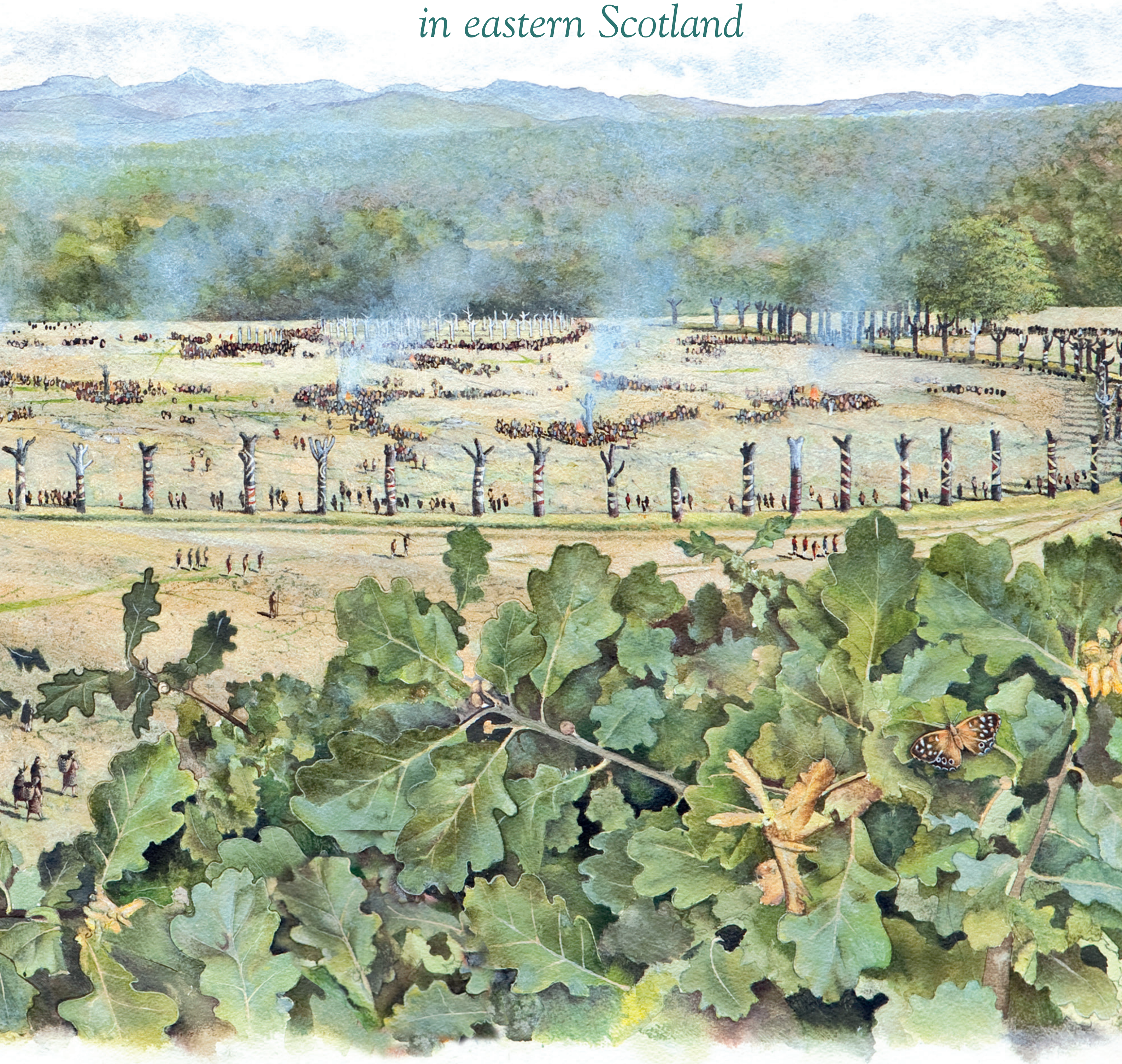
Prehistoric Forteviot

excavations of a ceremonial complex in eastern Scotland



KENNETH BROPHY AND GORDON NOBLE

PREHISTORIC FORTEVIOT: EXCAVATIONS OF A CEREMONIAL COMPLEX IN EASTERN SCOTLAND

SERF MONOGRAPH 1

Kenneth Brophy and Gordon Noble

with contributions from Iraia Arabaolaza, Angela Boyle, Esther Cameron, Ewan Campbell, Trevor Cowie, Anne Crone, Stephen Driscoll, Meggen Gondek, Aoife Gould, Pieta Greaves, Allan Hall, Derek Hamilton, Eva Hopman, Heather James, Ana Jorge, Matt Knight, Stephany Leach, Cathy MacIver, Jennifer Miller, Kirsty Millican, Stuart Needham, Peter Northover, Sonia O'Connor, Gert Petersen, Tessa Poller, Susan Ramsay, Alan Saville†, Alison Sheridan, Chris Standish, Denise Telford, Annelou van Gijn, Neil Wilkin, Lyn Wilson, Dene Wright, and Rebecca Younger

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Front cover: David Simon's reconstruction drawing of the Forteviot Neolithic palisaded enclosure
Back cover: (left) visualisation of the dagger grave at Foreteviot by Alice Watterson
(right) the Forteviot Bronze Age dagger

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This monograph is a collaborative project and individual contributions are acknowledged throughout the text. The individuals listed below, and other colleagues, especially Ewan Campbell, Stephen Driscoll, Tessa Poller (all University of Glasgow), and Dene Wright, contributed much to the overall project and helped form the ideas developed here. The authors are aware of the considerable debts owed to these contributors who, in some cases, have driven the research in directions that we had not anticipated. We are also aware that in utilising their contributions we have not always been able to retain the depth, detail, and nuance of the original contribution. We have done our best to avoid misrepresenting their work or introducing error, and subsidiary publications in some cases better reflect the contributions of some on this list. We are in their debt.

We would like to pay a special tribute to one of our contributors, Alan Saville of National Museums Scotland, who passed away during the writing of this book. It was a privilege to work with him.

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The excavations documented in this book were, for the most part, directed by Gordon Noble and Kenneth Brophy, although the double ring-ditch site excavations in 2010 were directed by Meggen Gondek and Heather James. Other sites in the Forteviot environs were excavated under the direction of colleagues including Ewan Campbell (early medieval cemetery and within Forteviot village), Tessa Poller (hillforts), Adrián Maldonado (Forteviot churchyard), and Stephen Driscoll (Forteviot churchyard and within the village). Our principal Site Supervisor, Dene Wright, trained a generation of students in excavation technique, on some very unforgiving gravel surfaces. He was assisted by several able supervisors: Cathy MacIver, Alison Kyle, Aoife Gould, Kevin Grant, Martin Goldberg, Kirsty Millican, Nicola Reid, and Rebecca Younger. During the course of the excavation, scores of students from the universities of Glasgow, Aberdeen, and Chester worked on SERF excavations, and their help and labour are very much appreciated. Numerous volunteers helped too, some from the local area, others with the Association of Certificated Field Archaeologists (ACFA), and their experience and good humour very much added to the experience for everyone.

Topographic survey was undertaken by Lorraine McEwan and Jeremy Huggett. Paul Johnstone and John Malcolm undertook early geophysical surveys, Tessa Poller the later work, and Tessa also liaised with SENSYS for their large-area geophysical survey in 2015. Gert Peterson and Rupert Housley provided technical support and undertook the flotation of samples. Many students helped with post-excavation processing. We value the intellectual and technical contributions on aerial photographic matters from Dave Cowley, Kirsty Millican, and Kevin McLeod of RCAHMS (now HES) who provided both reconnaissance images of our excavations from the air, and transcriptions. Michael Smith of Flying ScotsCam provided low-level aerial photographs of the excavations in progress using balloons and a drone.

We are fortunate to have enjoyed a positive and productive relationship with Historic Scotland, latterly Historic Environment Scotland, whose helpful oversight of the project allowed it to flourish for more than a decade. The advice and support we received was consistently knowledgeable and well-intentioned. We would like to thank in particular Kevin Grant, Candice Hatherley, Rebecca Jones, Oliver Lewis, Rod McCullagh, and Iona Murray. We benefited from local knowledge and help with recruiting and co-ordinating local volunteers by the team at Perth and Kinross Heritage Trust: David Strachan, Sophie Nicol, Stephen Timoney, and Sarah Winlow. Throughout the project Perth Museum and Art Gallery provided regular opportunities for the SERF team to present their work to the public, not least agreeing to co-sponsor the *Cradle of Scotland* exhibition. In all of this Mark Hall proved the ideal colleague, willing to engage in the research and providing unfailing access to the museum.

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Images are mainly the work of Lorraine McEwan, with reconstruction drawings by David Simon and Alice Watterson. Finds were drawn by Marion O'Neil, and artefact photographs taken by Pablo Llopis. The excavation and landscape photographs were taken by a range of team members unless otherwise credited. Rebecca Younger helped greatly in the gathering together of images for the book, notably from the extensive SERF photo archive. Image credits and copyright information are in the captions for each image, and we are grateful to all of those who allowed us permission to reproduce and/or update illustrations. The *Cradle of Scotland* exhibition, which showcased many of the key Forteviot discoveries, was largely curated by Mark Hall and SERF team members, notably Heather Christie who worked on the creation of the virtual exhibition website of the same name. Replica prehistoric objects featured in the exhibition and in the pages of this book were made by Neil Burridge and Mark Vyvyan-Perry. Many of the prehistoric objects discussed in this book would not have survived to appear in this exhibition had it not been for the amazing conservation work undertaken by Pieta Greaves and AOC Archaeology Ltd both during and in the months after our excavation of the dagger burial in 2009. This work was generously funded by (then) Historic Scotland, as was a symposium held in the University of Glasgow in 2010 to focus on the post-excavation programme of work based around this spectacular find.

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On a more personal note, we would like to thank our families for their patience and support over many, many years of SERF fieldwork, SERF research, and SERF writing up!

Summary

This monograph (SERF 1) is the first in a series that reports on the Strathearn Environs and Royal Forteviot Project (SERF), a landscape-scale archaeology project in eastern Strathearn, Perth and Kinross, Scotland, UK. The project was managed by the University of Glasgow and largely funded by Historic Environment Scotland (HES), with fieldwork carried out in 2006–2017. The SERF Project investigated the long-term trajectory of land use around the small modern-day village of Forteviot and in the wider environs. Evidence, untested by excavation before the SERF Project began, suggested that this was a place that had been a major prehistoric ceremonial centre, and was, millennia later, the site of the palace of Cináed mac Alpín, king of Picts (d AD 858). The hypothesis that connections had been made across this vast period of time was a major rationale for the SERF Project.

The significant body of evidence in relation to both prehistoric and early medieval Forteviot is an extensive cropmark complex first identified in the 1970s by J K St Joseph of Cambridge University. Since then, repeat sorties by the former Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), now HES, have documented a wide range of enclosures, burial monuments, and other features in the fields to the south of Forteviot. This monograph reports on a series of major excavations that took place between 2007 and 2010 on elements of the cropmark complex, concentrating on the prehistoric evidence. Early medieval and later activity in the area is discussed in depth in SERF 2, *Royal Forteviot*.[1] The two monographs should be viewed as complementary to one another.

Seven large trenches were opened over cropmark sites across four seasons of fieldwork, part of the largest programme of excavations carried out in Scotland in recent years. This book reports on work at the following sites: the Forteviot palisaded enclosure, Henges 1 and 2, and a double ring-ditch enclosure. These excavations were underpinned by an extensive radiocarbon dating and post-excavation programme.

The palisaded enclosure is the largest element of this complex, being up to 265m across, with interior area of some six hectares. This monument was constructed in the 28th to 26th century cal BC (the late Neolithic), from large oak posts set within substantial ramped postholes. These posts could have been up to 6m long, of which over 4m would have been above ground surface. Posts were spaced up to 2m apart; no evidence was found for smaller posts in between, suggesting a free-standing post boundary, although there may have been an earthwork component. The posts do not appear to have been maintained or repaired and thus probably rotted over a period of several generations. Entrance seems to have been controlled by a long narrow entrance avenue, and at least one living tree may have been part of this avenue.

Multiple cropmarks have been recorded within the palisaded enclosure, the most substantial of which is Henge 1, which appears to have been a pivotal location in the complex. The first evidence we have for activity here was a cremation cemetery, in use around and just after 3000 BC, for the burial of at least eighteen people, including adults and children. The location was subsequently enclosed in the following centuries by a timber circle and then henge earthworks. A Class 1 henge was constructed in the second half of the third millennium cal BC, the Chalcolithic. Fills within the ditch suggest periods of waterlogging and silting, punctuated by deposition of burnt materials including soil and turf. In the 21st century BC a large stone cist was inserted into the henge interior; this contained a probably male burial, buried with a large quantity of meadowsweet flowers, a fire-making kit, two daggers, and two wooden bowls. The cist was covered by a massive sandstone capstone with an enigmatic carved motif on the underside, and a cairn.

Henge 2, outside the palisaded enclosure, also has a complex biography. In the late Neolithic, a series of posts were erected here although the nature of this setting remains unclear. A ditch and bank were added around the same time as the construction of the Henge 1 earthworks. Towards the end of the 3rd millennium, or early 2nd millennium BC, the single

henge entrance was dug away, creating a continuous ditched boundary. This may have been related to the insertion of a Food Vessel and cremation burial into a small cist within the henge interior. Henges 1 and 2, therefore, both appear to have been converted into burial monuments in the Bronze Age.

A third circular enclosure, a double ring-ditch, also outside the palisaded enclosure, was investigated. This was a fenced enclosure associated with a standing stone, and with an interior double cist, probably dating to the late Neolithic. This was followed by the insertion of a Beaker pit burial into the monument interior, and a third compartment was added to the cist. This monument probably had the appearance of an earthen barrow.

These monuments all showed evidence of interventions in the early medieval period. Massive pits were dug into the centre of Henges 1 and 2, and it is probable that prehistoric materials were disturbed or even removed during these crude investigations into the earthworks. The triple cist appears to have been disturbed around this time, and evidence was identified for cremation pyres of early medieval date in and around the ruins of the palisaded enclosure.

This monograph explores the regional and broader implications of these discoveries and contextualises them within current discourse. Themes discussed include the emergence, construction, maintenance, and decline, of major late Neolithic ceremonial centres; Neolithic wooden monumentality; palisaded enclosures and henge monuments; late Neolithic and early Bronze Age funerary practices; and social change in the 3rd millennium BC.

