath Tay forts were multivallate, incorporated natural rock faces, and had an inner walled enclosure. He described the fort: 'the walled inner enclosure, now choked with impenetrable rhododendrons, crowns a rocky bluff; it measures axially only 115 feet by 70 feet. It is very strongly defended by natural hazards and four ramparts' and suggested the King's Seat 'though ruinous, is of particular interest' due to its location 'in the jaws of Upper Strathtay just above the legionary fortress and other Roman works at Inchtuthil' (Feachem 1966: 73-74).

The RCAHMS survey, which is particularly impressive given how overgrown the site had become, confirmed the fort comprised three main elements: a small, central, oval enclosure on the summit; a western enclosure enclosing a middle terrace and with three further ramparts on the west slope; and a lower, irregular though broadly rectangular, enclosure on the east. The quality of the survey is such that no significant detail could be added to it during the project herewith reported, until available LiDAR data was consulted and revealed several previously unidentified features (Banaszek and Strachan: section 1.4 below). The accompanying sections, not published by Feachem, are valuable in illustrating the relative heights of the enclosures: the central on the summit, the western on the middle terrace, and the eastern being the lowest, at the same level as the wider terrace from which the King's Seat knoll outcrops (Figure 1.15: A-B). However, section A-B is somewhat misleading in representing the interior of the summit enclosure as being a continual sloped surface from east to west. In fact, it is in two roughly equal parts: the western half being a raised rocky outcrop, and the eastern half being lower lying and almost level.

The OS revised mapping of the site at 1:10,000 scale in 1971, and in 1989 the RCAHMS plan of 1957 was 'redrawn in the field in dense woodland and scrub' (ID 27172) and published in *South-East Perth: an archaeological landscape* (RCAHMS 1994: 53; Figure 1.16) which noted King's Seat as the smallest fort in the survey area 'in which a variety of built terraces and annexes enclosure a small citadel (0.06 ha) crowning the summit of the knoll' (RCAHMS 1994: 51).

Re-Scheduling in May 2011 was prompted by forestry casework that indicated that the 1960 Scheduled area was poorly located and failed to cover the entirety of the known archaeology of the fort (Nicola Hall pers comm). The following summary was added to the Scheduled Monument designation:

> The fort is located in a naturally defensive position on a prominent hill, overlooking the River Tay and at the southern edge of the Highland boundary fault line. The maximum extent of the fort is defined by the outermost rampart which encloses an area approximately 180m by 140m. A central walled enclosure or citadel, measuring approximately 35m by 22m, is situated at the highest point of the hill and over its summit. The fort appears reasonably intact which, coupled with its remote location, suggests that the remains of occupation and related activities may survive relatively undisturbed. Up to four terraces and ramparts are formed around most of the western circuit of the fort, whilst around most of the NE, E and S sides, the steep craggy land form precludes any need for significant structural works. There is a break in the circuit at the N end of the monument, indicating the likely position of an entrance, from where a trackway drops down to a lower terrace on the west. There are traces of an enclosed terrace on the eastern side of the

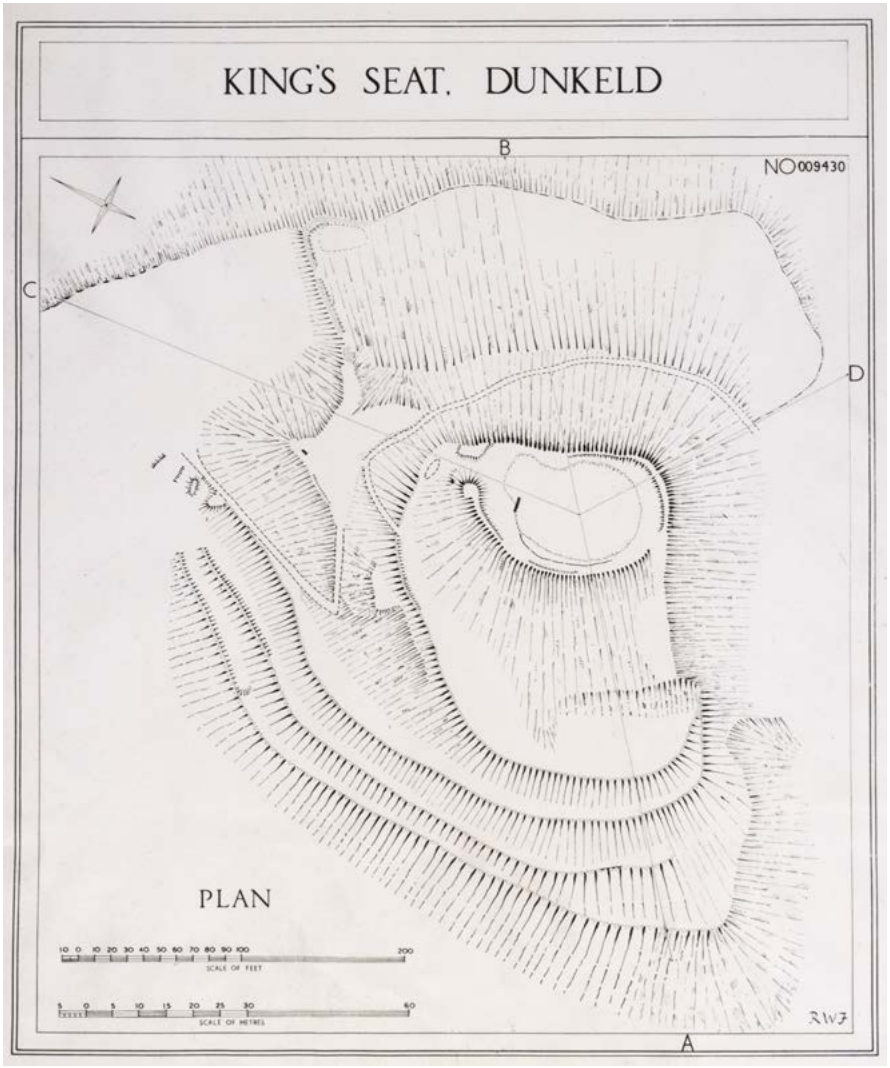

Figure 1.14: The RCAHMS 1957 survey as published by Feachem in 1966. Note the direction of North in the top left corner (© Crown Copyright: HES).

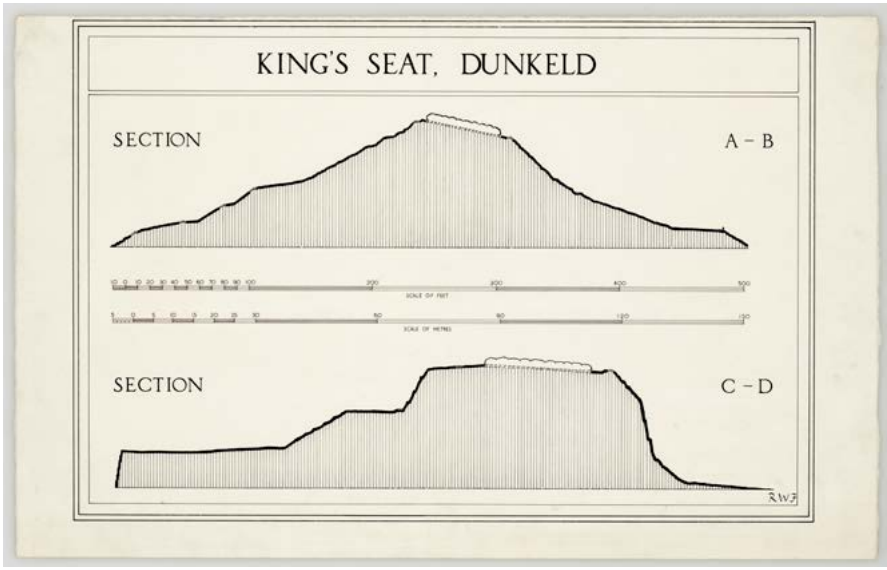

Figure 1.15: The unpublished sections from the 1957 RCAHMS survey (© Crown Copyright: HES).

> outermost circuit. Researchers have suggested that this site could be a seat of early historic royal power which originated as a prehistoric (earlier) tribal centre. The evidence of the place name, King's Seat, may support this. (HES ref: 1598)

However, despite its protection through Scheduling in 1960, the fort, and the upper central enclosure in particular, had once again become effectively lost to archaeology, largely inaccessible since the 1960s as it was so heavily overgrown with dense rhododendron that the summit was impenetrable.

The locational and administrative details of the site are shown in Table 1.1.

King's Seat and the 'nuclear forts'

The possible significance of King's Seat began to feature in archaeological literature in the 1980s due to the work of Leslie Alcock from The University of Glasgow on a site-type identified some 30 years earlier. In a classic and influential study of Dalmahoy, Robert B.K. Stevenson had noted the shared morphological characteristics of a group of Scottish forts where historical and/or archaeological evidence for early medieval occupation existed (1949: 195-198). Stevenson named the group 'nuclear forts' due to their appearance in plan: a central fortified citadel, on the summit of a craggy hill, with enclosures below looping out from this, their shape being governed by the topography of the hill. He initially envisaged these as the early medieval hierarchal strongholds of elites, conceived and constructed in one phase, with a high-status summit citadel surrounded by a hierarchy of descending courts enclosed by outworks. Feachem subsequently argued that some nuclear forts were Early Iron Age forts that were re-fortified in the early medieval period, and that some citadel forts were early medieval structures built within existing Early Iron Age forts (1955; 1966). Leslie Alcock furthered the study of 'nuclear forts' through his excavations at Dundurn (Alcock *et al.* 1989) and elsewhere, and suggested they were power centres periodically visited by kings performing ceremonial functions while collecting tribute (Alcock and Alcock 1987: 135). Alcock suggested King's Seat as a 'medium-sized example' of such a minor 'nuclear fort' (Alcock *et al.* 1989: 209; illus 12) and argued that nuclear and citadel forts should be considered as one class as the hierarchal organisation of space is the important feature, not the plan itself (Alcock *et al.* 1989: 211). Alcock subsequently illustrated King's Seat as an example showing 'conventional pre-Roman Iron Age situation and appearance' (2003: 184) and suggesting, much as Feachem had, that this reflected a 'compact ring-fort...built within pre-existing defences' (2003: 189). All of which demonstrates the considerable ambiguity around the classification of forts solely on morphological grounds. However, this question of chronology was key to the project's

Figure 1.16: The RCAHMS survey as published in South-East Perth: an archaeological landscape *in 1994 (© Crown Copyright: HES).*

Table 1.1: Locational and administrative details of the site.

Site name	NGR	NMRS	Canmore	PKHER	Scheduled Monument
King's Seat	NO 009 430	NO04SW 19	27172	MPK5444	1598

research agenda (section 1.5 below), and this narrative is further explored in Chapter 5 with the benefit of the results presented in Chapters 2 and 3.

1.4 New discoveries: the southern enclosure and other information from airborne LiDAR data

Łukasz Banaszek and David Strachan

In October 2019, airborne laser scanning (ALS – aka airborne LiDAR) data, collected in April 2011 through the LiDAR for Scotland Phase I survey, was consulted by David Strachan to ascertain whether any additional features could be identified at the fort or in its environs. Initial analysis of the Digital Terrain Model (DTM) at 1 m spatial resolution (OS map tile NO04SW), visualised using a simple hill-shading technique, identified what appeared to be a previously unrecognised large sub-circular, and partially banked, enclosure to the south of the fort.

A site visit in February 2020 by David Strachan, Stratford Halliday, and Martin Cook focussed on examining the west side of the enclosure where segments of bank and terrace were observed, concluding that, given their nature, condition, and scale, this feature was likely to be early, i.e. not post-medieval in date. In September 2021 the bank was excavated (MacIver: Chapter 2), and while not dated, was shown to have a stone base, probably to support a superstructure, perhaps of timber and turf. Another field visit by David Strachan, Łukasz Banaszek, Angela Gannon, and Adam Welfare, the latter trio representing Historic Environment Scotland (HES), was made in January 2023 to consider the enclosure and other features. David Strachan and Łukasz Banaszek visited the site again with Dave Cowley, also from HES, in February 2024 to finalise the site plan presented here.

The last two visits were informed by visualisations generated from reprocessed ALS data. Reclassification and denoising of the point cloud using the LAStools software suite, allowed the quality of the data to be assessed. The last echo density of 1.91/m^2 and average ground point spacing of 1.09 m limit the visibility of topographic features (cf. Doneus *et al.* 2022), which is further impacted by uneven distribution of ground points caused by patches of very dense vegetation on the hill. Nevertheless, a new DTM at 0.5 m spatial resolution was produced using QGIS through Ordinary Kriging and presented using the Visualization for Archaeological Topography (VAT) (Kokalj and Somrak 2019) and multidirectional hill-shade techniques (Figure 1.17).

The conclusion of the close inspection of the ALS-derived visualisations, the multiple field visits, and the limited excavation, is that the features do form a hitherto unrecognised enclosure occupying the large terrace to the south of the previously known remains of the fort. While in places the enclosure is defined by somewhat ambiguous features, a low bank 1.5 m thick and up to 0.5 m high, springing from the base of the cliff below the west enclosure of the fort, can be identified with a high degree of confidence (Figure 1.17). This runs south-south-west and after *c.* 40 m it gently turns south-east, fading away after some 76 m at a cliff face that serves to define the southern edge of the main terrace. In places, this bank is overlain by the remains of a lengthy post-medieval estate stone wall, with fallen trees affecting visibility on the ground and in the ALS-derived visualisations (Figure 1.18). A few metres below the main terrace, further to the south-east, a small terrace has two sections of a low bank along its west and east edges. The cliff face that defines the south edge of the main terrace continues east and north-east, with intermittent quarried faces above it. Along the south edge of the main terrace, there is a low stone wall, 4.4 m long, that appears to block an easy line of approach up the hillside from the south-south-east. Indeed, beside this wall, and extending to the east and down the slope, there is a ledge that may have been an access route to the south-east part of the enclosure. Beyond this to the north, there is a short section of bank along the eastern edge of the main terrace. The area immediately south of the eastern enclosure of the previously known fort is littered with boulders with no clear evidence of any built structures.

Based on the evidence described above, the newly recognised enclosure occupies a large terrace to the south of the previously identified remains on King's Seat. This enclosure measures up to 135 m from east to west and up to 137 m transversely from the foot of the cliffs on the north to the edge of the large terrace. The lower terrace measures 42 m from east to west by 23 m transversely. The enclosed area, broadly level and south-facing, extends to approximately 1.38 ha, roughly doubling the overall footprint of the fort complex.

The field visits identified a 4.5 m long section of a wall to the north of the central enclosure (marked 'wall' on Figure 1.18), as well as intermittent quarrying on the

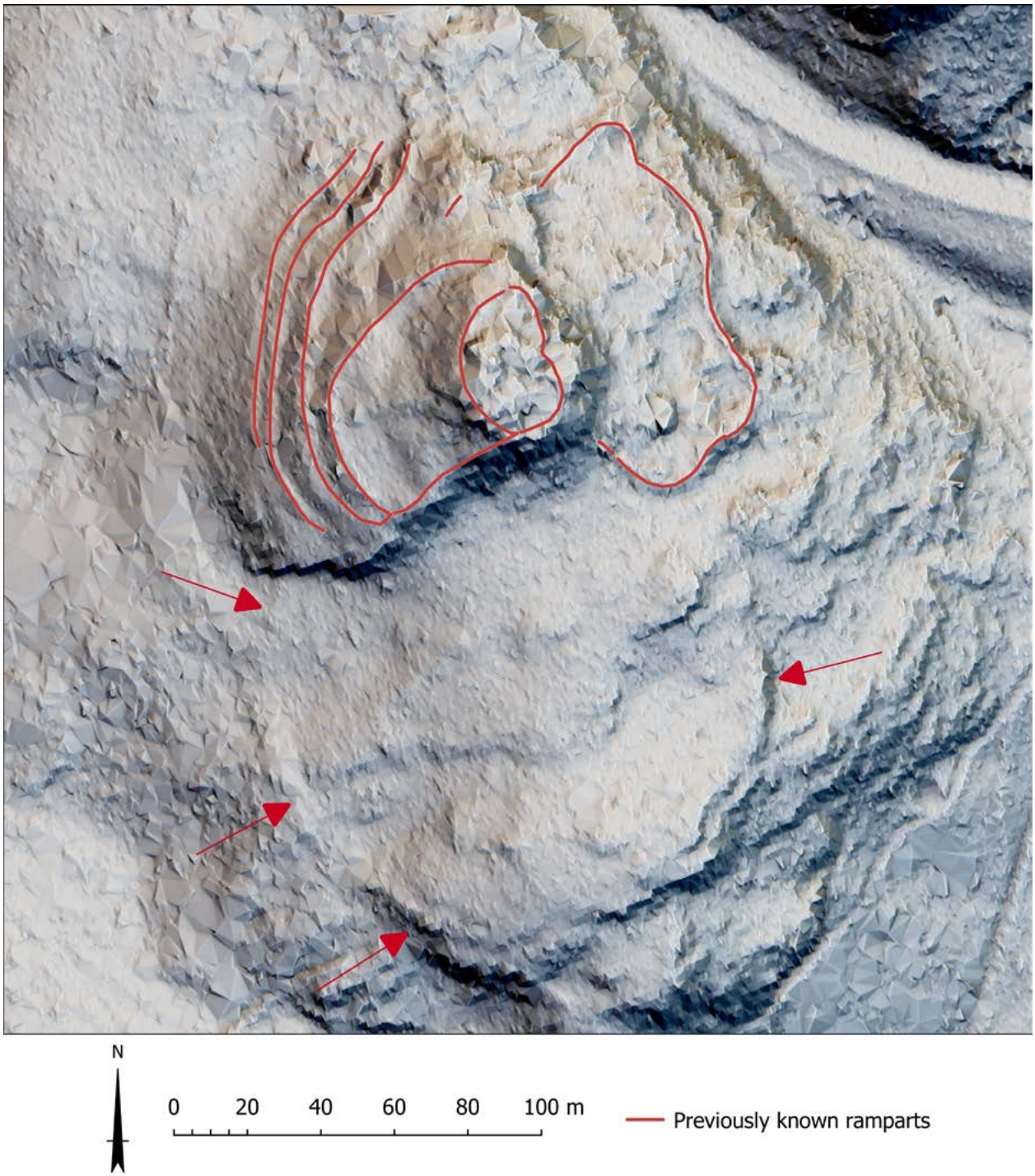

Figure 1.17: The newly identified enclosure (arrows) visible in the ALS-derived DTM south of the known ramparts. Visualization for Archaeological Topography (VAT) blended with multidirectional hill-shade (ALS data: Crown copyright Scottish Government, SEPA and Scottish Water (2012)).

hill, including along the inner side of the rampart of the east enclosure. In addition, a probable entrance was identified at the south of the east enclosure, and probable access routes identified at the south of the newly discovered south enclosure taking advantage of a rock-cut (marked 'cut' on Figure 1.18). All features on the plan presented benefit from a slope visualisation technique developed by HES through recent earthwork surveys (Figure 1.18) (Banaszek *et al.* 2021). The results demonstrate the value of ALS data in revealing significant new information about a relatively well-

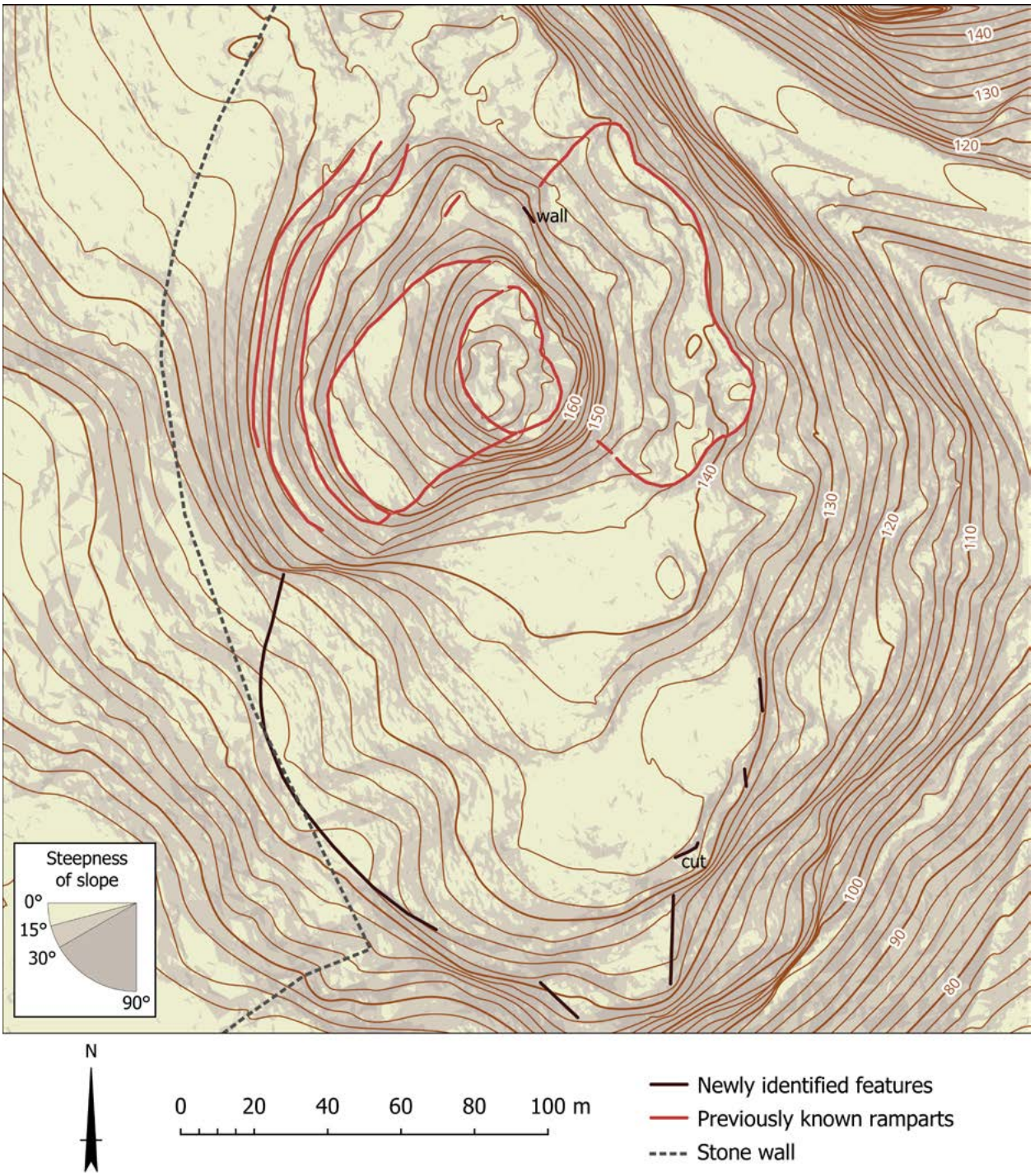

Figure 1.18: The revised plan of King's Seat, Dunkeld. Steepness of slope is based on the ALS data and helps to simplify the complex topography of the hill (ALS data: Crown copyright Scottish Government, SEPA and Scottish Water (2012)).

known site, despite patchy dense vegetation cover and less than optimal data resolution.

1.5 Project aims and research agenda

The project had three overarching aims on which Scheduled Monument Consent to excavate was based:

1. to conduct archaeological research to increase knowledge of the site;
2. to assess the impact of rhododendron roots and tree cover on archaeological deposits across the site, to better understand the threat, and improve long-term management and access; and

3. to engage the local public in their heritage through volunteering, local school engagement, and a range of outreach activities and products.

The excavation research objectives were primarily designed in response to the Scottish Archaeological Research Framework (ScARF), and other recent local research initiatives (Strachan 2013; Strachan *et al.* 2019 and 2023; Poller forthcoming). The excavations were ongoing during preparation of the Perth and Kinross Archaeological Research Framework (ScARF 2022), which incorporates only interim results from this work. The following ScARF research questions from Iron Age forts (2012b: 6 Enclosed Places) were identified as being specifically relevant:

- • Why did people choose to inhabit places such as hilltops, promontories jutting into the ocean and artificial islands in lochs? There is a need not only to study the setting of sites but also to try to reach a better understanding of how landscapes were conceived.
- • There is no overall picture regarding the role of 'hillforts', whether as tribal capitals, (seasonal) meeting places, elite residences, or other functions and it is likely that their role varied across time and space. This impacts directly on social models for the Iron Age; regionally-based diachronic models are key desiderata.
- • What lies behind the diversity of enclosure forms in some areas? A regionally-structured review of the classification and social context of enclosed places is required.
- • The lack of dating evidence for enclosed sites is an issue across the board, as it is a severe constraint in understanding them. 'Key-hole' offers the prospect of obtaining at least an outline chronology in an area relatively quickly, but with the caveat that such approaches will inevitably simplify each site sequence and can only produce a first-stage model.
- • The lack of evidence for activities within enclosed sites, due to limited work in enclosure interiors, is a severe constraint, as are the difficulties in connecting interior activity to enclosure sequences. Geophysical survey offers a cost-effective approach to assessing enclosure interiors in favourable circumstances.

The following relevant research question was identified in the Medieval ScARF report (2012a):

> Turning to the study of the later use of hillforts, work in the Moray Firth (Craig Phadrig, Portknockie, Burghead) remains unpublished and it would be good to reinvigorate this series of projects emphasising the prehistoric context (as at Traprain Law) and the protohistoric settlement context (with the SERF project beginning to address this). Whether protohistoric people are re-using a hillfort for defence or legitimation or are 'making reference' to earlier religious loyalties is perhaps more likely to emerge from studying the surrounding territory... rather than the site itself. However, if a hillfort site is to be examined small-scale excavation must be superseded by a range of new approaches, including the use of survey techniques such as Lidar... laser scanning, TST... survey, and area excavation.

As outlined, while forts in Scotland generally date from the Iron Age, a small number have been shown to be either constructed in the early medieval period or have been suggested as earlier Iron Age forts that were re-fortified at that time (Stevenson 1949, Feachem 1955; 1966; Alcock *et al.* 1989; Alcock 2003). As a result, the main objective of excavation was to establish a chronology, using radiocarbon dating, for the construction and occupation of the then known three enclosures. Given their very different nature, at the outset of the project the author considered it most likely that they were constructed at different times, which perhaps reflected early medieval occupation in the central 'citadel' within an earlier Iron Age fort, represented by the multivallate enclosure to the west.

The research aims for each area of excavation are presented at the start of Chapter 2. These were revised annually based on results from the previous year's work, with continued Scheduled Monument Consent agreed through updated project designs (Strachan 2017; Strachan and MacIver 2018). In addition to excavation, the RCAHMS survey was revisited, geophysical survey was considered (though found unviable due to the nature of the bedrock), and intangible heritage and placename evidence was studied. The main change to the consent over the project was an increase in the scale of the trenches within the central and western enclosures, to ensure that a meaningful sample of the site's interiors were evaluated. The excavation results are the subject of Chapter 2, while Chapter 3 details the small finds recovered. Chapter 4 then provides some broader archaeological context before the discussion and conclusions in Chapter 5, which is structured around the Perth and Kinross Archaeological Research Framework (ScARF 2022), which was developed after the project began.

Finally, our understanding of the local context of King's Seat will be significantly enhanced in the coming years through the A9 DUALLING programme, which is set to see extensive archaeological work along a large corridor in the Dunkeld area. The key research

benefits of such large linear infrastructure projects are their comprehensive approach, and the fact that they cut across varied landscapes, in this case from the Tay floodplains to high mountain passes. The sheer volume of archaeological investigation along its route will no doubt increase regional knowledge and so improve future management and decision-making on development across the wider area. One of the benefits of the community archaeology model through which King's Seat was excavated is that it can target sites where development is unlikely to ever occur and hence provide complementary data.

Chapter 2
The Excavation Results

Cathy MacIver
With a contribution by Derek Hamilton

2.1 Introduction

This chapter presents the results of four seasons of excavation at King's Seat. It covers the condition of the fort as it was found in 2017 and presents the phases of activity identified chronologically, beginning with the earliest. The results from the fort are organised by enclosure, starting with the central enclosure on the summit of the hill and moving progressively down the hill through the western enclosure, to the eastern enclosure and, lastly, the southern enclosure. This leads into the subsequent chapter which provides detailed descriptions of the artefacts and ecofacts recovered.

2.2 The site and excavation methodology

Site description

As outlined in Chapter 1, King's Seat fort sits on a prominent, now forested, craggy outcrop which is naturally arranged in multiple uneven, rocky terraces leading up to a small summit area at 168 m OD. As recorded by RCAHMS (1994: 53) it comprises three distinct enclosures, confirmed through topographic survey in 2017 (Figure 2.1): a central, oval enclosure on the summit; a western enclosure occupying a middle terrace above three further ramparts on the west slope; and an irregular eastern enclosure at the base of the hill, on the same level as the wider, south-facing terrace below the hill. In 2019, the fourth, much larger enclosure was identified by the project on LiDAR data on the terrace to the south (Figure 2.2).

The central enclosure

The uppermost central enclosure measures 35 m from north to south by 22 m transversely within its rampart, which encloses *c.* 0.07 ha on the summit of the hill. The rampart follows the edge of the abrupt break of slope defining the summit area to form an almost complete sub-oval enclosure with steep vertical cliffs to the north-east, east and south. A gap on the north is a clearly defined entrance, while a small break at the south-west edge is a second, and possibly a postern entrance. Both entrances lead to and from the western enclosure below, the former through a dramatic, funnelled approach between the ramparts of the west and central enclosures, the latter more directly. The interior consists of two bedrock terraces: the upper, forming the very top of the hill (at *c.* 168 m OD) extends along the western half of the interior and includes *c.* 0.03 ha of undulating bedrock outcrops, from which steeply sloping bedrock drops down to the lower terrace some 3 m below; this lower, earth-covered terrace extends to *c.* 0.035 ha along the eastern half of the enclosure, and is accessed by both entrances (Figures 2.3 and 2.4).

The northern portion of the lower terrace includes a massive glacial erratic boulder of schist perched on sloping exposed bedrock close to the north entrance. With a relatively flat top and eye-catching, wavy metamorphic banding, it provides a significant and memorable landmark on the hill. Without the extensive tree cover that exists today, the summit would have afforded panoramic views sweeping from the north round the west and south to the east. To the north-east the cliffs of Polney Crag and the higher ground of Craig a Barns dominate, but the elevation would still have offered some visibility into the King's Pass.

The western enclosure

Below and to the west of the central enclosure, there is a small sloping terrace of *c.* 0.09 ha dropping down to about 15 m below the summit (*c.* 153 m OD). It is enclosed by a rampart that runs south-west from outside the north entrance of the central enclosure and extends along the western lip of the terrace before returning up the edge of the crag on the south to the outside of the south, or postern, entrance (Figure 2.5). Overall, it measures 55 m from north-east to south-west by 45 m transversely. Three further ramparts, now reduced to terraces, follow the contours of the steep western slope of this terrace, splaying northwards from the edge of the terrace and possibly creating a large funnel-shaped arrangement in the defences for an entrance way leading towards a possible break in the rampart on the north-west side of the western enclosure. Another possible break in the western enclosure rampart, on the south, potentially indicates access to and from the southern terrace (Figures 2.1 and 2.2).

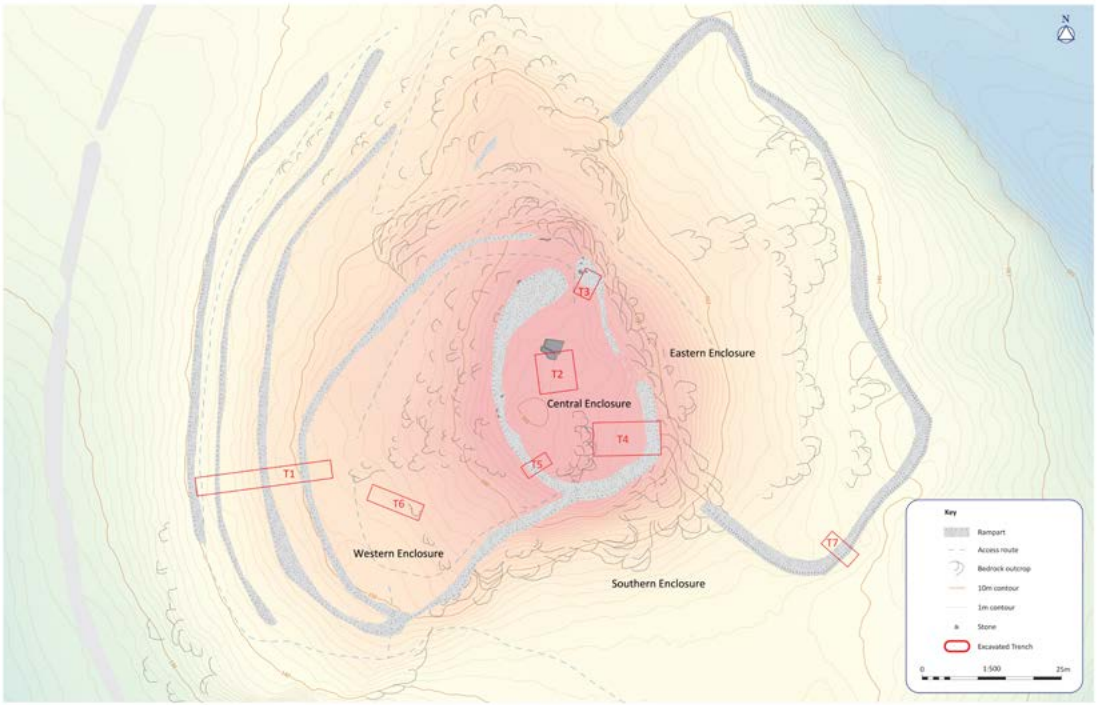

Figure 2.1: The central, western and eastern enclosures of the fort and the trenches 2017-19.

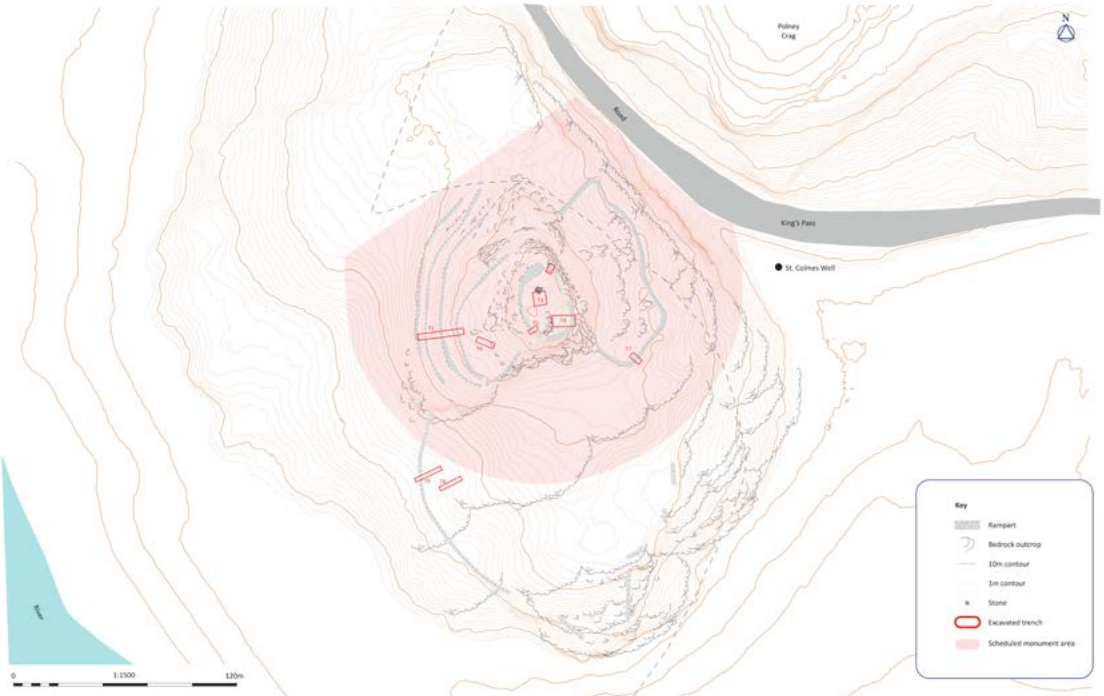

Figure 2.2: The enclosures of the fort with the southern enclosure and additional trenches in 2021.

Figure 2.3: General view of the central enclosure looking south, location of Structure 2 on the lower terrace.

Figure 2.4: The lower, eastern terrace of the central enclosure looking north, showing the break of slope between the terraces and the glacial erratic.

Figure 2.5: General view of the western enclosure looking south-east, with the line of the surviving rampart visible at the edge of the sloping terrace.

Figure 2.6: The surviving bank at the south end of the eastern enclosure, looking north-west.

The eastern enclosure

To the east of the hill, a large irregular enclosure is defined by a substantial stone and earth rampart which extends from the foot of the steep crags about 18 m below the rampart of the central enclosure on this side (Figure 2.6). Overshadowed by the cliffs above, this roughly D-shaped enclosure takes in *c*. 0.31 ha of very uneven sloping ground with multiple small bedrock outcrops and large boulders. The eastern line of its rampart follows the break of slope above the King's Pass before curving sharply back at either end to meet the foot of the cliffs. In effect, while the western ramparts control access along that side of the hill, the eastern enclosure blocks access along this side from the north.

The southern enclosure

The lowest and largest enclosure encompasses much of the sloping terrace some 30 m below the summit at *c*. 135 m OD on the south (Figure 2.2). Sub-circular in form and enclosing 1.38 ha, it extends in a curving line from the cliffs below the terminals of the western ramparts and follows the break in slope, to exploit the rocky outcrops and cliffs on the south and east of the terrace before returning on the south-east below the southern end of the eastern enclosure. Identified on LiDAR data in 2019 (Banaszek and Strachan: Chapter 1.4), it is barely visible in the ground, and while in some places on the west and south it is defined by an almost imperceptible bank in others on the east it incorporates or augments the rocky cliffs and outcrops of the native rock.

Excavation methodology

As outlined in Chapter 1, while there is no record of previous intrusive investigations at King's Seat, historic survey has prompted speculation that there may have been some 18th- or 19th-century intervention or augmentation to the site. In particular, the western ramparts have been suggested as 'an antiquarian confection to enhance the presence of the fort in the

designed landscape of paths and walks laid out in the policies of Dunkeld House' (Lock and Ralston: 2017 SC 3022).

Further to rhododendron clearance, a non-intrusive topographic survey was undertaken which confirmed the detail of features presented in the RCAHMS survey of 1989. The survey was tied into the modern national grid and used as a basis for proposing trench locations.

The preliminary stages of clearance and survey were followed by four seasons of small-scale investigation which aimed to determine the character, extent, condition, date, and significance of any surviving archaeological remains as outlined in the Project Research Designs (Strachan 2017; Strachan and MacIver 2018).

To successfully understand the development of the complex of ramparts and enclosures, it was vital to investigate and characterise each individual element. Therefore, the trenches aimed to investigate each of the ramparts in turn, as well as targeting the interior of the western and central enclosures to characterise the activities and associated structural remains (if any) within the fort. Key to the approach was to obtain secure dating evidence from as many components as possible with a view to demonstrating whether they represented one contemporary phase of use of the hilltop or instead multiple phases over time.

From 2017 to 2019 three seasons of excavation were undertaken over the eastern, western, and central enclosures, while the final season in 2021 investigated the southern enclosure that was discovered on LiDAR in 2019 (Banaszek and Strachan: Chapter 1.4). Over the course of the four seasons ten trenches were excavated and reinstated by hand (Figures 2.1 and 2.2), recorded with measured drawings and written descriptions. In 2017 Trench 1 (upper eastern end), Trench 2 and Trench 3 were completed; in 2018 Trench 1 (lower western end) and Trench 5 were completed; in 2019 Trench 4, Trench 6 and Trench 7 were completed. No fieldwork was undertaken in 2020 due to the COVID-19 pandemic, but a reduced team explored the character of the southern enclosure in 2021 through Trenches 8 and 9.

2.3 The excavation results

Late Mesolithic activity on the hill

The earliest material identified relates to an early use of the hill, considerably predating the construction of the fort. All the material is residual, comprising a chipped stone assemblage mainly of quartz, flint, and chalcedony, and indicates that the site was used in early prehistory. The lithics were identified within both the central enclosure on the summit of the hill and on the western terrace, the flattest areas of high ground on the site. The assemblage comprises thirteen cores (quartz and flint), four flint scrapers (SF 4130.1, SF 4075, SF 4094.1, SF 4094.2), two flint side scrapers (SF 651, SF 627), one chalcedony end scraper (SF 4118), one chalcedony thumb scraper (SF 4051.1), one flint piercer/borer (SF 218.2), three retouched flint bladelets (SF 4051, SF 4073 and SF 4142) and two retouched flint pieces (SF 209, SF 218.1) (Engl: Chapter 3.12). The quantity of lithics and the tool types may suggest a Late Mesolithic occupation where several domestic activities, such as hide-working and tool curation, were practised. While the material undoubtedly represents disturbed residual material the relative lack of core and other debitage classes suggest that only a limited amount of reduction was undertaken on site. Such as there was, likely focused on the expedient reduction of quartz (naturally occurring on the site) to provide useable sharp flakes. Given the relatively large proportion of modified tools within the assemblage relative to debitage, it is possible that many of these artefacts were brought onto site rather than manufactured *in situ*. Nevertheless, the possibility of occupation in a small camp cannot be discounted as the debitage demonstrates tool-making rather than simply the loss of pre made tools.

The early medieval fort

The fort and its immediate environs were heavily afforested and covered in dense, unmanaged rhododendron growth for decades. The resulting root action had a direct impact on the security of many of the deposits encountered, strictly limiting the number of secure contexts from which material could be derived for scientific dating. Four radiocarbon dates were obtained from features across the site, including two hearth fills, one posthole related to the upper of the western ramparts and a metalworking waste dump. The results all placed activity in the fort to the early medieval period (Table 2.1). The results below are structured by enclosure, beginning with the central and western enclosures followed by the eastern and southern enclosures.

The central enclosure

The following presents the various elements of the enclosure: the rampart; the nature of the interior; the upper summit terrace (including the small hearth/ stone setting; slingshot cache; and the glacial erratic); and the lower summit terrace (Structure 1: form and character, primary hearth, secondary hearth, and internal deposits; the platform; and post-medieval cultivation).

The rampart

The central enclosure rampart formed the core of the site and followed the edge of the steep break of slope around the top of the hill. It was evaluated within Trenches 3, 4 and 5 (Figure 2.1): Trench 3 measured 5 m by 2 m and was positioned at the eastern edge of the north entrance; Trench 4 measured 12 m by 6 m of which the eastern 3 m covered the rampart on the south-east; and Trench 5 measured 5 m by 2 m and was positioned across a section of the rampart on the south-west.

Within Trench 3 the single rampart [304] was aligned north-west to south-east and measured a minimum of 4 m in thickness (Figures 2.7 and 2.8). It consisted of fragmentary remains of an inner stone face [317], comprising a large boulder that had slipped out of position beside a small section of face formed of sub-angular stones surviving two courses high (Figures 2.9 and 2.10). This retained a rubble core [306] with a yellow-brown sandy silt matrix [303]. Artefacts from within the rubble core included a fragment of saddle quern re-purposed as a grinding platform/sharpening stone (SF 306). Tip lines evident in the section through rubble material [306] confirmed that the outside of the rampart had collapsed off the cliff edge in this area, with core material slumped and eroding over the edge. Thus, no remains of the outer face were identified in this location (Figures 2.8, 2.11 and 2.12). The rampart was largely constructed directly onto bedrock, but towards the interior it lay on bright red brown subsoil deposit [316] that had probably been redeposited to level this area with the natural bedrock surface to the north-east (Figures 2.11 and 2.13); it lay over a thin lens of grey sandy silt [315] representing an old ground surface.

A series of deposits abutting the inner face of the rampart were found that had formed after the construction of the wall. At the foot of the inner face [317] a thin lens of charcoal-stained mid brown sandy silt [310] was found which probably represents activity either directly after or during construction of the wall. A layer of friable yellow clayey sand [308] above this was succeeded by a sandy grey silty deposit [305] with occasional sub-angular stone; both layers likely represent root-disturbed deposits formed post-abandonment of the fort. Several artefacts were identified within this layer including fragments of plano-convex slag cake and unclassifiable slag (SF 307, SF 321), two joining saddle quern fragments re-purposed as a copper alloy handled mirror mould and sharpening stone (SF 306, SF 310 and SF 313). Several iron objects were also identified in this layer including a pricket candlestick (SF 308) and a spoon-bit auger (SF 309). Overlying this was a layer of sandy material [302] which contained two corroded heads of double bit felling axes (SF 301, SF 302) related to later post-medieval woodland management of the site. Overlying this were several spreads of sub-angular stone [307] and [309], representing the collapse of the rampart as it decayed over time. The area within the interior of the central enclosure contained an upper layer of forest loam topsoil, but in places across the top of the rampart other stones were exposed. It was noted that the width and size of the stones used in this part of the rampart were larger than those evident elsewhere, probably due to the close proximity to the main entrance.

Within Trench 4 the rampart [402] was aligned north to south and measured up to 4 m in thickness. It consisted of fragmentary remains of an inner stone face comprising a single course of sub-angular stones measuring 0.4 m by 0.2 m, and a maximum of 0.5 m in height, built onto the natural subsoil (Figure 2.14). This revetted a low deposit of angular stone and sandy silt, heavily impacted by substantial tree roots, which is probably all that remains of the rampart core (Figure 2.15). The outer face of the rampart was tentatively identified in the form of two structural stones forming an edge parallel with the inner face 4 m to the east. No evidence of a timber component or palisade was evident, and no datable material was recovered. Three cattle bones were identified from an animal over 24 months within the material in the rampart core [402]; they are likely to represent redeposited food or butchery waste.

Within Trench 5 the rampart [504] was aligned north-west to south-east and was a minimum of 3.5 m in thickness (Figures 2.16 and 2.17). It consisted of a very fragmentary inner stone face of a single course of sub-angular stones. These measured 0.6 m by 0.12 m and 0.25 m in maximum height and had been built directly onto the bedrock (Figures 2.18 and 2.19). A low spread of compact, light yellow sandy silt [502] containing frequent angular stones was all that remained of the rampart core (Figure 2.20). The lack of core material in this location is due to substantial collapse of the rampart, corroborated by the absence of any trace of the outer face in this location. On the interior of the rampart face the sloping bedrock terrace that the rampart is built upon abruptly steps up by 0.3 m to a flat outcrop of bedrock. Covered by a layer of shallow forest loam no more than 0.02 m, the bedrock of this terrace was the highest point on the hill, measuring approximately 4 m by 7 m, may well have been more fully exposed during the occupation of the site. A perforated stone weight (SF 505) was identified up against the inner face of the rampart, and in the upper layer of the topsoil [501] a whetstone (SF 503a), a grinding platform/sharpening stone (SF 504) and an apple-green glass bead (SF 501) were recovered; these contexts all post-date the rampart construction, and possibly also its collapse.

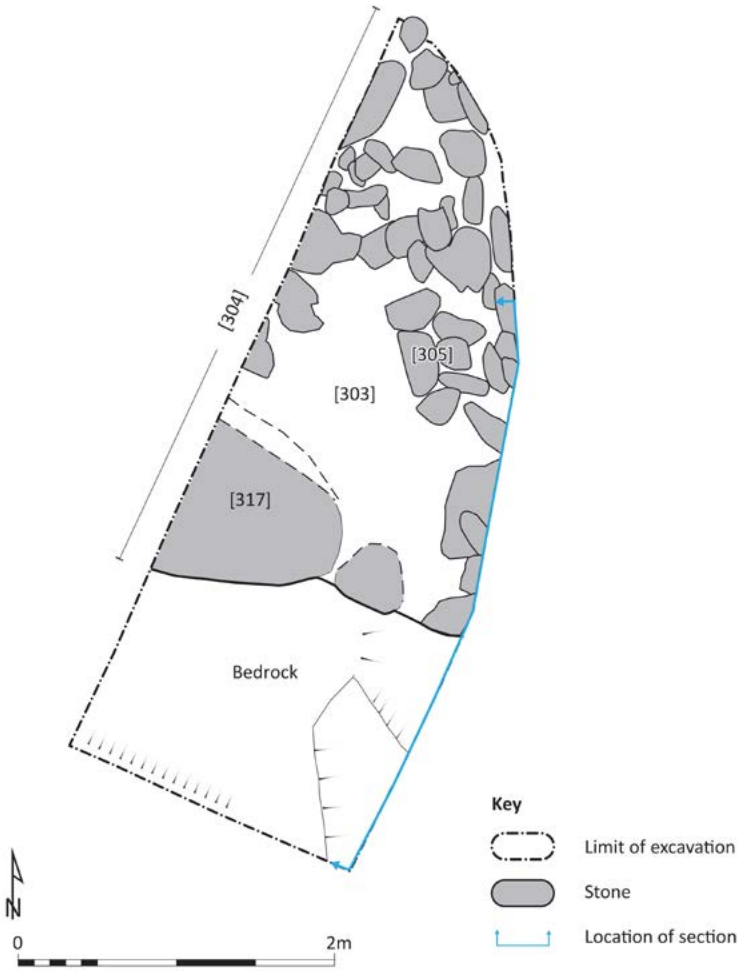

Figure 2.7: Plan of Trench 3 showing rampart [304] and surviving inner face [317].

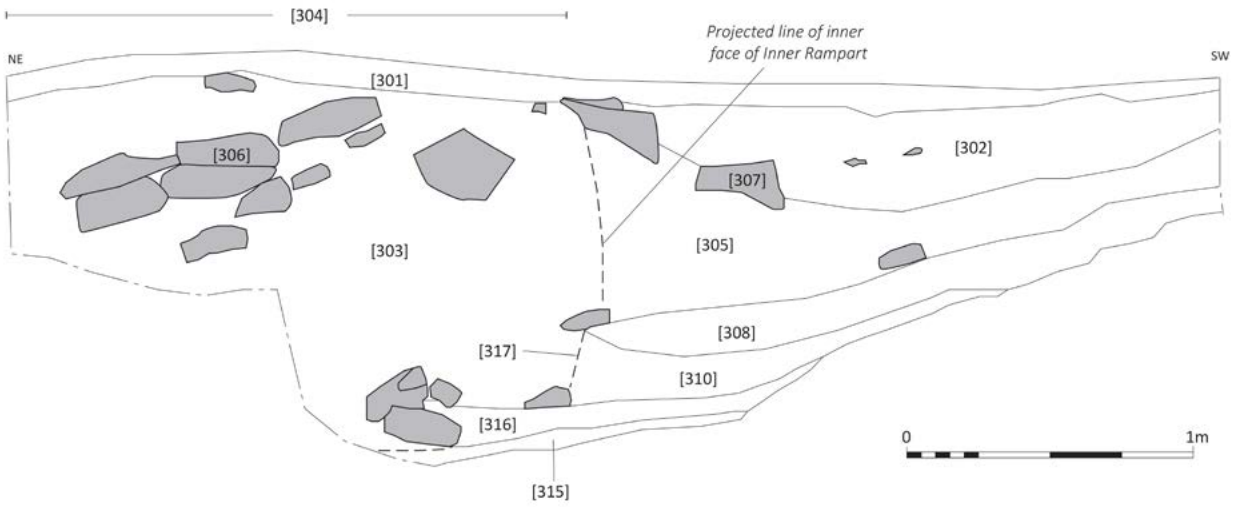

Figure 2.8: North-west facing section of Trench 3 showing collapsed rampart [304] and abutting deposits [310], [308] and [305].

Figure 2.9: Mid-excavation view of the inner face [317] of central enclosure rampart [304], looking north-east in Trench 3.

Figure 2.10: Detail of the surviving inner face [317] of central enclosure rampart [304] in Trench 3.

Figure 2.11: A general post-excavation view of the north-west facing section of central enclosure rampart [304], Trench 3.

The nature of the interior

The interior of the enclosure is characterised by two rough terraces of bedrock; the very top of the hill is localised around the west half of the enclosure and forms a relatively flat terrace (Figure 2.1). From here, the bedrock slopes steeply down to a lower terrace extending round the east edge of the enclosure from the entrance on the north to the possible postern entrance on the south. At the north entrance a large glacial erratic, perched directly on the bedrock, dominates the approach into the interior from a slightly raised position. The upper terrace was characterised by very shallow, root-disturbed forest soils and outcropping bedrock, while the lower eastern terrace included deeper homogenous topsoil deposits. The flatter ground on the lower terrace lay immediately to the rear of the rampart, which acted as a silt trap. In these areas, particularly Trench 4, this resulted in preservation of layers built up from occupation activity and subsequent decay and erosion.

The interior was evaluated in two trenches: Trench 2 and Trench 4. Trench 2, which measured 8 m by 8 m, was designed to investigate the potential for any structures or carvings related to the glacial erratic. Trench 4, which measured 12 m by 6 m, extended from the rampart on the east into the interior to investigate the potential for any structures or internal activity on the lower flat terrace.

The upper summit terrace

Trench 2 covered the edge of the upper terrace downslope from the glacial erratic (Figure 2.21). Across the whole trench a heavily root disturbed deposit was removed to reveal bedrock close to the surface. This poorly draining topsoil deposit [202] contained a mix of *ex situ* artefacts, including several flint fragments, a ceramic tuyère fragment (SF 208), a stone mirror shaped metalworking mould (SF 207), four stone gaming pieces (SF 220), two possible whetstones (SF 205, SF 221), and metalworking waste. This last included one fragment of stone (SF 215) that had red vitrification on one surface. This was probably used as a stand for a crucible but may have been no more than an accidental spillage. Other artefacts in this layer included two fragments of an iron horseshoe (SF 211/212) estimated to date from the 9th-13th centuries AD and several modern objects, amongst them a shotgun cartridge, a tombac button, a ceramic pipe stem and a 1957 Scottish shilling. The mixed nature of this material demonstrates that these shallow topsoil deposits are not secure contexts. The build-up of material is not only heavily disturbed by root action

Figure 2.12: Detail of the north-west facing section of central enclosure rampart [304], showing collapse off hill, Trench 3.

Figure 2.13: The south-east facing section of central enclosure rampart [304], showing collapse, Trench 3. The north entrance is visible as a break in the rampart beyond the trench.

Figure 2.14: The collapsed inner face [402] of central enclosure rampart emerging in Trench 4, looking east.

Figure 2.15: Rampart core behind inner face of central enclosure rampart [402] in Trench 4, looking north-west.

Figure 2.16: The plan of the central enclosure rampart [504] in Trench 5.

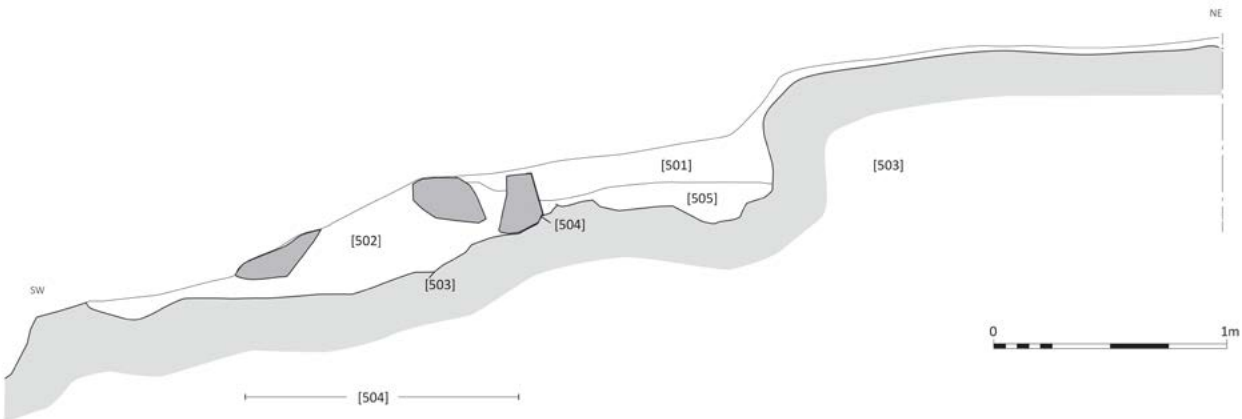

Figure 2.17: The south-east facing section of the central enclosure rampart [504] in Trench 5.

Figure 2.18: Mid-excavation view of central enclosure rampart [504] in Trench 5 looking south-west.

Figure 2.20: Post-excavation view of the central enclosure rampart [504] in Trench 5, facing south-west.

Figure 2.19: Post-excavation view of the central enclosure rampart [504] in Trench 5, facing north-east.

but spans a long period of time and represents multiple phases of activity on the hilltop (Figure 2.22).

The bedrock uncovered was a mixture of smooth weathered rock scored with glacial striations, and areas of rougher fissures and steep faces where quarrying had taken place (Figure 2.21). On the flat upper level, several of the quarried areas appear to be deliberately cut, if irregular, sockets [207], while on the slope below several cuts appear to have been rough steps. Elsewhere cuts into the bedrock exploited fissures of quartz and it was less clear if these were just the result of quarrying for stone (perhaps related to earlier prehistoric activity and potentially Late Mesolithic activity) or a more deliberate creation of a specific feature. The two possible sockets on the upper terrace were angular cuts [207] into the flat top of the bedrock. Both went against the natural plane of weakness of the outcrop indicating deliberate creation; each measured *c.* 0.26 m by 0.34 m and was *c.* 0.3 m deep, and they were 2 m apart (Figures 2.23 and 2.24). It is possible that in the absence of soil deposits that these were the bases of 'post settings' and, although no other structural features were detected within the limits of Trench 2, it is likely they indicate ephemeral foundations for a structure on the upper terrace. The depth of the deposits in these areas and the weathering on the bedrock also indicates that this surface was exposed while the site was in use, and that the accretion of the topsoil relates to subsequent decay and ongoing forest soil formation in more recent centuries.

Small hearth or stone setting

At the base of the bedrock slope in Trench 2 there was a small deposit of dark blackish-brown silt with charcoal flecks [210] which was sealed under three angular stones set upright to form a rectangular setting [209]. The stones measured 0.5 m by 0.2 m and enclosed a sub-square area of 0.4 m by 0.3 m (Figure 2.25). A fragment of clay tuyère (SF 208) was found just above one of these stones, although it may have washed in from upslope. The setting could represent a small hearth or another post setting.

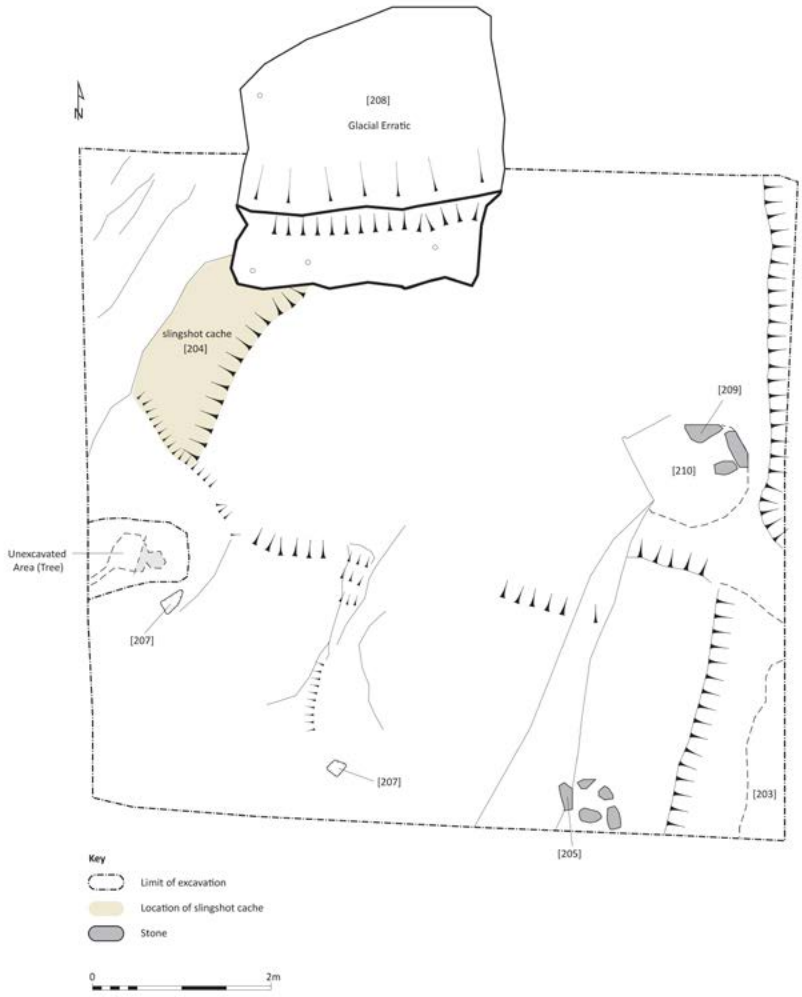

Figure 2.21: Plan of Trench 2 depicting the sloping bedrock, features identified in the text and glacial erratic, including the position of bored holes.

A slingshot cache

At the foot of the slope within Trench 2 a deposit of fine dry yellow silt [204] was present, adjacent to the glacial erratic [208] (Figure 2.26). This layer contained some occasional charcoal flecks and root disturbance in the upper layer but was generally compact and included frequent pockets of small river rolled rounded stones *c.* 0.05 m in diameter. These were very distinct from the very angular stones derived from the underlying bedrock (Figure 2.27), and as such have evidently been gathered elsewhere and brought to the fort. A total of 540 stones (SF 222) were retrieved from this context, their distinct concentration in this one small area suggesting they were introduced deliberately and stored behind the west wall of the central enclosure. Although unaltered by human intervention they resemble material interpreted as slingshot on mainly Iron Age hillforts (Finney 2006: 91-7, app 1.1; Robertson 2016), including Maiden Castle, Dorset (Sharples 1991) and Danebury, Hampshire (Cunliffe 1984). More recently, a total of 89 possible slingshots were retrieved in two caches at the early medieval fort of Trusty's Hill in Dumfries and Galloway (Toolis and Bowles 2017: 57). As at King's Seat they were predominantly recovered from immediately behind ramparts, suggesting they were stored at this location in readiness for use.

The glacial erratic

The glacial erratic [208] at the north end of the upper terrace of the central enclosure is both an imposing and enigmatic natural feature. It is a large sub-rectangular block of metamorphic mica schist. It measures *c.* 3.5 m east-west by 3 m transversely on its west side and 3.23 m on its east and stands *c.* 1.5 m in height. It is has broken in two along a fissure running east-west along the southern half of the block, and this southern block

Figure 2.22: Mid-excavation view of Trench 2 looking to the south-east showing rhododendron root disturbance.

Figure 2.23: Bedrock exposed in Trench 2 depicting some of the fissures resulting from possible quarrying.

Figure 2.24: Bedrock cuts [207] forming possible post-settings in Trench 2.

Figure 2.25: Stone setting [209] in Trench 2.

is higher than the surviving northern block (Figure 2.28). It has a striking appearance due to its distinctive glinting fabric and the undulating banding on the side (Figure 2.29). The excavation of Trench 2 confirmed that no archaeological deposits were preserved underneath it or up against it, probably because it was always perched on bare bedrock during the occupation of the fort.

The stone has four small holes bored vertically into its upper surface along the edge of its southern and western sides (Figures 2.21 and 2.31). The holes were all sub-circular and varied between 0.06 m and 0.065 m in diameter and between 0.15 m and 0.21 m in depth. Each is separated from its neighbours by between 0.6 m to 1.5 m. It is presumed they were formed in antiquity as they have uneven edges that confirm they were not machine drilled. They may have supported some kind of wooden superstructure built on the stone (such as a canopy or a screen), but this is impossible to confirm, or indeed to date. This striking natural feature, augmented by human intervention, may have parallels with rock-cut features at other early medieval forts, including 'St Fillan's chair' at Dundurn (Alcock *et al.* 1989: 198) and the carved footprint at Dunadd (Lane and Campbell 2000: 18-22). Without being too fanciful, perhaps the block at King's Seat served a similar purpose, being a focal platform around which gatherings or other events took place. The slightly downward slope towards the east (Figure 2.30) would have promoted display towards a gathering assembled in the lower summit terrace, an attribute shared by the features at Dundurn and Dunadd. However, it is not known when the fracture

Figure 2.26: The area of Trench 2 where the slingshot pebbles (SF 222) were uncovered.

Figure 2.27: The recovered slingshot pebbles (SF 222) from Trench 2 contrasting with the naturally occurring angular stone in the background.

Figure 2.28: The glacial erratic [208] from the east showing the fissure along the southern half of the stone.

Figure 2.29: The glacial erratic [208] from the west showing the wavy bedding and fissure.

Figure 2.30: The glacial erratic [208] from the south-east showing a slope at the south-west corner, towards the lower terrace near the entrance to the central enclosure.

Figure 2.31: Detail of the small holes bored into the glacial erratic [208] shown in Figure 2.21.

in the stone formed, and it is possible that the angle has increased further since the early medieval period. Similar erratic boulders exist in the immediate environs of the fort, some of which have also broken along their strata in a similar fashion.

The lower summit terrace

Structure 1: form and character

Trench 4 was positioned at the southern end of the lower terrace to investigate the flat area between the vertical bedrock face at the base of the upper terrace on the north-west, and the rampart on the south-east (Figures 2.32 and 2.33). Overlying the natural subsoil [433] across most of the trench was a compact yellow brown silt representing an old beaten-earth ground surface [406], which also extended beneath the rampart. Set on top of or slightly within this horizon were a series of features that included a substantial hearth and settings of stones to support upright timbers for a relatively large building, aligned roughly north-north-east and south-south-west. The western wall had been reduced to a 2 m wide band of sterile silty material with frequent small stones [444], interpreted as the degraded remains of a turf wall (Figures 2.34 and 2.35). Within its line there was a straggle of four stone settings, [417], [418], [431] and [432], at intervals of between 0.8 m and 1 m (Figures 2.36 and 2.37), each constructed from three to four large stones set up on surface [406]. These probably mark the positions of posts supporting timber components of the building's superstructure. The turf 'wall' ran roughly parallel with the foot of the bedrock face forming the west edge of the terrace, disappearing beneath the baulks on either side of the trench. The hearth lay on roughly the same axis about 1.8 m to the east of the 'wall', but immediately east of this later spade-dug cultivation (Figure 2.32) had removed all trace of both the eastern wall and any internal deposits. Thus truncated, the dimensions of the building are unknown, but the available space could have accommodated a structure in the order of some 6 m in overall breadth and 8 m in length. The cultivation had extended across most of the eastern portion Trench 4 but stopped short of the hearth and other more substantial stony features that would have impeded it. A sondage excavated to test the deposits below [415] identified further natural subsoil deposits of sterile yellow-brown sandy silt [433] and greyish-yellow compact clay [434] (Figure 2.33). The sondage was excavated to 0.85 m deep below the position of the natural, which demonstrated that in this location the bedrock must slope sharply away from the outcrop that forms the upper terrace.

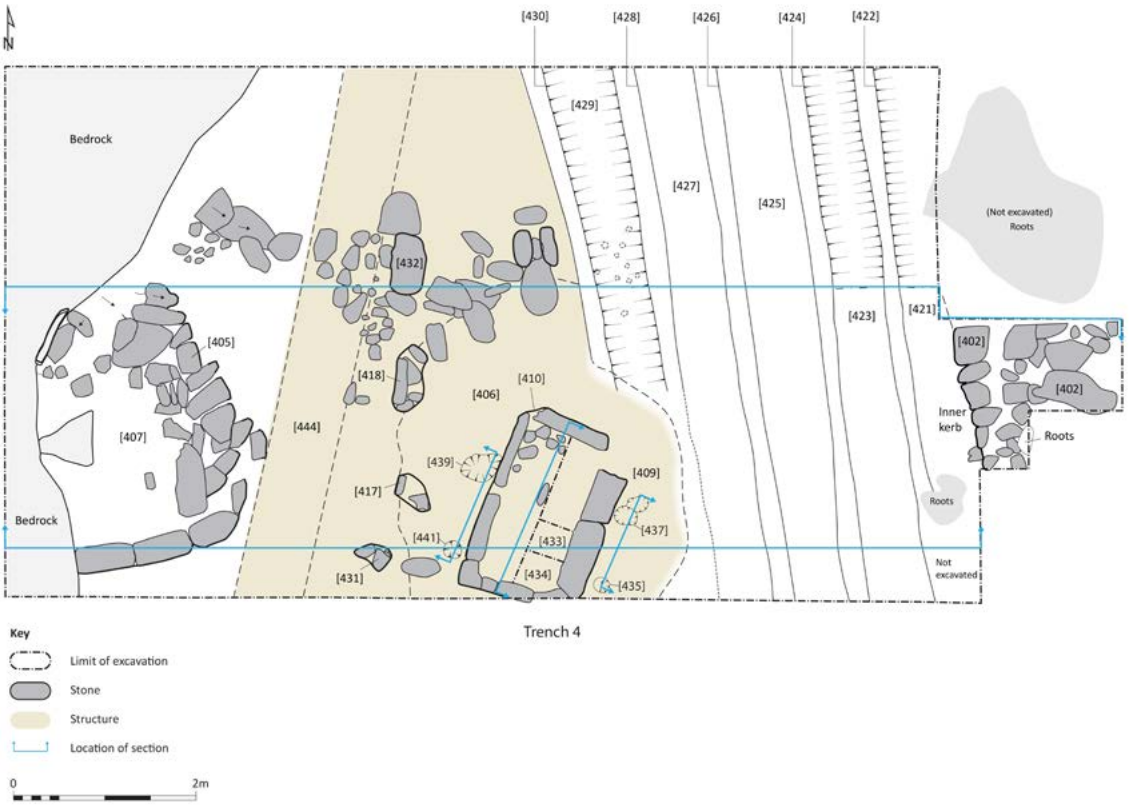

Figure 2.32: Plan of Trench 4 with primary hearth setting [410] within Structure 1 and small platform [405] up against the bedrock edge.

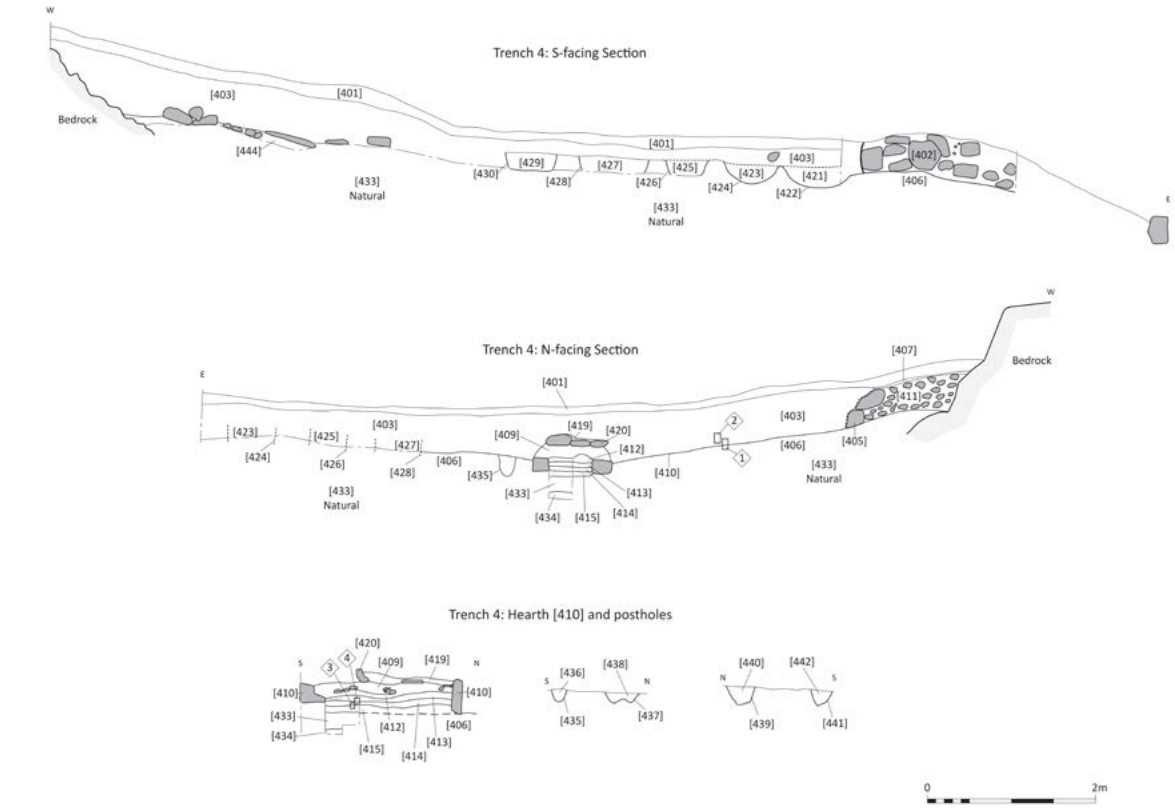

Figure 2.33: South-facing and north facing sections of Trench 4 and Structure 1 deposits and detailed south-east facing section of hearth [410] and post-settings.

Figure 2.34: Mid-excavation general view of stony silty deposit [444] located running across Trench 4 in front of scalebar, representing a degraded turf wall of Structure 1, facing west.

Figure 2.35: Post-excavation general view of natural subsoil underlying stony silty deposit [444] at edge of Structure 1, facing west.

Structure 1: primary hearth

Within this building a stone kerbed sub-rectangular hearth [410] was identified, constructed on a heat affected natural subsoil [415] (Figure 2.38). The hearth measured 1.5 m long by 0.75 m wide, narrowing slightly at either end to *c.* 0.65 m. The upright kerb of stones created an internal depth of 0.4 m. The base of the hearth was not stone lined but laid directly onto the natural subsoil [415]. The hearth was filled by three distinct ash-rich fills [414], [413] and [412], all of which contained frequent small flecks of burnt bone. Charcoal from the basal hearth fill [414] was dated to between 550-645 cal AD (calibrated to 2σ, SUERC-88166; Table 2.1). The middle fill [413] contained a single worked red deer antler (SF 4253) that had been chopped through its width and had multiple parallel cut marks along its surface, likely the remnants of craft activity it is an incomplete tool head. The upper hearth fill [412] contained several fragments of slag and vitrified material indicating some form of metalworking had taken place in the vicinity. It also contained 98 pieces of animal bone identified as cattle (8), sheep/goat (3) pig (9), large mammal (56) and medium mammal (22). The cattle, sheep/goat and pig bones were skull, teeth, scapula, ribs, long bones and metapodials. All the cattle bones came from animals aged over 12 months, while the sheep/goat bones came from animals aged between 6 and 42 months and the pig bones from animals aged between 8 and 42 months. The only bone in this context that showed signs of having been butchered was a pig scapula, which had a perforation through a portion of the blade. This may indicate it was hung on a hook and had been brought to the site as a joint of meat. The animal bones are in keeping with a mixed assemblage of butchery and craftworking waste.

Two pairs of postholes were set opposite each other to either side of the hearth [410]. Postholes [435] and [441] were at the southern end and measured 0.2m in diameter and 0.15m deep. Postholes [437] and [439] were towards the northern end and measured 0.4m in diameter and were 0.25m deep (Figures 2.39 and 2.40). All the postholes were cut into the natural and generally filled with material very similar to the compact yellow brown sandy silt [406] (*supra*) where this material had silted into the features as they decayed. The fact the postholes were arranged in pairs on opposite sides of the hearth indicates they relate to fireplace 'apparatus' such as a spit or pot-hanging system. This fireplace superstructure could have taken the form of a substantial A-frame with crossbar (although no

Figure 2.36: Mid-excavation general view of Structure 1 with primary hearth [410] and the upright stones of stone settings [417] and [418] emerging in Trench 4, facing south-west.

Figure 2.37: Post-excavation view of Structure 1 in Trench 4 with stone settings [417/418/431/432] along the west edge, sub-rectangular hearth [410] (centre image) and rampart [402] along edge of slope, facing east.

Figure 2.38: Primary hearth [410] and post settings [435/437/439/441] in Structure 1, Trench 4, facing north-east.

Figure 2.39: South-east facing section of primary hearth [410] and post settings [435/437] in Structure 1, Trench 4.

Figure 2.40: Primary hearth [410] showing sondage along south-east half of feature excavated to base, facing north.

incline was visible preserved in the feature cuts) and would have been substantial enough to support a spit to roast joints of meat or whole animals. The substantial quantity of animal bone concentrated in the vicinity to the hearth certainly suggests that it was designed for cooking.

Within and overlying hearth [410] an uppermost fill of ashy silt [409] with frequent small rough flat angular stones was found to contain 461 fragments of animal bone from cattle (39), sheep/goat (6), pig (23), domestic fowl (1), bird (2), large mammal (198), medium mammal (102) and indeterminate mammal (90). The cattle, sheep/goat and pig bones were mainly skull, teeth, limb, and foot bones, with two fragments of cattle scapula and one piece of a pig scapula also identified.

Fourteen of the cattle bone fragments provided aging data. The youngest was over 7 months old and at least one individual was still alive after 42 months. Three sheep/goat bones provided aging data. They were under 24 months, over 21 months and over 36 months. Nine pig bones came from animals between 1 week and 42 months of age at their time of death. The domestic fowl humerus came from an adult individual. Two large mammal ribs in this context showed evidence of butchery, manifested in cut- marks on their surfaces. Taken together this assemblage represents butchery, craft-working waste, cooking debris and food waste all being deposited within the hearth of Structure 1, indicating it is likely these processes were taking place with the structure.

The hearth is similar in both form and scale to a hearth identified within an early medieval building at Clatchard Craig, Fife (ID 30074) (Close-Brooks 1986; Noble *et al.* 2022: 273-274) as well as several other early medieval sites, such as Lair, Glen Shee (ID 29437) (Strachan *et al.* 2019: 45; fig 2.13). This is discussed in more detail in Chapter 5.

Structure 1: secondary hearth

Overlying the southern end of the primary hearth was a smaller secondary stone kerb [420], mainly comprised of long stones set upright to match up roughly with the top of the higher northern end of the original kerb [410] (Figure 2.41). These new kerbstones [420] and some of the original kerbstones formed a secondary smaller hearth setting measuring *c.* 0.9 m by 0.75 m (Figure 2.42).

The final use of this hearth is represented by a mid yellow-brown charcoal-rich ash deposit [419], which

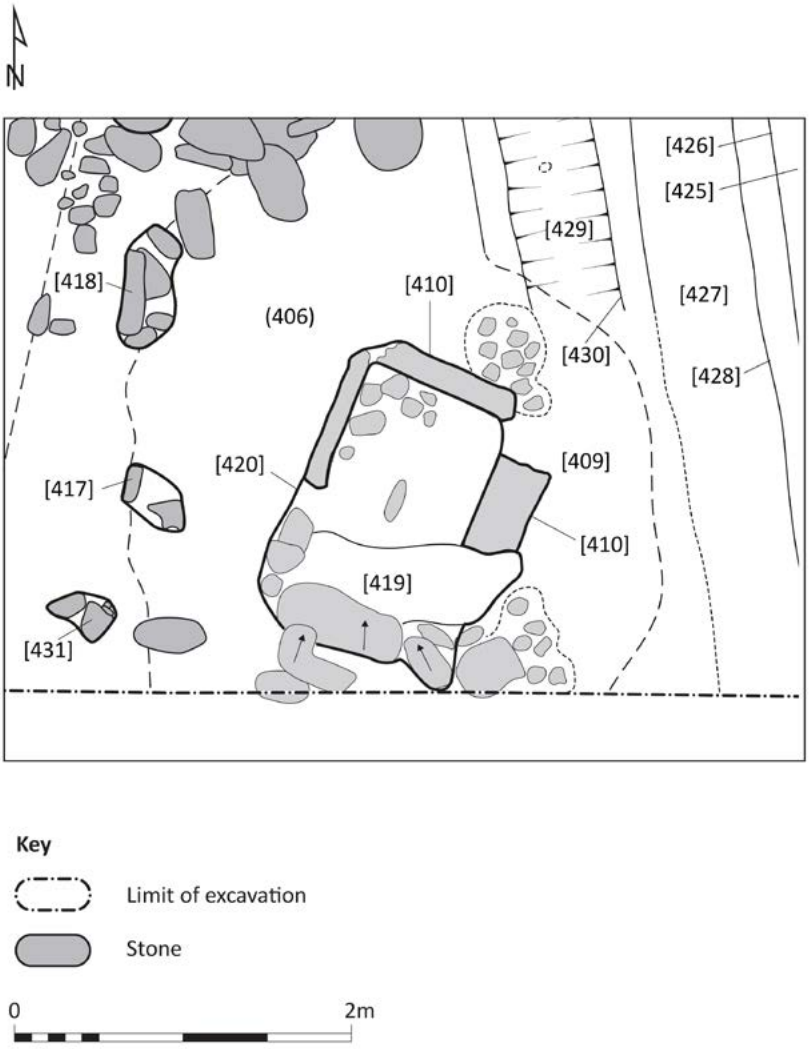

Figure 2.41: Plan of Trench 4 with secondary hearth setting [420] overlying earlier hearth [410] in Structure 1.

contained fragments of superimposed hearth bottom (SF 4238) derived from smithing (Figure 2.43). These smithing remains are of a scale that indicates that despite its everyday domestic purposes, the hearth was sometimes employed in the fabrication, maintenance, and repair of items such as tools and knives.

Structure 1: internal deposits

Within the building, the old ground surface [406] was largely indistinguishable from the overlying internal 'floor' or occupation deposit. Patches of this remained obvious only in the immediate vicinity of the hearth, where two patches measuring 0.35 m by 0.4 m of small angular stones formed a rough augmented surface at its north end. This area was rich in discarded animal bone. Material identified within the old ground surface and thin remnants of possible floor deposit included a ceramic mould for a pin (SF 4160), a fragment of copper alloy casting debris (SF 4264) and an intact perforated hot chisel (SF 4127), indicating that in addition to occasional smithing precious metalworking was taking place within this structure. A small assemblage of E-ware pottery was also identified, including a substantial part of an E1 jar or olla (SF 4154). A rim sherd, possibly from the same vessel was also identified in Trench 6 (SF 601). Carbonised residue on the interior of the E1 jar sherd (SF 4154) was radiocarbon dated to between 555-641 cal AD (calibrated to 2σ, SUERC-127794; Table 2.1), almost identical to the date from a sample in the lower primary hearth deposits (*supra*).

Overlying this was a silty loam deposit *c.* 0.4 m thick [403] mixed heavily by cultivation and later root action. The concentration of numerous artefacts in the immediate vicinity (within *c.* 2-3 m) of the hearth suggests that at least part of this deposit is contemporary with the building remains that have been outlined above, but this terrace behind the rampart is also a natural sediment trap for material washed in from higher up the interior.