Tangible evidence of a connection between the prehistoric ruins and the establishment of an early medieval royal centre at the same location is a significant discovery which suggests the seeds of the royal seat of Forteviot were sown thousands of years before.

1 Campbell, E & Driscoll, S T 2020 *Royal Forteviot: excavations at a Pictish power centre in Strathearn, eastern Scotland*. CBA Res Rep **177**. York: Council for British Archaeology

Résumé

Cette monographie est le premier volume (SERF 1) d'une série de rapports concernant le site royal de Forteviot et ses environs dans la vallée de la rivière Earn (Strathearn Environs and Royal Forteviot, ou projet SERF), une étude archéologique du paysage de Strathearn (Perth and Kinross) en Écosse. Le projet, géré par l'Université de Glasgow et en grande partie financé par les autorités responsables du patrimoine écossais (Historic Environment Scotland, HES) fit l'objet de travaux de terrain entre 2006 et 2017. Le but du projet SERF était de mener une enquête rigoureuse sur l'usage à long terme des environs immédiats du petit village actuel de Forteviot et de son paysage. Les témoignages à disposition, mais non vérifiés en fouille avant le début du projet SERF, indiquaient que ce site avait été un important centre cérémoniel préhistorique et que, des millénaires plus tard, il avait été le site du palais de Cináed mac Alpín, roi des Pictes (mort en 858 apr. J.-C.). L'hypothèse que des liens existaient entre ces deux évènements sépares par un laps de temps immense était à la base du projet SERF.

Un complexe de vestiges révélés en prospection aérienne constitue un ensemble d'indices importants concernant tant les époques préhistoriques que le haut Moyen Âge à Forteviot. Les premières prises de vue de J.K. St Joseph de l'Université de Cambridge datent des années 1970. Depuis, des sorties répétées de l'ancienne Commission Royale des Monuments Anciens et Historiques d'Écosse (RCAHMS, aujourd'hui HES) ont documenté une série d'enclos, d'enceintes, de monuments funéraires et d'autres structures dans les champs au sud de Forteviot. Notre monographie fait

état de plusieurs fouilles d'envergure menées entre 2007 et 2010 visant certains éléments du complexe révélés par les photos aériennes, en particulier les données concernant le site préhistorique. Les activités du haut Moyen Âge et plus récentes font l'objet d'une seconde monographie (SERF 2, *Royal Forteviot*[1]). On aura avantage à consulter ces deux monographies en tandem.

Pendant les quatre campagnes de fouilles annuelles, on ouvrit sept grandes tranchées sur les vestiges révélés en prospection aérienne ; celles-ci constituent le plus vaste programme de fouilles entrepris récemment en Écosse. Notre volume concerne les fouilles conduites sur les sites suivants : l'enceinte palissadée de Forteviot, les « henges » (monuments circulaires) 1 et 2, ainsi qu'un enclos circulaire à double fossé. Ces fouilles ont été suivies par un important programme de datation radiocarbone et d'analyses post-fouilles.

L'enceinte palissadée, d'une largeur maximum de de 265 m et couvrant une surface d'environ six hectares, constitue le plus vaste élément du complexe. Ce monument, construit au cours des vingt-huitième et vingt-sixième siècles cal BC (Néolithique Final) consiste en de robustes poteaux de chêne enfoncés dans de grands trous de poteaux à rampe. Ces poteaux pouvaient atteindre une longueur de 6 m, dont 4 m dépassaient de la surface du sol ; l'espace entre ces poteaux mesurait 2 m. Aucune trace de poteaux plus petits n'a été retrouvée dans ces intervalles, ce qui suppose une palissade autonome, qui aurait cependant pu incorporer une levée de terre. Les poteaux n'ont apparemment pas été entretenus ou réparés et se sont décomposés au cours de plusieurs générations. Un long passage en forme d'avenue étroite, incorporant au moins un arbre vivant, semble avoir formé l'entrée de l'enceinte.

De nombreuses traces visibles en prospection aérienne ont été relevées à l'intérieur de l'enceinte ; la structure la plus importante était un monument circulaire (Henge 1) qui parait avoir occupé une position pivotale dans le complexe. Les premiers indices d'activité appartiennent à un cimetière à incinération en usage autour de 3000 cal BC ou juste après comprenant au moins dix-huit individus adultes et juvéniles. Au cours des siècles suivants, un cercle de poteaux vint encercler le locus, suivi des levées de terre du monument. Un monument de type « henge » de première classe (« class 1 henge ») fut ensuite construit au Chalcolithique, pendant la seconde moitié du troisième millénaire BC. Le remplissage du fossé indique des phases contenant des sédiments saturés d'eau et envasés, entrecoupées par des couches contenant du matériel brûlé et des mottes de terre et d'herbe. Au vingt-et-unième siècle BC, on aménagea une grande tombe à ciste à l'intérieur du monument circulaire ; elle contenait un adulte, probablement mâle, accompagné d'une grande quantité de fleurs de reine-des-prés, d'un allume-feu, de deux poignards et de deux écuelles en bois. La ciste était recouverte d'une dalle en grès massive exhibant un motif gravé énigmatique sur sa face inférieure et d'un cairn.

Le second monument circulaire (Henge 2), en dehors de l'enceinte palissadée, possède également une séquence complexe. Au Néolithique Final, une série de poteaux fut érigée mais sans qu'on puisse déduire la fonction de cette structure. Un fossé et une levée de terre ont été ajoutés, à peu près en même temps que les levées du premier monument circulaire (Henge 1). Vers la fin du troisième millénaire ou au début du second millénaire BC, on ferma l'entrée unique du monument en creusant un fossé continu. Il se peut que cet acte soit lié à l'insertion d'une petite sépulture à incinération dans une ciste accompagnée de vaisselle de type Food Vessel à l'intérieur du monument. Les deux monuments circulaires (Henges 1 et 2) semblent donc avoir été transformés en monuments funéraires à l'âge du Bronze.

La fouille d'une troisième enceinte circulaire à double fossé, également en dehors de l'enceinte palissadée, a révélé un enclos associé à une pierre dressée. Une ciste double à l'intérieur date probablement du Néolithique Final. Une sépulture en fosse d'époque campaniforme a ensuite été insérée et un troisième compartiment ajouté à la ciste. Ce monument était sans doute recouvert d'un tumulus.

Ces monuments furent réaménagés durant le haut Moyen Âge en creusant de très grandes fosses au centre des monuments circulaires 1 et 2 ; le matériel préhistorique a fort probablement été redistribué ou même éliminé pendant ces explorations sommaires des ouvrages de terre. La triple ciste semble avoir été ouverte à cette époque, et des traces de bûchers servant à des incinérations du haut Moyen Âge ont été relevées à l'intérieur et autour de l'enceinte palissadée.

Notre monographie contient une étude des ramifications plus larges de ces découvertes et d'une mise en contexte dans l'état actuel de nos connaissances. La discussion porte sur l'émergence, la construction, l'entretien et le déclin d'importants centres cérémoniels du Néolithique Final, sur l'usage du bois dans les monuments néolithiques, sur les enceintes palissadées et monuments circulaires de cette période, ainsi que sur les pratiques funéraires du Néolithique et de l'âge du Bronze Ancien et les transformations sociales du troisième millénaire BC.

Les preuves concrètes d'un lien entre les ruines du complexe préhistorique et l'établissement d'un centre royal au haut Moyen Âge au même endroit constituent une découverte importante qui suggère que le siège royal de Fortevient tire ses racines dans un monument construit des millénaires avant.

1 Campbell, E & Driscoll, S T 2020 *Royal Forteviot: excavations at a Pictish power centre in Strathearn, eastern Scotland*. CBA Res Rep **177**. York: Council for British Archaeology.

Zusammenfassung

Dieser Band (SERF 1) ist der erste in einer Reihe von Monografien, die über das Strathearn Environs and Royal Forteviot (SERF) Projekt berichten, eine archäologische Untersuchung der Landschaftsarchäologie des östlichen Tals des Flusses Earn (Perth and Kinross) in Schottland. Das Projekt wurde von der Universität Glasgow geleitet und weitgehend vom schottischen Bodendenkmalpflegeamt (Historic Environment Scotland, HES) finanziert. Die Feldarbeiten wurden zwischen 2006 und 2017 durchgeführt. Das Ziel des SERF Projekts war, den langfristigen Verlauf der Landnutzung innerhalb und rund um das heutige Dorf Forteviot und seine Umgebung zu untersuchen. Die Angaben, welche vor dem SERF Projekt durch Ausgrabungen nicht erprobt waren, ließen darauf schließen, dass die Fundstelle ein wichtiges urgeschichtliches zeremonielles Zentrum bildete und, Jahrtausende später, die Stätte des Palasts von Cináed mac Alpín, König der Pikten (im Jahre 858 n. Chr. gestorben), war. Grundlegend war die Hypothese, dass es Zusammenhänge zwischen diesen sehr langen Zeitabständen gab.

Wichtige Hinweise über den umfangreichen urgeschichtlichen und mittelalterlichen Komplex von Forteviot bieten die Luftaufnahmen, die erstmals in den 1970er Jahren von J.K. St Joseph (Universität Cambridge) aufgenommen wurden. Seitdem hat die ehemalige königliche Kommission für Bodendenkmäler von Schottland (Royal Commission on the Ancient and Historical Monuments of Scotland, RCAHMS, heute HES) mehrere Anlagen, Einfassungen, Grabdenkmäler und andere Strukturen wiederholt durch Luftaufnahmen vermessen. Die vorliegende Monografie berichtet über verschiedene umfangreiche Ausgrabungen, die zwischen 2007 und 2010 durchgeführt worden sind, und welche Abschnitte des in den Luftaufnahmen erkennbaren Komplexes betrafen. Der Bericht umfasst die urgeschichtlichen Nachweise, während eine zweite Monografie (SERF 2, *Royal Forteviot*[1]), die frühmittelalterlichen und späteren Angaben in Forteviot und Umgebung bespricht. Die beiden Monografien ergänzen sich also.

Sieben große Schnitte wurden in den Bereichen, wo Spuren in den Luftaufnahmen erkennbar waren, angelegt und während vier jährlichen Grabungskampagnen ausgegraben. Diese Ausgrabungen bilden das umfangreichste Grabungsprogramm, das in den letzten Jahren in Schottland stattgefunden hat. Die Monografie betrifft die folgenden Fundstellen: die Palisadeneinfriedung von Forteviot, zwei Kreisanlagen (Henges 1 und 2) und eine doppelte Kreisgrabenanlage. Ein ausführliches Bewertungs- und Radiokarbondatierungsprogramm folgte diese Feldarbeiten.

Die Palisadeneinfriedung ist der größte Bestandteil des Komplexes; sie ist bis 265 m breit und umfasst eine Fläche von ungefähr sechs Hektaren. Das Denkmal wurde im Spätneolithikum, im achtundzwanzigsten bis sechsundzwanzigsten Jahrhundert v. Chr. (cal BC) errichtet und bestand aus massiven Eichenpfosten, welche in großen gerampten Pfostenlöcher festgehalten waren. Diese Pfosten konnten bis 6 m lang sein, wobei 4 m davon über den Boden ragten. Die Pfosten hatten einem Abstand von 2 m und keine Spuren von

kleineren Pfosten wurden dazwischen entdeckt. Dies deutet darauf hin, dass es sich um eine unabhängige Umzäunung handelte, obschon es möglich ist, dass ein Erdwerk dazu gehörte. Die Pfosten wurden scheinbar nicht instandgehalten und verrotteten wahrscheinlich im Laufe von mehreren Generationen. Eine lange, schmale Zugangsallee mit mindestens einem lebendigen Baum bildete den Eingang.

Mehrere in den Luftaufnahmen erkennbare Befunde wurden innerhalb der Palisadeneinfriedung untersucht. Der größte davon ist die Kreisanlage 1 (Henge 1), die eine wichtige Rolle im Komplex spielte. Die ersten Angaben gehören zu einem Brandbestattungsplatz, der um 3000 v. Chr. (cal BC) oder kurz danach benutzt wurde und mindestens achtzehn Individuen (Erwachsene und Kinder) enthielt. Die Stätte wurde in den folgenden Jahrhunderten mit einer Kreisanlage aus Holz umzäunt und später mit den Erdwällen eines Kreisdenkmals versehen. Eine Kreisanlage erster Klasse („Class 1 henge") wurde in der zweiten Hälfte des dritten Jahrtausends v. Chr. (in der Kupferzeit) gebaut. Die Einfüllung des Grabens enthielt verschiedene Staunässe- und Verschlammungsschichten, mit zwischengelagerten Brandschichten mit Gras- und Erdklumpen. Im einundzwanzigsten Jahrhundert v. Chr. wurde eine große Grabkammer aus Stein im Inneren des Kreisdenkmals errichtet; sie enthielt eine wahrscheinlich männliche Bestattung und die Grabbeigaben bestanden aus vielen Mädesüßblüten, ein Feuerzeug, zwei Dolche und zwei Holzschalen. Die Grabkammer war mit einer massiven Steinplatte gedeckt (in welcher ein enigmatisches Muster auf der Unterseite graviert war) und von einem Steinhaufen überlagert.

Die zweite Kreisanlage (Henge 2) liegt außerhalb der Palisadeneinfriedung und weist auch einen komplexen Verlauf auf. Im Spätneolithikum wurde eine Reihe von Pfosten errichtet, dessen Funktion jedoch unklar bleibt. Ein Graben und Erdwall wurden ungefähr gleichzeitig mit dem Bau des ersten Kreisdenkmals zugefügt. Im späten dritten Jahrtausend oder frühen zweiten Jahrtausend v. Chr. wurde der einzige Eingang abgetragen und der Graben bildete eine ununterbrochene Grenze. Dies kann mit der Einfügung einer Brandbestattung und Keramik (von „Food Vessel" Typ) in einer kleinen steinernen Grabkammer innerhalb des Kreisdenkmals in Verbindung gebracht werden. Die Kreisanlagen 1 und 2 wurden also beide in der Frühbronzezeit als Grabdenkmäler umgebaut.