Figure 2.42: Remnants of upper hearth [420] in Structure 1, Trench 4, facing south-west.

Figure 2.43: Remnants of upper hearth [420] in Structure 1, Trench 4, facing north-west.

Figure 2.44: Pivot stone (SF 4039), from Trench 2, likely located close to north end of Structure 1 entrance.

The artefacts include ten stone gaming pieces (SF 4096 (i); SF 4096 (ii); SF 4153; SF 4177; SF 4178; SF 4179; SF 4185 (i); SF 4185 (ii); SF 4213; SF 4243), several spindle whorls (SF 4225), whetstones (SF 4214; SF 4224; SF 4237) or whetstone manuports (SF 4221) and a fragment of a possible sandstone armlet (SF 4172). Evidence for non-ferrous metalworking is indicated by the presence of a ceramic tuyère (SF 4189) and multiple crucible fragments representing a minimum of four large thick-walled vessels and at least six of a smaller thinner-walled variety. Multiple ceramic mould fragments were identified in this layer, including several related to pin manufacture (SF 4180; SF 4101b; SF 4114), and round objects such as brooch hoops or rings (SF 4078; SF4101a), and one fragment representing a brooch terminal (SF 4066). Two fragments of glass are from an Anglo-Saxon-style conical beaker (SF 4135) and another vessel (SF 4196). Other glass artefacts include a biconical turquoise blue glass bead (SF 4116) of Roman/Early Anglo-Saxon type and a cabochon opaque white glass gaming piece (SF 4077). Iron objects include amongst others: a conical ferrule (SF 4125); eight complete or partial knives and blade fragments (SF 4121; SF 4198; SF 4261; SF 4099; SF 4132; SF 4250; SF 4139; SF 4097); a catch-plate and spring shank for a barrel padlock (SF 4267) and padlock key (SF 4087); an awl (SF 4120a); a ploughshare (SF 4241); and a jaw fragment from a pair of metalworking tongs (SF 4207). A small assemblage of E-ware pottery fragments representing a minimum of a further two vessels were also identified in this layer, including an uncommon E3 bowl (SF 4108) and a small E4 jug (SF 4206a) as well as a further three sherds (SF 4206b; SF 4206c; SF 4206d) possibly related to an E1 jar.

A coarse stone find recovered from this layer is probably a pivot stone (SF 4039) for a door post (Figure 2.44). The presence of both runned and unclassifiable slag indicates that ferrous metalworking took place in or near this location and several coarse stone tools have associations with metalworking. These include a large cobble (SF 4080) which has been used not only as a hammerstone, but with several flat faces also for an anvil, and a combination whetstone tool (SF 4163) first used as a sharpening stone and subsequently as a burnisher. A stone bar-ingot mould (SF 4157) was also recovered from this trench, probably deriving from this layer or the topsoil [401]. The topsoil [401] overlying the cultivation soil was no more than 0.1 m thick but contained a similar range of material. This included further crucible fragments (SF 4229/4200; SF 4122; SF 4242; SF 418; SF 4104; SF 4165) and another three E1 jar sherds (SF 406; SF 4044; SF 4112).

The topsoil [401] and the mixed layer below [403] also contained 935 fragments of animal bone comprising cattle (97), sheep/goat (22), pig (45), red deer antler (1), large mammal (388), medium mammal (89), small mammal (1) and indeterminate mammal (292). Again, the majority of this material was concentrated within 2 m of the hearth. Most of the cattle bones are skull, teeth, long bones and foot bones, found along with a single fragment of pelvis. The sheep/goat and pig bones are all teeth, long bones and foot bones. Thirty-five of the cattle bones could be aged using epiphyseal fusion and tooth eruption data. The youngest cattle died at under 16 months, while at least two individuals were still alive at over 42 months of age. Seventeen pig bones could be aged. They were killed in two peaks, some aged between 4 and 24 months, and others over 24 months. There are also 15 sheep/goat bones which could be aged. The youngest was under 16 months, the oldest over 30 months. Thirteen bones in this context had been modified. One of these is a red deer antler with deep chop marks at the base of the bone where it was removed from the skull; at the opposite end an area of the surface has been worked smooth. It is likely this bone was discarded at some point in the process of being worked to create an artefact. The modified bone also includes a cattle humerus with a hole through the shaft just before the distal epiphyses. This may also have been the start of some kind of bone-working which has also been abandoned. Several large mammal vertebrae, ribs and long bones and a medium mammal pelvis have cut and chop marks on their surfaces, probably created during the butchery process. The bones in these contexts are a mix of, butchery, food and craftworking waste.

In addition to the structural features identified above and the concentration of material around the hearth (albeit in mixed contexts), there are several other finds that are likely to have derived from a building here. For example, of 16 iron nails recovered, the majority are equivalent to a 3-inch nail, a size commonly used in the construction of fixtures and fittings. Other items were a possible roof-weight (SF 505) and two door-post pivot

stones (SF 4039), though one is unfinished (SF 4192). Despite the disturbance of the deposits by the hand-dug cultivation, it is unlikely that any of these artefacts has moved far from its original position.

The platform

In the limited space between the western edge of Structure 1 and the bedrock at the western end of Trench 4 a small stone and earth platform had been constructed up against the exposed bedrock face. It was built directly on top of bedrock at its rear, but onto natural subsoil [444] along its leading edge on the east. Here it was defined by a small stone revetment wall [405], which comprised two to three courses of rough angular stones and small boulders (Figure 2.45). Immediately downslope from this, five rough angular boulders [408] underpinned this low wall, which revetted the platform material of mixed grey-yellow brown silt [411] with frequent small angular stone and animal bone fragments. An iron socketed arrowhead (SF 4144) and two sherds of E-ware E1 jug (SF 4148a; SF 4148b) were recovered from this material. Downslope from this to the east, a spread of angular stones [404], measuring 0.25 m by 0.15 m, represented erosion and collapse of this platform and included a well-preserved ceramic mould fragment of a complete small ring (SF 4123). The surface area on top of the platform measured *c.* 3 m by 4 m and was covered by a thin layer of ashy charcoal rich silt [407] with patches of bright heat-affected soil, which demonstrated that burning had taken place on its surface (Figure 2.46). This could represent the remains of an open-air early medieval hearth situated on a sheltered working platform adjacent the building. In truth, however, it is neither possible to determine that they were broadly contemporary, nor indeed whether the platform is later, thus accounting for the arrowhead and E-ware sherds incorporated into its make-up.

Post-medieval cultivation

As previously discussed (*infra*), the eastern side of Structure 1 had been completely removed by a later phase of spade dug cultivation. This consisted of five closely spaced furrows [422], [424], [426], [428] and [430] set at intervals of no more than 0.2 m apart, trending just west of north and south along the lower terrace immediately to the rear of the rampart on the east (Figure 2.47). They were only easily identified where the bottoms of the furrows cut into [406] beneath one deep relatively homogenous deposit [403] with a thin topsoil [401]. Initially interpreted as deep topsoil, this was later understood to be the cultivation soil. Furrow [430] was fully excavated to confirm it stopped short of the hearth [410], perhaps providing some explanation for the battered looking condition of the kerb stones at the north end of the hearth (Figure 2.48). The furrows were spade dug, and their close and regular spacing suggests they formed narrow cultivation rigs little more than 1 m wide. As such they are the remains of lazy-beds of the type that are often seen in the garths of abandoned farmsteads. They took advantage of a south-facing terrace with rich fertile soils, and in common with traditional practice, had been split axially on at least one occasion to create the narrow intervals between the furrows observed cutting into [406]. Usually if such plots are used for any length of time, the bottom of the furrows coalesce into a relatively level surface at the base of the cultivated soil, created by slight lateral shifts in the continual splitting of the rigs and cutting of fresh furrows. The clear definition of the furrows here suggests that this plot was not long-lived.

Although difficult to date this sort of lazy-bedding, the presence of two joining body-sherds of a glazed globular vessel (SF 4231), representing a money box, likely dating to the early 19th century, were recovered from the cultivated soil and a fragment of flowerpot (SF 4103) of 18th/19th century date were recovered from within one of the furrows. Whether the remains of Structure 1 were still visible prior to this cultivation is unclear, and with the disturbed nature of the deposits it is equally unclear whether some of the soil and turf have been stripped from elsewhere on the summit and mixed into the tilth on the terrace; this is another traditional practice that might be anticipated. Despite the possibility that some artefacts may have been redeposited by these processes, the concentration of finds from immediately around the early medieval hearth suggests that little of this material has travelled far from where it was originally deposited.

The western enclosure

The structural elements relating to the western enclosure are described as follows: the ramparts (upper, middle, lower, and lowest) and internal structures (structures 2 and 3).

The ramparts

The rampart of the western enclosure extends from the north and south of the central enclosure to encompass the slope dropping away from the summit on the west to a lower-level terrace, beyond which a series of three additional ramparts, now reduced to terraces, steps down the hillside (Figure 2.1). The rampart forming the enclosure follows the break of slope of this western terrace, which is relatively level adjacent to the edge of the crag to the south but climbs gently around the north-west towards the north entrance of the central enclosure. The rampart was only visible and easy to trace in some segments due to erosion. The western side of the hill below the terrace, which is steeply sloping

Figure 2.45: Mid-excavation view of small platform [405] with boulders [408] underpinning it, set against bedrock face, facing west.

Figure 2.46: Small platform [405] built against bedrock face, looking north-west.

Figure 2.47: Base of cultivation furrows beyond the hearth, truncating the eastern half of Structure 1, Trench 4, facing north-east.

Figure 2.48: Base of cultivation furrows truncating the eastern half of Structure 1, Trench 4 facing north-west.

and broken by bedrock close to the surface, is traversed by the three lower ramparts, drawn in a shallow arc following the contour roughly north and south. On the north they all terminate in similar positions one above the other, but on the south, they tail off in different locations, and the upper of the three curves up and round to the east towards the rampart of the western enclosure. The position where it terminates falls short of joining the terrace rampart and the gap left between them is probably deliberately left to form a small postern entrance. On the ground the flight of three ramparts traversing round the slope appeared more like narrow terraces, the middle one very eroded and slumped almost flat down the steep slope. Trench 1 was laid out to evaluate the features on this side and extended from the rampart of the western enclosure and down through the upper two of the lower flight. As excavated, Trench 1 measured 24 m in length by 3 m in width (Figure 2.49), but it proved impossible to extend it through lowest rampart in the flight on account of substantial tree cover and the steepness of the ground.

The upper rampart

This rampart [003] was aligned north-south across the trench and measured up to 2.5 m in thickness (Figures 2.50 and 2.51). It consisted of a front stone face [007] of large boulders and sub-angular stones which had retained a substantial core of sandy silt [009] and very frequent sub-angular stones ranging in size from 0.1 by 0.03 m to 0.72 m by 0.23 m (Figure 2.52). This deposit had clearly slumped forward over time as the front face gradually failed, and tumbled stones and other eroded core material [008] were identified immediately downslope. At the back of the rampart two negative features were identified cut into the natural subsoil [016]. These resolved into two postholes, interpreted at the time, as part of a timber palisade running along the back of the rampart; to retain the rampart material and provide an additional boundary containing the western enclosure (Figure 2.53). Pit [020] was sub-circular and measured *c.* 0.7 m by 0.5 m by 0.2 m deep and was filled with a blackish brown silty sand [021]. Located one metre to the south of this, posthole [017] was oval, measured *c.* 0.6 m by 0.3 m by 0.2 m deep, and was filled with dark grey-orange sand [019] with occasional charcoal flecks (Figure 2.54). Material from the base of this posthole was dated to 435-642 cal AD (calibrated to 2σ, SUERC-88165; Table 2.1). In the limited glimpse of the deposits at the rear of the rampart provided in the trench, it is difficult to be certain of either the relationship of these two post-holes to the rampart, or of the taphonomic relationship of the sample to the latter's construction. The spacing would entail horizontal members for the structure, the stratigraphy suggesting that this stood back from the rear of the slumped rampart core. While other early medieval ramparts in Aberdeenshire have provided evidence of earthfast timberwork, for example Cairnmore (Noble *et al.* forthcoming), the stratigraphy here appears more akin to that found in the upper enclosure, where the rampart on the east had formed a sediment trap at the

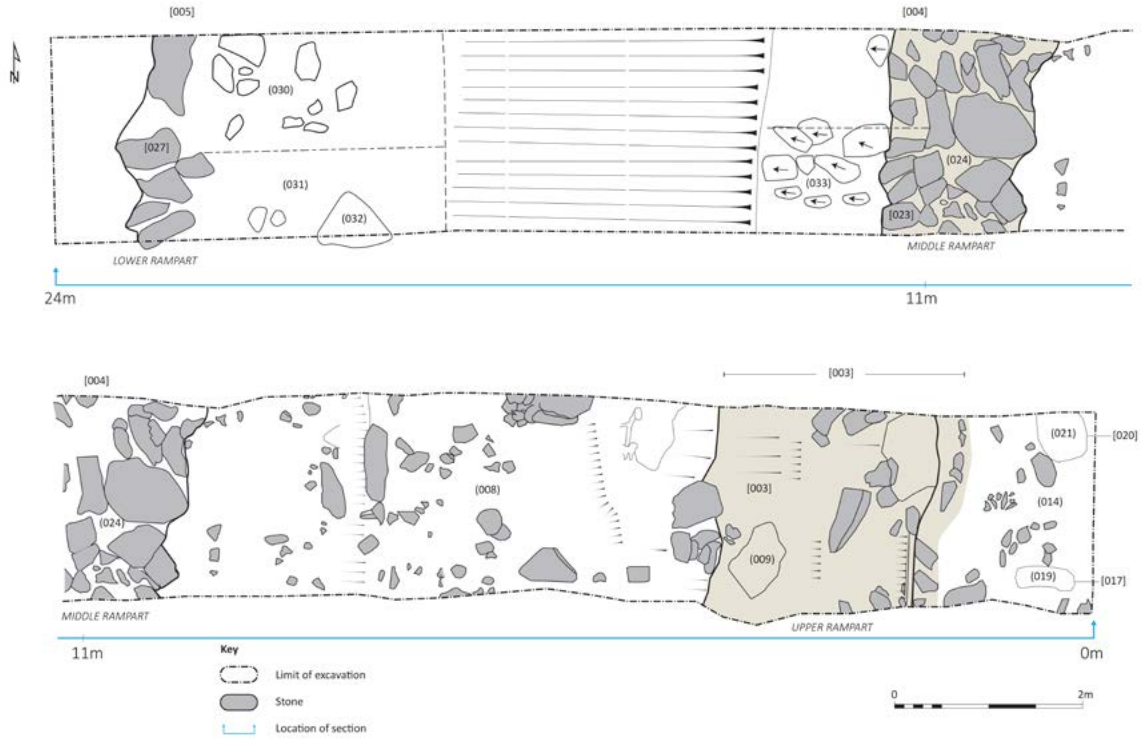

Figure 2.49: Plan of the upper [003], middle [004] and lower [005] western ramparts in Trench 1.

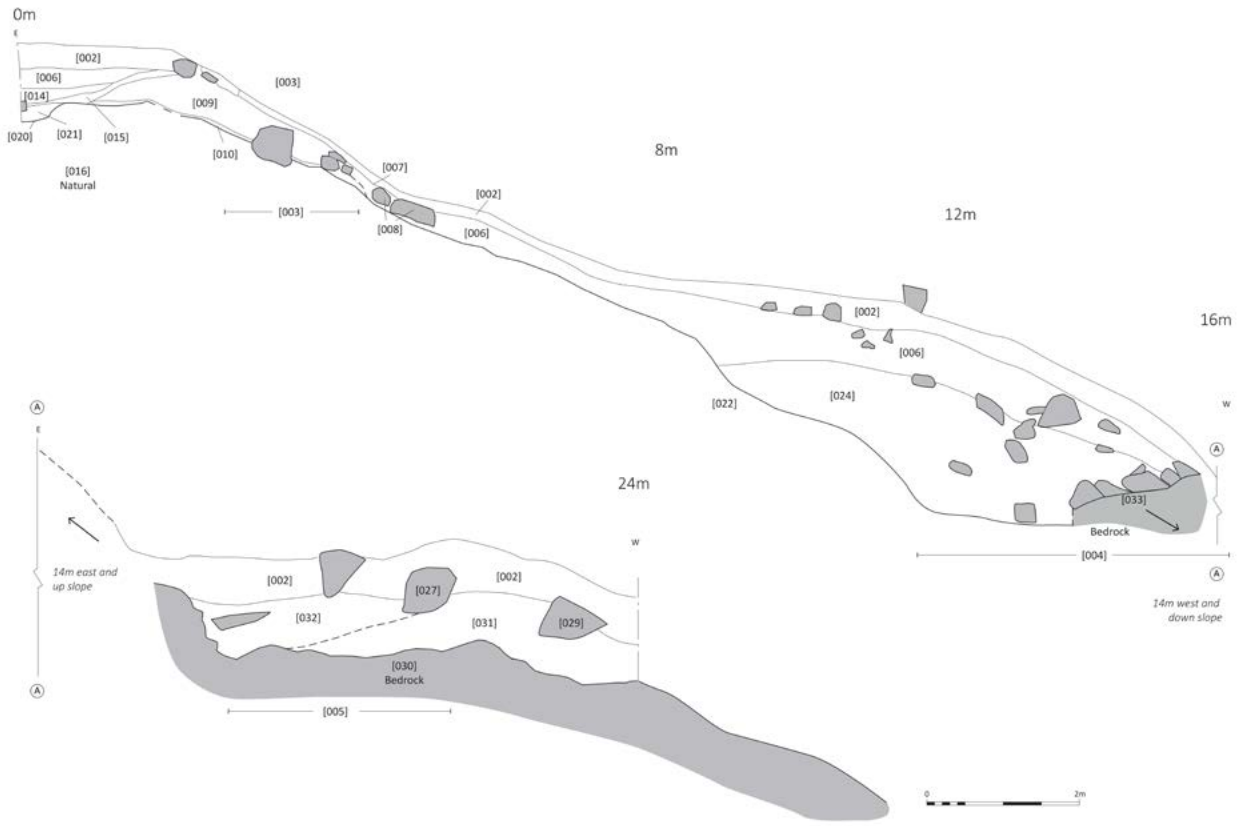

Figure 2.50: North facing section through upper [003], middle [004] and lower [005] western ramparts in Trench 1.

foot of the slope. Thus, the sediments overlying the post-holes at the rear of the rampart, [015],[014] and [006] (*infra*), have accreted after the construction of the rampart, sealing the post-holes, and confirming that they at least belong to the first use of this terrace, albeit that they may have formed part of a free-standing structure rather than a component of the defences.

The first of the sediments overlying the post-holes was a 0.05m thick deposit of black silty sand [015], similar to the fill of posthole [020], which appears to have slumped down off the rampart, achieving its greatest thickness at the foot of the inner edge of the rampart core [009]. This was overlain by a light yellow-grey silt [014], which extended eastward out the trench into the interior of the western enclosure but appeared to lap up onto [015] at the back of the rampart. Above this was a reddish brown silt [006] similar to the redeposited natural utilised in the rampart core; this too extended back into the interior of the enclosure. These were covered by a 0.3 m thick forest loam topsoil [002] and loam [001]. The depth of the materials on the flatter terrace behind the rampart was notable, compared to the thin forest soils elsewhere on the hill, indicating that the build-up of material here related to occupation and subsequent decay and erosion of materials and structures within the interior. The topsoil contained a possible stone potlid (SF 1008), one of only a few domestic items related to food-processing activities identified on the site.

The middle rampart

The upper of the three outer ramparts lay another 6 m downslope in Trench 1 from the western enclosure rampart [003]. This rampart [004] was again aligned roughly north-south and measured a minimum of 3 m in thickness. It was situated with its face resting on a small terrace of bedrock, behind which the slope had been either deliberately dug out, or a natural sloping terrace had been at least augmented before the construction of the rampart. The rampart comprised an outer stone face [023] of large angular stones and boulders which stood up to 1.12 m in height; the individual measured between 0.4 m by 0.3 m and up to *c.* 0.5 m by 0.45 m. The outer face [023] revetted an earthen core of reddish-brown sandy silt [024] within which frequent angular boulders and stones were pitched up at an angle to the general slope of the hillside (Figure 2.55). The face had failed in antiquity and remnants of the original

Figure 2.51: General view of upper rampart [003] looking down to middle rampart [004] terrace, facing west.

Figure 2.52: Front face [007] of upper western rampart [003], Trench 1, facing east.

Figure 2.53: Pre-excavation view of posthole [017], facing south.

Figure 2.54: Posthole [017] at the back of western rampart [003], Trench 1, facing east.

facing stones [033] were found collapsed face down directly in front of the rampart (Figure 2.56). No inner face or timber component was identified to explain how the back of the rampart was supported, but it had clearly undergone serious collapse and the subsequent slumping of deposits down the slope may have removed any evidence that once existed. No finds or datable material were associated with the rampart, although a stone bar ingot mould (SF 1011) was retrieved from the topsoil [002].

The lower rampart

At the very bottom of Trench 1 the middle of the three outer ramparts [005] was exposed *c.* 5 m further down the slope. Again, aligned roughly north-south, it measured *c.* 3m in thickness, but on excavation it was revealed to be little more than a simple line of rough boulders [027] forming a kerb on the edge of a flat bedrock terrace [030]; the stones of the kerb ranged from 0.15-1 m in diameter (Figure 2.57). On the inside of this kerb a redeposited mix of angular and sub-angular stones [032] within a matrix of reddish yellow silty sand [031] formed a basal layer of redeposited natural and was overlain by a thin forest loam topsoil. These deposits formed a relatively flat terrace some 3 m wide behind the kerb (Figure 2.58). It is possible that this feature, rather than being a traditional rampart, was instead a trackway or well-travelled route leading round the western flank of the fort, though quite where it went at its southern end is unclear. No finds and no dateable material were procured from this feature. While McNauton's plan (Chapter 1) doesn't show a path to the west of the fort, if it is a track rather than a rampart then it may be the result of later Victorian groundworks relating to the network of paths around Dunkeld House.

The lowest rampart

This rampart lies about 2-3 m further down the slope from the stone kerb of [005], but it was not possible to extend Trench 4 across its line due to the dense tree cover and extensive root bowls. Although depicted on the RCAHMS survey in the same style as the other ramparts on this side of the fort, on the ground it is only a minor break in the slope. Indeed, it is so slight that it is unlikely to be any more substantial than the lower rampart [005] above.

Internal structures

While many areas across the hill were characterised by shallow forest soils and outcropping bedrock, the interior of the western enclosure demonstrated some depth of deposits where less steeply sloping bedrock was enclosed behind its rampart. As already discussed in relation to the deposits in Trench 4 (*supra*), the rampart created a large silt trap, which retained material built up during the occupation of this terrace and the subsequent erosion on the slope above.

Trench 6, which measured 10 m by 3 m was placed north-west to south-east across the southern portion of the interior (Figure 2.59). A homogenous root disturbed topsoil [601] was recorded to a depth of 0.8 m at the east end of the trench and 0.4 m at the west end. This deposit was rich in material culture, probably *ex situ* in the upper extent of the deposit due to the intense tree root action on this part of the site, but some of it may have originated from further up the hill or been discarded from the central enclosure directly above. The artefacts from this upper topsoil included two flint side scrapers (SF 651, SF 627), a fragment of a stone spindle whorl (SF 614), and a fragment of E-ware pottery, rim sherd (SF 601) possibly relating to the same E1 jar vessel identified in Trench 4. The layer also contained several thin-walled crucible fragments (SF 608, SF 619, SF 632, SF 637, SF 669), a stone bar ingot mould (SF 617), an opaque terracotta glass bead (SF 620), a blue-green glass gaming piece (SF 603) and a fragment of blue-green glass armlet (SF 665). A mix of slag in the topsoil, including unclassifiable fragments (SF 606, SF 618, SF 631c), plano-convex slag cake (SF 624, SF 631a, SF 650) and runned slag (SF 631b, SF 660), indicated metalworking activity had occurred in the vicinity. Several iron objects of note from this layer included the head of a ringed pin (SF 622), a possible globular-headed pin (SF 646), a complete knife blade (SF 652/653/654), a fragment of a knife (SF 642), an awl (SF 634), and a socketed chisel (SF 667a), which are indicative of craft activities taking place within the western enclosure. Also of note is a two-pronged implement (SF 647) which formed a precision tool of unknown function, perhaps related to metal or leatherworking, and a small fragment of a U-shaped hinge (SF 613). Two whetstones (SF 637, SF 644) and a whetstone manuport (SF 628) were retrieved from this layer. Underlying this deep topsoil deposit remnants of several structure were identified, Structures 2 and 3, primarily by the presence of stone-kerbed hearths.

Structure 2

This structure was extremely truncated (Figures 2.60 and 2.61) but, where best preserved, was defined by a thin stone wall (one stone wide) with up to three courses [610] surviving in places (Figure 2.62). This lay at the north-west extremity of the trench, but its north-east side was potentially carried a further 2 m to the south-east in a rough line of distinctive larger flat stones [614]. Together, these defined an L-shape which extended beyond the edge of the trench. If these are indeed associated, the flat slabs might best be interpreted as

Figure 2.55: Pre-excavation of middle western rampart [004], Trench 1, facing north.

Figure 2.56: Excavated middle western rampart [004], collapsed front face [033], Trench 1, facing west.

Figure 2.57: Front kerb [027] of lower western rampart [005], Trench 1, facing north.

Figure 2.58: Front kerb [027] of lower western rampart [005], Trench 1, facing east.

the foundation course for a turf wall, while the ragged coursing may imply that this was stone-faced internally. On the south-east deposits [615/621] butting against the flat slabs of this proposed foundation course [614] are possibly part of the floor (*infra*), the edge of which continues the line of the foundation in an arc round to the south-west. Combined, these features can be projected speculatively to form the footprint of a small sub-rectangular or sub-square structure measuring a minimum of 4 m in length and width. Tumbled stones [611] were more prevalent in this area than in other parts of the trench, reinforcing the interpretation that this is all that remains of a small building.

Figure 2.59: Volunteers cleaning and sieving in Trench 6 on the middle terrace, west enclosure.

At the northern end of the projected building there was a well-built rectangular stone-kerbed hearth [617], beneath which the ground was clearly heat-affected, manifested in a reddish-brown sandy silt [623] with frequent flecks of charcoal evident. Measuring 1 m by 0.8 m overall, the kerbstones set upright around its edge measured 0.2 m by 0.3 m and its base was covered with flat stones (Figures 2.63, 2.64 and 2.65). An occupation deposit associated with this hearth, comprising dark grey-brown loose silt [618] with frequent charcoal, burnt bone and burnt clay fragments, was localised around the hearth.

A charcoal-rich ashy deposit [612] was identified directly overlying the primary rectangular hearth [617]. This formed the fill of a secondary more roughly constructed stone-kerbed hearth [606] constructed directly on top of the original hearth [617], reusing some of the flat basal stones (Figures 2.62 and 2.66). This secondary hearth [606] was sub-rectangular in plan with a slightly curved eastern edge (Figures 2.66-2.67) and measured 1.25 m by 0.8 m over a rough kerb of upright stones. The fill [612] contained a very small quantity of hammerscale flakes (0.1 g), and a sample of

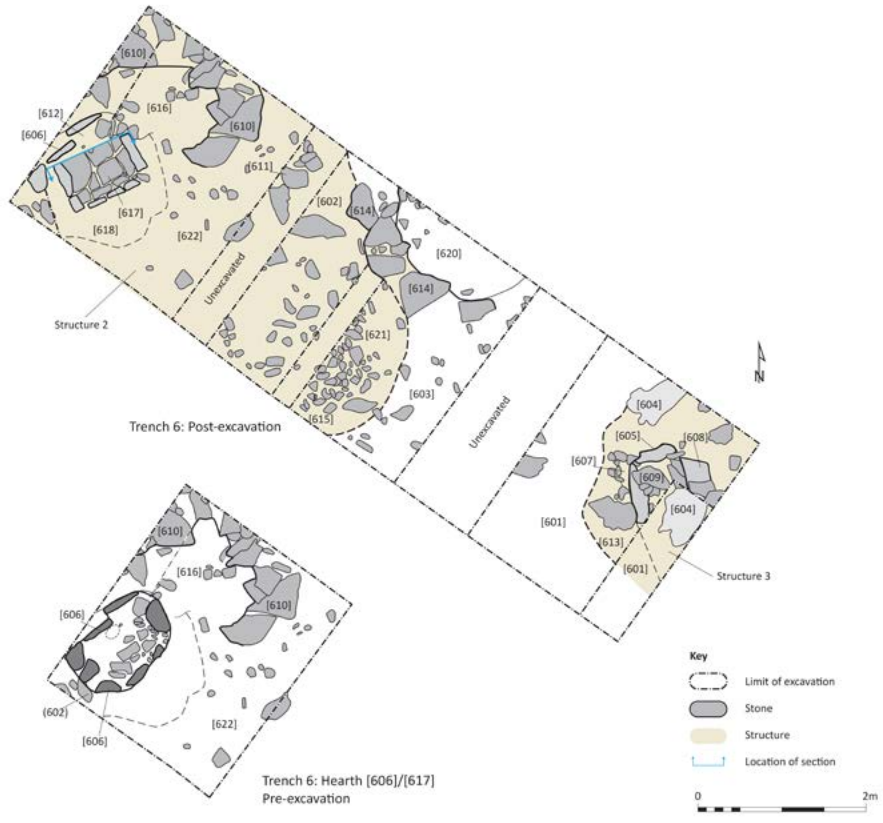

Figure 2.60: Plan of Structures 2 and 3 in Trench 6; and secondary hearth [606].

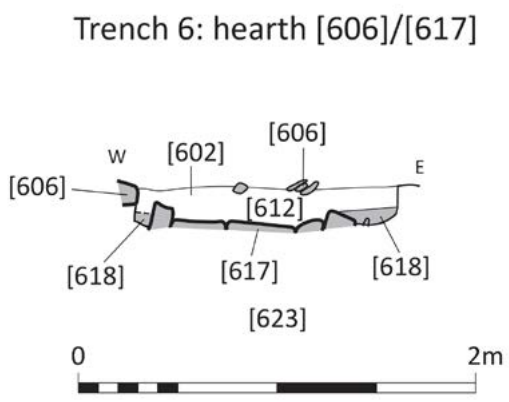

Figure 2.61: South-facing section of primary hearth [617] and secondary hearth [606] in Structure 2.

associated hazel charcoal was dated to between 427-564 cal AD (calibrated to 2σ, SUERC-98675; Table 2.1). This secondary use of the hearth was also associated with an occupation layer [616] localised on the north-east, which comprised compact dark grey-brown silty clay with very frequent charcoal; this overlay the earlier occupation deposit [618]. Another occupation layer [602] contained within and up against wall [614] was also associated with the secondary use and contained two small unidentifiable fragments of iron (SF 661, SF 662), a stone grinder tool (SF 641), a fired clay non-ferrous metalworking mould fragment (SF 657), and 0.2kg of plano-convex slag cake (*PCC*) fragments (SF 664). This clearly indicates a phase of metalworking associated with the secondary hearth, taking place within Structure 2.

To the south-east of the hearths and south-west of the foundation course of the putative turf wall [614], there were other deposits at a similar horizon to the occupation deposit [618] associated with the primary hearth and thus may have formed part of an associated floor. A rough stony surface [615] was identified that measured *c.* 2.5 m by 2 m (Figure 2.68 and 2.69) and consisted of small mixed angular stones [615] within a loose grey-brown silt matrix [621]. This abutted the foundation course on the north-east, and its edge could be traced in an arc extending round to the south-west. It contained charcoal and burnt bone and was heavily root affected. Extending out of the trench directly to the north of the foundation course [614] a concentrated deposit of heat affected ashy and charcoal rich material [620] was also identified, though whether this

Figure 2.62: Hearth setting [606] and possible wall base [610] of Structure 2 emerging in Trench 6, western enclosure, facing south-east.

Figure 2.63: Lower hearth setting [617] in Structure 2, facing north.

Figure 2.64: Lower hearth setting [617] in Structure 2, facing south-west.

Figure 2.65: Lower hearth setting [617] in Structure 2, facing south-east.

Figure 2.66: Mid-excavation of upper hearth setting [606] with lower hearth [617] emerging beneath in Trench 6, western enclosure, facing south-east.

Figure 2.67: Mid-excavation of upper hearth setting [606] with lower hearth [617] emerging beneath in Trench 6, western enclosure, facing north-west.

Figure 2.68: Mid-excavation view of possible rough surface [615] and segment of walling [614] in Structure 2, Trench 6, facing north-west.

Figure 2.69: Mid-excavation view of possible rough surface (615) and segment of walling [614] in Structure 2, Trench 6, facing north.

Figure 2.70: Collapsed hearth setting [605] in Structure 3, western enclosure, Trench 6, facing north-east.

Figure 2.71: South-east facing section of collapsed hearth setting [605] in Structure 3, western enclosure, Trench 6.

represented an earlier truncated hearth, or a deposit of hearth waste deposited against the outside of the wall of the building could not be determined.

Structure 3

The existence of elements of a second structure within Trench 6 is rather more tenuous than the first and rests largely on the presence of a hearth partly covered by the unexcavated baulk at the south-east end. Rectangular on plan, it was defined by a setting of stones [605] that in one place appeared to have collapsed over the edge of a steep bedrock face [604] (Figure 2.70). Internally it measured 0.3 m wide by a minimum of 0.6 m in length and was constructed on a rough levelling deposit overlying the sloping bedrock (Figure 2.71). The levelling deposit comprised angular stones 0.10 - 0.15 m across within a grey-brown silt [619] and extended beneath two stacked sub-rectangular flat stones [608] *c.* 0.27 m across on the east side of the hearth. The hearth was associated with several occupation deposits identified immediately around and over the setting. The most extensive of these was a reddish-brown clay silt [613] in which the blade and partial tang of a possible pattern-welded knife (SF 656) and slag were found. This material was over the levelling deposit [619] and located around the hearth kerb, it underlay a burnt reddish-brown heat-affected, ashy charcoal-rich silt [607]. Another heat-affected ashy deposit [609] filled the hearth and included fragments of slag and an intact smithing hearth bottom (SF 663). The quantity of metalworking waste from around hearth [605] indicates that it is part of a craft production area, but whether open air, within a freestanding workshop, or perhaps an extension of the building tentatively identified to the north-west, could not be determined within the confines of trench.

The eastern enclosure

The rampart

The eastern enclosure rampart enclosed a roughly D-shaped area of 0.35 ha up against the steep eastern side of the hill below the summit. It was evaluated at the southern end of the enclosure in Trench 7, which measured 8 m by 3 m (Figure 2.72).

At the point evaluated in Trench 7 the eastern enclosure rampart [7002] was aligned north-east to south-west and measured up to 2.4 m in thickness (Figures 2.72 and 2.73). It survived to a height of 1.15 m at its front face but stood only 0.5 m above the internal ground surface before excavation. This was due to the position of the rampart on the lip of a natural terrace in the bedrock, with the front face augmenting the natural change in topography. This would have had the advantage of requiring less materials and labour to build a substantial barrier. It was built up on a natural brown silty clay subsoil [7011].

The rampart was faced with boulders outside [7014] and in [7004]. These retained a basal layer of grey-brown silt [7010] about 0.5 m thick, above which there were a series of redeposited natural clayey silts [7009], [7008] and [7003]. Although essentially earthen cored, these layers within the rampart incorporated numerous angular stones (Figures 2.73 and 2.74).

Bedrock was evidently relatively close to the surface across much of the interior but broken by hollows that potentially contained deeper deposits. One of these, immediately to the rear of the rampart contained at its base a coherent deposit of metalworking waste that extended up to the inner face of the rampart [7004] (Figures 2.76 and 2.77). This lay directly over the natural subsoil and bedrock and comprised a very compacted charcoal-rich deposit [7013] containing frequent slag inclusions and *c.* 900 g of vitrified ceramic, including at least nine identifiable tuyère fragments. The slag included a mix of hammerscale flakes and slag spheres probably related to smithy rake-out material, fuel

Figure 2.72: Pre-excavation general view of the eastern enclosure rampart [7002] in Trench 7, facing south-east.

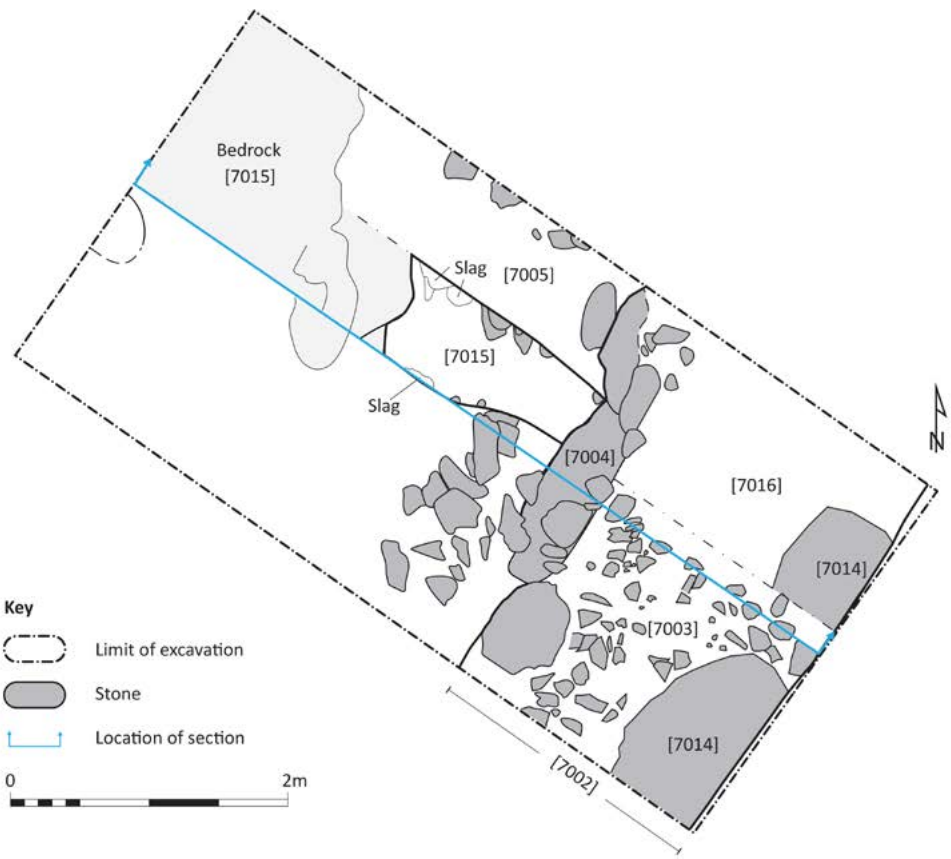

Figure 2.73: Plan of the eastern enclosure rampart [7002] in Trench 7.

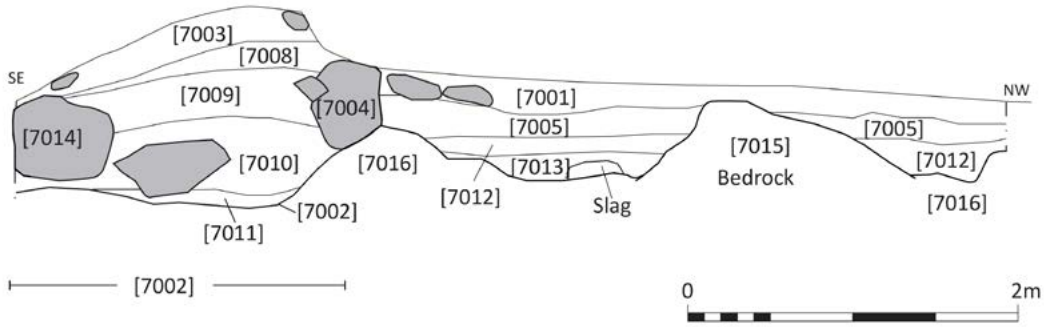

Figure 2.74: North-east facing section through the eastern enclosure rampart [7002] and iron-working waste deposit [7013]/[7012] in Trench 7.

Figure 2.75: North-east facing section through eastern enclosure rampart [7002] in Trench 7.

ash slag, large fragments of runned slag (SF 7087, SF 7088e), three intact plano-convex slag cakes *(PCC)* (SF 7066a, SF 7066b, SF 7092a), one of which is a large intact superimposed hearth bottom (SF 7092a).

The larger dimensions of the slag cakes recovered from Trench 7 may indicate a more industrial scale of use than is seen elsewhere in the fort, with a series of deposits accumulating over prolonged periods of use of a nearby smithy. Hazel charcoal from this layer produced a date range of 442-640 cal AD (calibrated to 2σ, SUERC-98676; Table 2.1), on the one hand providing a *terminus ante quem* for the rampart construction, while on the other a date for the metalworking activity in this part of the fort. Overlying this was a 0.2 m thick compact reddish-brown deposit containing frequent charcoal and slag

Figure 2.76: Mid-excavation view of metalworking deposit (7013) up against the inner face [7004] of the eastern enclosure rampart, Trench 7, facing north-west.

Figure 2.77: Natural subsoil/bedrock under metalworking deposit [7013] up against the inner face [7004] of the eastern enclosure rampart, Trench 7, facing south-east.

[7012], and above that a reddish-brown silty gravel with frequent charcoal and slag [7005] that extended northwards from the inner face of the rampart to cover the bedrock. The uppermost layer behind the rampart was a thin forest loam topsoil [7001] that contained 33 sherds of medieval Scottish White Gritty Ware dateable probably no later than the 12th century and indicating a period of later use of this part of the enclosure.

The southern enclosure

The southern enclosure, first identified in 2019 during analysis of LiDAR data, is sub-circular and extends from the base of the main hill. It enclosed a gently sloping terrace on the southern shoulder of the hill (Figure 2.2). A possible break in the rampart on the south-western side could indicate the location of an entrance, enabling access up the gently sloping ground from the river. Two trenches (8 and 9) excavated in 2021, targeted this location to evaluate the perimeter bank on the west, which was scarcely visible on the ground.

Trench 8, the first to be dug to locate the southern enclosure rampart measured 15 m by 2 m, but no archaeological features were recovered, only a thin topsoil above natural bedrock close to the surface. In places the fissures in the bedrock were filled by a thin natural subsoil.

Trench 9, measured 20 m by 2 m, and was positioned a little further north-west and intersected the bank visible on LiDAR. This revealed a stone foundation [903] of a rampart aligned north and south, measuring *c.* 1.6 m in thickness (Figure 2.78). It comprised an outer kerb [905] of two large angular boulders, and an inner kerb [904] where another two angular boulders and some other angular stones formed a single course of material retaining an earth and rubble core of redeposited reddish brown sandy silt [903] (Figure 2.79). This was constructed onto the reddish-brown sandy silt natural subsoil [907] and [909]. No dating evidence was recovered.

Radiocarbon Dating

Derek Hamilton

The two dated samples derived from secure *in situ* hearth fills within the western and central enclosures dated the activity in the western enclosure to between mid 5th century AD to mid 6th century AD. The date from the hearth in the central enclosure dated activity in this part of the site slightly later to mid 6th to mid 7th century AD. A date from an encrusted carbonised residue on a sherd of an E1 jar or olla (SF 4154) dated to the mid 6th to mid 7th century AD, providing a tight date for occupation activity in the central enclosure,

Figure 2.78: Post-excavation view of southern enclosure rampart [903] in Trench 9, facing north-east.

Figure 2.79: Post-excavation view of southern enclosure rampart [903], facing south-east.

Table 2.1: The radiocarbon dates.

Laboratory code	Material	Context	Uncalibrated date BP	Calibrated 1σ	Calibrated 2σ	Interpretation of dated deposit
SUERC-88165 (GU52226)	Charcoal: Hazel	19	1493±30	545-605calAD	435-642calAD	Fill of posthole at back of western enclosure rampart
SUERC-88166 (GU52227)	Charcoal: Hazel	414	1466±30	573-631calAD	550-645calAD	Lower fill of hearth in Structure 1, central enclosure
SUERC-98675 (GU57955)	Charcoal: Hazel	612	1568±27	436-549calAD	427-564calAD	Fill of later hearth [606] in Structure 2, western enclosure
SUERC-98576 (GU57956)	Charcoal: Hazel	7013	1509±27	552-595calAD	442-640calAD	Metalworking waste deposit, against back of rampart of eastern enclosure.
SUERC-127794 (GU68784)	Carbonised encrusted residues on pottery sherd	SF 4154 Vessel 1	1482±25	568-634calAD	555-641calAD	Carbonised residue on interior of E-ware sherd from Vessel 1 (E1 jar or olla) from occupation deposit by hearth in Structure 1

thought to be associated with Structure 1. A date from a posthole fill at the rear of the western enclosure rampart confirmed activity in this part of the site sometime between the mid 5th century to mid 7th century AD. Evidence from redeposited metalworking waste dumped onto the back of the rampart of the eastern enclosure confirms it must have been constructed by the mid 5th to mid 7th century, with the metalworking likely happening afterwards in the vicinity within the enclosure, probably post-dating the construction. These dates, although limited in number, can provide a fairly tight range for construction, subsequent activity and occupation of multiple elements of the fort spanning at most mid 5th to mid 7th century AD. Material culture identified on the site both *in situ* and *ex situ* broadly supports this timescale indicating the main elements of the site were constructed no earlier than the early 5th century, and likely out of use by the middle of the 7th century AD (Table 2.1).

The five radiocarbon results are statistically consistent, which means they are indistinguishable from one another at 95% confidence. Therefore, they likely represent a shorter, rather than longer, period of dated activity. Although there are only five dates, because they are statistically consistent and fall in an amenable area of calibration curve, a simple Bayesian model is suggestive of the activity being largely concentrated in the latter half of the 6th century cal AD, broadly compatible with the dates of the pottery and glass assemblages.

2.4 Conclusions

The excavations have considerably improved our understanding of the site in several key areas, including chronology, architecture, and function. They have also confirmed the presence of a previously unknown, though clearly related, large enclosure, which as noted in Chapter 1 may significantly revise how we envisage the fort functioned, and what its role was in early medieval society.

As outlined in Chapter 1, it had been suggested that the fort was multi-phased, an initial earlier Iron Age construction with later construction and occupation in the early medieval period (Feachem 1955; 1966; Alcock 2003: 189). While an original use of the site in prehistory cannot be precluded, no prehistoric structural evidence, or an earlier fortified phase, was identified during the excavation. Rather, the evidence points to a single phase of occupation in the fort, and this clearly relates specifically to the early medieval period. The targeted nature of the evaluation combined with the high level of stratigraphic disturbance across the site significantly limited the opportunity for an extensive programme of radiocarbon dating. Nevertheless, the secure and datable material from the site suggests a single, relatively coherent phase of fort construction and use spanning the 5th to 7th centuries AD, perhaps with a concentration of activity in the latter half of the 6th century (Table 2.1).

In terms of pre-fort activity, the excavations have demonstrated Late Mesolithic activity and likely short-term occupation on the hill, but no evidence of subsequent activity, until the early medieval period. A key objective was to establish the chronology of the defences and occupation of the fort, and as we have seen, the radiocarbon dates indicate that the main phase of activity was in the early medieval period. However, given the small scale of the excavations, the small number of radiocarbon dates recovered, and that the only one securely related to a rampart is a *terminus ante quem,* it may be premature to dismiss completely the possibility of an earlier Iron Age phase of fortification on the hill.

The excavations have confirmed the presence of the four enclosures identified in survey across the hill, each located on natural terraces at different heights, at face value replicating that the classic hierarchical footprint of a nuclear fort as proposed by Stevenson at Dalmahoy, Midlothian (1949). The central enclosure contains at least one large building within which craftworking took place, including leatherworking and precious metalworking, as well as feasting and leisure activities. The western mid-level enclosure contained a minimum of at least one, probably two, smaller structures within which metalworking also took place. Ironworking, indicating the presence of a furnace, was identified in the lower eastern enclosure and adjacent to this a new large southern enclosure was discovered. While undated, the latter appears to be contemporary with the fort and may have served as settlement, livestock management and other activities related to the fort. The structures all appear to have been abandoned by the late 7th century and the only subsequent activity identified on the hill relates to later medieval reuse of the eastern enclosure, where an assemblage of pottery probably dating from no later than the 12th century AD was recovered, and the hand-dug cultivation rigs on the lower terrace in the central enclosure. The excavations across the hill also confirmed that the dense rhododendron cover since the 1900s had heavily disturbed the upper deposits of much of the site. So much so, that identifying coherent buildings from the fragments glimpsed in the evaluation trenches could only be achieved by excavations at a much greater scale. This no doubt highlights the inherent limitations of small-scale excavation at such large and complex sites with such varied functions: the complexity can be hard to capture. Indeed, at King's Seat, much of our information comes from the wealth of artefacts recovered, which are presented in the next chapter.

Finally, the project has provided the opportunity to place the fort in its wider context, discuss how it functioned and what its social role was. In particular, the location and morphology of the hill selected were key to early medieval nuclear forts. The nature of the multiple enclosures at King's Seat links it with potentially royal centres from a similar time period elsewhere, connecting it with neighbouring kingdoms and the wider world. Access to the site was carefully controlled by a series of ramparts which limited and guided access. The use of the interior for high status metalworking as well as other craft activities indicates that the site was both a site of production as well as recipient of high-status goods through trade. These themes and how the excavation has contributed towards them are discussed further in Chapters 4 and 5.

Chapter 3
The Small Finds and Animal Bone

Ewan Campbell, Andy Heald, Andrew Morrison, Derek Hall, Dawn McLaren, Rob Engl, Daniel Bateman, Amy Halliday, and Lore Troalen

Abbreviations used: L length, W width, T thickness, D diameter, Dpt depth, Wgt weight, mm millimetre, g grammes. The small finds (abbreviated here as 'SF') were assigned individual numbers in the field, where finds were identified during sample processing in retent they were assigned a number (abbreviated here as 'RT').

3.1 Introduction

Around 534 artefacts were recovered from King's Seat (excluding slingshots and slag), making it one of the most important assemblages from southern Pictland and on par with sites that traditionally dominate discussion, such as the forts of Dundurn (ID 24873) and Clatchard Craig (ID 30074) in eastern Scotland, and Craig Phadrig (ID 13486) in the north. Arguably, being an undiscovered and previously unknown site of importance in the early medieval period, it is critical for understanding cultural and chronological links across Pictland and with their nearest neighbours to the west, east and south.

This chapter outlines and catalogues all the artefacts by type and places the finds within wider understanding of the objects. Wider, key research themes are drawn out in Chapter 5, particularly in relation to status, trade, contacts, and crafts.

3.2 E ware

Ewan Campbell

Fourteen sherds of E ware were recovered: 12 from the central enclosure (Trench 4) and 2 from the western enclosure (Trench 6). They are all in typical E ware white gritty fabric (Campbell 2007: 32) and are largely unabraded. The size of the sherds and their lack of abrasion suggests that the vessels were used and broken *in situ* within the central enclosure. At least three vessels are represented, a jar, a bowl and a small jug.

E ware generally can be dated to the later 6th and 7th centuries AD and originates from south-west France, probably in the Saintes region where E ware has recently been found (Guitton 2020: fig 46). The presence of a bowl and small jug at King's Seat might suggest a date early in this range. The date of the carbonised residue (SF 4154) places the (re)use of this vessel on the site between the mid 6th to mid 7th century AD, indicating it was imported to King's Seat in this period and providing a rare direct date for use of E ware in a Scottish assemblage. This date is compatible with the radiocarbon dates from occupation in Structure 1 in Trench 4 and Structure 2 in Trench 6.

The only sherd recovered from an *in situ* context is a large body sherd (SF 4154) of a large E1 jar retrieved from the old ground surface layer [406] within Structure 1, Trench 4, in the central enclosure. Other finds recovered from the *in situ* old ground surface deposit [406] include a possible whetstone (SF 4168), copper alloy casting debris (SF 4264), and a mould fragment (SF 4160). The other sherds were found in contexts disturbed by subsequent post-medieval cultivation.

Although the assemblage is small, the combination of three different forms of E ware is very unusual and tends to be restricted to sites with known royal associations. Importation from south-western France was by the Atlantic trading route, and most E ware sites are situated on the Atlantic coasts, with only a small scatter reaching eastern Scotland. These eastern sites are all important forts; Dundurn (ID 24873), Clatchard Craig (ID 30074), and Craig Phadrig (ID 13486). None of these has such a varied E ware assemblage as King's Seat, emphasising the special nature of the site and suggesting a royal association, with links to sites such as Dunadd (ID 39564), which seems to have controlled importation and redistribution of E ware and other luxury imports.

E ware is believed to have been mainly imported as containers (the E1 jars) for exotic foods (nuts, fruits, spices) and purple dyestuffs (dyer's madder), and the vessels usually show little signs of usage unless they have been re-purposed. The rarer forms – bowls, beakers and jugs – may have been used in feasting rituals associated with imported wine and foodstuffs. The carbonised residues on Vessel 1 are unusual, especially as they are only on the upper part of the interior of the vessel. This may indicate a secondary

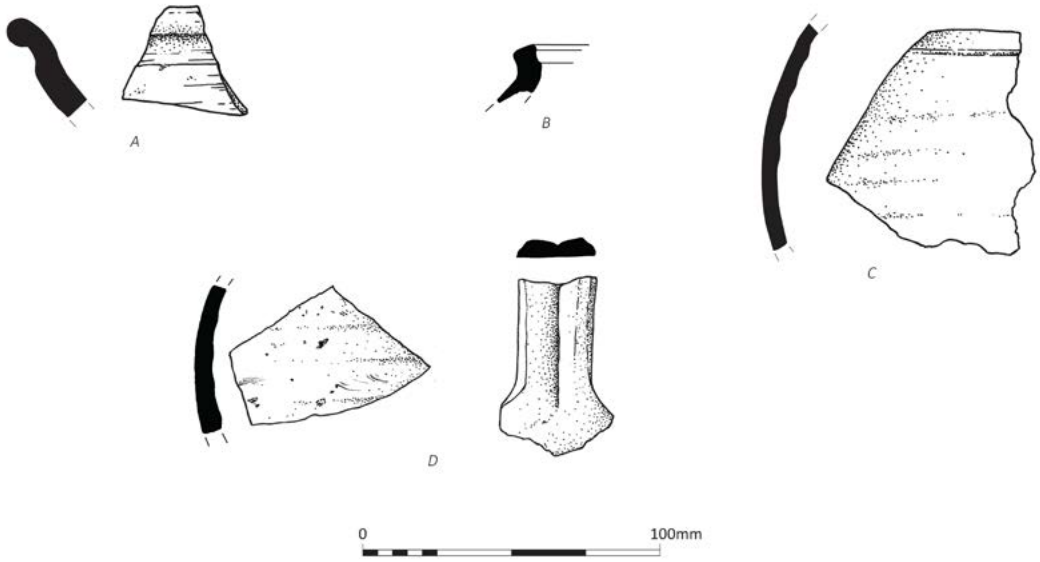

Figure 3.1: Illustrations of E ware fragments from Vessel 1 E1 jar SF 4154 (C) and SF 601 (B), Vessel 2 E3 bowl 4108 (A), Vessel 3 E4 jug (D) handle SF 4206a (right) and unassigned sherd SF 4206b (D, left).

usage as a cooking pot after the original contents were used up, thus providing a rare opportunity to date the reuse of the pottery on site.

Vessel 1

A large E1 jar or olla (Figure 3.1 B and C), the majority of the sherds seem to be from this vessel. There is also a rim fragment from Trench 6 which is from this type of vessel and may be from the same vessel. The rim is everted, and flat-topped with a lid-seat groove. This specific form of rim is seen in other E ware jars, for example from Dunadd, Argyll and Bute, and Whithorn, Wigtownshire, in Scotland, Carew Castle in Wales and Garranes in Ireland (Campbell 2007: fig 36). E ware vessels are very rarely decorated with incised lines, as in this example (Campbell 2007: 34). E1 jars are by far the commonest form of E ware found in Atlantic Britain. One fragment (SF 4154) had carbonised residues on the interior of the sherd; this was radiocarbon dated to between 555-641 cal AD (calibrated to 2σ, SUERC-127794; Table 2.1).

SF 4154 Substantial part of an E1 jar with incised decoration of two lines above the shoulder. Maximum body diameter *c.* 20 cm. Some charred residues on the upper part of the interior and sooting on the exterior. Strong internal finger rilling. Unabraded. Hard fabric, abundant large quartz grits, pimply outer surface. L 72 x W 70 x T 4 mm. Context [406]. Figure 3.1 C.

SF 601 Rim sherd with everted rim and flat top with lid-seat groove. Rim D *c.* 18 cm. L 25 x W 20 x T 6 mm. Context [601]. Probably from the same vessel as SF 4154 (Figure 3.1 B).

Vessel 2

An E3 bowl (Figure 3.1 A), represented by its distinctive rim and steeply insloping profile. Bowls are uncommon in E ware assemblages and tend to be found on high status sites such as Dunadd and Whithorn in Scotland, Dinas Powys in Wales and Lagore in Ireland.

SF 4108 Rim and upper bodysherd of E3 bowl. Rim simple, rounded with cavetto on exterior. Rim D *c.* 180 mm. Size L 43 x W 42 x T 7 mm. Context [403].

Vessel 3

A handle from a small E4 jug (Figure 3.1 D). Jugs are also rare in E ware assemblages, except at Dunadd. This handle is exceptionally small and must have come from a very small jug. There are only two other small jugs from Britain, both in Scotland, one from the Mote of Mark, Kircudbrightshire, and the other from Whithorn (Campbell 2007: fig 31), though others are known from sites in France (Campbell 2007: fig 35).

SF 4206a Wheel-thrown handle from a small E4 jug. Handle wheel thrown, asymmetric profile with central groove. Lower attachment luted to body.

Figure 3.2: Vessel 1 E1 jar fragment with charred residue in interior SF 4154.

Figure 3.3: Close up view of the food residue on sherd SF 4154.

Figure 3.4: Selection of E ware fragments from different vessel types within Structure 1.

W 25 mm, T 7 mm. L 60 x W 37 mm. Context [403]. Figure 3.1 D.

Unassigned sherds

The remaining ten sherds could all be from an E1 jar, and all could be from Vessel 1. They include a large sherd from near the base (SF 4206b; Figure 3.1 D):

Context 401: SF 406; 4044; 4112
Context 403: SF 4206b; 4206c; 4206d; 4128
Context 411: SF 4148a; 4148b
Context 601: SF 623

3.3 Later Medieval and later pottery

Derek Hall

Scottish White Gritty Ware

Thirty-one sherds of pottery have been identified as possibly being from Scottish White Gritty Ware (SWGW)

vessels. All are from the same context [7001], from the eastern enclosure, and in similar gritty Whiteware fabrics. They indicate a period of medieval activity taking place at King's Seat.

There are three diagnostic sherds, namely two flat base sherds (SF 7004; SF 7030) and a decorated bodysherd (SF 7034), that fit the parameters for vessels in SWGW; the remainder are bodysherds (MacAskill 1987: 103 Illus 54 Cat 288). Consistently these sherds have smooth external and internal surfaces and are wheel thrown, two sherds (SF 7011; SF 7039) having lightly rilled external surfaces. The absence of sherds of medieval Scottish Redware might suggest that this assemblage dates no later than the 12th century.

It is widely accepted by Scottish ceramic specialists that accurately identifying Whitewares to origin visually is fraught with difficulties. For example, Normandy Gritty Type Wares from France and Yorkshire Type Whitewares resemble SWGW very closely, and chemical sourcing (using ICP) is proving to be the only accurate way of confirming their provenance (Jones *et al.* 2002; Haggarty *et al.* 2012). With that in mind it is recommended that some consideration is given to chemically analysing the three diagnostic sherds (SF 7004, SF 7030 and SF 7034) and two of the more complete bodysherds (SF 7041).

SF 7002 Very small gritty Whiteware bodysherd with burnt out inclusions and smooth internal and external surfaces. Context [7001].

SF 7003 Bodysherd in a gritty Whiteware fabric with burnt out inclusions and smooth internal and external surfaces. Context [7001].

SF 7004 Externally smoke blackened basal angle from a flat-bottomed gritty Whiteware cooking vessel. Context [7001].

SF 7005 Two tiny bodysherds of gritty Whiteware, with smooth internal and external surfaces. Context [7001].

SF 7008 Very small gritty Whiteware bodysherd. Context [7001].

SF 7010 Bodysherd in a pinkish gritty Whiteware fabric, with smooth internal and external surfaces. Context [7001].

SF 7011 Bodysherd in a gritty Whiteware fabric with a slightly rilled external surface, with smooth internal and external surfaces. Context [7001].

SF 7012 Bodysherd in a pinkish gritty Whiteware fabric, with smooth internal and external surfaces. Context [7001].

SF 7013 Bodysherd of slightly pinkish gritty Whiteware, with smooth internal and external surfaces. Context [7001].

SF 7015 Bodysherd in a pinkish gritty Whiteware fabric. Context [7001].

SF 7019 Tiny gritty Whiteware bodysherd. Context [7001].

SF 7023 Very small gritty Whiteware bodysherd with smooth internal and external surfaces. Context [7001].

SF 7025 Small gritty Whiteware bodysherd with smooth internal and external surfaces. Context [7001].

SF 7030 Basal angle from a flat-bottomed smoke-blackened gritty Whiteware cooking vessel with burnt out inclusions. Context [7001].

SF 7033 Small bodysherd of a pinkish gritty Whiteware with slight smoke blackening and smooth internal and external surfaces. Found with a stone. Context [7001].

SF 7034 Bodysherd of a gritty Whiteware fabric with the remains of horizontal notched decoration; tiny spots of glaze are also visible. Context [7001].

SF 7036 Two small bodysherds in a gritty Whiteware fabric, one of them with traces of green glaze on its external surface. Context [7001].

SF 7037 A very small gritty Whiteware bodysherd with smooth internal and external surfaces. Context [7001].

SF 7039 Four bodysherds in a gritty Whiteware fabric. The largest sherd has traces of a lightly rilled external surface. All the sherds have smooth internal and external surfaces. Context [7001].

SF 7040 Small gritty Whiteware bodysherd with one visible red inclusion and smooth internal and external surfaces. Context [7001].

SF 7041 Four bodysherds in a gritty Whiteware fabric. One of the sherds has a visible red inclusion, and they all have smooth internal and external surfaces. Context [7001].

SF 7046 Bodysherd of slightly pinkish Whiteware with occasional burnt-out inclusions. Context [7001].

SF 7046 Bodysherd in a pinkish gritty Whiteware fabric with smooth outer and inner surfaces. Context [7001].

SF 7047 Bodysherd in a pinkish gritty Whiteware fabric with smooth outer and inner surfaces. Context [7001].

SF 7050 A very small pinkish gritty Whiteware bodysherd with smooth internal and external surfaces. Context [7001].

Brown Glazed Redware

SF 4103 This small unglazed Redware vessel has a flat base and is either a flowerpot or a piece of ceramic garden furniture of 18th/19th-century date. Context [403].

Figure 3.5: Two joining sherds of glazed globular vessel SF 4231 depicting coin slot.

3.4 Money-box

Ewan Campbell

This brown-glazed redware money-box (Figure 3.5) is of a type which originated in the medieval period and continued to be produced up until the 19th century (Noël Hulme 2013). Money boxes were commonest in the 16th and 17th century, when they were specifically Christmas boxes, hence 'Boxing Day' (Pearce 2013). The globular form of the King's Seat example is matched by some early 19th-century stoneware examples (Noël Hulme 2013: figs 18, 19). The glaze and fabric are similar to 19th-century industrial wares. The width of the slot is too small for Georgian pennies, so the box is likely to be Victorian in date. A wide variety of shapes (not just pigs) were produced in the 19th century (Noël Hulme 2013: fig 30), but this simple form may belong to the early 19th century.

SF 4231 Two joining bodysherds of a glazed globular vessel. On the upper part is one side of a rectangular slot 2 mm wide and at least 20 mm long. The outer surface is glazed with a shiny brown and cream glaze, and some of this glaze has run through the slot into the interior. The fabric is hard, well-fired, and red, with no obvious inclusions. T 3 mm. L: 100 x W: 42 mm. Body T: 90 mm. Context [403].

3.5 Glass

Ewan Campbell

Eight glass objects (Figures 3.6 and 3.7) were recovered from King's Seat: an early medieval imported vessel fragment (Figure 3.6 E), an armlet fragment (Figure 3.6 B), three beads (Figure 3.6 C, D, F), two gaming pieces (Figure 3.6 A, G), and a possible piece of Roman vessel glass (Figure 3.7).

Conical Beaker

Fragment of a decorated tall conical beaker (Figure 3.7) of characteristic Anglo-Saxon type (Campbell 2009 Group B) which has looped vertical trails on the lower half of the vessel, and horizontal trails on the upper part. The greenish-brown or olive colour is typical of Early Anglo-Saxon period glass. The applied vertical trail is relatively thick and there would have been room for only five or six in the narrow lower body. This means it is not a typical Kempston type of cone, which have closely spaced, narrower, trails (Evison 2000), and the colour is unusual for early Kempston type beakers, but there is a similar coloured one from Acklam, Yorkshire, in the Corning Museum of Glass, and another from Faversham, Kent (Evison 2008).

These cones date from the 5th-7th century, and some may have been made in Kent. Glass vessels, and other materials such as beads and personal jewellery, were imported into eastern Scotland via a trading network which ran up the east coast of England (Campbell 2009; Blackwell 2018). This network was quite separate from the Atlantic network which brought E ware to the site (see further discussion below).

SF 4135 Lower bodysherd from near base of a conical beaker, decorated with self-coloured unmarvered vertical trail. Good quality glass, with vertical bubbles. Colour greenish-brown. Body D *c.* 30 mm, trail 3 mm wide. L 22 x W 21 x T 1 mm. Context [403]. Figures 3.6 E and 3.7.

Armlet

Enough of this very fragmentary glass object (Figures 3.6 B and 3.7) survives to be sure it derives from an armlet or bangle of a type common in the Roman Iron Age and early medieval periods (Stevenson 1956; Carroll 2001). The base glass is transparent blue-green, probably derived from scrap Roman vessel glass. It

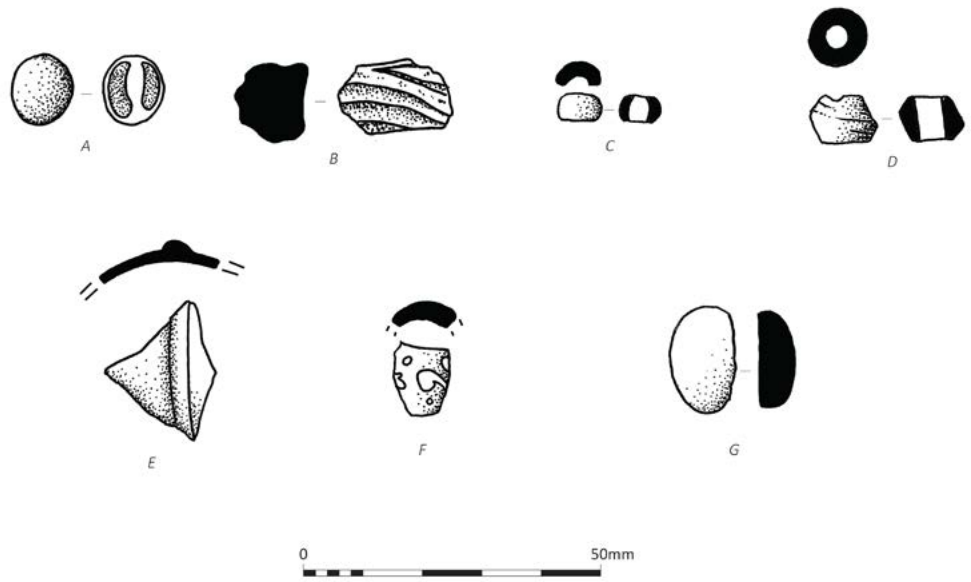

Figure 3.6: Illustrations of glass objects including beads SF 501 (C), SF 4116 (D) and SF 620 (F) vessel glass SF 4135 (E), armlet fragment SF 665 (B) and gaming pieces SF 4077 (A) and SF 603 (G).

Figure 3.7: Selection of glass objects including Roman vessel glass SF 4196 (top left) (clockwise) white cabochon SF 4077, blue cabochon SF 603, armlet fragment SF 665, terracotta bead SF 620, green bead SF 501 and conical beaker glass SF 4135 (central).

probably belongs to Kilbride-Jones's Type 1 (Kilbride-Jones 1938), which were common at Traprain Law and may have been manufactured there. Fragments of these armlets are found on early medieval sites, though it is not possible to say if this one is of Iron Age or early medieval date. A very similar abraded fragment was found at Dunadd, Argyll and Bute, in a 7th-century context (Lane and Campbell 2000: 175).

SF 665 Small abraded fragment of a glass armlet. Part of the original inner surface remains, with traces of opaque red decoration on the decayed outer

surface. Glass blue-green aqua colour, with bubbly trails. L 20 x W 13 x T 11 mm. Context [601]. Figures 3.6 B and 3.7.

Beads

Small biconical turquoise bead: Guido Group 5iv or 5x

A small biconical turquoise bead of a shape of Roman type which continued into the Early Anglo-Saxon period. In this colour it is Guido's Group 5iv or 5x, which she says is characteristic of the 6th/7th centuries AD and is found widely in Anglo-Saxon pagan graves (Guido 1999: 44, pl 4). There are a few examples found in Scotland. One was found as part of a necklace in a cist at Hound Point, Dalmeny, West Lothian, possibly an Anglo-Saxon burial, and has been dated to the mid-7th century (Blackwell 2018: 249, illus 7.3). There are two from Anglo-Saxon contexts at Dunbar, East Lothian (Blackwell 2018: 230, illus 7.3). Another was found at Fey Field, Whithorn, Wigtownshire, possibly in a disturbed later medieval context, though the context is unclear (McComish and Petts 2008: 79, fig 25).

SF 4116 Almost complete biconical wound glass bead. Broken in two, with a chip missing from one end. The glass is transparent turquoise blue but is full of bubbles making it appear semi-opaque. W 10 mm, T 8 mm. Hole D 5 mm. Context [403]. Figure 3.6 D.

Opaque Green Annular Bead: Guido Group 5i

An opaque green annular bead (Figure 3.7) of Guido's Group 5i, a common type again dated to the 6/7th centuries AD in Anglo-Saxon contexts (Guido 1999: 43). Small annular twist beads are common and difficult to characterise. However, the combination of annular shape and opaque green is not normally found in Scottish or Irish contexts, though there are cylindrical beads of uncertain date in this colour from Culbin Sands, Moray. There are a few examples of translucent green annular beads in Scotland, for example from Traprain Law, East Lothian (Christie 2019).

SF 501 Half of an annular wound glass bead. Opaque apple green glass, many bubbles. W 7 mm, T 4 mm. Hole D 3.5 mm. Context [501]. Figures 3.6 C and 3.7.

Cylindrical Terracotta Bead

A cylindrical bead (Figure 3.7) of a terracotta colour of a type that first appeared in the 6th century in Anglo-Saxon graves. The combination of terracotta ground and opaque yellow decoration, often on cylindrical beads, is found on a number of types of 6/7th-century date, principally Koch type 20 (Guido 1999: pl.s 6 and 7; Brugmann 2004: fig 160), which may be of Continental origin, but this particular decorative pattern of swirls and dots is not easy to parallel on Koch type 20. They are, however, similar to those of what Brugman styles 'Regular Dot' beads (Brugman 2004: fig 151). However, it seems likely to date to the later 6th century, the date of Brugmann's Group B1 types. The only other bead of red-brown colour from a Scottish context is from a 7th-century context at Dunadd, Argyll and Bute (Lane and Campbell 2000: 177, no. 421, Pl 22), but this is of a different form.

SF 620 About one third of a cylindrical wound glass bead. Opaque shiny terracotta, with decoration of opaque yellow dots and swirls. W 11 mm, T *c.* 11 mm. Hole D 6 mm. Context [601]. Figures 3.6 F and 3.7.

Cabochons

Two glass cabochon pieces were recovered. Such objects are created by simply dropping molten glass on a flat surface. Some were inserts in jewellery, intended to imitate precious stones. Examples are known from Anglo-Saxon contexts (Evison 2008: 71, fig 34, 216). One piece (SF 603) is similar to these in its well-formed oval shape and translucent blue-green colour (Figures 3.6 G and 3.7). This colour is similar to Roman bottle glass and may have been made by melting down sherds picked up on abandoned Roman sites. The other piece (SF 4077) is circular in form and made of opaque white glass (Figures 3.6 A and 3.7). It is likely to be a gaming piece from a *tabula* game, related to *hnefatafl*, which often have black and white counters (Hall and Forsyth 2011; Hall 2007b). Similar pieces, more commonly of bone or stone, are known from other Scottish sites, although this one is rather small. The opaque white colour could have been derived from melting down glass armlets, some of which have an opaque white body colour. The evidence of jewellery and gaming on the site contributes to its importance, as these features are associated with high status sites.

SF 603 Three-quarters of a glass oval cabochon. Translucent blue-green glass, few bubbles. Lower surface flat and matt, upper convex and top abraded. L 15 mm, W 10 mm, T 6 mm. Context [601]. Figures 3.6 G and 3.7.

SF 4077 Complete glass circular plano-convex gaming piece. Opaque white glass, full of bubbles, some dark streaky inclusions. Lower surface flat and matt, upper convex, shiny. Base chipped. L 11, W 9 mm, T 6 mm. Context [403]. Figures 3.6 A and 3.7.

Possible Roman vessel

Andy Heald

One glass fragment (Figure 3.7) is probably from a square-based bottle, a type discussed by Ingemark (2014: 129) within his 'prismatic bottle' type; that is

square, rectangular, hexagonal and octagonal bottles (the terms describing the varying base shapes). However, it is important to note that in native contexts north of Hadrian's Wall there is no evidence for any other type of prismatic bottles than the square ones. Such bottles were most frequent in the western and north-western provinces, and in parts of the UK were still in use, perhaps as late as the late 3rd or early 4th centuries AD (Ingemark 2014: 130-1). Regards their use, it is likely that the vessels probably had primary, secondary and tertiary uses – primary use may have been associated with wine or olive oil, but many vessels are worn, indicating an extended period of use and a number are reused as gaming pieces. Prismatic bottles found in non-Roman contexts have been discussed by Ingemark (2014: 132-5) who shows that they occur on a range of sites – the bulk of the material both in terms of quantity and geographical distribution comes from the south, although finds are known from north of the Forth-Clyde isthmus. Whether the glass vessel indicates activity at King's Seat during the Roman Iron Age is a moot point – perhaps the vessel should be viewed in the same light as other glass objects thought to have been made from Roman glass, such as SF 603 and SF 665 – scrap material scavenged from abandoned Roman sites to be re-used during the early medieval period.

SF 4196 An abraded bodysherd of blue-green glass from a substantial vessel. Good quality transparent glass, few bubbles. L 21, W 14, T 2 mm. Context [403]. Figure 3.7.

3.6 Copper alloy

Andrew Morrison

Four copper alloy finds were recovered, three of which are post-medieval to modern in date: a 1957 Scottish shilling of Queen Elizabeth II (SF 217); a shotgun cartridge (SF 219); and an 18th to early 19th century three-piece plain tombac button (SF 609).

One small fragment of copper alloy casting debris (SF 4264) was identified, retrieved from the old ground surface [406] within the central enclosure (Trench 4). This may indicate the occurrence of bronzeworking within the central enclosure. The fact that only a single small fragment of casting debris was retrieved from the site despite 100% sieving of excavated contexts could be significant, indicating a tightly managed and controlled resource where waste was minimised.

SF 4264 Casting Debris. Small amalgam of copper alloy nodules. Likely spill from casting activities. Not closely dateable. L 12.8 mm, W 8.5 mm, T 5.2 mm. Mass: 1.61 g. Central enclosure, Context [406].

3.7 Lead

Andrew Morrison

One lead item, a small bead or weight, was recovered. Although not closely dateable, the find is thought to be modern based on its condition and the surviving definition of its form with little corrosion or abrasion noted.

SF 410 Bead or Weight. Flat, barrel-shaped with a D-shaped section. Straight perforation. Moderate corrosion with slight damage to the edge of the perforation on one side as well as the outside edge. Not closely dateable. W 15.0 mm, T: 7.6 mm. Hole D 5.8 mm. Mass: 9.36 g. Context [401].

3.8 Iron objects

Andrew Morrison

Introduction

Seventy-seven iron objects (Table 3.1) were recovered from King's Seat, including a range of tools, domestic items, dress accessories, building fixtures and fittings, and weaponry. A small number of post-medieval and modern finds were also recovered from topsoil contexts relating to later phases of use of the hilltop (these have been included in the archive catalogue and are not discussed further here).

None of the artefacts recovered are specifically diagnostic of the early medieval period, with many of the finds types experiencing a long currency of use with very little change in function and form from the Iron Age and Romano-British periods up through the medieval and, in certain examples, even into the present day. That said, the make-up and character of the assemblage show close similarities to other early medieval assemblages in Scotland, such as, amongst others, Dunadd and Dunollie in Argyll and Bute, Dundurn in Perthshire, the Mote of Mark in Kirkcudbrightshire, and Buiston in Ayrshire.

Knives

A total of 12 knives and knife fragments were recovered, including two complete examples (SF 4250, SF 652/653/654), two with intact blades and broken tangs (SF 4182, SF 656), three partial blades with tangs (SF 4097, SF 4099, SF 4261), three blade fragments (SF 4121, SF 4132, SF 4139), and two tang fragments (SF 4198, SF 642). All of the knives are of whittle-tang type, having long and thin tapering rectangular cross-sectioned tangs extending from the blade back to be inserted

Table 3.1: Total quantity by of iron objects and their context.

Trench	Context	Fe											Total (Q)
		Building Fixtures and Fittings	Nails	Dress Accessories	Horse Equipment	Lighting	Security	Knives	Tools	Weaponry	Post-med/ Modern	Non- classifiable	
TR1	002 (topsoil western enclosure											1	1
TR2	202 (western enclosure topsoil)				1								1
TR3	302 (topsoil central enclosure)		1								2		3
	305 (post-abandonment deposit in central enclosure)					1			1				2
TR4	401 (topsoil over Structure 1)		5						1		1	4	11
	402 (rampart central enclosure)							1					1
	403 (occupation deposit around hearth Structure 1)	1	11				2	8	4			10	36
	406 (old ground surface in Structure 1)								1				1
	409 (secondary hearth fill in Structure 1)						1						1
	411 (platform deposit)									1			1
TR6	601 (topsoil western enclosure)	2		2				2	3			4	13
	602 (occupation layer related to secondary hearth in Structure 2)											2	2
	613 (occupation deposits around hearth in Structure 3)							1					1
TR7	7005 (metalworking waste rich deposit, eastern enclosure)		1										1
	7013 (metalworking waste deposit, eastern enclosure)											2	2
Total (Q)		3	18	2	1	1	3	12	10	1	3	23	77

into a handle. All of the knives and knife fragments were retrieved from the central (Trench 4) and western (Trench 6) enclosures.

Whittle-tang knives were in use from the Iron Age and, although they are still made and used up to and including the present day, they began to be supplanted by the scale-tang knife from around the mid-14th century, which was favored for the increased strength and durability that their riveted handle plates afforded. Numerous studies have shown that knives like those from King's Seat have a long currency as they were versatile, multi-function tools carried by a wide variety of people and used for a wide variety of purposes, including for craft, for eating, and for self-defence (Manning 1985: 116, types 17-20; Ford 1987: 132, illus 65, no 80-1; Ottaway 1992: 563; Franklin and Goodall 2012: 132; McLaren 2019a: 88).

The majority of the knives and knife fragments from King's Seat are sufficiently intact and with enough of the back form surviving to be able to classify them according to type. In this instance, Ottaway's blade typology (1992) based on the large assemblage of Anglo-Scandinavian knives recovered from Coppergate, in York has been employed as a means of classification and follows his use of descriptive terms.

Type A1

Two examples (SF 4099; Figures 3.8 A and 3.14 and SF 656; Figure 3.8 B) conform to Ottaway's Type A1 blade, which is an angle-backed blade, a blade which has an abrupt change in the back plane between the shoulder and the tip. In the case of the Type A1 blades, the rear portion of the blade from the shoulder is straight and horizontal, running parallel to the cutting edge, before

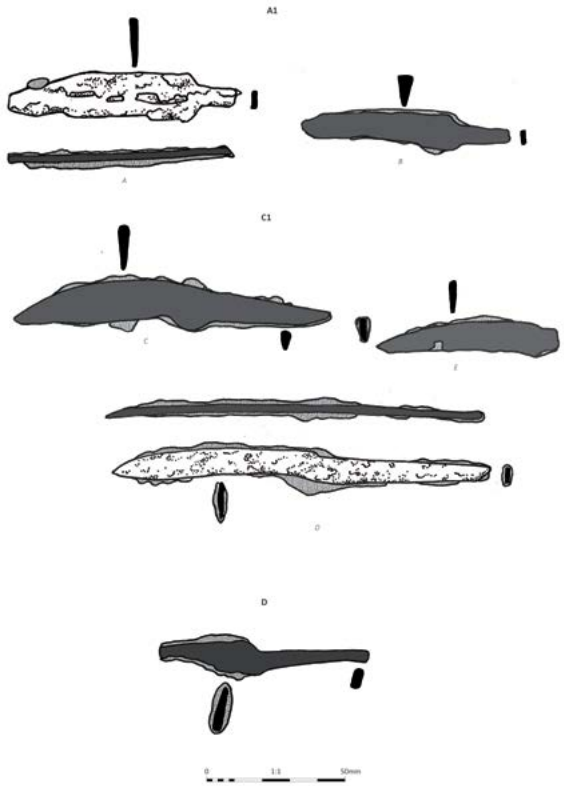

Figure 3.8: Iron blades: A1 blades SF 4099 (A) and SF 656 (B); C1 leatherworking blades SF 4250 (C), SF 4182 (E) and SF 652/653/654 (D); and D blade SF 4097.

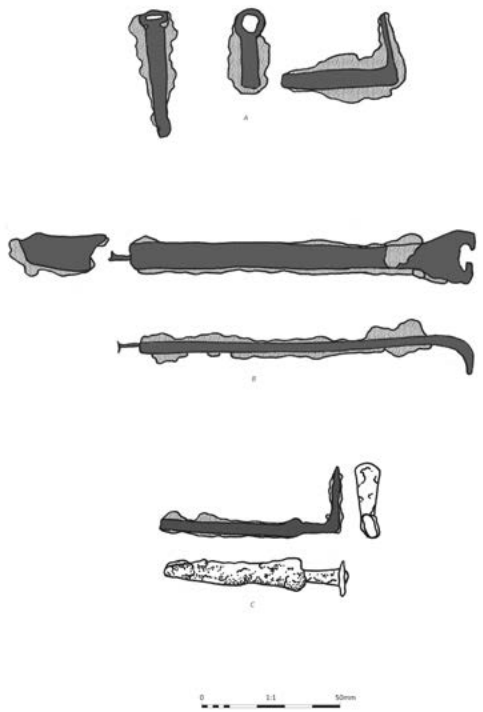

Figure 3.9: Iron security equipment: barbed spring padlock bolt SF 4147 (A), padlock key SF 4087 (B), barbed spring padlock bolt SF 4267 (C).

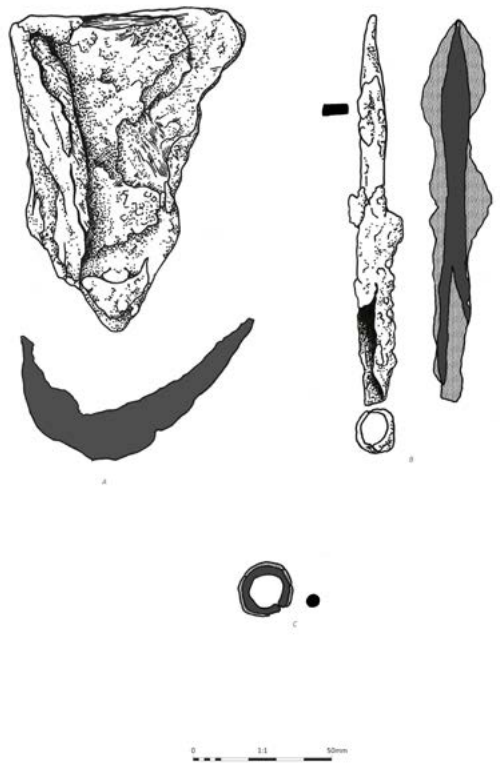

Figure 3.10: Ploughshare SF 4241 (A), socketed arrowhead SF 4144 (B), and head of a ringed pin SF 622 (C).

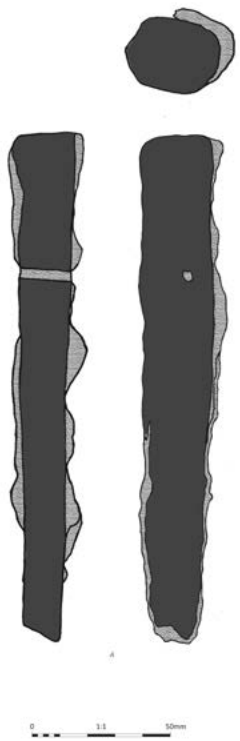

Figure 3.11: Perforated metalworking chisel SF 4127 A.

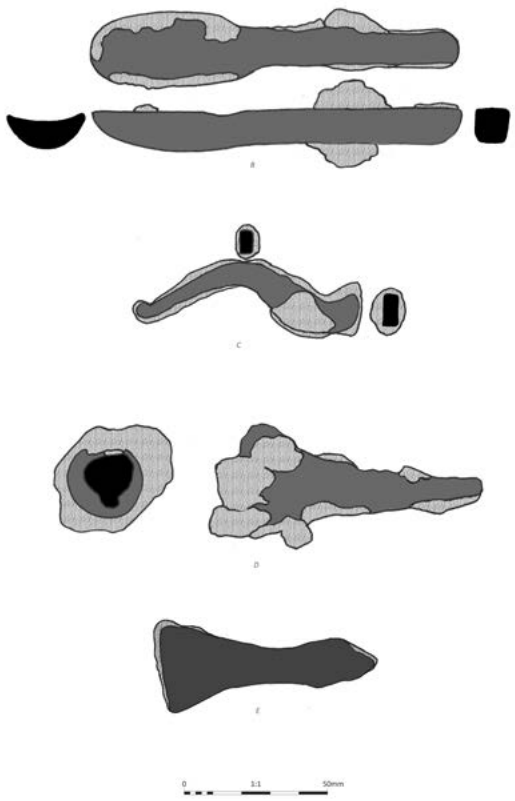

Figure 3.12: Iron tools: wood-working spoon-bit auger SF 309 (B), metalworking tongs SF 4207 (C), conical ferrule SF 4125 (D) and spatulate tool SF 4062 (E).

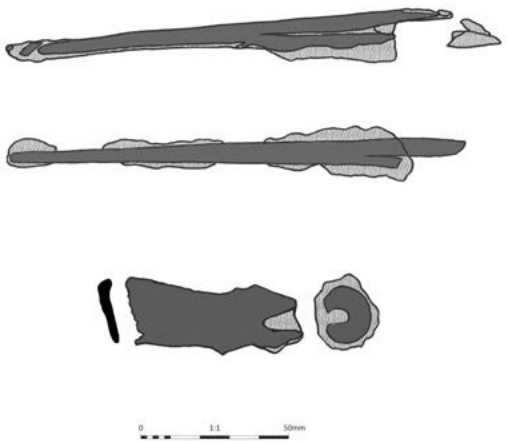

Figure 3.13: Iron tools: two-pronged implement SF 647 (A) and possible socketed chisel SF 667a (B).

angling down in a straight line to the tip (Ottaway 1992: 561-2). Angle-backed blades are known in Britain from the Roman period and are common finds amongst knife assemblages through the medieval period and are particularly common in the 9th to 11th centuries AD (Ottaway 1992: 564).

Blade (SF 656), which only has the tip missing, is of particular interest. The cutting edge has seen extensive use and whetting as evidenced by the instep from the choil, but the blade has been maintained to retain a straight and horizontal cutting edge. What is particularly notable is the appearance of what is probably pattern-welding identified during x-ray analysis, which appears as distinct wavy/undulating bands of parallel lines that run the length of the blade along the bottom of the cutting edge and continue along the length of the tang. The combination of the layered structure creating a sharper, more robust blade and the small size of the knife with a broad back suggests a use beyond that required for day-to-day activities, and more in line with particular craft activities where sharpness and the strength to allow the application of force were both prized attributes. Pattern-welded blades are relatively uncommon finds, potentially owing to a lack of recognition in the archaeological record rather than a rarity in their manufacture and use. Two of the 44 blades from Coppergate, York, that were metallographically analysed displayed pattern-welded cores, where during manufacture, strips of different types of iron (often steel and ferritic iron) were folded and welded together to create not only a stronger blade, but one that displayed a decorative pattern (Ottaway 1992: 598).

SF 4099 Knife blade with a broken tip and tang. Angle-back blade with a straight horizontal back angling downwards towards the broken tip (Ottaway Type A1). The cutting edge is parallel to the blade back and is largely intact with some wear or damage present. The partial tang is rectangular in cross-section and positioned centrally to the blade. The tang rounds upwards to a pronounced shoulder and displays a slight pinch at the blade junction below before angling downwards to the choil. Moderate corrosion. Not closely dateable. L 83.6 mm. Tang, L 13.1 mm, W 8.8 mm, Th 3.1 mm. Blade; L from shoulder to break in angle 40.5 mm, W choil to shoulder 18.3 mm, T 4.3 mm; L from break in slope to broken tip 28.1 mm, shoulder to tang 3.6 mm, tang to choil 6.4 mm. Mass: 15.87 g. Context [403]. Figures 3.8 A and 3.14.

SF 656 Knife blade and partial tang. Likely pattern-welded. Angled-back blade (Ottaway Type A1) with a straight horizontal back angling down to the tip. Broad back (W: 13.5 mm). Shoulder steps down to a broken, rectangular sectioned tang, which slopes to the choil before rounding up towards cutting edge. The cutting edge has seen use and whetting, and is inset from choil, but is straight and parallel to the

Figure 3.14: Type A1 angle-backed knife blade SF 4099.

Figure 3.15: Knife blade, Type C1 associated with leatherworking SF 4132.

back. Tip now lost. Pattern-weld visible in x-ray only as a distinct wavy undulating structure along the length of the blade on the cutting edge and continuing along the bottom of the tang. Not closely dateable. L 73.3 mm. Blade L 54.6 mm, shoulder to tang 4.6 mm, T 5.7 mm. Tang W 5.7 mm, T 4.0 mm. Mass 15.51 g. Context [613]. Figure 3.8 B.

Type C1

Four examples (SF 4132; Figure 3.15, SF 4182; Figure 3.8 E, SF 4250; Figure 3.8 C, and SF 652/653/654 Figure 3.8 D) conform to Ottaway's Type C1 blade, which has a straight or almost straight and horizontal back that runs parallel to the cutting edge from the shoulder, before becoming convex and curving downwards to the tip (Ottaway 1992: 565). Two of the blades (SF 4250; Figure 3.8 C and SF 652/653/654; Figure 3.8 D) are complete and are very similar to one another in form. Although these blades may have had a variety of uses they were clearly associated with leatherworking; four similar leatherworking knives or parchmenter's knives were recovered from the 8th- and 9th-century workshop layers at Portmahomack, Easter Ross (Carver *et al.* 2016: 204, illus 5.6.13).

SF 4132 Knife blade fragment. Tip intact, broken before shoulder and choil. Straight back parallel to cutting edge, slopes down to the tip (Ottaway Type C1). Slightly bent at the break, and the cutting edge is worn and corroded. Moderate to heavy corrosion, though the form is still apparent. Not closely dateable. L 61.8 mm, W 13.3 mm, T 4.7 mm. Mass 11.45 g. Context [403]. Figure 3.15.

SF 4182 Knife blade with partial tang. Straight horizontal back sloping down to the tip (Ottaway Type C1). Sloping shoulder and short angled choil. The tip angles down to a cutting edge that is worn from whetting. Wide rectangular tang. Moderate corrosion, though the form is readily apparent. Not closely dateable. L 63.2 mm. Tang, W 10.6 mm, T 5.2 mm. Blade, L shoulder to tip 51.7 mm, W from choil to shoulder 14.7 mm, shoulder to tang 2.7 mm, tang to choil 2.1 mm. Mass 11.45 g. Context [402]. Figure 3.8 E.

SF 4250 Knife. Intact with a straight horizontal back sloping down to the tip (Ottaway Type C1). The tip angles down slightly to the cutting edge. Cutting edge likely parallel to the back but is worn, extensively whetted, or corroded. Rectangular cross-sectioned tang tapers to a rounded tip - similar to SF 4198. Pronounced squared shoulder curving down to the tang, with a possibly worn small rounded choil. Moderate corrosion with heavy corrosion product, but the form remains readily apparent. Not closely dateable. L 113.1 mm. Blade, L 72.6 mm, W shoulder to choil 28.5 mm, T 5.2 mm. Tang, L 41.3 mm, W 11.3 mm, T 4.6 mm, shoulder to tang 5.3 mm, tang to choil 2.6 mm. Mass 22.55 g. Context [403]. Figure 3.8 C.

SF 652/653/654 Complete knife in three fragments reattached during conservation. Straight horizontal back sloping down to a pointed tip (Ottaway Type C1). Angled shoulder to a long rectangular sectioned tapering tang with a pointed end. The tang expands to a sloping minimal choil. Much of the blade cutting edge is lost to wear and whetting, which has now expanded from corrosion. The blade tip is slightly bent through use. Similar in form to SF 4250. Not closely dateable. L 134.3mm, W 15.3 mm, Th 3.8 mm. Blade L 79.8 mm. Tang L 54.5 mm, W 9.7 mm, T 3.4 mm, shoulder H 4.4 mm, choil H 2.7 mm. Mass 14.30 g. Context [601]. Figure 3.8 D.

Type D

Two examples (SF 4139 and SF 4097; Figures 3.8 and 3.16) conform to Ottaway's Type D blade, which has a convex back that curves downwards from the shoulder to the tip (Ottaway 1992: 572). Neither of the blades has enough of the blade back present for these classifications to be definitive, with SF 4097 missing its tip, and SF 4139 consisting of the tip and blade but broken before the shoulder. Both blades share distinct wear patterns with

Figure 3.16: Type D blade SF 4097.

a sharply curving concave blade forward of the choil created through extensive use and whetting. Type D blades are known from the Roman period onwards (Manning 1985: 109) and are particularly common from mid-9th- to 11th-century contexts across northern Europe, and often have long tangs relative to the length of the blade (Ottaway 1992: 572), as evidenced by the tang of SF 4097.

SF 4139 Knife blade fragment. Tip intact, broken before the shoulder and choil. Slightly convex back sloping down to the tip, and the cutting edge appears to rise to the tip, likely through use and sharpening. The width of the blade at the break tapers sharply due to heavy whetting and use. The type is not definitive but is very similar to Ottaway's Type D blades. Not closely dateable. L 52.6 mm, W at break 16.3 mm, T 4.7 mm. Mass: 4.63 g. Context [403].

SF 4097 Knife blade fragment with tang. Tip broken. Blade back appears slightly convex or straight to downward sloping, though not enough survives to classify the type definitively. It shows similarities to Ottaway Type D blades. It has a tapering rectangular cross-sectioned tang central to the blade with a rounded tip. The tang rounds upwards to a pronounced shoulder, and angles downwards to the choil. The cutting edge runs parallel to the back from the choil and curves upwards sharply to a concave profile from extensive whetting and use. Moderate corrosion, the blade is bent at the break, with a slight bend at the junction with the tang and has a slightly bent tang tip. Not closely dateable. L 80.8 mm. Tang, L 41.9 mm, W 6.5 mm, T 3.8 mm. Blade, W shoulder to choil 14.5 mm, T 4.6 mm; L of cutting edge from choil to wear 14.1 mm; tip H at break8.7 mm; shoulder to tang H 4.5 mm; tang to choil H 4.8 mm. Mass: 11.51 g. Context [403]. Figures 3.8 and 3.16.

Unclassified

The remaining knife fragments are incomplete and cannot be classified using Ottaway's typology. Blade and tang fragment SF 4261 has a relatively straight back, though with a missing tip and corroded cutting edge, but cannot be differentiated between a Type A1 or Type C1 blade. Blade tip SF 4121 may be a Type C1 blade with a convex dropped tip. SF 4198 is a broken tang similar in shape to the tang of the complete blade SF 4250 from the same context.

SF 4121 Knife blade tip. Heavy corrosion product and wear. Back form not clear, though possibly slightly convex. Cutting edge rounds up to a likely sloping tip. Not closely dateable. L 31.2 mm, W 4.1 mm. Mass: 6.58 g. Context [403].

SF 4198 Broken tang. Rectangular section tapering to a rounded tip. Broken before shoulder or choil. Heavily corroded, interpretation not definite. Not closely dateable. L 50.5 mm, W 8.3 mm, T 3.9 mm. Mass 5.02 g. Context [403].

SF 4261 Knife blade and tang fragment. Back slopes gently to the damaged tip. Not enough of the blade survives to properly classify. The cutting edge is lost to corrosion, but appears to have a sloping choil to a tapering rectangular sectioned tang. The tang tip is also lost. Not closely dateable. L 77.7 mm. Blade, L: tip to shoulder 43.0 mm, W 15.9, Th 3.5 mm. Tang W 7.7 mm, T 3.1 mm, shoulder to tang 4.6 mm. Mass 10.10 g. Context [403].

SF 642 Possible tang. Rectangular section tapering to a broken tip. Moderate to heavy corrosion. Not closely dateable. L 37.2 mm, W: 9.7 mm, T 4.5 mm. Mass 5.40 g. Context [601].

Discussion of the knives

Small, single-edged, tanged iron knives are one of the most common personal items identified in the archaeological record from both funerary and settlement sites (Alcock 2003: 97). Similar knife assemblages and blade types have been recovered from numerous early medieval Scottish sites, including: an angle-backed blade from Dundurn (Alcock *et al.* 1989: 2:F5, illus 30, 11); those suspected of use in leatherworking at Dunadd, Argyll and Bute (Lane and Campbell 2000: 162); angle-backed, sloping tipped, and convex backed examples at Buiston, Ayrshire (MacSween 2000: 268); and others from Bruach an Druimein, Argyll and Bute (Heald and Hunter 2008), Lair in Glen Shee (McLaren 2019a: 88), Mote of Mark, Kirkcudbrightshire (Laing and Longley 2006: 88-89), Alt Clut, Dunbartonshire (Alcock and Alcock 1990: 2: E1), Inchmarnock, Argyll and Bute

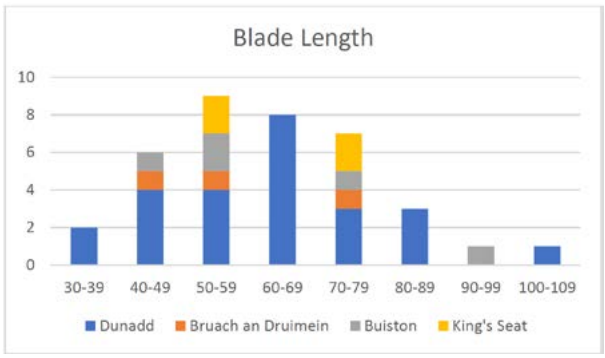

Figure 3.17: Blade length from a selection of comparative sites.

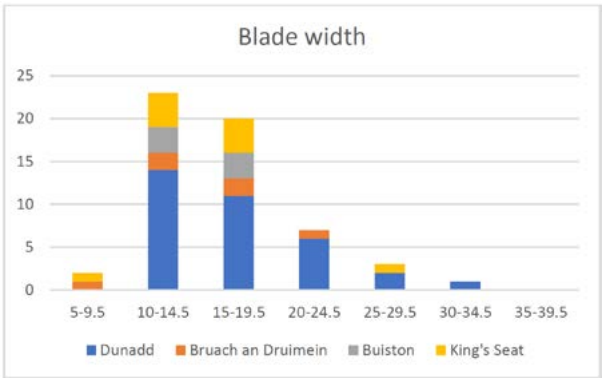

Figure 3.18: Blade width from a selection of comparative sites.

(Franklin 2008a: 182) and Portmahomack, Easter Ross (Carver *et al*. 2016: 204, illus 5.6.13).

Following the work of Heald and Hunter with the knife assemblage recovered from Bruach an Druimein, in Kilmartin Glen, Figures 3.17 and 3.18 present a comparison of knife blade lengths and knife blade widths respectively for the intact examples and others where accurate metrics could be taken in the broadly contemporary assemblages from Dunadd, Bruach an Druimein, Buiston, and King's Seat. The King's Seat examples fall well within the range of blade lengths and widths displayed at these sites. The lengths of the four intact King's Seat blades are consistent with blades from all three, falling between 50-60 mm, and 70-80 mm in length. For the 10 King's Seat blades for which the full width survives, the main range between 10-20 mm is matched closely by the examples recovered from the other three sites, with a thinner example of between 5-10 mm in width paralleled by an example at Bruach an Druimein, and a thicker example of between 25-30 mm matched by two examples recovered from Dunadd. The range and variation displayed by the King's Seat knives suggest use in specialist craft activities, especially with the smaller, finer examples, in addition to more prosaic, general-purpose uses.

By far the majority of Scottish knives come from domestic contexts and there is no evidence to demonstrate whether the carrying of such knives was particular to either men or women. Nor is it certain whether the crafts with which some of the knives are associated were necessarily the preserve of either sex. Elsewhere it is the case that some knives in Anglo-Saxon graves are probably associated with women (Alcock 2003:99) and we should probably assume that such a useful item formed part of a universal toolkit used in every realm of contemporary life.

Arrowhead

The King's Seat arrowhead (Figure 3.19) is of a type known from the Roman Iron Age and Romano-British periods, from around the mid-first century AD (though is a less common type) and was used for both bolt-headed projectiles and arrowheads (Manning 1985: 175-6). Examples are known from many early medieval sites, for example Buiston, Ayrshire (MacSween 2000: 269, fig.236), Dunollie (Alcock and Alcock 1987: 2:D12, 20) and Dunadd, Argyll and Bute (Lane and Campbell 2000: 162, 1639), and Flixborough, Lincolnshire (Ottaway 2009b: 123, 991). The King's Seat arrowhead (SF 4144) is also potentially classifiable as a crossbow bolt, although it would seem that projectile heads with sharply tapering square cross-sections, as seen on a number of the Buiston examples (MacSween 2000: 145, Fig.119, 234-5), are more likely candidates than the flat diamond-shaped head displayed by the King's Seat example.

SF 4144 Socketed arrowhead. Diamond/lozenge-shaped head with a flat, rectangular cross-section. The shaft is flattened and curled around to form the

Figure 3.19: Socketed arrowhead SF 4144.

socket. The tip is slightly deformed and broken, and a portion of the socket is lost to post-depositional damage. Obscured by heavy corrosion, but in overall good condition. Likely Early medieval. L 139.1 mm, max head W 9.8 mm, T 4.4 mm. Socket Diam, Ext 14.6 mm, Int 8.9 mm. Mass 39.54 g. Context [411]. Figures 3.10 B and 3.19.

Pins

Two possible dress accessories, comprising the head of a ringed pin (SF 622; Figure 3.10 C), and a possible globular-headed pin head and shank fragment (SF 646); the identification of the latter as a dome-headed pin is not certain, as it is heavily obscured by corrosion and is identifiable through x-ray analysis only.

SF 622 is the loose swivelling head of a ringed pin. Heavily obscured by corrosion, x-ray analysis has confirmed the loop to curl around and join at a pivot point, where it would have been either inserted into a loop or perforation in the pin head, or clamped into deeply bored depressions on either side of the pin (Foster 1989: 101). Ringed pins with plain looped heads of this type are common to Scotland and Ireland. Fanning has suggested that such pins originated in Ireland in around the 5th century AD, and gained popularity around the 8th or 9th century, the type later spread across the Western Isles and the rest of Scotland with the movements of the Hiberno-Norse (1994: 53). Iron pins generally only make up a very small percentage of pin assemblages, which are normally dominated by bronze and bone (Lane and Campbell 2000). That said, iron pins are known from early medieval Scottish contexts, with a double spiral-headed pin recovered at Alt Clut, Dunbartonshire (Alcock and Alcock 1990: 2:D11), and a large number of iron stick pins from Dunadd, Argyll and Bute (Lane and Campbell 2000: 166). Other examples of ringed pins with plain loop heads like the King's Seat example have been recovered from a 7th century wheelhouse deposit at Clickhimin, in Lerwick, Shetland, and from an 8th century context at Cheardach Mhor, in South Uist, Western Isles (Foster 1989: 102).

SF 622 Plain loop head from a ringed pin. Intact, with circular section, looped around with joined terminals. Plain type with pivot. Obscured by corrosion. D 19.4 mm x 20.2 mm, W 4.0 mm, T 4.6 mm. Mass: 2.82 g. Context [601]. Figure 3.10 C.

SF 646 Possible pin and shank fragment. Potential globular head. Inconclusive. Heavily obscured by corrosion. Not closely dateable. L 28.3 mm. Head, W 6.6 mm, T 5.0 mm. Shank T 2.4 mm. Mass 2.95 g. Context [601].

Figure 3.20: Possible spatulate tool SF 4062.

Figure 3.21: Possible chisel SF 4127.

Tools

Ten tools were found at King's Seat of which eight are readily identifiable and can be assigned a particular function, while the other two are less easily identifiable on account of their incomplete nature. The first group comprises: two woodworking tools, namely a spoon-bit auger (SF 309; Figure 3.12) and a possible socketed chisel (SF 667a; Figure 3.13 B); a perforated chisel (SF 4127; Figures 3.11 and 3.21) and a jaw fragment from a pair of tongs (SF 4207; Figure 3.12) for metalworking; two awls (SF 4120a; SF 634) with likely leatherworking associations; an agricultural implement in the form of a ploughshare (SF 4241; Figure 3.10 A); and finally a conical ferrule (SF 4125; Figures 3.12 and 3.22). The second group comprises a two-pronged implement (SF 647; Figure 3.13 A), and a fragment from a possible spatulate tool (SF 4062; Figures 3.12 E and 3.20).

Woodworking

Spoon-bit augers were used in woodworking for creating and enlarging holes in wood by the twisting motion of the sharpened spoon edges and tip, which carve out the material. The shank and terminus would have been fitted into a straight or winged handle, and worked with both hands or used braced against

the chest of the woodworker (Ottaway 1992: 532-3; Goodall 2011: 23), the latter practice shown in 11th-century depictions. Common uses for the auger were for creating holes for wooden pegs in timber-framed buildings and other timber constructions, as well as smaller items like panelling, furniture, and cutting mortices (Goodall 2011: 23). A similar example with early medieval associations was identified from Munro's 1882 excavations at Buiston, Ayrshire (MacSween 2000: 268), and an early medieval hoard of woodworkers tools found at Flixborough, North Lincolnshire, contained three similar spoon-bit augers amongst numerous other specialised woodworking tools (Ottaway 2009c: 263-4, fig.7.9, 2462-4).

The socketed tool identified as a possible chisel (SF 667a) is probably also a woodworking tool, but it is incomplete and the identification is not definitive. The blade has been broken and sheared off, most likely the effect of a twisting motion. Nevertheless, it is similar in form to a possible chisel from Mote of Mark, Kircudbrightshire (Laing and Longley 2006: 86-7, fig 41, 1300), which also displays a flattened expansion above the socket.

SF 309 Spoon-bit auger. Elongated ovoid spoon bit with likely pointed tip and a square to rectangular-sectioned tang. Incomplete with a missing head. Possible wood remnant on shank, though not definitive, is potentially a handle remnant. Moderate corrosion. Not closely dateable. L 128.3 mm; shank W 11.5 mm; spoon bit W 26.1 mm, L 53.7 mm, Depth 12.2 mm, T 2.3 mm. Wood remnant 76.6 mm from tip. Mass 99.56 g. Context [305/308]. Figure 3.12 B.

SF 667a Socketed tool. Possible chisel. Roughly triangular-shaped haft that is open at the top, tapering in a rounded V-shape. Haft tapers in on both sides to a constricted waist before expanding to a flat rectangular blade. The tip is damaged and sheared-off in an S-shape, most likely the effect of a twisting motion. Wood adhered through corrosion on one side. Heavily corroded. Not closely dateable. L 50.4 mm, W 21.9 mm, T 4.0 mm. Socket W 17.5 mm, T 7.4 mm. Mass 33.21 g. Context [601]. Figure 3.13 B.

Metalworking

A jaw fragment from a pair of metalworking tongs (SF 4207) was recovered. Tongs such as these are generally associated with ferrous metalworking and are used for holding the hot metal during various stages of the working process (Ottaway *et al.* 2009: 317-8), but in this case they are relatively small, which would also allow for their use in non-ferrous metalworking as crucible tongs (Goodall 2011: 7), or indeed for any task where a hot object needs to be held and manipulated. The jaw fragment from King's Seat is similar in form to many Romano-British examples (Manning 1985: 6-7, Plates 2-4), and also bears close similarities to an 8th- to 9th-century AD Anglo-Scandinavian example from Lea Green, in North Yorkshire (Noon 2010), and to early medieval examples from Flixborough, North Lincolnshire (Ottaway *et al.* 2009: 317-8, Fig 10.1, 3063).

Another tool recovered with a likely association to metalworking is an intact chisel with a circular perforation through the shaft 51.6 mm below the head (SF 4127; Figures 3.11 and 3.21). Chisels were used by blacksmiths for the cutting of hot or cold iron, with cold chisels shorter in length and usually handheld, and hot chisels often longer and sometimes hafted with a wire loop to protect the smith from the hot metal (Goodall 2011: 9). The perforation in the King's Seat example suggests it may have been threaded with a wire loop for use as a handle, which in turn may indicate that this example was used as a hot chisel. Similar probable metalworking chisels are known from early medieval contexts at Buiston in Ayrshire, and Dunollie and Dunadd in Argyll and Bute (MacSween 2000: 268-9; Alcock and Alcock 1987: 2:D14, 8; Lane and Campbell 2000: 166, 1343, 1631), although only one has a perforation through its shaft. That one is from Dunadd (1343) and has its perforation approximately one-third of the way down below the head in roughly the same location as the King's Seat example; the Dunadd object, however, has a rivet inserted through the perforation holding two copper alloy plates which are interpreted as part of a binding (Lane and Campbell 2000: 163).

SF 4127 Chisel. Intact with lightly tapering sides, a burred square head, tapering rectangular-sectioned shank, and a slightly flared flat tip. There is a central perforation about one third of the way down below the head (51.6 mm), which it is argued is likely for handling and which could indicate a use associated with ferrous metalworking. Obscured by heavy corrosion. Likely early medieval. L 184.5mm; head W 28.4 mm, T: 24.7 mm; Tip W 19.1 mm; Perforation D 4.8 mm. Mass 411.49 g. Context [406]. Figures 3.11 and 3.21.

SF 4207 Jaw fragment from metalworking tongs. Gently curved in an S-shape and tapering from a likely rectangular section at the break near the pivot point to a possible plano-convex section. The tip is possibly curled upwards, though the corrosion makes this unclear, and is possibly broken or distorted by heat. Likely broken right at the pivot point. Obscured by corrosion. Not closely dateable. L 81.9 mm, W 11.3 mm, T 7.4 mm. Tip, W 6.5 mm, Th: 4.3 mm; at break, W 10.2 mm, T 5.0 mm. Mass 29.94 g. Context [403]. Figure 3.12 C.

Leatherworking

The two awls from King's Seat are likely to be associated with leatherworking. Awls are used to pierce holes in the leather to receive stitching, and they generally have an expanded waist and two thin, tapering equal-length arms, one of which would have been hafted into a handle of bone, antler, or wood (Ottaway 1992: 552). Both of the examples from King's Seat have diamond-shaped cross-sections on their working arms, with the hafted arm of SF 4120a displaying a circular cross-section, and the hafted arm of SF 634 more ovoid in shape. Awls with diamond-shaped cross-sections are particularly suitable for leatherworking as they are able to make very clean cuts into the material (Ottaway 1992).

A large assemblage of awls associated with leatherworking was retrieved from Anglo-Scandinavian contexts in York, at Coppergate (Ottaway 1992: 552-3), and others have been found at several early medieval sites in Scotland, including: three from Dunadd, Argyll and Bute, with square, circular, and possible diamond-shaped cross-sections respectively (Lane and Campbell 2000: 163-6, illus 4.71); a circular cross-sectioned example from Dunollie, Argyll and Bute (Alcock and Alcock 1987: 2:D14, 29); examples with circular and pyramidal-shaped cross-sections from Buiston, Ayrshire (MacSween 2000: 268); one with a circular-shaped cross-section from Dundurn, in Strathearn (Alcock *et al.* 1989: 2:F8, 25); and a possible example from Lair, in Glen Shee (McLaren 2019a: 89, Cat 5).

SF 4120a Awl. Tapering from a broken circular cross section to a diamond-section arm with a damaged, angled tip. Partially obscured by corrosion. Not closely dateable. L 53.8 mm, W 6.0 mm, T 6.0 mm, D 5.8 mm. Mass 5.91 g. Context [403].

SF 634 Probable Awl. Square section with two tapering arms. One arm bent 45 degrees with a plano-convex or more ovoid section. The other arm has a diamond-shaped section and slightly bent tip. Partially obscured by moderate corrosion. Not closely dateable. L 58.5 mm, W 5.7 mm, T 6.9 mm, Ovoid section, 3.2 mm x 4.2 mm. Mass 6.68 g. Context [601].

Agricultural

The incomplete ploughshare (SF 4241) (Figure 3.10 A) found in the central enclosure on the summit is of a type that was widely used to shoe the tip of a plough's wooden share and protect it from wear. The share ran behind the plough's coulter, which sliced the ground, while the share undercut it creating the furrow (Goodall 2011: 77). Iron ploughshares have been in use since the Iron Age, though they are of a different form to the King's Seat example. Iron-Age examples tend to have a short tip with an almost circular cross-section that tapers to a rounded point, sometimes with long, open sockets, while Roman examples tended to form the complete tip of the share rather than acting as a protecting plate (Manning 1985: 43-4). An 8th- to 11th-century Anglo-Saxon example recovered from Flixborough, has a pointed blade and sides that step in to form the socket (Ottaway 2009a: 245, fig 6.1, 2360). In contrast, the King's Seat share tapers to a point, but the surviving flange of its socket presents an ovoid section, and in form it is almost identical to a 12th- to 13th-century example from South Witham, in Lincolnshire (Goodall 2011: 84-5, fig 7.2, F5).

SF 4241 Ploughshare. Incomplete flanged ploughshare with wood remnants adhering through corrosion to interior surface. Tapering with an ovoid section and pointed tip. Loss of material and damage to one half and to tip. Moderate corrosion. Likely early medieval. L 115.5 mm, W 78.9 mm x 70.7 mm, T 8.4 mm. Mass 254.44 g. Context [403]. Figure 3.10 A.

Other implements

Three other tools are either not readily identifiable or cannot be assigned to a particular function: these are a possible spatulate tool (SF 4062; Figures 3.12 E and 3.20), a conical ferrule (SF 4125; Figure 3.12 D), and a two-pronged implement (SF 647).

With only the tang and shoulders of the likely spatulate tool surviving, it is not possible to assign a date or specific function to it, though it does share similarities with a type of agricultural tool known as a spud, which was a type of hafted blade used for cleaning the earth from ploughs, shovels and other digging tools (Goodall 2011: 82, 103, fig 7.11, F128-30). It also bears resemblance to the tang and shoulders of a single handled saw recovered from Dunadd, Argyll and Bute; in a single handled saw the tang is set into a wooden handle and the teeth are set along the bottom edge of the spatulate end. These particular types of tools seem to be associated with the early medieval period and are thought to have been possibly used for cutting wire (Laing 1975: 296, fig 106, 2).

Conical ferrules are common finds within Scottish metal assemblages from the late Iron Age to the early medieval period (McLaren 2019a: 89). Often identified as weaponry (including spear, javelin, and arrow tips), these objects are designed to protect the tip of a wooden shaft, but could also have performed other domestic functions, for instance as pokers, like the Lair example that was recovered from the fill of a hearth (McLaren 2019a: Cat 7). The conical ferrules 10mm in diameter recovered from Dunollie, Argyll and Bute,

Figure 3.22: Conical ferrule SF 4125.

have been interpreted as arrow tips due to their small size (Alcock and Alcock 1987: 2: D12-3), though other uses are plausible. Similar conical ferrules to the King's Seat example are known from Dunadd (Lane and Campbell 2000: 161-2, Illus 4.71), Mote of Mark, Kirkcudbrightshire (Laing and Longley 2006: 89, 2235), and Buiston, Ayrshire (MacSween 2000: 269).

The function of the two-pronged implement is not clear, but it is likely that this was some type of precision tool designed to either hold or shape an object or material and may have associations with metalworking or leatherworking. A similar two-pronged object with circular stem is known from Dunollie (Alcock and Alcock 1987: 2:D11, illus 16, 30). Though much shorter in length the find has been tentatively interpreted as the upper arm of a balance, or possibly a mirror handle, though these interpretations are only speculative.

SF 4062 Fragment of a possible spatulate tool. Complete tapering shank with rounded tip expanding to the sloping shoulders of the rectangular-sectioned broken spatulate end. Similar in form to a spud or a single-handed saw. Obscured by corrosion. Not closely dateable. L 74.6 mm, W 34.0 mm, T 8.5 mm. Tang, L 53.3 mm, W 15.7 mm. Mass 69.15 g. Context [401]. Figures 3.12 E and 3.20.

SF 4125 Conical ferrule. Tapering conical ferrule with slightly bent and broken tip. No clear weld-seam. Largely intact, though heavily corroded with some loss to the base. May contain wood remnants within interior corrosion. Not closely dateable. L 92.2 mm, D 26.4 mm, T 3.5 mm. Mass 81.38 g. Context [403]. Figures 3.12 D and 3.22.

SF 647 Two-pronged implement. Thin circular sectioned and lightly tapering shank, with a broken end and possible wood remnants towards the break. Long and thin, expanding to twin plano-convex integral prongs with rounded tips. One intact, one broken. Precision tool possibly associated with metalworking or leatherworking. Moderately corroded. Not closely dateable. L 153.3 mm, W 11.5 mm, T 14.3 mm, D 4.6 mm. Prong T 3.5 mm. Wood at tip of tang, L 10.7 mm, W 10.0 mm. Mass 37.23 g. Context [601]. Figure 3.13 A.

Security equipment

Three items of security equipment were identified within the assemblage; two barbed-spring padlock bolts (SF 4147; Figure 3.9 A and SF 4267; Figure 3.9 C) and a padlock key (SF 4087; Figures 3.9 B and 3.23), all three of which are components of the same form of barb-spring barrel padlock. Padlocks such as these are thought to have been used on doors and chests, although their use in securing people and animals is also a possibility (McLaren 2019a: 91).

Barb-spring barrel padlocks are a long-lived type in Britain known from the Iron Age until around the 16th century (Laing 1975: 294; Manning 1985: 95-6; Alcock 2003: 99; Goodall 2011: 231). They consist of a sub-rectangular or barrel shaped casing with a U-shaped hasp projecting from one end. A loop-headed, barbed bolt slides into a square or rectangular aperture in the opposite end, with the point of the hasp fitting through the looped head, and the barb-springs securing the bolt in place (McLaren 2019a: 91).

They are used in conjunction with a barrel padlock key. This usually consists of a flat bar with one end upturned at a right angle, which either has a slot, or a rectangular or square hole in the end (Laing 1975: 294). The key is then inserted into the casing over the bolt, compressing the springs and allowing the lock to release (Egan 2010: 91-2). This particular type of key is typical from around the 6th to 11th centuries AD (Ottaway 1992: 676).

A close parallel in form to the barb-springed, padlock bolt (SF 4147) is known from Dundurn, which displays a looped head, a dumb-bell-shaped catch-plate, a rivetted rod, and a shorter length of rod in relation to the height of the catch-plate (Alcock *et al.* 1989: 2:F5, illus 30, 7). The Dundurn example, however, is almost twice the size of the King's Seat example; the difference in size may be attributable to the requirement of a padlock for a door as opposed to a chest (Alcock 2003: 99). Another close parallel was recovered in 1882 from Munro's excavations at Buiston, Ayrshire. Identified in the original catalogue illustration as an 'iron object' (Crone 2000: 146, fig 120, 237), it is a barb-spring, padlock bolt with a long barbed rod and a short catch-plate bent around at 90 degrees to a looped head for the hasp to insert into. Barbed padlock bolts and barrel padlock keys are also known from other early medieval Scottish sites, including a possible padlock key from Dunadd,

Figure 3.23: SF 4087 slide key.

Argyll and Bute (Lane and Campbell 2000: 168, 843), and a rectangular padlock casing with integral U-shaped hasp from Lair, in Glen Shee (McLaren 2019a: 91).

SF 4087 Key for a barrel padlock. Straight stem with flat rounded rectangular section, expanding slightly towards the broken end. Bit is intact and is formed by the flattening of the shank, which has then been bent upwards. The flat rounded bit has either an open slot for the padlock spring shank or a portion of the rectangular aperture has been lost. Heavily corroded and in three sections. Re-joined in conservation with the bit-form revealed. Not closely dateable. L 148.6mm. Stem W 9.7 mm, T 4.9 mm; Bit H 13.9 mm, D 19.9 mm, T 4.8 mm. Perforation W: 6.8 mm. Mass 31.14 g. Context [403]. Figures 3.9 B and 3.23.

SF 4147 Barbed-spring padlock bolt for a barrel padlock. Intact. Catch-plate has a perforated rounded terminal and projecting spring shank with a squared tip (possibly broken). Springs are intact and well preserved but obscured by heavy corrosion. Catch-plate form unclear, but possibly dumbbell-shaped. Obscured by corrosion. Likely Early medieval. L 41.6 mm, W 11.5 mm, H 30.7 mm, T 2.6 mm. Loop D 11.0 mm, perforation 3.4 mm, shank W 6.0 mm x 6.5 mm. Mass 14.44 g. Context [409]. Figure 3.9 A.

SF 4267 Barbed-spring padlock bolt for a barrel padlock. Intact, with tapering spring shank bent upwards to form the catch-plate. All one piece. Catch-plate end is fanned slightly by flattening, with lightly rounded sides. No evidence of a perforation, it is possible that the perforated tip is missing, or that the flattened end simply rested against the lock pin, but obscured by corrosion. Likely early medieval. L 65.0 mm, W 11.8 mm, H 26.9 mm, T 5.0 mm. Catch-plate H 23.4 mm, W 9.4 mm, T 2.1 mm. Spring W 9.0 mm. Mass 10.02 g. Context [403]. Figure 3.9 C.

Lighting equipment

One object relating to lighting was recovered in the form of a pricket candlestick (SF 308). Most likely used for internal lighting, pricket candlesticks consist of a double ended tapering spike, usually with two side scrolls for the candle to rest atop. They were used by impaling the candle on to the spike, with the tapered rod set into the ground or a piece of wood, such as a beam or bracket (Ottaway 1992: 679; Goodall 2011: 299). Candlesticks with spiked stems are known from the Romano-British period (Manning 1985: 99), though this particular type of pricket candlestick is generally regarded to have been in use mainly between the 12th and 15th centuries AD (Goodall 2011: 299). Nevertheless, pricket candlesticks are also known from earlier contexts, such as 9th- to 11th-century Anglo-Scandinavian examples from Coppergate, York (Ottaway 1992: 679).

SF 308 Pricket Candlestick. Broken pricket with two vestigial side scrolls. Stem, pricket, and side scrolls broken. Completely obscured by heavy corrosion. Possibly Early medieval. L 104.2 mm, W 22.3 mm, T at stem 8.4 mm, scrolls 4.0 mm, pricket 4.1 mm. Mass 63.85 g. Context [305].

Building fixtures and fittings

The classification of building fixtures and furniture fittings encompasses all iron objects associated with the structural components of a building and the doors, windows, and furniture it contains. Finds from King's Seat include nails, strap fragments (SF 4248/4249) and hinges. Small U-shaped hinges would have formed half of a looped hinge fitting and would likely have been associated with small boxes or caskets (Ottaway 1992: 641).

SF 4248/4249 Strap fragments, joining. Flattened rectangular section with a slight curve. No evidence of perforations or rivets. Possible barrel strap. Heavily corroded. Not closely dateable. L 210.4 mm, W 27.9 mm, T 3.0 mm. Mass 89.30 g. Context [403].

SF 613 Fragment of a possible small hinge with U-shaped eye. Flat rectangular base with possible perforation transitioning to a rectangular to ovoid sectioned loop projecting from the centre of the top. The second fragment is a square-sectioned possible shank expanding to a teardrop- shaped terminal. The ovoid section at the break likely joins with the first fragment. Heavily corroded and not closely dateable. 1) L 30.4 mm, W 11.4 mm, T 2.8 mm; Shank D 4.0 mm x 5.9 mm. 2) L 25.6 mm, W 5.8 mm, T 4.8 mm., Mass 4.94 g. Context [601].

Nails

A total of 19 nails were recovered, eight of which are intact, five largely intact, and six are fragmentary. Nails are ubiquitous on settlement sites, with hand-wrought nails being long-lived types that saw very little change, and, as such, most nail forms are not closely

dateable. Nails are typically classified using well-established nail typologies constructed to categorise large and well stratified excavated assemblages. In this instance the nails were classified using Alcock's system of nail classification devised for the large, excavated assemblage of over 100 nails recovered from Dundurn (Alcock *et al*. 1989: 2: F3-G6). The Dundurn assemblage was divided into five classes based on length, as well as the shapes of the head, shank, and tip:

- Class I: Large spikes over 170 mm in length with flat circular heads measuring approximately 35mm in diameter. Used for fastening timbers.
- Class II: Long nails generally 105-120 mm in length with rectangular or T-shaped heads, twice as long as they are wide. Used for general carpentry.
- Class III: Nails 95-105 mm in length with square, polygonal, or sub-circular heads. Generally with a square cross-sectioned shank and a flat or chisel tip.
- Class IV: Small version of Class III nails around 65-72 mm in length. Sub-rectangular heads and ovoid shanks squaring off to a pyramidal tip.
- Class V: Tacks 40-50 mm in length with square shanks and large flat round heads around 14 mm in diameter.

Based on this system, of the 14 nails from King's Seat that can be classified, 11 fit the parameters of Class III nails, displaying square to sub-circular, slightly peaked heads, square to rectangular cross-sectioned shanks, and flat or chisel tips, though they are slightly shorter than those described at Dundurn, falling between 76.6 mm and 78.8 mm in length. One possible Class III or Class IV nail was also identified, having the same head-shape as those described, but its broken shank prevents exact classification based on length. The remaining two nails fall under the category of tacks, which are Class V nails. Both of these measure between 22.5 mm and 41.5 mm in length and have flat round heads around 16 mm in diameter.

Of the eight intact nails recovered, three are straight, and the remainder are either clenched or bent in an S-shape. The surviving form of the shank can all help to indicate whether the nails had been removed from their fixtures (bent), perhaps for salvage, or if their fixtures had rotted or been burnt with the nails *in situ* (straight and clenched), but the assemblage here is too small for any useful conclusions to be drawn. Most of them were recovered from within the central enclosure, but beyond their general use in the carpentry, for example, the building identified there and its fittings, it is not possible to suggest their purpose with any certainty. Two nail fragments were recovered from contexts [7005] and [7013] within the eastern enclosure, associated with a large dump of smithy rake-out material and possibly suggesting that nails were being produced on-site. None of the nails are closely dateable, but their forms match those from other early medieval assemblages, such as Dundurn (Alcock *et al*. 1989: 2:F3-G6), Dunadd (Lane and Campbell 2000: 169) and Dunollie (Alcock and Alcock 1987; 2: E1) in Argyll and Bute, Alt Clut, Dunbartonshire (Alcock and Alcock 1990: 2: D7), and Mote of Mark, Kirkcudbrightshire (Laing and Longley 2006: 115).

Horse equipment

No discernible features can be made of the horseshoe fragment (SF 211 / SF 212) without x-radiography, which shows one intact nail hole with countersunk slot, two partial nail holes, what appears to be a slightly wavy exterior edge, a narrow rounded internal profile, and a down-turned caulkin. In such an advanced state of corrosion, the dating of this horseshoe is problematic. Certain features, such as the countersunk rectangular nail holes and the slightly undulating outside edge suggest a date somewhere between the 9th and 13th centuries AD (Ottaway 1992: 708; Goodall 2011: 371), but the state of the corrosion prevents conclusive estimate, and it could prove to be either earlier or later in date.

SF 211/212 Horseshoe fragment. Two joining pieces. 1) Toe with a partial branch on either side. One rectangular nail hole with a countersunk slot with squared ends on one side, together with one partial nail-hole, and one partial hole on the other side. Slightly wavy external edge and narrow rounded internal profile. 2) Flat, rectangular sectioned terminal with downturned caulkin. Branch expands and curves around to a break showing a plano-convex section. Heavily corroded, but no nail holes visible on x-ray. Multiple layers of iron material within corrosion product. Possibly 9th to 13th century. 1) L 43.6 mm, W 75.5 mm 2) L 87.7 mm, W 26.1 mm. Mass 187.22 g. Context [202].

Unclassified objects

Twenty-two iron finds could not be classified to type, either due to their fragmentary state, or their advanced state of corrosion. For most of these objects, possible interpretations are suggested, but due to a lack of positively identifiable features, none can be considered definitive. They comprise possible nail shanks, fixtures and fittings, possible pin shanks, perforated bars and other unidentifiable lumps, as well as a hooked arm of a possible strike-a-light.

SF 1015 Non-classifiable. Broken square section with slightly bent tip. Tapers on all four sides. Possible tapering nail shank. Obscured by heavy corrosion. Not dateable. L 46.5 mm, shank D 4.2 mm. Mass 4.01 g. Context [002].

SF 423 Non-classifiable. Roughly square-shaped plate, heavily corroded and fragmented, with possible square sectioned shank protruding from centre. Possible clench bolt and rove fragment. Not clear as is heavily corroded and the X-ray is inconclusive. Not dateable. Plate L 42.8 mm, W 23.5 mm, T 2.7 mm. Shank D 7.5 mm. Mass 29.78 g. Context [401].

SF 427 Non-classifiable. Unidentifiable fragment. Partially vitrified? Some wood adhered. Unknown material. Possibly heavily corroded bar or shank fragment. Roughly square to rectangular section, bent and delaminating. Not dateable. L 52.8 mm, W 14.9 mm, T 15.1 mm. Mass 14.24 g. Context [401].

SF 4045 Non-classifiable. Possible nail shank fragments. Heavily corroded and fragmented. Tapering rectangular section expanding on one end to a possible head fragment. Not dateable. L 20.2 mm, Shank D 5.5 mm. Mass 4.51 g. Context [401].

SF 4056 Non-classifiable. Flat rectangular tab with rounded base and waisted pinched section at top before expanding at possible break. Possible strap or hinge fragment. Not dateable. L 30.0 mm, W 19.0 mm, T 2.7 mm. Mass 4.18 g. Context [401].

SF 4106 Non-classifiable. Likely hook fragment with a possible square cross-section. Straight segment transitioning to semi-circular curve. Both ends broken. Not dateable. L 27.2 mm, W 3.5 mm, Internal D 10.5 mm. Mass 4.89 g. Context [403].

SF 4120b Non-classifiable. Tapering shank bent in an S-shape. Possible pin or nail/tack fragment. Not dateable. L 20.3 mm, Shank D 2.7 mm. Mass 1.54 g. Context [403].

SF 4126 Non-classifiable. One third to one half section of a cylindrical ferrule. One end possibly intact. Not dateable. L 32.4 mm, W 15.1 mm, H 4.8 mm, T 2.2 mm. Mass 2.98 g. Context [403].

SF 4129 Non-classifiable. Unidentifiable fragment. Thin rectangular section, tapering to a point. Similar to a knife tang, but too thin. Not dateable. L 23.7 mm, W 9.6 mm, T 2.0 mm. Mass 1.14 g. Context [403].

SF 4137b Non-classifiable. Bears some resemblance to the hooked arm of a fire-steel or strike-a-light. Tapering body, end broken. Top has one arm protruding from the top and curled over to one side. One side lost. Section unclear. Not dateable. L 30.2 mm, W 21.7 mm, arm T: 4.4 mm. Mass 15.69 g. Context [403].

SF 4188 Non-classifiable. Flat possible rectangular section tapering to a pointed tip. Bent near 90 degrees. Possible staple fragment or similar. Not dateable. L 15.3 mm, W 11.7 mm, H 12.5 mm, T 4.0 mm. Mass 2.62 g. Context [403].

SF 4197 Non-classifiable. Unidentifiable fragment. Aerofoil section broken at a possible perforation. Roughly square body with rectangular arm projecting from one side. Similar to a tang and blade fragment with shoulder, apart from a V-sectioned protrusion on one side of what would be the rectangular sectioned tang. Unknown function. Not dateable. L 33.4 mm, W 6.6-15.4 mm, T 3.2-4.4 mm. Mass 3.15 g. Context [403].

SF 4210 Non-classifiable. Perforated bar fragment. Rectangular section, both ends broken, but with small circular perforation towards one end. Perforation does not expand metal on either side, suggesting that it was drilled rather than punched. Not similar enough to a needle to class as a needle. Not dateable. L 59.0 mm, W 9.5 mm, T 5.2 mm. Mass 7.93 g. Context [403].

SF 4211 Non-classifiable. Small tapering shank rounding through 90 degrees to terminate in a pointed tip. Shank form unclear. Possible pin fragment. Not dateable. L 12.4 mm, D 2.4 mm. Mass 0.94 g. Context [403].

SF 4255 Non-classifiable. Rectangular sectioned tapering bar fragment in two joining sections. Both ends broken. Heavily obscured by corrosion. Not dateable. L 83.5 mm, W 11.5 mm, T 8.0 mm. Mass 21.09 g. Context [403].

SF 610 Non-classifiable. Circular section curving to 90 degree change in angle at one end. Both ends broken. Possible pin shank. Not dateable. L 34.0 mm, D 4.0mm. Mass 2.29 g. Context [601].

SF 629 Non-classifiable. Two joining unidentifiable fragments. Heavily corroded. Roughly ovoid section could suggest a buckle tongue or similar. Not dateable. L 28.4 mm, W 5.3 mm, T 4.6 mm. Mass 2.11 g. Context [601].

SF 636 Non-classifiable. Heavily corroded. Section unclear. Possible pin shank or wire fragment. Not dateable. L 23.7 mm, W 3.5 mm. Mass 2.95 g. Context [601].

SF 649 Non-classifiable. Possible knife tang, though may equally be a nail shank or similar. Broken end tapering to a rounded tip. Section not visible. Completely obscured by heavy corrosion. Not dateable. L 51.6 mm, W 7.8 mm. Mass 11.06 g. Context [601].

SF 661 Non-classifiable. Unidentifiable lump, completely obscured by heavy corrosion. X-ray is inconclusive. Not dateable. L 13.5 mm, W 9.3 mm. Mass 2.01 g. Context [602].

SF 662 Non-classifiable. Unidentifiable heavily corroded fragment. X-ray is inconclusive, possibly a nail head and shank or looped terminal. Not dateable. L 29.1 mm. Mass 4.81 g. Context [602].

RT 7013 Non-classifiable. Perforated rectangular plate fragment. Thin plate with slight curve in section. Perforation for attachment at two corners, and is broken along the opposite edge. Possible wood remnants on underside. From a smithing context. Not dateable. L 14.4 mm, W 13.1 mm, T 0.9mm. Mass 0.42 g. Context [7013].

Table 3.2: Iron objects from comparable excavated and published early medieval sites in Scotland.

		Weaponry	Knives	Tools	Nails	Ornaments	Other	Ref
King's Seat, Perthshire	Fort	X?	X	X	X	X	X	
Dunadd, Argyll and Bute	Fort	X	X	X	X	X	X	Lane and Campbell 2000
Dunollie, Argyll and Bute	Fort	X	X	X	X		X	Alcock and Alcock 1987
Dundurn, Perthshire	Fort	X	X	X	X	X	X	Alcock *et al*. 1989
Mote of Mark, Kirkcudbrightshire	Fort		X	X	X		X	Laing and Longley 2006
Alt Clut, Dunbartonshire	Fort		X	X	X	X	X	Alcock and Alcock 1990
Buiston, Ayrshire	Crannog	X	X	X		X	X	Crone 2000
Bruach an Druimein, Argyll and Bute	Open?		X	X	X	X	X	Heald and Hunter 2008
Lair, Glen Shee, Perthshire	Open		X	X		X	X	McLaren 2019a

Discussion of the iron objects

The vast majority of the ferrous finds were retrieved from topsoil and disturbed contexts. Only five were recovered from secure contexts, but these include: from the central enclosure (Trench 4), a ferrous metalworking chisel (SF 4127) from the old ground surface [406]; a catch-plate and spring shank for a barrel padlock (SF 4147) from the final deposit [409] in hearth [410]; and from Trench 6 in the western enclosure, the blade and partial tang of a possible pattern-welded knife (SF 656; Figure 3.8 B), which was recovered from the activity layer [613] underlying the slumped hearth fill [607]. Despite the general disturbance of so many of the other deposits, however, it has been argued (Chapter 2 *supra*) that the artefacts that they contained had not travelled far from where they were originally deposited. Thus, the majority of these ferrous objects can be reasonably confidently ascribed to activities that were contemporary with the occupation of the fort.

Those objects recovered from Trenches 3 and 4, therefore, indicate that in addition to everyday domestic tasks, various specialist craft activities were also taking place within the central enclosure, which is also seen in the non-ferrous finds. The quantity of knives and knife fragments recovered partly reflect those domestic duties, but the awl (SF 4120a) is probably evidence of leatherworking, the spoon-bit auger (SF 309) of carpentry, and the hot chisel (SF 4127) and the fragment from a pair of metalworking tongs (SF 4207) of smithing, this last probably in association with both the primary and secondary hearths [410] and [420] within Structure 1. The padlock mechanism (SF 4267) and a padlock key (SF 4087), on the other hand show there were things of value held here, either in chests or buildings, that needed to be locked away. Lastly the socketed arrowhead (SF 4144) provides a nod to the defensive intent of the ramparts, also confirmed by the slingshots found here.

This assemblage from King's Seat is not particularly extensive, but it provides glimpses of the craft and industry that was carried out here, as well as other facets of the day-to-day life of the inhabitants. It also makes an important contribution to the overall corpus of knowledge regarding craft and industry in mainland northern Britain during the early medieval period, filling out a picture that was much more threadbare some 20 years ago than it is today (Alcock 2003: 93). As can be seen from Table 3.2 (after Heald and Hunter 2008), the King's Seat assemblage is consistent with a series of others that have now been published.

3.9 Non-ferrous metalworking

Clay moulds

Ewan Campbell

A large number of fired clay fragments were recovered. Some are certainly mould fragments, many are possible mould fragments, while others could be fired clay from furnace lining or other processes. The red fabric of the moulds is rather coarse and seems to disintegrate rather easily, meaning there are few recognisable pieces. Very few of the fragments can be assigned to objects.

All of the certain mould fragments come from Trench 4 and almost all are from the heavily disturbed upper deposits in the stratigraphy, contexts [401] and [403]. The certain mould fragments are important as they

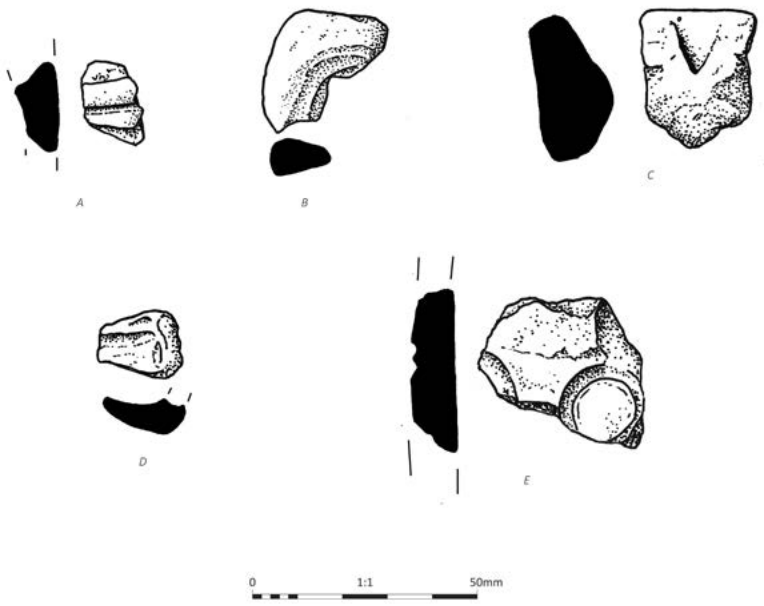

Figure 3.24: Pin shaft mould fragment SF 4114 (A), part of a ring or brooch mould SF 4078 (B), lower valve of mould with triangular keying mark SF 4100 (C), clay brooch terminal mould SF 4066 (D) and brooch hoop or ring mould SF 4123 (E).

show that the type of objects being cast, and that the method of making the two-piece moulds is similar to that in other high-status sites of the period in Scotland, such as the Brough of Birsay on Orkney, Mote of Mark in Kirkcudbrightshire, Dunadd in Argyll and Bute, and Rhynie in Aberdeenshire. These have a lower, flat valve and an upper plano-convex valve, luted together with clay at the edges. One fragment (SF 4100; Figure 3.24 C) shows the keying method consisting of a triangular incision made by a knife point. This is similar to the type of keying found at the Brough of Birsay and differs from the vertical cuts seen on the edges of the moulds at Dunadd, a type seen on (SF 4160).

Only two moulds were retrieved from *in situ* deposits, both from the central enclosure (Trench 4, contexts [404] and [406]). The mould for a brooch hoop or ring (SF 4123; Figure 3.24 E) was retrieved from the spread of a collapsed stone structure [404] of unknown date, and part of a pin mould (SF 4160) from the old ground surface [406]. Other finds from the old ground surface [406] include E ware pottery (SF 4154), and a fragment of copper alloy casting debris (SF 4264).

Brooch

The most significant piece (SF 4066; Figure 3.24 D) has the only possibly identifiable object, part of a brooch terminal with a collar at one end. So little survives this cannot be a certain identification, but there are similarities to the collared Type G3 brooches found at Dunadd (Lane and Campbell 2000: 112, fig 4.8), which have been dated to the 7th century.

SF4066 Small part of upper valve of mould, showing possible curved terminal with collared end. Context [404]. Figure 3.40 D.

Pin moulds

There are four examples of pin moulds (SF 4160, 4114, Figure 3.24 A; 4180, 4101b), though as only the shafts are represented these are undiagnostic.

SF 4160 Part of a lower valve of a long mould showing part of the shaft of a pin. Shaft L 25+mm, D 3 mm. Possibly starting to expand to pinhead or ingate at one end. Two parallel-sided keying marks at one end. Context [406].
SF 4180 Part of a lower valve of a mould for a pin. Shaft L 15 mm, W 1 mm. Context [403].
SF 4101bPart of a pin shaft. Context [403].
SF 4114 Part of a mould with part of a pin shaft. Shaft L 11 mm, D 1.5 mm, circular section. Context [403]. Figure 3.24 A.

Rings or brooch hoops

There are several fragments that appear to be from circular objects, either rings or brooch hoops (SF 4078;

4101a, 4123; 4236a). SF 4043 is very degraded but might represent part of the hoop of a possible brooch. SF 4123 shows a complete small ring similar to ones from Dunadd (Lane and Campbell 2000: fig 4.38). This piece was stratified in the collapse from the stone platform at the back of the lower terrace in the central enclosure, context [404]. Although there was evidence of burning on this platform, context [407], there was no evidence this was associated with metalworking, and in view of the socketed iron arrowhead (SF 4144) in the makeup of the platform, it seems likely that the mould fragment was incorporated likewise. This, however, may be why it has survived in more complete form, undisturbed by later agricultural activity.

SF 4078 Part of a lower valve of a mould, with part of the hoop of a ring or brooch. Diameter 60-70 mm, width of hoop 3 mm, possibly of circular section. Context [403]. Figure 3.24 B.

SF 4101a Part of the upper valve of a mould for a small circular ring or brooch, diameter *c.* 50 mm. Remains of luting clay on edges. Context [403].

SF 4123 Part of the lower valve of a mould showing a fairly complete ring, diameter 20 mm, hoop diameter 3 mm. Context [404]. Figure 3.40 E.

SF 4236a Part of a lower valve of a mould with the edge of a ring *c.* 30 mm in diameter. Context [403].

SF 4043 Two fragments of a mould showing very abraded part of the hoop of a possible brooch. Context [401].

Larger miscellaneous objects

SF 4236b Part of the upper valve of a mould for a large object. Context [403].

SF 4100 Part of the lower valve of a large mould. A flat triangular keying mark at one edge. Context [403]. Figure 3.24 C.

Stone moulds

Dawn McLaren, Andrew Morrison, and Ewan Campbell

Bar ingot moulds

The bar ingot moulds are a type found on other metalworking sites of the period, such as Dunadd, Argyll and Bute (Lane and Campbell 2000: 192, illus 4.107-9); Garranes, Co. Cork (Ó Riordáin 1942: 108-9, fig 10); Lagore royal crannog, Co. Meath (Hencken 1950: 170, fig 88); and Rhynie, Aberdeenshire (Cruikshanks forthcoming), where large numbers have been found. Typically, they have multiple moulds on each stone, often on several faces of the block, as is the case at King' Seat, where three stones bear evidence of a total of eleven moulds. The shape of the bar ingots is usually rectangular with rounded ends, the rounded ends presumably making it easier to extract the metal

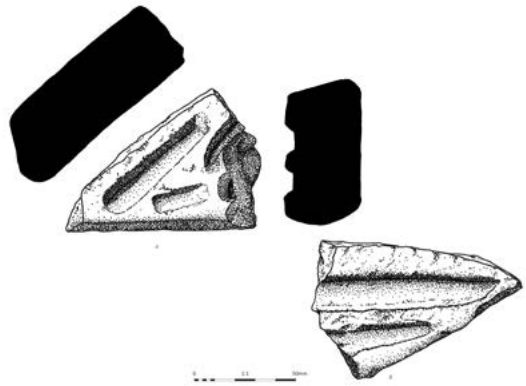

Figure 3.25: Sandstone bar ingot mould, both faces SF 1011.

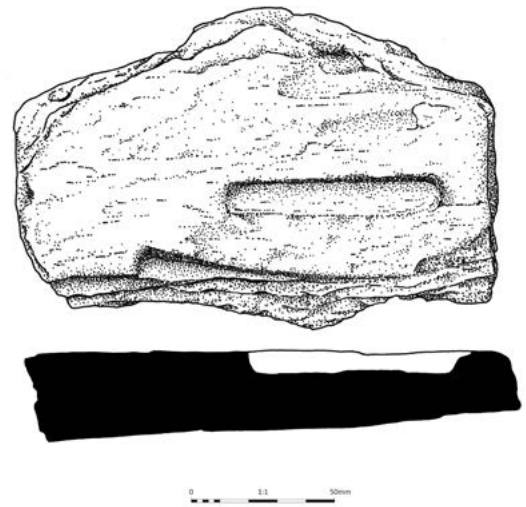

Figure 3.26: Schist complete and partial bar ingot mould SF 617.

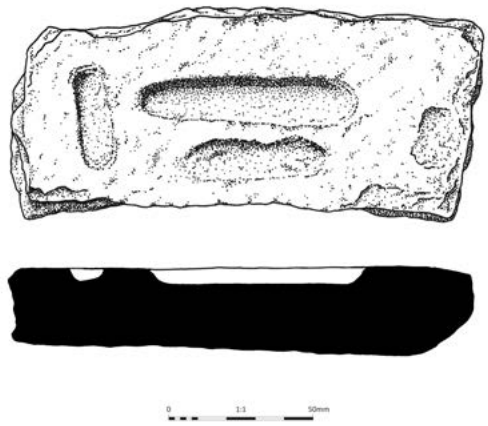

Figure 3.27: Schist bar ingot mould, lower mould possibly incomplete SF4157.

bar from the mould. Surviving ingots of this shape are often copper, silver or gold.

The 11 King's Seat bar moulds have a variety of lengths, from very small at 30 mm to over 100 mm, but are generally the same width and depth. The ingots would have been used for a variety of purposes. Some could have been blanks that were hammered out to create specific wrought artefacts; others may have been used as stock for metalworkers, or for ease of exchange in trade. None of the moulds were from *in situ* deposits.

SF 1011 Block of red sandstone with bar ingot moulds on two opposite faces. One face has two complete rectangular moulds (Figure 3.25 A), 61 x 12 x 7 mm, and 45 x 7 x 5 mm; there are also the ends of two other moulds probably of similar shape. The other face (Figure 3.25 B) has two incomplete moulds, one L 12 x W 80+ x T 7 mm, the other L 7 x W 50+ x T 5 mm. Context [102/4]. Figure 3.25.

SF 4157 Slab of flaggy schist with three complete ingot moulds on one face. The largest is L 75 x W 12 x T 6 mm, another L 30 x W 10 x T 5 mm. The third is shallow, pecked, and appears unfinished, *c.* L 45 x W 10 x T 3 mm. Unstratified. Figure 3.27.

SF 617 Slab of flaggy schist with one complete and one partial bar ingot mould on one face. Complete mould is L 70 x W 11 x T 7 mm, the incomplete L 100+ x W 5+ x T 7 mm. Context [601]. Figure 3.26.

Mirror moulds

Two of the stone moulds found at King's Seat are unusual. Both have the same shape, of a handled mirror. If these are moulds for molten metal, as seems likely, the object produced would be quite thick and too small to be a mirror. It is possible they are just an unusual form of ingot mould, like the ox-hide shape of some Bronze Age ingots. Similar moulds have been found at other contemporary sites: Portmahomack monastery, Tarbat, Easter Ross (Carver *et al.* 2016: 275); the Irish royal fort of Garranes, Co. Cork (Ó Ríordáin 1942: 109, fig 10, no. 445); and at Nendrum monastery, Co Down (Lawlor 1925: 135, Pl X, no. 19). Lawlor suggested they were used to beat out sheet metal in the form of a cresset lamp, but no such lamps have been found in early medieval contexts. Some stone cresset lamps are known, but these do not have the same outline form and are deeper and less regular. As a result, the function of these moulds remains unknown, though all have been found in contexts where metalworking was taking place. It might be suggested that the object has some connection to the well-known mirror symbol, found on Pictish symbol stones, but this seems unlikely given the wide spread of known examples outside Pictish Scotland. It is interesting that a saddle quern has been re-used for one example. The red sandstone of the quern is ideal for making detailed moulds, but the re-use of an prehistoric object may also have been a deliberate act, as older querns were often incorporated in later buildings (McLaren and Hunter 2008; McLaren 2013).

SF 207 A slab of red sandstone with part of a mould in the shape of a handled mirror on one face. The complete handle and part of the disc survive. The handle is about 45 mm long, 20 mm broad and expands slightly to a circular terminal. Depth 10-12 mm. Context [202]. Figure 3.32.

SF 310/313 Mould fragment / sharpening stone, re-purposed saddle quern. Two joining fragments, with one fragment missing, representing approximately one third of the total mass. Small saddle quern of mid brown micaceous quartzitic sandstone, roughly triangular in plan, with secondary use as a mould for a handled mirror on the lower face. Sharpening grooves are present on the lower face as well as along both long edges of the quern and also faintly within the dished quern face. As a quern, the stone has been dressed on all sides to create a roughly triangular shape with rounded top. The top face of the quern is concave: moderately dished with raised rounded edges sloping towards the centre. A depression in the rounded corner creates a form of lip or spout-like feature. The quern face is fairly consistent in texture, with areas of smoothing and wear from abrasion. There is slight staining around the quern edges, possibly from handling during its secondary use. The lower face contains a smoothly cut mould in the form of a handled mirror, of which less than half survives. There is a slight ovoid depression along the lower face of the stone to the right of the mirror handle (L 103.6 mm, W 29.4 mm, Depth 2.8 mm), and an area of sharpening grooves above the mirror forming a sort of peak in concordance with the shape of the stone. There are three partial V-shaped linear grooves on one side of varying length and depth (Max L 54.6 mm, W 3.9 mm, Depth 1.3 mm), the longest of which contains a light orangey-brown substance or residue. There is one long, deep U-shaped linear groove on the other side of the mirror body (L 112.9 mm, W 5.7 mm, Depth 2.8 mm), with an area of smoothing to one side of it (L 50.6 mm, W 24.9 mm) possible where the side of the object was abraded against the side of the groove for sharpening its edge. There are also a number of faint horizontal linear grooves (L 35.5 mm, W 5.8 mm) above the top of the mirror body between the area of the two sets of deeper linear grooves. The two long edges of the quern contain areas of slight smoothing from abrasion and a number of linear U-shaped grooves of varying depth. The complete edge has an area of smoothing 176.0 mm in length

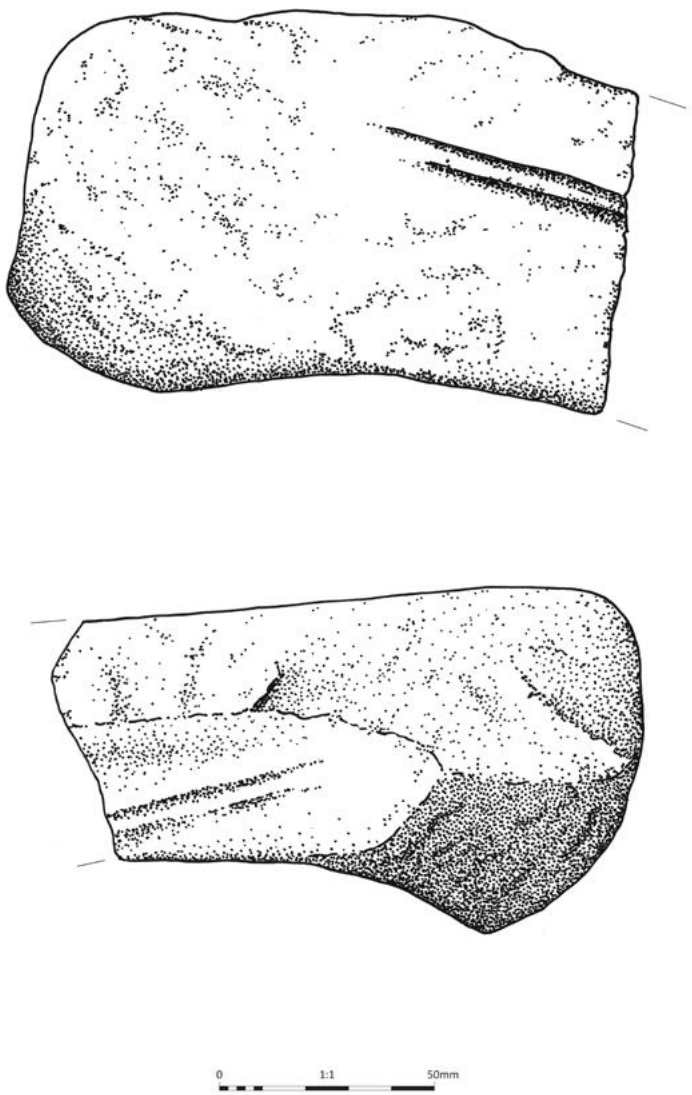

Figure 3.28: Re-purposed saddle quern, SF 310/313 showing blade sharpening marks.

Figure 3.29: View of SF 310 /SF 313 refitted to form mirror shape.

Figure 3.30: Re-purposed saddle quern, mirror mould face SF 310.

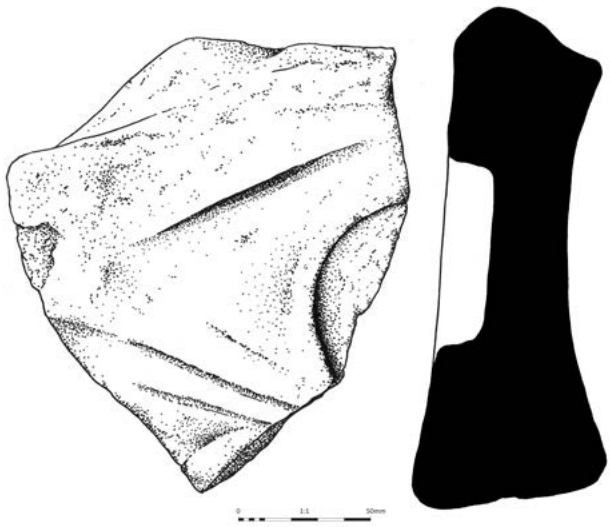

Figure 3.31: Re-purposed saddle quern, mirror mould and sharpening stone face SF 313.

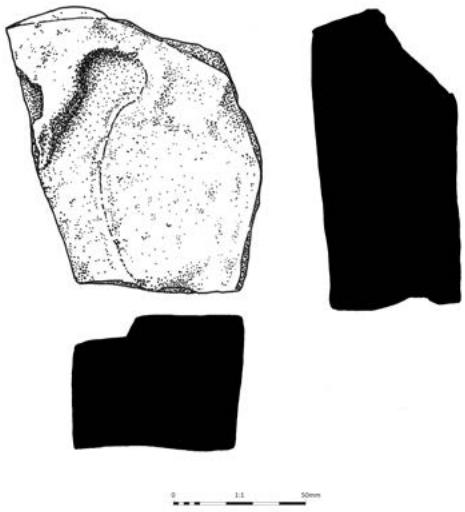

Figure 3.32: Sandstone mould fragment, mirror SF 207.

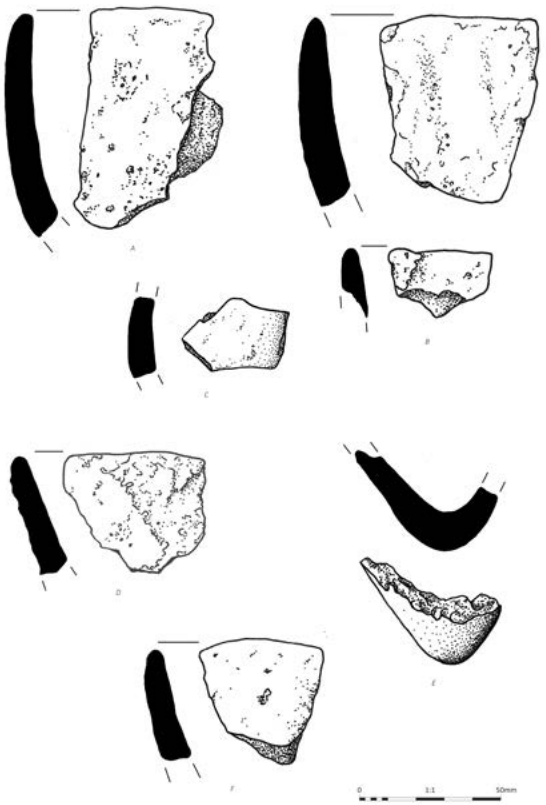

Figure 3.33: Vessel 1 thick-walled crucible SF 4138 (A), SF 4175 (B) and SF 4091 (D) and Vessel 4 thick-walled crucible SF 4190 (C), SF 4242 (E) and SF 424 (F).

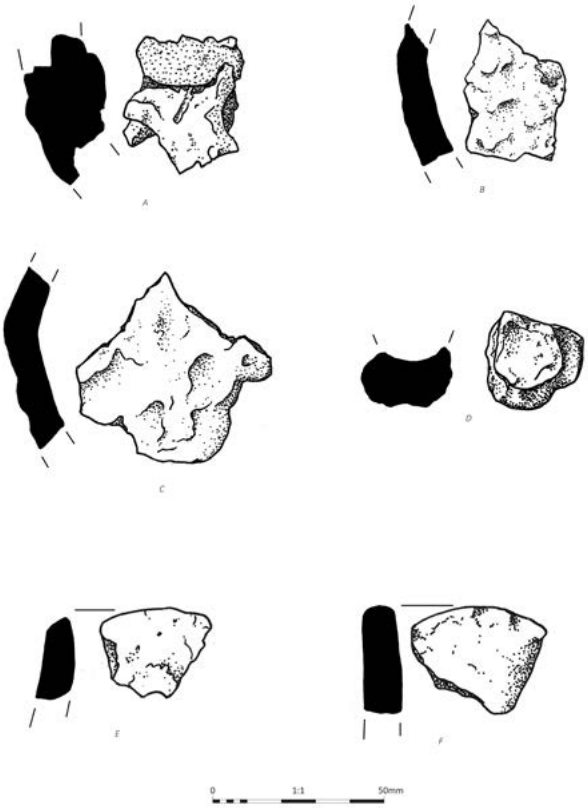

Figure 3.34: Vessel 2 thick-walled crucible SF 414 (A), SF 4200 (B), SF 4229 (C), and SF 4203 (D) and ceramic tyueres SF 208 (E) and SF 4189 (F).

by 40.6mm in width, with shallow and broad linear grooves confined to an area 153.5 mm in length by 21.6 mm in width. The surface of the opposing edge is rougher and contains two partial linear grooves (L 65.2 mm, W 4.0 mm, Depth 1.0 mm). There are also a number of shallow sweeping arched grooves or abrasions across the face of the quern (L 153.4 mm, W 66.4 mm). It is likely that the grooves are contemporaneous with the mirror mould, which made use of the opposing face of the quern. It is also possible that the mould and quern were in use interchangeably. L 292.0 mm, W 247.0 mm, T 85.7 mm. Mass 3513.7g. Context [305]. Figures 3.28-3.31.

Crucibles

Ewan Campbell and Andy Heald

The crucible fabric is much harder than that of the moulds, so survives better. Two types of crucible can be identified: a very large thick-walled version; and a smaller thinner-walled variety. Overall, this is a substantial assemblage, comparable with Dunadd in Argyll and Bute, Mote of Mark in Kirkcudbrightshire, Brough of Birsay on Orkney (Curle 1982), and Rhynie in Aberdeenshire. A striking feature, shared with the Mote of Mark, Trusty's Hill, also in Kirkcudbrightshire (Toolis and Bowles 2017) and Rhynie (Cruikshanks forthcoming) is the lack of the lidded or handled forms of crucible seen at Dunadd and Birsay. At present there is not enough evidence to say whether these technological differences in the crucible types (and in the keying methods of the moulds) are chronological, cultural, or due to the practices of individual craftsmen.

The crucibles were recovered from three trenches: 2, 4 and 6, and the vast majority were residual. One small crucible fragment (SF 4145) was recovered from an *in situ* final deposit [409] in hearth [410]. This context also produced a fragment of fired clay (SF 4164), an iron barbed-spring padlock bolt for a barrel padlock (SF 4147; Figure 3.9), a possible stone gaming piece (SF 4162), a whetstone (SF 4143a (i)), and a smoother (SF 4143a (ii)). With the presence of these other artefacts within the same hearth deposit it is not possible to be certain if the crucible fragment relates directly to the use of the hearth. Nevertheless, it is likely that the hearth, and probably the building within which it was set, formed the focal point of a craft area within the central enclosure, and that the concentration of other crucible

fragments and a ceramic tuyère (SF 4189) in adjacent deposits indicates that this included metallurgy.

Large, thick-walled crucibles

The larger type is unusual as most crucibles of this period are small. The shape is not clear, but may be the same as the smaller type; they have pointed bases. Similar vessels are present at Dunadd (Lane and Campbell 2000: Type B5, illus 4.43). It can be estimated from SF 4138 that these stood up to 100 mm high and had capacities of up to 500 ml. The exteriors of these large crucibles are heavily vitrified in places (especially the bases), but the interiors do not have slaggy deposits, so it is not certain that they were used for melting metal. Some show white material on the interior but this has not been analysed. One piece (SF 4229, Figure 3.34) shows tongmarks in the vitrification (cf Lane and Campbell 2000: illus 4.43). There are probably at least four vessels represented by 13 sherds, some of which join. The walls are 6-12 mm thick, with one base being 15 mm thick. There is no complete profile of a larger one, but they seem to be about twice the size of the smaller thinner-walled, with a correspondingly larger capacity.

Vessel 1 Two joining sherds and a rim sherd make up one side of a very large triangular-shaped crucible. Together these sherds measure at least 100mm, representing a height of at least 75mm, with a thickness of 6-10mm. The exterior has patches of green and red vitrification, but there is no internal vitrification. SF 4175/ SF 4138; SF 4091. Context [403]. Figure 3.33.