Eine dritte kreisförmige Einzäunung mit doppeltem Graben, ebenso außerhalb der Palisadeneinfriedung, wurde auch untersucht. De Einzäunung war mit einem aufrechtstehenden Stein vergesellschaftet und im Inneren stand eine doppelte Grabkammer aus Stein, die wahrscheinlich im Spätneolithikum gebaut wurde. Ein Grab, auch innerhalb der Einzäunung, folgte in der Glockenbecherzeit und eine dritte Kammer wurde der Grabkammer beigefügt. Vermutlich hatte das Denkmal den Aspekt eines Grabhügels.

Die Forteviot Denkmäler zeigen alle Spuren von Eingriffen im Frühmittelalter. Enorme Gruben wurden im Zentrum der Kreisanlagen 1 und 2 eingetieft und das urgeschichtliche Material wurde während dieser groben Aufsuchungen in den Erdwerken zerstreut oder sogar abgetragen. Die dreifache Grabkammer wurde ungefähr zu dieser Zeit gestört und Spuren von Scheiterhaufen von frühmittelalterlichen Brandbestattungen wurden innerhalb und rund um die Überreste der Palisadeneinfriedung entdeckt.

Die Monografie enthält eine Betrachtung der regionalen und weiteren Bedeutung der Entdeckungen und stellt sie in den Kontext des aktuellen Diskurses. Die Entstehung, Errichtung, Instandhaltung und Niedergang eines wichtigen neolithischen zeremoniellen Zentralorts, die Bedeutung von aus Holz gebaute Monumentalität, Palisadeneinfriedungen und Kreisanlagen, spätneolithische und frühbronzezeitliche Grabsitten und soziale Veränderungen im dritten Jahrtausend v. Chr. werden behandelt.

Der Beweis, dass es Zusammenhänge zwischen den urgeschichtlichen Überresten und der frühmittelalterlichen Stätte Forteviot an der gleichen Stelle gab, ist besonders bedeutend, da es darauf schließen lässt, dass die Wurzeln des königlichen Sitzes Tausende von Jahren zurückgehen.

1 Campbell, E & Driscoll, S T 2020 *Royal Forteviot: excavations at a Pictish power centre in Strathearn, eastern Scotland*. CBA Res Rep **177**. York: Council for British Archaeology

Geàrr-iomradh

Tha am monograf seo (SERF 1) a' chiad phàirt de shreath de dh'aithisgean a bhios a' toirt chunntas seachad air a' phròiseact *Srathearn Environs and Royal Forteviot Project (SERF).* Pròiseact àrc-eòlach aig sgèile cruth-tìr aig taobh an Ear Strath Earn, Peairt is Ceann Rois, Alba, RA. Chaidh stiùir a chuir air a' phròiseact le Oilthigh Ghlaschu is fhuair e maoineachadh sa mhòr chuid le Àrainneachd Eachdraidheil Alba, le obair practaigeach a' phròiseict a ghabhail àite eadar 2006 – 2017. Rinn am pròiseact *SERF* rannsachadh fad-ùineach air cleachdadh an fhearainn mun chuairt am baile beag ùr-nòsach Fothair Tabhaicht agus an t-àite timcheall air. Ro na measaidhean foirmeil aig SERF, bha fianais ann a bha na thaisbeanair gun deach an t-àite a chleachdadh mar phrìomh àite deas-ghnàthach. Mìle bhliadhna às dèidh seo, bha an t-àite ann mar lùchairt airson suidhe Cináed mac Alpín, Rìgh Cruinneach (d AC 858). B' e am beachd-bharail gun robh ceanglaichean ri lorg eadar an dà thìm seo na fàth-sgeul mòr airson a' phròiseict SERF.

Tha an stòras fhianais a bhuineas dhan linn ro-eachdraidheil agus an tràth ìre mheadhan-aoiseil am broinn comharra-barra ioma-fhillte a chaidh a lorg anns na 1970'n le J K Joseph, Oilthigh Camebridge. Bhon uair sin, chaidh iomadh rannsachaidhean eile a dhèanamh leis An Coimisean Rìoghail airson Carraighean Àrsaidh is Eachdraidheil na h-Alba (RCAHMS), a-nis Àrainneachd Eachdraidheil Alba (ÀEA/HES), a rinn clàradh air iomadh geàrraidh, carraighean-tòrraidh is nithean eile anns na h-achaidhean air taobh deas Fothair Tabhaicht. Tha am monograf seo ag aithris bho shreath de chladhaich chudromach a ghabh àite eadar 2007 agus 2010 air eileamaidean de na comharran-barra, is le cuideam ga chuir air an fhianais ro-eachdraidheil. Tha fianais bhon tràth ìre meadhan-aoiseil air a thoirt seachad gu mionaideach ann an SERF 2 *Fothair Tabhaicht Rìoghail.* Bu chòir dhan dà mhonograf a bhith air a leughadh mar dà phìos obrach ri chèile.

Chaidh seachd trainnsean fhosgladh thar làrach nan comharran-barra thairis air ceithir ràithean de dh'obair. Bha an obair arc-eòlais seo cuid den fhear as cudromaiche a chaidh a dhèanamh ann an Alba airson iomadh bhliadhna. Tha an leabhar seo ag aithris air obair bho na làraichean a leanas: An geàrraidh fhiodha mun cuairt Fothair Tabhaicht, Heinnsean 1 agus 2, agus lann le cuairt-dhìg dhùbailte. Chaidh bunait fhianais a chuir ris a' chladhaich le prògram fharsaing de dheiteadh rèidio-charboin.

Tha an geàrraidh fhiodha an eileamaid as motha den ionad, le meudachd a tha a' sìneadh gu ruige 265m thairis, le beàrn an urra ri 6 heactair na bhroinn. Chaidh an carragh seo a chruthachadh uair san 28mh dhan 26mh linn cal RC (Fadalach san linn nua-chreagach), le postaichean daraich suidhichte no bhroinn tuill mòra. Thathar a' smaoineachadh gum b' urrainn dha na postaichean a bhith 6m de dh'fhaid, le barrachd na 4m ag èirigh suas às an talamh. Bha beàrn de 2m eadar na postaichean ach cha deach lorg air postaichean nas lugha eadarra; rud a tha a' cur ris a' bheachd gun robh an crìoch fhiodha seo na sheasamh leis fhèin. Tha ma dh'fhaoidte ge-tà gun robh obair talaimh ann eadarra. Chan eil e coltach gun deach càradh a dhèanamh air na postaichean, is mar sin tha e dualtach gun deach milleadh orra rè ùine cuid ghinealaichean. Bha inntrigeadh air a chumail fo chois le trannsa caol is fada, agus bha co-dhiù aon chraobh a mhaireas fhathast na phàirt den inntrigeadh seo.

Chaidh iomadh chomharra-barran a chlàradh taobh a-staigh crìochan a' gheàrraidh fhiodha. 'S e Heinnse 1 am fear as cudromaiche, is tha e coltach gun robh e ann an àite chudromach taobh a-staigh an ionad. 'S e an cladh luath-chorp a' chiad fhianais a th' againn gun robh stuth a' tachairt an seo. Bha e air a chleachdadh mun àm 3000 cal RC is às dèidh seo cuideachd. Chaidh co-dhiù 18 daoine a chuir gu laighe an seo, a' gabhail a-steach inbhich is pàistean. Chaidh an ionad seo a chuir am falach rè ùine le cearcall fhiodha agus an uair sin obair talamh na heinnse. Chaidh togail de Heinnse clas 1 anns an dàrna leth den treasamh mìle bhliadhna RC, san linn *Chalcolithic.* Tha fianais anns an dìg a' sealltainn gun robh greisean far an tàinig uisge is eabar a-steach air, is gun robh amannan far an deach stuth loisgte a chuir ann mar ùir is fòid.

Anns an 21mh linn RC, chuireadh leac-chistean a-steach am broinn an heinnse. Thathar den bheachd gun robh duine air a thòrradh an seo le suim mhòr de lus chneas chù-chulainn, acainn-teinne, dà bhiodag is dà bhobhla fhiodha. Bha an leac-chistean còmhdaichte le clach-mhullaich mhòir air a dhèanamh le clach-ghainmhich is le moitif dubh-fhaclach sgrìobhte air an taobh ìosal, is le càrn.

Tha eachdraidh-bheatha ioma-fhillte aig Heinnse 2 cuideachd a tha suidhichte taobh a-muigh an geàrraidh fhiodha. Fadalach anns an linn nua-chreagach, chaidh sreath de phostaichean a chuir gu dìreach an seo, ach chan eil nàdar an stèidheachaidh builleach soilleir. Chaidh dìg agus banca a chuir ris mun aon àm a bha obair-talaimh air a dhèanamh air Heinnse 1. Gu ruige deireadh an treasamh mìle bhliadhna, no tràth san dàrna mìle bhliadhna RC, chaidh an inntrigeadh singilte aig an heinnse a thoirt air falbh, is gun deach crìochan dìg leantainneach a chruthachadh. Bha seo is dòcha co-cheangailte ri uidheamachd-bìdh agus rèilig luath-chorp a chaidh a chuir a-staigh air an leac-chistean bheag a bha am broinn an heinnse. Mar sin dheth, is coltach gun deach Heinnsean 1 agus 2 a thionndadh gu carraighean-tòrraidh ann an Linn an Uamha.

Chaidh an treasamh geàrraidh-chruinn, cuairt-dhìg dhùbailte a bha cuideachd taobh a-muigh an geàrraidh fhiodha a rùrachadh cuideachd. B' e làrach le feansa a bha seo co-cheangailte ri tursa agus le leac-chistean dùbailte air an taobh a-staigh. Thath dùil againn gu bheil seo bhon Linn Nua-Chreagach. Às dèidh seo, chaidh sloc-tòrraidh Biocair a chuir a-steach gu meadhan an carraigh, is chaidh treasamh seotal a chuir dhan leac-chistean. Bha an carragh seo dòcha coltach ri barpa.

Bha fianais ann gun deach ùrachadh air uileadh de na carraighean anns an tràth ìre meadhan-aoiseil. Chaidh slocan mòra a chladhach gu meadhan Heinnsean 1 agus 2, agus tha e coltach gun deach stuthan ro-eachdraidheil a ghluasad, no a thoirt air falbh fiù fhad is a bha na sgrùdaidhean amh air an obair talaimh seo a ghabhail àite. Thathar den bheachd gun deach mùthadh air an leac-chistean trì-fhillteach aig an àm seo, is chaidh fianais a lorg co-cheangailte ri cairbh-theinntean san tràth mheadhan-aoiseil a-staigh agus mun cuairt an mainnearaich làrach a' gheàrraidh fhiodha.

Tha am monograf seo a' rannsachadh buaidhean sgìreil agus nas fharsaing de na fuasglaidhean an seo, agus bithear ga chuir ann an co-theagsa nuadh dheasbad. Thathar a' togail air cuspairean mar às-èirigh, togail, glèidheadh, agus crìonadh de phrìomh ionadan deas-ghnàthach fadalach san Linn Nua-chreagach. Carraighean fiodha nua-chreagach agus geàrraidhean fiodha agus carraighean fiodha. Cleachdaidhean tiodhlacaidh fadalach anns an Linn Nua-chreagach, tràth san Linn Umha, agus gluasadan sòisealta anns an treasamh mìle bhliadhna RC.

Tha am fianais so-bheantainn de an ceangail eadar mainnearaich ro-eachdraidheil agus stèidheachadh de ionad rìoghail tràth anns na meadhan aoisean na fuasgladh chudromach a bhios a' cur ris a' bheachd gun deach bunait a chuir air an t-suidhe Fothair Tabhaicht mìltean de bhliadhna ro àm.

1

The prehistory of an early medieval royal centre

Kenneth Brophy, Gordon Noble, Ewan Campbell, and Stephen Driscoll

1.1 No ordinary place, no ordinary project

Now a sleepy village in central Scotland only fifteen minutes' drive from Perth, Forteviot has secrets that are not obvious to visitors today. There are hints of hidden depths on an information plaque on the front of one of the white houses of this 1920s' model village, and in an unremarkable modern church containing a remarkable collection of Pictish carved stones. These suggest to the visitor that Forteviot was once an early medieval power centre of some note, although the current disposition of the village suggests otherwise. However, there are even deeper secrets. For around one thousand years, in the depths of prehistory, the place we now call Forteviot was one of the major power centres of northern Europe, a place of extravagant monumentality and extreme landscape transformation, and a focus for high-status burials, complex mortuary rites, large social gatherings, and pilgrimage. Yet standing in the village today (Figure 1.1), it is almost impossible to imagine any of this.

This book reports on excavations between 2007 and 2010 immediately south of Forteviot that revealed the prehistoric secrets of this place and identified the ancient origins of a Pictish royal centre. Our narrative follows the trajectory of a major sacred power centre over a millennium, bookended by two significant acts of mortuary practice – the establishment of a cremation cemetery just after 3000 cal BC and the staging of an extravagant dagger-burial just before 2000 cal BC. These events were separated in time, but not space, 800 years apart, but within 10m of one another. It is the story of how Neolithic and Bronze Age people transformed this place, through humble acts such as digging pits in the 4th millennium BC, to the establishment of a place of intense activity with few parallels in the prehistory of Britain and Ireland.

The excavations that focused on Forteviot's prehistory were a major element of the wider Strathearn Environs and Royal Forteviot (SERF) project, which will be introduced in more detail below. Seven substantial trenches were opened over four seasons of fieldwork, part of the largest programme of excavations carried out in Scotland in recent years. This in turn allowed the collection of samples for what was, at the time, one of the most comprehensive sets of radiocarbon dates for any prehistoric complex in Britain. The investigations revealed several significant discoveries, including the most extensive Neolithic cremation cemetery found in Scotland to date (and one of the biggest in Britain); the largest assemblage of All-Over-Corded (AOC) beakers from eastern Scotland; and a unique triple cist. The Forteviot dagger-burial, excavated in 2009, contained the first definitive evidence for flowers in a Bronze Age grave in Britain, the most complete Bronze Age fire-making kit yet found in Europe, and tripled the number of wooden vessels of Bronze Age date found in mortuary contexts in Britain. Our excavations also revealed unique tangible evidence for early medieval, Pictish, reuse of some of these prehistoric monuments, which is reported in more detail in the companion volume, *Royal Forteviot* (Campbell and Driscoll 2020, henceforth SERF2). Indeed, it was the hypothesis that this reuse may have occurred that was the major rationale for the SERF Project in the first place (Driscoll 1987; 1998).

Excavations at Forteviot have shed light not only on the establishment, rise and decline of a major ceremonial centre of the 3rd millennium BC, but also on broader issues of relevance locally, regionally, nationally, and beyond. In this book we therefore consider issues such as the:

- emergence and construction of major Neolithic ceremonial centres, maintenance of their significance, management of change, and the mechanics of decline;
- landscape impact of substantial oak timber monuments, from resources required to construct such monuments, to the wider impact on the local environment;
- morphology, construction, and destruction of massive palisaded enclosures across Scotland, England and Scandinavia;
- the chronology of henge monuments, especially in mainland Scotland;
- complexity of late Neolithic mortuary practice and the role of cremation in the emergence of the so-called late Neolithic 'Grooved Ware complex';
- nature and extent of cremation practice in the Neolithic, from the processes involved in cremation, to the treatment of the dead and its role in placemaking;
- transition, continuity and change for middle to late 3rd millennium BC communities supported by the establishment of the micro-chronology of a monument complex;
- nature of activities at henge monuments in the 3rd millennium BC, from blocking of entrances, to the conversion into barrows through mound and cairn construction, to the strategic deposition of Beaker pottery;
- role of flowers, fire-making kits and other organic materials such as a whale tooth in high-status Bronze Age burials;
- variability in early Bronze Age burial practice.

The intensive nature of this research, and the detailed chronological information that resulted from these excavations, has allowed the creation of a grand narrative of the prehistoric landscape that unfolds over a millennium. In the late Neolithic, Forteviot became a dynamic centre of monumentality, power and pilgrimage that was on a par with contemporary ceremonial centres in northern Europe such as Stonehenge, Avebury (both Wiltshire, England), Orkney (Scotland), Brú na Bóinne (Ireland), Rispebjerg (Bornholm, Denmark), and Hyllie (Scania, Sweden). One of the key challenges with regard to these highly monumentalised and enduring complexes is determining why they were established where they were in the first place. Discoveries at Forteviot have helped to shed light on this issue and have broader implications for understanding such complexes across a wide geographical area.

Figure 1.1 The village of Forteviot as it looks today (photo: S Driscoll)

This book is not just about prehistory. Perhaps the most remarkable aspect of Forteviot is the deep time represented there. From its conception, the SERF Project set out to undertake an innovative study examining a place that had *two* great periods of importance, separated by over 2500 years. The geographical juxtaposition of evidence for major Neolithic monumentality at Forteviot visible in the form of cropmarks, and archaeological and historical evidence for an early medieval royal and/or ecclesiastical site in the same place, was the key driver of our collaborative research. Was this spatial proximity merely coincidence, or did remnants of prehistoric activity play a role in the decision-making processes of the Picts? The discovery of material culture and physical interventions associated with people in the 1st millennium AD integrated with the prehistoric sites, graves and monuments has allowed us to develop one of the most comprehensive studies of the emergence of an early medieval power centre undertaken anywhere in Europe. The resulting narrative runs not for centuries, but millennia, and is told across this book, and its companion volume (SERF2).

1.2 The SERF Project: intellectual origins and collaboration

It was during reconnaissance flights over the rich arable fields of the valley of the River Earn in the summers between 1973 and 1977 that the prehistoric significance of Forteviot became apparent to aerial archaeologist Kenneth St Joseph. The observed 'unexpected features', the spark that lit a fire that burns throughout the SERF Project and this book, were recorded as cropmarks, 'ripe barley, pale yellow in colour', and little more than a collection of shapes and impressions upon first sight (St Joseph 1976, 56). Subsequent flights saw these cropmark features appear with increasing clarity and detail, and St Joseph recognised that several resembled Neolithic and Bronze Age ritual enclosures, dominated by traces of what he interpreted as an enormous timber palisaded enclosure (or 'stockade') enclosing some six hectares (St Joseph 1978). The level of detail in his descriptions, and the production of a sketch transcription (Figure 1.2), capture St Joseph's sense of wonderment and something of the significance of this discovery. Inevitably, the site became a focus for further aerial reconnaissance from the late 1970s by other parties, resulting in the discovery of further detail amidst the prehistoric complex, but also features of a very different nature 500m to the north-east (see section 2.3.1 for a more detailed historiography of aerial reconnaissance at Forteviot and a discussion of the cropmarks).

It was this latter group of cropmarks that opened the next chapter in the story of the archaeological studies at Forteviot. The significance of these features, which included square enclosures and what appeared to be a cemetery of long graves, was recognised by the University of Glasgow's Professor Leslie Alcock, who suggested they belonged to a 'Pictish burial complex of Early Christian date, perhaps with pagan antecedents' (1982, 231). This discovery prompted Alcock to add Forteviot to his pioneering programme of excavations at locations he termed Early Historic royal sites, and so a short season of excavation took place on the north side of the village in 1981 (Alcock and Alcock 1993). Although the results of this work were disappointing, encountering only post-medieval remains, and did not focus on the cropmark sites, Alcock's research highlighted the documentary, antiquarian, and sculptural evidence for the importance of Forteviot as a royal power centre from the 8th to the 12th century AD. His work at Forteviot also highlighted the proximity of these cropmarks to the prehistoric complex.

This work prompted one of Alcock's postgraduate students (and future SERF Project co-director), Stephen Driscoll, to study Strathearn for his PhD, looking at relationships between Picts and their past, and the development of lordship and the Scottish state (Driscoll 1987; 1998). A driver of this research was the occurrence of significant prehistoric and early medieval cropmarks close to one another at Forteviot, with the cropmarks identified by St Joseph now regarded as representing a Neolithic palisaded enclosure and several henge monuments (Kinnes 1986, 29; Harding and Lee 1987, 409–12; Darvill 1996, 190–1). This was suggested in part by the excavation in 1974–75 of a similar cropmark enclosure at Meldon Bridge, Scottish Borders, also a St Joseph discovery (Speak and Burgess 2000, 2–4). Independently, another former postgraduate student of Alcock's, Nick Aitchison, later published a popular account of Forteviot and its sculpture, highlighting the intriguing co-location of major prehistoric and medieval power centres (Aitchison 2006).

In 2006, the Department of Archaeology at the University of Glasgow was looking for a long-term

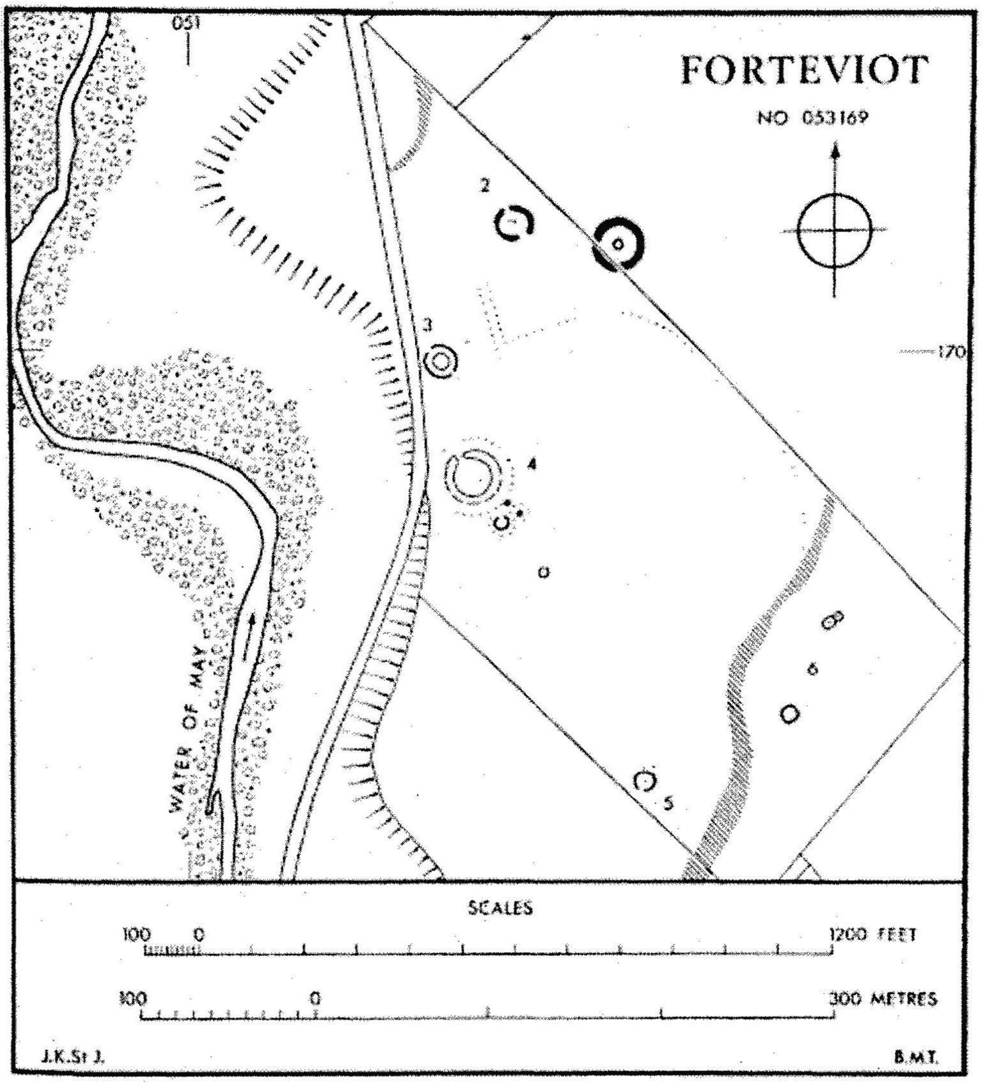


Figure 1.2 St Joseph's transcription of the Forteviot cropmark complex (St Joseph 1978, 49, figure 1)

project as the basis of its archaeological fieldschool for training undergraduates in excavation and survey techniques, within a community archaeology context. There had not been a Scottish archaeology department fieldschool based in Scotland since the end of the University of Edinburgh's Angus and South Aberdeenshire Fieldschool (ASAF) in 2000 (Dunwell and Ralston 2008). Historic Scotland (HS) was actively supportive of this and similar ventures, and the government agency was also proactively encouraging and funding academic research fieldwork projects through its Archaeology Programme (Barclay 1997). This was transformative, especially for the study of prehistory. The campaigns of research excavations in the late 1990s to early 2000s by Julian Thomas and Gordon Barclay in Dumfries and Galloway and Perth and Kinross, respectively, shifted the historic focus from megaliths and Orkney, to lowland earthwork and timber sites (cf Barclay *et al* 2003; Thomas 2007; 2015). Bradley's excavations at megalithic monuments in eastern Scotland over the same period (see for instance Bradley 2000a; 2005; Bradley and Sheridan 2005) offered a re-evaluation of supposedly familiar monuments, insights into long-term sequences in the 3rd and 2nd millennia, and additional depth of understanding of early and middle Bronze Age funerary practice. The proposed SERF Project fulfilled a number of key aims of the HS Archaeology Programme, such as 'regional approaches', 'multi-period studies', and 'understanding the resource', and addressed curatorial issues related to 'damage to ploughed sites' (Barclay 1997, 19–21). SERF offered research and recommendations related to mitigating the belief that HS was, at the turn of the millennium, 'hindered by the lack of structured understanding of the temporal and functional relationships of … elements recorded by field survey and aerial archaeology, and also by the processes [by] which destruction occurs' (Fojut in Dunwell and Ralston 2008, 10).

Furthermore, in the decade leading up to the start of SERF, 'national' research questions and priorities existed, in relation to HS and their Archaeology Programme (Barclay 1997, 28ff). The current round of research frameworks emerged as a concept in British archaeology after Planning Policy Guidance 16 (PPG16 – Archaeology and Planning) was introduced in 1990, the subsequent explosion of data from developer-funded work requiring quantification and synthesis (English Heritage 2014, 14). Olivier (1996) argued for an urgent need for research frameworks at both regional and national level. Around this time HS produced 'overarching research themes', some relevant to SERF (eg 'the contribution of archaeology to the understanding of the formation of the Scots kingdom' (Barclay 1997, 21)). Period-specific summaries produced by HS in 1997 (*ibid*, 28ff) identified regional imbalances (eg in Neolithic studies towards islands and

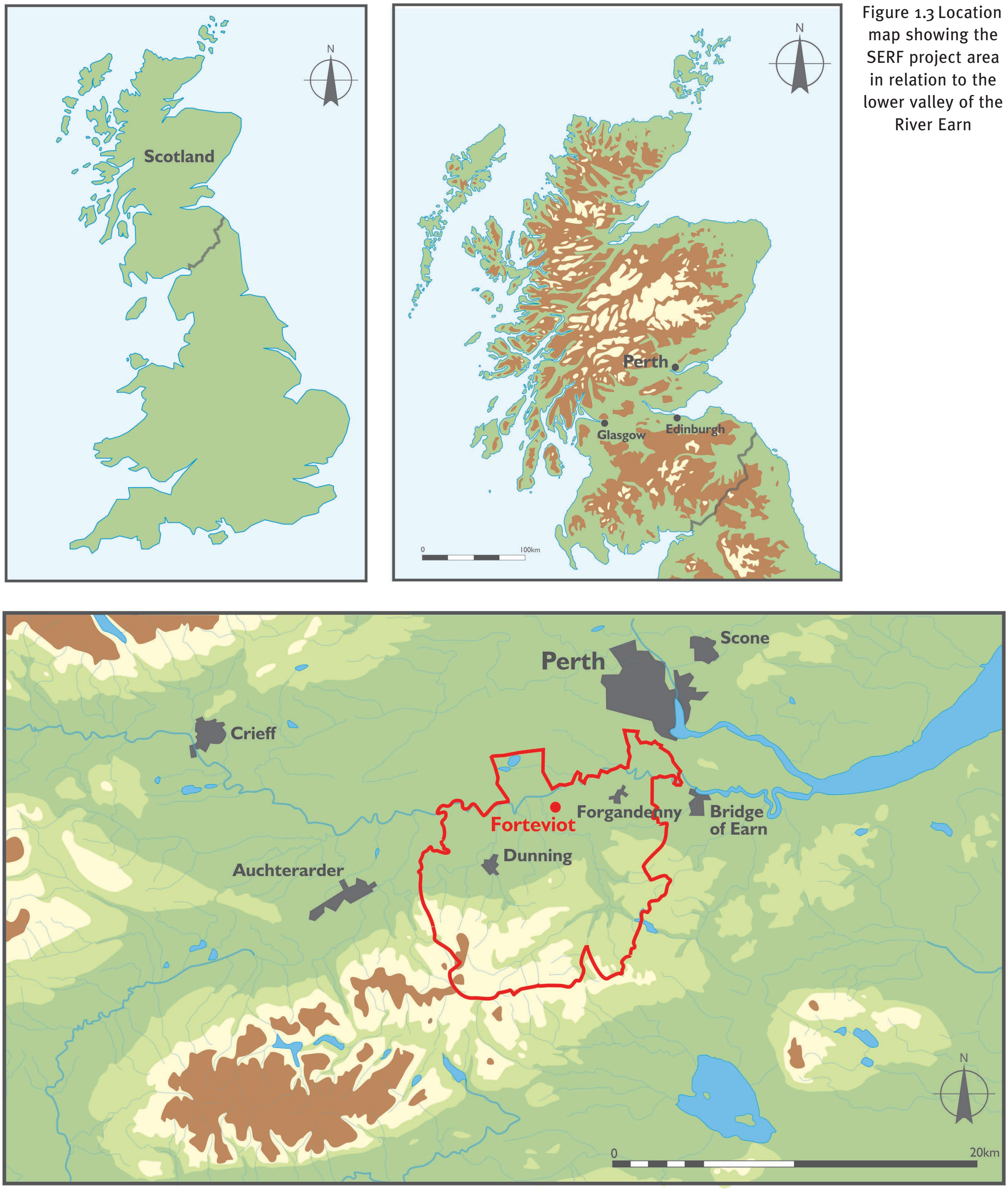


Figure 1.3 Location map showing the SERF project area in relation to the lower valley of the River Earn