Vessel 2 Two joining wall sherds and a third basal sherd of a very large crucible. The exterior has very thick red and black vitrification, up 8mm thick on SF 414. Ridged tongmarks on one surface of SF 4229. No internal vitrification, but SF 414 has whitish inner surface. Height of vessel estimated *c.* 80-100 mm. Wall thickness 8-12 mm. SF 4229/ SF 4200; SF 414; SF 4203. Contexts [401] and [403]. Figures 3.34, and 3.36).

Vessel 3 Two sherds from a large crucible. Exterior has thick pale coloured drossy slag with some red vitrification. No internal deposits. T 5-7 mm. SF 4122; SF 4040. Contexts [401] and [403].

Vessel 4 A rim, base and body sherd of a large crucible. The base is a rounded point, with internal drossy deposits. Wall thickness 5-1 0mm. The external surfaces are smooth and unvitrified. SF 4242; SF 424; SF 4190. Contexts [401] and [403]. Figure 3.33.

Several fragments remained unassigned but relate to further thick-walled vessels.

SF 4107 Two small denuded fragments probably from a thick walled crucible. SF 4107a possibly from a base. H 13 mm, W 15 mm, T 19mm. SF 4107b: L 11 mm, W 17 mm, T 12 mm. Context [401].

Smaller, thin-walled crucibles

The smaller type of crucible has a simple triangular shape with a pouring lip in one angle. This is a long-lived form which is found from the Iron Age through to the early medieval period. The crucibles here are sub-triangular or bag-shaped, but also with a pouring lip at one corner. Generally, the walls are 3-5mm thick, but some (SF 669) are thinner and must have been made from a very refractory clay to survive the high temperatures. As with the large crucibles, they have been heated from below and only show vitrification on the exterior. From the rim fragments it can be estimated that there are at least half a dozen vessels represented. The smallest (SF 4110; Figures 3.35 A and 3.37 and SF 4140; Figure 3.35 C) with complete profiles are 50-60mm in height and had a very small capacity, holding only enough metal to make a pin or small ring. No certain copper alloy deposits were seen internally, though some have a slaggy dross or whitish coating that may indicate silver working. Two pieces have extensive vitrification of the interior. One piece (SF 608; Figure 3.35 F) is coated internally with red vitrified material, as well as on the exterior. This could be from melting red enamel, rather than metal melting. SF 214 is similar but with a pale green glaze.

SF 418 Rim of small sub-triangular crucible. T 3-4mm. Context [401].

SF 421 Base fragment of large thick walled crucible with mass of vitrification at the base. H 42 mm, W 38 mm, T 51 mm. Context [401].

SF 408b Body sherd of thin walled crucible. H 17 mm, W 15 mm, T 2mm. Context [403].

SF 4069 Undiagnostic body sherd of thin walled crucible with evidence of soot on the exterior. H 34 mm, W 26 mm, T 2mm. Context [402].

SF 4076 Base of crucible, external vitrification interior deposits. T 4-6 mm. Context [403]. Figure 3.35 E.

SF 4079 Miscellaneous body sherd, possibly base of thin walled crucible. H 13 mm, W 29 mm, T 3mm. Context [403].

SF 4088a Rim and body sherd of thin walled crucible. H 26 mm, W 18 mm, T 4 mm. Context [403].

SF 4110 Complete profile of small bag-shaped crucible with very thin walls. Vitrified lumps on external base. H 29 mm, T 1-2 mm. Context [403]. Figure 3.35 A, Figure 3.37.

SF 4119 Rim of thin-walled crucible. T 2-3 mm. Context [403].

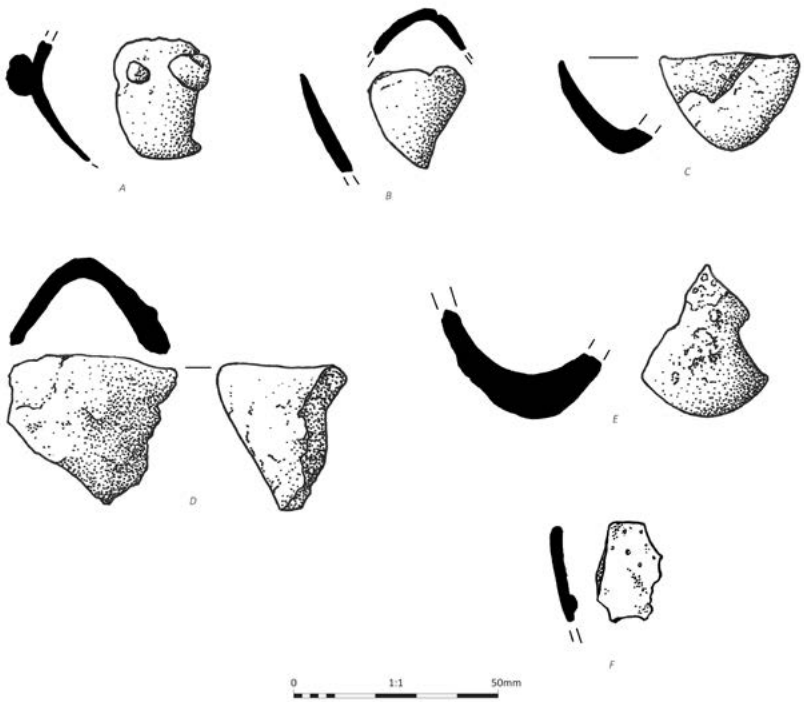

Figure 3.35: Thin-walled bag-shaped crucible SF 4110 (A), SF 632 (B), thin-walled triangular crucible SF 4140 (C), medium-sized sub-triangular thin-walled crucible SF 4165 (D), base of thin-walled crucible SF 4076 (E) and rim sherd of thin-walled crucible SF 608 (F).

Figure 3.36: Fragments of thick-walled crucible, Vessel 2, SF 4203.

Figure 3.37: Fragment of thin-walled bag shaped crucible SF 4110.

SF 4128 Rim of crucible, external vitrification. T 2-4 mm. Context [403].

SF 4140 Complete profile of small sub-triangular crucible. Some external vitrification. H 30 mm, T 2-5 mm. Context [403]. Figure 3.35 C.

SF 4104 Rim of thin walled crucible, external vitrification, internal drossy deposit. T 5-6 mm. Context [401].

SF 4131 Pouring lip of medium-sized sub-triangular thin walled crucible. Patch of external vitrification, internal drossy deposits. H 40+mm, T 3-5 mm. Context [403].

SF 4145 Undiagnostic body sherd of thin walled crucible. H 34 mm, W 26 mm, T 3 mm. Context [409].

SF 4165 Rim and pouring lip of medium-sized sub-triangular crucible. H 35+mm, T 4-5 mm. Heavy external vitrification. Context [401]. Figure 3.35 D.

SF 4239 Rim and pouring lip of sub-triangular crucible. T 3-4 mm. Context [403].

Table 3.3: XRF analysis of the King's Seat crucibles.

Find	XRF	Key feature
SF 608	Red glaze inside, 2 spots	Pb, Sn and Cu
SF 612	Small fragment, 2 spots	Traces of Zn in both areas, probably contamination rather than metalwork residues
SF 615	Red glaze, exterior	Possible traces of glaze as small amount of Pb, Sn and Cu detected / main elements are however Fe and Ti
SF 616	Small fragment, 2 spots (inside and outside)	Positive traces of Zn on the inside
SF 619	Small fragment – red glaze, exterior Large fragment, white vitrification (attempt) Large fragment red glaze, exterior	K, Ca, Mn, Fe and Cu, traces of Zn and Sn / no Pb Mainly Fe, positive traces of Cu, Pb and Zn Mainly Fe, positive traces of Cu, Sn and Zn / no Pb
SF 4040	Red glaze, exterior	K, Ca, Mn and Fe, traces of Cu and Sn
SF 4050	Red glaze, exterior Interior	K, Ca, Mn and Fe, traces of Cu, Pb and (?) Sn
SF 4069	Interior, 2 spots Exterior, 1 spot	Positive traces of Zn, Pb and (?) Cu Positive traces Cu / no Pb or Zn
SF 4076	Large fragment red glaze Large fragment inside Small fragment inside	K, Ca, Mn, Fe, and Cu, traces (?) Sn Cu and Sn, traces Pb and Zn Small Cu only
SF 4079	Yellow dots outside (attempt, very small)	Positives traces Cu and Zn
SF 4088	Large fragment Small fragment	Inside traces Cu and Zn, outside traces Cu Inside Zn, traces Cu (?)
SF 4091	Clear glaze Grey patch Interior	K, Ca, Mn, Fe and Cu Not much, (?) Cu and (?) Zn Traces Cu, (?) Zn
SF 4104	Faint glaze outside Irregular surface, interior	Cu and Sn, traces Pb and Zn Cu, Sn, traces Zn
SF 4110	Large bubble Small bubble Interior	Traces Cu and Zn Traces Cu and Zn Zn, traces Cu and (?) Pb
SF 4119	Interior	Pb and Zn, traces Cu
SF 4122	Yellow glaze exterior	Fe and Cu
SF 4124	Interior Exterior	Traces Cu Traces Pb, (?) Cu
SF 4128	Large frag, interior Large frag exterior	Small Cu, traces Zn, Pb and Sn Traces Cu
SF 4131	Dark/ red glaze exterior Interior	K, Ca, Mn, Fe and Cu Traces Cu, Zn and Pb
SF 4138	Glaze (two areas) exterior Interior	K, Ca and Fe, small Mn and Cu, traces Sn Traces Cu
SF 4140	Interior Exterior	High Pb, traces (?) Sn Traces Pb
SF 4145	Interior Exterior	Traces Cu and Zn Traces Cu and Zn

SF 608 Rim sherd of small thin-walled crucible. Interior completely coated with red vitrification, exterior with blackish vitrification. H 25+mm, T 2 mm. Context [601]. Figure 3.35 F.

SF 612 Miscellaneous body sherd of thin walled crucible. H 19 mm, W 15 mm, T 2mm. Context 601.

SF 615 Miscellaneous body sherd of thin walled crucible. H 12 mm, W 9 mm, T 2 mm. Context 601.

SF 616 Rim and body sherd of thin walled crucible. H 18 mm, W 16 mm, T 2 mm. Context [601].

SF 619 Rim and pouring lip of sub-triangular crucible with external vitrification. T 4-5 mm. Context [601].

SF 625 Undiagnostic body sherd of probable thin walled crucible. L 21 mm, W 21 mm, T 2 mm. Context [601].

SF 632 Most of profile and pouring lip of small thin-walled sub-triangular crucible. H 25+mm, T 2-3 mm. Context [601].
SF 637 Broken rim and body sherd of small thin walled triangular crucible. L 22 mm, W 19 mm, T 3 mm. Context 601.
SF 669 Rim of thin-walled crucible. T 2 mm, H 40+mm. Context [601].
SF 670 Miscellaneous body sherd of probable thin walled crucible. L 18 mm, W 15 mm, T 2 mm. Context [620].

XRF analysis of the crucibles

Lore Troalen

Twenty-two crucible fragments were analysed by the National Museums Scotland. They were investigated non-invasively using Energy Dispersive X-Ray Fluorescence analysis (EDXRF), without any surface preparation or cleaning. Qualitative analysis was undertaken in the interior and exterior of the crucibles and also on specific features such as red glaze residues.

The results obtained for each item are summarised in Table 3.3. Only the key features related to possible residues of metalwork or glaze are highlighted, but all samples were found to contain high levels of iron, with minor potassium, calcium and manganese. In several crucibles significant levels of titanium, strontium and zirconium, sometime rubidium, were also detected.

Interpretation of the XRF results

Andy Heald

Chemical analysis of the slag layer or the metal droplets within/on crucibles can often indicate the broad composition of the metal being melted (Howard 1983; Bayley 1992: 757-46; 817; Lane and Campbell 2000: 205-7). Energy Dispersive X-ray Fluoresence (EDXRF) has been used to study archaeological materials for over 30 years and has proved a reliable and quick method for determining chemical composition (see Hall *et al.* 1964; Hall and Schweizer 1973; Dungworth 1996; Bayley 1989 for outline of technique and application).

However, the interpretation of EDXRF spectra is problematic (Dungworth 2000). Different elements of the melted alloy react differently during melting due to reduction, oxidisation, volatility, and melting temperature. High temperatures also increase the volatility of some metals and so their transfer to the mould or crucible fabric. Furthermore, the more oxidising the conditions within the crucible, the more likely the metallic elements will oxidise and react with the crucible fabric. Thus, zinc and lead are more likely to become entrapped in the ceramic than, for example, tin and silver. It is also clear that the elements do not survive in a uniform way or area on ceramics. Thus, while visible droplets may survive, most information is usually within the actual ceramic matrix. Therefore, different areas of the ceramic produce better signatures than others. Random processes, texture, and type of material also affect the retention or loss of elements from crucibles. Importantly, the absence of a particular element in a crucible may be related to the particular thermo-chemical conditions rather than because the element was not present in the original alloy. Crucibles were often re-used (Bayley 1992: 755) with a range of different alloys melted in the same crucible; analysis by EDXRF will not be able to distinguish between such repeated use. Finally, during long periods of burial metal tends to corrode, and some elements may be depleted or enriched at the surface.

Despite these problems EDXRF is well suited to determine, non-destructively, whether crucibles were used in the manufacture of precious or base metals. However, caution must be taken when interpreting the results. Where only base metals are detected, it is much harder to determine the exact nature of the alloy that was melted. The four principal metallic elements present in copper alloys (from around the Roman Iron Age - zinc, tin, lead and copper) have very different physical and chemical properties, and during melting they will be absorbed by the crucible in varying degrees depending on the melting conditions. Thus, reconstruction of copper alloy type from the analysis of the mould or crucible alone is difficult (Dungworth 2000). However, the technique does allow identification between those crucibles used for base metals and those for precious ones. If significant levels of other copper alloys exist, these can also be instructive. Further, significant zinc components probably suggest a Roman or post-Roman date.

As part of a wider study into non-ferrous metalworking in Scotland (800 BC to AD 800) pertinent crucibles were analysed by EDXRF in the National Museums of Scotland (Heald 2005). Approximately 900 analyses were undertaken. Together with Bayley's analysis of the finds from Dunadd, and numerous other publications over the last two decades, there are now well over 1,300 analyses of Scottish crucibles, a significant majority of the total. More particularly, the overwhelming majority of sites with evidence for non-ferrous metalworking from Scotland have had part or all of its crucible assemblage analysed. The result is the most thorough geographical and chronological study of its kind for Scotland (Heald 2005).

The King's Seat XRF results show, in terms of metal, varying degrees of lead (Pb), Copper (Cu), Tin (Sn) and

Zinc (Zn). Not all crucibles have all these elements, but these are the general components. No evidence of silver (Ag) and gold (Au) were detected. This lack of precious metals may suggest that the metalsmith did not make objects from silver and gold; alternatively, it may have been that the analysis merely did not detect the chemical signature.

Miscellaneous

Possible crucible stand

There is one fragment of stone (SF 215) that has red vitrification on one surface – this was probably used as a stand for a crucible or is purely an accidental spillage.

SF 215 Stone with red vitrification on surface. Context [202]

Tuyéres related to precious metal-working

Tuyéres were used to protect the nozzle of a blowpipe used to heat the charcoal in a bowl furnace. The small sizes of these examples demonstrate that they were used in non-ferrous metalworking and would have been used to heat the small crucibles found on the site. Most tuyéres of this period are heavily quartz gritted to help withstand the high temperatures reached, but SF 208 is not, and indeed has only a little vitrification, so probably was not used much. SF 4189 is possibly part of another, possibly unused example.

SF 208 Section of flat ceramic disc with part of central hole with vitrification around it. Fabric same as moulds. D *c.* 60 mm, hole *c.* 10 mm, T 10 mm. Context [202]. Figure 3.34 E.

SF 4189 Part of a ceramic flat disc-shaped object, similar in size to SF 208. D *c.* 70mm, T 10mm. No vitrification. Context [403]. Figure 3.34 F.

Fired clay

A total of 99 additional fragments of undiagnostic fired clay were recovered. It is likely that some pieces within this group represent non-ferrous metalworking casting debris such as very denuded fragments of clay moulds and crucibles but they are too fragmentary or bear no diagnostic features to allow them to be identified as anything other than fired clay.

SF 206 One undiagnostic fragment, possible vitrified material. [202].
SF 214 One undiagnostic fragment, possible vitrified material. [202].
SF 215 One undiagnostic fragment, possible vitrified material/heat affected. [202].
SF 438 One undiagnostic fragment, small indentation. [401].
SF 4050 One undiagnostic fragment. [401].
SF 4052 One undiagnostic fragment. [401].
SF 4081 One undiagnostic fragment. [403].
SF 4086 One undiagnostic fragment, small groove/cut mark. [403].
SF 4089 One undiagnostic fragment. [403].
SF 4093 Nine undiagnostic fragments. [403].
SF 4109 Two undiagnostic fragments. [403].
SF 4111 Two undiagnostic fragments. [401].
SF 4113 One undiagnostic fragment. [403].
SF 4117 Thirteen undiagnostic fragments, one with small groove. [403].
SF 4124 One undiagnostic fragment of heat affected clay. [403].
SF 4133 Four undiagnostic fragments. [403].
SF 4136 Two undiagnostic fragments. [403].
SF 4146 One undiagnostic fragment. [409].
SF 4152 Ten undiagnostic fragments. [403].
SF 4186 Two undiagnostic fragments. [403].
SF 4187 Three undiagnostic fragments. [403].
SF 4195 Five undiagnostic fragments. [403].
SF 4201 Three undiagnostic fragments. [403].
SF 4202 Six undiagnostic fragments. [403].
SF 4204 Two undiagnostic fragments. [403].
SF 4205 One undiagnostic fragment. [405].
SF 4247 One undiagnostic fragment. [412].
SF 4259 One undiagnostic fragment. [403].
SF 605 One undiagnostic fragment. [601].
SF 633 One undiagnostic fragment. [601].
SF 645 One undiagnostic fragment. [601].
SF 657 One undiagnostic fragment. [602].
SF 7042 Two undiagnostic fragments. [7001].
SF 7049 Two undiagnostic fragments. [7001].
SF 7052 One undiagnostic fragment. [7001].
SF 7053 One undiagnostic fragment. [7001].
SF 7059 One undiagnostic fragment. [7005].
SF 7060 Two undiagnostic fragments. [7005].
SF 7063 Two undiagnostic fragments. [7005].
SF 7083 One undiagnostic fragment. [7013].
No Num Five undiagnostic fragments. [7013].

3.10 Iron-working evidence

Andrew Morrison

Introduction

A total of 24.6 kg of vitrified material (Table 3.4) was visually examined, enabling the residues to be sorted into broad categories using the criteria of morphology, density, colour, vesicularity, and magnetic response. Based on this, the vitrified material assemblage can be divided into two broad categories: diagnostic materials that can be attributed to ferrous metalworking; and

Table 3.4: Total quantities of ferrous slags and other residues (weight g).

	Abbreviation	Mass (g)
Indicative of ironworking		
Plano-convex slag cakes and fragments	PCC	6687.38
Hammerscale: flake and spheroidal	HS/ SS	153.72
Runned slag	RS	816.12
Unclassified iron slag	UIS	15804.83
Undiagnostic vitrified material		
Fuel ash slag	FAS	88.65
Non-magnetic vitrified residues (NMVR)	NMVR	63.33
Vitrified ceramic, including Tuyère fragments	VC	937.86
Other		
Charcoal		72.65
Magnetic rock, natural		1.40
Total		**24625.94**

non-diagnostic materials that have been affected by high-temperature pyrotechnic processes but show no distinct characteristics to allow them to be directly attributed to a specific ferrous metalworking process.

A variety of slag morphologies are produced during ferrous metalworking, with only a few of them being truly diagnostic of a particular process; this can include (amongst others) plano-convex slag cakes (*PCC*), hammerscale (*HS*), slag spheres (*SS*), which are indicative of smithing, and tapped slag, which is diagnostic of smelting. The second group of non-diagnostic slags – unclassified iron slag (*UIS*) – is often made up of a significant amount of material that is unclassifiable, which makes the allocation of specific pieces to specific processes difficult, particularly in the case of smaller samples (Crew and Rehren 2002: 84). Though they may be largely non-diagnostic, it is sometimes possible to ascribe these unclassifiable slags to particular ironworking processes through archaeological association.

The vitrified material recovered from King's Seat is dominated by unclassified iron slag and plano-convex slag cakes and other categories indicative of ferrous metalworking, with a smaller amount of material not diagnostic of metalworking also present (including non-magnetic vitrified material and fuel ash slags). The vitrified material has been described using common terminology (e.g. McDonnell 1994; Spearman 1997; Starley 2000). A full catalogue of the vitrified material is presented in the site archive.

Plano-convex slag cakes

Plano-convex slag cakes are dense plano-convex accumulations of slag formed in a pit, which can come in a range of different sizes. It can be difficult to distinguish between cakes produced during the smithing process (hearth bottoms) and those produced during the smelting process (furnace bottoms). The criteria employed in distinguishing between the two include size, weight, texture, visible inclusions, and magnetic response (McDonnell 1994: 230, 200, 219; Starley 2000: 338). In addition, chemical analysis can also be used to complement the classifications.

Smelting slag cakes tend to be plano-convex accumulations of smelting slag formed by the raking out of material from the furnace into a pit; they tend to be larger, heavier, and non-magnetic, with a vesicular texture and runned appearance, and lack the charcoal impressions seen in some smelting slags (McDonnell 1994: 230).

Plano-convex hearth bottoms associated with smithing, however, are formed through the result of a high temperature reaction between the iron, hammerscale, and silica from the lining of the hearth or from a flux. These accumulations in the bottom of the hearth, the distinctive shape partly reflecting the shape of the hearth often have a dished upper surface resulting from downward pressure imposed by the air from the bellows. These hearth bottoms would have been removed from the hearth once they became large enough to interfere

with operations. They tend to be lower in density and weight for their size than comparable smelting slag cakes (McDonnell 1994: 230). Often, plano-convex slag cakes are formed of multiple smithing hearth bottoms layered atop one another as the result of multiple smithing events; these are referred to as superimposed hearth bottoms (McLaren 2019b: 99).

In total, four intact and 26 fractured *PCC* pieces (6687.38 g) were found at King's Seat. The intact cakes (SF 663, SF 7066a, SF 7066b, SF 7092a) vary in shape from sub-circular to more ovoid in shape; these intact examples possess maximum lengths ranging from 70.3 mm to 162.9 mm, and vary in weight from 127.3 g to 1,366.3 g. Superimposed hearth bottoms are represented by a large intact example (SF 7092a) recovered from a dump deposit [7013] within the eastern enclosure, and by fragments (SF 4238) recovered from deposit [419] associated with secondary hearth [420] within the central enclosure, and (SF 664) recovered from occupation layer [602] associated with hearth [606] within the western enclosure. Some fragments also display a straight edge along one side from where the slag cake likely detached from the edge of the hearth.

The intact slag cakes and slag cake fragments recovered from Trenches 3, 4, and 6 (1795.3 g) compare closely in size with slag cakes associated with Iron Age and early medieval smithing (e.g. McDonnell 1994: 230; McDonnell 2000: 219; Starley 2000: 338), with the length and width of the intact example from Trench 6 (SF 663) measuring 90.3 mm and 70.0 mm respectively. The three intact slag cakes recovered from Trench 7 in comparison are much larger on average, with the two larger 120 mm and 162.9 mm in length, and over 70 mm and up to 153 mm in width. These are comparable to smithing hearth bottoms of early medieval and medieval date from Portmahomack, on Tarbat Ness, Easter Ross, and medieval date from Eilean Donan Castle (Spall and Mortimer 2016: D108-9). The larger dimensions of the slag cakes recovered from Trench 7 could indicate a more industrial scale of use in comparison to the smithing remains from the hearths in Trenches 4 and 6, which were more likely to be multi-purpose hearths sometimes employed in the fabrication, maintenance and repair of everyday items such as tools and knives (McLaren 2019b: 99). Or they could suggest a difference in chronology.

Runned slag

A total of 816.12 g of 'runned' slag (*RS*) was recovered, slags of dark metallic grey colour that possess a runned or flowing appearance. This material is typically non-magnetic and can contain charcoal or stone impressions along one side where it made contact with the hearth or ground surfaces. Runned slags are typical of non-tapping bloomery furnaces (Dungworth and McLaren 2021: 146), though smaller flowed runs can also be produced in a smithing hearth. Thus, not all slags with a runned appearance, particularly the smaller fragments, are associated with smelting (Heald 2008b: 207). What is referred to here as runned slag should not be confused with tapped slag, which is a flow of molten slag that has been separated from the iron during smelting and allowed to flow from the furnace, often within a prepared channel in the ground surface, and sometimes forming extensive plates or 'tongues' (Bayley *et al.* 2001: 11). No tapped slag was recognised within the King's Seat assemblage. The vast majority of runned slags are small fragments weighing less than 20 g, though two larger fragments (SF 7087, SF 7088e), weighing 299.9 g and 283.4 g respectively, were both recovered from the extensive smithing dump deposit [7013] within the eastern enclosure.

Unclassified iron slag

Unclassified iron slags (*UIS*) are small amorphous fragments of iron silicate slag usually interpreted as rake-out material from smelting furnaces or smithing hearths (McLaren and Heald 2006:156). A total of 15.8 kg of vitrified material was recovered from King's Seat. As noted, it is difficult to classify *UIS* as relating to the smithing or smelting process through visual examination alone, though classification may sometimes be possible through archaeological association. The vast majority of UIS (95.7%) was recovered from Trench 7, specifically the contexts associated with the large dump of likely rake-out material from a nearby, unlocated hearth. A smaller quantity of UIS was also recovered from deposits in both phases of the hearth associated with smithing in Trench 4, contexts [412] and [419], in the central enclosure.

Diagnostic micro-debris: hammerscale and slag spheres

Hammerscale (*HS*) is small flakes of iron oxide produced by the impact of a hammer against the hot iron during either the refining of blooms during smelting or the working of wrought iron during smithing. Slag spheres (*SS*), or spheroidal hammerscale as they are also referred, are small spheroidal, porous or hollow masses of once molten iron oxide within a silicate matrix and are mainly associated with the forge-welding of iron objects during the smithing process (Dungworth and Wilkes 2009: 45). Hammerscale flakes and slag spheres are generally considered to be one of the few categories of waste material diagnostic of metalworking, and when found in significant quantities provide direct evidence for *in situ* metalworking and blacksmithing activities (Bayley *et al.* 2001; Dungworth and Wilkes 2009).

Table 3.5: Distribution of vitrified and heat-affected materials across the excavated area by type and weight.

Enclosure	Trench	Context number	Feature number	Context description	Ironworking				Undiagnostic vitrified material			Other		Total (g)
					PCC	HS/SS	RS	UIS	FAS	NMVR	VC	Charcoal	Mag. Rock	
Central	2	202		Surface deposit							14.52			*14.52*
Central	3	305		Loose root affected deposit underlying compact layer [302]	103.49			103.17						*206.66*
Central	4	401		Topsoil	163.78			76.67		10.82				*251.27*
Central	4	402		Rampart			4.43	10.00						*14.43*
Central	4	403		Disturbed deposit overlying possible old ground surface [406]	508.61			205.58	53.13	2.24	13.38			*782.94*
Central	4	412	410	Hearth ash. Upper fill of hearth [410]	108.86			20.23						*129.09*
Central	4	414	410	Hearth ash. Lower fill of hearth [410]									1.40	*1.40*
Central	4	419	420	Deposit associated with secondary hearth [420]	175.90			21.65						*197.55*
Western	6	601		Topsoil	297.82		20.60	246.49		38.49				*603.40*
Western	6	602	606	Occupation layer, associated with hearth [606]	220.14									*220.14*
Western	6	609	605	Fill of hearth [605]	216.67					8.64				*225.31*
Western	6	612	606	Fill of secondary hearth [606]		0.08								*0.08*
Eastern	7	7001		Topsoil			80.41	1141.99	1.72					*1224.12*
Eastern	7	7003	7002	Upper rampart core of the eastern enclosure				26.24						*26.24*
Eastern	7	7005		Deposit butted against the inner face of the rampart [7004]	545.17		14.94	3136.50			22.14	4.44		*3723.19*
Eastern	7	7008	7002	Upper rampart core of eastern enclosure				30.24				28.46		*58.70*
Eastern	7	7012		Deposit containing frequent charcoal and slag overlying metalworking waste dump [7013]				118.21			4.60	0.90		*123.71*
Eastern	7	7013		Slag hearth base. Includes heat affected clay hearth lining in metalworking waste dump.	4346.94	153.64	695.74	10667.86	33.80	3.14	905.28	38.85		*16845.25*
Total (g)					*6687.38*	*153.72*	*816.12*	*15804.83*	*88.65*	*63.33*	*959.92*	*72.65*	*1.40*	***24648.00***

A small amount of hammerscale flakes and slag spheres (153.72 g) was identified within the assemblage, with the vast majority (153.6 g) represented by a mix of hammerscale flakes and slag spheres recovered during the processing of soil sample retent from the large dump deposit [7013] of likely smithy rake-out material within Trench 7. A very small quantity of hammerscale flakes (0.1 g) was also retrieved during the processing of soil sample retent from the fill [612] of secondary hearth [606] within Trench 6 in the western enclosure. The small quantity of material from hearth [606] is not enough on its own to indicate that the hearth was used for blacksmithing activities, but when considered together with the intact plano-convex slag cake (SF 663) and *PCC* fragments (SF 664) associated with hearths [605] and [606], *in situ* blacksmithing seems likely.

Undiagnostic vitrified material

1.08 kg of the vitrified material (Table 3.5) recovered from King's Seat has been classed as undiagnostic vitrified material (*UVM*), that is to say that it cannot be attributed to a particular smithing or smelting process and is the result of an unspecified pyrotechnic process. The undiagnostic material includes non-magnetic

Table 3.6: Evidence for ironworking by deposit type.

	Context	Context description	Material	Mass (g)
***In situ* material**				
Central enclosure	412	Hearth ash. Upper fill of hearth [410]	PCC	108.86
			UIS	20.23
	419	Deposit associated with secondary hearth [420]	PCC	175.90
			UIS	21.65
Western enclosure	609	Fill of hearth [605]	PCC	216.67
	602	Occupation layer associated with hearth [606]	PCC	220.14
	612	Fill of secondary hearth [606]	HS/SS	0.08
Re-deposited material				
Eastern enclosure	7005	Deposit butted against the inner face of the rampart [7004]	PCC	545.17
			RS	14.94
			UIS	3136.50
	7012	Deposit containing frequent charcoal and slag overlying metalworking waste dump [7013]	UIS	118.21
	7013	Slag hearth base. Includes heat affected clay hearth lining in metalworking waste dump.	PCC	4346.94
			HS/SS	153.64
			RS	695.74
			UIS	10667.86
Mixed deposits				
Central enclosure	202	Surface deposit	VC	14.52
	305	Loose root affected deposit underlying compact layer [302]	PCC	103.49
			UIS	103.17
	401	Topsoil	PCC	163.78
			UIS	76.67
	402	Rampart	RS	4.43
			UIS	10.00
	403	Disturbed deposit overlying possible old ground surface [406]	PCC	508.61
			UIS	205.58
Western enclosure	601	Topsoil	PCC	297.82
			RS	20.60
			UIS	246.49
Eastern enclosure	7001	Topsoil	RS	80.41
			UIS	1141.99
	7003	Upper rampart core of eastern enclosure	UIS	26.24
	7008	Upper rampart core of the eastern enclosure	UIS	30.24

vitrified residues, fuel ash slag, vitrified ceramics, and magnetised rock.

Non-magnetic vitrified residues

Non-magnetic vitrified residues (*NMVR*) are amorphous pieces of vitrified material that appear in a wide range of textures, colours, and sizes. These fragments do not produce a magnetic response and are lacking in any diagnostic features identifiable at the macroscopic level that could indicate by which process they were formed. These fragments are not diagnostic of metalworking and could be formed by a wide range of pyrotechnic processes (Heald and McLaren 2008: 203). A total of 63.33 g of NMVR was retrieved from Trenches 4, 6, and 7, all of which have associated hearths. In addition, 8.6 g of material was recovered from [609], which is the fill of hearth [606], within which evidence of metalworking was noted.

Fuel ash slag

Fuel ash slags (*FAS*) are formed by the heating of sand, earth, clay, stone, and ceramic at high temperatures, usually in a hearth setting, which causes the material to react with the alkali in the ash, producing a vitreous and porous residue (Bayley 1985: 41). As they can result from a number of different pyrotechnic processes, they are not considered to be diagnostic of any deliberate industrial activity (McDonnell 1994: 230). In all, 88.65 g of *FAS* was recovered from the site, mostly from the disturbed context [403] within Trench 4 on the lower terrace in the central enclosure, and from a large dump of smithy waste [7013] from within Trench 7 in the eastern enclosure.

Vitrified ceramics (including Tuyère fragments related to iron-working)

Vitrified ceramics (*VC*) are the heat affected (or fired) remains of clay-lined features such as hearths or kilns, which are associated with pyrotechnic processes, but, again, not always associated with metalworking. The vitrified material assemblage from King's Seat produced a total of 937.86 g of vitrified ceramic, which displays a gradient in colour from a pinkish-buff or orangey-red fired clay to a dark brown/black glassy material, some of which has slag attached.

Although the majority of the fragments are amorphous and undiagnostic, at least nine tuyère fragments were identified from the iron-working waste [7013] in Trench 7, consisting mainly of fragmented and heavily friable portions of the face, aperture lip, and nozzle shaft. Typically made of clay or stone, tuyères were used to shield the wooden nozzle of the bellows from the intense heat of the furnace or hearth during use (Cleere 1971: 210; Tylecote 1986: 142). Examples from archaeological contexts are often cylindrical, conical or disc-shaped, but they rarely survive intact due to the friability of the heat-affected material (Scott 1994: 162-3, 167, fig 6.5.7). Although no complete apertures are present, it is possible to reconstruct the diameter of two examples (SF 7068 and SF 7080a), 19.2 mm and 24.5 mm respectively.

99% of the vitrified ceramic and the majority of the tuyère fragments were retrieved from Trench 7, of which 97% of the vitrified ceramic and all nine of the tuyère fragments from this trench were recovered from the large dump of smithy waste [7013]. Two other tuyère fragments were retrieved from the central enclosure, with one fragment (SF 208) from the disturbed surface deposit [202] within Trench 2, and the other (SF 4189) from the disturbed deposit [403] within Trench 4, which also produced an additional 5.8 g of vitrified ceramic.

Site distribution

Ferrous metal slags and other vitrified residues were retrieved from a total of 18 separate contexts from within five of the seven excavated trenches: Trenches 2, 3, and 4 within the central enclosure; Trench 6 within the western enclosure; and Trench 7 within the eastern enclosure.

None of the material recovered is closely dateable, reflecting metalworking techniques practised from the Iron Age through to the late medieval period. The overwhelming weight of evidence from King's Seat, however, which includes artefacts and radiocarbon dates closely associated with the hearth contexts within Trenches 4 and 6, and the dump of waste in Trench 7, indicates that it is of early medieval date. Table 3.6 shows the evidence for ironworking by context type by area, separating the assemblage into those retrieved from secure contexts, those retrieved from re-deposited contexts, and those retrieved from mixed contexts.

Central enclosure

Within the central enclosure, *in situ* evidence was identified in association with the kerbed hearth [410] and secondary hearth [420] that overlies it within Structure 1. The upper ash fill [412] of hearth [410] produced both *PCC* fragments (108.86 g) and *UIS* (20.23 g), while the deposit [419] associated with secondary hearth [420] also produced both *PCC* fragments (175.90 g) and *UIS* (21.65 g). The presence of metalworking waste within the hearth fills indicates that they were used for or in the immediate vicinity of metalworking taking place in Structure 1. The fragments of *PCC* represent broken up or raked out hearth bottom fragments which have been reworked into the hearth fills as they have continued in use. A radiocarbon date obtained from the lower fill of the hearth returned a date of 550-645

cal AD (95% probability) (SEURC-88166) showing that ironworking took place on the hilltop in the 6th-7th centuries AD.

Western enclosure

Within the western enclosure, *in situ* evidence for ironworking was identified in relation to hearth [605] in Structure 3 and secondary kerbed hearth [606] in Structure 2, with 216.67 g of *PCC* fragments retrieved from the fill [609] of hearth [605], a small quantity of hammerscale and slag spheres (0.08 g) recovered from the fill [612] of secondary hearth [606], and a quantity of *PCC* fragments (220.14 g) from the occupation layer [602] directly associated with that same hearth. Based on the material recovered from these contexts, the hearths were used for smithing, while a radiocarbon date from context [612] places at least some of this activity in the 5th-6th centuries AD.

Eastern enclosure

The majority (almost 70%) of the slag and other vitrified materials were recovered from [7013], Trench 7 located within the eastern enclosure. Context [7013] is interpreted as a deliberate dump of rake-out material immediately to the rear of the rampart near the southeast corner of the enclosure. The volume of waste material would suggest an accumulation related to more than one episode of smithing activity but over exactly how long a period remains unclear. A radiocarbon date places the activity within the 5th-7th centuries AD. Though no associated hearth was identified within the excavated area, this material likely represents the accumulation of ironworking waste from more-industrial scale activities that were taking place within the interior of the eastern enclosure, rather than the smaller scale activities that are indicated within the central and western enclosures (see below).

Compared to the deposits in the eastern enclosure, the areas of ferrous metalworking within the western and central enclosures probably represent the remains of relatively small scale smithing, perhaps utilising multi-purpose domestic hearths to make, repair, and maintain the more functional day-to-day objects, such as tools, knives, and other smaller items (Heald and McLaren 2008: 207), that were required by the inhabitants to live and to work within the fort.

3.11 Worked antler

Dawn McLaren

Despite the large quantity of faunal remains recovered during the excavation, evidence of worked items was restricted to only two fragments of antler.

The first of these consists of a fragment the base of a large antler tine cast from a mature adult red deer (SF 415; Figures 3.40 and 3.41), which came from the topsoil [401] over a rough stone platform [405] at the rear of the lower terrace in the central enclosure. The burr, cornet and base of the beam are intact, but the brow tine has been snapped off and the beam is missing forward of the position of the bez tine. There are various areas of damage and erosion of the surfaces of the antler making it difficult to distinguish what markings are the result of ancient incidental damage or use. Chop marks are noted towards the cornet, confirming that the fragment has indeed been worked. A narrow sub-circular but damaged channel into the cancellous tissue of the brow tine stub hints at the possibility that the brow tine may have been socketed, perhaps suggesting use as a pick or tool head, but this is far from certain. It is entirely possible that this channel is simply pre- or post-depositional damage, in which case the fragment would most appropriately be identified as a discarded piece of working waste.

The second is an incomplete tool head (SF 4253; Figures 3.38 and 3.39) produced from the cast antler of a mature red deer, which was recovered from the mid-fill [413] of the hearth [410] in Trench 4. The lack of burning evident on the object is curious. It could indicate that the antler waste has been discarded into the hearth when not in use and has not subsequently been heat affected during later hearth use. The tool head has been crudely produced by cutting through the main beam of the antler and hollowing out the spongy, cancellous tissue to create a deep socket into which a tool tip or blade would originally have been housed but is now lost. The brow tine appears to have been retained to act as a handle during use, but this has split down its length and one face of it has been lost, perhaps resulting in the tool head's discard. Similar composite tool heads produced from antler are known from, for example, the settlement of Broxmouth, East Lothian, in an Iron Age sealing deposit (Hunter *et al.* 2013: 287, e.g. SF 369), and Cnip, Western Isles (Hunter 2006: 137, 144 e.g. SF 181). The presence of tool marks from a heavy, cleaver-type blade, and potentially those of two separate finer knife blades, on the surfaces of the antler provide an excellent proxy record of some of the metal implements formally present on the site but now lost.

SF 415 Working waste or heavily damaged pick/tool head. Fragment of cast right antler from mature red deer. The burr, cornet (D 76 mm) and base of the beam (D 48 mm) are intact, but the brow tine is snapped off, leaving only a short ragged stub of the tine remaining, and the beam is broken forward of the bez tine. The stub of the beam is eroded, but large flakes have detached from two opposing faces, the largest of which terminates in a set of short chop

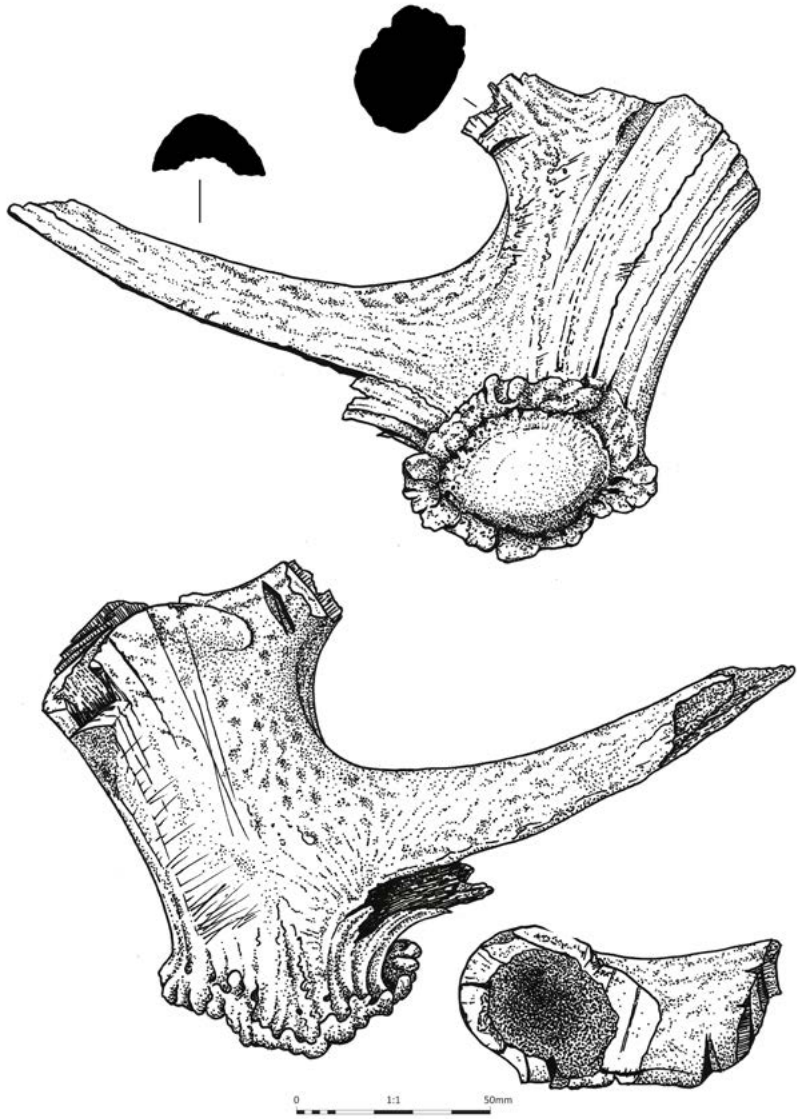

Figure 3.38: The incomplete composite tool head of worked red deer antler SF 4253.

Figure 3.39: The incomplete composite tool head of worked red deer antler SF 4253.

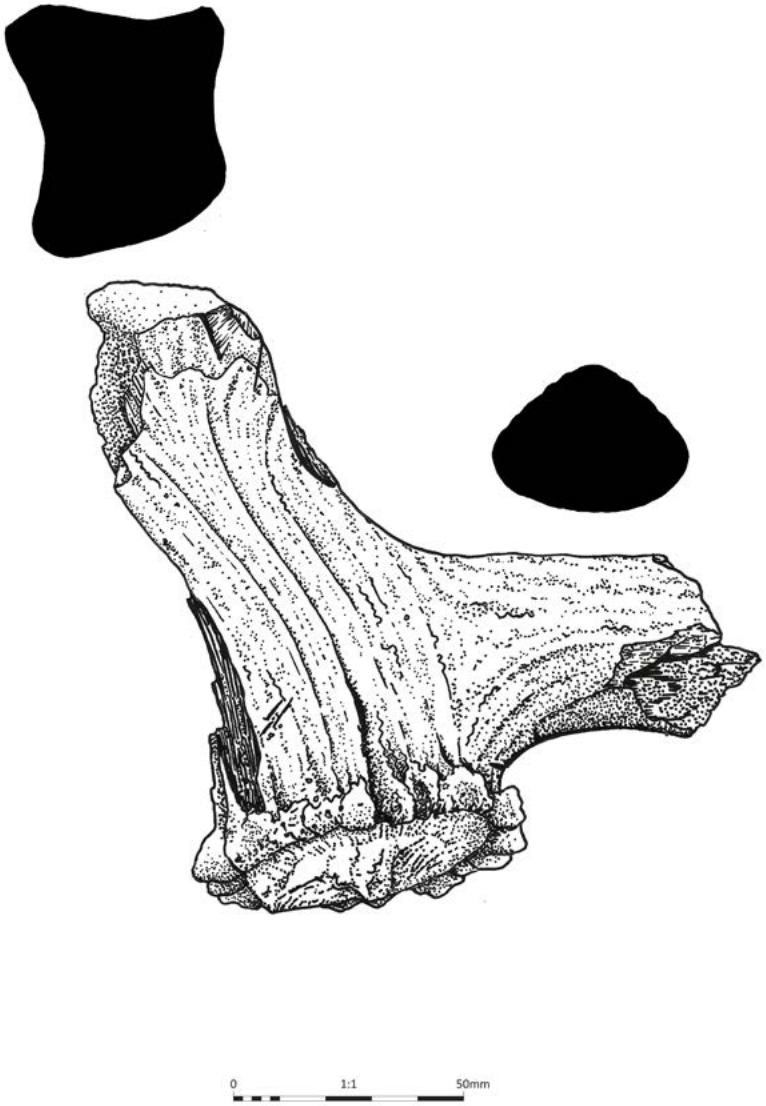

Figure 3.40: The heavily damaged pick/tool head of worked red deer antler SF 415.

Figure 3.41: Worked red deer antler damaged pick/tool head SF 415.

marks (L 25.5 mm) positioned at a diagonal angle to the fracture. Looking closely at the remains of the brow tine, there is a very short and narrow channel (D 4 mm) bored into the cancellous tissue. Due to the extent of damage and erosion to the surfaces of the antler, it is not possible to be certain whether this is the vestige of the terminal of a socket, perhaps suggesting use as a pick or tool head, or whether this is simply post-depositional damage. If the latter, the antler is likely to be discarded working waste. Remaining L 145.5 mm. Context [407]. Figures 3.40 and 3.41.

SF 4253 Composite tool head, incomplete. Base of the ?left antler of a mature red deer (cast), pedicle remains intact. The main beam has been crudely chopped with a heavy bladed instrument just above the bez tine and the cancellous tissue has been hollowed out, creating a conical socket (D 21 x 23 mm expanding to 52 mm) presumably intended to house a robust tool tip or blade, now lost. The bez tine has been broken off at the point where deep cut marks have been made from opposing sides, with no attempt to smooth or shape the remaining stub. A substantial portion of the brow tine remains to almost full length (remaining L 108 mm) but has split from the tip (now lost) down its length and a long, wide, splinter has detached from just above the pedicle. The flatter of the two faces of the base of the beam has a band (L 40 mm) of fine, short, parallel cut marks (av L 8.5 mm, W 0.2 mm) made with a sharp-edged knife blade perpendicular to the long inner edge of the beam. Below these cut marks, running from the chopped end of the beam towards the base, are three more deeply-incised, long, diagonal knife cut marks (L 59.5 mm, W 0.5-1 mm), indicating the expedient use of this face of the tool handle as a working surface. L 124 mm. Circumference above brow tine 37.5 x 52.5 mm. Context [413]. Figures 3.38 and 3.39.

3.12 Chipped stone

Rob Engl

Introduction

A total of 156 pieces of chipped stone were recovered and the assemblage was macroscopically examined, and a general characterisation of the material was undertaken. General classifications and descriptions

Table 3.7: The chipped stone assemblage by raw material.

Rock Crystal Quartz	Granular 'Milky' Quartz	Translucent 'Greasy' Quartz	Flint	Chalcedony	Haematite	Jasper
5	96	13	38	2	1	1

Table 3.8: The chipped stone assemblage by type.

Type	Flint	Rock Crystal Quartz	Translucent 'Greasy' Quartz	Granular 'Milky' Quartz	Chalcedony	Jasper	Haematite	Total
Shatter	13	2	3	93	0	1	1	113
Scrapers	7	0	0	0	2	0	0	9
Retouched Pieces	5	0	0	0	0	0	0	5
Piercer/borer	1	0	0	0	0	0	0	1
Pebble	1	0	0	2	0	0	0	3
Bipolar Core	1	0	9	0	0	0	0	10
Platform Core	1	1	0	0	0	0	0	2
Platform Core Fragment	1	0	0	0	0	0	0	1
Flake Regular	1	1	0	1	0	0	0	3
Flake Irregular	1	0	0	0	0	0	0	1
Flake Bipolar	1	0	0	0	0	0	0	1
Flake Fragment	3	0	1	0	0	0	0	4
Crystal	0	1	0	0	0	0	0	1
Pebble	1	0	0	2	0	0	0	3
Bladelet	2	0	0	0	0	0	0	2

of the artefacts are based on those proposed by Ballin (2000). A complete catalogue of all the lithic material is given within the archive.

The assemblage

Raw material (Table 3.7)

The assemblage is dominated by 96 fragments of granular quartz, although it must be noted that with the exception of a single regular flake this consists of blocky fractured shatter and as such a significant proportion may be naturally occurring. Other types of quartz are present in the form of crystal (n. 5) and translucent fine-grained material (n.13). Both these materials produced core types (Table 3.8), reinforcing the notion that these were the preferred forms of quartz for utilisation. Where present, the cortex appears smooth and water-rolled, suggesting it was obtained from a local riverine source.

Flint provides a total of 38 pieces. The flint is fresh in appearance with little signs of patination. Only one artefact shows signs of heat treatment, such as loss of mass, crazing and colour change. Where present, the cortex appears smooth and water rolled. It is likely that the flint was obtained from riverine or coastal sources and brought onto the hill by human agency.

The flint ranges from red to grey in colour and is typical of material found within early pre-medieval assemblages across the east coast of Scotland.

Other supplementary raw materials found within the assemblage include crystal quartz (n. 5), a fine-grained, translucent chalcedony (n. 2) and single pieces of jasper and haematite.

Primary technology

A total of thirteen cores were recovered, consisting of ten bipolar remnants made primarily on translucent quartz, and three small platform cores made on flint (SF 4092 and SF 213) and rock crystal (SF 1001). The platform cores are all of narrow blade/flake type and have been intensively worked to the point of abandonment due to size. The core types suggest activity on the site within the later Mesolithic.

Table 3.9: Modified tool types.

Type	Flint	Chalcedony	Total
Angled scraper	4	0	4
Side scraper	2	0	2
End scraper	0	1	1
Irregular scraper	1	0	1
Thumbnail scraper	0	1	1
Piercer/borer	1	0	1
Retouched bladelet	3	0	3
Retouched Piece	2	0	2
Totals	**13**	**2**	**15**

Flakes in all materials are surprisingly rare, with only three regular, one irregular, one bipolar and four fragments being identified. Similarly, there are only two flint narrow-blades. Where present these debitage classes reveal crushed and unprepared striking platforms, together with hinged and abrupt distal terminations, and pronounced bulbs of percussion. Taken together with the evidence of the cores this suggests that a medium to hard hammer method of reduction was used, possibly with the use of an anvil.

Evidence of cortication is rare and appears rolled, suggesting that the material was obtained from local coastal or riverine deposits and brought up onto the site.

The majority of the assemblage is composed of shatter (n. 113), of which 93 pieces are of granular 'milky' quartz. With the exception of an 'orange segment' piece related to bipolar reduction, this material is blocky in nature and, given the absence of supporting debitage classes or modified artefacts in this material, the majority can be probably considered as naturally occurring.

Secondary technology

A total of 15 tools (Table 3.9; Figures 3.42 and 3.43) can be identified within the assemblage, accounting for 9.62 % of the total assemblage. This climbs to 23.8 % when the natural shatter made on granular quartz is removed. All but two of the modified pieces are made on flint with the others made on chalcedony.

Small scrapers made on short thick flakes predominate (n.9). These appear in a variety of typological forms and appear typical of types found within later Mesolithic assemblages (Finlayson *et al.* 2000; Engl and Gooder 2021). The scrapers typically have semi abrupt to abrupt regular retouch applied to their working edges. Angled scrapers appear the most common (SF 4130.1, SF 4075, SF 4094.1, SF 4094.2), with the latter two recovered in fragmentary condition. Two sidescrapers (SF 651 and SF 627) have abrupt retouch applied along the right lateral edge.

The irregular scraper form (SF 201) has both semi abrupt and abrupt retouch along the left lateral and distal ends respectively.

The two scrapers made on chalcedony consist of the fragment of an endscraper (SF 4118) and a thick

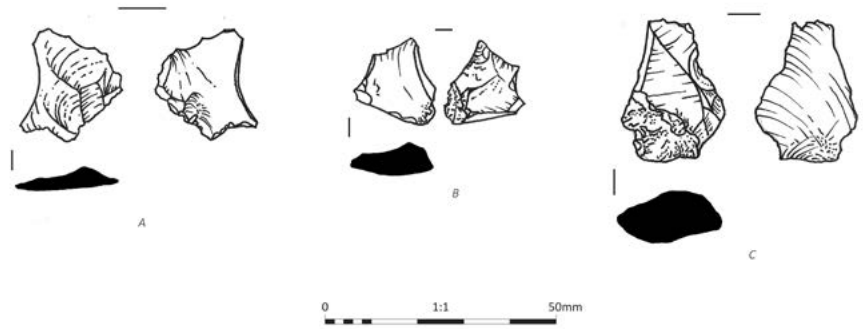

Figure 3.42: Angled scrapers SF 4094.1 (A), SF 4094.2 (B), and SF 4075 (C).

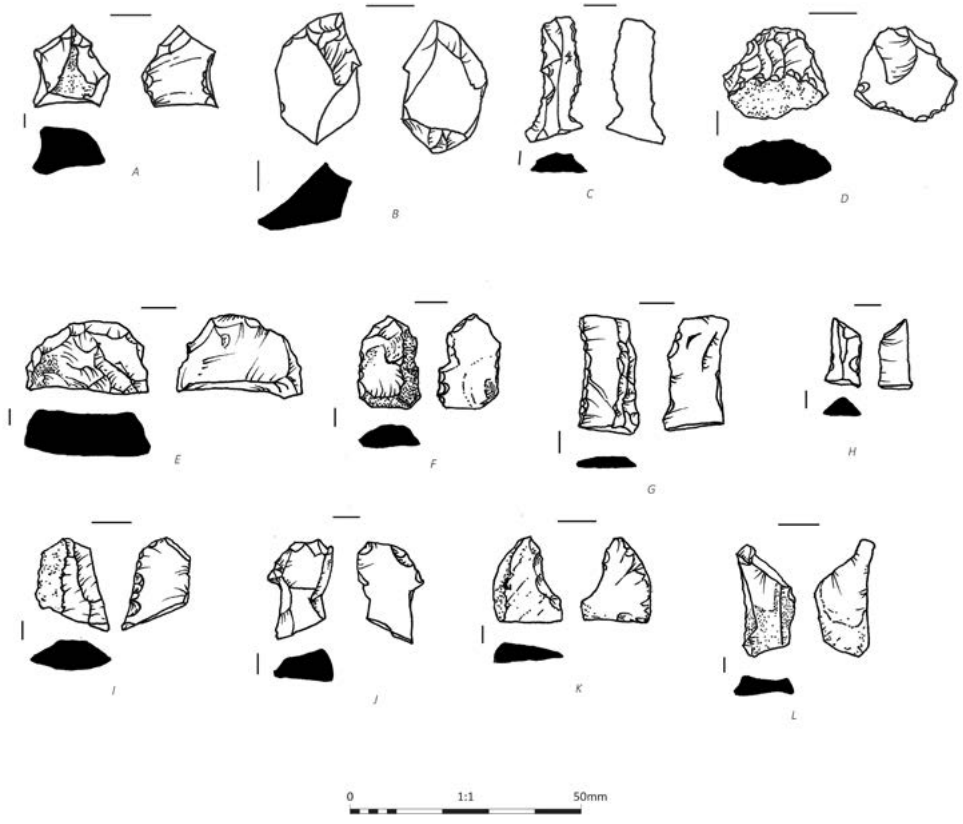

Figure 3.43: Angled scraper SF 4130.1 (A), SF 4130 (B), bladelets SF 4051 (C), SF 4142 (G) and SF 4073 (H), side scrapers SF 627 (D) and SF 651 (F), end scraper fragment SF 4118 (E), SF 209 (I) and SF 218.1 (K) fragments with retouch, irregular scraper SF 201 (J) and piercer SF 218.2 (L).

thumbnail scraper (SF 4051.1) respectively. This latter artefact appears to have been invasively worked across its dorsal face.

Six other modified pieces can be identified. These consist of the piercer (SF 218.2), which has slight retouch along both lateral edges forming a point, two pieces with miscellaneous retouch (SF 209 and SF 218.1) and three bladelets with microlithic retouch along their lateral edges (SF 4051, SF 4073 and SF 4142).

The tool types present at King's Seat suggest Late Mesolithic activity, potentially representing short-term occupation of the site.

Figure 3.44: Possible flint pendant SF 223.

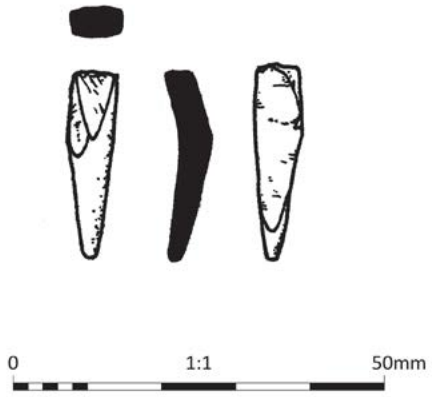

Figure 3.45: Possible flint pendant SF 223.

Distribution and discussion of chipped stone

Though almost certainly residual in nature, the small lithic assemblage recovered from the King's Seat suggests Late Mesolithic activity at the site. A number of domestic activities, such as hide working and tool manufacture/curation, were being practised. The lack of signature Mesolithic artefacts such as microliths/ microburins is interesting, but their absence can be most probably put down to the nature of the excavation techniques employed on a site where artefacts of this type are not expected.

Though a clearer picture of the Mesolithic occupation of the site is not possible, the relative lack of core and other debitage classes suggests that only a limited amount of reduction was being undertaken on site, and that this was focused on the expedient reduction of quartz in order to provide useable sharp flakes. Given the relatively large proportion of modified tools within the assemblage relative to debitage, it is possible that these artefacts were brought onto site rather than manufactured *in situ*.

It is likely that the prominent location of the King's Seat on high, well-drained ground overlooking the flatter, wetter land of the River Tay was a particular draw for Mesolithic populations. The visibility from accessible hilltops overlooking the straths would have held value as positions for hunting camps. Indeed, residual Mesolithic material has been recovered from other fort sites overlooking the rivers Tay and Earn, at Moredun and Moncreiffe (Engl 2023) and within other fort sites such as The Mote of Mark, Dumfries and Galloway (Smith 2006: 99).

SF 223 One fragment of flint was identified which formed a modified piece. It was dog toothed in shape. Made on pale grey east coast flint. The artefact has six polished, shaping facets with one taking up the entire left hand lateral edge. The right-hand lateral edge has two facets on the proximal and distal ends. Two facets are present on the dorsal face at the proximal end. The majority of the ventral face appears polished. The artefact appears fashioned into an elongated tooth shape with a rounded point at the distal end. The proximal end appears flattened with some scarring possibly related to a break. L 25.2 mm, W 6.4 mm T 4 mm. [210]. It does not conform to most early prehistoric flint tools and it is possible that this piece of flint has been fashioned into a decorative object such as a pendant which has broken at the proximal end (Figures 3.44 and 3.45).

3.13 The coarse stone

Andrew Morrison

Introduction

A total of 79 coarse stone objects (Table 3.10) were recovered, comprising a variety of cobble tools and other stone objects, including whetstones, smoothers, combination tools, gaming pieces, and spindle whorls. These are all typical of Iron Age and early medieval sites in Scotland. Cobble tools are the most numerous of the objects represented, making up almost 50% of the recovered assemblage by number. These display a wide range of wear patterns that suggest a number of different functions and uses in both industrial and domestic contexts. Aside from the cobble tools, objects relating to personal life and leisure are also represented, including 17 pebble gaming pieces and possible gaming pieces, five spindle whorls, and one possible sandstone armlet fragment. Household objects are also represented, with one potlid and one perforated weight. Very few objects relating to food production were identified within the assemblage, with

Table 3.10: Stone Function and Type by Trench.

Function	Type	TR1	TR2	TR3	TR4	TR5	TR6	U/S	Total
Food processing and consumption	Saddle querns (later reused) *not counted towards total			2					2
	Pot Lids	1							1
Tools	Burnishers				1		1		2
	Burnishers/Pounders			1					1
	Grinders						1		1
	Pounders			1					1
	Pounders/Sharpeners	1							1
	Pounders/Hammerstones			1					1
	Pounders/Strike-a-lights	1			1				2
	Smoothers			1	7				8
	Smoothers/Pounders						1		1
	Whetstones		2		6	1	2		11
	Whetstone Manuports				2		1		3
	Whetstones/Hammerstones				2				2
	Hammerstones				1		1		2
	Hammerstones/Anvils/Smoothers				1				1
	Grinding Platform/Sharpening Stones			1		1			2
	Sharpening Stones/Grinders	1							1
	Sharpening Stones/Burnishers				1				1
	Moulds/Sharpening Stones			1					1
	Strike-a-light							1	1
	Spindle whorl				4		1		5
Structural	Roof weights					1			1
	Pivot Stones				2				2
Personal and leisure	Armlet / Bangle				1				1
	Gaming pieces		4		13				17
Other	Fire cracked				1				1
	Unmodified Disc-shaped Cobbles			1	7				8
Total by area		**4**	**6**	**7**	**50**	**3**	**8**	**1**	**79**

only the fragments of two saddle querns present, both of which have been repurposed as sharpening stones/ grinding platforms, and one as a casting mould (SF 310/ SF 313; Figures 3.28-3.31).

The catalogue has been divided into broad functional groups within which the different typological categories are described and discussed. Each tool with a single identified function is discussed under its typological category, where tools have several functions or represent combination tools they are grouped under a combination tool heading then discussed first by their primary function. Following this, the discussion section will attempt to consider the information based on distribution and function and place the assemblage within the wider Scottish early medieval context. Stone objects relating to non-ferrous metalworking such as the stone moulds, are discussed separately, as are the numerous unmodified slingshots recovered from site. The classification of the cobble tools is based on wear-type using a system employed by Ballin-Smith at the Howe, Orkney (1994: 196), and a full catalogue of the stone assemblage is included below.

Methodology

The finds were all examined macroscopically and with the aid of a low-powered binocular microscope

to clarify surface details. Each object was individually examined with the aim of identifying material type and classification, and to produce a catalogue inventory database of the finds for archive purposes. The finds were assigned small finds numbers in the field, in some cases to a single bag containing multiple items; where this has happened, letters have been appended to the number to differentiate between different categories of material, and Roman numerals to differentiate between multiple examples of the same type. All finds were measured using a 0-150 mm Carbon Dial Calliper with 0.1 mm accuracy and were weighed using a Sartorius Universal digital scale accurate to 0.01 g.

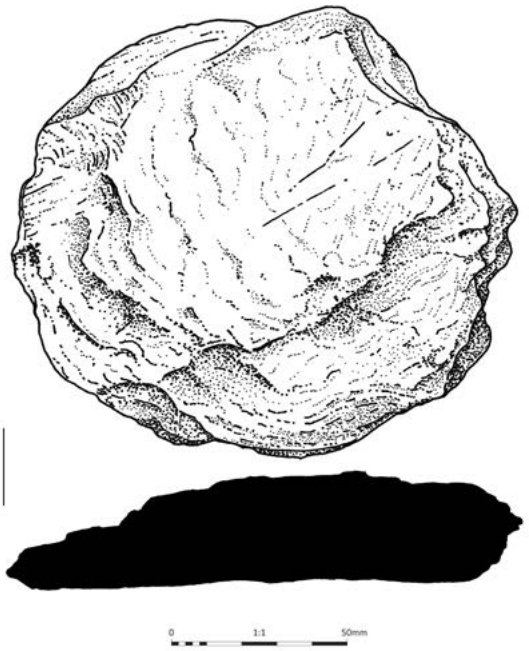

Figure 3.46: Pot lid SF 1008.

Food processing and consumption

Repurposed saddle querns

Two saddle querns (SF 306 and SF 310/313) were repurposed respectively as a grinding platform/ working surface and sharpening stone, and as a mould and sharpening stone.

Recovered as part of the rubble core of the central enclosure's rampart [304], SF 306 is a large fragment of a mid-brown micaceous sandstone saddle quern, roughly triangular in shape, and dressed on the base to create a flat surface. The sloping grinding face of the quern has been repurposed for use as a grinding platform with U and V-shaped grooves present in multiple areas from the sharpening of metal objects, such as knife blades, pins, and needles.

SF 310/313 (described above, section 3.9) has multiple areas of U and V-shaped grooves from the sharpening and maintenance of metal implements. No other quern fragments were retrieved from site, and it is curious that the only ones recovered had been repurposed to perform other functions. Broken querns reused in masonry, such as the one retrieved from the rubble core of the rampart in Trench 3, is a well-documented occurrence, with many examples noted in later Iron Age levels at the Howe, Orkney (Ballin-Smith 1994: 187). It is possible that the lack of querns recovered may be an indicator that the querns were transported with the inhabitants during their movements on and off-site, the grain processing was occurring elsewhere in the fort or that there was a reduced need for grain preparation, perhaps suggesting that foodstuffs were brought-in pre-prepared.

Potlids

Chipped stone potlids are common finds from the Neolithic period onwards, becoming especially common during the Iron Age (McLaren and Hunter 2014; 289),

Table 3.11: Summary of natural disc-shaped cobbles. Possible pot boiler manuports.

SF No.	Trench	Context	Shape	Staining	L: (mm)	W: (mm)	Th: (mm)	Mass: (g)
315	3	305	Subcircular, flattened biconvex section	X	66.0	62.7	17.6	105.8
4149	4	411	Circular, flattened ovoid section	-	69.3	68.1	15.7	115.0
4170	4	406	Subcircular, flattened ovoid section	-	79.6	79.1	11.9	110.1
4222	4	403	Subcircular, flattened ovoid section	-	51.2	46.3	16.4	47.0
4245 (i)	4	403	Circular, biconvex section	X	107.8	103.9	23.7	372.8
4245 (ii)	4	403	Ovoid, flattened ovoid section	-	79.6	59.2	17.2	115.8
4245 (iii)	4	403	Circular, flattened ovoid section	-	35.2	34.1	11.2	19.2
4263	4	406	Subcircular, flattened ovoid section	-	85.0	78.0	14.2	158.4
4217	4	403	Water-rounded cobble. Fire cracked.	-	76.9	58.0	12.1	85.0

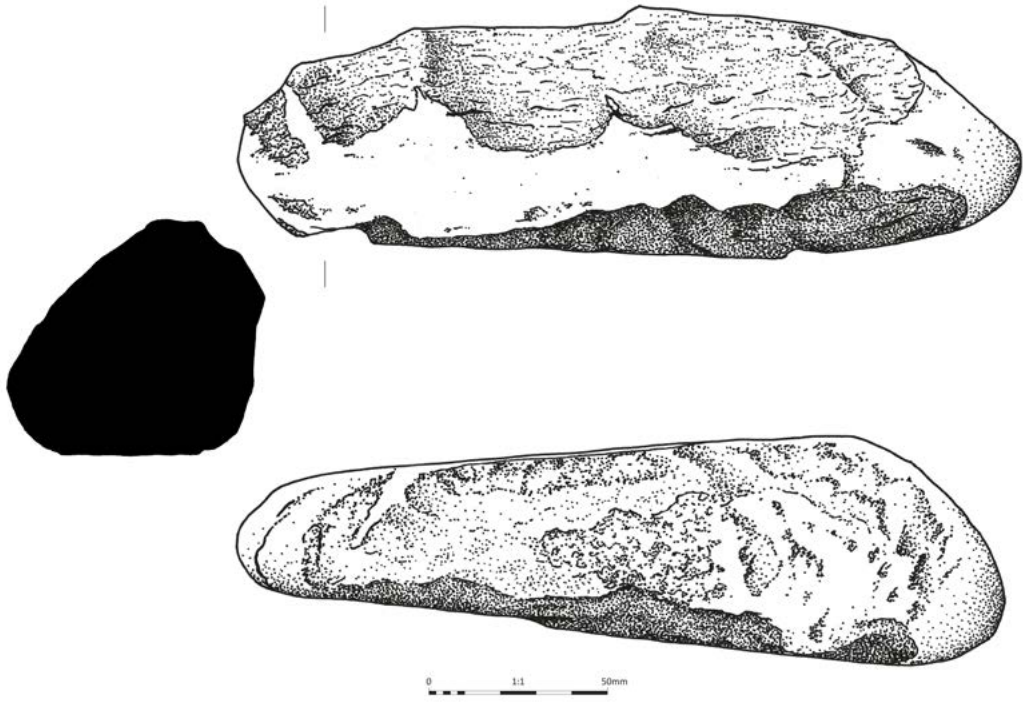

Figure 3.47: Hammerstone SF 4265.

continuing in use through the early medieval period and beyond, with other examples found on site such as the Howe (Ballin-Smith 1994: 204), Inchmarnock (Franklin 2008b: 191), Alt Clut (Alcock and Alcock 1990: 2:F8), and Freswick, in Caithness (Curle 1939: 107), amongst many others.

SF 1008 Pot lid. Flat chipped stone disc of blue-grey schist with the edges shaped by bifacial flaking. Sub-circular in shape with a shallow rectangular protrusion along one side (L 93.7 mm, W 20.1 mm). L 140.7 mm, W 131.4 mm, T 23.4 mm. Mass 618.6 g. Context [002]. Figure 3.46.

A single rounded firecracked natural cobble was identified, associated with food preparation and consumption. Eight further unmodified disc-shaped cobbles (Table 3.11) were retrieved from a total of five contexts within the central enclosure. These stones have been intentionally transported to site for an as-yet unidentified purpose. Their potential identification as pot-boiler manuports is just one of numerous possible interpretations.

Tools

Hammerstones

Two hammerstones were identified amongst the cobble tool assemblage in addition to four other cobble tools with multiple functions including hammerstone (SF 413a; SF 4214; SF 4080 in Table 3.13; SF312 see pounders). Both are water-rounded and are amongst the larger of the cobble tools. They are characterised by their large fracture scars. SF 4265 is a large ovoid quartzitic sandstone cobble that displays four successive flaked ovoid facets along one edge. Sandstone is not an ideal material for use as a hammerstone, and it is likely that it was selected and used hurriedly as the need arose. SF 666 is formed of a biotite schist; both ends are broken, probably fracturing during use. Both finds were retrieved from disturbed contexts: SF 4265 was retrieved from the fill [429] of one of the spade-dug furrows [430] of the cultivated plot on the lower terrace in the central enclosure; SF 666 came from the topsoil in the western enclosure.

SF 4265 Hammerstone. Large ovoid shape with an asymmetric and slightly angular D-shaped section tapering down to a flattened end. Water-rounded greyish brown quartzitic sandstone cobble with thin veins of pinkish granite-like stone. One face wide and flat, with one edge broader than the other, and more rounded around the rest. While broader edge is subject to onion weathering, the narrower has four successive flaked ovoid facets, decreasing in size towards the tapered end and struck from the flat side. The stone has flaked along the lines of the denser granite-like seams. There is possible darker brown staining along the surviving naturally

Table 3.12: Summary of smoothers (possible smoothers identified by a * next to the small finds number).

SF No.	Trench	Context	Stone	Shape	Wear	L: (mm)	W: (mm)	Th: (mm)	Mass: (g)
311*	3	305	Granite	Ovoid, domed plano-convex section	Abraded from rubbing, sheen and staining from use, firecracking	64.2	54.7	52.8	274.0
435a	4	401	Micaceous Schist	Elongated tapering ovoid, flattened biconvex section	Smoothed from rubbing, dark staining along leading edge, staining from handling	126.1	49.9	35.4	285.0
4143a (ii)	4	409	Micaceous Quartzitic Sandstone	Elongated ovoid, plano-convex section	Abraded and smoothed from rubbing, staining along one edge	130.0	38.1	27.9	240.3
4158a (i)	4	403	Quartzitic Sandstone	Ovoid, rounded triangular section	Wear from abrasion producing a bright sheen from the quartz	40.5	34.6	26.2	53.1
4181	4	403	Quartzitic Sandstone	Multifaceted pyramidal, flattened sides, rounded edges	Slight abrasion and smoothing to two facets, deep sheen and staining	35.5	32.6	26.7	41.2
4226*	4	403	Quartzitic	Flattened sub-rectangular	Possible wear and a speckled reddish brown residue	72.0	45.7	18.3	111.9
4252	4	403	-	Elongated sub-rectangular, flattened D-shaped section	Slight abrasion and smoothing, areas of staining	154.0	54.3	35.6	561.9
4266a*	4	403	Quartzitic Sandstone	Spheroidal	Light staining and possible wear	38.9	36.0	33.0	64.2

smoothed edges. L 215.0 mm, W 65.2 mm, T 60.7 mm. Mass 1169.9 g. Context [429]. Figure 3.47.

SF 666 Hammerstone fragment. Sub-rectangular in shape with a bulbous circular section tapering down to an ovoid section. Water-rounded dark grey/ black biotite schist cobble with small flecks of gold-coloured mica. Actively flaking along fracture lines. The fragment probably represents the central section of a hammerstone that has fractured at both ends during percussion. Brownish-grey staining is present on the bulbous face and along one edge, probably from handling in use, with one small, blackened area (9.6 mm x 11.7 mm) central on the stained edge, possibly indicating grip placement. L 83.4 mm, W 46.7 mm, T 39.1 mm. Mass 216.0 g. Context [601].

Pounders

Both objects are characterised by their areas of peckmarks from pounding. Both tools display areas of dark reddish-brown staining from handling. Five other combination tools display use as pounders (see combination tools section).

SF 303 Pounder. Small, ovoid in shape with rounded sub-triangular section. Water-rounded light brown quartzitic sandstone pebble. One rounded end reduced by peckmarks from pounding (20.0 mm x 27.6 mm). Opposing end has smaller area of peckmarks (17.5 mm x 18.3 mm), though not so heavily used as to alter the stone's shape. All faces are stained a dark reddish brown from handling/ use. L 45.1 mm, W 31.6 mm, T 30.6 mm. Mass 67.7 g. Context [302]. Figure 3.57 A.

SF 312 Pounder/Hammerstone. Ovoid in shape, tapering slightly to one end, and a rounded square-shaped section. Water-rounded quartzitic sandstone cobble with onion weathering to two opposing sides and natural smoothed surfaces on the other two sides. Both ends have been subject to pounding/hammering, with the tapered end displaying numerous ovoid facets (L 16.2 mm, W 11.6 mm) and diagonal gouges (L 31.1 mm, W 13.4

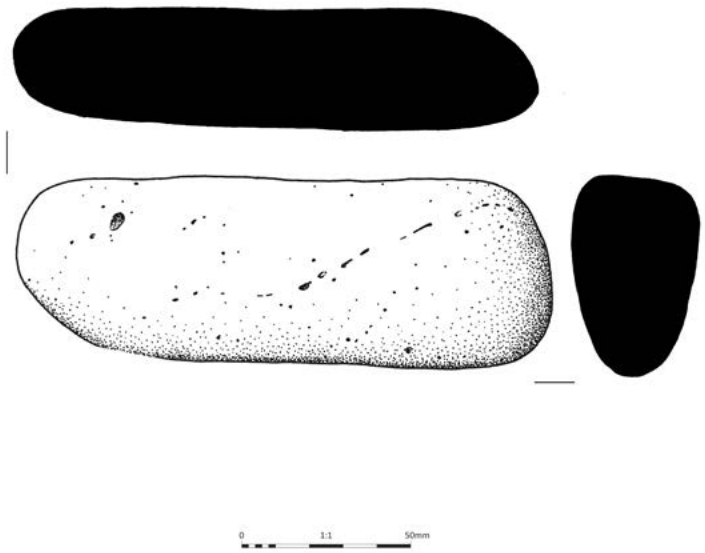

Figure 3.48: Smoother SF 4252.

mm), and the broader end with a diagonal gouge (L 41.8 mm, W 7.4 mm) and larger chipped facets (L 32.7 mm, W 15.7 mm). Areas of darker grey staining along edges with remaining surfaces, possibly from handling. L 143.3 mm, W 53.9 mm, T 50.1 mm. Mass 663.1 g. Context [305].

Grinder

Sandstone is considered to be the most suitable material for this tool type, which could have been used in food processing amongst other functions (Ballin-Smith 1994: 196). One of the few artefacts recovered from what can be considered as an *in situ* context, this grinder fragment was recovered from the occupation layer [602] associated with hearth [606] in the western enclosure. Other finds associated with this context [602] are 0.2 kg of plano-convex slag cake (PCC) fragments and two non-classifiable iron fragments. These finds suggest a likely craftworking area and a possible association between the cobble grinder fragment (SF 641) and metalworking.

SF 641 Grinder fragment. Quarter of a water-rounded light grey quartzitic sandstone ovoid cobble. Fractured in half both horizontally and vertically, probably along natural seams. The edges of the breaks display some loss to weathering, as does the rounded face. There is an area of smoothing and polishing (L 47.8 mm, W 10.8 mm) confined to the surviving tip of the rounded end, and an area of darker brown staining surrounding it (L 49.8 mm, W 24.0 mm). There is a light pinkish hue across the surface of the broken edge of the stone, possibly from light heat damage. The breaks post-date the use of the stone as a grinder as the surface wear ends abruptly at the break. L 74.5 mm, W 74.9 mm, T 28.5 mm. Mass 269.7 g. Context [602].

Burnishers

There are two burnishers in the coarse stone assemblage in addition to two combination tools which display use as burnishers (SF 320; SF 4163 in Table 3.13). These are characterised by a light sheen across one face from polishing, and light staining from handling and use.

SF 4105 Burnisher. Sub-circular in shape with a biconvex section. Water-rounded light grey/white quartzitic cobble with a slightly polished sheen and light staining to the flatter face, and a small area of shallow pecking concentrated in the centre of the opposing face. L 70.9 mm, W 67.2 mm, T 47.9 mm. Mass 315.3 g. Context [403].

SF 648 Burnisher. Elongated triangular shape with one flattened corner and a sub-rectangular section. Water-rounded grey basalt cobble broken in two halves horizontally. Wear is confined to the naturally flattened corner (27.1 mm x 33.9 mm), with light sheen from abrasion and polishing, and light reddish-brown staining through handling. L 148.4 mm, W 69.5 mm, T 51.1 mm. Mass 807.3 g. Context [601].

Smoothers

Of a total of up to ten smoothers (Table 3.12) recovered, one is a combination smoother/pounder (SF 621), one

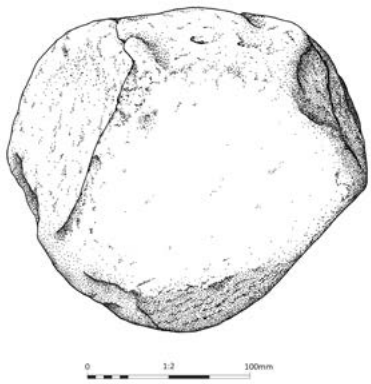

Figure 3.49: Grinding platform/sharpening stone SF 504.

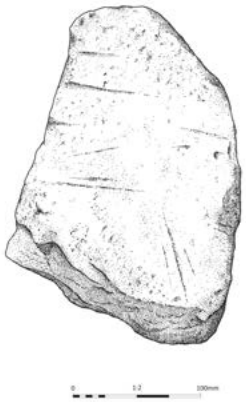

Figure 3.50: Grinding platform / working surface/ sharpening stone, re-purposed saddle quern SF 314.

is a hammerstone/anvil/smoother (SF 4080) and three are categorised as only possible (* in Table 3.12). The smaller of them range in size from 35.5 mm to 72.0 mm in length and display smooth areas of wear that vary in size from 12.2 mm to 61.5 mm in length, by 10.1 mm to 36.7 mm in width.

The five larger smoothers, including the combination smoother/pounder are all water-rounded cobbles, variously of granite, micaceous schist and quartzitic sandstone (SF 4252; Figure 3.48). They vary in length from 64.2 mm to 154.0 mm. The areas of wear on these larger smoothers range from 37.5 mm to 142.0 mm in length, by 14.7 mm to 49.4 mm in width. The length and mass of these stones vary greatly, and it is only the width and thickness that shows any preference, falling within the parameters of what can be comfortably held in the hand, the size of the areas of wear determined only by the shape of the stone.

Strike-a-light

One single purpose strike-a-light has been identified in the assemblage, and two pounders (SF 1012; Figure 3.52 A; and SF 4266c in Table 3.13) also bear distinctive strike marks, and are catalogued as combination tools (infra) Despite the importance of setting a fire as an everyday task, such evidence is relatively rare in artefact assemblages.

SF 4271 Strike-a-light. Elongated ovoid in shape with trapezoidal section. Light blue grey quartzite cobble with one flat side from a natural fracture. The stone is unmodified, apart from one diagonal reddish-brown linear strike mark along one face (L 30.8 mm, W 1.8 mm). L 116.6 mm, W 51.1 mm, T 40.7 mm. Mass 420.6 g. Context (Unstratified; Trench 4).

Sharpening stone and grinding platforms

Four objects are sharpening stones, which have also seen use as grinding stones, grinding platforms, or other working surfaces. Two of these are the repurposed saddle quern fragments (SF 314, Figure 3.50 and SF 310/313) already discussed (*supra*), both of which display distinct V-shaped and U-shaped grooves from sharpening. One of the others is a large circular sandstone cobble with plano-convex section (SF 504; Figure 3.49), which displays areas of grinding, polishing and sharpening across its naturally flat face, with nine areas of concentric rings, possibly caused by a circular grinding motion, potentially from use as a palette. The other is no more than a fragment (SF 1018) recovered from the topsoil [002] and while many of the overlapping linear incisions of varying depth and width on its surfaces are likely to be natural abrasions, some have the appearance of being deliberately formed.