Argyll) and key gaps in knowledge that were very much in our minds as SERF developed. Subsequently, Scotland's national research framework – Scottish Archaeological Research Framework (ScARF) – emerged as a collaboration between HS and the Society of Antiquaries of Scotland in 2007, with the full document published in its entirety in 2012.[1] The SERF Project commenced at the cusp of, and developed alongside, the establishment of ScARF, with two SERF Project directors participating in the steering committee (Driscoll) and as a period panel chair (Brophy); the impact of SERF and work at Forteviot is clear in these documents (the subsequent impact is considered in sections 9.1 and 9.2).

Within this intellectual and policy context, Forteviot seemed the ideal place to centre the project, having the potential to bring together then-current staff members and postgraduate research students working in different chronological periods, and being an area in which the archaeology department had already been intellectually invested for several decades. Kenneth Brophy (1999; 2004; 2007a; 2007b), Gordon Noble (2006; 2017) and Kirsty Millican (2009; 2016a; 2016b) were already working on Neolithic monumentality and cropmark archaeology, and around the time SERF was being conceived, overviews of the period were published by Brophy (2007) and Noble (2006). Later prehistory was the specialism of PhD research by Tessa Poller (2005) and Martin Goldberg (2009). For the early medieval period, in addition to Stephen Driscoll, Ewan Campbell, Meggen Gondek, and the late Oliver O'Grady, there was also a fortunate nexus of scholars working in the Scottish History and Celtic departments at the University with interests in the sculpture, history, and place-names of this area: Katherine Forsyth, Dauvit Broun, Simon Taylor, Nicholas Evans, and Thomas Clancy (see SERF2 for the full results of our collaborations with these scholars). The potential for cross-fertilisation between these disparate scholars, and other colleagues, including Chris Dalglish and Michael Given, was one of the clear benefits of choosing the lower valley of the Earn as a study area, with the potential not only to focus on both the Neolithic and Pictish flourishing of Forteviot, but also to explore a much broader and more ambitious narrative. The co-directors of the first fieldwork phase of the project (Phase 1, 2006–2011) were Kenneth Brophy, Ewan Campbell, Stephen Driscoll and Gordon Noble, with Tessa Poller as Research Officer.

The core of the SERF project area is the modern parish of Forteviot, and the adjoining parishes of Dunning and Forgandenny, all within the modern administrative county of Perth and Kinross (Figure 1.3). These parishes stretch from the Ochil Hills in the south, across the valley to the Gask Ridge on the north side, thereby providing a cross-section through the different environments of the valley of the Earn. A wider scope, taking in the whole of the lower Earn valley, was studied more generally to set the core area in context. Although the Earn valley lowlands are highly fertile, the slopes of the Ochils and Gask Ridge are more suited to pasturage, and the tops of the Ochils are moorland suitable only for rough grazing. The intensive agricultural activity on the better-quality lands has resulted in the removal of almost all of the upstanding elements of archaeological monuments here such that they now only exist as cropmarks. An important part of the project was to assess the impact continuing arable ploughing is having on underlying archaeological remains.

From the start of the SERF project there was an aspiration to involve members of the local community in our research and fieldwork. The excavations in and around Forteviot were carried out by a team of students, mostly from the universities of Glasgow and Aberdeen, often on their first dig, working alongside dozens of volunteers who gave up their time to help out, learn the skills of excavation and lend us their local expertise. The volunteer and community elements of the project around Forteviot were co-ordinated by Perth and Kinross Heritage Trust staff, David Strachan and Steven Timoney, while the Dunning Parish Historic Society facilitated relationships with the local community. Over the course of Phase 1 of the SERF Project, 184 students participated in the training programme, and we worked with some 120 volunteers. It was fundamentally important to the training received by all team members that they were working on an active research project, not merely a 'training dig'. Other partnerships vital to the programme were with HS (now Historic Environment Scotland (HES)), who agreed Scheduled Monument Consent (SMC) on an annual basis, offered expertise, and were the major financial supporter of the project, and the Royal Commission on Ancient and Historical Monuments of Scotland (RCAHMS, now part of HES), who provided new transcriptions of available aerial photographs and undertook survey and aerial reconnaissance with and for us.

Preliminary fieldwork started in 2006 with a geophysical survey at Forteviot; the first excavation season took place in 2007, and subsequently annually.

Figure 1.4 Aerial photograph of SERF 2010 excavations, with the village of Forteviot in the background (DP 086359; ©Crown Copyright: HES)

The initial plan was for a five-year programme of research (now called Phase 1), and this book covers the results of the 2007–2010 seasons (with 2011 excavations focused wholly on later periods (SERF2)). Phase 1 focused on Forteviot, with most of the fieldwork undertaken in the fields south of the village, and in green spaces within the village itself. A further five-year programme was then initiated, Phase 2, with the focus of activity moving to the nearby town of Dunning, located 4km west of Forteviot (with results to be reported in a further monograph in this series (Wright and Brophy forthcoming, henceforth known as SERF3)). This was essentially the 'environs' element of the SERF project name, and work concentrated on a wide range of cropmark sites around Dunning, as well as investigations in that village. Running throughout Phases 1 and 2 of SERF was a complementary programme of upland fieldwork that lasted for a decade, including field survey and the excavation of forts, enclosed settlement sites, and a broch (reported on in Given *et al* 2019; Poller forthcoming, henceforth known as SERF4).

In summary, the SERF Project was carried out on a grand scale, with the core study area some 150km^2 in extent, with over 50 excavations undertaken, and involving a large team of contributors and collaborators. Fieldwork has only just been completed at the time of writing, and post-excavation work, community initiatives, and the dissemination of results will continue for many years.

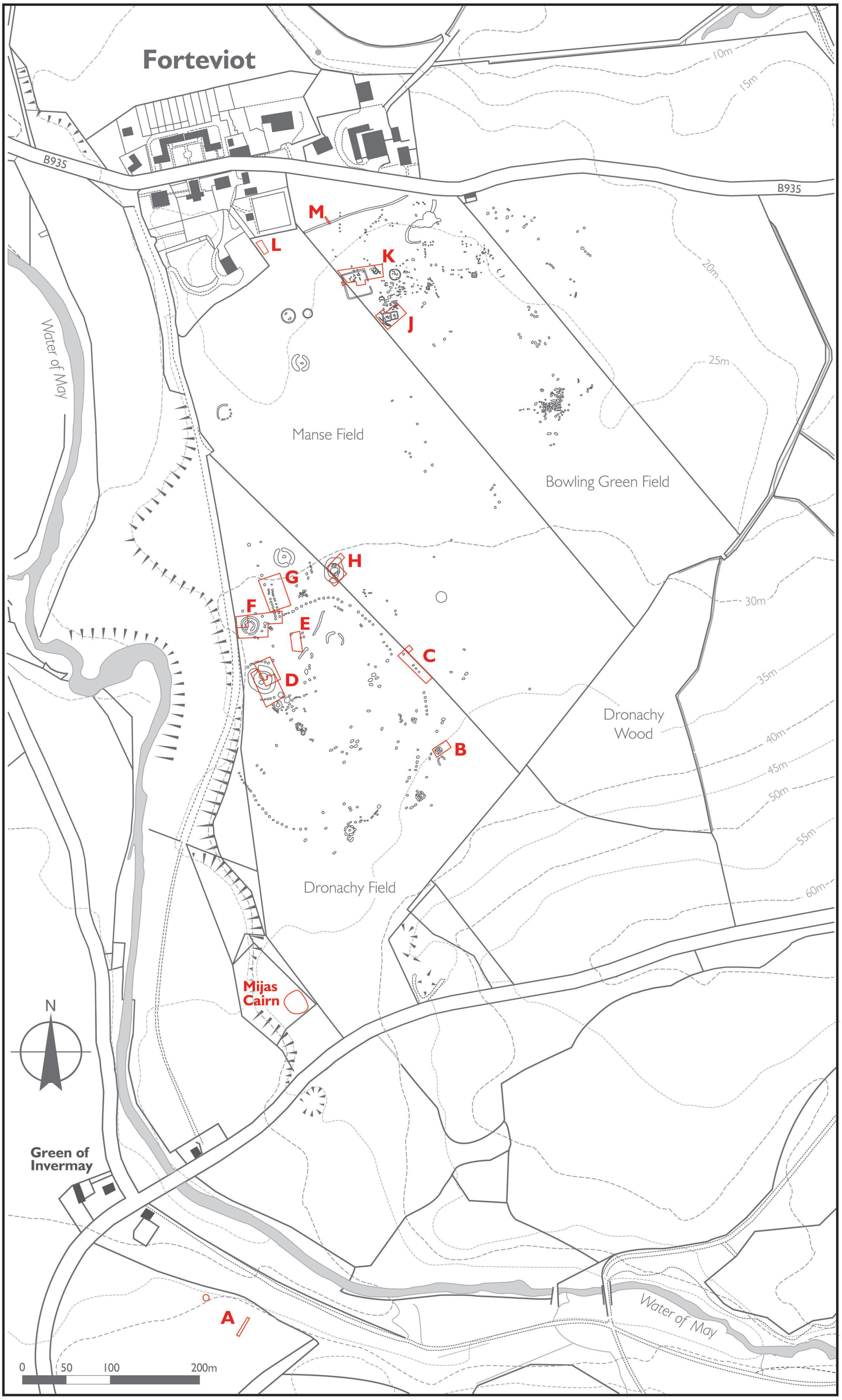


Figure 1.5 Transcription of the cropmarks south of Forteviot, with trench locations and field names marked

1.3 SERF Phase 1 aims, objectives, and methods

From the outset the SERF Project had a series of ambitious research objectives, the outcomes of which are discussed in our monograph series and related publications (see section 1.4, Table 1.1 and Driscoll *et al* 2010).

Those relevant to this volume, summarised in broad terms, were:

- exploring the nature and chronology of the archaeological features identifiable from the air as cropmarks south of the village of Forteviot, and any associated archaeology not visible from the air;
- explaining why Forteviot was chosen for the location of a Neolithic monument complex (the 'Why Forteviot?' question);
- investigating and trying to understand the enduring significance of this location in prehistory, how it developed, was maintained, and when and why it declined;
- considering the relationship between prehistoric sites and later land-use in this location, and assessing periods of continuity and hiatus;
- making sense of settlement and occupation of the broader landscape in prehistory and beyond;
- contextualising the significance of Forteviot in its local, regional, national and international context;
- documenting the survival of archaeological features in the ploughzone and assessing the efficacy of current management of the cropmarks.

In the spirit of archaeological field projects being ongoing hermeneutic processes, as advocated by Hodder (1992) when reflecting on his campaign of excavations at Haddenham causewayed enclosure, Cambridgeshire, supplementary research questions underpinned each of our fieldwork seasons and excavations, informing the relevant chapters of this volume. Research questions were refined, dropped, introduced, and revisited over the five years of fieldwork around prehistoric Forteviot, as discoveries emerged, conditions altered, team dynamics changed, and opportunities arose or were closed off to us. Our fieldwork schedule

Figure 1.6 Hi-spy image of Trench D, taken from the south- east, in 2008 (DP 057663; ©Crown Copyright: HES)

Table 1.1 Forteviot trenches related to the prehistoric element of the project (for locations in relation to the cropmarks, see Figure 1.5). Trench D consists of two overlapping trenches excavated over two seasons. DES references refer to *Discovery and Excavation in Scotland* annual reports

Trench	Year	Target	DES reference
G	2007	Palisaded Enclosure avenue	2007, 157–8
D	2008	Henge 1 north-east sector	2008, 145–6
E	2008	Pits within palisaded enclosure interior	2008, 145–6
D	2009	Henge 1 south and west sectors	2009, 150
C	2010	Palisaded enclosure east boundary	2010, 141–3
F	2010	Palisaded enclosure north boundary and ring-ditch	2010, 141–3
H	2010	Henge 2	2010, 141–3

Table 1.2 SERF Project publications summary

SERF Monograph series	
SERF 1 Brophy, K and Noble, G 2020 *Prehistoric Forteviot: excavations of a ceremonial complex in eastern Scotland*. CBA Res Rep **176**. York: Council for British Archaeology	
SERF 2 Campbell, E and Driscoll, ST 2020 *Royal Forteviot: excavations at a Pictish power centre in eastern Scotland*. CBA Res Rep **177**. York: Council for British Archaeology.	
SERF 3 Wright, D and Brophy, K forthcoming *Prehistoric Dunning: excavations of a farming and settlement landscape*. York: Council for British Archaeology.	
SERF 4 Poller, T forthcoming *Hillforts of Strathearn*	
Secondary reporting and syntheses	
Publication content	**Citation**
Neolithic pottery analysis from Phase 2 excavations	Alexander *et al* in prep
Phasing of Henge 1 and Henge 2	Brophy and Noble 2012
Possible Neolithic farming evidence from Wellhill, Leadketty	Brophy and Wright forthcoming
Overview of SERF Project	Campbell *et al* 2019
Overview of the aspirations of the SERF Project	Driscoll 2010
Antiquity Project gallery feature on the SERF Project	Driscoll *et al* 2010
SERF Project in a Pictish studies context	Driscoll 2011
Summary of upland survey method and results	Given *et al* 2019
Palisaded enclosure synthesis and Forteviot Palisaded Enclosure summary	Noble and Brophy 2011a
Summary account of excavations 2007–2009	Noble and Brophy 2011b
Forteviot and Leadketty palisaded enclosures	Noble and Brophy 2014
Forteviot Neolithic cremation cemetery	Noble and Brophy 2015
Forteviot Neolithic cremation cemetery	Noble and Brophy 2017
Mesolithic pit alignments in Scotland	Wright *et al* in prep
Popular publications	
Forteviot. *Current Archaeology 231* (April 2009)	SERF 2009
Strathearn Environs and Royal Forteviot Project Report 2006–2009	SERF 2010

was also, to an extent, governed by the crop regime implemented by tenant farmers with, for instance, some fields being beyond use to us at certain times due to the potato crop cycle.

The methods adopted between 2006 and 2010 were largely focused on open-area excavation (Figure 1.4). Trial trenching in and around the village of Forteviot across Phase 1 of the project revealed almost no prehistoric material, so large trenches were opened by machine over a sample of cropmark features south of Forteviot village. Targeted excavation of key elements of the prehistoric monument cropmark complex was accompanied by a detailed programme of deposit sampling, radiocarbon dating, and specialist studies. Excavation was routinely shown to be the most successful method for characterising the archaeological deposits, revealing features often not evident on either the aerial photographs or our various geophysical surveys. Over the four seasons of excavation relevant to this volume, seven trenches of varying size (labelled C to H) were opened by machine, stripping an area of *c* 4000m²; these trench letters will be routinely referred to throughout this volume (Table 1.1; Figure 1.5).

Geophysical survey, largely gradiometry and to a lesser extent electrical resistivity, was undertaken across much of the Forteviot cropmark zone, as part of large-scale prospection, targeted pre-excavation surveys, and PhD research (the results of which are summarised in section 2.4). Upstanding remains of possible prehistoric date were rarely encountered, with topographic survey undertaken at only two relevant sites, the cairns at Mijas (Huggett 2008, location shown in Figure 1.5) and Jackschairs Woods (SERF4). Fieldwalking was undertaken in the vicinity during the early stages of the project. No scatters were found, although sporadic objects of prehistoric and 1st millennium AD origin aligned with material found during previous field-walking here (Hallyburton and Brown 2000). Where relevant, results of survey work will be discussed throughout this volume. More detail on the what, when, and where of fieldwork methods employed can be found in Chapter 2.

Extensive use was made of the aerial photograph record for the vicinity, mostly utilising oblique collections, with vertical photographs consulted when relevant. As discussed in section 2.3.1, the SERF Project area has benefited from repeated and comprehensive reconnaissance since the RCAHMS aerial survey programme was established in 1976 (Maxwell 1979), with scores of sorties flown, hundreds of oblique photographs taken, and dozens of sites discovered as cropmarks that would otherwise have remained invisible and unknown. The former RCAHMS (now HES) aerial survey team conducted repeated reconnaissance during our excavations offering a wonderful documentation of the scale of some of our work (Figure 1.4) and they prepared new cropmark transcriptions for us. This was augmented by additional detailed cropmark transcriptions carried out by Millican as part of her concurrent PhD research into Scotland's Neolithic timber monuments (2009). We also worked with local business, *Flying ScotsCam*, to carry out drone photography of our trenches, while the RCAHMS hi-spy unit was also deployed on several occasions (Figure 1.6).

Material held in the former National Monuments Record of Scotland (NMRS), now the National Record of the Historic Environment (NRHE, commonly known by its web-based portal Canmore), proved invaluable both in tracing the historiography of the prehistoric Forteviot cropmark complex, but also in establishing a local and regional archaeological context.

1.4 Dissemination and publication

The publication of SERF is a massive and complicated undertaking. In this volume we have described only fieldwork and research activity related to one strand of the Forteviot element of the project (conducted between 2006 and 2010). This work ran concurrently with excavations at several hillforts on the south side of the Earn valley, various upland and topographic survey campaigns, excavations of the early medieval element of the Forteviot cropmark complex, and investigations within and on the northern edge of the village of Forteviot itself. The results of this work are documented in the companion SERF monographs and a range of other publications (see Table 1.2).

One of the great challenges of SERF has been to find suitable means to publish the results of our work coherently. This has led to a tiered series of publications, from dozens of interim data structure reports (DSRs) hosted on the project website,[2] to papers in peer-reviewed academic journals, and book chapters in edited volumes, on specific discoveries and themes, all the way up to the monograph series, of which this is volume 1 of 4. Summary accounts of all our work have also been published annually in *Discovery and*

Excavation in Scotland (DES) 2006–17, material which is regularly uploaded onto Canmore, thus enhancing the Scotland's National Record of the Historic Environment.

One of the greatest challenges has been to address overlaps between the topics covered within each of the monographs. There are close connections between this volume (henceforth SERF1) and the *Royal Forteviot* book (SERF2). We have attempted at a general level to operate with a strict division of contents between the two: earlier prehistory in this monograph, and Iron Age, Roman and historical archaeology in the other. However, material and features related to Iron Age and Pictish activity were found at most of the Neolithic sites we excavated at Forteviot. This has allowed us to demonstrate tangible reuse, modification or damage to prehistoric sites in the 1st millennium AD, with a good example being Henge 1, where a massive pit of Pictish date was dug into the henge interior, thus disturbing Neolithic and, possibly, early Bronze Age burials (Figure 1.7). Relevant later intrusive features (and material culture) will be discussed briefly in this volume, with detail and interpretation cross-referenced to SERF2.

The same cropmark transcriptions and excavation plans have been used in both books; in other words, for ease of reference illustrations have been duplicated across the monographs. It is intended that both volumes can stand alone but taken together we would argue that they offer a lengthy, and cohesive, narrative. The connections between these two books offers a fitting metaphor for our thinking and working processes over the course of Phase 1 of SERF, tacking back and forth across the centuries – and millennia. We would argue that it is impossible to understand early medieval Forteviot without reference to the prehistoric material, and the prehistoric sites must be considered within the context of later, sometimes destructive, Pictish interventions.

Subsequent substantial synthetic publications will be referred to here as SERF3 and SERF4. The first of these will report on investigations of Mesolithic through to Iron Age sites 4km from Forteviot around Dunning, including excavations at Baldinnies, Cranberry, Dun Knock, Leadketty, Millhaugh and Wellhill, largely directed by Dene Wright. SERF3 should be viewed as complementary to this volume, fleshing out and offering valuable wider landscape and

Figure 1.7 Excavation of large Pit 531 within the interior of Forteviot Henge 1 in 2009, a tangible connection between the prehistoric and early medieval

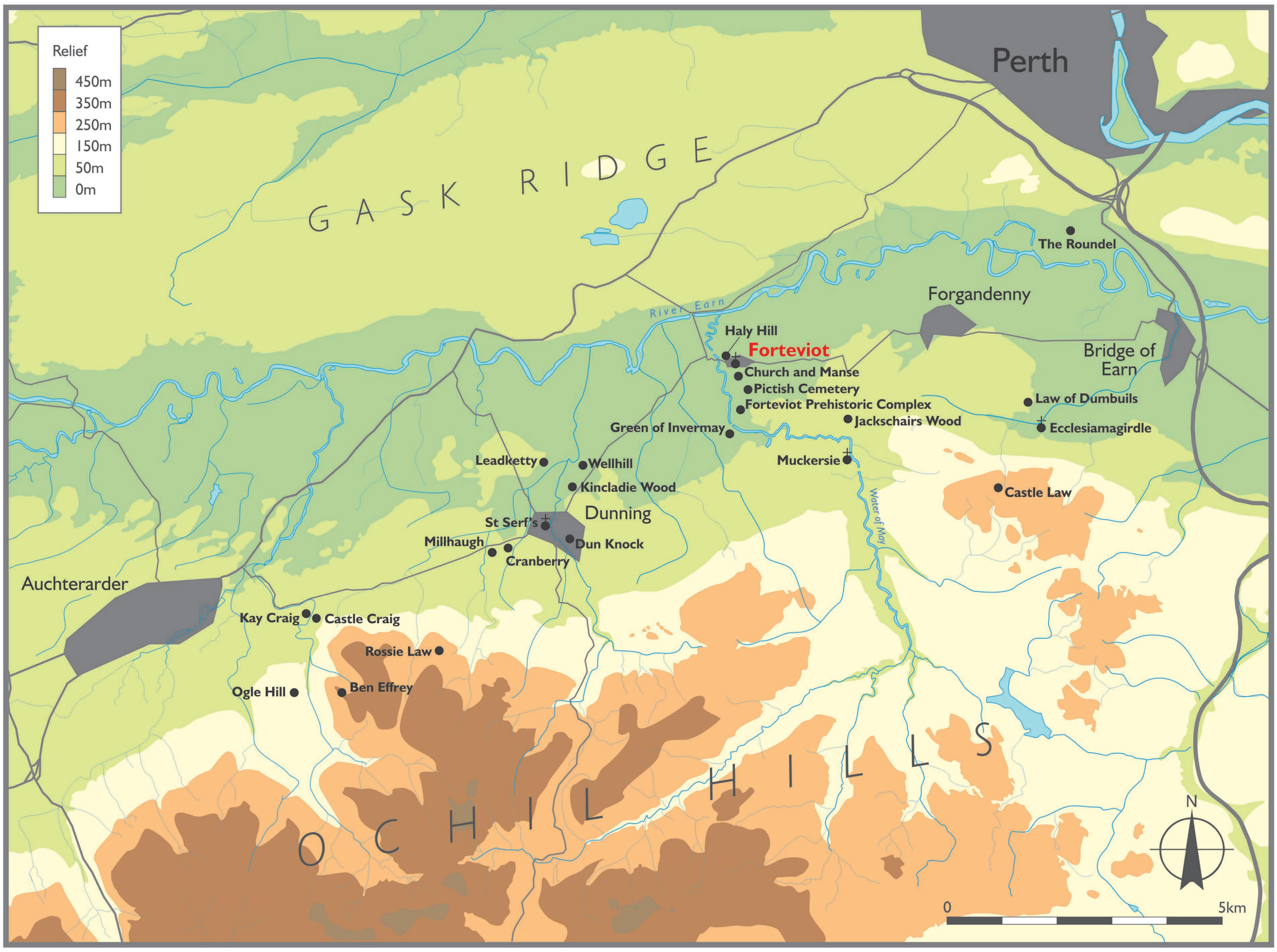


Figure 1.8 Location map showing all sites excavated by the SERF Project 2007–19

temporal context. SERF4 again has wider landscape (and at times chronological) relevance to this volume, being an account of a decade-long campaign of field-work at hillforts and enclosures in the SERF Project study area directed by Tessa Poller. Locations of all SERF excavations from 2007 to 2017 referred to in the text are shown in Figure 1.8.

The sites and discoveries discussed in the SERF monographs are supplemented by a range of additional publications which allow for more detail and space to explore ideas, an example being a broad and deep exploration of late Neolithic cremation cemeteries in Britain drawing on discovers at Forteviot, here summarised in Chapter 4 but expounded in more depth elsewhere (Noble and Brophy 2017). Everything that is needed to understand prehistoric Forteviot is included in this monograph, but inevitably more detail, for those who want it, can be found elsewhere, often set within a broader synthesis (eg Noble and Brophy 2011a on the palisaded enclosure; Brophy and Noble 2012b on the henges; Brophy *et al* (in prep) on the dagger-burial and so on). Methodological, theoretical and 'lessons learned' papers drawing on SERF fieldwork will further complement this work.

As the project's major funder is HES (whose research priorities we have attempted to address), this has ensured that papers published in peer-reviewed journals, post-2015, will be Open Access, and the monographs will be accessible and affordable with their support. More broadly, we have a deep commitment to making the results and interpretation of SERF Project fieldwork widely available, which is facilitated by our website, social media (including a blog which ran during excavation seasons), online publication of all our DSRs, DES entries (which will, in time, all come to be Open Access) and Canmore. A popular colour-illustrated account published by Perth and Kinross Heritage Trust (SERF Project Team 2010) summarised some of the key discoveries of the Forteviot excavations, while accessible online resources – such as *The Cradle of Scotland*[3] and *Designing Digital Engagements: the SERF Hillforts Project*[4] websites – offer significant levels of depth and detail regarding our work. Finally, a long-term aspiration of the SERF team, and the final outcome of the dissemination of the fieldwork phases of the project, will be the publication of an accessible and single account of the archaeology of Forteviot, which could be viewed as both a companion piece to, and update of, Aitchison's 2006 book.

1.5 The structure of this volume

This monograph sets out the results of a series of excavations and for the most part is organised on a site-by-site basis. This chapter and the next offer background and context for the excavations, with Chapter 2 including an overview of previous approaches to prehistoric Forteviot by prehistorians and medievalists, and a detailed introduction to the cropmark record and the landscape and environmental context. Summaries of work undertaken cross-site will also be included in Chapter 2, including our geophysical surveys, while an overview will be presented on the chronological framework and nomenclature adopted across the SERF monographs, alongside a brief discussion of methodologies adopted by specialist contributors.

Chapters 3 to 7 will present the results of excavation work on the palisaded enclosure and interior features; Henge 1; the dagger-burial; and features outside the palisaded enclosure such as Henge 2 and a ring-ditch. These reports will describe and interpret the results of the excavation of each site, and include specialist contributions on material culture, environmental data and chronology as well as discussion, interpretation and contextualisation of these results.