These sharpening stones and working surfaces, particularly the grinding platform (SF 314; Figure 3.50), the mould/sharpening stone (SF 310/313), and the grinding platform sharpening stone (SF 504), reflect craft activities taking place within the central enclosure, not only in supporting the manufacture and maintenance of blades and pins, but also crafts that required them,, as well as working surfaces on which to grind or hammer. The large assemblage of iron knives and other edge tools from King's Seat is in itself a good indication of the requirement for whetstones and grinders for their maintenance. Equally the

abundant evidence within the central enclosure and the western enclosure, for the working and casting of non-ferrous metals (*supra*) these stones would have formed an integral part of the toolkit in the craft process, for example, for finishing the shanks of pins and sharpening the point.

SF 1018 Sharpening/grinding stone. Water-rounded ovoid light brown buff siltstone cobble fragment with a flattened ovoid section. Break in the stone is well worn and weathered. The soft surface of the stone is covered in linear incisions of varying depth and thickness, overlapping and running in multiple directions. Some are potentially caused by natural abrasions, though others are most likely the result of intentional sharpening, or the grinding of the stone against another surface. L 90.5 mm, W 77.6 mm, T 46.1 mm. Mass 308.6 g. Context: [002].

SF 314 Grinding platform/working surface/ sharpening stone, re-purposed saddle quern. Large fragment of a mid-brown micaceous quartzitic sandstone slab. Rectangular in section, it retains the roughly-finished curve of the quern, but is broken elsewhere with two straight edges meeting at a near ninety-degree angle. The working surface is confined to one face (L 210.0mm, W 178.0mm), while the opposing face appears lightly dressed to create a flat base. The worked face of the stone slopes downward slightly from the curved edge towards the breaks and is likely part of a disused saddle quern that has been repurposed. This secondary use is as a grinding surface. Along the worked face, there is an area of pecking confined to the more pointed end of the stone (L 112.2 mm, W 118.1 mm), possibly a remnant of the re-dressing of the quern face. The remaining face has been smoothed and abraded through wear and is slightly undulating, with an overall slope downwards into a shallow circular depression (L 67.9 mm, W 50.7 mm) where there are small areas of peckmarks within and around, likely from grinding and light pounding. There are small areas of light peckmarks across the face as well as areas of what appears to be more recent damage, with an area of flaking along the curved edge (L 36.9 mm, W 15.7 mm). There are numerous U- to V-sectioned sharpening grooves running along the stone diagonally from near to the top corner down towards the opposite pointed end (Max L 202.0 mm, W 2.6mm, Depth 0.7mm). A lesser number of U-sectioned sharpening grooves run vertically from the long, broken edge towards the curved edge, overlapping the diagonal grooves (Max L 83.5 mm, W 5.3 mm, Depth 1.6 mm). The sharpening grooves overly the smoothed and pecked surfaces, maintaining depth and thickness through the change in slope within the circular depression. The longest and deepest of the diagonal sharpening grooves fades towards the centre of the face before re-emerging, though it is not clear if this is due to a decrease in pressure during the sharpening stroke, or if there was additional smoothing to the area after the sharpening grooves had been made (L 47.5 mm). It may also relate to the length of the object being sharpened and the angle at which it is applied to the stone and whether that causes it to be impeded by minor topographical features of the surface. Some of the sharpening grooves display a light orangey-brown substance or residue within them, which may be either a remnant from the object that carved the grooves, or residue from an item being worked on the surface when the grooves were already present. Finally incorporated into the core of the rampart of the central enclosure. L 250.0 mm, W 178.0 mm, T 64.2 mm. Mass: 3793.0 g. Context [306]. Figure 3.50.

SF 504 Grinding platform/Sharpening stone. Large, subcircular light grey-brown water-rounded micaceous quartzitic sandstone cobble. Flattened bi-convex to planoconvex in section, the stone has one flattened edge and a break to the opposing edge. Wear is confined to the natural flat face (L 172.0 mm, W 138.8 mm), which has been modified through use and is now slightly concave, with areas of grinding, polishing, and sharpening. There are eight to nine areas of arranged around the edge of the working surface and in the centre where the wear comprises a small central circle and a surrounding ring that appears slightly raised from the surrounding surface. These do not appear to be natural features of the stone and are potentially caused by a circular grinding motion, possibly through the use of the working surface as a palette. The rings are very faint to the naked eye, but appear to vary in overall size from 31 mm to 41mm in diameter. There are areas of smoothing between these wear-markings, with one small darker stained circular patch of smoother wear present just off centre (D 21.1 mm). There are also areas of darker brown staining along the edges of the working surface, likely through handling. The stone has seen light secondary use as a sharpening stone, with multiple faint linear grooves running across the face in the area of a natural seam, all in roughly the same direction with only a slight change in angle (L 109.0 mm, Groove W 0.9 mm, Overall W 28.4 mm). The opposite naturally rounded face is subject to light weathering as well as multi-directional linear grooves, likely from scaping across the surface on which it sat.]. L 214.0 mm, W 198.0 mm, T 77.0 mm. Mass 4710.5 g. Context [501]. Figure 3.49.

Combination tools with the primary function of hammering, grinding, pounding

Four finds within the assemblage are combination tools, that is they display wear patterns indicative of being used for more than one purpose, with use as a hammerstone,

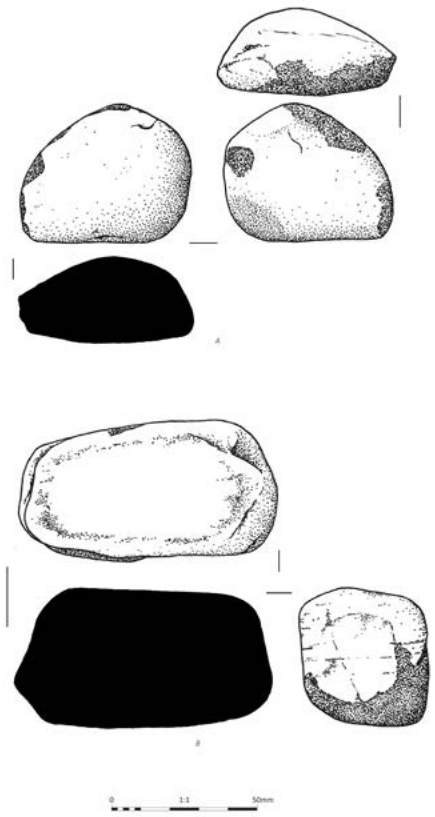

Figure 3.51: Pounder/strike-a-light SF 4266c (A) and burnisher/ pounder SF 320 (B).

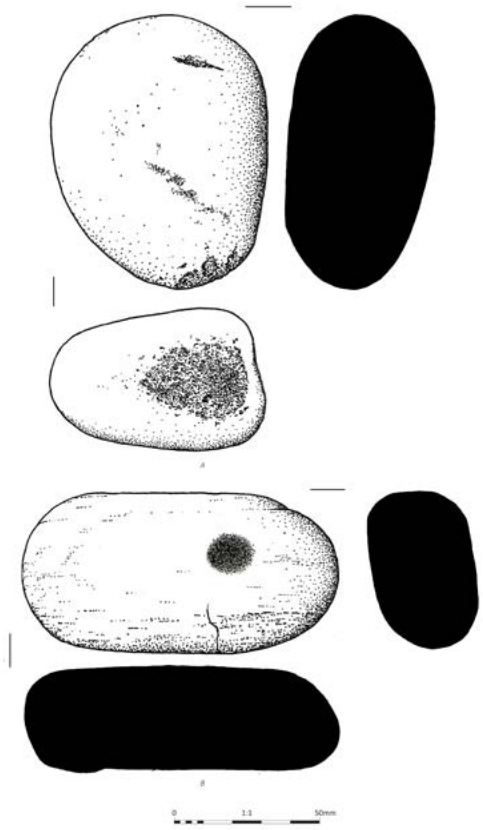

Figure 3.52: Pounder/strike-a-light SF 1012 (A) and whetstone SF 644 (B).

grinder, or pounder as a primary function. SF 4080, for example, is an elongated tapering cobble, that displays facets on both ends with considerable loss of material due to hammering and pounding, while both flat faces have been used as anvils, displaying areas of surface loss caused by pecking. One edge of the tool also displays light abrasion and polishing from use as a smoother, and there is light brown staining covering the surfaces of the stone, likely from handling and use.

Two pounders (SF 1012; Figure 3.52 A; and SF 4266c) had also been used as strike-a-lights, displaying both areas of peckmarks from pounding over multiple surfaces, and the characteristic reddish-brown linear strike lines present along one face.

The last of these combination tools, a pounder/ sharpener (SF 1019), is of interest for its context in a deposit [010] underlying the uppermost of the three ramparts below the western enclosure. These and a handful of other objects incorporated into the ramparts are the sole evidence that there was either earlier Iron Age activity on the hill, or, if early medieval, that some of the ramparts are marginally later in date than others.

SF 4080 Hammerstone/Anvil/Possible Smoother. Elongated rectangular shape with a roughly square section, tapering to a more rounded, bulbous end. Water-rounded light blueish-grey cobble. Both ends have been subject to hammering/pounding. There is considerable loss of material to the broad end due to hammering, with one large, flaked facet reducing the stone's original profile (L 51.5 mm, W 41.8 mm). The opposing end also shows signs of hammering or pounding, with approximately four small rounded successive chipped facets along the leading edge (L 44.6 mm). Both flat faces have been used as anvils, with an area of surface loss to pecking on the flatter sloped face confined towards the tapered, more rounded end and continuing up one edge (L 104.5 mm, W 47.2 mm). The opposing, stepped face also displays surface loss due to pecking, as well as weathering, extending over the lower face and rounded end (L 87.0 mm, W 41.4 mm). One edge also shows signs of use as a smoother, with light abrasion and polishing from use (L 61.9 mm, W 28.1 mm) as well as darker brown mottled staining confined to one end (L 49.7mm, W 22.4mm). There is also light brown staining over the remaining surfaces of the stone, probably through handling and use. L 168.8

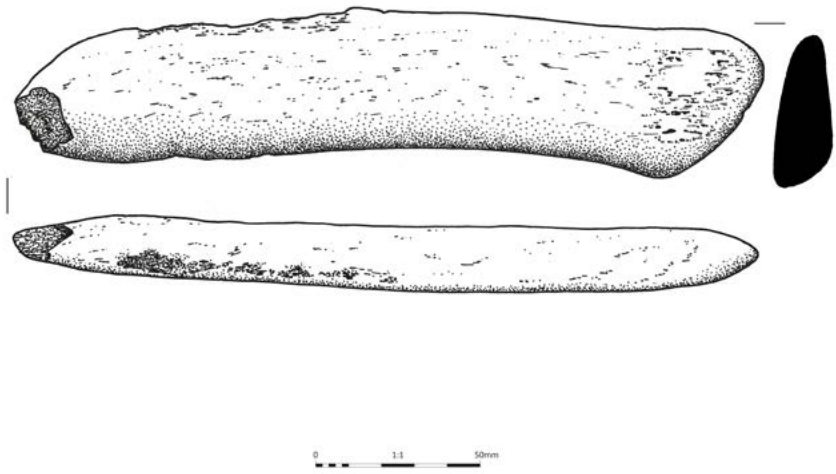

Figure 3.53: Whetstone/hammerstone SF 4214.

mm, W 57.3 mm, T 53.8 mm. Mass 871.3 g. Context [403].

SF 1012 Pounder/Strike-a-light. Ovoid in shape with a flattened ovoid section and one naturally flattened side. Small water-rounded quartzite cobble. Narrower end displays a concentration of peckmarks from pounding (L 25.6 mm, W 38.3 mm), though not enough to alter the shape of the stone. A small area of pecking is present on a small, rounded edge adjacent to the main working area (L 7.4 mm, W10.0 mm), with the opposing rounded corners also displaying light peckmarks from pounding (L 17.9 mm W21.4 mm; L 16.5 mm W26.6 mm). The stone is completely covered in a dark grey-brown stain from use, and there is a single long strike mark (L 33.3 mm, W 2.7 mm) and a partial contact point (L 1.9 mm, W 1.9 mm) along the more rounded face, indicating its use as a strike-a-light. L 92.5 mm, W 73.1 mm, T 46.4 mm. Mass 482.5 g. Context [1002]. Figure 3.52 A.

SF 1019 Possible Pounder/Sharpener. Rounded trapezoidal shape with an off-set triangular section tapering slightly to one end. Water-rounded light brown/buff siltstone cobble. Flat face is slightly concave. Multi-directional linear incisions forming an overlapping, roughly triangular pattern, possibly from sharpening, confined to the slightly concave face (L 69.9 mm, W 67.9 mm). Peckmarks along the narrower edge from possible use as a pounder (L 101.7 mm, W 24.7 mm). Slight darker staining to peaked face and opposing concave face, possibly through handling. L 111.7 mm, W 115.4 mm, T 66.9 mm. Mass 1128.5 g. Context [010].

SF 4266c Pounder/Strike-a-light. Sub-circular in shape, with one naturally flattened side and a flattened D-shape or offset triangular section. Water-

Table 3.13: Combination tools by primary and subsequent functions.

Primary function	Secondary function	Tertiary function	Quaternary function	Finds number	Context	Trench
Burnisher	Pounder			SF 320	308	3
Burnisher	Whetstone			SF 4163	406	4
Hammerstone	Pounder	Anvil	Possible smoother	SF 4080	403	4
Pounder	Strike-a-light			SF 1012	1002	1
Pounder	Strike-a-light			SF 4266c	403	4
Possible pounder	Sharpener			SF 1019	010	1
Smoother	Pounder			SF 621	U/S	6
Whetstone	Hammerstone			SF 413a	401	4
Whetstone	Hammerstone			SF 4214	403	4

rounded quartzite pebble. One corner displays a concentration of peckmarks from pounding (W 13.7 mm) that extends up the rounded edge (L 54.1 mm, W 10.6 mm). There is evidence of light peckmarks on the opposite end with one flake removed by percussion (L 7.6 mm, W 9.1 mm). The stone has also seen use as a strike-a-light, with two faint linear reddish-brown marks along the more rounded face (L 37.2 mm, W 0.7 mm), one along the flat edge (L 27.6 mm, W 0.8 mm), and one diagonally across the unworked end (L 14.6 mm, W 0.7 mm). L 58.7 mm, W 46.9 mm, T 26.9 mm. Mass 104.48 g. Context [403]. Figure 3.51 A.

Combination tools with a primary function as a whetstone

Two whetstones (SF 413a and SF 4214) were identified within the assemblage that displayed evidence of secondary use as hammerstones (Table 3.13). The

Table 3.14: Summary of whetstones and whetstone manuports (possible whetstones identified by * next to SF No.).

SF No.	Trench	Context	Manuport	Shape	Wear	L: (mm)	W: (mm)	Th: (mm)	Mass (g)
205*	2	202	-	Elongated, flattened ovoid section	Possible abrasion	64.8	31.1	25.9	83.8
221	2	202	-	Elongated triangular, flattened rectangular section	Staining, smoothing and polishing	134.3	51.3	17.3	191.7
4065	4	402	X	Elongated crescent, flattened D-shaped section	-	139.6	48.0	19.2	226.1
4070	4	402	X	Elongated rectangular, flattened plano-convex section	-	110.1	33.6	13.6	89.7
4143a (i)	4	409	-	Elongated rectangular, sub-rectangular to triangular section	Staining, smoothing and polishing	95.3	21.0	23.2	77.6
4151	4	411	-	Prepared. Elongated rectangular, square section	Smoothing and polishing,	66.3	22.2	22.7	71.8
4168*	4	406	-	Elongated ovoid, plano-convex to D-shaped section	Loss of surfaces	136.7	51.6	25.6	282.4
4221*	4	403	-	Elongated ovoid, flattened biconvex section	Onion weathering	132.3	52.4	20.5	255.5
4224	4	403	-	Elongated ovoid, plano-convex section	Onion weathering, band of smoothing and polishing	163.0	63.2	43.5	816.2
4237	4	403	-	Elongated rounded rectangular, flattened D-shaped section	Smoothing and polishing with staining	136.7	55.1	28.7	396.5
503a*	5	502	-	Rectangular, sub-rectangular section	Possible slight wear	98.2	31.9	17.4	103.9
628	6	601	X	Elongated ovoid, flattened biconvex section	-	138.9	43.4	21.6	235.7
637	6	601	-	Fragment. Rounded rectangular section	Smoothing and polishing	39.0	42.9	34.9	105.2
644	6	601	-	Elongated ovoid, flattened slightly D-shaped section	Smoothing and polishing, staining	107.7	53.8	35.5	356.0

light wear as whetstones they display, followed by use as hammerstones may suggest unsatisfactory performance in their primary function, leading to the secondary usage prior to being discarded.

SF 413a Whetstone/Hammerstone. Elongated ovoid in shape with a biconvex section transitioning to a flattened D-shaped section. Water-rounded light greyish brown micaceous quartzitic sandstone, with moderate onion weathering confined to both faces of the more bulbous end. Both faces have seen light use as a whetstone, with slight smoothing from wear (L 100.1 mm, W 13.4 mm; L 112.6 mm, W 7.6 mm). The stone has seen secondary use as a hammerstone, with severe bifacial fracture damage at the narrower end (L 49.7 mm, W 23.7 mm; L 25.9 mm, W 19.6 mm). The stone displays areas of dark grey-brown staining confined to one face of the bulbous end (L 22.1 mm, W 21.0 mm) and along one long edge (L 104.0 mm, W 8.8 mm). L 157.0 mm, W 42.6 mm, T 27.4 mm. Mass 280.1 g. Context [401].

SF 4214 Whetstone/hammerstone. Elongated ovoid shape with an offset triangular section. Water-rounded dark blueish-grey biotite schist cobble with remnants of a quartzite vein along one face. One end tapers to a flattened point, while the opposing end is slightly more bulbous. There is a small chip from a fresh break at the tip of the tapered end. Broad edge slopes to one side, steepening in angle towards one end, and displays slight smoothing and polishing through use (15.7 mm x 90.0 mm), with dark reddish-brown staining along one edge and down the centre of the wear. There is also a small area of damage along one side of the broad edge (L 43.6 mm). The opposing narrow edge has three to four successive percussion impact points causing bifacial flaking from the midway point towards the tapered end (L 66.2 mm). The area of damage on both edges is the result of secondary use as a hammer stone. L 224.0 mm, W 44.1 mm, T 18.7 mm. Mass 341.3 g. Context [403]. Figure 3.53.

Combination tools with a primary function as a burnisher or smoother

One burnisher (SF 320; Figure 3.51 B) and one smoother (SF 621) saw secondary use as pounders (See Table 3.13, below). Both are from disturbed contexts, one in the central enclosure and one in the western enclosure, but evidently relate to the craft activities that were being practised there. Both tools display smoothing and polishing from use over two faces, but there are then areas of peckmarking that betray their secondary use as pounders before they were discarded. One of the tools (SF 320) fits neatly in the hand, with a dimple in its surface serving as a convenient thumb hold when it was subsequently used for pounding.

Most combination tools are simply natural stones that have been chosen for their size, shape or weight to perform a particular function, but a third tool (SF 4163) included in this category began life as a shaped sharpening stone but was subsequently employed as a burnisher. Prepared from a piece of dark grey slate, both ends are now broken, but it is finely made in a flattened rectangular shape that tapers slightly towards one end. One face is highly smoothed and polished from use as a burnisher, while the opposing face is characterised by a concave channel running lengthwise for use as a sharpening stone/hone. Also found in the central enclosure, this object has possible associations with metalworking and was clearly a prized tool.

SF 320 Burnisher/Pounder. Rectangular in shape with rounded ends and a square-shaped section. Small water-rounded quartzite cobble. Two opposing faces smoothed and polished from wear. The flatter of the two faces has a smoothed and highly polished surface (L 59.5 mm, W 23.7 mm), bordered by a band of abraded wear on both long sides (W 7.8-8.6 mm). The opposing face is more irregular, with a somewhat smoothed and polished surface confined towards one end (L 37.3 mm, W 25.0 mm). The cobble tool has seen secondary use as a pounder, with a sub-circular area of peckmarks concentrated largely at one corner of one of the faces, but extending to the adjacent corner. (L 34.7 mm, W 12.4-21.6 mm). The peckmarks from pounding have slightly altered the shape of the cobble on the affected corner. There is a naturally formed hollow in the surface on one side of the cobble that forms an ideal right-handed thumb-hold when gripping the pounder to produce the abrasion at the corner. The majority of the cobble is covered in a reddish-brown stain with darker patches from its handling during use. L 87.8 mm, W 46.8 mm, T 43.5 mm. Mass 326.5 g. Context [308]. Figure 3.51 B.

SF 4163 Burnisher/Sharpening stone. Rectangular in shape, tapering slightly to one end, with a flattened rectangular section. One face is flat, and the opposing face has a concave channel running lengthwise; both ends are broken. Possible dark grey slate. All faces have been worked, having been modified into a tool form prior to use. The flat face is highly smoothed and polished, with faint lengthwise striations. Both narrow edges have been shaped and polished. The opposing face has a slightly offset shallow concave channel (W 12.5 mm) with a small break in slope and lengthwise striations formed by abrasion. L 38.9 mm, W 20.1-22.1 mm, T 4.5 mm. Mass 7.2 g. Context [406]. Figure 3.57 D.

SF 621 Smoother/Pounder. Rounded rectangular shape, rounded rectangular section. Water-rounded dark blue-grey cobble. Two opposing faces smoothed and polished from wear (L 93.3 mm, W 41.4 mm; L

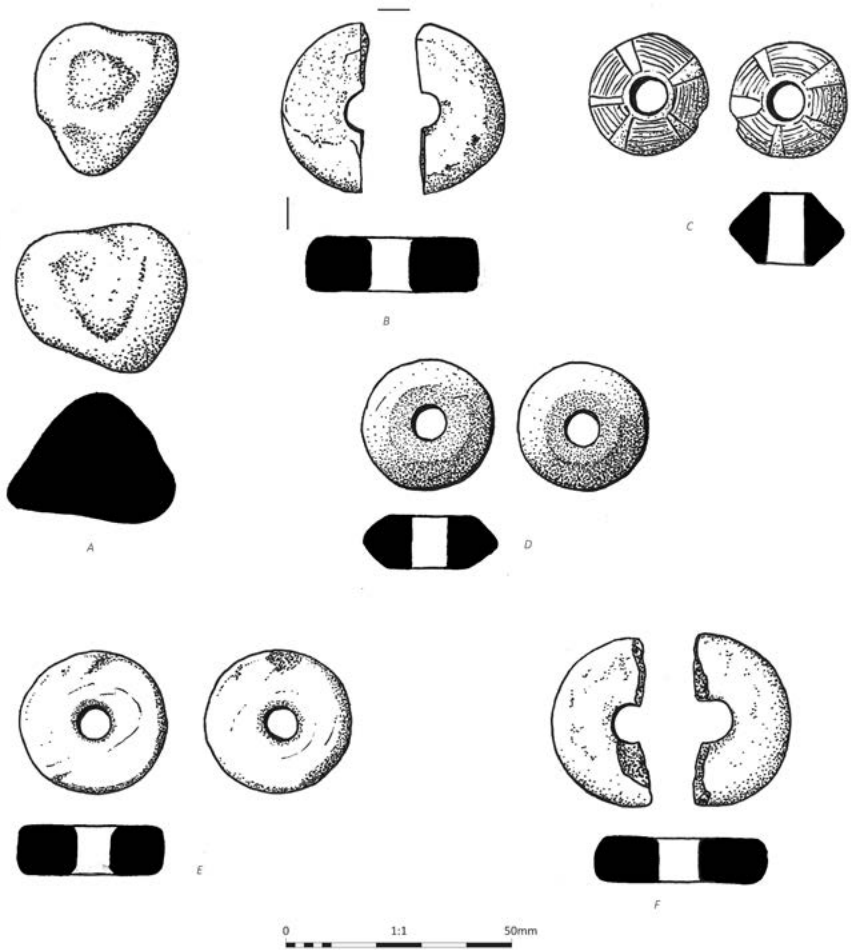

Figure 3.54: SF 4181 smoother (A), and spindle whorls SF 4074 (B), SF 4060 (C), SF 4225 (D), SF 401 (E) and SF 614 (F).

Figure 3.55: SF 401 spindle whorl.

Figure 3.56: SF 4060 biconical spindle whorl with decoration.

92.5 mm, W 49.4 mm), with the broader of the two faces displaying a band of darker staining following one edge (W 15.6 mm). The cobble tool has seen secondary use as a pounder, with two well-defined conjoining circular peck wear facets (L 35.9 mm, W 22.6 mm; L 24.3 mm, W 20.7 mm) on one end, and a linear hairline fracture radiating from one side (L 46.3 mm). The opposite end of the stone has been lost to a diagonal fracture removing approximately one third of the cobble. The broad face also has a

chipped facet along one side towards the broken end (L 30.4 mm, W 22.3 mm). L 114.9 mm, W 59.7 mm, T 38.3 mm. Mass 452.4 g. Context [Unstratified].

Whetstones and whetstone manuports

Of the 14 cobble stone tools recovered that are classed as whetstones (Table 3.14), five are complete and intact, three are fragments, and six are either manuports that are the correct material, size, and shape, but display no evidence of wear from use, or stones of the correct material, size and shape to have been used as whetstones, but where the surface has been lost to onion weathering. Two additional combination tools had a primary function as whetstones but were subsequently used as hammerstones (SF 4214 and SF 413a).

The whetstones are generally elongated stones, their shapes ranging across ovoid to triangular, and in section from crescent-shaped to sub-rectangular, and are either of a quartzitic sandstone or biotite schist. Length varies from 95.3 mm to 224.0 mm, with approximately half falling within the range of 132.2 mm to 139.6 mm. Width varies between 21.0 mm to 63.2 mm, with a fairly even distribution over the range, and thickness varies from between 13.6 mm and 43.5 mm, with around one third falling within the range of 19.2 mm to 23.2 mm. The objects identified as possible whetstones and whetstone manuports all fall well within these ranges and are considered at least to be plausible examples with regards to dimensions, form, and material.

The majority of the whetstones, possible whetstones, and whetstone manuports were recovered from superficial or heavily disturbed contexts. One whetstone (SF 4151; Figure 3.57 C) was incorporated into the redeposited material making up part of a platform [411] at the rear of the lower terrace in the central enclosure; this context also produced residual sherds of E ware dating to the late 6th to 7th century (SF 4148a-b), and an iron socketed arrowhead (SF 4144; Figure 3.10 B and 3.19).

Only two whetstones were recovered from what are considered to be *in situ* contexts; these comprise a possible whetstone (SF 4168) from an old ground surface layer [406] that also produced late 6th- to 7th-century E ware (SF 4154), a fired clay mould fragment (SF 4160), and a combination burnisher/whetstone (SF 4163). Another whetstone (SF 4143a(i)) came from the final deposit [409] in the secondary hearth [420], which also produced a crucible fragment (SF 4145), fired clay (SF 4146), a gaming piece (SF 4162), and a smoother (SF 4143a(ii)). These finds, taken together with the mass of other material found in disturbed deposits adjacent, provide additional information regarding the types of activities taking place within the central enclosure, both for sharpening the blades of tools used in the crafts, and indeed in other metalworking processes.

Spindle whorls (or beads)

Straight-sided disc-shaped whorls

Three straight-sided disc-shaped whorls were found, one intact and the other two broken in half. They vary in colour and material from a mid-brown siltstone to orange-brown to dark brown sandstone. They range in diameter from 31.6 mm to 37.7 mm, in thickness from 9.3 mm to 11.9 mm, and in perforation diameter from 6.8 mm to 9.2 mm. Though made of different types of stone, both the broken examples are very similar to one another in size, with a difference in overall diameter of only 0.6 mm, in thickness of 1.5 mm, and in perforation diameter of 0.7 mm.

Two of whorls are decorated, the simpler (SF 4074; Figure 3.54 B) with repeating diagonally incised lines across its vertical face. The more complex design, (SF 401; Figures 3.54 E and 3.55), is decorated on both faces with curving and linear incisions that cross over in places, as well as rounded and triangular shapes. Although no recognisable motif is easily identifiable, there is an area of shorter lines crossing over a longer line that bears some superficial resemblance to ogham. Although the King's Seat example is not ogham, whorls with ogham script inscribed on their faces are known, such as an 8th-century spindle whorl from Buckquoy, which bears a blessing to the soul of 'L' (Forsyth 1995: 688). A close parallel to the King's Seat example was found at a nearby early medieval upland settlement at Lair, in Glen Shee. Made from a beige, fine-grained sandstone, the disc-shaped whorl is heavily marked on one face with both deliberate carving and accidental scratches, some of which resemble depictions of animals, and others ogham script (Johnson 2019: 85-6). Like the one from King's Seat, this is not ogham, but it is also stained with what is suspected to be lanolin from handling (Clarke 2019b: 87). Another local parallel to the King's Seat example is one from the barrow at North Mains, Strathallan, with similarly incised lines (Barclay 1983: 225-6, fig.60, 114), though this is evidently of Bronze Age date, while further afield whorls with 'ogham-like' decoration have been found at the Broch of Burrian on North Ronaldsay, and Fintray in Aberdeenshire (Johnson 2019: 86).

SF 401 Spindle Whorl. Intact circular disc of dark brown sandstone with slightly rounded vertical edges and a well-worn biconical perforation (D 6.8-9.7mm). Both faces are decorated with linear and curving incisions that cross over in places, as well as rounded and triangular shapes. No recognisable

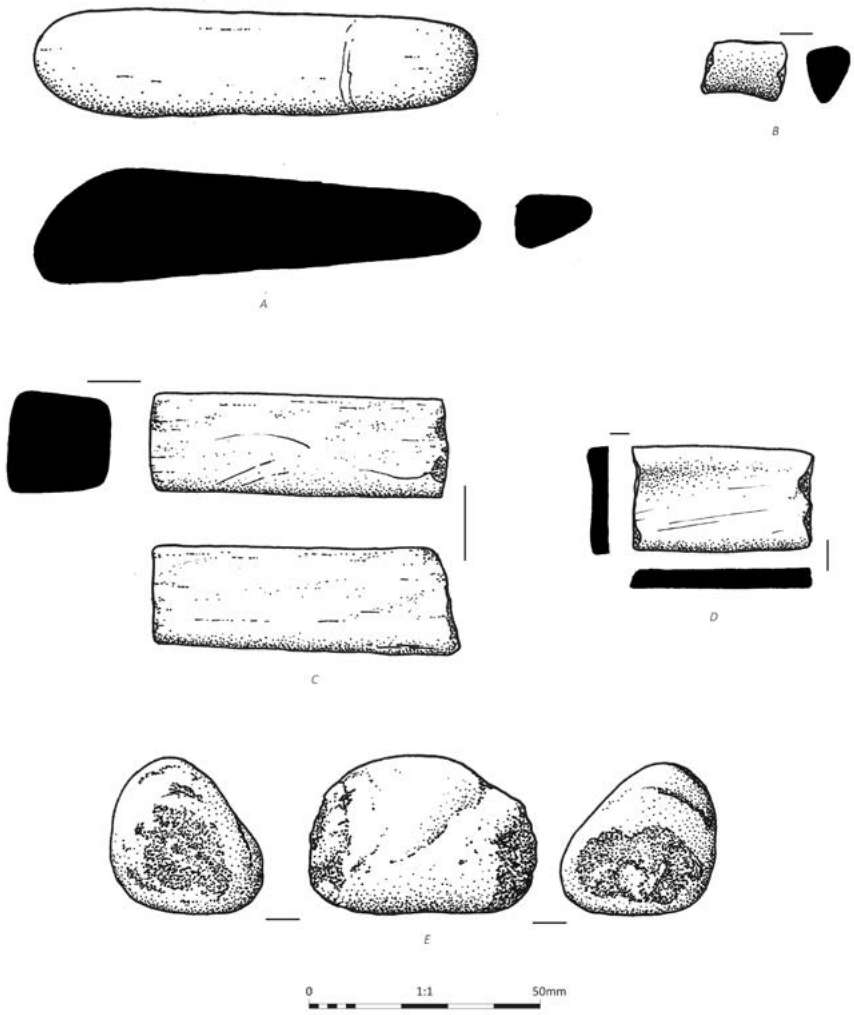

Figure 3.57: Whetstone SF 4143a(i) (A), sandstone armlet fragment SF 4172 (B), whetstone SF 4151 (C), sharpening stone/burnisher SF 4163 (D), and pounder SF 303 (E).

motif can be readily identified, but some shorter strokes crossing a longer line bear a superficial resemblance to ogham script. Surface is stained a dark grey-brown and there is slight damage to both edges along one side. All surfaces have been carefully shaped and show signs of abrasion, and the whorl appears well-balanced and well used. D 31.6-32.0 mm, T 9.3 mm. Mass 15.1 g. Context [401]. Figures 3.54 E and 3.55.

SF 4074 Spindle Whorl fragment. One half of a mid-brown siltstone disc-shaped spindle whorl. Straight sided with slightly rounded edges and decorated with diagonal linear incisions. Perforation is drilled (D 9.2 mm). One face intact, and one partial face with approximately one third of the surface remaining. Possible faint incisions on intact face. D 37.2 mm, T 11.9 mm, Perforation D 8.0 mm. Mass 9.8 g. Context [402]. Figure 3.54 B.

SF 614 Spindle whorl fragment. Coarse-grained orange-brown sandstone. Half fragment of an undecorated, straight sided disc-shaped whorl with slightly rounded edges. Possible faint rounded divots in face. Biconical perforation (D 8.5-9.6mm). D 37.7 mm, T 10.4 mm. Mass 11.46 g. Context [601]. Figure 3.54 F.

Biconical whorls

Two biconical whorls were found, both intact and vary in colour and material from a light brown/ buff siltstone (SF 4060; Figures 3.54 C and 3.56) to a dark grey/black shale (SF 4225; Figure 3.54 D). The overall size and shape of the whorls is not comparable in terms of diameter and thickness, with the decorated siltstone whorl being narrower and taller (D 25.8 mm, T 14.9 mm), and the shale whorl being broader and thinner

Table 3.15: Summary of gaming pieces (possible gaming pieces identified by *next to SF No.).

SF No.	Trench	Context	Shape	L: (mm)	W: (mm)	Th: (mm)	Mass (g)	Lighter stone	Darker stone	Stained	Polished
220 (i)	2	202	Ovoid, flattened oval section	22.8	20.2	9.9	7.1	X	-	-	X
220 (ii)	2	202	Circular, flattened oval section	21.1	21.1	8.8	6.0	X	-	X	X
220 (iii)	2	202	Circular, ovoid section	19.3	17.9	12.7	6.5	X	-	-	X
220 (iv)	2	202	Circular, flattened ovoid section	17.9	17.1	10.7	4.8	-	X	-	X
426	4	401	Ovoid, plano-convex section	19.4	15.7	11.4	5.0	-	X	X	X
4058*	4	401	Ovoid, sub-circular section	19.1	16.6	15.5	6.8	X	-	-	X
4096 (i)	4	403	Ovoid, flattened plano-convex section	26.6	23.0	11.0	10.5	-	X	-	X
4096 (ii)	4	403	Ovoid, plano-convex section	23.9	21.0	14.9	11.0	X	-	X	X
4153*	4	403	Ovoid, plano-convex section	28.3	21.1	12.3	10.0	-	X	-	-
4162*	4	409	Ovoid, circular section	17.1	14.9	13.7	5.0	X	-	X	-
4177*	4	403	Ovoid, circular section	21.0	17.4	15.7	8.2	-	X	-	-
4178	4	403	Ovoid, flattened biconvex section	17.4	14.7	7.2	2.9	-	X	X	X
4179	4	403	Ovoid, sub-circular section	21.2	17.1	15.2	7.9	X	-	X	X
4185 (i)*	4	403	Ovoid, ovoid section	24.7	20.9	14.7	10.4	X	-	X	X
4185 (ii)*	4	403	Ovoid, ovoid section	18.3	14.7	11.9	4.1	X	-	X	-
4213*	4	403	Ovoid, flattened ovoid section	17.4	13.0	9.9	3.1	X	-	-	-
4243	4	403	Ovoid, flattened plano-convex section	17.7	15.5	8.4	3.5	X	-	-	X

(D 28.9 mm, T 10.4 mm). The perforation diameters, however, differ by only 0.3 mm, measuring 7.8 mm and 7.5 mm respectively.

The siltstone whorl (SF 4060), however, is decorated on both sides with a design in which splaying pairs of radial lines divide each sloping face into five panels that are filled with close-set lines aligned roughly with the circumference. The panels of each face are offset so that each lined panel is matched with a pair of splaying radials. This contrasts with the undecorated shale whorl, which is heavily smoothed and has a rounded waist.

SF 4060 Spindle Whorl. Light brown/buff siltstone. Intact, biconical form with a biconical, slightly off-centre perforation (D 7.8-9.0mm). Decorated on both halves with five irregular panels of seven to nine roughly horizontal incised lines bordered by narrow undecorated panels defined by radial pairs from the perforation down to the waist. The pattern repeats on the opposing side, but is offset so that the centre of each banded panel is matched with an undecorated radial panel on the opposing half. A large portion of the surface is stained mid to dark brown. D 25.8 mm, T 14.9 mm. Mass 8.8 g. Context [401]. Figures 3.54 C and 3.56.

SF 4225 Spindle Whorl. Dark grey/black shale. Intact undecorated biconical whorl with rounded waistline and likely drilled perforation (D 7.5 mm). Moderate wear and abrasion. D 28.9 mm, T 10.4 mm. Mass 7.7 g. Context [403]. Figure 3.54 D.

Spindle whorls are commonly associated with domestic textile production and are mounted at the end of a spindle to provide momentum and balance while twisting raw fibres into thread (Walton Rogers 2009: 283; Johnson 2019: 86). Traditionally believed to be associated with feminine gender roles, spindle whorls may have been prized personal items and are sometimes included as grave goods (Johnson 2019: 86). They are known throughout Britain from the Neolithic to the later medieval period and beyond (Johnson 2019: 86), and have been found on other sites with early medieval deposits, including: Loch Glashan, Argyll and Bute (Batey 2005: 107); Castle Park, Dunbar, East Lothian (Cox 2000: 141); The Mote of Mark, Kirkcudbrightshire (Laing and Longley 2006: 96); Dundurn (Alcock *et al.* 1989: 3:B8); Buiston, Ayrshire (Clarke 2000: 142); Dunadd, Argyll and Bute (Lane and Campbell 2000: 192); and Lair, in Glen Shee (Clarke 2019b: 80).

However, there is still debate about whether all the artefacts classified as 'spindle whorls' are actually associated with textile production. Wear marks on the Lair example suggest that it had been worn as a pendant (Clarke 2019b: 80). Indeed, the distinction between stone beads and spindle whorls can often be blurred. For example, of the 36 spindle whorls recovered from the Howe, Ballin-Smith attempted to differentiate between beads and whorls based on size, with whorls weighing 10 g or less classified as beads, and those above classed as whorls (1994: 192). Applying this classification to the whorls from King's Seat, SF 401 (Figure 3.54 E) would be classed as a whorl, but the other two intact examples (SF 4060 and SF 4225) would be classed as beads. Size and weight, one would suppose depends more on the properties of the material used and the requirements of the gauge and weight of the thread being spun. Furthermore, many of these objects may have had dual lives, acting as whorls on one occasion, but strung as beads on another, perhaps strung and worn when not in use.

Personal and leisure

Armlet

One possible sandstone armlet fragment (SF 4172; Figure 3.57 B) was identified. The interpretation of this fragment as an armlet is not certain, though if the curve

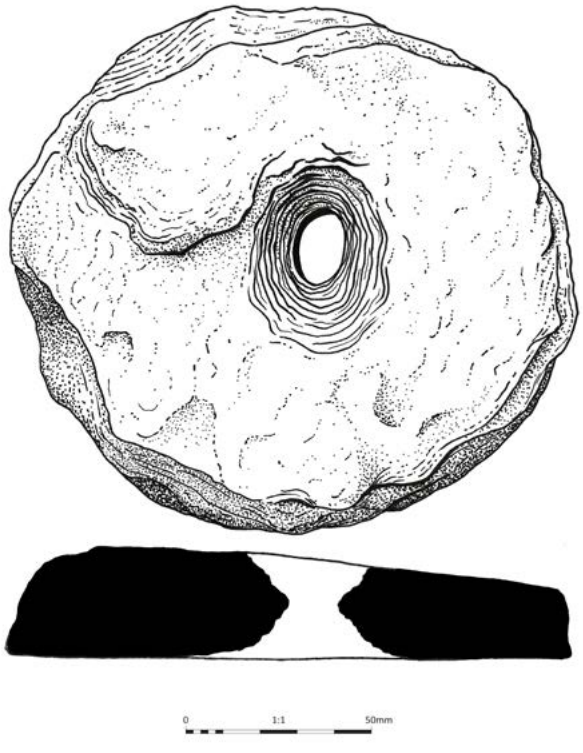

Figure 3.58: Roof weight SF 505, likely from Structure 1.

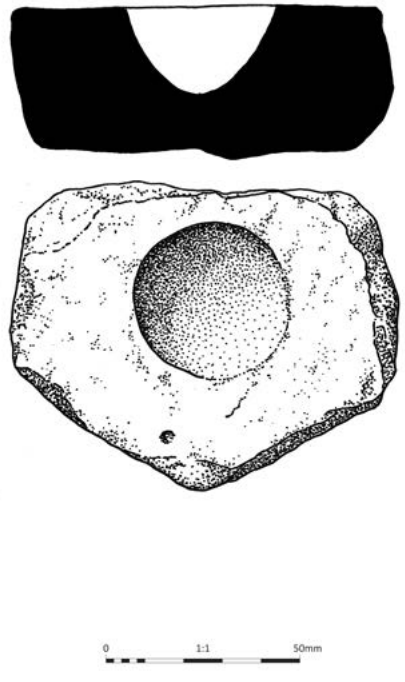

Figure 3.59: Pivot stone SF 4039, likely from Structure 1.

is extrapolated, it would give an internal diameter of 67.5mm, and an external diameter of 94.1mm.

Most armlets or bangles recovered from similar assemblages are made from jet/lignite or oil shale, such as the ones identified at Buiston (Clarke 2000: 142), Castle Park, in Dunbar (Cox 2000: 143), the fortified Iron Age homestead of Aldclune, in Blair Atholl (Cool 1997: 443), the Howe, in Orkney (Ballin-Smith 1994: 188), and at Dunadd, where there is also evidence of oil shale manufacture on site (Lane and Campbell 2000: 192). Jet/lignite jewellery is known in Scotland from the Early Bronze Age onwards, and armlets remain common through to the early medieval period, most of which display D-shaped cross-sections (Clarke 2000: 142).

Though far less common, sandstone armlets are also known from several Iron Age sites. Two fragments were recovered from the later phases at the Howe, Orkney, from contexts dateable to around the 4th to 6th centuries AD (Ballin-Smith 1994: 188, 2087, 7082), while one half ring of sandstone with an internal diameter of 50.8 mm was recovered from an Iron Age homestead at West Plean, Stirlingshire (Steer 1958: 246, Cat 3, 6, plate XIX). Though not described as an armlet, this half ring has a suitable internal diameter for a bracelet or armlet worn by someone with slender hands and wrists.

SF 4172 Possible armlet fragment. Dark reddish-brown sandstone. Rounded triangular section tapering down to internal edge. Slightly curved in plan, both ends broken. L 18.2 mm, W 13.3 mm, T 9.6 mm. Possible D; Ext 94.1 mm, Int 67.5 mm. Mass 3.2 g. Context [403]. Figure 3.57 B.

Gaming pieces

Seventeen small water-rounded pebbles of quartzite and sandstone are likely to have been gaming pieces. The objects are predominantly naturally ovoid or circular in shape, with a flattened ovoid or plano-convex section, and either a slightly flattened and polished surface from wear central to one face, or a slightly concave and polished flatter surface. Six of the 17 gaming pieces display varying degrees of staining over their surfaces from use and handling, ranging in colour from a light yellowish and light greyish-brown to dark brown.

The gaming pieces can be split into two different groups based on tone. First, the lighter coloured stones, which account for 11 of the 17, and comprise those in light grey-brown quartzite (6), opaque opalescent quartz clasts (2), light pinkish-grey quartzite (1), and a light grey/white quartzitic sandstone (2). Second, the darker coloured stones, which account for 6, and comprise those in a dark grey-brown quartzite (2), a dark brownish-black sandstone (1), a dark reddish brown/grey sandstone (1), a dark pinkish-grey granite (1), and a blue-grey banded quartzite (1).

There does not appear to be any obvious correlation between colour and size, but the sample is too small to expect any discernible patterns. The gaming pieces have been summarised in Table 3.15, above.

Gaming pieces and counters are known from the Iron Age through the early medieval period and later (Hall 2007b; McLaren and Hunter 2014: 287; Carver *et al.* 2016: 202). The identification of gaming pieces on sites can be problematic on account of the unmodified rounded or ovoid water-rounded pebbles that were often used; these may show very little sign of wear or polish. The more obvious of the gaming pieces are the modified rounded and flattened stone discs, such as the ones recovered from the Howe (Ballin-Smith 1994: 287), Inchmarnock, Argyll and Bute (Franklin 2008b: 191), Dundurn (Alcock *et al.* 1989: 3:B8), and Burland, Shetland (McLaren and Hunter 2014: 287). Unmodified water-rounded pebbles described as possible playing pieces have also been identified on other early medieval sites, such as Loch Glashan, Argyll and Bute (Batey 2005: 105), the Mote of Mark, Kircudbrightshire (Laing and Longley 2006: 93), and at Auldhame, East Lothian (Engl 2016: 91). Further evidence of gaming is present in the form of a number of gaming boards (see Hall 2007b for a summary; and further discussion below). These have been recovered from sites like the Howe, from a later Iron Age context (Ballin-Smith 1994: 188), from the 8th to 9th century phases at Portmahomack, Easter Ross (Carver *et al.* 2016: 202), and from the fill of a grave as a likely grave good at Inchmarnock (Franklin 2008b: 191).

Structural

Although the following finds were retrieved from disturbed contexts, the recovery of a possible roof-weight (SF 505; Figure 3.58), a door post pivot stone (SF 4039; Figure 3.59), and an unfinished pivot stone (SF 4192) are all suggestive of structures located within the central enclosure.

Roof weight

This perforated disc (SF 505) is probably a weight with one face appearing to be lightly abraded in one direction. The biconical perforation is set at an angle, with wear along its inner edge on the thinner side of the weight, possibly indicating that the weight was strung with rope, potentially acting as a roof weight or similar.

SF 505 Weight. Large, perforated disc of light silvery-brown micaceous quartzitic schist with tiny garnet

Figure 3.60: The slingshot cache gathered on site.

clasts. Worked into a roughly circular shape with a slightly off-centre ovoid perforation. The edges of the weight have been roughly shaped, with the thickness tapering down to one side (27.2–17.5 mm). One face of the weight appears to be lightly abraded in one direction. The biconical perforation is set at an angle, with wear along its inner edge on the thinner side, suggesting that it was suspended, possibly as a roof weight or similar. L 154.0 mm, W 141.7 mm, T 27.2-17.5 mm. Perforation; max D 47.1-33.3 mm; inner D 16.9-13.3 mm. Mass 832.3 g. Context [501]. Figure 3.58.

Pivot stones

One hollowed stone (SF 4039; Figure 3.59) is probably a pivot stone for a door post due to the rotational wear shown on the interior of the cone-shaped hole. It has been suggested that it could have been a crucible stand, but there is no sign of vitrification or slag droplets as is usually found on these. Its location at the northern end of Structure 1 could indicate where an access door into this building would be anticipated. Another stone (SF 4192) included here has a pecked depression on one face, but it lacks the smooth rotational wear of the complete stone.

SF 4039 Probable pivot stone. Irregular slab of red sandstone, with circular depression on one face. The hole is a regular rounded cone shape, diameter 40mm, depth 25mm. The sides of the hole are smoothed and show signs of wear. No signs of burning. L 100.0 mm, W 70.0 mm, T 35 mm. Context [401]. Figure 3.59.

SF 4192 Possible unfinished pivot stone. Irregular slab of sandstone with pecked depression on one face. D 30 mm, Depth 12 mm. Context [403].

Discussion of the coarse stone

The quantity and composition of the stone assemblage from King's Seat is consistent with other early medieval sites, including Dunadd (Lane and Campbell 2000) and Dunollie in Argyll and Bute (Alcock and Alcock 1987), Dundurn (Alcock *et al.* 1989), The Mote of Mark, Kirkcudbrightshire (Laing and Longley 2006), Alt Clut, Dunbartonshire (Alcock and Alcock 1990), Buiston, Ayrshire (Crone 2000), and Kirk Hill, Berwickshire (Alcock *et al.* 1986). Of particular interest, is the lack of quern stones, rotary or otherwise, recovered from site. The only querns within the King's Seat assemblage are the saddle querns re-used as moulds and sharpening stones. The Mote of Mark is perhaps the closest assemblage to King's Seat in this regard, where no more than a single fragment of a rotary quern (now lost) was noted (Laing and Longley 2006: 93) whereas other sites such as Dunadd have several examples within the assemblage.

Although only a small number of stone objects were retrieved from undisturbed contexts, when looking at the finds on a trench by trench basis and in comparing the central, western and eastern enclosures, certain patterns begin to emerge.

It is clear from the material evidence that craft activities and domestic/leisure activities were taking place within both the western and central enclosures, with the central enclosure seeing the highest concentration of activity, with no fewer than 65 stone objects, though only seven come from securely stratified deposits. Of particular note, all 17 of the recovered gaming pieces were from the central enclosure, as were four out of the five recovered spindle whorls, and the vast majority of the whetstones, smoothers, and hammerstones.

In comparison, both grinding tools were retrieved from the western enclosure, and a near equal distribution of pounders and sharpening stones was split between the western and central enclosures. Although it is a possibility that the make-up and distribution of finds between the western and central enclosures is attributable to preferential recovery in totally excavated areas within the trenches, the range of objects from the central enclosure suggests it saw not only a higher level of activity than the western enclosure, but also a wider variety.

Slingshot

Daniel Bateman

A total of 548 stones (Figure 3.60) that were suspected to be slingshot or similar were recovered. A 20% sample of the total from context [204], SF 222, were examined for this report. All measurements are within the site archive. In summary, none of them have been deliberately worked and all are in a natural, unmodified state. The weight of individual slingshots varies from 2.9 g to 345.3 g.

The use of slingshot in Iron Age warfare is well-documented in England and Wales (Finney 2006: 91-7), and both stone and clay slingshots have been recovered from numerous hillforts, amongst them Maiden Castle, Dorset (Sharples 1991) and Danebury, Hampshire (Cunliffe 1984). It is believed that a leather or cloth sling would have been used to throw (or sling) the slingshots from the higher vantage point of the hillfort ramparts to ward off attackers advancing up the hill. Due to the organic nature of the materials used to make a sling, it is unsurprising that no examples have survived (Robertson 2016: 29), making the slingshots not only a proxy for their use in warfare, but also as evidence that hillfort defences had a practical function (Armit 2007; Lock 2011). The sorts of deposits containing slingshots that have been found in England are unknown from Iron Age forts in Scotland, although small carved stone balls of unknown function are a common find from sites in south-eastern Scotland (Cool and Baxter 2013; Armit and McKenzie 2013). The King Seat slingshots, however, are apparently early medieval in date, in the sense that although they were all unstratified there is no evidence of a substantive Iron Age occupation from the excavation trenches. If this is indeed the case, the parallel drawn with Trusty's Hill, another early medieval fort in Kirkcudbrightshire, is more appropriate. There 89 rounded pebbles interpreted as slingshots were recovered. The majority of them were found close together in deposits behind the rampart on the eastern side of the fort and included two caches (Ballin Smith 2017). The apparent absence of such stones from small scale excavations in numerous Scottish forts, and indeed from the more excavations at Broxmouth, the association with two early medieval forts suggests a change in warfare tactics had taken place.

3.14 Unworked animal bone

Amy Halliday

Introduction

Animal bone (12.5kg) was retrieved primarily from deposits localised around the hearth settings in Structure 1 and came from six contexts comprising the topsoil [401], the upper enclosure rampart [402], a disturbed deposit [403], and fills [409], [412] and [413] from hearth [410]. The main aim of this study was to understand the economic role of animals on site and in the diet of its occupants in the early medieval period. The animal bone also provides a valuable opportunity for comparison with assemblages from similar early medieval sites.

The assemblage

The assemblage comprised 1505 fragments (12.5kg). The numbers of identified specimens (NISP) were cattle (147), sheep/goat (31), pig (77), red deer (2), bird

Table 3.16: Animal species identified on site.

Species	NISP	MNI
Cattle	147	3
Sheep/goat	31	3
Pig	77	3
Red deer	2	1
Domestic fowl	1	1
Bird	2	
L/M	645	
M/M	216	
S/M	1	
I/M	383	
Total	1505	

(2) and domestic fowl (1). The remaining fragments were described as Large Mammal (L/M) (645), Medium Mammal (M/M) (216), Small Mammal (S/M) (1) and Indeterminate Mammal (I/M) (383). Preservation of this material was mostly poor with a smaller number recorded as adequate to excellent. The poor preservation was influenced by several taphonomic factors, such as prolonged exposure to the elements and burning. It was noted that the deposits in Trench 4 had been subjected to disturbance, including widespread modern rhododendron roots, and spade dug cultivation.

Summary of the contextual units

Topsoil

Context [401], topsoil

There were 933 fragments (7345.2g) identified as cattle (95), sheep/goat (22), pig (45), red deer (1), L/M (388), M/M (89), S/M (1), I/M (292). Most of the cattle bones were skull, teeth, long bones and foot bones found along with a single fragment of pelvis. The sheep/goat and pig bones were all teeth, long bones and foot bones. The red deer bone was an antler.

Thirty-five of the cattle bones could be aged using epiphyseal fusion and tooth eruption data. The youngest cattle died at under 16 months of age, while at least two individuals were still alive at over 42 months. Seventeen pig bones could be aged. They were killed in two peaks, some aged between 4 and 24 months, and others over 24 months. There were also 15 sheep/goat bones that could be aged. The youngest was under 16 months, the oldest over 30 months.

Thirteen bones in this context had been modified. One of which was a red deer antler (SF 415) with deep chop marks at the base of the bone where it had been removed from the skull. At the opposite end of the bone an area of the surface had been worked smooth. It is likely this bone was discarded at some point in the process of being worked to create an artefact (intra). The modified bone also included a cattle humerus with a hole through the shaft just before the distal epiphyses. This may also have been the start of some kind of bone working which was also been abandoned. Several L/M vertebrae, ribs and long bones and a M/M pelvis had cut and chop marks on their surfaces, likely to have been created during the butchery process. The bones in this context are a mix of, butchery, food and craft working waste which has become distributed into the topsoil close to the hearth due to the high level of disturbance.

Context: [402], upper enclosure rampart

Ten bones (88.5g) were identified as cattle (3), L/M (3), M/M (3) and I/M (1). The cattle bones were a molar, a tibia and an astragalus. The cattle tibia came from an animal over 24 months. The bones in this context are likely to be food or butchery waste which have been redeposited during collapse of the rampart, post-abandonment.

Context: [403], disturbed deposits below topsoil

Two cattle molars (20.1g) had become incorporated this deposit.

Hearth [410], fills [409], [412] and [413]

Contexts [409], [412] and [413] were identified as fills of hearth [410], which probably sits within the remains of a large building. The lower fill of this hearth was radiocarbon dated to the 6th-7th centuries AD.

Within [409] there were 461 bones (2800.3g) from cattle (39), sheep/goat (6), pig (23), domestic fowl (1), bird (2) L/M (198), M/M (102) and I/M (90). The cattle, sheep/goat and pig bones were mainly skull, teeth, limb and foot bones, with two fragments of cattle scapula and one piece of pig scapula also being found. The bird bones were a long bone, a sternum and a humerus, this last identified as domestic fowl.

Fourteen cattle bones provided aging data. The youngest was over 7 months old and at least one individual was still alive after 42 months. Three sheep/goat bones provided aging data. They were under 24 months, over 21 months and over 36 months respectively. Nine pig bones came from animals between 1 week and 42 months of age at their time of death. The domestic fowl humerus came from an adult individual. Two large mammal ribs in this context showed signs of having been butchered; they both had cut marks visible on their surfaces.

In [412] there were 98 bones (1987.6g), identified as cattle (8), sheep/goat (3), pig (9), L/M (56), and M/M (22). The cattle, sheep/goat and pig bones were skull, teeth, scapula, ribs, long bones and metapodials. All the cattle bones came from animals aged over 12 months, the sheep/goat bones came from animals aged between 6 and 42 months, and the pig bones came from animals aged between eight and 42 months. The only bone in this context which showed signs of having been butchered was a pig scapula which had a perforation through a portion of the blade. This may indicate it which was hung on a hook and may have been brought to site from elsewhere as a joint of meat.

Table 3.17: Measured animal bone.

Feature	Find	Context	Element	Species	Side	Number	Measured
Topsoil	437	401	Phalanx 3	Cattle	N/A	1	DLS 61mm, LD 46mm, MBS 16mm
Topsoil	437	401	Phalanx 3	Cattle	N/A	1	DLS 64mm, LD 47.5mm, MBS 17mm
Hearth [410]	4260	409	Calcaneum	Cattle	Left	1	GL 123mm, GD 30mm
Topsoil	437	401	Astragalus	Sheep/ goat	Left	1	GL 38mm
Topsoil	429	401	Phalanx 2	Cattle	N/A	1	GL 38mm, Bp 24.5mm, SD 18mm, Bd 19.2mm
Hearth [410]	4260	409	Astragalus	Cattle	Right	1	GL 55.6mm
Topsoil	437	401	Astragalus	Cattle	Right	1	GL 58mm
Topsoil	429	401	Astragalus	Cattle	Left	1	GLpe 33mm, Bp 24.5mm, SD 19.6mm, BD 20mm GL 50.5mm
Topsoil	429	401	Phalanx 1	Pig	N/A	1	GLpe 37mm, Bp 13.5mm, SD 11mm, Bd 13mm
Topsoil	416	401	Phalanx 1	Cattle	N/A	1	GLpe 53mm, Bp 24mm, SD 22.5mm, Bd 24.1mm
Topsoil	437	401	Phalanx 1	Cattle	N/A	1	GLpe 55mm, Bp 24mm, SD 23mm, Bd 25.5mm
Hearth [410]	4260	409	Phalanx 1	Cattle	N/A	1	GLpe 58mm, Bp 23mm, SD 39mm, Bd 21mm
Hearth [410]	4260	409	Phalanx 1	Cattle	N/A	1	GLpe 59mm, Bp 26mm, SD 24mm, Bd 23mm

In [413] a single worked red deer antler (287.4) was found (SF 4253). It had been chopped through its width and had multiple parallel cut marks along its surface. It is likely the remnants of craft activity (intra).

The animal bone from the fills of [410] suggests that butchery and craft working waste was derived from activities were taking place nearby. The cooking debris and food waste also disposed of in the hearth included bone from joints of meat which had probably been hung on hooks.

Discussion of the unworked animal bone

Species Present

The number of identified species (NISP) and minimum number of individuals (MNI) results are presented in Table 3.16. The NISP for the identified species was cattle (147), sheep/goat (31), pig (77), red deer (2), domestic fowl (1) and bird (2). MNI was calculated for cattle (3), sheep/goat (3), pig (3), red deer (1) and domestic fowl (1). The assemblage was dispersed throughout the deposits in Trench 4, but these were so heavily disturbed that, with the exception of the hearth deposits, it is unclear whether there was any selective disposal within any particular features.

The cattle

There were 147 cattle bones scattered among the six contexts. They were maxilla, mandible, teeth, scapula, pelvis, long bones, metapodials, calcaneum, astragalus and phalanges. The youngest was under 16 months. The eldest was over 42 months at its time of death. The only cattle bone which showed signs of having

Table 3.18: Evidence for high status and trade networks.

Research priority	Evidence
High status	• E ware pottery • Glass vessels • Non-ferrous metalworking • Glass-working • Leisure
Economic networks and trade	• Connections with the West (Dalriada) • Connections with the East and South (Northumbria) • Connections with the North (Pictland)
Material culture	• Post-Roman Material Culture • Everyday life • Crafts (wood-working; textile working; ironworking; leatherworking)

been butchered or worked was a single humerus with a perforation near its distal epiphyses. A single cattle bone had been burnt. The cattle bones are likely to be a mixture of butchery, cooking and food waste. The cattle were probably exploited for a range of primary and secondary products, from meat and dairy produce for consumption, to the raw materials for craft work in bone and leather. The iron ploughshare (SF 4241) discovered also reminds us that some of these beasts may have been used for traction.

The sheep/goat

There were 31 sheep/goat bones found in three deposits. They were maxilla, teeth, scapula, long bones, calcaneum, astragalus and phalanges. They came from animals as young as six months to over 36 months at their time of death. These are the remnants of butchery and food waste, though sheep and goats may have been used also to produce wool, leather goods and dairy produce.

The pig

Seventy-seven pig bones were present in three contexts. These were identified as maxilla, mandible, teeth, scapula, long bones, metapodials and phalanges. The pig bones were aged to between one week and over 42 months. The only bone which had been butchered was a scapula with a perforation through its blade, suggesting it came from a joint of meat that had been hung on a hook. The pig bones are butchery, food and cooking waste. Pigs, which apart from their skins and bristles have no secondary products, would normally have been slaughtered when they reached the desired weight for their meat. Older animals were probably kept for breeding.

The Red Deer

Two worked red deer antler were found on site. They were probably brought to the site to be worked into artefacts and were abandoned before the process was completed. Although a very small sample size, they do allude to a degree of wild species exploitation taking place. The exclusion of all other skeletal elements and the fact the at least one antler (SF 415) shows signs of having been cast, suggests that shed antler was collected from the wild with the express purpose of bone working, though it is possible that these animals were killed in the chase.

The Domestic Fowl

A single domestic fowl humerus was found in the assemblage. It was both proximally and distally fused. As most bird skeletons fuse soon after hatching this suggests it came from an adult individual (O'Connor 2004: 139). This bird has probably been exploited for its eggs, then slaughtered for its meat and feathers.

The bird

Two bird bones were recorded as a long bone and part of a sternum. It is likely that these bones are derived from food refuse. Both bird bones came from the same hearth fill (409). Birds could have been exploited for eggs and then later slaughtered for their meat, feathers, fat or oil.

The large mammal

There were 645 L/M fragmentary bones recorded as pieces of skull, teeth, vertebrae, scapula, pelvis, long bones and foot bones. There was evidence of butchery on 12 of these bones, including chop and cut marks. These finds are a mix of butchery, cooking and food waste.

The medium mammal

There were 216 M/M bones described as skull, tooth, vertebrae, scapula, ribs, limb and foot bones. A single pelvis in this context had been butchered and had a cut mark visible on its surface. These bones are derived from butchery, cooking and food waste.

The small mammal

A single fragment of S/M mandible was found. It was poorly preserved and could not be identified further. In such a small quantity it is not possible to reach any conclusion about its origin.

The indeterminate mammal

Due to the poor preservation of the assemblage 383 of the bones were only described as I/M. It is likely these bones are derived from butchery, food and cooking waste.

At King's Seat the cattle, sheep/goat and pig assemblages were too small to extract any reliable conclusions about sex. Given the high degree of fragmentation within the assemblage the number of bones suitable for measurement for the three main domesticates was limited (Table 3.17).

Bone modification

Butchery

Within the assemblage there were 17 bones that had evidence of butchery and or bone working. The butchery marks included chopping and cutting marks. These are consistent with animal carcasses being dismembered, which involved the vertebrae and the ribs being detached from the carcass by chopping. Although only a limited number of examples were found, bone working waste was discarded on site. The two red deer antler both had cut and chop marks on their surfaces as well as areas where they had been worked smooth. It is likely these bones were abandoned during the craft process. There was also a pig scapula with a hole visible through its blade where it may have been hung on a hook.

There was no surviving evidence of any pathologies or animal gnawing in the assemblage. A portion of the assemblage (66 bones) was burnt.

Comparison sites for the animal bone

The sites of Dundurn and Dunadd (Alcock *et al.* 1989; Lane and Campbell 2000) provide useful comparison for King's Seat. They share similarities including topography, construction, and time period. Despite a reasonably large quantity of animal bone being recovered from Dundurn the worked bone assemblage was described as small and of poor quality (Alcock *et al.* 1989: 217). Notably the NISP of the main species recovered followed a similar pattern to those found at King's Seat with cattle being the most numerous (61%), followed by pig (31%) and then in a much smaller quantity sheep/goat (8%). This reflects findings at early historic sites across Britain and Ireland, including recent results from Burghead in Moray, Craig Rock in Fife, and the Mither Tap o' Bennachie in Aberdeenshire (Masson-Maclean *et al.* 2023: 3-4), with cattle consistently being found to be the largest dietary element, whilst pig and sheep/goat vary (Alcock *et al.* 1989: 222). This is also the case at Dunadd, where cattle make up 76% of the excavated assemblage, followed by sheep/goat (12%) and pig (10%) (Lane and Campbell 2000: 231). Like at Dundurn and Dunadd, most of the identifiable bone at King's Seat came from cattle followed by the other two domesticates, with small quantities of other animals including deer also being recovered, some of which had been worked (Lane and Campbell 2000: 231; Alcock *et al.* 1989: 222). At Dunadd large quantities of highly burnt bone were found and are thought to have been used as a fuel source, perhaps for metal working activities (Lane and Campbell 2000: 229) but this is not the case in Trench 4 at King's Seat.

The animal bone from King's Seat has provided limited evidence of the diet and economy of the occupants of King's Seat fort. What has become clear is that there was a reliance on the main domesticates, with cattle making up the greatest portion of the diet, followed by pig, then sheep/goat, and that this is in keeping with the NISP of other sites of similar type and date. Three bird bones on site, one of them a domestic fowl, is an insufficient sample to indicate whether these were a regular addition to the diet. Likewise, the two red deer bones recovered demonstrate no more than that wild species were occasionally exploited. Overall, the bone from King's Seat is characteristic of the refuse from a mixed-use site with food and cooking waste being deposited along with the remnants of craft working and butchery.

3.15 Conclusions

Wider discussion and interpretation of the artefacts and ecofacts are presented in the final discussion (Chapter 5). In summary, the King's Seat assemblage is a critical new addition to the material culture of southern Scotland in the early Medieval period, pertinent to wider current research questions, particularly: high status sites; economic networks and trade and understanding of material culture in the post-Roman period.

Chapter 4
King's Seat in Context: Early Medieval Landscape and Culture

David Strachan
with contributions by Richard Tipping, Mark A Hall, and Oisín Plumb

4.1 Introduction

Pictish studies have progressed significantly since *The Problem of the Picts* (Wainwright 1955) highlighted the paucity of excavated structures for a culture otherwise well-represented through both its unique art surviving on carved stones and metalwork, and in placenames. The last two decades have seen continued research into high-status Pictish art on carved stones and artefacts (Henderson and Henderson 2004; Fraser 2008), an important review of historical sources (Woolf 2006 and 2007; Fraser 2009), and further excavation. The latter has also largely focussed on high-status power centres, whether secular forts and enclosures (Lane and Campbell 2000; Toolis and Bowles 2017; Noble *et al.* 2020), or ecclesiastical sites (e.g. Lowe 2006, 2008; Carver *et al.* 2016). The former is most relevant to this volume, the re-emergence of fortified enclosures across Scotland, as in Ireland, Wales, and western England, as manifest symbols of the power of emerging local elites.

One of these, Dundurn fort (Alcock *et al.* 1989), was for long the classic Pictish excavation in Perthshire and one of several sites referenced in early historical sources (the others including Abernethy, Forteviot, Meigle, Clunie and Dunkeld itself) that indicate the areas importance in the period. While recent research has retained a focus on high-status sites, such as Forteviot (Campbell and Driscoll 2020), this social bias has been at least partly addressed through the excavation of dispersed upland farms in Strathardle (Carver *et al.* 2012) and Glen Shee (Strachan *et al.* 2019), significantly increasing our understanding of everyday domestic settlement, for which previously there was no firm evidence on the mainland. Similarly, recent study of high-status burials (Mitchell *et al.* 2020) has been complemented by analysis of a lower status cist burial from Blair Atholl (Czére *et al.* 2021). These various strands of research illustrate how the political, economic, and social change that brought the transition from the Iron Age to the medieval period was reflected in the development of new and diverse sites and monuments, and through material culture.

This chapter sets the excavation results, presented in Chapters 2 and 3, in their landscape and cultural context. First, early medieval land use change is explored, then earlier prehistoric and contemporary sites are considered, along with important sculpture and portable antiquities in the uplands north and west of Dunkeld. Finally, the historical background is presented in advance of our discussion in Chapter 5.

4.2 Land use and land use change in the early medieval period

Richard Tipping

This topic has been reviewed recently (Tipping 2013; Strachan and Tipping 2019), at least for the uplands of north-east Perthshire to the north and north-east of Dunkeld, where most published pollen analyses are. The natural woodland cover around Dunkeld was deciduous, with oak, hazel and birch (Bennett 1989; Tipping 1994). Very little of this survived to the 1st millennium AD. Natural woodland had all probably been used by people in later prehistory. They changed woodland composition. Trees like oak and elm were lost from dry soils; rapid colonisers of abandoned, for instance, farmland like hazel, birch, ash and rowan grew more common. Around and on wetlands and fens, alder, birch and willow remained on soils of little use to farmers. At Carn Dubh in the uplands above Pitlochry (see Figure 4.4 for the location of pollen sites), woodland recovery after *c.* AD 150, probably reflecting reduced human pressures, was followed by short-lived, temporary woodland clearance after *c.* AD 300 and a final reduction of woodland on dry soils ^{14}C dated to AD 630–840. Trees probably still grew after this on peat and wetland soils, but away from these, grassland dominated, although not intensively grazed (Tipping 1995). At Lair in the hills of upper Glen Shee, later Iron Age activity was limited. After a hiatus in the early 1st millennium AD, peat growth resumed by AD 600-660 (Paterson and Tipping 2019). Renewed peat growth resulted from re-invigorated human activities, associated with the establishment of Pitcarmick-type buildings and a vigorous arable (oat, barley) and pastoral agricultural economy. Most trees were lost from the pollen source area, replaced by *Calluna* heath and by heavily grazed grassland.

At Rae Loch in the Lowlands near Blairgowrie (Edwards and Whittington 1998) the beginning of a major reduction in woodland is ^{14}C dated to 1681-1231 BC, and

its end interpolated at 160 BC-AD 300. Clearance was initially for pasture, but sustained representation of cereal-type pollen commenced at an interpolated 100 BC–AD 210. Major and very rapid deforestation of the large pollen source area, imprecisely dated to AD 91-600, led to both cereal cultivation and grazed grassland. At Methven Moss, west of Perth in the Almond valley, Milburn (1996) recorded an expansion of the mixed farming economy at AD 120–330. Agricultural activity may have declined between AD 330 and AD 790, although regeneration of woodland may have been limited to the moss itself, but from *c*. AD 1020 there was a further resurgence of agricultural activity.

The lowland pollen stratigraphies strongly suggest that the extensive late Iron Age deforestation recorded throughout central and southern Scotland (Tipping 1997 and 2018; Tipping and Tisdall 2006) extended north to the 'Highland Line', at least in eastern Scotland. This has been associated with the generation of an agricultural surplus (Tipping 2010; Mercer 2018) or to rapid population growth (Haselgrove 2009, 2016; Bevan *et al.* 2017; Hamilton and Haselgrove 2019). Further west along Loch Lomond, there may have been a very pronounced contrast in land-use between lowland and highland (Stewart *et al.* 1984; Barclay *et al.* in press).

King's Seat, Dunkeld, is on the 'Highland Line' and within the bedrock gorge of the River Tay. Glaciofluvial river terraces between King's Seat and Dunkeld provided well-drained, though acid, agricultural soil but Dunkeld is 6-7 km northwest of the lowland landscapes typified by Rae Loch and Methven Moss. This isolation must indicate that the political significance of King's Seat was not built on the local farming economy: crop growing would surely have remained at the level of subsistence. This may explain the only limited evidence for crops and livestock recovered in excavation at Dundurn, near Loch Earn (Alcock *et al.* 1989), forts being consumer, rather than producer, sites. The establishment of such high-status sites need not lead to land use change, as at the early medieval fort at Moat Knowe in the Scottish Borders (Campbell *et al.* 2003). Land-use change at Dunadd on the Scottish west coast (Miller and Ramsay 2001; Housley *et al.* 2004, 2010) also seems less than would be expected from a royal site (Tipping 2017), and around Rhynie, a different high-status site, agricultural activities did not reflect socio-political change (Jones *et al.* 2021). Livestock grazed in the hills and traded to the south, particularly cattle (cf. Mercer 2018; Hamilton *et al.* 2019) for earlier centuries and Haldane (1957) and McHardy (2004) for later centuries), are a more likely source of wealth and status (Alcock 2003: 114) as they were until the 8th century in Ireland (McCormick 2014). But control of movement along the Tay gorge must have been fundamental to its location.

Strachan *et al.* (2019: 140) relate the 7th-century re-colonisation of the uplands around and north of Dunkeld, seen in the many Pitcarmick-type buildings, to climate change. This was the end, in the early-mid 7th century, of an intensely cold and arid spell called the 'late antique little ice age' (Baker *et al.* 2015; Büntgen *et al.* 2016). Oat cultivation at Lair and elsewhere may have been a response to wetter soils (McClatchie *et al.* 2015). Strachan *et al.* (2019: 132) also argued that the re-population of the uplands with settlements of Pitcarmick-type houses was facilitated by comparatively weak political control of the hills. It is interesting, then, that King's Seat seems to have been abandoned in the mid-7th century. Strachan *et al.* also identify (2019: 140-3), from well-dated pollen records, a 7th century agrarian expansion in many parts of Scotland: whether the two are connected is unclear. Rippon and Fyfe (2018) and Davies (2019) have used similar evidence in other parts of upland Britain to argue for economic revival, and Davies suggested that the abandonment of Welsh hillforts coincides with climate change, though the mechanisms need to be explored. Kerr *et al.* (2009) identified this climate shift in Ireland, and a later shift to wetter soils at *c*. AD 770, suggesting the latter to have disrupted the cattle-based economy there. There is little evidence for a later 8th century agrarian crisis in Scotland, but our records are much poorer.

4.3 Prehistoric and early medieval sites in the landscape

David Strachan

It is suggested that King's Seat fort appeared as a *de novo* construction in the 5th/6th century AD within a landscape littered with the remains of buildings and monuments spanning back to the Late Neolithic. Many of these would have been very visible and some highly evocative, and the re-use or referencing of earlier prehistoric sites appears to have held special relevance to emerging Pictish social hierarchies (Driscoll 1998). A key local example, high in the hierarchy, is at Forteviot, lower Strathearn, where the early medieval royal and ecclesiastical centre was constructed beside a significant prehistoric 'ritual landscape'. This has been interpreted as appropriation by the Pictish elite to legitimise their claim to authority through signifying ancestral connections (Driscoll *et al.* 2010; Campbell and Driscoll 2020: 191-2). More prosaically, in the uplands of Glen Shee, Pictish settlement frequently occurs near prehistoric roundhouse sites, probably simply reflecting pragmatic re-use of cleared land for cultivation. But at Lair, Pitcarmick-type longhouses were aligned with, and re-used material from, an early prehistoric ring-cairn, possibly a reverential act of

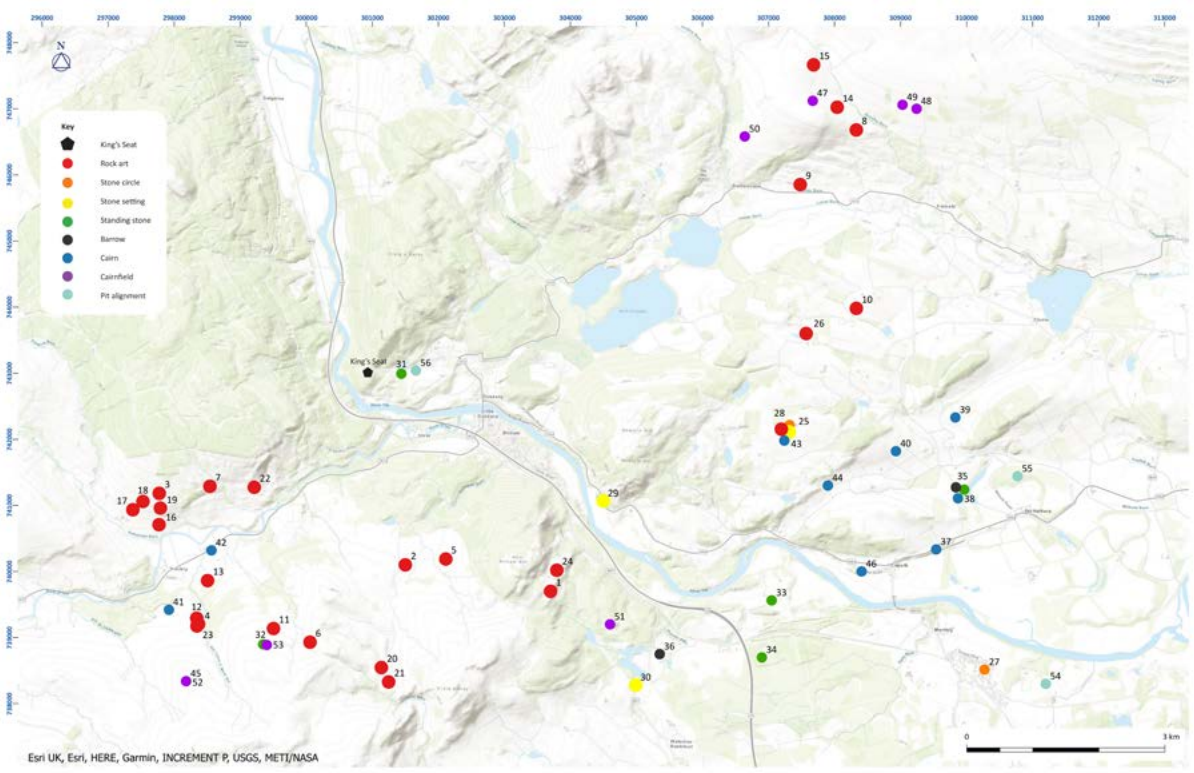

Figure 4.1: Known and possible earlier prehistoric sites around Dunkeld (for details see Appendix A).

acknowledgement perhaps with similar intentions as at Forteviot (Strachan *et al.* 2019: 108-9, fig. 4.1). This mix of practical and ideological motives may also be at play in the reuse of other sites, such as the Iron Age monumental roundhouses at Queen's View and Litigan (Taylor 1990), Black Spout (Strachan 2013), and Aldclune (Stevenson 1985; Hingley *et al.* 1997). Even more local to King's Seat, the referencing of ancient sites with ritual significance might be seen at Staredam, near Dunkeld, where a simple incised cross has been added to one of a pair of standing stones (Coles 1908: 153-4, fig.53; Figure 4.1).

Earlier prehistoric sites in the immediate environs

Neolithic and Bronze Age monuments in the environs of King's Seat (Figure 4.1) are predominantly known to the south and east of the Highland Boundary Fault. The earliest, Neolithic/Early Bronze Age rock in the form of cup-marks and cup-and-ring marks, usually carved directly onto exposed bedrock, are found above *c.* 150 m OD on the hills overlooking the straths in the uplands. These include one of the region's densest known concentrations, around Trochy in Strathbraan, where the Ballinloan Burn meets the River Braan, and a smaller group in the Stormont hills is similarly focussed along the Drouthy Burn. The only confirmed stone circle is at Murthly, but several standing stones and pairs of stone settings survive, including the stone close to King's Seat to the south of Polney Loch. Burial monuments of this period, in the form of barrows and cairns, occur in the hills to the south of Trochy across to the low hills to the east of Dunkeld.

While evidence of Neolithic settlement remains elusive, cultivations remains were identified beneath Pitnacree Neolithic barrow (Coles and Simpson 1965). Much of the corpus of unenclosed upland settlement and cairnfields may date to the Middle and Late Bronze Age, with others of Iron Age date. While none in the immediate environs have been excavated, concentrations are again found south of Trochy and in Stormont, where earlier rock art is also focussed (Figure 4.2). While numerous in the Perthshire uplands, the distribution of these hut-circles is uneven, in part due to the extent of coniferous woodland and higher ground to the west of the Tay, and also due survey bias, with no detailed RCAHMS survey covering this area (RCAHMS 1990; 1994) and few studies to highlight potential (Cowley 1997). Their chronology and variety of form is best illustrated by the most extensively explored group at Carn Dubh on Moulin Moor, Pitlochry (ID 26422; Rideout 1995). At

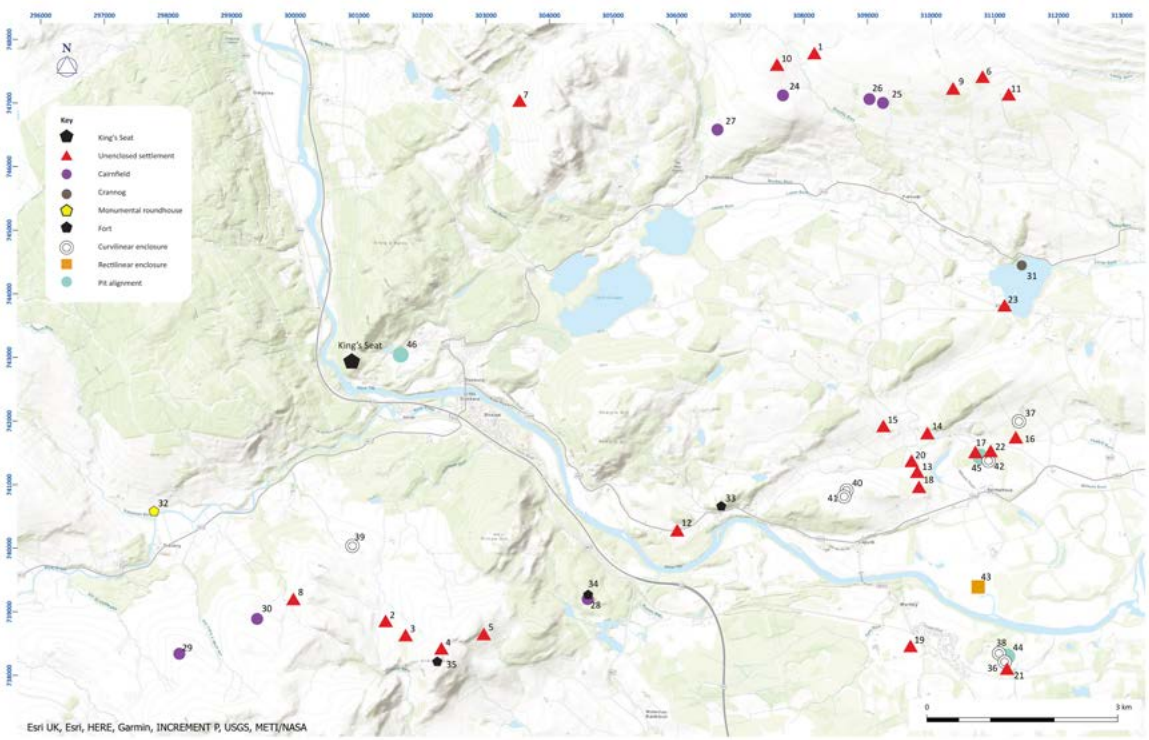

Figure 4.2: Possible later prehistoric sites in the environs of King's Seat, Dunkeld (Appendix A including the forts at Kemp's Hold (33), Duncan's Camp (34) and Craig Obney (35).

Figure 4.3: A reconstruction of the monumental roundhouse at Borenich, Loch Tummel, one of around 60 or in upland Perthshire west of the Tay. Evidence suggests they date to the later 1st millennium BC, but some excavated examples show activity in the later 1st millennium AD (artist: David Simon).

heights of 300-400 m OD, three Bronze Age hut-circles were excavated, including a double-walled Dalrulzion-type, a form found across north-east Perthshire and Angus, and named after the type-site in Glen Shee (ID 29060; Thorneycroft 1933). Early-Middle Iron Age single-walled roundhouses were also explored and reoccupation in the later first millennium AD involved reconfiguration of two of these into a sub-rectangular house (ID 26422; Rideout 1995: 175).

Later prehistoric sites

Enclosure is a widely recognised key feature of the Late Bronze Age and Iron Age in some parts of Britain and Europe (Haselgrove 2007). The majority of the uni- and multi-vallate curvilinear enclosures, including palisaded examples, recorded as cropmarks in the Scottish Lowlands are most probably Iron Age, but as noted below, to date one notable local example has revealed early medieval activity.

Other settlement forms in the area are more confidently attributed to the Iron Age, with current evidence suggesting an Early Iron Age introduction of crannogs (Cook *et al.* forthcoming), followed by other dramatic new monumental forms, including forts and dun-like monumental roundhouses (Figure 4.2). Around 80% of forts in the wider area occur along the Ochil and Sidlaw Hills, and along the southern fringe of the Highland Boundary Fault. In the uplands there is a minor concentration in upper Strath Tay, but they are noticeably absent east of the River Tay. In the environs of King's Seat they include Craig Obney (ID 26986), Duncan's Camp (ID 27000), and Kemp's Hold (ID 27118) which are roughly evenly spaced along the southern face of the Highland Fault Line, reminiscent of how the forts of the Ochil Hills overlook Strathearn. In the uplands to the west of the River Tay there is a notable concentration of around 60 massive, stone-walled enclosures found on high pastures overlooking upland passes (Strachan 2013; Figure 4.3). Previously termed 'circular forts' (Watson 1913), 'ring-forts' (Stewart 1969), and 'homesteads' (Taylor 1990) they were suggested as having early medieval origins following excavations at Litigan and Queen's View (Stewart 1969; Taylor 1990). However, excavations at Black Spout (ID 26267), Pitlochry, revealed a monumental roundhouse, a regional variant of a substantial house tradition of the 1st millennium BC occupied in the 3rd and 2nd centuries BC (Strachan 2013), while two similar structures at Aldclune, Blair Atholl (ID 25822) were constructed between the 2nd and 1st centuries BC and the 2nd and 3rd centuries AD. As discussed further below, the picture remains nuanced at these sites, as early medieval activity or re-use has been suggested or identified at some of them, even if their construction at that time has not been confirmed.

Contemporary sites

Perthshire contains a wider range of contemporary sites and monuments confidently attributed to the early medieval period than most other areas. Not only does this include higher status sites such as the forts, but also, and much more rarely for mainland Scotland, good settlement evidence, if only for the uplands. The burial record is dominated by square and circular barrow cemeteries, but also includes long cists. The period also sees the emerging importance of Christianity, from monastic missionary outposts to a new religious power centre closely associated with the local elite (Figure 4.4). In addition, there is a rich seam of contemporary sculpture, ranging from simple cross-incised stones to spectacular cross-slabs.

High status sites are best-known through the forts, and of the two known contemporary examples, the closest parallels are with Dundurn (ID 24873), which controls the tight pass on the floor of Strathearn from a steep, rocky hill rising to *c.* 170 m OD on the south of the River Earn *c.* 1.5 km to the east and downstream from Loch Earn. The fortifications consist of a dun-like summit enclosure, a roughly triangular enclosure on the uppermost terrace of the hill, a series of walls taking in lower terraces, and a hollowed trackway with a substantial bank and external ditch that climbs the north-west flank of the hill. Radiocarbon dates from the enclosures on the summit and uppermost terrace, along with the small finds, confirmed the upper fortifications to be early medieval, and a sequence of several phases of construction was postulated, including a hypothetical late 6th-early 7th century AD palisade, a first phase of the summit enclosure in the 7th-9th centuries, and subsequent construction of a massive wall around the uppermost terrace (Alcock *et al.* 1989). In addition to the immediate topographical setting of Dundurn, its broader geography is also like King's Seat, being on the threshold of the Highland Fault Line, but in this instance controlling access to and from lowland Perthshire in the east along Loch Earn to Glen Ogle and Strathyre, offering access through the western Grampian mountains. The nearby curvilinear burial ground of St Fillan's Chapel suggests an early medieval date, supported by a cross-slab of 7th-9th-century date and an early font (ID 24872; Figure 4.5).

The other confirmed early medieval fort, Clatchard Craig, Newburgh, Fife (ID 30074), was completely quarried away by around 1980, but had also occupied a very prominent hill, this time overlooking the Tay estuary while controlling the pass of Lindores through the North Fife Hills (Figure 4.6). It consisted of three enclosures: an innermost sub-rectangular enclosure on the rocky summit, and larger, outer enclosures defending lower terraces, the outermost with multi-

vallate ramparts. Rescue excavations in the 1950s confirmed all phases of enclosure were by timber-laced walls of early medieval in date and recovered high-status small finds (Close-Brooks 1986). Recent C14 dating of archived material has refined the dating further, suggesting that all phases were constructed and occupied over a short period of a few generations, ending in destruction by fire in the 7th century AD (Noble *et al.* 2022), however the possibility of a longer history of construction, including an earlier site, has also been suggested (Lock and Ralston 2017: SC3125).

A tentative early medieval connection may be suggested at Drummond Hill fort (ID 24911), also known as Caisteal Mac Tuithal, referring to Tuathal, son of Argusto, an Abbot of Dunkeld in the 9th century AD (Hutcheson 1889: 359-362; Christison 1900: 69-71). The site shares some characteristics with the nuclear forts and occupies a rocky knoll overlooking Appin of Dull and controlling the confluence of the Rivers Tay and Lyon, a principle east-west route hosting the important early monasteries at Fortingall and Dull. Another possible nuclear fort, Tom a' Chaisteil (ID 25524) survives *c.* 11 km east-south-east of Dundurn, also controlling upper Strathearn (Lock and Ralston 2017: SC2637).

In a contrasting lowland location, Inchtuthil promontory fort (ID 28598) evidently included a post-Roman phase as masonry from the legionary fortress was incorporated into its rampart (Abercromby *et al.* 1902; RCAHMS 1994: 3, 52-3; Lock and Ralston 2017: SC3042). It evidently had earlier phases, however, and the reuse of Roman masonry may only signify a phase of post Flavian construction, possibly contemporary with the barrows (ID 28599) that overlie the Roman fortress, one of which has produced a single date of the 1st century AD (Winlow 2010). Early medieval activity close to Roman sites is known elsewhere in the area, as at the Sheriffton barrow cemetery (ID 68811), consisting of square and round barrows, directly to the east of Grassy Walls Roman temporary camp (ID 28188), near Scone. On the other side of the River Tay Bertha Roman fort (ID 26734), on the northern outskirts of Perth, has been suggested as the *Rathinveramon*, which is recorded as the site of the death of Domnall mac Ailpín, or Donald I, King of the Picts AD 858-862, and Constantine III, King of Alba from AD 995-997. The fort may have been reused as the *palatium* of *Cinnbelathoír* (Noble and Evans 2022: 117).

Other possible Pictish forts can be identified in the cropmark record, but beyond forts there is yet little evidence of the diversity in the form of high-status enclosed sites that has been revealed in north-east Scotland (Noble *et al.* 2019a; 2020). However several cropmark complexes, some including forts, may suggest different enclosed forms of estate centres, and suggest these developed over time at some locations. For example, cropmarks at The Welton promontory fort, Blairgowrie (ID 28903), suggest two distinct and intersecting bi-vallate forts, with broadly concentric and intersecting palisade trenches between (Figure 4.7). Clearly multi-phased, the probability of an early medieval phase is supported by a square and round barrow cemetery immediately outside the forts (ID 28907; Maxwell 1987: 40 fig.7; RCAHMS 1994: 54-55). At Logierait, another bi-vallate promontory fort of similar size (ID 26338), again contains concentric palisade trenches and in this instance an internal circular enclosure (Figure 4.7). It occupies a level terrace at the important confluence of the Rivers Tummel and Tay *c.* 10 km north of King's Seat, and excavation of the surrounding multi-period cropmark complex revealed activity from the Early Bronze Age to Late Iron Age, but more importantly extensive cultivation over the 7th to 9th centuries AD within well-defined and extensive field systems on a scale suggesting an estate with tenant farmers (Ellis *et al.* 2021: 16). In addition, early medieval buried soils produced evidence of the processing of animals and the drying of grain, while evidence of ironworking, and a sub-rectangular post-built structure were identified, the latter perhaps with parallels to the building within the Barflat/Craw Stane complex at Rhynie, Aberdeenshire (Noble *et al.* 2019a: 67-70; fig. 5). Medieval activity was also recovered, no doubt associated with Rath of Logierait (ID 26324), a stone medieval castle within a large, ditched enclosure, *c.* 300 m north-east of the fort. Logierait controls an important location; like Drummond Hill, it dominates the confluence of two key rivers and their straths. Its continued importance is demonstrated by this prolonged, if not continuous, presence of estate centres spanning the early medieval and medieval periods, which is re-enforced by the nearby church and carved stones discussed below. It is particularly valuable in terms of informing our currently very limited knowledge of settlement outside forts. The possible significance of palisaded enclosures at both above sites is supported through excavations at Upper Gothens palisaded enclosure (ID 28912), near Blairgowrie *c.* 15 km east of King's Seat (Figure 4.7). Here an inner enclosure, also defined by a palisade, was located and evidence iron-working evidence and a tinned buckle recovered, the latter possibly a later intrusion (Barclay 2001: 38). Radiocarbon dates of AD 885-1017, AD 895-1024 and AD 1040-1259 were returned from contexts belonging to the outer perimeter, and the site was interpreted as a settlement of some status, perhaps an estate centre (Barclay 2001: 43). Broadly contemporary palisaded enclosures, and palisades within forts have been recognised at numerous sites in north-east Scotland, including the outer palisade, with an internal line of pits, at the Barflat/Craw Stane complex at Rhynie, Aberdeenshire (Noble *et al.* 2019a: 67-70; fig. 5). While

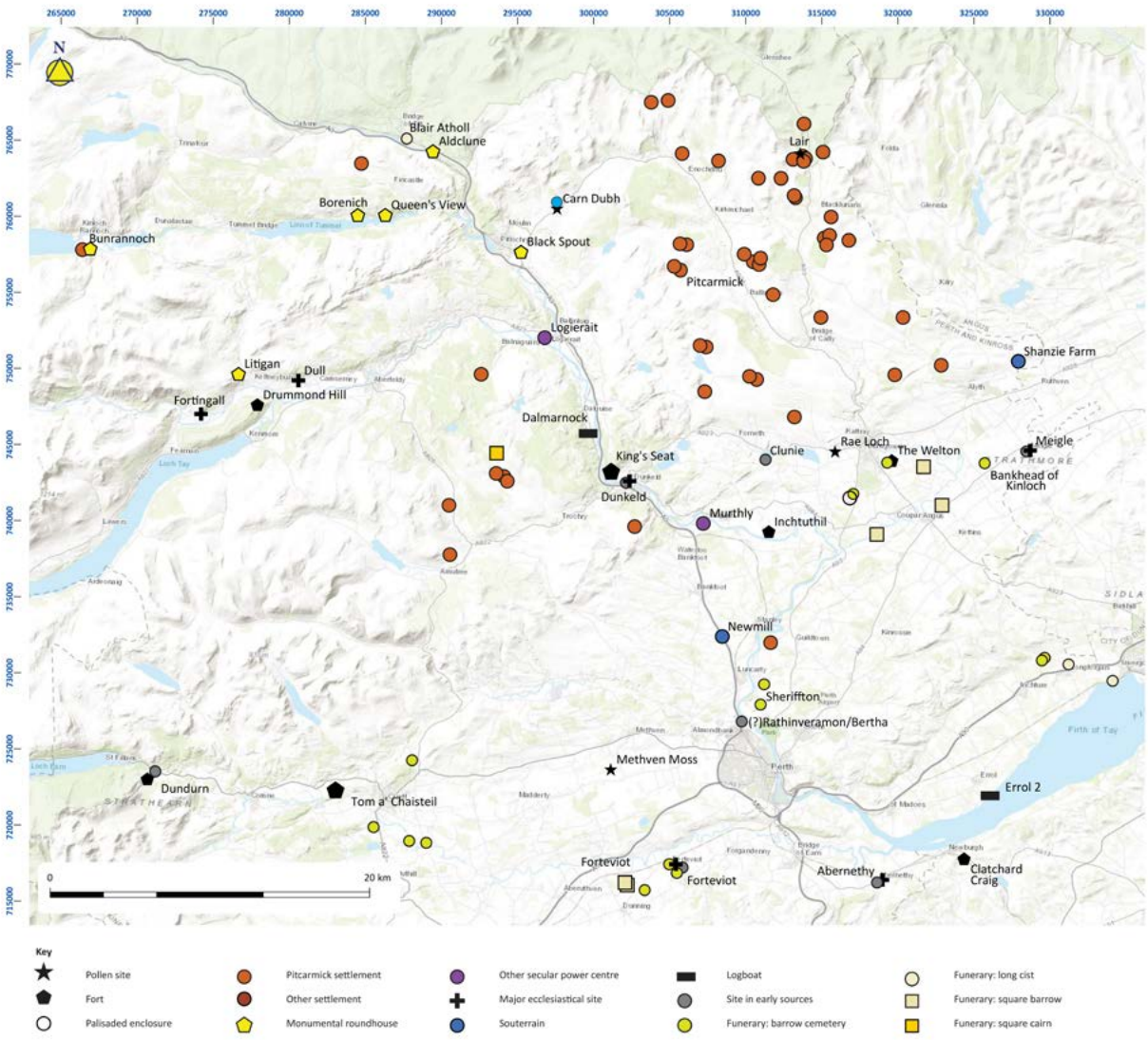

Figure 4.4: Known and probable early medieval sites in the wider area.

they are far less frequent in central Scotland, Alcock *et al.* (1989) suggested that construction at Dundurn was initiated by a palisade in the late 6th to early 7th century AD, inferred from a build-up of midden material and the survival of structural timbers below a wattle floor. More recently a slightly later palisaded enclosure of 8th to 10th century date has been excavated at Titwood, East Renfrewshire (ID 240113; Johnson and Rees 2003). While some phases of both the forts and palisaded enclosures at sites such as The Welton no doubt pre-date the early medieval, it is possible their multi-phased use indicates the development of enclosed forms over time. At Logierait, it is probable that continued control of this key location, through various sites, spanned the Iron Age, to the early medieval and medieval periods, as the focus of an estate of some influence.

As outlined above, diversity of enclosed form in the area might also exist in the 'ring forts' or monumental roundhouses in the uplands west of the River Tay, as excavation at some of these has suggested early medieval activity, if not construction. While Borenich (ID 25880) produced no diagnostically early medieval finds (Watson 1915), Litigan (ID 24945) produced a radiocarbon date of the late 1st millennium (albeit from a disturbed context) and slag suggested as being early medieval (Taylor 1990: 17). At Queen's View (ID 25844) early medieval activity was suggested by a suggested Anglian bead and a stone lamp, and possibly also ironworking hearths (Taylor 1990: 33, 38), although the latter could relate to nearby post-medieval settlement. At Bunrannoch, Loch Tummel, another monumental roundhouse produced evidence for iron working,

Figure 4.5: Dundurn fort occupying the rocky outcrop on the right, and St Fillan's chapel on the left (David Strachan, Perth and Kinross Heritage Trust).

Figure 4.6: Clatchard Craig fort, directly to the right of the smoking chimney, prior to its destruction by quarrying. The hill had an imposing presence over the estuary with sheer cliffs above the inland pass through the Den of Lindores into the Howe of Fife (Culture Perth and Kinross Local and Family History).

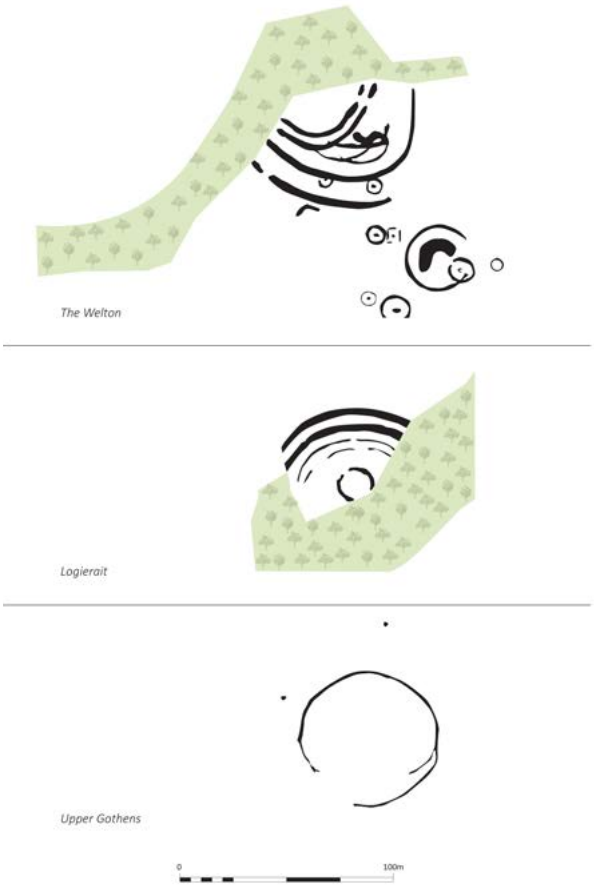

Figure 4.7: Cropmarks transcription of The Welton and Logierait forts and palisaded enclosures, and Upper Gothens palisaded enclosure: note the similar size and morphology of the forts and the similar scale of the palisaded enclosure at all three sites (cropmark transcription: David Strachan, Perth and Kinross Heritage Trust).

including smelting, smithing slag, and furnace lining, during a phase of re-use, radiocarbon dated to AD 660–880 and associated with a nearby Pitcarmick-type longhouse settlement (MacGregor 2010; Strachan 2013: 8). The Black Spout example, occupied over the late 3rd and late 2nd centuries BC, appears to have been reconfigured *c.* AD 1000, presumably for re-use (Strachan 2013: 36-37), while the excavations of the Aldclune structures in Blair Atholl (ID 25822) recovered a spectacular silver penannular brooch of late 8th-/early 9th-century AD date and a purse mount of probable 7th-century AD Anglo-Saxon origin (Blackwell 2018), though these were possibly related to a burial rather than an episode of occupation (Hingley *et al.* 1997: 419 and Hall below). While sites such as Litigan and Queen's View have been suggested as part of a wider array of 'ring-forts' in early medieval Pictland (Carver *et al.* 2012: 190-191; Noble *et al.* 2013: 1142), there is no secure evidence for their construction at this time, and they are equally likely to be earlier Iron Age structures re-used in some way at that time. However, there is some variation in their scale and form, suggesting they may not all belong in a single class of monuments.

What emerges from this brief review is that a range of enclosed site-types with evidence of occupation across the period can be identified. Less certain is whether we can postulate a hierarchy of social status; with, for example, local royalty at nuclear and lowland bi-vallate forts, and lower levels of lordship at some lowland palisaded enclosures and possibly at the 'ring-forts' (or monumental roundhouses) in the uplands. The chronologies established for both King's Seat and Upper Gothens are brief compared to a period that spans some 600 years as a whole, and our knowledge of the other site-types remains vague at best. It is equally possible that differences in enclosed form reflect changes in lordship and royal presence over time, with one form replacing another either on the same site, or in a nearby location. Future investigation of the rich corpus of cropmark enclosures in the area may radically alter our perception in due course, as might further work on upland sites, no doubt to be much improved through the availability of more and better LiDAR data.

The uplands of the surrounding region include a distinctive settlement form, Pitcarmick-type turf-built longhouses, that have been found predominantly east of the River Tay. Due to their high altitude and their function as byre-houses, they have often been considered low status, marginal communities. However, excavations at the type-site in Strathardle (Carver *et al.* 2012) and at *c.* 380 m OD at Lair in Glen Shee (Strachan *et al.* 2019) has demonstrated their introduction into previously farmed landscapes in the early 7th century AD, made possible due to climatic amelioration, and has confirmed that they were integrated farm complexes, comprising byre-houses and outbuildings supporting a prosperous mixed arable and pastoral economy (Figure 4.8). They remained viable until the 11-12th centuries AD, when poorly understood changes brought about their demise and the high moorland upon which they have been recorded again became unoccupied. Apart from seasonal sheilings, this ground would remain unoccupied until the post-medieval period, when farmers in the *fermtouns* and townships once again began to plough up some of these hill pastures. Their survival mainly east of the Tay may partly be the result of limited improvement

in this area, and partly the result of survey bias, to some extent reflecting where RCAHMS conducted surveys. While some examples have been identified in Strathbraan (Cowley 1997), the only other known early medieval building in the area is of a very different form. Building 8 at Carn Dubh was constructed over two adjacent earlier roundhouses, resulting in a D-shaped structure of *c*. 15 m by 12.5 m internally (Rideout 1995: 153-155). Dated to AD 657-961 (Rideout 1995: 175-6), it may have parallels with the 'bag-shaped' structure at Portmahomack (Carver *et al*. 2016: 215, D19), or the proposed sub-square building with a sunken structure at Easter Kinnear, north-east Fife, reconstructed on at least three occasions over the 6th-7th centuries AD (Driscoll 1997). An alternative interpretation proposes that this scooped feature was an earlier roundhouse on the same site (Halliday 2006).

In the Lowlands, early medieval settlement evidence remains elusive. However, excavation at Bertha Park, Perth, around 1.5 km west of the Roman fort, revealed the truncated remains of an early medieval farmstead and its ancillary structures occupied between the late 7th to 12th centuries AD, with features again including a rectangular post-built structure (Engl 2020). Proxy evidence for settlement evidence was found at Newmill West (ID 27029) in the form of a cereal-drying kiln dated to AD 421–547 (Wilson and Clarke 2019). Cereal-drying kilns are known in association with sub-rectangular structures, as at the albeit later (AD 1043–1282) example at North Scotstarvit, Fife (MacGregor 1998). Elsewhere, as with the monumental roundhouses, other earlier Iron Age sites attracted early medieval activity; as at two souterrains associated with Late Iron Age settlements, one at Shanzie Farm, Alyth (ID 183018; Coleman and Hunter 2002) and the other at Newmill, Bankfoot (ID 27007; Watkins 1980). Such activity may simply represent pragmatic re-use of earlier large sites but perhaps might also indicate an awareness of the social or political significance that such a physical association might confer.

Beyond settlement forms, the early medieval period also saw the introduction of new monument types, namely new forms of burial (Maldonado 2013) and new insular art, in particular Pictish sculpture on symbol stones and later cross-slabs (Henderson and Henderson 2004; Fraser 2008). High status burials in round and causewayed square barrows, often in cemeteries, were introduced from the 4th-5th century AD, as at Forteviot (Maldonado 2017; 2020) and Bankhead of Kinloch, Meigle (Mitchell *et al.* 2020), while several possible square cairns have been identified in the uplands (Cowley 1997; Bailey 2014). Another strand in the local funerary record is provided

Figure 4.8: Reconstruction of a Pitcarmick-type Pictish longhouse at Lair, Glen Shee with cut-aways showing the main byre-house for over-wintering cattle and an external workshop/store (artist Chris Mitchell).

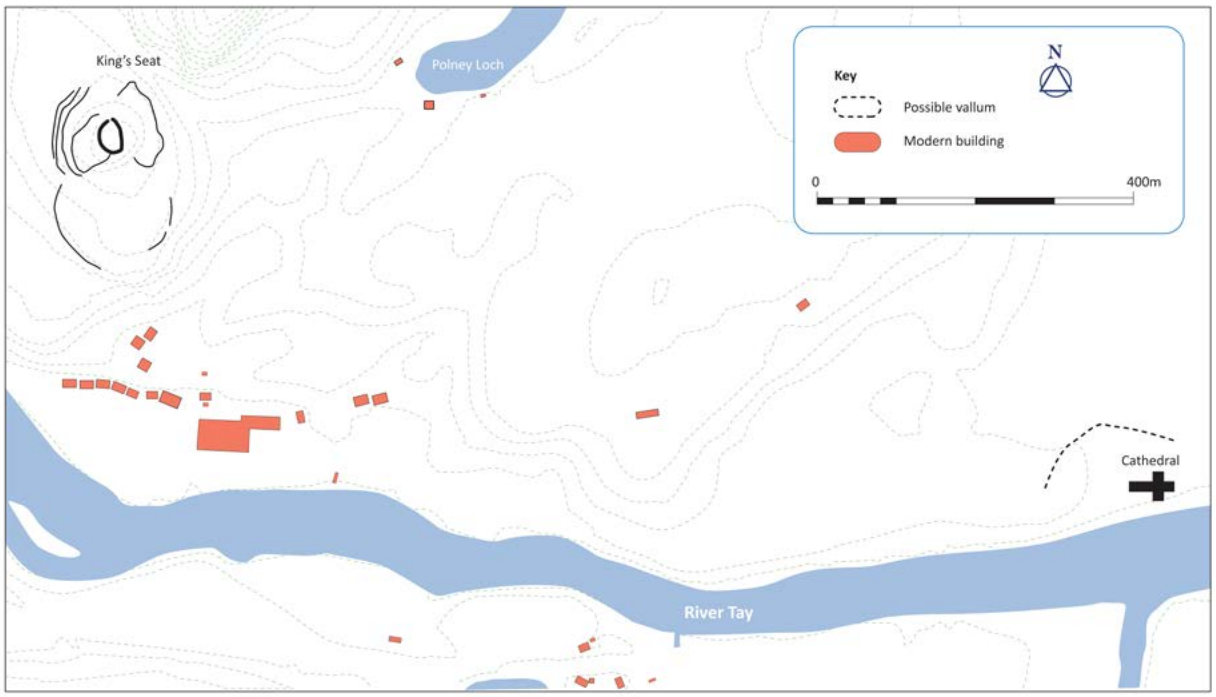

Figure 4.9: Annotated extract of geophysical survey by the University of Aberdeen showing the line of the early monastic vallum (courtesy of The University of Aberdeen).

by long cists, the majority of which date from the 5th-9th centuries AD and are generally aligned east-west or north-east-south-west and without grave goods. The best-studied example in the area is from Glen Tilt, Blair Atholl where the skeleton within a stone long cist, oriented east-west, was dated to the 5th–6th century. Multi-isotope analysis has provided rare insight into diet and mobility of the individual, indicating a childhood beyond Pictland, in western Scotland or Ireland, which is significant in that he was afforded a Pictish style burial (Czére *et al.* 2021; and Hall below).

However, arguably the most significant introduction of the period was Christianity, brought to the area through the work of missionaries, principally from Iona. Arriving from the west through Glen Lyon, Loch Tay, and Loch Earn, they established churches and monastic sites in the 7th and 8th centuries AD (Taylor 1999; 2000), although an earlier missionary activity has been posited (Smyth 1989: 82-3; Clancy 2000: 95-6). Particularly significant are Fortingall and Dull (Will *et al.* 2003), identified through the sculpture discussed further below, and at the former by a handbell, font, and rectangular monastic 'vallum' around the church (Robertson 1997; O'Grady 2011). It is possible that King's Seat was an intended destination, and its powerful elite an important audience of this missionary work, resulting in the early ecclesiastical site established at Dunkeld itself, evidenced in part by surviving sculpture. A probable monastic vallum identified by geophysics around the cathedral (Figure 4.9) has recently been dated to 9th-10th centuries AD (Noble and Evans 2022: 159-160 and fig. 4.7). The implications for King's Seat fort, which would appear to go out of use by the middle of the 7th century AD, are significant and are considered further in Chapter 5, but this process also raises the question of the geographical location of Dundurn and whether a parallel process may have occurred along Loch Earn into lowland Perthshire.

Finally, in 1975 a logboat was discovered on the edge of a palaeochannel of the River Tay at Dalmarnock, near Dalguise. It was *c.* 4.6 m in length, nearly flat-bottomed with both rounded bow and stern (Mowat 1996: 22-22, fig. 5), and was radiocarbon dated to the late 7th century AD. This places it only slightly later than the other known Pictish boat from the Tay, recovered from the inter-tidal north bank of the estuary near Errol and radiocarbon dated to the late 6th century AD. The Errol vessel is much larger at *c.* 8.9 m in length (Mowat 1996: 28-30, fig. 8), and could have transported groups of up to 10-12 people, or large cargoes, probably using estuarine tides in a similar fashion to the Carpow Bronze Age logboat of similar size (Strachan 2010: 169-170). The Dalguise boat, comfortably accommodating 4-5 people, would have been suited to ferrying people and goods both across and along what would have been a much wider braided river system. Given its date, it may have been used by people associated with the fort, or who knew of it. The Errol vessel was recovered downstream from two Pictish power centres, at Abernethy and at

Clatchard Craig (the latter directly opposite the boat's findspot). These vessels no doubt represent only a fraction of the watercraft used, and the survival of such craft within the orbit of the forts may reflect the increased travel of people and amplified economic vibrancy around these socio-economic power centres. As such they offer useful insights into Pictish rivercraft and networks of communication, transport, and trade, of particular importance in considering their function as centres of manufacture.

4.4 Early medieval sculpture and portable antiquities in and around Dunkeld

Mark A Hall

The overlap between this contribution and the rest of the volume is their shared concern with the development of Dunkeld and its immediate geographic context of Atholl. It is an exploration of the sculpture from 19 sites in and around Strath Tay (Appendix B: Table 1), along with 23 sites (some of them co-terminous with the sculpture sites) that have produced related items of portable material culture (Appendix B: Table 2). The cross-fertilization of these two strands of evidence configures the discussion as a contribution to the understanding of the physical footprint of the territory (province/kingdom/earldom) of Atholl and the ecclesiastical orbit of Dunkeld, an area geographically dominated by the River Tay and its tributaries the Garry, the Tummel, the Braan, the Tilt and the Isla. As this task involves ranging over 50 pieces of sculpture and 50 portable artefacts, there is too much to detail individually, so they are presented in two tables, which give all the necessary references. A fuller discussion of this evidence and the chronological and social trajectory of Atholl is forthcoming (Hall forthcoming). What follows is a short discussion of the evidence presented in the tables to give a sense of the wider extent of archaeological and material culture evidence for Dunkeld and its development. Both tables can be found in Appendix B but are henceforth referred to simply as Table 1 and Table 2.

Taken overall, the sculptures in and around Dunkeld, and encompassing much of Atholl, indicate high and middle-ranking status sites, both secular and ecclesiastical, and sometimes in combination. The survival of symbol stones both on their own, as at Cargill (Table 1, no. 5) and at Struan (Table 1, no.12), and in combination with Christian iconography, as at Murthly (Table 1, no.2 M2 and Figure 4.10) and Logierait (Table 1, no. 7), suggests both the existence of smaller, aspirational centres of lordship, and of their conversion. Maldonado (2021: 11) has noted that the use of Pictish symbols is not currently known for the royal monasteries of St Andrews, Dunkeld and Forteviot, suggesting they were seen as unfashionable by the early 9th century, perhaps by then already confined to use within 'specific arenas of aristocratic display', which would certainly be apt for Dunfallandy (Table 1, no. 9), Logierait and Murthly and their geo-political arenas. Cargill and Struan may well reflect an earlier phase of aristocratic display, possibly short-lived at Cargill where evidence for lordship does not resurface until the 10/11th century AD (though we should notice the presence of a chapel and supporting acre dedicated to St Adamnan, at Campsie, Cargill parish). At Struan, conversion to Christianity is attested by two cross-incised pillars, while the presence of a handbell indicates a longer-lived monastic presence, with a probable assembly mound indicating this occurred alongside a continuing lordship presence.

Figure 4.10: Gellyburn cross-slab, Murthly (© Perth Museums & Art Galleries, Culture Perth & Kinross).

The greater proportion of the sculptures in and around Dunkeld speak to that conversion, by which I mean the whole long process beyond any immediacy of a change to, or an accommodation of, a new faith/belief system, and the maintenance of a Christian presence and authority that develops from it. It is conversion that may be key to the origin and evolution of Dunkeld. Undoubtedly it started as an important secular power centre, to which the excavations reported in this volume testify, but it is no great stretch of credibility to suggest that it was the importance of that power centre that attracted an early church, one pre-dating those of Constantine and Cinnead. Such a church may well have been contemporary with the Columban establishments in Strath Tay, and an existing Columban link, along with Dunkeld's royal/noble status, may be what finally determined it as the place where Columban relics were to be relocated to. The investment in the church from

Figure 4.11: Dunkeld cross-slab no.1, (left to right) Faces A-C (© Historic Environment Scotland).

Figure 4.12: Lethendy cross-slab (face C), with angel, clerics and musicians (photo: Tom Gray © Historic Environment Scotland).

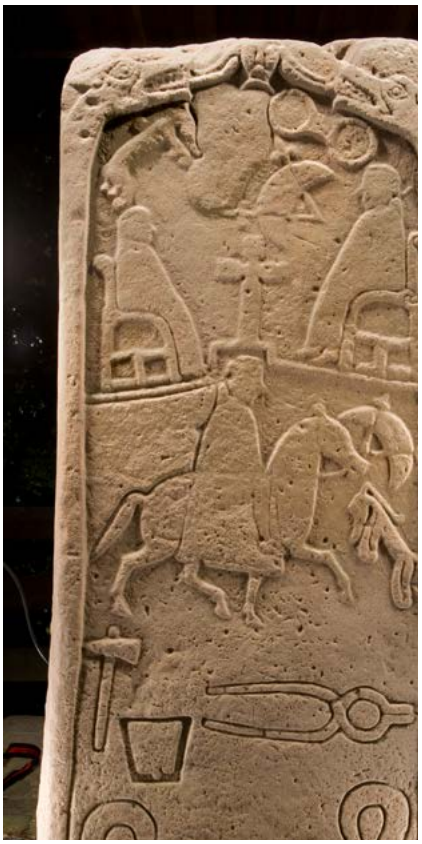

Figure 4.13: Dunfallandy cross-slab (face C), with its heterogenous mix of a range of Pictish symbols (with a seemingly clear labelling function), a meeting of seated clerics, A Pictish rider and iron-working anvil, hammer and tongs; all set within a frame of two, fish-tailed hybrid, serpentine monsters, their tongues licking a long-haired, human head staring out at the viewer (© Historic Environment Scotland).

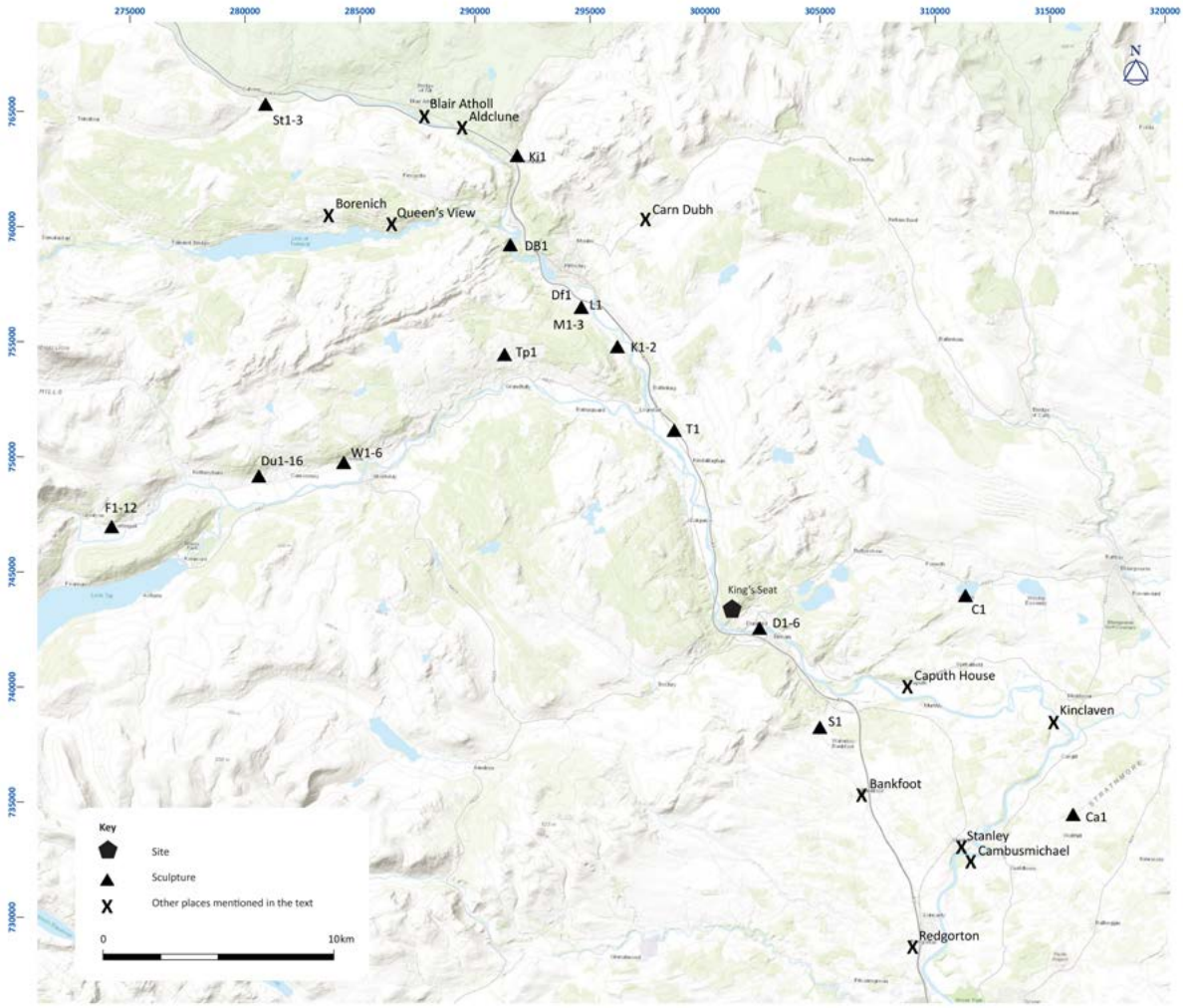

Figure 4.14: The distribution of sculpture listed in Appendix B, and other sites mentioned in the text.

the 9th century onwards was to give it an elevated status that superseded its secular ones, indeed absorbed them one might say through its line of royal secular abbots, notably Crinan, in the 11th century AD (who held both the Dunkeld and Dull offices). That more political outlook is also reflected in its brief ecclesiastical primacy and its centrality to the burgeoning idea of the kingdom of Alba, the Gaelicised version of Pictland and with a major, Chronicle-producing scriptorium in the 9/10th century AD (Broun 1997 and 2007; Maldonado 2021: 9). The key piece of Dunkeld sculpture, the so-called Apostle's Stone (Table 1, no.1 D2; Figure 4.11 a-c), encompasses religious iconography (pointing to Christ and/or Columba), but also points to the church's self-awareness of its status and the need and desire to commemorate its involvement in the world (its abbots Donchad and Crinan died in battle, respectively in AD 963 and AD 1045), a response also detectable in the church's updated care of its relics. The presence of the relics of Columba in Dunkeld certainly made it an important pilgrimage destination – it is the only Scottish site listed in the Anglo-Saxon *Secgan* or 'List of Resting Places of Saints' (Rollason 1978; Hall 2005a: 65). Evidence furnished by seal matrices and texts (including a miracle story in the *Life of St Catroe*) indicates the presence of a range of reliquaries (including a possible bell now associated with Kilmichael Glassary, Argyll (see above) and the retention of some corporeal remains through later medieval times (Hall 2005a: 69-72). With caution due to the sculpture's incompleteness, we can perhaps think of Dunkeld 1 (table 1, no. 1 D1), possibly dating to as early as to the 8th century AD, with its mounted spear-bearing warrior and findspot closer to King's Seat, as speaking most closely to the relationship between resident lord and developing church. We can safely assume that the surviving pieces of sculpture from Dunkeld are a small residue of what once stood there; its reuse for the likes of gateposts,

Figure 4.15: The Little Dunkeld monastic handbell (M.A. Hall, courtesy of Dunkeld Chapter House Museum).

steppingstones, and later burial markers demonstrates some of the mechanisms by which the sculptures were dispersed in later medieval and post-medieval times.

Much greater quantities of sculpture survive at Dull and Fortingall, monastic houses founded from Iona *c.* AD 700. At both the preponderance is simple cross-incised slabs surely used as burial markers. Dull also boasts the only inscribed stone in the region (the name 'becli' the only surviving element), and indications of higher investment in the figurative slab with elements of a hunt scene or procession. The otherwise lack of evidence for carved inscriptions (a blank text panel can be postulated for Logierait 2 – Table 1, no. 7) is rather surprising given the status and reach of Dunkeld, it links with Iona and its royal patronage. Fortingall boasts fragments of three slender, elaborately carved cross-slabs, one with a triple cross motif, copied more simply on other stones from Fortingall, and at Weem and Old Faskally.

The presence of sculpture also has wider landscape trajectories, notably pilgrimage. It is likely that the simple incised crosses at Haughend, Dunkeld and on the prehistoric standing stone at Staredam indicate pilgrimage routes to Dunkeld, the remote stones at Tullypowrie and Shenavail may possibly indicate the same, if not more localised pilgrimage to the monastic sites of Dull and Fortingall. Certainly, for Dunkeld, these routes and their markers had a long-term resonance of generations, even centuries which give them a much longer, active biographical trajectory. They transcend their period of origin. Pilgrimage, of course, is only one form of movement across or through the landscape, including piratical raiding and warfare, peripatetic lordship and the sacral showing of relics: many of the portable antiquities catalogued in Table 2 testify to such movements, either on foot, on horseback, or by boat. The remains of a logboat from Dalmarnock, near Dunkeld (Table 2, no. 24) has recently been reassessed as late 7th century in date as discussed above.

Excavations at Lair, Glen Shee (Strachan *et al.* 2019) evidenced a landscape of production, interpreted as supporting free farming households of some status. That status was described as high, but that landscape is also noticeable for its lack of key markers of higher status, such as investment in sculpture. South and west of Glen Shee lies a rich landscape of elite investment centered on Dunkeld and it has on its margins indications of farming/agricultural production – Carn Dubh, Blair Atholl and Borenich included. Allied to them we can see several sites of lower-level lordship, at Queen's View, Aldclune, perhaps Struan and Cargill, perhaps representing the controllers of the farmed landscapes and who directed some of its output to higher secular and ecclesiastical lordship. One of the most fascinating finds from Lair, is the small, green, segmented glass bead of *c.* 6th/7th century AD date (Campbell 2019). Its date aligns it with differently coloured segmented beads from Dunadd in Argyll, Mote of Mark in Kirkcudbrightshire, Dundurn, and Yeavering in Northumberland, all fortified sites of high status, either on the coast or on major routeways (see Campbell 2019: 104 for refs). Campbell speculates on how the bead ended-up at the lower status Lair and suggests this may have been through a connection with a high-status site in the Lowlands. Seasonal fairs might be another mechanism. Non-segmented beads are known from the study area, to the south-west of Glen Shee, at Carn Dubh and Queen's View (Table 2: 13 and 15), and, as Campbell notes (2019: 104) there is the as yet unpublished bead from Fortingall (Table 2: 18). Might we be seeing a chain of sites through which people moved such material culture? This shows how valuable finds of more portable material culture are in connecting and illuminating the movements of people.

From Dunkeld, a key piece of corroborating evidence is the monastic handbell from the adjoining and much bigger parish of Little Dunkeld (Table 2, no.1; Figure 4.15). Cormac Bourke dated this example to *c.* AD 900 and suggested its possible association with church foundations of either Constantine or Cinnead. There

Figure 4.16: Viking Age silver from near Bankfoot (M.A. Hall, © Perth Museums & Art Galleries, Culture Perth & Kinross).

Figure 4.17: Northumbrian silver strap end, decorated with a cross (M.A. Hall, © Perth Museums & Art Galleries, Culture Perth & Kinross).

are further bells listed in the table associated with the church sites at Struan, Fortingall, Cladh Bhranno and Balnahanaid (Loch Tay), and a further postulated bell from Invervar (Robertson 1997: n. 11). They form the highest regional concentration of early medieval bells anywhere in Scotland, a neat fit for the intense monastic activity indicated by the sculptures and sites between Glen Lyon and Dunkeld. We can add to them the bell from Kilmichael Glassary, Argyll (NMS reg. no. H.KA5&6; Glenn 2003; Caldwell *et al.* 2012). This is likely to have originally been a Dunkeld bell, which Bourke has identified based on a very close match between the crozier chain and crucifix attached to the bell and that depicted on Dunkeld Cathedral seal matrices (1997: 175-77; Hall 2005a: 69-71).

The overlap between sculpture and portable material culture can also be seen around Loch of Clunie, with a piece of sculpture (Table 1: 4), 3 brooches (Table 2: no. 4) and a mound to take cognisance of. The piece of sculpture is not at the loch; it was discovered close-by in use as a stairway lintel stone at the 16th century tower house at Lethendy. This elegant cross-slab also shows evidence of having been used as a drain or gutter. On one face it bears the remnants of a cross, with to either side human and animal figures. The other broad face is surmounted by an angel beneath whose wings stand two long-robed clerical figures and below them musicians and a dog. I have previously suggested that the cross-slab can be best understood as originally associated with the church and assembly site at Clunie, on the shore of the Loch. The cross-slab may have been associated with a postulated early church or with the mound beside the church, on the edge of the loch. Generally interpreted as a later medieval castle site, the mound appears to predate any stone building placed at one end and is distinguished by an apparent processional route ascending around the mound to its summit. It is very likely to be the royal assembly site recorded as still in use during the reign of William I. The slab also bears many blade cut-marks indicating repeated use in this fashion, likely as an oath stone used in connection with assembly events. On the edge of the loch, between the mound and the church were found two silver gilt penannular brooches, of the 8th-9th century AD, now in NMS, Edinburgh and separately a terminal fragment of a third brooch (Table 2: 4). Attention has generally been drawn to explaining their findspot as losses caused by Viking raiding, documented for both Dunkeld and Clunie (Hall *et al.* 1998). Certainly plausible, it does though side-step the context of manufacture and use. Henderson and Henderson (2004: 103-07) discuss the amphibious creatures depicted on one of the brooches and we can see the same type of creature, in profile and from above, on the Murthly 1 slab (Table 1: 3), the Logierait 2 cross-slab (Table 1: 7) and

on the Dunfallandy slab (Table 1: 9). Such brooches we would expect to see in some profusion at Clunie when assemblies took place and provide an understandable context of accidental or argumentative loss.

In terms of portable material culture there are several other pieces to take account of. From close to Dunkeld come two poorly provenanced dress pins (Table 2: 2 and 3), one ring-headed the other solid-headed. The latter is from Caputh House and is a type rarely seen in Scotland but common in Northumbria and Mercia – such dress items were probably brought north by members of the Viking Great Army (Maldonado 2021: 92). A further disc-headed pin (Table 2: 10) comes from Redgorton. From Stanley we have the first of two silver, Northumbrian strap ends (Table 2: 9). Further metalwork testifying to a Viking presence comes in the form of a fragment of 10th-century AD, decorated silver ring money, hacked at both ends, a metal detector find (along with a splash of silver) from near Bankfoot (Table 2: 5; Figure 4.16). Maldonado (2021: 142-3) has recently observed that the punched style of decoration is early in the series of ring-money in Scotland and appears to be the only known example of the use of silver bullion in the heartland of Alba. Just to the east of the Tay comes a fragment of a copper alloy brooch and two enamelled mounts from Cambusmichael and Cargill (Table 2: 6 and 7), which can be linked to the landscape movements of clerics and lesser nobility (Hall 2007a). The second Northumbrian cross-decorated strap end (Table 2: 12; Figure 4.17) is a metal-detector find from Logierait and is of 8th/9th-century AD date, similar to the example from Stanley discussed above. Other dress fittings, including a similarly dated, double-looped pin from Pitlochry (Table 2: 14) and a later type of disc-headed pin are joined by a small blue glass bead of long chronological duration. The bead and disc pin come from excavations at the settlement site of Carn Dubh (Table 2: 13), just to the north-east of Pitlochry. They were excavated from layers above a house occupied into the 10th century AD, but with no precise context, leading the excavators to speculate they could point to casual loss during a short-lived moment of reuse or an unrecognised horizon of later medieval occupation.

The open-socketed, iron spearhead from close to Kinclaven (Table 2: 11), adds a further dimension to our understanding. It was found in the silts of the River Tay, opposite Kinclaven Castle; a fragment of the ash shaft from within the socket has given a radiocarbon date in the 11th century AD. Leaf-shaped forms of spearheads occur both early and late in the first millennium AD, with early examples known from: Scalloway, Shetland; Brough of Birsay, Orkney; Dunadd, Argyll; and Buiston, Ayrshire (Campbell 1998: 159), to which we can add Aldclune (Table 2: 19). These are consistent with typologies of the 6th and 7th centuries AD (e.g. Swanton 1973; Solberg 1980 and 1984). Later Viking Age typologies and types as late as the 13th century AD are also a good match (Wheeler 1927: 26-29; Caldwell 1981: 254-59). Iconographic support for both chronologies is found in the warrior or demi-god stelae from Tulloch, Perth (Hall *et al.* 2021; Hall forthcoming) and the mid-14th-century tombstone of John Drummond at Inchmahone Priory (Caldwell 1981). The Kinclaven example is damaged at both ends, defeating precise attribution, but the radiocarbon date permits a confident acceptance of an 11th century date. The findspot places it in the territory of Stormont, which seems to have straddled both Gowrie and Atholl, but its status is poorly understood. It would be easy to simply link it to the troubled dynastic politics of the early to mid-11th century AD, but its finding in the Tay also situates it in a long history of votive/ritual deposits in the river dating back to the Neolithic and with a strong Bronze Age concentration (Cowie and Hall 2001 and 2010; and cf. for examples from Europe, Turk *et al.* 2009: 66-78, 125-30). Such practices appear to have continued well into the medieval period and work elsewhere on riverine deposits (notably on the River Witham, Lincolnshire) has shown how such activity was continued and 'converted' by the Church (Stocker and Everson 2003; for a European comparison see Turk *et al.* 2009).

Looking at the Tummel valley before it joins the Tay, the hugely significant Tummel Bridge silver metalwork hoard comprises penannular brooches and fragments of bowls (Table 2, no. 16). The bowls are thought to date to *c.* AD 500 and the brooches later in the 6th or 7th century AD. The make-up and condition of the hoard suggest its contents was to be used as material to make other items. Perhaps it belonged to an itinerant smith or to a patron. From further down the valley, we have the 7th-9th century AD stone cup/lamp and the yellow glass bead from the Queen's View monumental roundhouse (Table 2: 15; the date of the bead is not certain beyond the first millennium AD [Hoffmann 2013: 125-6]). Queen's View can be understood as a possible lordship site where such a smith as owned or used the Tummel Hoard might have been employed. It is one of a group of monumental roundhouses above the north-east end of Loch Tummel (for their chronology see Strachan 2013: 1-9). They include Borenich, which includes the placename element 'both', meaning church, and in this case may refer to a hermitage (Taylor 1996: 105).

Like Carn Dubh, Aldclune, near Blair Atholl has a clutch of later early medieval finds (Table 2: 19), that don't quite fit the chronology of its two defended roundhouses, occupation of which may have sneaked into the mid first millennium (and understood in the early 20th century as the remains of a Pictish palace, as referenced in Table 2, no. 19). The magnificent early

9th-century AD silver, gilt, and glass penannular brooch is well-known, and often interpreted as representing a short-term transitory episode. Less well known are a small number of other objects including a 7th-century AD strike-a-light and a socketed spearhead, which could be late, like the example from Kinclaven discussed above. Do they signal extensive short-term use of abandoned sites, or unrecognised continuity into the later first millennium AD?

Struan, as we have seen, lies a few miles north of Aldclune, and to its sculpture and politico-religious landscape, we can add the monastic handbell named to St Fillan (Table 2: 20). It points to monastic activity in the northern reaches of Atholl. The roulade of Hiberno-Norse pennies from Dull (Table 2: 17) perhaps points to a more secular tone of the abbacy in the 11th century AD (as with contemporary Dunkeld and at a time when Crinan was abbot of both monasteries) and signals continued contacts with Iona and so Ireland.

Finally, excavation at Glen Tilt, Blair Atholl, uncovered a long cist with a large stone disc at the foot end (Table 2: 21), recently characterized as a pseudo-quern. Interpretation has linked it ritually to the agricultural life of its owner, closing off the foot end of the cist. Isotope analysis indicates he grew-up on the west coast, radiocarbon dates place him in the 5th-6th centuries AD, and his pathology suggests a hard life of manual labour before dying around age 45-50. He gives us a rare insight into the osteology and humanity of Picts being converted to Christianity through the operation of such sites as Struan.

4.5 The historical background of King's Seat

Oisín Plumb

King's Seat's 5th to 7th century AD period of use sits in an infuriatingly opaque period in the history of the region, later than the last Roman sources and earlier than the earliest securely datable early medieval references to the area. The name Dunkeld itself means 'Fort of the Caledonians' (Watson 1926: 21; Noble and Evans 2022: 105). Ancient references to the *Caledonii* and related terms place these Caledonians at the heart of a newly emerging 'Pictish' identity – at least in the eyes of the Roman world (Fraser 2009: 15-22). In the middle of the 3rd century AD, Cassius Dio described them as one of 'two principal races of the Britons' in the north, alongside the Maeatae (Cary 1927: 263), whereas by *c.* 392 AD, the Dicalydones (seemingly '"twin" or "double" *Calidones*') were included by Ammianus Marcellinus under the term *Picti* (Noble and Evans 2022: 7). The works of Ammianus and other Roman observers suggest that from the late 3rd century AD onwards, a 'Pictish' identity became established which encompassed those who gave their name to Dunkeld. However, the idea that this was the beginning of a continuous self-held Pictish identity, emerging in late antiquity and continuing into the 9th century AD uninterrupted, and covering extensive territory north of the Forth, has been challenged in recent years. It has been argued that the increasing hegemony of the kings of Fortriu (a region now widely held to have been centred on the Moray Firth) over much of northern Britain from the 7th century AD, was pivotal to establishing 'self-conscious Pictishness' over an extensive area (Fraser 2009: 50; Woolf 2017). Nonetheless, recent work arguing for a late 3rd-century genesis for the Pictish symbol system as a possible expression of non-Roman identity might nudge the balance back in favour of a more extensive early embracing of something we might describe as 'Pictishness' (Noble *et al.* 2018). However, the lack of early symbol stones in the vicinity of King's Seat must be noted (Fraser 2008: 11; Noble and Evans 2022: 262-3). While the name of Dunkeld might hint that the earliest inhabitants of King's Seat would recognise, and potentially identify with, the term *Caledonii*, it is impossible to say whether they considered themselves to be Picts.

When Dunkeld and its environs return to the historical view, they sit firmly within the orbit of both Pictish politics and Gaelic ecclesiastical influence. The church of Dunkeld and its association with the relics of Columba and Pictish royalty seems traceable to the 9th century AD. One 13th-century AD addition to the Pictish King-list attributes its founding to Constantín son of Vurguist (or Fergus) between AD 807 and AD 818 (Anderson 1973: 287; Woolf 2007: 65; Fraser 2009: 134, 369). Dál Riata, and consequently Iona, are likely to have been under Pictish overlordship at this time, and Woolf suggests that the founding may reflect Constantín's desire to keep the relics of Columba within his own kingdom in the face of the building of the new major ecclesiastical site at Kells by Cellach, Abbot of Iona, between AD 807 and AD 814 (Clancy 2004a; Woolf 2007: 59 and 64-5). An intriguing further testament to the relationship between Constantín and the Columban Church may exist on the Dupplin Cross. This free-standing cross, originally situated overlooking the late-Pictish power centre of Forteviot and now located in St Serf's Church Dunning, contains an inscribed panel commemorating the king (Fraser 2009: 329). Under this panel is 'an interlace-filled roundel bordered by plump birds' which Henderson and Henderson suggest may be a reference to 'Columba' – Latin for 'dove' (2004: 190) (Figure 4.18). The link between Dunkeld and royalty seems to be further evidenced in the Chronicle of the Kings of Alba's possible assertion that it was Cinead son of Alpin who was responsible for placing the relics there in AD 849.

> *Septímo anno regní suí reliquias sancti Columbe transportauit ad ecclesiam quam construxít.*
>
> In the seventh year of his reign, he conveyed the relics of St Columba to a church that he had built. (Hudson 1998: 148 and 152)

This has often been interpreted as marking the removal of Columba's relics from Iona, and their division between Kells and Dunkeld, as the Irish Annals have the relics arriving at Kells in the same year. However, it is important to note that the Chronicle of the Kings of Alba does not explicitly name the destination of the relics as Dunkeld (Bannerman 1993: 42; Woolf 2007: 98-99). The precise details of the foundation of Dunkeld and of when it came to be associated with the relics of Columba remain murky. However, by the 10th century AD at the very latest, the foundation was firmly associated with his relics, and 9th-century AD regal activity appears to have played a large part in this (Hudson 1998: 152; Broun 1999: 105; Woolf 2007: 98-101).

Even if the association between Dunkeld and Columba himself was largely forged over the course of the 9th century AD, there are some grounds to posit an earlier relationship between the area and the Columban Church, perhaps dating to the late 7th or early 8th century AD. Taylor contrasts a lack of local dedications to Columba with the presence of a number of dedications to Adomnán (or Eunan), the ninth Abbot of Iona and his contemporary, Coeti, Bishop of Iona. An example of the latter includes Logierait, around 8 km north-west of King's Seat, attested in late medieval sources as Logie Mahedd (Logie of St Coeti). Local dedications to Coeti are particularly interesting. Taylor argues that it is likely that, given the lack of 'great fame or prestige' after Coeti's death, 'his very localised cult found in Atholl was a result of contemporary presence in that area either of himself or of closely associated clergy'. (Taylor 1999: 59; 2000: 113-14). Fraser has suggested that Coeti's see may have encompassed both Argyll and Atholl (Fraser 2009: 257). Further possible indication of active Gaelic ecclesiastical influence in the vicinity comes from the presence of five placenames containing the Gaelic element *cill* (church) clustered around Logierait. These are the only examples in Atholl. Taylor argues that this, when considered in conjunction with the Adomnán and Coeti dedications, is likely to reflect late 7th- and early 8th-century Columban activity in the area (Taylor 1996: 101-2). Another possible dedication to a Columban saint has been suggested in Tobair Fheargáin (Fergna's Well) in Pitlochry, which may refer to Fergna or Virgno, the fourth Abbot of Iona. The name of Farragon Hill to the north of Aberfeldy, may also be related (Taylor 1999: 54). A hint of political relationships fostered by the Columban church might be visible in the chronicles, where the defeat of a King Elphin, argued by Fraser likely to be king of Atholl, by Onuist son of Vurguist in AD 728, was described as 'lamentable'. Fraser suggests that such a 'partisan comment' may suggest that the Columban Church was sympathetic to Elphin (Fraser 2009: 288-9).

One text frequently proffered as evidence for genuine early activity in the environs of Dunkeld, not just by the Columban Church, but by Columba himself, is Amrae Coluimb Chille ('The Elegy of Colum Cille'). At face value, this Irish text appears to be an elegy lamenting the death of Columba, written soon after his death in AD 597, and attributed to Dallán Forgaill (Clancy and Márkus 1995: 96-100; Herbert 1996: 9-12). The text is notable for its significant divergence from the prevailing traditions reflected in Adomnán's Vita Sancti Columbae (*c.* 697) and other sources, not least due to the apparent southern focus of Columba's activities amongst the Picts. This significant detachment from influential narratives from the late 7th century onwards has been used as an argument for an early date for the text (Clancy and Márkus 1995: 239). The text makes two references to what appears to be the Tay.

> *Ar nín forcetlaid, for-chanad túatha Taë*
>
> For we do not have the teacher who instructed the peoples of the Tay. (Bisagni 2019: 268-9)
>
> *cloisius borb béolu bendacht*
>
> *bátar oc Taë- tol Ríg*
>
> with a blessing he subdued (?) the mouths of the foolish ones
>
> who were near the Tay- [this was] the King's will. (Bisagni 2019: 276-77)

The provenance of this text has however recently been called into question, and with it, the suggestion that Columba himself may have visited the environs of King's Seat in the latter days of its occupation. Bisagni has argued that the language and content of the work points more plausibly to composition in the earlier part of the 9th century AD (2019: 250-7). Bisagni makes the case that rather than revealing real missionary activity by Columba amongst the southern Picts in the 6th century AD, the poem instead reflects a deliberate attempt to enhance the prestige of the church at Dunkeld 'by attributing retrospectively to Columba's own time the connections between Iona and the Tay area' (2019: 255). In this context it can be noted that the ambiguous reference to Columba's work being the will of the 'King' (which has been interpreted variously as referring to a secular ruler, God or potentially both), might sit comfortably with the regal connection of the church at Dunkeld from the 9th century AD onwards (Bisagni 2019: 266-7). The rejection of an early date for the work has not met with universal acceptance,

Figure 4.18: Detail from the Dupplin Cross. A possible 'dove' motif under an inscribed panel commemorating Constantín son of Fergus (© Historic Environment Scotland).

however. Charles-Edwards argues that several issues of linguistics and content leave the possibility open that an early original text was substantially re-written and expanded in the 9th century AD (Charles-Edwards 2021: 287). While the issue remains unresolved, what can be at the very least concluded is that by the 9th century AD at the latest there was *perceived* to have been a link between Dunkeld and Columba in the 6th century AD. This claim may have built on activity in the area by the Columban Church from the 7th century AD onwards, and it is not impossible that its roots are earlier. However, it is important to consider the extent to which the 7th and 8th centuries AD may have seen significant cultural and political upheaval, after which there may have been a desire to 're-write' the earlier story of Atholl. Indeed, 'Atholl' (or a Brittonic cognate) may not have been a term the rulers of King's Seat would have recognised.

It is possible that connections between the area and Iona, going back to the late 7th or early 8th century AD were instrumental in the creation of the name *Atholl*. This has often been interpreted as comprising the Gaelic *ath-* or *aith-*, which can be interpreted as 'a second' or 'another' (Watson 1926: 228-9; Taylor 2000: 112; Clancy 2010: 84), alongside *Fotla*, frequently used as a name for Ireland in medieval literary sources (Clancy 2010: 79-84). The earliest attestation of Atholl appears in the Irish annals in AD 739 associated with the death of its king at the hands of Onuist son of Vurguist:

> AU 739.7: *Talorggan m. Drostain, rex Athfoitle, dimersus est, .i. la Oengus.*
>
> 'Talorgan son of Drostan, king of Athfoitle, was drowned, i.e. by Aengus.' (Mac Airt and Mac Niocaill 1983: 192-3)

An alternative interpretation of the name has been offered by Fraser. He posits that while the Annals of Ulster give *Rex Athfoitle*, both the longer Pictish king-list and the Chronicle of the Kings of Alba give forms with a *c* instead of a *t*: *Floclaid* in the former and *co Achcochlam* and *satrapas Athochlach* in the latter. He argues that the name may have been derived from the Gaelic *fochla* 'north', with the *Athfotla* of the annals being the result of a scribal misreading of *t* for *c*. He suggests that the name may have emerged from a Gaelic *Áth Fochla*, potentially translated from a Brittonic *Atui Guocled*, translatable as 'north pass' or 'north way' (Fraser 2009: 101-2). Clancy however points to the form *Athótla* within the Gaelic notes in the Book of Deer, arguing that this 'only early form written in a securely eastern Scottish Gaelic-literate context, strongly supports a derivation instead from *ath-* + *Fotla*' (Jackson 1972: 23 and 32; Clancy 2010: 87). Clancy further points to the presence of *Fotla* within the 9th-century AD text *Mórseiser do Cruithne claind* 'Seven Children of Cruithne', as one of seven eponymously named sons of *Cruithne* 'Pict', each named after a Pictish region. He argues that this either indicates that at time of composition the derivation of *ath+ Fotla* 'remained suitably transparent', or that the term Fotla on its own could describe the region (Fraser 2009: 44-45; Clancy 2010: 87). He suggests that the literary nature of the term *Fotla* has a 'reek of the schoolroom' and that the term may have been coined and used by the Columban Church before eventually entering wider usage (Clancy 2010: 88). If the term is indeed a reflection of significant influence of the Columban Church in the district, it is also worth noting that the name of the adjacent (and potentially originally overlapping or identical) district of Gowrie has been argued to derive from the Cenél nGabráin of Dál Riata (Woolf 2007: 226-28). The abbots of Dunkeld were to trace their descent from this kindred (Driscoll 2002: 45). While none of these etymologies are certain, they do add further circumstantial evidence that the century or so following the end of the occupation of King's Seat, the region saw notable interest and influence from the west.

Influence from the North is another significant factor in our source materials. Significant engagement, and dynastic entanglement with Fortriu, the pre-eminent Pictish kingdom now regarded by most scholars as being centred on the Moray Firth region (Woolf 2006; Fraser 2009: 50; Noble and Evans 2022: 19) is evident in the glimpses we are given of the kingship of Atholl within the sources. The Talorgan son of Drostan, king of Athfoitle, whose killing by Onuist son of Vurguist is recorded in the annals at AD 739, was named in the chronicles 26 years previously as the brother of Nechtán King of the Picts.

> AU 713.7 *Tolargg filius Drostain ligatur apud fratrem suum Nectan regem*.
>
> 'Tolarg son of Drostan is held captive by his brother, king Nechtan.' (Mac Airt and Mac Niocaill 1983: 168-169).

Clancy has argued that King Nechtán's mother was Der-Ilei, likely a member of the royal house of Fortriu, and his father was Dargart, a member of the Dál Riatan Cenél Comgaill kindred. He suggests that Talorgan (or Tolarg) son of Drostan was therefore his half-brother, with Der-Ilie the mother of both (Clancy 2004b). He argues that it is likely that Drostan's kin were rulers of Atholl, though it is also possible that Talorgan and his kin were placed there by Bruide mac Der-Ilei, Nechtan's brother and predecessor as Pictish king (Clancy 2004b: 137). While we may never glean a full understanding of the enormously complex machinations of contenders for the Pictish kingship and their associates in the early 8th century AD, it is clear that Atholl and its rulers were crucial players in the wider contest of Pictish supremacy (Fraser 2009: 274). This seems to be underlined by the participation of Elphin in a 'four-way round-robin contest' for the Pictish kingship (Clancy 2004b: 143), leading ultimately to his 'lamentable' defeat in AD 728.

The occupation of King's Seat took place in a period of silence in our securely datable written evidence. We are given a meagre glimpse of the period before the occupation of the site in our records and have slightly better evidence for the period after. These bookends suggest that the period of use of King's Seat both followed and preceded significant moments of upheaval in politics and identity. The Caledonians who gave Dunkeld their name were, at least in the minds of external observers, grouped within a new 'Pictish' identity by the 4th century AD. Following the period of occupation of the fort, the area saw significant influence from both Dál Riata and Fortriu, which significantly shaped the political and religious landscape. It is notable that, despite survival in the name Dunkeld and other locational names, the *Caledonii* do not survive as a population group in our early medieval written sources. Fraser suggests it possible that 'Caledonian identity' was a victim of 'the process of ethnogenesis that embraced self-conscious Pictishness' (Fraser 2009: 49). While the consolidation of 'self-conscious' Pictishness is likely to have helped to downplay local identities beyond that of Fortriu, the sources do attest the survival of a distinct local 'Atholl' identity within a larger Pictish one. As such, it seems unlikely that the encroachment of 'Pictishness' alone is responsible for the disappearance of the *Caledonii*. Perhaps we should instead look to the creation of 'Atholl' as the ethnogenesis which displaced Caledonian identity. This may have been a gradual process, beginning in the 7th century AD, particularly if Atholl began life as a scholarly term used by the Columban Church. How and why (and if) this occurred may be a mystery destined to remain just the far side of the historical horizon. Nonetheless, it is possible that King's Seat represents one of the last strongholds of people who considered themselves to be Caledonians.

Chapter 5
Discussion and Conclusions

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..from the 6th century to the mid-9th century AD, northern Britain had an underlying unity that was distinct, vigorous, even vibrant (Alcock 2003: 1).

5.1 Introduction

This chapter discusses the implications of the results from the King's Seat excavations in the context of early medieval Scotland, covering a period defined as *c.* AD 350 to *c.* 1058 (Noble *et al.* 2013; ScARF 2022). As with many early medieval sites, discussions are centred around key areas such as landscape, settlement, resources, status, and trade. To further contextualise, the discussion also focuses on how the results contribute to the Perth and Kinross Archaeological Research Framework (PKARF) themes, priorities, and questions. The PKARF *Early Medieval Research Agenda* (ScARF 2022) identifies 11 research themes of which King's Seat contributes in varying degrees to at least five. These five themes provide the structure of the chapter: *Upland and Lowland Relationships; High-Status Sites; Economic Networks; Material Culture;* and *Periods of Transition*.

5.2 Upland and lowland relationships: defining the nature of settlements, buildings, royal sites and their locations, and the relationships between them.

PKARF identified three main priorities of which two are pertinent for King's Seat (our *emphasis)*:

- **Priority 1:** The RCAHMS (1990) survey of Glen Shee and Strathardle highlighted the early medieval Pitcarmick-type byre-houses, surviving as earthworks in the largely unimproved uplands of the area. While some examples have now been recognised west of the River Tay, no lowland equivalents have been discovered to date, and the nature of lowland settlement remains essentially unknown. *Identification and excavation of lowland buildings and structures should be a priority with a view to better understanding the nature of settlement across the whole region.*
- **Priority 2:** *The nature of high-status sites across the uplands and lowlands should be considered a priority for study*. Forts in both areas are constructed on rocky outcrops on top of hills. Upper Gothens palisaded enclosure, constructed on the summit of a low hill, has been confirmed as early medieval and suggested as high-status (Barclay 2001). It is probable that at least some of the early medieval crannogs in the area are of high status, as is the case elsewhere. The nature of these various forms requires further study – do their distributions indicate differences in lowland and upland society, or are they simply broadly comparable sites which are simply adapted to local topography?

While these priorities encompass a wide range of site types (e.g. Pitcarmick-type buildings, palisaded enclosures, crannogs, and ecclesiastical sites), the King's Seat contributes in two ways: a) adding to the meagre understanding of the nature – that is the features, character, and qualities – of high status sites, and b) the identification and characterisation of different buildings and structures not hitherto appreciated. As such, the structural evidence from King's Seat now sits alongside the classic fort excavations at Dundurn (Alcock *et al.* 1989) and Clatchard Craig (Close-Brooks 1986) in illuminating our understandings of the nature of high-status sites in southern Pictland.

The features, character and qualities of high-status nuclear forts

In his classic study of Dalmahoy, R.B.K. Stevenson noted the shared morphological characteristics of a group of Scottish forts where there was historical and/or archaeological evidence for early medieval occupation (1949: 195-198). Influencing understanding of such forts since, Stevenson named the group 'nuclear' forts due to their appearance in plan: a central fortified 'citadel', on the summit of a craggy hill, with enclosures below looping out from this, their shape being governed by the topography of the hill. Stevenson initially envisaged these as the early medieval hierarchal strongholds of Pictish elites, conceived and constructed in one phase, with a high-status summit citadel surrounded by a hierarchy of descending courts enclosed by out-works. Feachem subsequently argued that some nuclear forts were earlier Iron Age forts that were re-fortified in the

early medieval period and that some citadel forts were early medieval structures built within earlier Iron Age forts (1955; 1966).

Alcock suggested King's Seat as a 'medium-sized example', not a principal stronghold, but still royal (Alcock *et al.* 1989: 209; illus 12) and argued that nuclear and citadel forts should be considered as one class, as the hierarchal organisation of space is the important feature, not the plan itself (Alcock *et al.* 1989: 211). However, most scholars agree that the two key characteristics of Scottish nuclear forts are location (a dominant and striking landmark, usually the summit of a craggy hill) and morphology (with a central fortified citadel with a series of lower, outwork enclosures). King's Seat adds valuable evidence to the small corpus of known sites. In Perthshire there are few examples. In addition to Dundurn, these include Tom a' Chaisteil (ID 25524), Comrie; Dunmore (ID 24375), near Callander; and Drummond Hill (ID24911), near Loch Tay. These few, from around 100 forts in the area, illustrates the rarity of the site type. This brief discussion will consider location and morphology and then explore the nature of enclosure and activities within each enclosure.

Location: the summit of a craggy hill

The selection of confined, rocky outcrops for nuclear forts is known primarily through key sites such as Dunadd, Argyll (ID 39564); Dundurn (ID 24873), and Clatchard Craig, Fife (ID 30074) (Figures 5.1-5.4). These are all located where the prominence, height, and steepness of the hill is emphasised by low-lying and level surrounding terrain. This no doubt enhanced the visibility and impressiveness of the sites when approached – with the ramparts on each ascending terrace appearing as one continual 'sequence' of defence. Visibility of, and from, the sites were also concern, as illustrated by the excellent views afforded by their locations. King's Seat has a particularly prominent position, highly visible to those travelling up and down Strath Tay, and from the central enclosure has long-ranging views to the south-east and north along Strath Tay.

Like the above sites, the summit on which King's Seat sits is topographically distinctive, with multiple natural terraces (with limited space) and numerous bedrock outcrops. The bedrock is a metamorphic schist with frequent mica inclusions and more granular quartz veins, which can create striking reflections when caught in sunlight. The upper terraces are protected by steeply sloping ground and vertical cliff faces, and the lower terraces, although larger in area, are characterised by uneven and rocky platforms, setting them apart from the more low-lying ground they overlook down by the riverside.

That the site was chosen for these attributes is supported through the consideration of nearby alternative locations that might superficially appear more suitable. If a large space with no surrounding ground overlooking it was the main requirement, then the higher sites of Craig a' Barns or Polney Crag, both of which overlook King's Seat to the north-east, may have been more suitable. If a larger space that was more accessible was required there are plenty of good options available on lower-lying ground; including the current site of Dunkeld, which is closer to the river and the land-based routes through the region. The choice of site

Figure 5.1: The profile of Dunadd from the north-east, showing the morphology of the hill dominated by the upper rocky outcrops (© Historic Environment Scotland).

Figure 5.2: An aerial view from the east showing Dunadd's close relationship with the River Add, its earlier enclosed terraces, and the low-lying surrounding land (© Historic Environment Scotland).

Figure 5.3: A view from the south-east showing Dundurn's relationship to the River Earn and Loch Earn in the distance (© Historic Environment Scotland).

Figure 5.4: A 1932 view of Clatchard Craig fort looking north showing the multiple terraced enclosures draping the hill, and the encroaching quarry on the east (© Historic Environment Scotland).

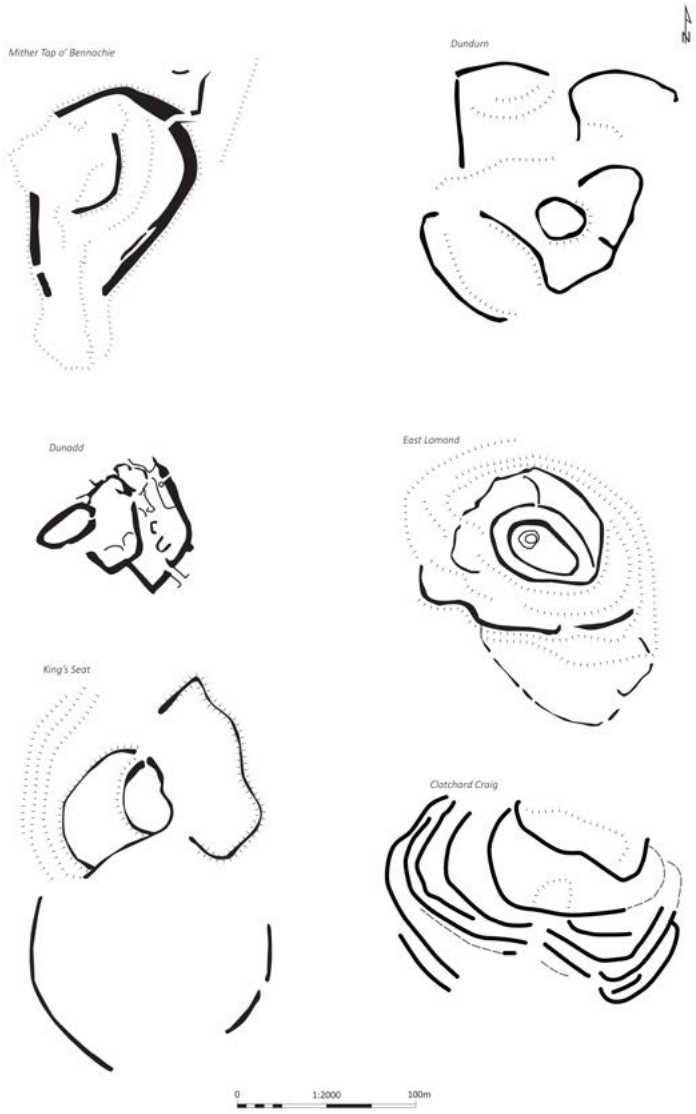

Figure 5.5: Comparative plans of early medieval forts active in the 6th-7th century AD; Mither Tap o'Bennachie (Aberdeenshire), Dundurn (Perth and Kinross), Dunadd (Argyll and Bute), East Lomond (Fife), King's Seat (Perth and Kinross), and Clatchard Craig (Fife).

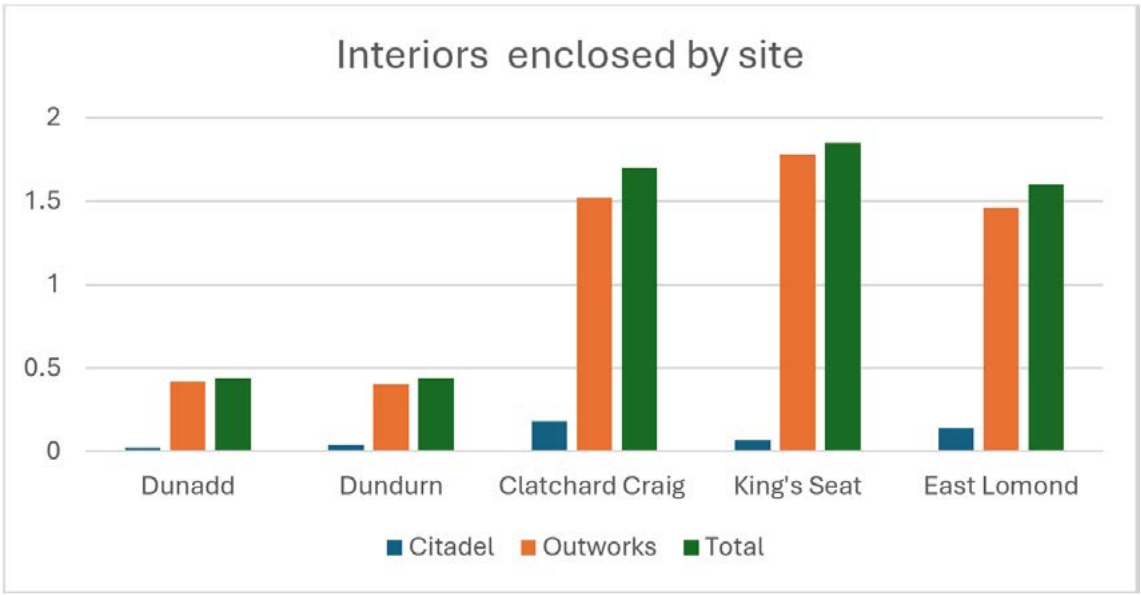

Figure 5.6: The relative interior areas enclosed by the citadels and outworks at key comparators for the King's Seat.

utilising the rocky outcrop speaks to the requirement for smaller confined spaces with the opportunity to restrict access for visitors as they progressed up the hill. However, as at other early medieval nuclear forts, while King's Seat appears to have been chosen primarily for the location and topography of the hill itself, there may have also been other factors.

Morphology: an upper citadel with connected enclosures below

Construction on these distinctive, rocky hills took advantage of the topography by enclosing the summit with a 'citadel' and augmenting and reinforcing the lower terraces with additional enclosures or outworks extending from it, or the hill itself. The result is a descending hierarchy of space through the adaption of natural terracing and multi-vallation. Of the comparative plans of selected Scottish forts active in the 6th-7th century AD, shown in Figure 5.5, the classic nuclear form is best illustrated at Dunadd, Dundurn, and at King's Seat. East Lomond has a more concentric configuration, but does shares some features with King's Seat, notably the large southern enclosure attached to the fort complex. Another variation can be seen at Clatchard Craig where the multiple enclosures constructed against the top of a cliff face, appear to suggest a multi-phased development, as at Moredun on Moncreiffe Hill (Strachan *et al.* 2023). However, the common feature is the 'citadel', which at King's Seat, is the central enclosure on the summit and is herewith referred to as such.