The implications of these excavations will be explored in more depth across two discussion chapters. Chapter 8 will look at the contribution of our excavations to the study of aspects of the British Neolithic, Copper and early Bronze Ages, including cremation cemeteries, timber monumentality, the transition to the Chalcolithic, henge trajectories and typology, 3rd-millennium monument complex choreography, and mortuary rites and strategies towards the end of that millennium. Chapter 9 will present reflections on how successful we have been at answering SERF Project research questions, and responding to the ScARF national framework document. We will consider the ramifications of, and recommendations emerging from, our work. Connections to Scottish archaeology initiatives such as ScARF and Scotland's Archaeology Strategy (Scotland's Strategic Archaeology Committee 2015) and methodological and management recommendations regarding cropmark archaeology will be made. Links to work undertaken elsewhere in the SERF Project, notably at Leadketty, and future work and project legacies, will also be discussed.

1.6 Theoretical background

This volume, and the interpretation of the data therein, very much sits within a contemporary theoretical approach to understanding the 4th and 3rd millennia, drawing extensively on ideas, theories and concepts that emerged in the 1990s in British and Scandinavian Neolithic studies and which matured and developed in the following two decades. Both lead authors began their careers during this theoretically dynamic time, although in reality much of this intellectual endeavour also related to the Copper and early Bronze Age (see for instance the temporal scope of Barrett's *Fragments from Antiquity* (1994) and Parker Pearson's *Bronze Age Britain* (2005)). Our interpretations of the Forteviot excavations are deeply indebted in particular to strands of research related to landscape, monumental architecture, materiality and bodily engagement published in the 1990s, beginning with Bradley's seminal *Altering the earth* (1993; see also Tilley 1994; Barrett 1994; Richards 1996). Further important work at the turn of the millennium (notably Edmonds 1999; Thomas 1999; Bradley 2000a; Cooney 2000) emphasised the importance of agency, materiality, and ideology in the interpretation of Neolithic lifeways. Ours is very much an engaged approach to interpreting prehistoric practice.

Following these theoretical innovations has been a period of consolidation, with concepts such as phenomenology and materiality undergoing refinement and critique (Brück 2006; Ingold 2007), and thus a critical approach to the interpretation of our excavations is, we hope, evident throughout. We have also been deeply indebted to what we might call a Neolithic pragmatism, evident in the work of Barclay (2003), Bradley (2007), and Darvill (2010) for instance, where common sense interpretations are encouraged. Our critical post-phenomenological approach has also been shaped by a growing scientific component of Neolithic studies (Ray and Thomas 2018, 35–8) where narratives are increasingly underpinned by – perhaps even driven by – big data related to mobility, diet and chronology. The impact of the latter is most evident in our volume, written in a post-*Gathering Time* (Whittle *et al* 2011) world, with Bayesian statistics adding necessary and vital refinement to our dating sequence, and thus at times our narrative has taken on an almost historical quality (after Whittle 2017).

A final theoretical driver for our approach to Forteviot in prehistory is the growing realisation that regional narratives should be significant aspects of how we make sense of prehistory. Forteviot is very much part of an emergent trend of concentrating on (mostly) non-megalithic monumentality in a region that has not always had the focus that it deserved. A shift in attention away from core areas such as Wessex and Orkney has been advocated since the 1990s (eg Harding 1991; Brophy and Barclay 2009; Jones and Kirkham 2011), and this aspiration was also reflected in the aims of the HS Archaeology Programme at the time SERF was being conceived (Barclay 1997, 30). There was, in particular, a renewed interest in the early 2000s in stating the case for a distinctive regional Neolithic in eastern lowland Scotland (eg Barclay *et al* 2003; Brophy 2007b), unencumbered by decades of baggage associated with generalised British/English Neolithic paradigms (Barclay 2001a). This is what Ray and Thomas (2018, 38) have called 'writing the Neolithic in a geographically balanced way'. In other words, not claiming pre-eminence for any one site, place or region, but proactively redressing a historic imbalance in the ways that the British Neolithic (and Bronze Age) have previously been studied. Our approach to the prehistory of Forteviot has been one of positive discrimination towards mainland, lowland archaeology in a Scottish context.

We have attempted to present a Forteviot narrative that is as much about process as product, that escapes typological and morphological straightjackets (Waddington 2001), addresses historic imbalances in prehistoric archaeology, and attempts to write a people-centred story. To this end we have attempted to celebrate the myriad actors who passed through Forteviot, especially in the 3rd millennium BC, whether as participants in rites and performance, or as the dead or mourners or pilgrims, or fulfilling an obligation as part of a construction team.

1.7 A dynamic situation

During the 3rd millennium cal BC, monuments and activities around the place we now call Forteviot emerged on a truly spectacular scale, and it is likely that had the palisaded enclosure been built in stone, not timber, it would be a world-famous prehistoric monument. It is our contention that in those centuries Forteviot was one of a handful of elite power and cult centres dotted sporadically across northern Europe (many of them now World Heritage Sites). The SERF Project has given us a unique insight into the establishment, emergence, maintenance, and decline of such a power centre, and thus provides an important means of tracking social change across the 3rd millennium BC both within and beyond Scotland.

The changes that occurred in this millennium included a renewed focus on grand monumental projects, the emergence of what could be termed the 'Grooved Ware horizon' during the first half of the millennium, and the appearance of a range of novelties, including new forms of material culture, elaborate single burial and distinctive monument types associated with the spread of metalworking in the second half of the millennium. These latter changes, in turn, had a major impact on how developments in the centuries before came to be exploited, referenced, memorialised and understood. This was a dynamic situation, straddling many generations and competing cultural traditions, and our study at Forteviot – with the chronological resolution achieved – has the potential to shed light on our understanding of the development of complex societies both locally and across north-west Europe.

What elevates Forteviot above even some of the world-famous monument complexes noted above is that this was not just another prehistoric place that dwindled into ghostly obscurity, a taboo and dangerous, or worse still, forgotten place. Due perhaps to interest shown in the ruins by the Romans, and certainly because of Royal Pictish fascination and perhaps political expediency, this place was resurrected into a new glorious incarnation as the seat of Kings. SERF1 and SERF2 therefore together present a narrative about the enduring power of place and the meaning and mythical qualities of ancestry. Uniquely, Forteviot offers an insight into prehistoric *and* early medieval centres of power: how they are established, maintained and repurposed, over unimaginable spans of time, and what connects them. This narrative has been unlocked through a density and timespan of excavations and fieldwork that is rare in Scotland.

The challenges of making sense of this rebirth are reserved for SERF2, *Royal Forteviot*, but they cast a long shadow over the work discussed in this volume. This book contains the story of the *first* rise and fall of ancient Forteviot, when – incredibly – the seeds of the seat of an early medieval kingdom were unintentionally being sown over 3000 years previously.

1 https://www.scottishheritagehub.com/
2 www.gla.ac.uk/schools/humanities/research/archaeologyresearch/projects/serf/
3 http://serfexhibition.archaeology.arts.gla.ac.uk/
4 http://www.seriousanimation.com/hillforts/

2

Making sense of prehistoric Forteviot

Kenneth Brophy and Gordon Noble

with contributions from Ewan Campbell, Derek Hamilton, Ana Jorge, Gert Peterson, Tessa Poller, Susan Ramsay, Alison Sheridan, and Neil Wilkin

2.1 Introduction

This chapter sets the scene for the archaeological account to follow through a discussion of the baseline parameters for our study, commencing with a brief introduction to the geological, geomorphological, and environmental context of the Forteviot excavations. This will be followed by a discussion of the cropmark complex and the history of its study, as this was the focus of our excavations and the means by which prehistoric Forteviot was first identified. The remainder of the chapter will focus on background information drawing on research and SERF Project work, starting with an overview of the geophysical surveys undertaken. Methodologies and strategies adopted during the analysis of artefactual and ecofactual materials generated by the excavations will be summarised. This will include the radiocarbon dating strategy for the project, followed by an explanation of the chronological model and dating conventions adopted in SERF publications.

2.2 Landscape and environmental background

2.2.1 Geology, geomorphology, and landscape setting

Ewan Campbell

As noted in the previous chapter, the SERF Project core study area consists of the three adjoining parishes of Forgandenny, Forteviot, and Dunning in the lower Earn valley. The River Earn runs from the eastern Highlands at Loch Earn, through the rolling country of rural Perth and Kinross to join the estuary of the River Tay at Bridge of Earn, just south of the city of Perth. The lower reaches of the Strath are bounded to the south by the uplands of the Ochil Hills rising to over 400m, and to the north by the much lower Gask Ridge (Figure 2.1). The land is one of the most fertile areas of Scotland, with extensive cereal production in recent centuries, which in part accounts for the high incidence of cropmark discoveries. The valley bottom is filled with silts and gravels of fluvio-glacial origin, terraced in the late glacial and post-glacial periods. Marine clays of the late Devensian Errol Beds of the late glacial period of marine inundation underlie these superficial deposits and can be seen outcropping in the Water of May which lies immediately to the west of the Forteviot cropmarks. The Ochil Hills are formed from a series of mainly andesitic lavas and pyroclastic deposits of Lower Devonian age, separated from the sandstones and siltstones of the Lower Old Red Sandstone Scone Formation to the north by a series of faults (British Geological Survey 1985). The Old Red Sandstone sedimentary rocks are generally well-bedded and much used as a local building stone.

The area around the village of Forteviot lies entirely on the gravel terrace bounded to the west by the Water of May. This stream is now canalised, but in

Figure 2.1 View from Forteviot, looking up the Earn valley, with the Gask Ridge on the right and the Highland peaks of Stuc a' Chroin and Ben Vorlich on the skyline. Trench B square barrows under excavation in foreground

Figure 2.2 View of Forteviot village from the air with palaeochannels evident in surrounding fields (SC 450275; ©Crown Copyright: HES)

Figure 2.3 View of the location of the cropmark complex from the Dronachy Ridge. This photograph was taken during the 2007 excavation season

the past was notorious for flash floods which threatened to undermine the parish church at times in the 18th and 19th centuries (Meldrum 1926, 281–3; Aitchison 2006, 37–48). Traces of the former channels can be seen on aerial photographs (eg Figure 2.2). The full extent of this erosion is important to understand, given its role in the supposed washing away of the remains of Cináed's 8th-century AD palace (Aitchison 2006, 44ff). The terrace edge scarred by the Water of May was also apparently used as a natural western boundary to the Neolithic palisaded enclosure, although it is possible this enclosure was once complete and only subsequently denuded by the actions of the river.

The surface of the gravel terrace upon which the village and the cropmarks are situated is now largely flat, though with slight localised undulations and slopes northwards from around 35m to 25m OD. To the south, the ground slopes up sharply towards the present Dunning to Forgandenny road, providing a convenient viewing platform overlooking the ceremonial complex (Figure 2.3) and it may have served this role in prehistory. To the north, the present floodplain of the Earn forms a boundary just north of the village, the terrace sloping down to this level just beyond the extent of the modern village of Forteviot. To the east, the terrace continues uninterrupted for several kilometres.

In general, this area is characterised by excellent free-draining soils formed from the silts which originally covered the gravel to a significant depth, but which have now been eroded by agricultural activity. On aerial photographs, the surface of the terrace is covered by the remains of old channels from the braided rivers of the post-glacial period largely visible as cropmarks (Figure 2.2). Such silt-filled features were a recurrent presence on our excavations, first encountered in 2007 when excavating the avenue of the palisaded enclosure. We quickly came to realise these palaeochannels were both a challenge and an opportunity. They insulated some archaeological features from being disturbed by modern deep ploughing, but also made these features difficult to identify and excavate, as well as obscuring the cropmarks on air photos. These conditions are evident across the Forteviot cropmark complex.

Although the prehistoric complex occupies a low-lying area, there are extensive views north-westwards along the Earn valley, culminating in the prominent southern Highland peaks of Stuc a' Chroin (Figure 2.1). Weston (2007, 210) has suggested, in an exhaustive survey of Neolithic and Bronze Age monuments and their visual relationship with mountains across Britain, that two of the henges (the account does not state which two) at Forteviot are intervisible with mountains such as Ben Vorlich, Beinn Tarsuinn and Ben Lawers, although such visual relationships would have been contingent on vegetation cover and weather conditions. Views of such mountains, visible from most of lowland Perth and Kinross, may have had a mythical significance in the past, as with other prominent landmark mountains in the region such as Schiehallion and Ben Lomond, and the Paps of Ainu in Ireland. Bradley and Sheridan (2005, 274) suggested, for instance, that views towards Schiehallion were a significant factor in the orientation of Croft Moraig Bronze Age stone setting, in Strath Tay, Perth and Kinross. The relevance to prehistoric Forteviot is discussed in section 8.7.

2.2.2 Environmental context

The environmental setting for the prehistoric archaeology of the valley of the Earn is not well known as it is poorly served by pollen studies; as we shall see, our excavations have begun to change this situation. Extensive efforts were expended as part of the SERF Project to identify suitable locations for pollen cores within the project study area but to no avail. The agricultural setting makes sources scarce and the few potential locations lack the depth of deposits needed for analysis of prehistoric environmental conditions. The only dated core in the Earn valley is from North Mains, Strathallan (Hulme and Shirriffs 1983, 272; 1986). This was taken 300m west of an early Bronze Age monument complex, some 12km upriver from Forteviot (Hulme and Shirriffs 1983). A kettle-hole deposit such as this is likely to give relatively localised indicators of vegetation change and therefore its applicability to the wider valley is doubtful. Unfortunately, there appears to be a hiatus in radiocarbon dates for the core that covers some of the period relevant to the story of prehistoric Forteviot. Nonetheless, Hulme and Shirriffs (1986) note that declines in woodland percentages and in the accumulation of wood in the kettle-hole itself suggest tree 'clearance and farm expansion' took place at least in the immediate vicinity throughout the Neolithic (*ibid*, 112). Tipping (1995, 20) has questioned Hulme and Shirriffs' identification of pre-elm decline cereal-type pollen at this site and again the chronological resolution of the core makes it difficult to assess the evidence fully.