The citadels at all the sites are small, ranging from 0.02 ha at Dunadd to 0.18 ha at Clatchard Craig (King's Seat is 0.07 ha). However, the areas of their outer enclosures vary considerably, with total footprints ranging from 0.44 ha at Dunadd to King's Seat at 1.85 ha (Figures 5.5 and 5.6). Such variation in scale may reflect differing functions of some if, not all, the types of enclosure present. Figure 5.6 also illustrates similarities in the scale of King's Seat with East Lomond and Clatchard Craig, in comparison with the diminutive scale of Dunadd and Dundurn. Dunadd could only have housed a very small group of residents, and so the supporting population presumably lived in dispersed settlement across the site's wider environs, perhaps apart from the specialist craftworkers, unless they were peripatetic and from further afield. While the total area enclosed by forts on such rocky outcrops can be misleading, large areas being unusable due to steepness, the inclusion of the southern enclosure at King's Seat fits more comfortably with other Pictish forts in central eastern Scotland: Clatchard Craig, and East Lomond, and may reflect much denser, proto-urban settlement.

Access: approaches and entrances

Control of access through the various elements of a nuclear complex is another attribute afforded by the morphology of these sites. Overall, access to the hill is steep and uneven in parts and irrespective of the direction of approach, the terrain offers natural defence.

The main entrance to the citadel at the north was accessed from the north end of the lower western enclosure, via a narrowing approach defined by the inner face of the western enclosure wall to the left and overlooked by the exposed bedrock and the citadel rampart on the right (Figures 5.7 and 5.12). This funnelled approach, using the western enclosure as a form of outwork to confine access, is an inherent feature of the hierarchical arrangement of the annexes of a true nuclear fort, where the roles of the various enclosures contain some intrinsic ranked value. It was undoubtedly designed, if not to intimidate visitors, certainly to impress upon them that they were ascending to the innermost and most exclusive area of the complex. With no space for stabling in the citadel, this approach was probably usually made on foot. This progression through fortified enclosures is reminiscent of the rocky cleft piercing the outer wall at Dunadd and also has parallels with the approaches and entrances at Dundurn. The possible small postern entrance at King's Seat, at the south of the citadel, also led into the western enclosure, so that all access to the citadel was through the western enclosure (Figures 5.7 and 5.13). The postern gate is more difficult to parallel, as narrow entrances tend to fill with wall material and become difficult to identify. However, while not common, some Scottish examples are known (Lock and Ralston 2022: 233-4).

The main access to the western enclosure was also from the north, probably through a simple gap in the rampart at the north, opening into the foot of the funnelled approach to the citadel described above (Figure 5.7). While relatively steep, the approach is the gentlest incline at the north of the hill, and the entrance could have afforded access for horses and pack animals, and of course access on foot up to the citadel. While a 'simple gap' entrance (Lock and Ralston 2022: 208), it is rendered more complex by the multiple outer works extending along the western flank of the hill, which splay to create a larger funnelled approach from the north into the western enclosure entrance. A much less certain entrance may have existed further up the slope, close to where the funnelled approach meets the citadel, and where a modern path mounts the steep and rocky north flank of the summit. The visible gap may simply be the result of collapse and subsequent erosion by the modern path. However, it could conceivably have offered foot access to the small north terrace, at which hints of defences have been identified (Figure 1.18). If this small northern terrace was also enclosed and defended, the additional entrance could function

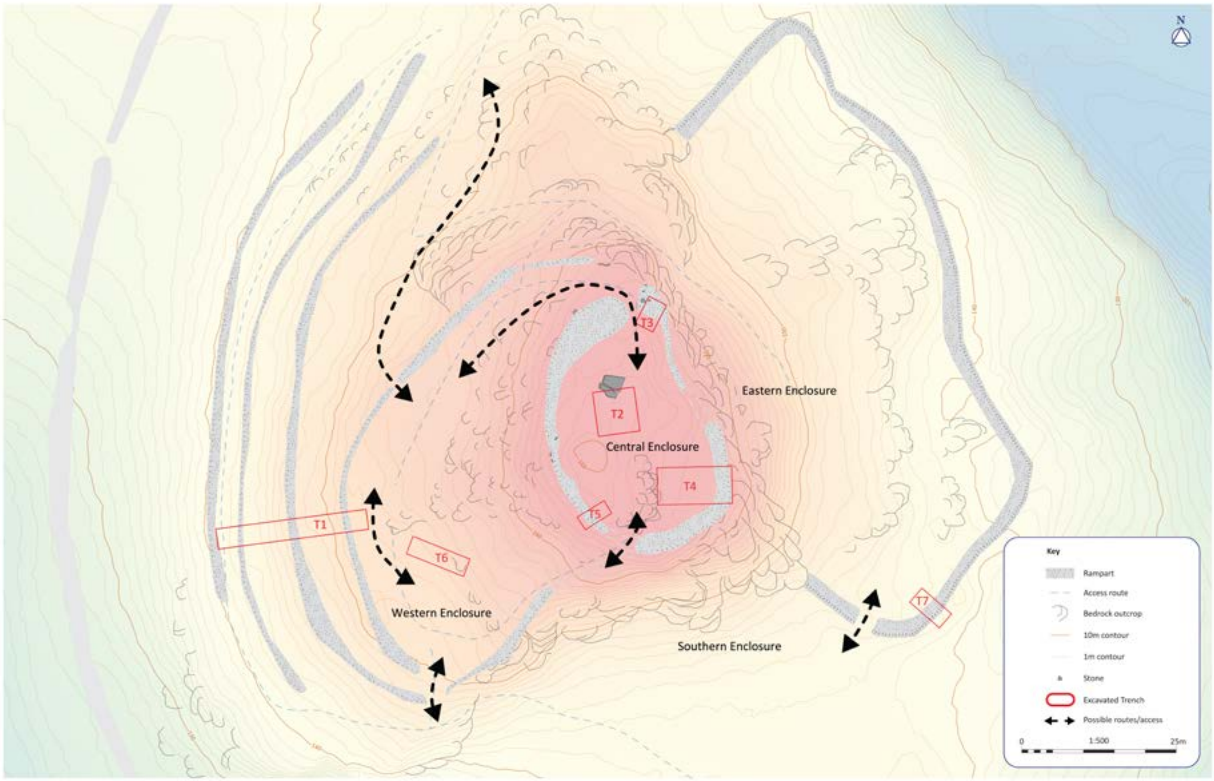

Figure 5.7: Suggested access analysis of the core of the complex, indicating main and postern entrances and a controlled flow of access increasingly restricted towards the central enclosure or citadel.

without compromising what is essentially a ceremonial route from the western enclosure to the citadel.

The western enclosure is divided by an exposed block of bedrock into a narrow northern section, providing access to the citadel, and a wider southern area, containing at least one building and accessed via a route between the inner rampart and the exposed bedrock. Again, a possible postern entrance has been identified, connecting the western enclosure to the southern enclosure over a steep section of bedrock (Figure 5.7), used for access by the project excavation team. One probable entrance to the eastern enclosure has been identified at its southern end, west of Trench 7, providing access to and from the large southern enclosure. The southern enclosure may have had an entrance on the south-west, providing easy access to and from the river at this point and complementing another probable entrance on the east identified in the LiDAR data (Figure 1.18). The entrances reveal lines of access between the different enclosures of the fort complex, but it is only the main route up and into the citadel that highlights that control of access may have had a hierarchical dimension – the citadel only being accessible via the western enclosure, and this approach is from the north. The eastern enclosure entrance on the south was accessed from within the large southern enclosure, and only the southern and northern enclosures appear to have been accessed from outside the complex.

The nature of enclosure: structural characteristics

The interior of the oval citadel at King's Seat is quite distinctive, with a raised rocky western half, and lower eastern half, representing limited workable surface area. Overall, it is large enough for a maximum of two or three buildings, although only one has been confirmed (see below). Its central location and most restricted access, implies that only a select group lived or worked within, and it may have been used for other activities that probably served to reinforce their importance. It was enclosed by a rampart with inner and outer stone facing and a rubble core, at least 3.4 m to 4m thick. It is unclear whether it was capped by a timber palisade, but there can be little doubt that it was once a much more substantial stone-faced feature. There was no evidence of timber lacing, as found at Clatchard Craig, Dundurn, or Burghead, however the scale of the evaluation trenches and the poor survival of the ramparts would make such identification difficult.

The interior of the western enclosure was larger and as outlined above was in two parts, the southern including at least one building and the northern acting as an entrance courtyard. The multiple ramparts on its steep western side had a stone outer face and a rubble and earth core. Given the degree of steepness here, multivallation may have been primarily designed to increase visual impact from the river, and on an approach from the north, rather than purely for defence. However, the discovery of the slingshot cache within the citadel, at the rear of its rampart overlooking the western enclosure and its outer ramparts, may indicate otherwise.

The eastern and southern enclosures take in rather different spaces. The eastern occupies an uneven, rocky terrace that extends round the foot of the citadel on the east, its uneven interior is littered with rocks from the cliff above. It produced evidence of ironworking (see Chapters 2 and 3, and below), and industrial activity and protection of the King's Pass may have been its primary function, as its broken, rocky interior made it unsuitable for other uses. Its rampart varies in nature along its course, but at the south was constructed with substantial internal and external boulder faces with an earth and rubble core.

In contrast, the southern enclosure occupies a much wider, more level, and south-facing terrace. In parts it was enclosed by a simple stone wall footing, while in other areas bedrock cliff faces were exposed and enhanced. No trace of the superstructure survived, and it was presumably of turf and timber. Although no dating evidence was recovered from this enclosure, its configuration with the rest of the defences suggests that they were all in use at the same time. The south-facing southern enclosure was far more suited to residential occupation, although it might equally have served as a stock corral.

Both these lower enclosures visually augment the site on different sides of the hill and protect the upper enclosures on otherwise vulnerable approaches, while increasing available space in the complex significantly, the southern enclosure alone more than doubling the combined footprint of the others.

Importantly, the revised configuration of the complex, including the newly discovered southern enclosure (Figure 5.5) does not compromise the integrity of the nuclear fort model: a smaller upper citadel surrounded by a series of contemporary enclosures on lower terraces. The best comparator for the southern enclosure may be the broadly contemporary fort on East Lomond (Banaszek *et al.* 2021), where excavation of the large southern enclosure has indicated high-status occupation over the 2nd to 7th centuries AD (Noble and Evans 2022: 105-6), however as yet there is has been no excavation of the citadel. Conversely the King's Seat southern enclosure remains unknown, although it would clearly be well suited to settlement.

In summary, the King's Seat fort builders capitalised on the outcrops and multi-layered terraces in the construction of a tiered series of enclosures, as took place in other sites such as Dunadd and Dundurn. The sheer scale of the monumental architecture incorporated, and the size of the site itself signal the status and co-ordinating power behind the construction and indicate a controlling elite led by a significant individual. Overall, this concurs with Alcock's suggested model made over 30 years ago (Alcock *et al.* 1989: 209-211). Moreover, the choice of site and its configuration appears as a conscious statement linking it to the emerging pattern of royal centres elsewhere and demands that we consider its functions alongside those of other demonstrably royal sites.

Hilltop features and activities: the glacial erratic

The most dominant feature surviving in the citadel is the large glacial erratic, into which four holes have been bored at some point in antiquity. At Dunadd, a bedrock outcrop carved with a footprint played an integral role in the inauguration of the kings of Dal Riata (Lane and Campbell 2000: 249). While not on the summit, its appearance on the skyline has been noted and the role of theatre and ceremony in such inauguration events is key. There is potential for similar activities at the summit of Dundurn with St Fillan's chair (Alcock *et al*. 1989), a natural bedrock outcrop that has been augmented to create a throne like feature.

The King's Seat glacial erratic is near to the entrance of the citadel, and augmented and worked bedrock around it, along with the bored holes, certainly indicates that the stone held some significance. The shallow forest loam, developed in more recent centuries, suggests that large areas of bedrock may have been exposed during the fort's occupation. The appearance of this highest terrace would have been striking, within this enclosed space. The impressive glacial erratic, dominating the entranceway, may have played an integral, or more symbolic role in ceremonies or assemblies, possibly related to the creation and maintenance of social and political power. The bored holes, assuming they are contemporary with the early medieval occupation evidenced, perhaps supported a superstructure or ornamentation, to enhance its use as a dais or stage from which to address a restricted gathering. Equally, proclamations or ceremonies may have been made from the top of roughly flat terrace, with the terrace itself acting as a raised stage above an assembled group on the lower terrace within the enclosure.

It is unlikely that someone sitting or standing on the erratic, or indeed on the rocky summit terrace, would have been visible from any of the lower enclosures, the view blocked by the natural topography and the citadel rampart (of unknown height but perhaps *c.* 2 m high) that encircled the summit. Therefore, it seems likely that whatever role the glacial erratic played, was limited to a small, select, and presumably important audience. This contrasts with Dunadd where the inauguration site was in direct view from the surrounding enclosures, and presumably to a wider audience, assuming that the wall of Enclosure B was no more than 1 m high and not entirely roofed (Lane and Campbell 2000: 247). St Fillan's chair on the summit of Dundurn may have been similar to King's Seat as the summit enclosure is high in comparison to the outworks and so probably screened by the upper rampart. The importance of ceremonies or announcements within the citadel, whether on the summit terrace or the glacial erratic would have enhanced by control of access through, the hierarchical nature of, the sequential enclosures on the hill, becoming successively smaller and more exclusive towards the summit, and may have played an important part in the King's Seat narrative.

Landscape and legitimacy

In considering the nature of select gatherings within the citadel at King's Seat, it is pertinent to discuss the wider landscape in which it sits. It has been argued that some important early medieval sites, such as Forteviot and Dunadd, were located near existing significant prehistoric ritual landscapes, acting as a focal point for later royal and ceremonial centres (Driscoll 1998: 145; Campbell and Driscoll 2020: 91-93). For example, at Forteviot the early medieval royal centre is located within and adjacent to a substantial monumental complex spanning the Neolithic to the Late Bronze Age (Brophy and Noble 2020), which attracted an extensive early medieval barrow cemetery, used into the Christian period (Campbell and Driscoll 2020: 66) and the palace of King Constantine who died there in AD 820. Similarly, Dunadd is situated in the rich prehistoric landscape of Kilmartin, from where prominent distinctive natural mountaintops such as Cruachan on Arran, The Witches Step, and the Paps of Jura are visible on the horizon. There, the combined cultural and natural landscape provoked a sense of seeing, and hence uniting, different parts of a kingdom from its royal centre (Campbell 2003: 54-55).

There is little evidence of such linkage between King's Seat and more ancient remains in the surrounding landscape. While the wider region is rich in prehistoric monuments that would have been visible in the early medieval period, there are very few such sites in its immediate environs (Strachan Chapter 4.3). A single standing stone (ID 27205) *c.* 0.5 km east of the fort and an undated pit alignment (ID 27181) at Dunkeld Park indicate some prehistoric activity, while the rocking stone at Craig a' Barns (ID 163596) *c.* 1 km north-east

of the fort, may have been a natural landmark in prehistory. However, this apparent lack of evidence may be exaggerated by limited archaeological investigation, combined with the dense woodland cover and the extensive designed landscape to the south and east of the fort. Elsewhere, agricultural improvement may also have destroyed or masked earlier prehistoric monuments, though it is striking that the nearest recognisable monument northwards up Strath Tay is the site of a burial cairn removed in the 19th century *c.* 4 km distant at Dowally (ID 27110).

However, a similar dearth of prehistoric monuments exists at the other key Pictish forts in the region. At Dundurn, in upper Strath Earn, the only notable exception is Kindrochet chambered long cairn (ID 24875) *c.* 1.2 km to the east, but again it is possible other monuments have been removed. At Clatchard Craig, on the east side of Ormiston Hill in north Fife, the only notable monument now visible is Black Cairn fort (ID 300068) *c.* 1.5 km to the south-west. Likewise on East Lomond Hill, with its panoramic views across Fife in every direction except where obscured by its larger neighbour on the west, there is no outstanding concentration of earlier monuments. There are burial cairns of presumed Bronze Age date on both the West and East Lomond, a few roundhouses, and Maiden Castle fort (ID 29936); but this constitutes a broadly typical assemblage as might be found anywhere in eastern Scotland.

In conclusion, there is nothing in the environs of King's Seat to indicate its siting as referencing the remains of a prehistoric landscape to support legitimacy to kingship as has been suggested at Dunadd and Forteviot. However, it is difficult to argue that any of the Pictish forts in the region contain such specific landscape references, and so the prehistoric ritual landscapes at Dunadd and Forteviot are thus perhaps exceptional for Scotland in terms of their density and scale. While it is likely that numerous monuments in their immediate hinterlands have been removed, or remain undiscovered, it is perhaps more probable that other over-riding factors dictated the selection of forts like King's Seat, Dundurn, and Dunmore, near Callander; for example controlling the principal entrances and exits between the Highland/Lowland boundary, with everything that implies for routeways, and access to resources (perhaps specifically for metalworking). These are important political and geographical nodes from which to control production and facilitate trade. These important attributes are considered further below.

Identification and excavation of lowland buildings and structures should be a priority with a view to better understanding the nature of settlement across the whole region.

Another key research priority in early medieval Scotland, including Perth and Kinross, is the identification of new buildings and structures and the work at King's Seat may also have added to an expanding corpus.

There is an established picture of Pictish architectural diversity (Ralston 1997; 2004), with no single building tradition or style, although the adoption of rectangular architecture and a shift away from the characteristic late prehistoric roundhouse is a prevalent theme (Noble and Evans 2022: 92-93). Within the wider region around Dunkeld the main body of evidence is provided by the elongated and predominantly turf-built Pitcarmick-type longhouses, surviving mainly in the uplands to the east of the River Tay (Carver *et al.* 2012; Strachan *et al.* 2019). While dating is problematic, early medieval rectangular structures are known within Scottish forts, and are likely to represent houses (Lock and Ralston 2022: 284-5), including Pictish examples at Barflat, Aberdeenshire (Noble and Evans 2019) and Green Castle, Portknockie, in Banffshire (Ralston 1987). The results at King's Seat now add to this corpus.

An early medieval hall?

Within the citadel, one building (Structure 1) was identified, defined by fragmentary post-settings and a degraded turf wall, it enclosed a substantial hearth with complex fills and a secondary phase that indicates some continuity of use. The presence of iron fixtures and fittings (nails, padlocks), a stone roof weight, and two pivot stones all support the interpretation of a substantial structure within the citadel. While a second building could feasibly have been fitted into the remaining lower terrace, between Structure 1 and the north entrance, it more likely this area remained open as a courtyard in front of the main structure.

As outlined in Chapter 2, the available space suggests Structure 1 was probably 5-6 m wide by a minimum of 8 m long and would have been broadly sub-rectangular in plan, with the hearth probably lying on its axis. To make a comparison with the longhouses at Lair in Glen Shee, in particular Building 2, the smallest of them measured some 15 m in overall length and was in use from the 7th century AD onwards (Strachan *et al.* 2019: 40, 65), whereas the adjacent Building 1 was up to 26 m in length by 6.5 m in breadth. The Pitcarmick-type

Figure 5.8: The context for the hearth at Clatchard Craig indicating the location of a building against inner face of the rampart (© Historic Environment Scotland).

Figure 5.9: Detail of the Clatchard Craig hearth showing the sandstone kerb and resurfacing of the interior (© Historic Environment Scotland).

longhouses in Perthshire more generally range from 10 m to 30 m in length, but these are byre-houses, with as much as two thirds of the interior given over to a sunken-floored byre. Built and used between the 7th-10th centuries AD, these are typically bigger structures than anything that could have stood within the citadel at King's Seat, though the domestic space they contained may have been rather smaller.

A better comparator is a post-defined timber hall within the central enclosure at Barflat, Rhynie (Noble and Evans 2019). This measured *c.* 9 m by 5 m and thus much the same size as the King's Seat structure. A second structure at the entrance to the Barflat enclosure measured *c.* 9 m by 6 m but is superficially more similar in plan to the 8th-century, bag-shaped structure identified at Portmahomack (Carver *et al.* 2016: 240). Of higher status than the Pitcarmick-type buildings at Lair, those within the Barflat enclosure were part of an elite settlement associated with craftworking (particularly precious metalworking) and feasting (indicated by Late Roman Amphora and imported African Red Slipware). The nature of the materials found within and around the King's Seat structure including high status glass drinking vessels, E ware and gaming pieces point towards similar domestic and leisure purposes, including cooking and feasting in addition to craftworking. The earlier hearth at King's Seat is likely to have been used for cooking, with evidence for large joints of meat being brought onto the site in the animal bone assemblage, sporadic metalworking may also have occurred as well. The smaller hearth on top is more clearly associated with ironworking and metalworking waste; crucible fragments and clay mould fragments were found in the immediate vicinity.

However perhaps the best comparator for the King's Seat structure is the early medieval building within the upper citadel enclosure at Clatchard Craig, Newburgh (ID 30074), where a hearth, floor layers and artefact spreads were recovered (Figures 5.8 and 5.9; Close-Brooks 1986). Here, the hearth measured 1.8 m by 1.1 m and was sub-rectangular, well-built, with red sandstone kerb stones and internal paving. Like the hearth in King's Seat Structure 1, it had a secondary resurfacing for a later hearth and contained animal bone with extensive metal working deposits around it. A pivot stone was situated north-east of the hearth at the edge of the floor layer, and its position, and the extent of the floor layers, suggest a rectangular building of *c.* 9 m by 4 m (Noble *et al.* 2022: 272). A pivot stone was also recovered, probably *ex situ*, *c.* 8 m to the north of the hearth in Structure 1 at King's Seat. It may have been moved by the later cultivation, but probably not very far, and thus may indicate an entrance to Structure 1 at its northern end, facing the glacial erratic and main entrance into the citadel. The context, form and scale of the buildings within the central, upper enclosures at King's Seat and Clatchard Craig are similar, while the presence of metalworking debris in the finds assemblage suggest that similar activities were taking place there.

In conclusion, it is suggested that the King's Seat structure may have been multi-purpose; a dwelling and/or feasting hall, within which both important 'royal' events and everyday craftworking space in which tool maintenance and spinning, occurred. The presence of imported Continental pottery, including tableware and Anglian glassware, as well as gaming pieces, substantiate the theory that this would, at least

initially, have been the site of a high-status dwelling where feasting would also have taken place. A hall such as this might have been used for entertaining and hosting significant people within the community as well as visitors from further afield.

> Adomnan writing in the late seventh century refers to the arch-magus at the court of King Brude near Inverness drinking from a glass vessel that shatters in his hand (Close-Brooks 1986: 146).

5.3 Routeways: contact, communication, and control

Beyond, but perhaps integral to, the choice of location and structural characteristics of the forts discussed above is their physical relationship and control of routeways and water courses connecting them to other sites and communities, for diplomatic contact, trade, and defence. These aspects are highlighted in PKARF (2022) which identified two main priorities in relation to *Rivers as Routeways* of which Priority 1 is relevant:

- **Priority 1:** The high-status forts of Dundurn and King's Seat control river valleys which are also important terrestrial routes connecting the area to the west and north of Scotland respectively.

From this, a specific research question was posed:

- How best can we explore and model trade networks of known sites, such as the King's Seat, and their connectivity through riverine and terrestrial routes?

The importance of the River Tay and its connecting straths

A key factor for the location of King's Seat is undoubtedly its proximity to an important strath and waterway, the River Tay, and other comparators are similarly close to rivers and waterways. For example, Dundurn is also positioned on a prominent hill close to a river (Figure 5.3) while Clatchard Craig overlooks the Tay estuary. Outwith southern Pictland, Alt Clut on the River Clyde estuary, and Mote of Mark on Rough Firth in Galloway are similarly tied to broad coastal inlets, while Dunadd, in Argyll, and Trusty's Hill, in Galloway, are located on lesser waterways set a short distance inland.

On a local level, these waterways would have helped these settlements manage and exploit resources, including nearby lochs, hill pastures, lower lying agricultural land, coastal waters and the rivers themselves. However, the use of waterways for communication and transport is another key factor behind this recurring scenario. This is especially the case at Dunkeld, where the river is a substantial and strategically important waterway. The use of the river in this way is supported by the early medieval logboat recovered at Dalmarnock, less than 4 km upstream, and such watercraft would have been capable of both crossing the river, and to travel north and south along its route. The Continental imports arrived by boat and continued transport by inland watercraft could have offered an efficient and safe method of transporting relatively fragile items, rather than the alternative of overland transport.

However, in addition to using the rivers and straths as a conduit for communication and transport, the King's Seat was also ideally located to control these key overland routes. Its occupants not only wanted to acquire exotic goods but also control access to them as an expression of status. Hence the routeways become significant not only as a connection, directly or indirectly, to distant lands, but also as a mark of political control. The hilltop provides excellent visibility both north and south, with an easy crossing point (the historic ferry at Inver is some 0.5 km downstream) allowing a physical presence on either bank with ease. However, while being overlooked by Polney Crag, the fort occupies a dominant position looking over the primary route north through the Highlands (a course that remains the current artery for north-south traffic today) but also connects westwards across the country. Any traffic, by boat or on land cannot have passed unnoticed, and the creation of fortified centres implies measures of control were being exercised. This may have been of people or goods, or both (Figure 5.10).

Near neighbours

The routeways controlled by King's Seat offered contact far beyond its locale (Figure 5.10). The closest known early medieval fort, with potentially contemporary activity, is Dundurn (ID 24873; Alcock *et al.* 1989). It could be accessed to the west along Strathbraan and south through the Sma Glen into Strathearn, a relatively straightforward terrestrial route of *c.* 40 km involving only the crossing of minor watercourses and the River Earn. The contemporary forts on Clatchard Craig (ID 30074; Close-Brooks 1986) and East Lomond (ID 29881; O'Grady 2015; 2017) in Fife, are both *c.* 50 km from King's Seat, following the shortest land route and would have involved crossing the rivers Almond and Earn. While several forts along the northern edge of the Ochils in Strathearn have produced limited evidence of early medieval activity, there is no current evidence that any were a regional centre of any significance (Poller forthcoming). Indeed, two forts previously suggested as

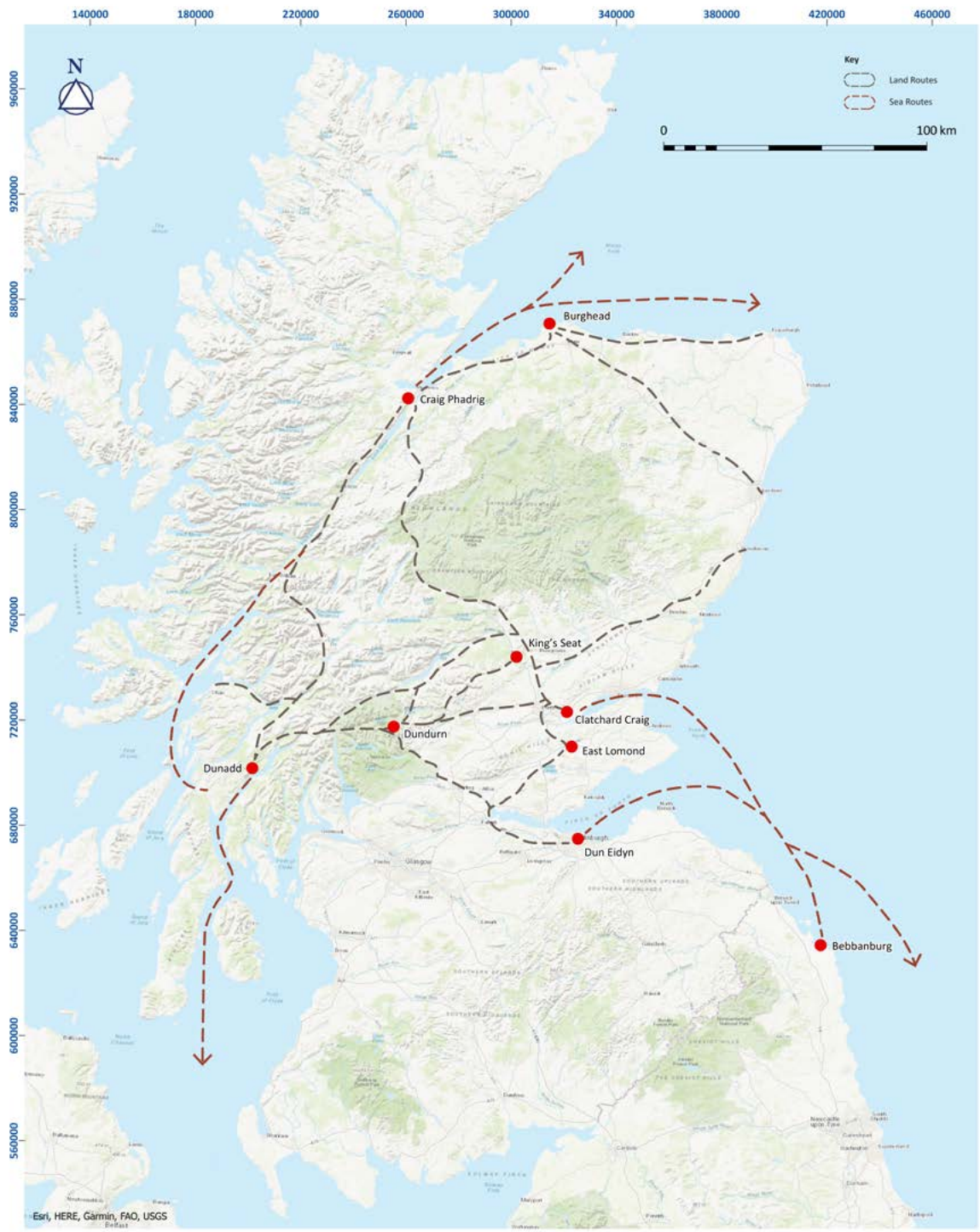

Figure 5.10: Potential routeways between a selection of sites of note active in the 7th century indicating potential trade and communications links with Kings Seat, Dunkeld.

either being either *de novo* early medieval nuclear forts, or at least to have included early medieval phases, have been demonstrated by excavation to be entirely Iron Age in date; namely Moredun (ID 28025; Strachan *et al.* 2023) and Dunsinane (ID 30660; Noble 2023).

North

King's Seat sits on the northern periphery of southern Pictland, separated from the communities in northern Pictland by the upland landscape of the Cairngorm

massif, or the Mounth as it is historically referred to. While the known contemporary centres in northern Pictland are therefore geographically distant, northern and southern Pictland are potentially linked by trade and other common purpose, including the overlordship of the Picts originating from Fortrui, now considered to be situated in the north around the Firthlands with a single strong Pictish kingdom by the 740s AD (Woolf 2006; 2007: 9-12). As noted above, Strath Tay is at the southern end of the key route north-south over the Highland massif and so King's Seat would have been a primary point of any such contact.

West

King's Seat is also well located to connect through the mountains to the west coast, again linking communities and facilitating trade. These routes (Figure 5.10) link directly with the Atlantic seaboard and west coast Scotland distribution centres, as evidenced by the trade in objects discussed in Chapter 3 (and below). In particular, the presence of E ware ceramics indicates direct or indirect links to the wider trading network probably emanating from the distribution centre of Dunadd (Lane and Campbell 2000; Campbell 2007). Access can be easily achieved from Dunadd to Loch Awe, from whence the major east-west route leads through the Highlands from Glen Orchy to Strath Fillan (Lane and Campbell 2000: 3). From there several choices of route open up into the Tay Valley, the southern of them also passing by Dundurn in Strathearn. If we assume that the original placing of a monastic establishment at Dunkeld is tacit confirmation of traffic from the west, then there can be little doubt that King's Seat was placed on a well-worn route taken by travellers, traders and warbands alike, with multiple 'clients' between the kingdoms.

East

While this east-west linkage is signalled by the E ware assemblage from King's Seat, the sherd of a conical glass beaker (SF 4135) and several beads (SF 4116; SF 501; SF 620), show that the fort was connected to North Sea trading networks. In his discussion of the destination of 6th-century AD imported pottery, Carver (2019: 9, fig.1.5) suggests that the Irish Sea, the Channel and North Sea were populated by several 'offshore polities' over the 5th-6th centuries AD. By the 6th-7th centuries AD, the main estuaries of the east coast of the British Isles were part of a wider network of North Sea kingdoms (Crumlin-Pedersen 2010: 95, fig. 4.1), including the Moray Firth (*Fortrui*) and the estuaries of Tay and Forth (*Fib*). While large, rowed longboats crossed the North Sea in the 5th and 6th centuries AD, the relatively late introduction of the sail in northern Europe (Crumlin-Pedersen 2010: 96-7) led to a new phase in maritime contacts from the 8th century AD. A fort like Clatchard Craig with its distinctive profile when viewed from the firth (Figure 4.6) may have advertised its presence to maritime vessels as a potential market. East Lomond's distinctive profile, though distant from the coast, is highly visible from surrounding waters and may also have signalled produce and trade in addition to power and prestige. Remote from the coast, connections with King's Seat must reflect more local linkages, and the presence of exotic items is a testament to the network of significant people and places across the early medieval landscape.

South

The political landscape of Pictland *c*. 750 AD was dominated by Fortriu in the north and Atholl in the south, centred on what is now Highland Perthshire (Woolf 2007: 5, map I.1). The location of King's Seat, controlling the key north-south route into the Highlands could be read as defending access into Atholl from the south, much like the Roman 'glen-blocker' forts (Maxwell 1989: 94-100). Similarly, Dundurn's control of the key east-west terrestrial routeway protects the western boundary of Pictland, bordering with Scottic Dal Riata, and may be a factor in the siege in AD 682 recorded in the Annals of Ulster (Alcock *et al*. 1989: 192; Woolf 2007: 120). Dunmore, positioned to the south controls the route north-south to Dundurn and is also positioned on the east-west route along Loch Venachar, potentially providing another frontier site, situated in the border between Dal Riata and Pictland. However, as outlined above, these locations are equally well-placed for trade and/or the control of transported goods. In the case of Dundurn from east to west, and at both Dunmore and King's Seat from both north to south, and east to west. Such functions need not be mutually exclusive, and forts may have combined roles of defence, control and trade, as well as production.

5.4 High-status sites

> From the archaeological evidence alone, then, we can infer that the fortifications of Celtic Britain in the sixth through the eight centuries were the seats of potentates of varied rank, power and wealth (Alcock 1988: 29).

The discussion above has focussed on the location and structural characteristics of King's Seat (site and landscape), attributes which have previously been used (particularly Alcock *inter alia*.) to suggest that King's Seat was a high status early medieval fort. We have seen that the hilltop also saw activity in the early prehistoric and later medieval periods, but the artefactual and

Table 5.1: Updated summary of Import Site Characteristics from Scotland (after Campbell 2007, table 19). C - Crucible CC - many M - Mould MM - many B - Brooch BB - many. Brackets indicate presence at later date.

SITE	Cont. pot (MNV)	Med. pot	Glass	Site	Size 00sqm	Document references	weapons	Gold/ Silver	Jewellery	Import status	I.A. fort
Dal Riata											
Dunadd	31	-	7	fort	40(20)	?royal	sword, spears	gold, silver	CCMMBB	centre	yes
Dunollie	4	-	-	fort	32	royal	spear	gold	C M B	?centre	-
Loch Glashan	5	-	-	crannog	3	-	axe	silver	C B	secondary	-
Ardifuir	1	-	-	dun	5	-	-	-	C	secondary	dun
Kildalloig	1	-	-	dun	2	-	-	-	-	secondary	dun
Iona	1	1	-	enclosure	1140	monastic	(sword)	-	M	secondary	-
Cruach Mhor	-	-	?1	unenclosed	-	-	-	-	-	secondary	-
Poltalloch	?1	-	-	enclosure	80	-	-	-	C	secondary	-
Ederline	1	-	-	crannog	3	-	-	-	-	secondary	crannog
Pictland											
King's Seat	3	-	1	fort	185	-	-	-	C MM	secondary	?
Dundurn	1	-	2	fort	160	?royal	-	silver	C M	secondary	-
East Lomond (*work in progress*)	1	1	>1	fort	265	-	spears	-	CC M	secondary	yes
Craig Phadrig	1	-	-	fort	55	?royal	-	-	M C	secondary	yes
Clatchard Craig	1	-	1	fort	?120	-	-	silver	MMCBB	secondary	-
Dun Ardtreck	?1	-	-	dun	-	-	-	-	-	secondary	dun
Rhynie	-	4-5	6	fort	3	-	sword pommel	silver	CC MM B	secondary	-
Birsay	-	-	9	island	?10	-	spear	silver	MMCCBB	?	-
Tap O'Noth	-	4	?1	fort	1700	-			M C	secondary	yes
British Kingdoms											
Dumbarton	3	4	7	fort	?	royal	(sword)	gold	C	centre	-
Lit. Dunagoil	3	-	1	fort	50	-	-	-	M	secondary	?
Mote of Mark	13	1	18	fort	4	-	-	gold	CCMMBB	centre	-
Castle Hill	-	-	3	fort	6	-	(sword); ?spears	-	B	secondary	yes
Trusty's Hill	1	-	-	fort	28	-	-	gold, silver	C M ?B	secondary	-
Dundonald	1	-	-	fort	-	(royal)	spears	(gold)	-	?centre	yes
Buiston	2	-	1	crannog	4	-	spears	gold	C B	secondary	-
Lochlee	4	-	-	crannog	6	-		-	-	secondary	-
Whithorn	17	14	85	unenclosed	-	-	-	?gold	C	?centre	-

radiocarbon dating places the majority of datable evidence at King's Seat firmly with the early medieval period. But is it a high-status site?

In outlining the three main research priorities relating to *High-Status Sites*, PKARF highlights one pertinent for King's Seat:

- **Priority 1:** Two early medieval forts are now known in the area, and it is probable others exist. Confirming these will require further targeted excavation, but they can now be more easily identified given their recognisable archaeological signature. It is important, however, to better understand their environmental context, relationship to other contemporary sites, and to explore their political role and trading networks within Scotland and beyond.

Aligned to this priority is a specific research question that the work at King's Seat can help to answer, specifically:

- what could a comprehensive programme of multidisciplinary landscape research in the Dunkeld area tell us about the role of the King's Seat as a power centre, including any relationship with the abbey and the cathedral?

Discussion of Scottish early medieval potentates (a monarch or ruler) tend to use enclosed spaces (including forts) and monastic sites as their key points of reference (Stevenson 1949; Feachem 1955; 1966; Alcock 1988; 2003; Lane and Campbell 2000; Campbell 2007; Noble and Evans 2022). As well as their defensive attributes, these sites have a suite of artefacts that justify their 'high status' or 'power centre' label, including imported pottery and glass, weapons, evidence of non-ferrous metalworking (particularly gold and silver) and jewellery. Some also have documentary references in the medieval literature to bolster their credentials. Campbell illustrates this relationship (1996b: 84) in his discussion of the characteristics of sites with early medieval imports, now modified (Table 5.1) to include King's Seat and recent work at Trusty's Hill, Rhynie, Tap O'Noth and East Lomond (still ongoing).

Table 5.1 demonstrates that 'royal' power centres have certain, recurring characteristics. When discussing the wider Atlantic British and Irish evidence, Campbell (2007: 123) observes that '...it is striking to see the correspondence between forts and the sites with major import assemblages' and notes that most imports found in Scotland are from larger forts (2007: 116), monastic sites and crannogs. He argues (2007: 117) that the Continental import centres are also centres of production, have important ritual associations (with royal inauguration at Dunadd), and increasing links to the Church (as at Whithorn). These features contribute to the process of increasing centralisation and royal control which preceded state formation. In summary, Campbell (2007: 124) concludes that these centres of importation possess set criteria that distinguish them as a group from other sites. Discussing the Pictish evidence Noble and Evans (2022: 137-40) concur, using the recent finds from Rhynie as an excellent example. How does King's Seat fit into these patterns? Was it a site of status and perhaps even an unknown Royal site?

High status indicators

E ware pottery

As we have seen most of the sites where E ware pottery has been found are on the Atlantic coasts (e.g. the west), with only a small scatter in eastern Scotland. These eastern sites are all important forts, some classed as 'royal': Dundurn, Clatchard Craig, East Lomond and Craig Phadrig. However, none of these eastern sites have such a varied assemblage as King's Seat (Campbell Chapter 3.2), indicating the special nature of King's Seat and likely confirming a royal association, linked to sites such as Dunadd, that controlled importation and redistribution of E ware and other luxury imports.

Although the assemblage is small, the combination of three different forms of E ware is very unusual and tends to be restricted to sites with known royal associations (Campbell 2007: 45, table 2) or other high-status sites attributes. Further, E3 bowls are uncommon in the wider British and Irish E ware corpus and, again, tend to be found on high status sites, such as Dunadd, Whithorn, Mote of Mark, Dinas Powys, and Lagore. E4 jugs are also rare in the E ware assemblage, except at Dunadd. The handle of the King's Seat E ware vessel is exceptionally small and must have come from a very small jug, and there are only two other small jugs from Britain, from the Mote of Mark and Whithorn (Campbell 2007: fig 31), although others are known from France (Campbell 2007: fig 35).

Taken together, and with the wider British and Irish find-spots in mind, there is no doubt that the inhabitants of King's Seat received pottery that elsewhere ended up on sites with royal association and/or high status. As Campbell (2007: 50) reminds us, the extremely small number of vessels and their concentration on high-status sites make it clear that the use of E ware pottery would have been restricted to a few individuals of high status. Clearly, the inhabitants of King's Seat had access to exotic items, with E ware mainly imported as containers (the E1 jars) for exotic foods (nuts, fruits, spices) and purple dyestuffs (dyer's madder). The rarer forms – bowls, beakers and jugs –

may have been used in feasting rituals associated with imported wine and foodstuffs. There can be little doubt these all indicate the high status of the King's Seat inhabitants and potential for high status wining and dining taking place.

The glass vessel

There are no better words than Alcock's to convey the status of the King's Seat glass vessel:

> ...the importation of glass vessels was a major component in the later trade nexus. This has a profound social significance. Since the vessels were chiefly beakers and bowls for drinking, we can now fully appreciate 'the brimming glass vessels' of wine attributed to the warrior heroes of the Gododdin in their citadel at Din Eidyn, Edinburgh...Subjectively, we may appreciate the delicacy, even elegance, of these drinking vessels, wholly appropriate for the leaders of a heroic society (2003: 88).

Glass vessels have been shown to overwhelmingly occur on important early medieval sites, either royal or monastic (Table 5.1). Again, the King's Seat vessel must be seen in the same light. Such vessels were part of the pleasures of the feasting hall; the wine feast, and occur on 'potentate' or 'elite' defended or enclosed sites. Crucially, '...indeed it is such finds which are considered to justify social classifications such as 'potentate'' (Blackwell 2018; Alcock 2003: 401; Campbell 2007).

Non-Ferrous Metalworking

The moulds, crucibles and copper alloy debris (and perhaps some iron and stone objects) evidence non-ferrous metalworking at King's Seat. Although few of the moulds confirm what was being made, it appears that at least ingots, pins, rings, and brooches were manufactured. The use of large crucibles (up to 10 cm high) suggests the manufacture of significant objects. Although the XRF analysis did not show any chemical traces of silver or gold (a sign of high status), this negative evidence could relate to the fluorescence of silver and gold, which is often harder to detect in non-destructive XRF analysis, i.e. it may not be a true representation of a lack of precious metals (Heald 2005). XRF analysis did show that some of the metal used ultimately derived from the Roman metal pool.

The evidence for non-ferrous metalworking on Scottish early medieval sites was collated and discussed some 20 years ago (Heald 2005; see also 2010: 222, fig 6.1). Since then, the corpus of both material and sites has expanded, for example from the notable excavations at Rhynie (Noble and Evans 2022: 100). Despite these additions, the essential premises behind the interpretations have not changed significantly. Even at Rhynie evidence for silver working was limited to one crucible and several probable refining vessels in addition to a single fragment of silver working waste, highlighting that silver was perhaps more precious than even previously thought (Noble *et al.* forthcoming). Further, silver working could be spatially and chronologically restricted, further biased by the varying percentages excavated on different sites. The absence of direct evidence at Kings Seat therefore does not detract from its presentation as a high status, possibly royal site.

Again, discussions have usually centred on assemblages from high status sites with narratives often influenced by the perception that the craft as a high-status activity controlled by potentates within forts and other central places. Analysis of the data continues to show that this is true, particularly in the Gaelic and British Kingdoms. Of the over 40 early medieval sites that have produced evidence for non-ferrous metalworking, numerically the greatest quantities and range have been recovered from sites argued to be important to society, namely 'nuclear' and other forts, and monastic sites. The majority of evidence is from forts believed to be chiefly or kingly residences, such as: Dunadd (Christison and Anderson 1905: 311-14; Craw 1930: 120-3; Lane and Campbell 2000: 106-49); Dunollie, Argyll (Alcock and Alcock 1987); Mote of Mark, Kirkcudbrightshire (Curle 1914; Longley 2001; Laing and Longley 2006); Alt Clut, Strathclyde (Alcock and Alcock 1990: 114-15); Dundurn (Alcock *et al.* 1989); Clatchard Craig, Fife (Close-Brooks 1986); Craig Phadrig, Inverness-shire (Small and Cottam 1972; Stevenson 1972); and Brough of Birsay, Orkney (Curle 1982). Metalworking on monastic sites is also well-documented, for example at Iona (Barber 1981; Reece 1981; McCormick 1992); Portmahomack, Ross and Cromarty (Carver *et al.* 2016); Whithorn, Galloway (Hill 1997); St Blane's, Bute (Anderson 1900; Laing *et al.* 1998) and Inchmarnock, Bute (Heald 2008a).

Important power centres during this formative period, also controlled access to exotic goods (e.g. Continental pottery and glass vessels) and maintained their power through redistribution of these (Alcock and Alcock 1987; Alcock 1988; Campbell 1996a and b; 1999; Foster 1998 ; 2014). They may also have used surplus resources to support specialised activities, including fine metalworking, and hence also controlled the production and distribution of other prestige goods (Foster 2014: 80-81). On these sites the work of the smith supported individual and group authority through the production of specific goods. Similarly, fine metalwork was fashioned within monastic enclosures, objects made for the glory of God. These recurrent associations have understandably led to a common narrative, that the control of jewellery manufacture was the 'prerogative

Table 5.2: Early medieval sites with non-ferrous metal working evidence.

Pictland	context	Precious metals?	Crucible	Diagnostic Moulds
King's Seat	Fort	-	Large Small	Ingots, pins, rings and brooches.
East Lomond	Fort	-	Large Small	Ingot, pin shaft.
Dundurn	Fort	silver	Small	Stick pin; motif piece.
Clatchard Craig	Fort	silver ingot	Large Small	Pins, brooches, misc.

of the elite' (e.g. Crone 2000: 9) and that 'specialised craftworkers, particularly fine-metalworkers, appear to have largely confined their activities to high status sites' (Foster 2014: 81).

While the connection between non-ferrous metalworking and high-status sites in some regions is generally accepted, we cannot simply infer such social status on King's Seat merely because it has moulds and crucibles. In some areas a wider range of sites were also the scene for non-ferrous metalworking, particularly in Argyll and the Western and Northern Isles (Heald 2005; 2010). The evidence from many of these sites is extremely limited, the occasional crucible and/or mould fragment, making it difficult to ascertain the nature and scale of metalworking. However, aside from the wider distribution, it also appears that on some sites the objects produced were not everyday objects, but objects found on other higher status sites and widely distributed over the Celtic West and beyond, such as penannular brooches (Campbell and Heald 2007). Furthermore, some sites hint at the working of silver, often believed to require the patronage of the upper echelons of society. The possibility that all these sites were high status, or convenient workshops cannot be sustained, neither on the available evidence nor the prevailing socio-political models. Thus, we need to be cautious in applying blanket interpretations of non-ferrous metalworking in the early medieval, particularly within Pictland, as Alcock notes:

> ...no clear picture has emerged about connections between kings and metalworking, about the role of brooch-giving in established bonds between higher and lower ranks in society, or about the status of craftsmen. This, I believe, is a true reflection of the actual state of our knowledge. Negative though it may seem, it is intended as a caution against the ready importation into northern Britain of models of society which have been formulated elsewhere, but for which there is no evidence in the area of this study [Northern Britain] (2003: 209).

Non-ferrous metalworking in Pictland

What does the evidence from Pictland tell us? Notable northern mainland sites with non-ferrous metalworking include the early medieval power centres of Rhynie (Noble and Evans 2022: 100); Portmahomack (Carver *et al.* 2016); and Craig Phadrig (Small and Cottam 1972; Stevenson 1972). Closer to Kings Seat, Heald (2010: 222, fig 6.1) has highlighted that the evidence from the eastern and southern mainland is meagre, though evidence is again known only at high-status sites. As Table 5.2 shows, the only evidence is from Dundurn (Alcock *et al.* 1989), Clatchard Craig (Close-Brooks 1986), and East Lomond Hill (RCAHMS 1933; Banaszek *et al.* 2021), all important centres, some perhaps royal sites. It is within this context we should view the non-ferrous metalworking from King's Seat.

Dundurn was excavated in 1976-77, revealing a sequence of development of the citadel and encircling terrace rampart was revealed spanning the 6th to 9th centuries AD (Alcock *et al.* 1989). Three crucibles (Cat 38, 40 and 41) were recovered (Alcock *et al.* 1989: 216-7, and microfiche), all within cutting 400, the upper terrace and terrace wall. Cat 38 and 41 were body sherds, Cat 40 was a thin-walled rim-fragment, probably of Heald (2005) Type 4 or 5. XRF analysis demonstrated that one crucible (Cat 38; sample 7556) showed traces of Ag, Cu, Pb and Zn, demonstrating silver and copper working , while another crucible (Cat 41; sample 7555) demonstrated use for bronze working (Tate 1989; microfiche 2:G14). A mould fragment (SF 159) was also found, for casting a stick pin with an ornate head in the form of a central oval with four projecting bosses in a square array. A broadly similar ornament is seen on the head of a gilt bronze pin from 8th-century AD Coileagan an Udail (Crawford and Switsur 1977: 131, pl xiv a). Of interest also at Dundurn is a motif piece and a silvered bronze dangle both of which '...reflect the Germanic or Anglo-Saxon element in Insular art...[and]...seem to represent an Anglian, and specifically Northumbrian, influence north of the Forth' (Alcock *et al.* 1989: 217). This evidence clearly shows that Dundurn had contacts to the south and created high status objects from

precious metals, justifying its status as the seat of a potentate.

The same is true of Clatchard Craig, Fife, where early medieval finds included a small metal disc decorated in hanging bowl style, two sherds of E ware, a silver ingot, and a significant group of clay moulds for casting penannular brooches of 8th-century AD type. Three possible crucibles were recovered (Close-Brooks 1986: 165-6, illus 27, Cat 106-8). Cat 107 is probably a Heald (2005) Type 9a; XRF analysis showed high lead and a little tin on its surface. Two larger vessels (Cat 106 and 108) may be crucibles or lamps. However, there is no ambiguity about the 50 plus moulds (Close-Brooks 1986: 156-162, Cat 47-104), many of which were to produce penannular brooches of Type H that have close parallels with Pictish sites, for example at St Ninian's Isle, Croy and Cluny (Close-Brooks 1986: 162-4). Moulds for possible pins (including a possible handpin), rings, and discs were also recovered. Recent higher precision dating could suggest that the development and destruction of the site covered a much shorter period centring on the first half of the 7th century AD (Noble and Evans 2022; Noble *et al*. 2022).

Finally, survey of East Lomond, also Fife, revealed a spindle whorl, two hollow glass beads and a mould for casting small metal ingots (RCHAMS 1933), and a Pictish presence suggested mainly by a small stone slab (NMS X.IB 205) bearing the incised figure of a bull, found within the fort in *c*. 1920. Recent excavation has indicated occupation of the southern enclosure in the 2nd to 7th centuries AD, with '...E ware pottery and other finds suggesting this was a well-connected community of elevated status' (Noble and Evans 2022: 105-6).

Considered together it is clear that King's Seat is one of a small group of sites in eastern Scotland (viz. Dundurn, Clatchard Craig, and East Lomond) where the evidence of non-ferrous metalworking indicates a melting pot for different cultural and artistic traditions, with influences from the north, west, and south. Within the walls of these sites, metalworking included the use of silver and copper and the creation of brooches and pins. This production is rightly seen as an indicator of high-status, if not the presence of a royal elite.

Glass-working

There is no definitive evidence of glass-working at King's Seat, although the fragment of glass armlet (and probable Roman glass vessel) may have been scrap destined for the glass-workers crucible. Whilst this is conjecture, it is likely that the glass cabochon was to be used as an insert in jewellery and intended to imitate a precious stone. The piece is similar to Roman bottle glass (Campbell Chapter 3.5) and may have been made by melting down sherds picked up on abandoned Roman sites. Inlays, glass and enamels on early medieval sites have been summarised (Alcock 2003: 333-4) and unsurprisingly attested at royal centres and monastic sites. On balance, given the wider assemblage, it would seem reasonable to also view King's Seat glass fragments in this context.

Leisure

The King's Seat is notable for the number of gaming pieces recovered, and one of this group – the opaque white glass – is likely to be from a *tabula* game related to *hnefatafl*, which often had black and white counters (Hall and Forsyth 2011; Hall 2007b). The assemblage points to the importance of leisure, defined as '...free time (or the time not devoted to one's occupation and survival needs)...and so can be deemed to be a measure of the strictures in time applied within a given society' (Hall 2007b: 1). Hall has reviewed the evidence for board and dice games in early medieval Scotland, particularly Pictland and observes that whilst leisure is open to all, it is not equally so, and therefore needs to be understood contextually both in the archaeological record and in society (2014). His analysis suggests that much of the surviving material culture of play indicates its pursuit by social elites (Hall 2018). Noble and Evans concur, arguing that '...game playing may have been an important part of major gatherings with shows of strength, horse racing and board gaming all possible entertainment for elites...while probably not entirely restricted to elites, gaming was certainly part of elite culture and may have been an important part of learning strategy and a competitive test of intelligence for high-status adolescents and young adults' (2022: 138-9). Thus, whilst lacking anything as luxurious as the pegged glass gaming piece from Dundurn (Hall 2007b: 51; Hall *et al*. forthcoming), the King's Seat pieces may be a fifth indicator of elite status. Finally, could it be that much like medieval archery, the cache of slingshot recovered was used as much for recreational competition by the elites occupying or visiting the citadel, or were they for defence?

High status indicators conclusion: a Royal site

The first indicator of the site's status is the nature and scale of fort complex itself, designed to display power, they required the authority to co-ordinate a considerable workforce and make the resources required available. The site can now be added to the growing corpus of high-status early medieval forts in Scotland (Figure 5.11).

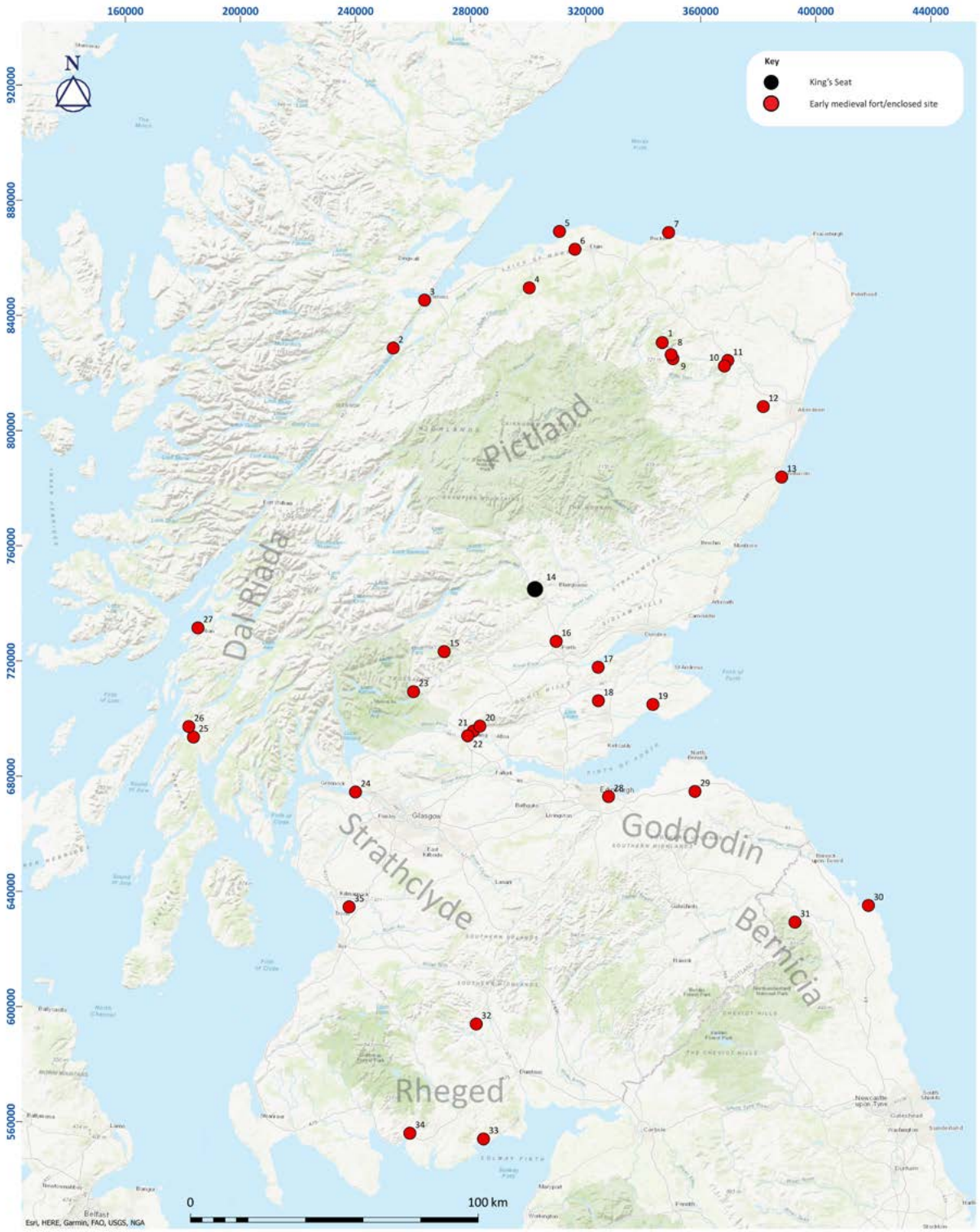

Figure 5.11: Broadly contemporary early medieval forts in Scotland: 1. Tap O' Noth; 2. Castle Urquhart; 3. Craig Phadrig; 4. Doune of Relugas; 5. Burghead; 6. Knock of Alves; 7. Green Castle, Portknockie; 8. Barflat, Rhynie; 9. Cairnmore; 10; Mither Tap o' Bennachie; 11. Maiden Castle; 12. Hill of Keir; 13. Dunnottar; 14. King's Seat; 15. Dundurn; 16. Rathinveramon?; 17. Clatchard Craig; 18. East Lomond; 19. Craig Rock; 20. Dumyat; 21. Abbey Craig; 22. Urbs Guidi ?Stirling; 23. Dunmore; 24. Alt Clut; 25. Dunadd; 26. Bruaich an Druimein; 27. Dunollie; 28. Dun Eidyn; 29. Traprain Law; 30. Bamburgh; 31. Yeavering; 32. Tynron Doon; 33. Mote of Mark; 34. Trusty's Hill, 35. Dundonald (after Alcock 2003; Noble and Evans 2022).

The second indicator of high status is the finds assemblage; the imported pottery and glass, and the non-ferrous metalworking (and possibly glass-working). These undoubtedly confirm King's Seat as a key power centre in southern Pictland, to be considered as significant as the 'royal' sites at Dundurn, East Lomond, and Craig Phadrig. The absence of precious metalworking in the crucibles may appear to run counter this conclusion, but as noted, may more likely reflect issues of recovery and identification, rather than being a genuine absence or an indicator of social differentiation. Likewise, the absence of evidence of weaponry has little bearing on status. This is actually very rare on other sites classed as the seats of 'potentates' – there is not a single published weapon from any early medieval royal Pictish site on mainland Scotland. Nor are there any weapons from Mote of Mark.

Forts often had multiple functions and saw a change in the emphasis of function over time. These include use as fortifications, permanent settlements, places of temporary refuge, seasonal gathering places, symbols of power for a social elite, and centres for trade and/or production. Many of these functions are not mutually exclusive and several are attested at King's Seat. The architecture and artefactual evidence speak of a well defended power centre; an elite hub of kingship where 'soft power' was as important as military might in the control of the surrounding landscape. Non-ferrous metalworking evidence confirms the production of high-status items produced by specialist craft-workers for this social elite, and the evidence of feasting, illustrated in part through the imported goods, illustrates conspicuous consumption designed to impress and influence important visitors. Alongside these high-status, specialist activities, a host of pursuits that served the everyday life of its residents; the animal bone indicates food preparation, ironworking debris the manufacture and maintenance of tools, while other objects demonstrate leatherworking and textiles. This was a specialist craft-working centre, but also a place where people lived and produced more prosaic items. This juxtaposition of the elite and the everyday is also observed at Dunadd, Dundurn, and Clatchard Craig. Campbell (2007: 132-138) has proposed these sites as centres of production and for Dunadd, a centre of distribution for exotic items including E ware, glass, and other Continental imports. It is probable that King's Seat also served multiple roles: a population centre, a production centre for wider communities, and a link in the wider network of trading and gifting of exotic items that indicated its elite status.

5.5 Economic networks

As outlined, King's Seat elite had access to a range of non-local goods, including Roman glass objects, imported pottery and glass, and controlled key routeways in southern Pictland. It is worth therefore considering further the sites wider economic network and PKARF identified three main priorities relating to this, of which the following are particularly relevant:

> **Priority 2:** By pursuing new evidence and re-analysing existing assemblages, we will be able to refine our understanding of how patterns of trade changed over the first millennium AD. This includes the transition from west coast trade to the east coast, notably using the Tay valley.

Aligned to this, two specific research questions are informed by the results from King's Seat:

- what can the artefact assemblages from the high-status forts of Dundurn and the King's Seat tell us about trade networks both within Scotland and beyond?
- what new scientific techniques exist to analyse material culture objects to help explore the sourcing of materials and places of production to assist with our understanding of the pattern of economic networks?

The site's economic networks and contacts are primarily illustrated by the artefact assemblage which allow us to answer some of these questions.

West

A major link is clear between the occupants of King's Seat and their western neighbours in Dalriada, shown particularly through the E ware pottery. Table 5.3 summarises published Continental pottery from Scotland; over 20 sites with definite examples of E ware. The distribution is remarkably western orientated, although examples stretch from Craig Phadrig above Inverness to Dun Ardtreck on Syke. In terms of Minimum Number of Vessels (MNV), three sites dominate – Dunadd, Whithorn, and Mote of Mark, having 68% of the total. Twelve sites have only one or two examples. With at least three examples, King's Seat (in terms of MNV) sits alongside Loch Glashan, Dunollie, and Dumbarton Rock. Only three other sites in southern Pictland have E ware pottery, namely Dundurn, East Lomond, and Clatchard Craig.

Table 5.3: Updated summary of Continental imported pottery vessels (MNV); (after Campbell 2007: table 13).

Site	DSPA	E ware	Unclass. pottery	All Cont. pottery
King's Seat		3		3
Whithorn	1	16		17
Dunadd	1	25	5	31
Mote of Mark	1	12	1	14
Dumbarton Rock		3		3
Dunollie		4		4
Loch Glashan		5		5
East Lomond		1		1
Dundurn		1	1	2
Little Dunagoil		2	1	3
Lochlee		1	3	4
Buiston		2		2
Clatchard Craig		1		1
Ardifuir		1		1
Bruach an Druimein			1	1
Craig Phadrig		1		1
Dun Ardtreck		1		1
Dundonald Castle		1		1
Ederline		1		1
Iona		1		1
Trusty's Hill		1		1
Totals	**3**	**83**	**12**	**98**

The distribution of Scottish E ware find-spots has been considered by numerous scholars (e.g Campbell 1991; 2007; Lane and Campbell 2000: 242-3; Alcock 2003). Campbell's model of trade and redistribution in the Atlantic west is a useful starting point for discussion:

> Merchants from Western France undertook trading voyages directed towards royal sites which were centres of power in the Atlantic areas. Trade took place at or near these centres, with Continental luxuries such as wine, honey, dyestuffs, species and nuts being traded in exchange for surplus produce, perhaps leather goods, and probably slaves. The kings or princes of these sites used these luxuries directly in their royal strongholds, perhaps in feasting rituals, but also redistributed some of the good by gifts to lesser aristocrats. This process was used to articulate social relationships, enhance the standing of the ruler by his provision of luxuries and to bind the receivers of these gifts in ties of mutual obligation to the ruler. Occasionally, as in Scotland, these luxuries may have been sent as diplomatic gifts to rulers in areas far from the western seaways, such as Pictland (2007: 124).

The overall distribution of Continental pottery and glass suggests that traders were sailing from western France and trading throughout the Irish Sea in what '...seems to be a surprisingly monopolistic trade' (Lane and Campbell 2000: 242). Campbell (1991) suggests that Continental pottery was being brought to important coastal sites from where items were selectively redistributed to lesser sites inland. Whilst some specialist trading places may have existed, it appears that supply was mainly direct to elite sites, which in turn may have controlled dispersal to both lower status sites and more distant elite sites (Campbell 1991; 1996a; Lane 1984). Clarke, Blackwell and Goldberg (2012: 118) suggest that '...contact would have been restricted to representatives from the royal sites like Dunadd, enabling the king to control access to the Continental imports. Small quantities of these imports would then be distributed to royal kin or clients in return for renders of surplus produce'.

Whilst it is acknowledged that '...others may have received imports from another source' (Lane and Campbell 2000: 242) current models assume that sites with few items of Continental pottery (e.g. secondary sites) received them indirectly as diplomatic gifts from west to east (Campbell 1991: 234-7; Lane and Campbell 2000: 242-3). Alcock suggests that:

> Of the few eastern find-spots in northern Britain, Dundurn and the fort at Clatchard Craig (Fife) could have been supplied from Dumbarton, via the head of Loch Lomond and then by well-established routes into Strathearn and on to the Tay, while Craig Phadrig would have been accessible from Dunollie and thence largely by water up the Great Glen (2003: 87).

Such western transactions into Pictland may have been complex with '...gifts further afield to sites in the north and east, without direct access to Gaulish merchants, might represent claims to political hegemony over those areas, but could just as easily reflect diplomatic gifts between equals' (Clarke *et al.* 2012: 118). In other words, when considering the King's Seat E ware we must be cautious: we cannot assume that they (or other exotic items) are evidence of direct trade from Gaulish merchants. Further, we cannot assume that the imports evidence a subservient client; they may be diplomatic gifts, possibly between equals. Following this model, the King's Seat E Ware may have arrived as diplomatic gifts from Dalriadan power centres such as Dunadd and Dunollie, or from Alt Clut, Dumbarton, in Strathclyde.

Table 5.4: Summary of finds catalogued from southern Pictland (Blackwell 2018: 407, table 5.16).

Location	Type	Date	Context
Aldclune	Purse mount	6-7	Excavation; settlement
Blackhill House	Pin	8-9	Metal detected
Clatchard Craig	Glass bead	5-6	Excavation; fort
Clatchard Craig	Glass vessel sherd	7-9	Excavation; fort
Culross	Strap end	8-9	Metal detected
Dundurn	Glass vessel sherd	7-9	Excavation; fort
Dundurn	Glass vessel sherd	7-9	Excavation; fort
Forfar	Bridle mount	6	Metal detected
Fortingall	Glass bead	5-6	Excavation; monastery
Lindores	Coin	9	Stray

Nevertheless, the more westerly connection of Dunadd is supported by two other finds from King's Seat, the probable Type G3 brooch mould and the iron ringed pin.

Mould (SF 4066) from King's Seat has similarities to the collared Type G3 brooches dated to the 7th century AD and thus contemporary with the E Ware. Type G3 brooches and moulds for their production are west-coast restricted (Dickinson 1982: 59, fig 1). Dunadd is the only Scottish site with G3 moulds (Lane and Campbell 2000: 106-112), where they were found in abundance. The other sites with evidence of production are in Ireland: Dooey (O' Ríordáin and Rynne 1961: fig. 7; Youngs 1989: no. 180) and Moynagh Lough crannog (Youngs 1989: no.164; Bradley 1993: 78, fig. 8.4 no. 1209). Regarding actual brooches from Scotland, two examples are from Dunadd, and three are known from Balevullin, North Uist, and Skye. Elsewhere, examples are known from Trewhiddle, Cornwall, Ballynass Bay, Cloghaneely, Co Donegal (Dickinson 1982: 44), and three unprovenanced examples in the Ulster Museum (Dickinson 1982: 58, no 43-5).

Ringed pins with plain looped heads of this type are common to Scotland and Ireland. Fanning has suggested they originated in Ireland in around the 5th century AD, gaining popularity by the 8th or 9th century AD, before spreading across the Western Isles and the rest of Scotland with the movements of the Hiberno-Norse (1994: 53). Iron pins make up a very small percentage of pin assemblages, which are normally dominated by bronze and bone examples (Lane and Campbell 2000). However, iron pins are known from early medieval contexts in Scotland, with a double spiral-headed pin from Alt Clut (Alcock and Alcock 1990: 2: D11), and several iron stick pins from Dunadd, which is at odds with the lack of bronze or bone examples recovered (Lane and Campbell 2000: 166). Other examples of ringed pins with plain loop heads, like the King's Seat example (SF 622), have been recovered from a 7th-century AD wheelhouse deposit at Clickhimin, Shetland, and an 8th-century AD context at Cheardach Mhor, South Uist (Foster 1989: 102). In summary, in light of these other links, it is likely that the King's Seat E ware arrived directly from royal sites in Dalriada. Given the apparent status of King's Seat in Pictland, the most likely mechanism is through diplomatic contacts and a relationship amongst equals.

East

As well as neighbours in the west, the inhabitants of King's Seat, like other sites in southern Pictland, were also connected to the Anglo-Saxons to the south and east. Blackwell has outlined catalogued Anglo-Saxon finds, ranked by region from the greatest to the least; and southern Pictland (defined as Fife, Angus, Perth and Kinross) has the fewest, with less than northern mainland Pictland and the Northern and Western Isles (2018: 386, tables 5.1 and 5.2). When considering the 124 pre-8th-century Anglo-Saxon and Continental objects, Blackwell (2018: 393, table 5.5) highlights that just 4% are from southern Pictland. The 8th- and 9th-century objects (2018: table 5.6) are equally sparse, accounting for 5% of the 97 objects. Table 5.4 outlines the finds from southern Pictland.

Ten objects from eight locations from southern Pictland were discussed by Blackwell (2018: table 5.16; map 5.7; charts 5.24– 5.26) and were evenly split between pre-8th-century and 8th/9th-century objects. Six are from excavated contexts, the rest are stray finds. The excavated finds are from a monastic site (Fortingall), two forts (Dundurn and Clatchard Craig) and an enclosed settlement (Aldclune).

Aside from King's Seat, two other southern Pictish forts have produced sparse Anglo-Saxon material; Clatchard Craig and Dundurn, the same sites with E ware pottery. Further, imported vessel glass, both of Campbell's Group B type, were recovered from both these sites. Alas, the glass vessel from Clatchard Craig (Group B, unidentifiable form) has no contextual information

Table 5.5: Updated summary of imported glass vessels (MNV) (after Campbell 2007, table 14.)

Site	Group ?	Group A	Group B	Group C	Group D	Group E	TOTAL
Brough of Birsay	4		5				**9**
Buiston			1				**1**
Castle Hill, Dalry			1	2			**3**
Clatchard Craig			1				**1**
Dumbarton Rock	1		3	2	1		**7**
Dunadd	2		3	1	1		**7**
Dundurn			2				**2**
Dunollie					1		**1**
King's Seat	1						**1**
Little Dunagoil	1						**1**
Mote of Mark	1		2	11	4		**18**
Rhynie, Barflat		2	3	1			**6**
Portmahomack, Tarbat			3				**3**
Whithorn	10	8	11	32	9	15	**85**
TOTALS	**20**	**10**	**35**	**49**	**16**	**15**	**145**

(Close-Brooks 1986: 146). The two sherds of imported vessel glass from Dundurn were from the final phase of the rampart and the destruction deposits of the primary citadel (Alcock *et al.* 1989: table 1). Clatchard Craig also produced a 5th/6th-century glass bead of probable Continental manufacture, recovered from the central enclosure within rampart 1, together with most of the site's other early medieval finds.

Glass vessel fragments from early medieval sites are of particular importance and found on many settlements in western Britain and Ireland (Campbell 2007: 54-55, fig 39). Campbell denoted five groups, based on chronology, form, decoration, and material. Whithorn has the largest minimum number of vessels (MNV), over 60% of the Scottish corpus; Mote of Mark around 13%. Brough of Birsay, Dumbarton Rock and Dunadd account for 17%. The remaining 10% of the corpus consists of sites with only a few vessels (Table 5.5).

The King's Seat, Rhynie, Dundurn, and Clatchard Craig vessels are all part of Campbell's (2007: 60-4) Group B: Germanic Tradition. As Table 5.5 shows, small amounts of Group B vessels are found on many western sites, being much more widespread than the other four Groups. Although many are found on western sites, it is clear that Group B glass vessels reached sites across Scotland in more diverse ways than E ware pottery (Campbell 2007: 64, 73, fig 48). Campbell (2009) suggested routes by which they arrived in the west and north-west of Britain on the basis of their distribution: from Kent to the Bristol Channel region; from Northumbria west to Whithorn, and westwards to Mote of Mark through the gap between the Solway Firth and the source of the Tweed; and from northernmost Northumbria (East Lothian) through central Scotland to sites in western Scotland, and perhaps north along the coast to Portmahomack (on the Tarbat Peninsula in the Moray Firth). Thus, sites such as Dunadd and possibly Buiston are known to have had overland contacts with Anglo-Saxon England, but some others, particularly those in Ireland, may have been supplied from western English sites across the Irish Sea. But what of the Group B glass vessels from Pictland?

Unlike the E ware, the vessels from Clatchard Craig, Dundurn, and King's Seat were probably supplied directly by east coast trading contacts. Campbell (2007: 135) states '...it seems likely that some, or all, of the Group B glass might have been supplied directly from eastern Britain' and '...sites in northern and eastern Scotland such as Dundurn, Portmahomack, and Birsay are likely to have been supplied by the eastern coastal route'. In summary, it is likely that Group B glass vessels, and other materials such as beads and personal jewellery, were imported into eastern Scotland via a trading network that ran up the east coast of England, '...supplied directly by east coast trading contacts' (Campbell 2007: 73).

The three glass beads derive from a Germanic milieu and were also probably imported via a North Sea trading route (Campbell 2009; Blackwell 2018). An increasing number of Germanic beads of this date are known from eastern Scotland, though the only other from Perthshire is from the monastic site at Fortingall (Blackwell 2018: 227, illus 7.3). Examples of the small biconical turquoise bead (Guido 5iv or 5x) found at King's Seat are known from Hound Point, Dalmeny, and from Anglo-Saxon contexts at Dunbar. Beads are highly

portable and were probably widely transported with other desirable goods. The opaque white glass gaming piece could also have originated through eastern trade routes, being the primary material (at least in beads) commonly used in England and the Continent from the 5th to around the 8th century AD. In contrast opaque white glass was only used in applied decoration during the Iron Age and Roman period.

Another connection, to the more immediate south-east, is shown through the glass armlet, possibly manufactured on Traprain Law, probably during the 1st or 2nd centuries AD (Kilbride Jones 1938). Type 1 glass bangles are clustered in south-eastern Scotland, around East Lothian and the Borders, although there are rare examples in other areas, including those from the Culbin Sands and as far west as Skye (Kilbride Jones 1938: 372; Stevenson 1966: fig 3). While manufactured in the 1st/2nd centuries AD, fragments of these armlets are found on early medieval sites, including in a 7th-century context at Dunadd. Here, the excavators suggested the armlet most likely arrived as an heirloom, and were sceptical of the suggestion that it arrived as scrap glass because Dunadd lies so far from the distribution of the type, though it was found in the industrial area (Lane and Campbell 2000: 175). There is no independent date for the King's Seat armlet and, by reference to other sites, it may indicate either Iron Age or early medieval activity. Reduced to a small, abraded fragment, there are no means of telling whether it arrived complete as an heirloom and/or was merely scrap material to be used for glassworking. Irrespective, we can be confident that it originated from southern Scotland, probably Traprain Law. Similarly, although prismatic glass vessels are found in several sites across Scotland, in terms of quantity and geographical distribution their largest concentration is again in southern Scotland. Thus, perhaps the King's Seat vessel should also be viewed in the same light as the glass armlet, perhaps being obtained from southern Scotland, perhaps even Traprain Law.

What was traded in return?

We have seen that King's Seat accessed exotic goods from the east, west and south. But what did they trade in return? Over two decades ago Alcock pondered what products northern Britain offered in return, either to parts of southern Britain or directly to the Continent and suggested (depending on which part of northern Britain) slaves, gold, silver, pearls, furs, hides, and feathers (Alcock 2003: 89-91, fig 25). While Alcock puts particular emphasis on furs, he recognised that access to copper ores may have determined the location of the fortified metalworking centre of Mote of Mark (2003: 91) and noted the natural resources of silver and pearls in the broad vicinity of King's Seat (2003: 90, fig 25).

In practice, King's Seat had access to a much wider range of resources. Apart from exploiting the agricultural potential of its hinterland, and perhaps slaves captured in raiding, there are sources of copper and other base minerals in the vicinity. It is equally clear that this was a centre where sophisticated industrial processes were taking place. We have established through the excavation that smiths at King's Seat worked both ferrous and non-ferrous materials, and may have undertaken glassworking; and, while there is no evidence of precious metalworking, it is possible that this also took place. Perhaps it was the metal and/or products in these materials that were exchanged as well as onward trade of Anglo-Saxon exotica from the east.

5.6 Material culture

Chapter 3 presents the King's Seat artefacts, contextualised by reference to other sites and current understanding. With reference to PKARF (2022), there are 3 priorities and 10 research questions relating to *Material Culture*, of which the following are especially relevant:

- **Priority 1:** There is a need to find and identify material culture dating to the post-Roman and earlier part of the period around AD 400–700.

- **RQu 6.60:** More research is needed on mundane object types, such as iron knives, rotary querns, spindle whorls and whetstones, in order to refine object chronologies.
- **RQu 6.61**: What sources of metal were exploited, and where are the ironworking deposits so ubiquitous in other early medieval settlements?
- **RQu 6.62:** There is evidence for leatherworking at Dundurn; is there more evidence for a cattle-based economy and its by-products?

Early medieval material culture: more research on non-diagnostic ('mundane') artefacts

Leaving aside the Late Mesolithic flints recovered, the bulk of the diagnostic finds are of early medieval date, while the Scottish White Gritty Ware sherds indicate some later medieval activity, probably no later than the 12th century.

Many of the other objects belong to types that have a long currency and could date from the Iron Age, Roman Iron Age, early medieval and even later medieval periods. This is particularly true of most of the iron and stone objects, the slag, and most of the undiagnostic moulds and crucibles. Even when we can identify objects as being, for example Roman (eg the glass bangle and possible glass vessel), it is unclear when they were deposited. This is not unique to King's Seat

and is the case on many Scottish 1st millennium BC / AD sites, particularly those without pottery or exotica.

Some of the finds, however, do allow closer chronological resolution and can confidently be placed within the broad AD 350-700 period. The zinc component in some of the crucibles is suggestive of the Roman/post Roman periods. The possible Roman glass vessel, the glass cabochon, and the glass bangle are indicative of a 1st/2nd-century AD date (but probably arrived at King's Seat centuries later, as at other early medieval sites). The fragment of decorated tall conical Anglo-Saxon drinking beaker probably dates to the 5th/6th centuries AD. The E ware pottery can be dated to the later 6th and 7th century and the presence of a bowl and small jug might suggest a date early in this range. The three glass beads of Germanic tradition are conventionally dated to the 6th-7th centuries AD. If the smiths were making Type G3 brooches, these too suggest a 7th-century date. The mirror mould probably dates to between the 7th and 8th centuries AD. The iron ringed pin probably dates to between the 5th and 8th/9th centuries AD. This cluster of artefactual dates around the 5th to 7th centuries AD fits with the radiocarbon dates from the site. Although there is a scatter of undiagnostic items recovered from rampart contexts, it is likely that most of the other iron and stone objects were used and deposited within this time bracket, and so too the non-ferrous and ferrous metalworking evidence from the central and western enclosures.

To focus on the chronology of individual items, however, is to divorce them from the complex interactions between the different groups occupying the spaces within the fort, be they elite patrons, smiths, craftworkers, servants and slaves. It is also important to remember that, while a reasonable sample of the useable space in the eastern half of the citadel was explored (*c.* 40 % of its interior), only *c.* 5 % of the western enclosure was investigated, and even less of the eastern and southern enclosures. Furthermore, most of the artefacts were recovered *ex situ*, in secondary contexts where they were evidently residual, and the stratification had been extensively disturbed by both later cultivation and natural bioturbation. We cannot assume that all activities, nor indeed periods of use, have been identified. Nor can we assume activity was either broken or continuous. With these caveats in mind, this important artefact assemblage nevertheless provides some limited insights into two further areas beyond those already discussed: everyday life and crafts.

Everyday life

Few objects can be related to everyday life, the need of food and clothing, as most objects employed were organic and simply do not survive. Alcock (2003: 101-7) has summarised the range of leather, wool, bone and antler, and wooden objects that would have been used in the first millennium AD, none of which were found at King's Seat, simply because they have perished. Unsurprisingly, most early medieval organic finds come from crannogs (e.g. Buiston and Loch Glashan) or in water-logged hollows or ditches, as at Dundurn.

While a few objects provide a glimpse of everyday life (possible reused saddle querns, ploughshare, pot lid, cobbled tools, and the spindle whorls) the evidence is relatively scant. Gaming pieces indicate some leisure pursuits were undertaken and the animal bone assemblage indicates butchery and cooking within the citadel, although whether this was a regular occurrence or for specific events is unclear. The relative lack of evidence might suggest that the central, western, and eastern enclosures were not primarily used for 'everyday life' with other activities such as specialist crafts being undertaken.

Crafts

The majority of artefacts demonstrate that the inhabitants either had access to, or carried out, a range of crafts on site including non-ferrous and ferrous metalworking; possibly glass-working; leatherworking; textile-working, and woodworking. Some crafts may have been everyday activities, but others, such as non-ferrous metalworking and glass-working, are indicative of specialists and status.

The spoon auger and chisel are probably related to woodworking, augers were commonly used to create holes for wooden pegs in timber-framed buildings and other timber constructions, as well as smaller items such as panelling, furniture, and cutting mortices (Goodall 2011: 23) A similar example with early medieval associations was identified from Munro's 1882 excavations at Buiston Crannog, in Ayrshire (MacSween 2000: 268), and an early medieval hoard of woodworkers tools was found at Flixborough, in North Lincolnshire, which contained three similar spoon-bit augers amongst numerous other specialised woodworking tools (Ottaway 2009c: 263-4,Fig.7.9, 2462-4). If the spindle whorls are whorls (and not beads) then they indicate domestic textile production.

What sources of metal were exploited?

Understanding of the metals used, and particularly the sources of ores, is still very limited in Iron Age and early medieval Scotland. As we have seen, both non-ferrous and ferrous metalworking occurred at King's Seat, as at other high status early medieval sites. Some, it might be argued, are located specifically to exploit

nearby natural resources: lead ore near Trusty's Hill (Toolis and Bowles 2017: 120), for example, and copper ore at Dunadd (Lane and Campbell 2000: 212). If this is the case, much of the processing of the raw materials for metalworking may have been processed at source, rather than on the forts themselves.

While there is no evidence of ores or smelting at King's Seat, this is by no means unusual on early medieval Scottish sites. Only the XRF of crucibles provides an insight into the source of non-ferrous metal pools – as at other early medieval sites in Scotland, a good proportion of the King's Seat non-ferrous metal is likely to be derived ultimately from the Roman pool.

However, the British Geological Society (2023) notes concentrations of both precious and base mineral occurrences in highland Perthshire, most notably the seams of lead and zinc ores at Tyndrum, where there are also small amounts of silver. But iron, lead, and zinc are also known at various sites around Loch Tay, most extensively exploited through the copper mine at Tomnadashan (ID 24473), Ardtalnaig. In 1841-58, the second Marquis of Breadalbane extracted pyritic and copper-bearing ores of varying grades. Following initial trials, 1.5 tons of good copper ore were extracted per fortnight, and by the summer of 1846, 70 tons of 'rich' ore had been won (Devéria 2001: 89). Trials were made elsewhere on the estate, but all ended in financial failure; chromite at Corrycharmaig, by Killin; iron pyrites at Dalkillin, Glenquaich; and galena at Meal na Creige (Gillies 1938: 212). In the immediate environs of King's Seat, copper is known from Craig a' Barns (malachite being visible in the stone of the various Victorian follies around Dunkeld House) and *c.* 4 km south-east at Newtyle Quary, while on the summit of Birnam Hill thin veins of lead ore occur (*c.* 3 km south-east), along with isolated fragments of galena discovered on its slopes. One piece of fine-grained, compact galena ore weighed 2.7 kg (Wilson 1921: 105). Iron also occurs in Glen Quaich, *c.* 15 km to the south-west of Dunkeld, accessed through Strathbraan.

Finally, while analyses of residues in the King's Seat crucible fragments primarily indicate copper working, this does not preclude the potential for other metalworking occurring elsewhere on the site, particularly given the limited excavation of the annexes. This has not only limited the potential to recover evidence of the processes involved, but also objects of different type being imported, or indeed of raw material (likely in the form of ingots) being exported. Galena working, for example, is noted at both Whithorn (Nicholson and Hill 1997: 396) and Dunadd (Lane and Campbell 2000: 211).

Where are the ironworking deposits so ubiquitous in other early medieval settlements?

As outlined in Chapter 3 (Morrison), ferrous metalworking, probably smithing, occurred in various areas of King's Seat. Of particular note is the *in situ* evidence associated with the hearths within the citadel and western enclosure (the former dated to the 6th-7th centuries AD), and the significant dump of material of broadly the same date in the eastern enclosure.

Ironworking evidence, in the form of slag, exists on a range of early medieval site types, including nuclear forts, duns, open settlements, crannogs, and monastic sites (Heald and McLaren 2008: 206). This is unsurprising as most iron objects were functional objects such as knives, agricultural tools, and structural fittings (Alcock 2003: 95-101). The occurrence of slag on many sites may simply represent everyday repair or manufacture of prosaic, functional objects. This is surely true when only small amounts of smithing debris are recovered, which is the case from the slag from the citadel and western enclosure. However, what the King's Seat smiths produced, for whom, and what status this conferred (if any), is difficult at present to answer.

As well as the slag, it is likely that some of the iron objects were also associated with ferrous-metalworking. Tongs similar to those from King's Seat are generally associated with ferrous metalworking, used for holding the hot metal (Ottaway *et al.* 2009: 317-8). The King's Seat example are relatively small, perhaps suggesting their use holding non-ferrous crucibles (Goodall 2011: 7), or indeed any hot object to be worked on. Chisels were used by blacksmiths to cut hot or cold iron; cold chisels tend to be shorter and usually handheld, while hot chisels are often longer and sometimes hafted with a wire loop to protect the smith from the hot metal (Goodall 2011: 9). The King's Seat example is noteworthy as it has a circular perforation through the shaft *c.* 52 mm below the head, which may have been threaded with a wire loop as a handle, suggesting its use as a hot chisel.

In the same way that most of the smithing debris are the result of routine tool maintenance, the same is true of some stone objects. The whetstones, sharpening stones, and grinding stones were probably used to maintain small blades used in craftworking and/or the working of pins and awls. Whetstones, whetstone manuports, and sharpening stones are, again, known from a range of early medieval sites representing all ranks of society, such as: Lair, Glen Shee (Clarke 2019a: 80); Dunadd (Lane and Campbell 2000: 178); Dundurn

(Alcock *et al.* 1989: 3:B8); The Mote of Mark (Laing and Longley 2006: 93); Kirk Hill (Alcock *et al.* 1986: 1:F14); Inchmarnock (Franklin 2008a: 189); and Portmahomack (Carver *et al.* 2016).

Craftworking in the citadel

The presence of craftworking within the citadel is a significant discovery. There are parallels at Clatchard Craig where fine metalworking is evidenced in the upper enclosure by part of a flat-based crucible, 22 separate clay moulds for decorative objects, including brooch production, and a silver ingot (Close-Brooks 1986: 145-146). This activity has been attributed to the 7th century AD during recent refinement of the radiocarbon dating and fort sequence (Noble *et al.* 2022: 286). The multiple crucibles and clay moulds from the King's Seat citadel and western enclosure confirms this activity in these upper enclosures also. At Dunadd, zones of activity were identified, based on the concentrations of materials in particular spaces (Lane and Campbell 2000: 250-251). Here, the uppermost enclosure (A) was associated mainly with feasting and domestic activities, but metalworking was signalled by small quantities of waste and objects such as ingot moulds, crucibles, and clay moulds. The secondary enclosure on the summit (B) had the rock carvings interpreted as the site of inauguration and ceremony. In contrast, rich metalworking deposits were identified in the middle enclosure (D), but the lower enclosures had more limited evidence and were potentially used only for stock yards or more domestic functions. On limited evidence, this pattern of evidence is mirrored at King's Seat. If there is any veracity in the selection of sites for early medieval centres on the basis of their hierarchical topography and location, then their use appears to follow a similar pattern, conforming to the established or emerging social hierarchy.

The finds assemblage from Mote of Mark, interpreted as the defended home and workshop of a master craftsperson (Laing and Longley 2006: 174), is again comparable with the King's Seat material. Similar objects include a rare form of E ware jug and a clay mould for a complete small ring, and the iron assemblage is similar in its make-up. The presence of stone smoothers also indicates leatherworking was carried out at both, but apart from this and the butchered bones, products of farmed beasts, there is little evidence of any other agricultural processing. At King's Seat the only quern stones were the two fragments reused as stone moulds for metalworking, one of which had been incorporated into the rampart, while at Mote of Mark none were identified. All the caveats of the sample size must be invoked, but despite the iron ploughshare that was recovered this might suggest that the inner enclosures of the fort were not a focus of any agricultural activity as such during the early medieval phase of activity. While very little is known about the function of the outer enclosure on the south, this could indicate that the focus of activities at King's Seat was primarily craftworking, where agricultural goods were consumed rather than produced. In this sense, we perhaps glimpse some hierarchy in the settlement pattern where cereals and meat were produced and processed elsewhere and only brought into the citadel as finished products for consumption.

In summary, it appears that high status fine metalworking and the production of other higher status objects took place in the citadel where space and access were restricted. This was undoubtedly the most secure space within the fort, an inner sanctum protected by the layered defences of the enclosures below it. This was where the cooking waste and gaming pieces appear also to reveal the elite at rest and play, and it is this association that reflects the status of the craft activities that took place here. This was perhaps where the most valuable raw materials and the finished objects were kept prior to their distribution, the lock and key found in the last firings of the hearth in Structure 1 a reminder that even here there were further restrictions on access.

The western enclosure workshops

As we have seen, the area of the interior of the western enclosure investigated within Trench 1 and Trench 6 covered only *c.* 4%. However, not all the 0.09 ha interior was suitable for building. Making some allowance for the steepness of terrain dropping down on the east from the rampart of inner enclosure reduces the usable space closer to 0.07 ha, though some of this was also required to service the access to the central enclosure (Figures 5.7, 5.10 and 5.11). The area investigated rises correspondingly to 5.5%, but this is still a small sample of the overall area.

With such a small sample, relatively little is known about the organisation of the interior of the western enclosure. With the principal entrance to the citadel on the north, we can perhaps speculate that there would have been some kind of open space in the northern half, serving as a courtyard at the foot of the access leading up to the citadel. The probable entrance into the western enclosure lies in this quarter, so this would also service access into the southern half where at least one, if not two, buildings were identified in Trench 6. The principal feature of each was a hearth, one of which was associated with a possible stone base for a turf wall. This suggested a sub-rectangular or sub-square building measuring at least 4 m across internally, though it is equally possible that this was one end of a larger building enclosing both hearths and measuring

8-12 m in length. The finds from these features imply craft activities and low-level industry, such as metalworking. Deposits in both hearths indicate iron-smithing, including hammerscale in a secondary phase of one, and slag and an intact smithing hearth bottom from the other, but the secondary phase use of the former was also associated with deposits containing a non-ferrous mould fragment (SF 657) and pieces of plano-convex slag cake. Much less animal bone was recovered in this area than around the hearth in the citadel. While this could be a result poor survival in the heavily root-affected deposits, it seems more likely that food preparation was not the focus of activity here. The structural evidence, therefore, has been interpreted primarily as workshops, although it would be unwise to assume that this characterisation of activity applies to all the usable space.

The eastern enclosure ironworking

While evaluation of the lower, eastern enclosure was limited and focussed on the rampart, it uncovered a large ironworking waste deposit, revealing at least one substantial episode of ironworking.

Whether this discovery was mere chance, or whether this industrial activity was widespread across the enclosure is unknown. The unusual nature of the eastern enclosure, with its uneven interior would not have encouraged domestic occupation but may have lent itself to a series of ironworking sites, each separated from its neighbour by rocky outcrops or fallen boulders, and well away from the main residential areas. The ironworking evidence is in keeping with the everyday manufacture and maintenance of household and agricultural objects and tools, some of which were recovered from elsewhere on the site. However, depending on the scale of production, it is possible that the ironworking in the eastern enclosure represented a larger-scale industry, not only servicing the occupants of the fort, but also providing materials and/or objects for adjacent communities through trade. The apparent distinction between the ironworking in the lower, eastern enclosure and the non-ferrous metalworking taking place in the citadel overlooking the terrace from the top of the hill is likely a deliberate division, imbuing the upper echelons of the site with additional importance. The lower enclosure at Clatchard Craig also produced iron slag (Close-Brooks 1986: 141), whereas the debris from the non-ferrous metalworking was concentrated in the innermost enclosure on the summit. In contrast, however, the large southern enclosure at East Lomond has produced evidence of both ironworking and more elite metalworking (O'Grady 2015; 2017).

There is evidence for leatherworking at Dundurn; is there more evidence for a cattle-based economy and its by-products?

The artefacts

Artefactual evidence for leatherworking at King's Seat comes in the form of iron knives, awls and smoothers (see Chapter 3).

Similar knives have been found on a range of early medieval Scottish sites, including an angle-backed blade from Dundurn (Alcock *et al.* 1989: 2:F5, 11, illus 30). Close parallels were also noted from the 19 blades from Dunadd, including those suspected of use in leatherworking (Lane and Campbell 2000: 162). Four Type C1 one blades are clearly associated with leatherworking, with four similar leatherworking knives or parchmenter's knives recovered from 8th- and 9th-century workshop layers at Portmahomack (Carver *et al.* 2016: 202).

Awls are used in leatherworking to pierce holes in leather to be stitched. They generally have an expanded waist and two thin, tapering equal-length arms, one of which would have been hafted into a bone, antler, or wooden handle (Ottaway 1992: 552). Both the King's Seat examples have diamond-shaped cross-sections on their working arms and are particularly suitable for leatherworking as they make very clean cuts into the material (Ottaway 1992: 552).

Of particular note are the ten smoothers, most of which were retrieved within the citadel. All display areas of smoothing and abrasion from rubbing and are notable for the presence of areas of dark reddish brown or grey staining along the edge of the worked face. This staining is likely caused by tallow and animal fats deposited during hide processing, where the smoothers or polishers were used to remove excess fat and smooth out the hide as part of the leatherworking process (Lane and Campbell 2000: 179). Dunadd produced polishers similar to these, most of which displayed similar distinctive dark reddish-brown organic deposits (Lane and Campbell 2000: 179). Smoothers with the same reddish-brown residue were also identified at: Buiston Crannog (Clarke 2000: 142); Mote of Mark (Laing and Longley 2006: 93); the Howe (Ballin-Smith 1994: 196); and also Portmahomack, where a large number of smoothed pebbles, pumice and limestone rubbers and polished slickers with reddish-brown residues were associated with a large-scale 8th- and 9th-century skin-working workshop producing vellum for use in manuscripts (Carver *et al.* 2016: 202). The presence of residue-stained polishers usually associated with

leatherworking, most of which were recovered from the citadel, suggests a hide processing area at King's Seat.

The animal bone

As outlined in Chapter 3, the animal bone assemblage from King's Seat at least indicates that the surrounding area supported the fort with the products of a mixed agricultural and pastoral economy. Cattle bone was predominant, as is common on early medieval sites, and while some probably came on the hoof, there is limited evidence for joints of meat being transported to or stored on site.

Cooking and Craftworking in Structure 1

As at other early medieval sites such as Dunadd, Dundurn, Mither Tap O' Bennachie, Craig Rock, and Burghead (Masson-MacLean *et al.* 2023: 3-4) the animal bone assemblage from Structure 1 demonstrates a reliance on the main domesticates with cattle making up the greatest portion of the diet, followed by pig, then sheep/goat. This is in keeping with the NISP of other sites of similar type and date in early medieval Britain (McCormick 2008; O'Connor 2014).

The presence of bones from different parts of the skeleton, particularly skull and foot bones, may indicate that livestock were generally brought in on the hoof and butchered on site. The red deer antler provides evidence for exploitation of wild resources, but with NISP of two, and MNI of one, on this as well as evidence at least one of the antler was cast naturally, showing hunting was not a pursuit conducted from the fort. The variation in the age of the cattle and the sheep/goat indicates they were raised for secondary products as well as meat. The pigs appear to have been slaughtered at prime weight for meat, skin and bristles, with potentially some older individuals related to ex-breeding stock, and one very young piglet that might tentatively be related to feasting activity (suckling pig?). Pigs are noted as being associated with high-status sites and related to feasting activities (Smith 2000: 720). The predominance of cattle, but with pig rather than sheep secondary, is possibly a signature of feasting activities on a site where there are so many other indicators of high status. At the very least King's Seat should be viewed as a consumer site, where livestock were brought in from the surrounding area in tribute or trade to augment locally produced resources. Other sites with comparable animal bone assemblages from this period, such as Mither Tap O' Bennachie, Burghead and Craig Rock, have also been proposed to conform to this model (Masson-MacLean *et al.* 2023: 7), but it is also possible that the assemblage from King's Seat has been skewed by the preferential selection of bones for later reuse in craftworking. Overall, the bone from Trench 4 of King's Seat is characteristic of the refuse from a mixed-use site, with food and cooking waste being deposited along with the remnants of craftworking and butchery. The concentration of animal bone and evidence of butchery in certain deposits potentially indicates larger scale cooking/feasting events. Paired with the artefactual evidence for stone smoothers possibly associated with leatherworking the animal bone assemblage is indicative of exploitation of all parts of the animals for craftworking on the site.

5.7 Periods of transition

PKARF identified two main priorities in relation to Periods of Transition: summarised here:

- **Priority 1:** The Long Iron Age transition to the early medieval period is poorly understood and little is known about the immediate post-Roman and earlier part of the period, around AD 350–600, either through sites or artefacts.
- **Priority 2:** In the latter part of the period the foundations were laid for the emergence of the kingdom of Scotland. There is scope for interdisciplinary research involving archaeology, folk traditions, written records and place-names and environmental evidence to inform us about the processes which shaped this transition.

Pertinent to these two priorities are the specific research questions of:

- How best can documentary sources, and place-name evidence be brought to good use alongside the archaeological record?
- How best can we identify sites, both religious and secular (or a blend of both) from the immediate post-Roman period around AD 350–450?

Earlier activity and early medieval construction

In considering early medieval fortifications through the publication of his Rhind lectures, Leslie Alcock proposed three categories. The first were palisaded forts; the second being those Iron Age forts that were re-occupied in the early medieval period; and the third being forts dating solely to the 1st millennium AD, in which he included Dunadd, Dunollie, Dumyat, Moredun (Moncreiffe Hill), and King's Seat, Dunkeld (Alcock 1989: 328-329; 2003: 183-90). One of these, the lowland fort of Moredun, has since been dated to the 4th-1st centuries BC, with no indication of early medieval activity (Strachan *et al.* 2023: 106-108; 120). In contrast, the available structural evidence from King's Seat suggests a single, relatively coherent fort of *de novo* construction in the early medieval period. There is, however, the caveat that the ramparts were

Table 5.6: Summary of residual finds in earlier or later features.

Find No	Find	Context	Description of Context / Interpretation
SF 314	Sharpening stone	306	Rubble core of central enclosure rampart. Residual material reused in rampart.
-	Cattle bone (10 pieces)	402	Central enclosure rampart likely reworked into this shallow deposit post abandonment/collapse
SF 4182	Knife	402	Central enclosure rampart, likely reworked into this shallow deposit post abandonment/collapse
SF 4069	Crucible sherd	402	Central enclosure rampart, likely reworked into this shallow deposit post abandonment/collapse
SF 4065	Whetstone Manuport	402	Central enclosure rampart, likely reworked into this shallow deposit post abandonment/collapse
SF 4070	Whetstone Manuport	402	Central enclosure rampart, likely reworked into this shallow deposit post abandonment/collapse
SF 4151	Whetstone	411	Platform which post dates Structure 1, incorporating residual early medieval finds
SF 4148a-b	E ware	411	Platform which post dates Structure 1, incorporating residual early medieval finds
SF 4144	Socketed arrowhead	411	Platform which post dates Structure 1, incorporating residual early medieval finds

only investigated in narrow trenches and that several artefacts recovered from rampart core appear to be residual from an earlier phase (Table 5.6). Several artefacts were identified within upper deposits of the central enclosure rampart including a knife, crucible sherd, some cattle bone fragments and several whetstone manuports. These were identified in shallow heavily root disturbed deposits across the face of the central enclosure rampart [402]. These finds are entirely in keeping with material derived from the occupation deposits associated with Structure 1 and are most likely to have been incorporated into this deposit post-abandonment of Structure 1 and collapse of the rampart. A single sharpening stone SF 314 was identified incorporated into the rubble core of the central enclosure near the entrance. It is likely this was redeposited during construction and represents rare residual material on the site. Several finds including a fragment of E ware, a socketed arrowhead and a whetstone were incorporated into the small stone platform adjacent to Structure 1. This material likely indicates material derived from the nearby occupation of Structure 1 and indicates that the construction of the platform post-dates the use of Structure 1. Several finds from topsoil overlying the ramparts of the western enclosure are derived from material which has washed down from the terrace and become incorporated in the upper deposits on the slope post-rampart collapse.

While a phase of later prehistoric activity thus cannot be completely precluded, and indeed many of the find types span a wide range of use, both the material culture and the radiocarbon dates from key features point to the key episode of construction and occupation spanning the 5th to 7th centuries AD, perhaps with concentrated activity in the latter half of the 6th century (Hamilton Chapter 2).

Early Kingdom formation

The creation of a power centre at King's Seat, is decisively within a period when early kingdoms were forming and hierarchies were becoming more firmly entrenched in a post-Roman world. Its establishment at this time, a comparable entity to those emerging or established elsewhere, is therefore significant, especially given its location. While the placename is probably medieval and related to hunting, it may also contain some echo its earlier importance, apt, as its form and the activities evidenced by the finds are both contemporary and comparable to others sites plausibly interpreted as royal, including Dunadd; Dundurn; Trustys Hill (Toolis and Bowles 2017); Rhynie (Noble *et al*. 2019a: 58); and Craig Phadrig (Peteranna and Birch 2018: 74; Small and Cottam 1972: 45). Trusty's Hill, potentially the capital of Rheged far to the southwest of core Pictland, was probably established in the 5th century AD and flourished over the 6th century AD before occupation ceased abruptly with a large fire before the middle of the 7th century AD (Toolis and Bowles 2017: 132-134). Activity at Clatchard Craig may have begun in the 5th-6th century AD, but the majority of the evidence of occupation and rampart construction appears to have occurred in a very short time span within the early to mid 7th century AD, spanning a period of 75 years, 2-3 generations at most (Noble *et al*. 2022: 288). Dunadd, the

capital of Dalriada is a well-known site with origins in prehistory but a coherent and vibrant phase of activity in the early medieval period between the 6th to 8th centuries AD, perhaps persisting into the 9th century AD (Lane and Campbell 2000). Dundurn similarly was a prominent site in the late 6th-7th centuries AD with activity persisting into later centuries. In contrast the royal complex at Rhynie was out of use by the latter half of the 6th century AD with activity persisting at nearby sites of Tap O'Noth and Cairnmore (Noble *et al.* forthcoming).

Emerging research has also placed the establishment of many of the Irish ringforts, such as Garranes (O'Brien and Hogan 2021: 3), and recent refinement of the chronology at Dinas Powys in South Wales to the 5th-6th centuries AD, correlating with the artefactual material (Campbell *et al.* 2023: 1552). Overall, it would appear that this general pattern is widespread with sites often only in use for a relatively short period of time spanning several generations at most.

The departure from Kings Seat

The apparent lack of activity at King's Seat after the late 7th century to perhaps early 8th century may signal a shift in power from the hilltop to a new site down to the riverside, closer to the then newly established church and monastery or perhaps even to the church itself. The exact nature of this shift in focus remains unclear. There is clearly a shift away from Kings Seat in the 7th century AD and definitely an increase in the importance of a lowland ecclesiastical community. But the specific nature of the site here and how it evolved into the prominent ecclesiastical community are currently unknown. This shift in power to a lowland setting is not an isolated event at Dunkeld but part of a widespread pattern seen at sites elsewhere. Further afield 'analysis of dates from all broadly comparable sites in Wales and south-west England indicates that there was a widespread move away from hillforts in the late-6th/early-7th century AD, pointing to a period of significant socio-political and economic change' (Comeau *et al.* 2023: 9–10). While several defended sites do have evidence of continuous (Dunadd, Cairnmore) or emerging (Burghead) activity into the later centuries of the 1st millennium AD (Noble 2016: 30), many, such as Clatchard Craig, have been proposed to exhibit a relatively short (*c.* 75 years) lifespan (Noble *et al.* 2022: 288). This demonstrates that the power once held at King's Seat, with its relatively short occupation shifts to a lower, more accessible site. Although speculative this could be initially to an unidentified secular centre or perhaps even directly to the church depending on its founding date. This shift is broadly in keeping with wider changes in early medieval social systems, a Europe-wide phenomenon involving the rise of the church and a marked shift away from forts to lowland centres (Campbell *et al.* 2023: 14).

Plague

Another agent in social change at this time is the widespread impact of the Justinian plague, which appeared in Europe between AD 541-549 and persisted until AD 750. It coincided with, and was probably linked to, the aftermath of a significant climatic downturn caused by substantive volcanic activity in the 6th century AD, which affected societies across northern Europe. The plague was present in Britain and Ireland in the AD 540s and persisted in some form in the AD 550s, with a further episode about a century later; it could have had a profound impact on population, although there is very little direct evidence outside of cemetery sites such as Edix Hill (Fraser 2009: 68; Singer 2024: 5-6). Elsewhere in Europe it disrupted established systems wherever it spread, significantly in some communities, with the death of high-status figures limiting or ending the trade of key materials (Campbell 2007: 132; Comeau *et al.* 2023). The impact on infected communities would have extended in turn to partners in their trade networks, if indeed the infection itself was not passed on. Disruption of trade could have significantly undermined the economic model underpinning sites and their networks, perhaps resulting in a loss or shift of power, and eventually relocation of the power base.

Political tension

Similarly, socio-political unrest associated with other events, as well as competition for limited resources, could have been factors in destabilising regimes and associated trade to partners further afield. The late 7th century AD in northern Britain was a time of significant unrest and political tension, with pronounced pressure on southern Pictland during the reign of Bridei, king of *Fortrui*, AD 671-692 (Fraser 2009: 214). According to the Annals of Ulster, Dunadd and Dundurn were besieged in AD 682; Dunnottar in AD 680 and AD 693; and Dunollie AD 685 and AD 698/699; (then destroyed AD 701/702 and (re)constructed AD 714). Scottish sites recorded as being burned, destroyed, captured, constructed, besieged or otherwise compromised, have been discussed in detail in consideration of the demise of Clatchard Craig (Noble *et al.* 2022: table 3, 293). While these may be among the most significant events, it is probable that other such events went unreported and have fallen into obscurity. However, there is no evidence for such destruction at King's Seat.

Warfare must have interrupted production, supply and trade of items from west to east, and perhaps brought change in the role of Dundurn from a production and trade to defence. Several phases of construction

have been proposed there, including an early timber palisade, which was dismantled and replaced by later timber and stone ramparts. These were themselves burnt down, a destructive event that possibly accords with the documentation of a siege and subsequent remodelling (Alcock 1989: 192, 201-2, 206). Similarly, Clatchard Craig suffered a destructive end, with the ramparts burnt sometime in the mid-7th century AD, in this case perhaps 'a victim of the tumultuous and pivotal events of the latter half of the 7th century when southern Pictland came under Northumbrian control before being wrested back into Pictish overkingship in the aftermath of the Battle of Nechtanesmere of AD 685' (Noble *et al*. 2022: 266).

The Battle of Nechtansmere, which marked Bridei's victory over Ecgfrith of Northumbria, occurred somewhere within Pictland. While Dunnichen, near Aberlemno (Angus) was for long the suggested site, Woolf's relocation of Fortriu (2006) makes Dunachton in Grantown on Spey a more likely candidate. Its aftermath saw a period of consolidation and the emergence of the concept of the Picts united as a single overarching group. Against this political backdrop, the strategic location of King's Seat, and subsequently Dunkeld, would have been pivotal, linking north with south, and east with west. Woolf (2006: 193) has highlighted that in the second half of the 7th century AD the over-kingship of Fortriu first appears in the Irish chronicles, which could be concurrent with many smaller regional centres being abandoned as populations converged on larger regional centres. In the north this is apparent at sites such as Burghead (ID 16146) and Mither Tap O' Bennachie (ID 85507), which come into focus in the 7th and 8th centuries AD with continued activity into later centuries. In contrast, there is a slight geographical shift in the power base from King's Seat to Dunkeld on the Tay itself sometime in the late 7th-early 8th century AD although it remains unclear at this time exactly where the community from Kings Seat moved to. However, the importance of Dunkeld was to continue and flourish in later centuries.

Settlement expansion

If there was a relocation of the King's Seat power centre to a lower site, or a shift in power to the church directly, the more open and level setting around the Tay might also reflect social expansion of the community, even beyond the extent offered by the southern enclosure. This may be an indication of the formation of larger polities. A new site on the banks of the Tay would have allowed for expansion and larger structures with new architecture, such as palace-like buildings that were coming into fashion. In AD 858 Cinaed son of Alpin died in his 'palatium' at Forteviot (Woolf 2007: 94-95; Campbell and Driscoll 2020: 39), illustrating the introduction of new, grander architectural forms at this time. Recent and ongoing excavations at the massive Burghead promontory fort, in the heart of Fortrui, have confirmed proto-urban settlement with large turf- and stone-built structures from the 6th-9th centuries AD (Noble and Evans 2022: 111), along with an early church, Christian graveyard and the substantial well (Young 1891; 1893). Larger settlements of this scale could not be accommodated by the small rocky outcrop at King's Seat, even with settlement in the southern enclosure. Furthermore, a riverside setting near a ford and watercraft, with routes both north-south and east-west, would have also been more accessible. Regardless of the nature of the settlement here, the less naturally defensible location may indicate that external threats were deemed less of a risk in this later period, perhaps as power structures became better established, aided by the increasing prominence of the church (Driscoll 1988: 232). This growing confidence and emerging stability, even if only perceived, may have rendered defence in the form of a hilltop fort less of a priority, or indeed the need to impress authority across the landscape to passing groups. However, it remains unclear why some sites, including Dundurn remain active beyond the 7th century AD.

The early church

Dunkeld sits at the eastern end of the Iona to Dunkeld pilgrimage route, a branch of the subsequent and longer Iona to St Andrews route (Hall Chapter 4.4). The monastery on Iona was founded in AD 563 and rose to prominence within the latter half of the 6th century AD. The church at Dunkeld emerged around the 7th century AD and was well established by the 9th century AD. According to the Pictish king-list the great Columban church was established at Dunkeld during the reign of Constantin, son of Uurguist (Fraser 2009: 369), suggesting a date at least in the late 8th to early 9th century AD, potentially between AD 788-820 (Noble and Evans 2022: 159). Recent geophysical survey and excavation has confirmed evidence of a possible monastic vallum ditch around Dunkeld Cathedral, with basal fills containing material dating to the 9th-10th centuries AD (O'Driscoll and Noble 2019: 7-8; Noble and Evans 2022). In AD 849 the relics of Columba were reputedly divided between Dunkeld and Kells, indicating a church and associated settlement were well-established by this time. No low-lying 7th-8th century AD settlement is currently known at Dunkeld and so it remains unclear whether the community from King's Seat relocated to another nearby secular site, with a later shift in power and control to the ecclesiastical community at Dunkeld, or whether there was a more direct shift to an early church related settlement/community in the 7th century AD, which later grew into the flourishing ecclesiastical centre

known to be established by the following centuries. Further investigation in and around the Cathedral might clarify this somewhat murky period between the abandonment of Kings Seat and the well-established ecclesiastical community active from at least the late 8th to early 9th centuries AD.

An abrupt departure?

There are indications that King's Seat fort was not catastrophically destroyed, or even carefully cleared out before abandonment. The concentration of materials around the hearth in Structure 1 included objects such as a hot chisel and intact knife blades, both in relatively good condition. Such objects could have continued in use, or have been recycled, and their presence might suggest a relatively abrupt departure. There are numerous mechanisms by which this may have happened. As argued above, it may be simply related to the relocation of the seat of power to lower ground and these were things left to be collected later, but there is also the possibility of other political change, such as a change in leadership, or conflict rendering the area unsafe. While speculative, it is interesting that these useful items should have been left in place with no clear explanation, such as a fire event or other evidence of the fort's destruction.

Elsewhere, contemporary sites do appear to have been deliberately decommissioned when a shift in focus occurs. Deliberate closing deposits and events are evident at important places like Barflat Rhynie (ID 281408), in Aberdeenshire, a phenomenon that can also be observed at important Continental centres, for example at Uppsala, Sweden. A trend can be seen at both of the 'death of the great halls', the outer enclosures and several internal structures being burnt down (Noble *et al.* 2013: 1142). Both sites show evidence of deliberate deposition post-dating the conflagration, with horse and cattle jaws deposited into postholes after the remainder of the lower sections of the posts had rotted at Uppsala. The abandonment of a 6th-7th-century hall was accompanied by evidence of ritual events that included closure with a clay layer over a cremation layer, in which most of the bones were teeth or mandibles from cattle and horses (Ljungkvist and Frolund 2015: 19). At Rhynie a similar practice might be inferred, with cattle bones and a set of shears inserted into several of the palisade postpipes after several of posts had been removed and the entire outer palisade enclosure, the latest phase of enclosure, was apparently deliberately dismantled (Noble *et al.* 2019a: 59). These decommissioning events appear to have taken place through the agency of the communities themselves, rather than some hostile incursion.

There is certainly no equivalent evidence from King's Seat, and in the narrow sections observed across the defences there is no firm evidence of any deliberate decommissioning, albeit that the remains of the ramparts appeared poorly preserved. This contrasts with the overt destruction of the ramparts at Clatchard Craig, and the burning of the palisade at Dundurn, suggesting that King's Seat was not destroyed by hostile parties, nor deliberately 'extinguished' by the community themselves, but rather simply left, and perhaps eventually forgotten. It is possible that the nature of the departure from King's Seat may even suggest continuity of leadership through this process, with respect for the old power centre retained rather than obliterated which is why it is speculated that the community are most likely to have moved down towards the Tay rather than out of the area entirely.

Our understanding of how the site was left, however, is confused by the later agricultural activity that truncated elements of Structure 1 in the citadel, and the heavy disturbance caused by tree and rhododendron roots here and elsewhere on the site. The survival of clay moulds and crucible fragments, for example, has probably been compromised by this activity. Recent studies at Rhynie demonstrated that 'abrasion on the ceramic moulds recovered from the ploughzone were such that the majority did not preserve any diagnostic morphological or design feature', which was in direct contrast with the mould identified from the same area but sealed within deposits below the impact of cultivation (Noble *et al.* 2019b: 5, fig. 6). It is entirely possible that some deliberation in the placing of artefacts in these deposits at King's Seat has been lost in the subsequent processes of decay and degradation.

5.8 Conclusions: a royal seat and the capital of Atholl

The status of King's Seat fort, as a high-status, royal power centre of the 6-7th centuries AD is clearly evidenced by the nature and scale of fort complex itself, and the range of activities it hosted, as indicated by the finds assemblage recovered. A large Pictish complex, it occupies a key strategic position Atholl, the important kingdom of southern Pictland first recorded in Irish annals in the 8th century AD (Fraser 2009: 101). Indeed, it may well have served as its capital. In the form of a classic nuclear fort, its enclosing ramparts were designed to display power through the control and co-ordination of both the resources and workforce required and for its construction, and the site can now be added to the growing corpus of high-status early medieval Scottish forts (Figures 5.12 and 5.13). The use of compact but monumental fort architecture to display the power of elite rulers began in the area much earlier in the Iron Age, as seen at the timber oblong and oval forts at Castle Law, Abernethy and Moredun on Moncreiffe Hill outside Perth (Strachan *et al.* 2023: 237-238, fig. 7.1, 254). Is it possible that the resurrection

of hilltop forts over half a millennia after such sites were abandoned was a reference to their authority and might?

The location and architecture of the fort indicate a defended military strength controlling key routes both north-south and east-west through the Highland Boundary Fault line. It was constructed, probably *de novo*, and occupied in a period in which royal kingdoms were emerging from earlier social hierarchies across Britain, and the small finds recovered confirm activities recognised at contemporary royal forts elsewhere, while the nature of the fort may suggest others. The crucibles and moulds demonstrate non-ferrous metal working in the upper enclosures that indicate a production centre of high-status decorative items, such as brooches and pins, certainly in copper and possibly in silver. It's role as an important hub in an elite trading network is evidenced by the exotic imports, including E ware from the continent, and glass items from Anglo-Saxon Northumbria. These items also suggest feasting and trysts of peers, possibly related to gifts and trade of these rare items. There is also the possibility that the site witnessed royal ceremonies, including inauguration. Finally, the complex may have housed a sizable population to deliver and service these functions, and formed a significant 'proto urban' settlement, rather than the just the caput of a small elite. The significant discovery of the large southern enclosure through the project might suggest Pictish settlement on a scale inconceivable even a decade ago (Ralston 2004). Either way, as the premier power centre of Atholl it would have overlorded smaller centres of lordship in the wider area.

All these features meet Campbell's criteria for a royal centre: 'strong defences, presence of precious metals (especially gold), consumption of imported pottery (and its contents) and glass vessels, and large-scale production of personal jewellery' (2020). Its position, at the geographical centre of a key network extending in all directions between the Picts to the north, Anglo-Saxon influences to the east and south-east, and Scots to the west, made it integral in linking different kingdoms via communication and trade. This location, and the evidence of high-status activities as found at other royal sites, are key factors in proposing it as a dominant, if not the predominant, site in southern Pictland, if only for a relatively brief period of time.

A significant narrative in the life of the King's Seat is its relationship to the emerging importance of the

Figure 5.12: A reconstruction looking south-east showing the citadel with its hall and main entrance on the summit, the western enclosure below this, and the eastern enclosure on the left and large, southern enclosure on the right. The location offered excellent visibility along Strath Tay to the meandering Tay. Left of these are the steep cliffs of Polney Crag with Newtyle Hill (left) and Birnam Hill (right) in middle distance. Between these are the Sidlaw Hills in the distance including sight of Dunsinane fort (artist: Chris Mitchell).

Figure 5.13: A reconstruction looking north showing excellent visibility along Strath Tay to the north. The citadel shows the hall, main entrance, postern entrance, and use of the erratic boulder. The western enclosure shows works and postern entrance, and the lower eastern enclosure contains further industrial activity. While no buildings have been identified within the southern enclosure it may have protected residential occupation to serve the fort complex. The stretch of river in the distance at Dalmarnock has produced a contemporary logboat (artist: Chris Mitchell).

Columban church. Both the handbells and sculpture from the wider landscape indicate an intense area for such missionary work in Scotland, and the draw of Dunkeld was no doubt to covert the royal resident of King's Seat. While the church of Dunkeld and its association with the relics of Columba and Pictish royalty is only traceable to the 9th century AD, the strong likelihood of an earlier monastic site has recently been boosted and would support this idea. The Pictish King-list attributes the founding of the church to Constantín son of Vurguist (or Fergus) between AD 807 and AD 818 (Woolf 2007: 65; Fraser 2009: 134, 369), and Dál Riata, including Iona, were probably under Pictish overlordship at this time, perhaps explaining why Constantín's moved Columba's relics to Dunkeld in AD 849 (Woolf 2007: 64-5): a strong royal fort, with an early church linked to Columba offered the security in his own territory. The result was the creation of an important pilgrimage destination that brought ecclesiastical investment at Dunkeld from the 9th century AD, securing its growing importance, beyond its secular one, and brief ecclesiastical primacy.

The King's Seat occupation ends in the 7th century AD and the church ascends in power in the following centuries. There is currently no evidence of a subsequent secular site nearby, but the elite may have chosen to relocate to a more accessible, lower site with room for expansion. The chronology and characteristics of King's Seat is consistent with similar contemporary sites that represent a key stage in the development of kingship and kingdoms in Celtic-speaking areas, abandoned by the late 1st millennium AD as larger kingdoms were created. The name Dunkeld, meaning 'Fort of the Caledones', surely relates directly to King's Seat, and it is apt that it is retained today, commemorating the last of the Caledonians in a place of significance in their territory, that later became part of the southern Pictish territory of Atholl.

As we have seen throughout this study, other royal sites from this period include Dunadd, the inauguration place of the Kingdom of Dal Riata; Alt Clut (Dumbarton Rock), which may have played a similar role for the Britons in the Kingdom of Strathclyde; Trusty's Hill in

the Kingdom of Rheged; and Din Guayrdi (Bamburgh), the capital of Anglian Bernicia and later Northumbria. Within Pictland, generally held to be the land north of the Forth, there are multiple references to distinct sub-groups and several references to individuals that were viewed as kings of part, or all of the territories held at the time. An overlordship was held by the ruler of Fortrui, a Pictish kingdom located around the Moray Firth north of the Mounth. Amongst the southern Picts (those who inhabited the land south of the Mounth), there was a two-tier system, with a number of lesser regional kings (Alcock 2003: 39).

In conclusion, King's Seat was probably the royal capital of Atholl, a significant kingdom of southern Pictland in the 6th-7th centuries AD. Although relatively short-lived, it was used along with other centres at a time when emerging kingdoms played a significant role in the development of early Scottish history. While some of these centres were much longer-lived, here power passed eventually to the church in Dunkeld, which was to remain a focus of ecclesiastical power over much of the Middle Ages.

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Appendix A
Archaeological Sites in the Environs of Dunkeld and the Wider Area

Details of known prehistoric sites in the environs of King's Seat, Dunkeld (Figures 4.1 and 4.2). Summarised data based on the Perth and Kinross Historic Environment Record (PKHER) and the National Record of the Historic Environment (NRHE). No = feature number on map; ID = NRHE CANMORE reference; MPK = PKHER reference.

Table 1: Earlier prehistoric sites in the environs of King's Seat, Dunkeld

No	MPK	ID	NGR	Name	Site Type
1	2303	27001	NO 0370 3970	Craig Ruenshin	rock art
2	2457	27174	NO 0150 4010	Balhomish	rock art
3	18392	314752	NN 9777 4118	Ballinloan	rock art
4	18766	346412	NN 9836 3920	Trochry	rock art
5	16821	283096	NO 0211 4018	Balhomish	rock art
6	16834	283115	NO 0005 3893	Dancy Burn	rock art
7	18394	314763	NN 9854 4128	Meikle Logie	rock art
8	2388	27088	NO 0833 4668	Arlick	rock art
9	2392	27092	NO 0748 4585	Laighwood	rock art
10	5223	27124	NO 0833 4398	Kincairney	rock art
11	15387	274039	NN 9950 3913	Little Trochry Hill	rock art
12	18767	346411	NN 9834 3929	Trochry	rock art
13	18771	346400	NN 9850 3986	Little Trochry	rock art
14	16774	283020	NO 0804 4702	Arlick	rock art
15	16775	283031	NO 0768 4766	Craigend	rock art
16	16822	283097	NN 9777 4070	Newton of Ballinloan	rock art
17	16824	283099	NN 9737 4093	Ballinloan	rock art
18	16825	283100	NN 9752 4105	Ballinloan	rock art
19	16826	283106	NN 9779 4095	Ballinlick	rock art
20	16835	283116	NO 0113 3854	Glen Garr	rock art
21	16836	283117	NO 0124 3832	Glen Garr	rock art
22	19739	356554	NN 9921 4127	Lagganallachie	rock art
23	18765	346413	NN 9834 3917	Trochry	rock art
24	2458	27175	NO 0379 4001	Craig Ruenshin	rock art
25	2424	27127	NO 0725 4216	East Cult	rock Art
26	2414	27115	NO 0757 4360	Ninewells	rock art
27	3638	28591	NO 1027 3851	Murthly Hospital	stone circle
28	2431	27135	NO 0723 4220	East Cult; Caputh Church	stone circle
25	2424	27127	NO 0725 4216	East Cult	stone setting
29	2482	27206	NO 0449 4106	Newtyle	stone setting
30	2297	26994	NO 0499 3828	Staredam	stone setting
31	2481	27205	NO 0144 4299	Pulney Lodge	standing stone
32	18770	346408	NN 9934 3889	Little Trochry Hill	standing stone
33	2284	26981	NO 0704 3956	Murthly Castle	standing stone

No	MPK	ID	NGR	Name	Site Type
34	20121		NO 0690 3870	Murthly Estate	standing stone
35	2419	27120	NO 0995 4130	Glendelvine House	standing stone
35	2419	27120	NO 0995 4130	Glendelvine House	barrow
36	2276	26973	NO 0535 3875	Murthly	barrow
37	2422	27123	NO 0954 4033	Caputh / Forehill	cairn
38	2439	27149	NO 0987 4115	Glendelvine House	cairn
39	3941	27139	NO 0983 4233	Cairn Muir	cairn
40	3942	27151	NO 0893 4182	Mains of Fordie	cairn
41	6008	86433	NN 9792 3942	Trochry	cairn
26	2414	27115	NO 0757 4360	Ninewells	cairn
42	1587	26247	NN 9856 4031	Little Trochry	cairn
43	2440	27150	NO 0724 4198	East Cult	cairn
44	5523	27134	NO 0790 4130	Whirley	cairn
45	5770	86475	NN 9818 3834	Trochry Hill	cairn
46	2418	27119	NO 0841 4000	Caputh	cairn
47	2391	27091	NO 0767 4712	Arlick	cairnfield
48	2385	27085	NO 0924 4700	Seefar	cairnfield
49	2386	27086	NO 0903 4706	Seefar	cairnfield
50	2378	27077	NO 0664 4658	Leduckie	cairnfield
51	2294	26991	NO 0460 3920	Duncan's Hill	cairnfield
52	5770	86475	NN 9818 3834	Trochry Hill	cairnfield
53	18768	346410	NN 9940 3888	Little Trochry Hill	cairnfield
54	3631	28584	NO 1120 3830	Baldarroch	pit alignment
55	3979	28999	NO 1077 4144	Spittalfield	pit alignment
56	5445	27181	NO 0166 4304	Dunkeld Park	pit alignment

Table 2: Possible later prehistoric sites in the environs of King's Seat, Dunkeld

No	MPK	ID	NGR	Name	Site Type
1	2407	27107	NO 0815 4776	Drouthy Burn	unenclosed settlement
2	7821	92936	NO 0142 3882	Balhomish	unenclosed settlement
3	7822	92937	NO 0147 3861	Balhomish	unenclosed settlement
4	7823	92938	NO 0230 3840	Craig Obney	unenclosed settlement
5	7826	92942	NO 0297 3864	Meikle Obney	unenclosed settlement
6	3877	28858	NO 1080 4737	Seefar	unenclosed settlement
7	2413	27114	NO 0352 4701	Knock of Findowie	unenclosed settlement
8	7236	86480	NN 9998 3919	Dancy Burn	unenclosed settlement
9	3878	28859	NO 1036 4722	Seefar	unenclosed settlement
10	2405	27105	NO 0758 4758	Craigend	unenclosed settlement
11	3880	28861	NO 1118 4710	Cairns	unenclosed settlement
12	2417	27147	NO 0600 4028	Dalbeathie	unenclosed settlement
13	2438	27146	NO 0979 4116	Glendelvine / Lodge Cottages	unenclosed settlement
14	5524	27141	NO 0995 4180	Culthill	unenclosed settlement
15	5525	27142	NO 0925 4190	Mains of Fordie	unenclosed settlement

No	MPK	ID	NGR	Name	Site Type
16	5993	71457	NO 1133 4173	Middle Gourdie	unenclosed settlement
17	3975	28991	NO 1069 4149	Spittalfield	unenclosed settlement
18	2436	27143	NO 0981 4096	Blackhillock	unenclosed settlement
19	12828	239585	NO 0967 3844	Bradyston	unenclosed settlement
20	5526	27148	NO 0968 4134	Glendelvine	unenclosed settlement
21	3633	28586	NO 1120 3820	Baldarroch	unenclosed settlement
22	3955	28936	NO 1089 4145	Spittalfield	unenclosed settlement
23	16927	286117	NO 1114 4379	Mains of Clunie	unenclosed settlement
24	2391	27091	NO 0767 4712	Arlick	cairnfield
25	2385	27085	NO 0924 4700	Seefar	cairnfield
26	2386	27086	NO 0903 4706	Seefar	cairnfield
27	2378	27077	NO 0664 4658	Leduckie	cairnfield
28	2294	26991	NO 0460 3920	Duncan's Hill	cairnfield
29	5770	86475	NN 9818 3834	Trochry Hill	cairnfield
30	18768	346410	NN 9940 3888	Little Trochry Hill	cairnfield
31	3937	28944	NO 1142 4445	Loch of Clunie	crannog
32	6906	87233	NN 9778 4059	Newton of Ballinloan	monumental roundhouse
33	2416	27118	NO 0670 4067	Kemp's Hold; King's Hole	fort
34	2302	27000	NO 0460 3927	Duncan's Camp	fort
35	2289	26986	NO 0223 3822	Craig Obney	fort
36	3633	28586	NO 1120 3820	Baldarroch	curvilinear enclosure
37	16926	286116	NO 1140 42000	Middle Gourdie	curvilinear enclosure
38	5758	82093	NO 1113 3832	Baldarroch	curvilinear enclosure
39	7079	83852	NO 0089 4008	Balhomish	curvilinear enclosure
40	5522	27125	NO 0867 4092	Stralochy	curvilinear enclosure
41	2443	27144	NO 0864 4086	Stralochy	curvilinear enclosure
42	3955	28936	NO 1089 4145	Spittalfield	curvilinear enclosure
43	14896	267996	NO 1074 3939	Easter Caputh	rectilinear enclosure
44	3631	28584	NO 1120 3830	Baldarroch	pit alignment
45	3979	28999	NO 1077 4144	Spittalfield	pit alignment
46	5445	27181	NO 0166 4304	Dunkeld Park	pit alignment

Appendix B
Early Medieval Sculpture from Dunkeld and its Environs

Table 1: Early medieval sculpture from in and around Dunkeld

Place	Sculpture	Site context	Date	Geology	References
1. Dunkeld	**D1**: possible architectural fragment; a triangular block with an incised horse and rider, with spear and drinking horn; horse trotting; top face incised with sunken, equal armed cross. **D2**: the 'Apostle Stone', the lower portion of a large cross-slab relief carved on all four faces. Face A cross with figures; Face B: figures and horses; Face C: 22 'severed' heads and 12 so called Apostles; Face D: spiral design. **D3**: Currently lost, the lower portion of a cross-slab relief carved with cross, a rearing horse, key pattern and with post-medieval burial inscription. **D4**: Tall cross-slab carved in relief on both broad faces. Face A with a plain cross, with round-hollow angles to the arms but the arms are irregular: the side arms are very short, confined by the narrow slab, the upper arm/head is very long, twice the length of the lower arm /shaft and tapers and projects very slightly from the slab, the shaft is very short and expands to give an angled-base. The edge of the slab is defined with a border beading. Face B carved with plain, lower shaft resting on top of a domed mound base, inside the base is a smaller mound from which project three arms, the upper one bifurcates into two spirals, the two side arms level with the base of the mound have single spirals. The shaft and the slab each have a moulded edge.	Monastic/cathedral. D1 (in cathedral tower) originally found in the grounds of King's Park, between Cathedral and King's Seat; moved to Cathedral *c.* 1946. D2 and D4 in Chapter House Museum, both in use as gateposts in the mid-19th C., at the entrance to the churchyard and had been for some time. D4 miss-read by Allen as two cross-slabs. D3 Re-used as a gravestone of a farmer in 1729 and later laid in the cathedral floor; Stuart records it as lifted mid-19th C.	8/11th C. AD	Red sandstone	Stuart 1856: pl.50; Stuart 1867: pl. 16 nos. 1 and 2, pl.68, 10; Stewart 1926: 12-13; ECMS, ii: 39, 284, 317-19, 342; RCAHMS, 1994: 89, 96-7, 160; Hall *et al.* 1998: 137-9, app. ii, 141-2; Hall 2005a: 64-72; Reid and Borland 2014.
	D5: Whereabouts unknown. A stone known as the Priest's Stone, standing in the river Tay nr. Dunkeld and reached by stepping-stones. Not known whether carved. Cf. No. 9, Dun Beag, Faskally, below.	Ecclesiastical/ pilgrimage (?)	?	?	Stewart 1926: 137.
	D6: A large boulder set in a field-wall at a junction of paths is incised with an equal-armed Latin cross set within a plain circle, of which only the upper left and lower right quadrants appear to have been executed.	Monastic/ pilgrimage (boundary or way-marker)	9-12th C. AD	Schistose-quartz	Walsh *et al.* 2022: 138-9.

Place	Sculpture	Site context	Date	Geology	References
2. Murthly	**M1**: A large shrine/screen panel, relief carved within a plain flatband border with, from left to right, a pair of animal-masked humans fighting with swords and shields, a pair of confronted sea-horses with fish tails, and a naked man fleeing a bear-like creature and a goggle-eyed serpentine creature with a fish-tail. **M2**: Substantial portion of a cross-slab, carved in relief on both broad faces. Face A has a roll moulded edge and bears the tapering shaft of a cross. Two arcs define the lower rim of the open armpits of the lower part of the cross-head. The shaft is decorated with spirals terminating in a beaked, zoomorphic head. Face C bears the symbols of a V-rod and a Pictish beast. Above them a circular cross-head (no shaft) with open armpits and interlace in the surviving arm. **M3**: Left-hand fragment of a shrine/screen panel relief carved. An edge defined by flatband moulding with an incised median line. On the right the hindquarters of two quadrupeds move right; on the left two confronted humans who grasp at each other's wrist and what appears to be a book; their lower bodies change into intertwining snakes whose heads turn back to bite their genitals.	Church. M1 found in 1886 close to the junction of the Gelly Burn and the river Tay, buried flat, possibly above decayed bone, a second, uncarved slab was not kept. NMS reg. IB/101. M2 found as two broken fragments used as wall foundation for Rose Cottage, Gellyburn, in 1949. PERGM registration: 6/1949. M3 found during gardening work at Pittensorn Farm, Gellyburn, 1990. PERGM reg. 1995.319.	*c.* 750-850 AD	Sandstone (grey)	Hutcheson 1886; Calder 1951; Hall *et al.* 1998; Hall *et al.* 2005; Hall 2013: 101-2.
3. Staredam / Waterloo	**S1:** A standing stone incised with a simple, equal-armed cross, with rounded terminals, in the middle of the upper part of the stone.	Boundary/pilgrimage. The stone is the NE one of a pair of standing stones about 5m apart, and each almost 1.5m high.	9-11th C. AD	Sandstone	Coles 1908: 153-4, fig. 53.
4. Tower of Lethendy / Loch of Clunie	**C1**: Cross-slab of slender rectangular form with rounded top. Relief carved all over. Incomplete due to reuse, with lower arm and part of shaft missing. Blade sharpening marks may reflect use as an oath stone. Face A bears upper part of a cross-head with rectangular terminals, square centre-panel and double-square armpits. Field either side of the missing shaft has key pattern, a human figure in profile with curled hair (left field) and double cord knot, of fierce appearance wearing a collar and an animal 'walking' up the shaft. On Face C an angel with wings out faces the viewer at the top of the stone, below are two seated figures wearing elaborate hemmed robes and unshod, the left-hand figure holds a book or reliquary and the other figure a chalice and some other object. They share a bench; below them are two musicians, one playing triple pipes and the other a triangular harp; a drum lies on the ground and a small dog-like creature wanders.	Church / assembly place. Discovered in 1969 as a lintel in the stair of the 16th C. Tower of Lethendy. Possibly added here in the 17/18th C. after earlier reuse as a drain element. No Pictish context at Lethendy; it could have been sited at Loch of Clunie. An early church, penannular brooches and a (royal) assembly mound – the mound would mean the Cross was an ideal oath stone, which may explain the many blade strikes upon it.	9-10th C. AD	Sandstone	Fisher and Greenhill 1974: 238-40; Henderson 1986: 91, 102, 105; RCAHMS 1994: 92, 94, 97, 161; Hall 2005b; Hall 2015: 190-2.

Place	Sculpture	Site context	Date	Geology	References
5. Cargill	**Ca1**: Symbol stone decorated on one face with an incised rectangle containing opposed 'commas' above a central motif aligned with two vertical parallel lines; to the left a simple rectangle on a long shaft. Both roughly pecked.	Found in a plantation dyke *c.* 1880; later moved to garden of Balhomie House.	7th C. AD	Whinstone	ECMS ii: 283-4; Fraser 2008: no. 179; Hutcheson 1884: 315-17, fig. 3.
6. Haugh of Tulliemet, Ballinluig	**T1**: A conical-shaped pillar stone, possibly a Standing Stone, has been deeply carved on both broad faces with an unusual cross design. The irregular side arms are of lower relief than the shafts, with simple hollow armpits; deep grooving defines the edges of the arms and running into the hollows.	Church Sometimes known as St Maroc's (St Muireach's) Cross	10-11th C. AD (?)	Sandstone	Dixon 1925: 94-5.
7. Logierait	**L1**: Cross-slab, possibly shaped before carving. Carved in false relief with a roll moulded border. Face A bears a cross with a circular centre and bosses in the circular armpits. Cross filled with interlace and the bottom of the shaft is embellished with incised inturned spirals. Face C shows part of a horse and rider, with the horse's head, legs and bridle clear, rider's spear and lower part of garment visible. Below the horse a snake coiled around a straight rod with curlicued terminals. **L2**: Both faces carved in false relief and incised. Face A bears a quadrilobate cross with large circular armpits closed with arcs. Interlace infilling. Either side of the upper arm are opposed S-dragons with a large disc between their open jaws. Interlace panels flank the shaft. Face C bears Pictish symbols of a double-disc with simple z-rod and a serpent with a z-rod, below two horsemen and a hound.	Church / secular power centre L1 broken and worn with much of Face C missing. Found almost buried near to church in 1877. L2 initially reported as a late medieval graveslab when found lying in the churchyard in 1986. Extremely worn on both faces and possibly deliberately defaced.	9th C. AD	Mica-schist	Anderson 1878; ECMS ii: 291-2; Reid 1986: 40; Taylor 1996: 101-2.
8. Killiechangie (Mains of)	**K1**: Large natural boulder incised on both broad faces with a plain Latin Cross. **K2**: Smaller, natural boulder incised on one broad face with a plain Latin cross.	Church. Both stones lean against a dyke at the bottom of a field making Face C of each difficult to see in their entirety.	9-11th C. AD	Schistose (?)	Reid 1912: 391-2; Dixon 1925: 92.

Place	Sculpture	Site context	Date	Geology	References
9. Dunfallandy	**Df1**: a large rectangular cross-slab, relief and Incision carved on the two broad faces. Face A bears an interlace- filled edge moulding and filled with an equal-armed cross on a shaft, filled with interlace, bosses and spirals. The field around the cross is filled with figural carvings, five either side, comprising animals, angels and a monster devouring a human. Face C is defined by a border of confronted serpent-like dragons with fish-tails. Their tongues lick a human head between them. Two seated figures look at each other across a small, free-standing cross, above are Pictish symbols – beast, double-disc and crescent with v-rod. Below is a large rider, no weapons, beside him a further beast and crescent with v-rod, below that a hammer, anvil and tongues.	Church – monastic? Allen records its name as the 'Priest's Stone', which Dixon refutes. There is also some confusion whether it always stood at Dunfallandy or was moved from Killiecrankie.	8/9th C. AD	Sandstone	Stuart 1856: 15, pls. 47-8; ECMS ii: 268-69; Reid 1912: 395-6; Mitchell 1923: 78; Dixon 1925: 92-93, 96-7; Henderson and Henderson 2004: 46, 77-8, 152-3, illus 49.
10. Dun Beag / Chapelton, Faskally	**DB1**: Medium-sized cross-slab, relief-carved on both faces with a plain cross, cut with trefoil hollow angles. Allen (in ECMS) records a warrior at the base of the shaft on the western face, but later writers (incl. Dixon) say this is not visible.	Ecclesiastical/monastic Known as the Clach-na-Taggart, or 'Priest's Stone' or the 'Chapel Stone'. Stands beside roadside above Loch Faskally, a few metres away from the ruins of Dun Beag chapel.	10/11th C. AD	Mica-slate	ECMS ii: 343; Reid 1912: 392 -3; Dixon 1925: 92-4.
11. Old Faskally, Killiecrankie	**Ki1**: Within the church a recumbent stone with rounded off ends is cut with three crosses in a row, of roughly equal-armed form and plain. **Ki2**: A slab with incised carvings is re-set as a lintel over the S doorway. Carvings include a plain Latin cross on one of its short sides. **Ki3**: a slab between the S doorway and the E gable, incised with a further Latin cross with extended shaft and two symbols (Alpha and Omega). **F4:** fragment of recumbent cross slab with incised cross surviving as lower shaft and outline of base.	Church – Monastic? A large prehistoric burial mound (a 'sithean') crowned by chapel ruins with internal burials	9-11th C. AD	Sandstone and schistose	Stuart 1856: pl. 47; ECMS ii: 286-89; Dixon 1925: 96-7; Robertson 1991a: 72.

Place	Sculpture	Site context	Date	Geology	References
12. Struan, Blair Atholl	**St1**: Near-complete slab incised with the double-disc and Z-rod symbol, a possible second symbol is too heavily worn to identify. **St2**: Large slab incised with a simple linear cross on each of its narrow faces. **St3**: Tapering slab carved with an equal-armed cross with rounded terminals.	Since the 1960s St1 has been clamped to chancel north wall; the cross incised stones are erect in the churchyard or built into the later churchyard wall. The church is dedicated to St Fillan, with an early medieval handbell dedicated to him (see Table 2) and a probable assembly mound close by.	7-8th C. AD	Schistose-slate	Laing 1868; Gow 1890: 383-5; ECMS ii: 343; Hall 2004; Bourke 2021: no. 72, 377-8.
13. Tullypowrie	**Tp1**: Rectangular slab with simple incised cross on each broad face. The west face cross-head has rounded corners, with circular arm-pits and similar circles defining the foot of the cross. Shaft divided in 2 by an incised line. The other cross, on the east face, is roughly equal-armed with round cups defining the arm-pits and the top and bottom of the shaft; two further depressions below bottom of shaft. No socket and the cross leans against another stone and is supported by smaller stones.	Said to relate to the remains of a chapel but this may be an illusion created out of the remains of a hamlet with mill on the Tullpowrie Burn. The cross may be a boundary marker for Dull monastery.	8th C. AD (?)	Schistose	Anon. 1901: 77-8, fig. 12; Dixon 1925: 95.
14. Shenavail / Tominteold/ Meall Rawer	A small, shaped boulder which bears on one face cup and ring marks and on the other a plain cross with rounded terminals to all the arms.	Originally found on Meall Rawer summit above Weem amidst a cluster of prehistoric cairns and cup-marked stones. Found by owner of Shenavil Farm in late 1950s and recorded in Tominteold farmyard; was in Weem by the 1980s then donated to Perth Museum. Probable boundary marker for Dull monastery. Perth Museum reg. no. 1985.105.	7-10th C. AD	Sandstone	Dunbar 1956: 446, pl. 65.

Place	Sculpture	Site context	Date	Geology	References
15. Dull (including Weem and Camserney)	**Du1**: Relief carved upper portion of a panel, with two-armed horseman following ranks of foot soldiers, with 2 dogs, all moving left. The most complete foot soldiers carry round shields. **Du2**: Portion of cross-slab with r/h edge missing carved with a cross with rectangular terminals and small, rounded armpits. **Du3**: Broken and worn cross-slab, bearing an incised cross, the upper arm and shaft cut as a single element, suggesting a timber cross. The whole cross seems to have been set within a pecked circle. **Du4**: Slightly tapering slab with a small incised cross within a circle above a deeply incised linear cross with a hollow at its centre. **Du5**: Cross-slab: small, simple cross, carved in relief. **Du6**: Cross-slab incised with an outline cross with rounded armpits. **Du7**: fragment of inscribed cross-slab; incised cross with rectangular terminals and open rounded armpits, frame around the cross, across the upper arm and field is the Gaelic female name 'BECLI'. **Du8**: complete slab incised with simple, linear cross. **Du9**: cross-base in form of a natural D-shaped boulder cut with a deep rectangular slot to take a cross shaft or slab. **Du10**: A stout, crudely carved free-standing cross, southerly side arm missing, and northerly arm has a triangular terminal. Flat circular base overgrown. **Du11**: Monolithic cross with substantial shaft and upper arm, with less thick side arms. **Du12**: Monolithic cross with upper arm missing, bears a large central boss incised with an equal-armed cross with a hollow at the intersection of the arms. **Du13**: Lost monolithic cross, possibly the same as Weem 3. **Du14**: Stone balluan/font, battered and weathered. A large boulder shaped into a rough hexagonal form with large oval hollow. **Du15**: Broken mid-section of a recumbent cross-slab bearing an incised long shaft; reused in east gable of the church. **Du16**: Carved slab, exhibiting a panel of knotwork within roll-moulded borders.	All associated with the Church of St Adomnan, a Columban monastery founded from Iona by *c.* AD 700. Majority of stones discovered in churchyard, in near-by gardens and beneath the church. The majority appear to be burial markers including the inscribed 'BECLI' stone (Du7 Perth Museum reg. no. 2007.1.1). Du1 maybe part of a shrine or an architectural screen/frieze. Three of the crosses are traditionally identified as garth or boundary crosses of the monastery, Du10 stands in the village, whilst Du11 and 12 are housed in Weem Old Kirk. They were found in 19th C. in use as gateposts. A fourth such cross is missing. Du16 is built into a wall at Camserney Cottage – reused as a corner stone; it was found in 1971 built into the lint mill at Camserney and subsequently used in the restoration of the cottage. Probably originated at Dull, though Weem is also possible.	Late 7th - 9th C. AD	Sandstone and schistose	ECMS ii: 315 and fig. 329, 342; BAS 1962: 38; Macdonald and Laing 1970: 9 and 11; Robertson 1989: 64; Robertson 1991b: 71; Will *et al.* 2003; Taylor 1996: 101-2, 106; Taylor 1999: 40-43, 54-60, 68-9.

Place	Sculpture	Site context	Date	Geology	References
16. Weem	**W1**: Irregularly carved cross slab with a plain, relief-carved cross. Slightly expanded upper arm, rounded terminals to side arms. Base missing. **W2**: Irregularly shaped slab bearing a long cross-shaft carved in relief, head missing **W3**: Plain wide slab with small projecting side arms. **W4**: Roughly hexagonal basin/balluan/font carved from a boulder. **W5:** Socketed base, modified to serve as a splayed window opening. **W6:** frag. of a probably recumbent cross-slab reused as a lintel; one face is carved with panels of a beast, interlace, vinescroll and interlace, the zones defined by a triple-transomed cross with square angles.	Linked to the church of St Cuthbert, W1 is in the graveyard, W5 set in the lean-to extension of the north loft, the rest are housed in the kirk, apart from W6, reused as a lintel in near-by Lovatt Cottage. These pieces may relate to a putative early church in Weem or derive from Dull.	7/9th C. AD	Sandstone	Hall 2005c: 457-58; ID 25668.
17. Fortingall	**F1**: 2 upper fragments of a slender cross slab, on face A, a ringed cross with squared terminals and rounded armpits; cross filled with double-strand interlace, running spirals in the ring. Diagonal key pattern either side of the shaft. Face C bears two robed figures either side of a cross-shaft. Step pattern on the narrow faces. **F2**: Central portion of a thin cross-slab carved in relief on both faces with ringed cross-head. **F3:** Upper left-hand portion of a small ring-headed cross-slab with rounded top. Face A carries cross with rounded armpits and keypattern in the ring. **F4**: Recumbent cross-slab, incomplete, in 4 pieces; upper face carved with 3 conjoined equal-armed, ringed crosses, rounded armpits, continuous knotwork in arms and centre, double-strand twist in rings and triquetra knots between rings. **F5**: Recumbent cross-slab, tapers towards one end, where incised with simple cross with side arms slightly longer than upper and lower arms. The slab may originally have stood upright. **F6**: Recumbent slab, broken in two but complete. In the centre of the slab an incised cross with 3 transoms. The later initials, DMG added. **F7**: Recumbent cross-slab the upper face carved with two small equal-armed crosses, either side of an incised hatchet. **F8**: recumbent cross-slab broken in 2 but complete; separately and away from each other are carved a small, equal-armed cross and a ringed cross. **F9**: A recumbent slab broken into 3 pieces, with 3 recessed equal-armed Latin crosses. Far right cross has a teno depicted. **F10**: Recumbent slab carved with 3 recessed, equal armed Latin crosses. **F11**: Squarish fragment of a slab reused in a boundary wall. Incised cross in middle of slab. **F12**: Roughly hexagonally-shaped font/balluan carved from a large sandstone boulder; round bowl with a raised inner base.	Linked to the church of St Coeti of Iona, F1-3 found in walls of medieval church demolished in 1832 at the same time one fragment of F4 was found built into wall of thatched cottage beside church. The remainder were found in the churchyard or the boundary wall. F5 used as threshold for kirkyard gate until *c*. 1998.	7-10th C. AD	Sandstone and schist	ECMS ii: 508-10; Robertson 1997; Hall *et al.* 2004: 104-5; Taylor 1999.

Place	Sculpture	Site context	Date	Geology	References
18. St Adamnan's Cross, Glen Lyon	Small upright slab with an incised plain cross on either side.	Sits atop a natural mound called Tom a Mhoid ('assembly hill/ mound') and close beside Caslorg Pheallaidh ('the footmark of Peallaidh'), on Craigieannie, both linked by tradition to St Adamnan delivering the Glen from plague.	8/9th C. AD	Sandstone	Campbell 1888: 319; Watson 1926: 271; Busset and Evemalm-Graham 2020: 83-87; Busset *et al.* 2020: 160.
19. Cladh Bhranno, Kerrowmore, Glen Lyon	Dressed slab with plain incised cross, shaft long and narrow with arms four times as broad as shaft. Possibly overlying an earlier cross orientated in the opposite direction. Small, plain font/balluan.	In the ancient burial ground of St Brandon; chapel ruinous. For associated bell see Table 2, no. 22.	8/9th C. AD	Sandstone	Watson 1926: 312; Robertson 1991c; Busset *et al.* 2020: 160; Busset and E-Graham 2020: 92-98.

Table 2: Early medieval portable antiquities in the Dunkeld region

Place	Material	Site context	Date	References
1. Little Dunkeld	Copper alloy early medieval monastic handbell.	Long historical association with Little Dunkeld parish church (since 1866). May link to activity in Dunkeld under patronage of Constantine/Cinnead. Also early saint dedications in Little Dunkeld including Ewen and Ernene.	9-10th C. AD	Anderson 1889; Bourke 1983: 466; Clouston 1992: 492, illus 40; Bourke 2021: 422, no.122; Hall *et al.* 1998: 138.
2. Dunkeld (area)	Copper alloy ringed pin with dot ornament.	Casual find in the Dunkeld area, no secure provenance. NMS reg. no. X. FC 235.	9-10th C. AD	Grieg 1940: 157, fig. 73; Fanning 1983: 338, no. 29; Hall *et al.* 1998: 138.
3. Black Hill House, Caputh	Copper alloy pin with racquet-shaped head and ring-and-dot decoration.	Casual garden find in 1921 at Black Hill House. NMS registration no. X.FC 234.	9-10th C. AD	Anon 1922: 19; Maldonado 2021: 92, fig. 4.30; Hall *et al.* 1998: 138.
4. Loch Clunie	Two complete and one fragmentary penannular brooches. The larger is of silver-gilt, with expanded, rounded terminals, each with 3 zoomorphic lobes, the smaller is of cast silver with zoomorphic and interlace decoration. Of silver gilt, comprising a terminal hoop with 3 zoomorphic lobes and red glass stud.	The two complete brooches were found in unclear circumstances in the late 19th C., near Clunie Castle on the shore of Loch Clunie. The fragment was a metal-detector find of the early 1990s. NMS registration nos. X.FC 176 and 177; X.1993.7.	8-9th C. AD	Youngs 1989: 114-15, illus 109-10; Henderson and Henderson 2004: 103-07; Blackwell *et al.* 2018: 113, fig. 9.12; Maldonado 2021: 84, fig. 4.16-17.
5. Balmacolly, Bankfoot	Section of silver ring money decorated on two faces with punched, floral motifs; found with an irregular disc or splash of silver.	Metal-detector finds. Perth Museum registration no. 2016.35.1-2.	10th C. AD	Maldonado 2021: 142-3, fig. 6.23.
6. Cargill Mains, Cargill	Enamelled (yellow) copper alloy mount of square form with swastika design. Plain back has a stub of a rounded attachment lug.	Metal-detector find. Perth museum registration no. 2004.106.	8/9th C. AD	Hall 2007a: 72.

Place	Material	Site context	Date	References
7. Cambusmichael	Enameled mount with central round cell within field of 8 smaller cells; enamel is a decayed yellow colour; 4 broken circumferential lugs suggest use as a harness fitting; a filed-off central lug on the back suggests reuse as a pendant. Found with a fragment of a copper alloy, penannular brooch, comprising part of the loop element and an expanded terminal of three zoomorphic lobes.	Metal-detector finds beside Cambusmichael Chapel. Perth Museum registration no. 2005.58 and.59.	8/9th C. AD	Hall 2007a: 70-72.
8. Upper Gothens	Tinned, iron buckle of rectangular form with slightly concave long sides, very poor condition. Excavation report leans to a stray loss of later medieval/post medieval date.	Excavated from a ditched and palisaded enclosure – specifically fill from a posthole of a timber structure adjacent to inner face of palisade; upper fill radiocarbon dated to AD 1040-1259. Earlier phase of site dated to AD 885-1024. Perth Museum registration no. 2003.39.3	11-12th C. AD	Barclay 2001: 38, 40-1; Hall 2007a: 77.
9. Stanley	Almost complete Northumbrian, silver strap end with zoomorphic decoration; damage has largely removed roundel bearing a possible cross design at strap connection end.	Metal-detector find. Perth Museum registration no. 2016.34	8-9th C. AD	Thomas 2000: 69-88 (for the type).
10. Redgorton	Disc-headed, copper alloy dress pin, badly corroded but with probable decoration on the head.	Metal-detector find. Perth Museum registration no. 2016.62	8-10th C. AD	
11. Kinclaven	Open-socketed, iron spearhead. Slender, leaf-shaped blade with midrib. Upper portion of blade missing and socket damaged. Fragment of ash wood shaft inside socket.	Casual find in the silts of the river Tay, opposite Kinclaven Castle. Perth Museum reg. no. 1991.55.	11-12th C. AD	King 1991: 72; ScARF 2022.
12. Logierait	Almost complete copper alloy strap end, with zoomorphic decoration with a roundel containing a cross motif. Broken at strap connection point. Thomas type A2b.	Metal-detector find. Perth Museum registration no. 2016.33	8-9th C. AD	Thomas 2000: 89, 200, 238 (for the type).

Place	Material	Site context	Date	References
13. Carn Dubh, Pitlochry	A small, pale watery blue, translucent annular glass bead, with a flat facet around one end of the bead hole. Copper alloy disc-headed pin with a fillet either side of the shank junction. Both faces of the head are decorated with a punched cross-in-circle motif. Shank bent at 45 degrees just above mid-point; tip missing.	Excavated at the complex of roundhouses of 1st millennium BCE. The bead, from a post-abandonment context of house 3, may date to late 1st millennium BC or 1st millennium AD. The pin came from post-occupation deposits above house 8 of mid-late 1st millennium AD. This and several later medieval objects are taken to suggest reoccupation (with no structural remains visible), field-middening or accidental loss. Cf. Aldclune. Perth Museum registration no. 1997.282.4 and.10	pin: 11-12th C. bead: 7th C. BC-9th C. AD	Rideout 1995; Henderson 1995: 151-3; Newman 1995: 155-57.
14. Pitlochry	Copper alloy dress pin with head split into two opposing loops, the shaft is broken, and the point lost.	Metal-detector find. Perth Museum registration no. 2018.98	Mid-8th-9th C. AD	
15. Queen's View, Loch Tummel	A coarse stone cup/lamp of hemispherical form, with a smaller hemisphere lug /handle, pierced with an hour-glass perforation. A translucent, yellow, glass bead, with slight flattening around the perforation.	Homestead excavation led by Dr Margaret Stewart in 1974. The cup was excavated from a small boulder pile over a depression in middle of southern sector of the homestead interior. The bead was excavated from a crevice in tumbled stones close to southern inner wall face of the homestead. Perth Museum registration nos. 1990.198.3 and .4.	cup: 7-8th C. AD; bead: *c.* 3-9th C. AD	Taylor 1990: 33, fig.6; Hoffmann 2013.
16.Tummel Bridge	Metalwork hoard comprising 3 silver, penannular brooches, 2 with unfinished punch decoration; a rim, base fragment and an openwork escutcheon from a large bronze bowl; 2 rim frags of a second, smaller bowl; and a fragment of rim and body from a small bronze, cup or tumbler.	Found some years before 1888 in the roots of a tree that had blown down at Tummel Bridge. The composition – fragmentary and unfinished – is taken to imply a craftsman's workinghoard. NMS registration nos. X.FC 162-164 (brooches); X.FC 165-170 (vessel frags, incl. escutcheon).	vessels: *c.* 500 AD; brooches: *c.* 6/7th C. AD	Anon. 1888: 268-9; Bruce-Mitford 2005: 323-7, no.117, 323-27; Blackwell *et al.* 2018: 109-11, fig. 9.7, 9.8.
17. Dull	Fused rouleau (broken into 4 parts) of silver Hiberno-Pennies, a minimum of 16 All appear to be phase II (c. 1020-1035) of the series, issued in Dublin.	Found close to the general site of Dull monastery through metal-detector use; hoard partially blackened through stubble burning. Bateson suggests they reflect Irish-connected monastic activity rather than, of necessity, Scandinavian activity.	*c.* 1025 AD (deposition)	Bateson 1993; Hall 2021: table 1 no. 37.

Place	Material	Site context	Date	References
18. Fortingall	Small, quadrangular iron bell with patches of bronze coating; modified handle. N.B. early medieval glass bead and other finds unpublished so details pending – Noble and Evans 2022, 161 summarises O'Grady 2011 (unpub.)	Historically associated with the church and first recorded in the manse in 1881. On display in the kirk until stolen c. 2017.	9th C. AD	Campbell 1888: 380-1; Clouston 1992: 482; Bourke 2021: no.75, 380, illus. C75.
19. Aldclune, Blair Atholl	Cast silver penannular brooch with rounded terminals, with studs of blue and amber-coloured glass and panels of gilded, imitation chip-carved decoration. Tip of pin missing. Also of interest, a split-socket iron spearhead which could equally be Roman Iron Age or mid-first millennium AD, and an iron strike-a-light of 6/7th c. AD.	Recovered during excavations of the ringfort complex of 2 roundhouses and a third, less well understood structure, generally dated to the late 1st millennium BC to early 1st millennium AD. The brooch came from post-occupation layers of house 1, thought to suggest later occupation or deliberate deposition at an abandoned site. The excavators considered the spearhead (from wall tumble of house 2) and strike-a-light to be in the same category (the latter possibly associated with a burial) – cf. Carn Dubh. NMS registration no. X.FC 304.	late 8th-early 9th C. AD	Stevenson 1985; Hingley *et al.* 1997: 436-9; Youngs 1989: 113, illus.108; Blackwell *et al.* 2018: 114, fig. 9.13.
20. Struan, Blair Atholl	Largely intact iron handbell with patches of copper alloy coating; damaged mouth and hole in body; handle loose.	Long historical association with church at Struan and cult of St Fillan (the church is dedicated to him) including a possible episode in Logierait. Struan has a symbol stone and three cross-marked stones and a possible assembly site. The bell is now in Perth Museum, registration no. 1939.3.	9-10th C. AD	Bourke 2021: no. 72, 377-78, illus. C72.
21. Glen Tilt, Blair Atholl	Long cist burial of a male aged 45+ and who appears to have grown up on the Western seaboard. The only find with the body, a pseudo quern stone of mica-schist, placed at the feet to close-off the cist.	Best surviving example of clutch of burials known from Blair Atholl – Pitlochry area. This example part of a long cist cemetery along the banks of the River Tilt.	5-6th C. AD (radiocarbon determination)	Reid and MacLaughlin 1987; Czére *et al.* 2021.
22. Innerwick and Cladh Bhranno, Kerrowmore, Glen Lyon	Intact iron handbell with patches of copper alloy covering remaining.	Formerly associated with the chapel and graveyard of Cladh Bhranno (and probably an earlier chapel before that). Donated to Perth Museum in 2020 (re. no. 2022.35).	9-10th C. AD	Anderson 1880: 102-3; Bourke 2021: 379-80; Busset and Evemalm-Graham 2020: 83-7.

Place	Material	Site context	Date	References
23. Balnahannaid, Fearnan	Substantial fragment of upper portion of iron handbell, handle missing, traces of bronze coating. Chance discovery in the late 19th C. of a cist included 3 neolithic stone Axes, one of them decorated with interlace. All 3 axes were probably buried as early medieval amulets.	The whereabouts of this bell are currently unknown. It was recorded in the late 19th C. and disappeared thereafter. Chance discovery and excavation suggests an early medieval cemetery here, one of the cists included in its make-up a sub-circular stone comparable to the pseudo-quern from Glen Tilt.	9-10th C. AD	Anderson 1880: 106-7; Bourke 2021: 378-9; MacKenzie 1901; Gillies 1938: 3-4, Atkinson 2016: 62-77; Sheridan 2016: 28.
24. Dalmarnock, Dalguise, Little Dunkeld	The bottom and rounded portion of an oak logboat. The results of a radiocarbon assay in 1975 were lost and a second assay was made in 2013 (SUERC 49562 – GU32183), giving a determination in the late 7th C.	Discovered during road construction works in 1975, across the haughland of the river Tay south of Dalguise village, immediately NW of Dunkeld. Moved to Mill Dam reservoir, Dunkeld, for long-term storage.	*c.* 670 AD	Mowatt 1996: 21-2; 1998: 32-3; Brookes 2015: 140.

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King's Seat, Dunkeld presents the results of community archaeology excavations, begun in 2015 and led by Perth and Kinross Heritage Trust working with AOC Archaeology Group. They revealed a high-status Pictish fort complex which, like the classic site Dundurn, had a summit citadel surrounded by a hierarchy of connected out-works on lower terraces. However, at King's Seat LiDAR data has now revealed a previously unknown southern enclosure, more than doubling its total footprint and raising questions about the role of such sites and the nature of Pictish settlement.

Controlling important routes from the north and west into the lower Tay region, King's Seat was a Pictish 'royal' stronghold, estate, and production centre which was to attract an important early monastic foundation. While the fort was relatively short-lived, it has produced evidence of specialist metalworking, trade, and feasting that saw the consumption of exotic luxuries including Continental imports. The relics of Columba were brought to Dunkeld in the 9th century, and it played a leading role in the history of the early church in Scotland. The name Dunkeld comes from the Gaelic *dùn Cailleann* or the 'fort of the Caledonians' undoubtedly referring to King's Seat. It is apt that this survival celebrates the link between later prehistory and medieval Scotland, which is so well represented by the early church and later cathedral.

David Strachan has over 35 years' experience of curatorial field archaeology in Wales, England, and Scotland, working at both national and county level. As 'county archaeologist' with Perth and Kinross Heritage Trust over the last 25 of these, he has led several research projects, often delivered through community archaeology. These include the recovery of the Late Bronze Age Carpow logboat, excavation of early medieval longhouses in the uplands of Glen Shee, and Iron Age forts around the Tay estuary, also published by Archaeopress.

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