The only other radiocarbon-dated pollen core that has some relevance here is the well-dated sequence from Black Loch, Fife (Whittington *et al* 1991), not far removed from the upper end of the valley of the Earn where the river transitions to the Firth of Tay. Black Loch provides much better chronological resolution and the deposits cover the full span of the Neolithic and the Bronze Age, giving an insight into the general patterns of vegetation change for central Scotland in this period. The main core at Black Loch (BLII) measured some 7m in depth and analysis was supported by fourteen radiocarbon dates. The total pollen percentages in the diagram for trees and shrubs in the Black Loch area remained high until around 2m depth, corresponding to around the second half of the 3rd millennium BC when there was a distinct decline (*ibid*, figure 11). Pollen percentages for individual tree species likewise dramatically decline around the same period, with the near disappearance of elm and major declines in oak, hazel and alder occurring from this period onwards. Grasses also dramatically increase from the middle of the 3rd millennium and *Plantago lanceolata*, a good indicator of grazing, also rises (*ibid*, figures 8 and 9). In earlier deposits there are notable elm declines (with an elm recovery in between) which would correspond to the early and later centuries of the 4th millennium respectively. These earlier episodes are accompanied by smaller declines in other tree species, but only a slight decline in overall tree and shrub pollen percentages. The general trends, therefore, were for a gradual decline in woodland species during the 4th and early 3rd millennium, accelerating from the Chalcolithic/early Bronze Age onwards. There were also variations within this data, with hazel and oak, for example, appearing to increase prior to the major decline from *c* 2500–2300 cal BC onwards.

At a more general level, the valley of the Earn would have been part of the oak-dominated woodlands of lowland Scotland, with oak, hazel and elm probably the pre-eminent species in this region, providing a relatively dense woodland cover in the Neolithic (Tipping 1995, illus 3; ScARF 2012a, section 4.6.5). The number of large oak timbers used in the palisaded enclosure at Forteviot (and nearby Leadketty) suggests that mature (and perhaps primary) woodland was readily available in the Earn valley and that Neolithic communities lived within a still relatively forested environment, although the act of monument construction in itself would likely have thinned or denuded forest density (Gibson 2002; Noble and Brophy 2014).

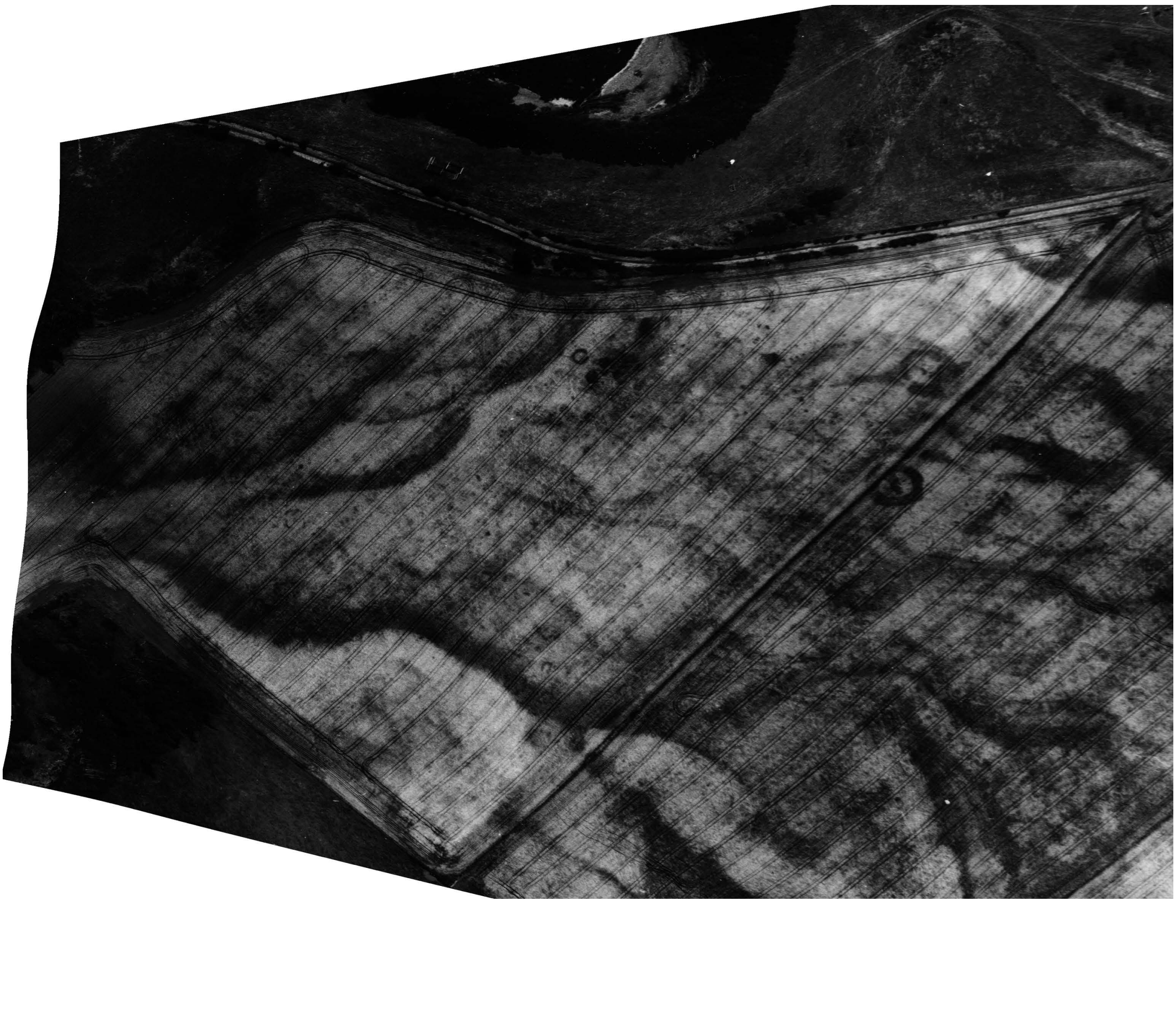
The more dramatic decline in woodland cover seen at Black Loch from *c* 2500 BC onwards is matched by the increased use of earth and stone for monument building at Forteviot, suggesting that woodland resources were more difficult to obtain from this date, at least at the local level. We should be cautious about how far we can push the available evidence and much more work needs to be done to reconstruct the Forteviot environs in prehistory; however, in places it may have been 'not too dissimilar to that at the present' (Hulme and Shirriffs 1983, 272) as woodland declined.

2.3 The archaeological background

2.3.1. Invisible prehistory: the Forteviot cropmarks

As noted in Chapter 1, the cropmarks at Forteviot were initially discovered in a series of sorties by St Joseph between 1973 and 1977, documenting a remarkable density of cropmarks spread over fields immediately south of Forteviot. St Joseph was flying on behalf of the Cambridge University Collection of Aerial Photography (CUCAP), an organisation that in the context of northern Britain is more associated with looking for, and interpreting, cropmarks of Roman sites (eg Wilson 2000, 20; Jones 2005). On a flight in 1973 St Joseph spotted a cluster of cropmarks that had been previously un-recorded (St Joseph 1976); repeat visits clarified the nature of the cropmarks, with three further inspections in the drier summer of 1977 proving especially fruitful. St Joseph was obviously struck by the scale of the monuments (Figure 2.4), for he later wrote that the cropmarks were, 'of a nature so remarkable as to justify a second note' (1978, 48), and it is easy to see why: the complex is dominated by a

Figure 2.4 Rectified aerial photograph showing the Forteviot cropmarks: this stunning image shows the level of detail St Joseph saw from the air on his August 1977 sortie for CUCAP (based on SC 1705504; ©Crown Copyright: HES)



large subcircular palisaded enclosure with a circumference of almost three-quarters of a kilometre, bounded on one side by an escarpment.

Of all the 'native' sites documented by St Joseph in his regular *Antiquity* contributions, Forteviot was perhaps the most spectacular. His stylised transcription of the cropmark complex was the first published plan of the site, which identifies six key elements (Figure 1.2; summarised in Table 2.1). Several smaller cropmark enclosures were also identified in and around the main 'stockade'; the most northerly three interpreted as 'bronze age ritual structures', and two southerly outliers thought to be square barrows (St Joseph 1978, 50). He concluded his account by noting, 'this site is clearly one of exceptional interest, for there is the likelihood here that excavation might not only reveal … structures and pits within the stockade, but might define a sequence by determining the relationship of the structures outside' (*ibid*, 50). However, at the time of discovery, understanding of the role and chronology of such palisaded enclosure monuments was limited, such sites only being identified as a Neolithic phenomenon after Wainwright's excavations at Mount Pleasant, Dorset (Wainwright 1979, part I.IV).

Repeated reconnaissance since the mid-1970s by the RCAHMS (now HES) aerial survey team, and private and local government air photographers, fleshed out

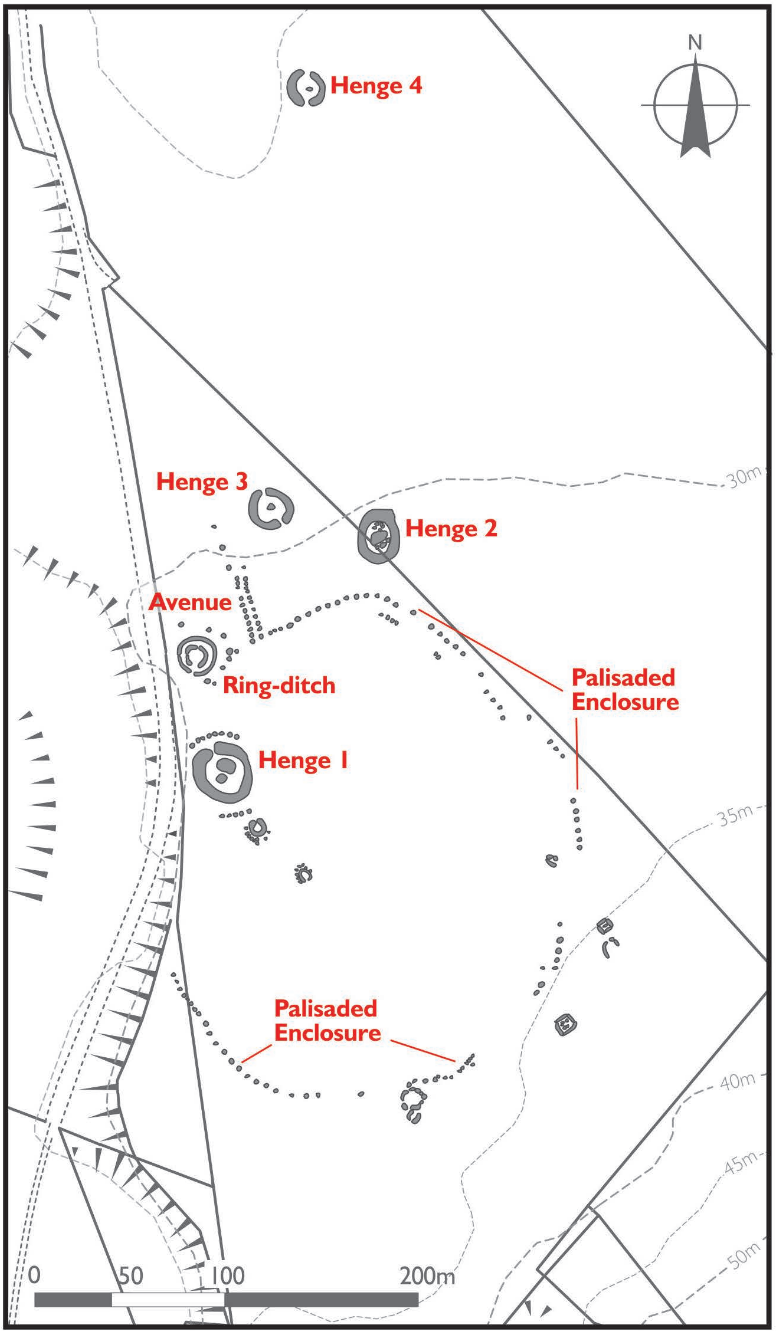


Figure 2.5 Transcription of the cropmarks of the prehistoric complex, with preferred nomenclature for each monument indicated

Table 2.1 National Record of the Historic Environment sites in the Forteviot cropmark complex relevant to this volume with 'official' classification as of December 2019

Canmore ID *SAM	NO01NE Number	Site classification = SERF nomenclature
26559*	28	Timber enclosure (Neolithic) = **Palisaded enclosure, excavated in Trenches C, F, and G**
26560*	29	Barrows, Cemetery, Enclosure, Square barrows, Pit alignment = **excavations reported on in SERF2**
26562*	30	Enclosure (period unassigned) / Henge (Neolithic/Bronze Age) = **Henge 2, excavated in Trench H**
26563*	31	Henge (Neolithic/Bronze Age) (possible) = **Henge 3, unexcavated**
26564*	32	Enclosure (period unassigned) / Henge (Neolithic/Bronze Age) = **Ring-ditch, excavated in Trench F**
26565*	33	Barrow Cemetery (Medieval), Henge(s) (Neol/Bronze Age)(possible), Ring Ditch (period unassigned), Settlement (prehistoric), Short Cist (Bronze Age), Timber Circle(s) (Neolithic), Timber Enclosure (Neolithic), Dagger(s), Inorganic Material (Iron), Lithic Implement(s), Organic Material, Scabbard = **Henge 1, excavated in Trench D**
26566	34	Ring-ditch (period unassigned) = **unexcavated**
26567*	35	Barrows (prehistoric) = **excavations reported on in SERF2**
26568	36	Enclosure (period unassigned) = **unexcavated**
26952	58	Cropmark (period unknown), Pit alignment (prehistoric) (possible) = **unexcavated**
68303	70	Pit enclosure (prehistoric) = **unexcavated, see Figure 2.6**
84897	83	Pit alignment (prehistoric) = **unexcavated**
144783*	169	Barrow cemetery (Pictish), Pits, Pit enclosure, Square enclosure = **excavations reported on in SERF2**
296263*	219	Palisaded enclosure = **excavated [same as site 26559]**
314691*	238	Cist(s) (Bronze Age), Enclosure (period unassigned), Pit(s) (period unassigned) = **Ring-ditch, excavated [same as site 26564]**
355240	246	Henge = **Henge 4, unexcavated**
355241	247	Square enclosure = **unexcavated**

the detail of the Forteviot complex as well as identifying much later activity here such as an early medieval cemetery in a field to the north-east. Between 1977 and 2015, the Forteviot cropmarks were flown over and recorded on at least seventeen RCAHMS sorties, including twice in the summer of 2003. CUCAP also photographed elements of the cropmark complex three more times after St Joseph's 1977 flights, in 1979, 1981 and 1984, and aerial photographer John Dewar recorded the site from the air in 1975, producing early colour prints of the site. These different perspectives, during sorties flown by different individuals with differing motivations, under varying conditions, and at different times of the year, allow the compilation of hundreds of views of Forteviot cropmarks from the air from all angles, which in turn allows plots or transcriptions to be created that are composites of all information gathered.

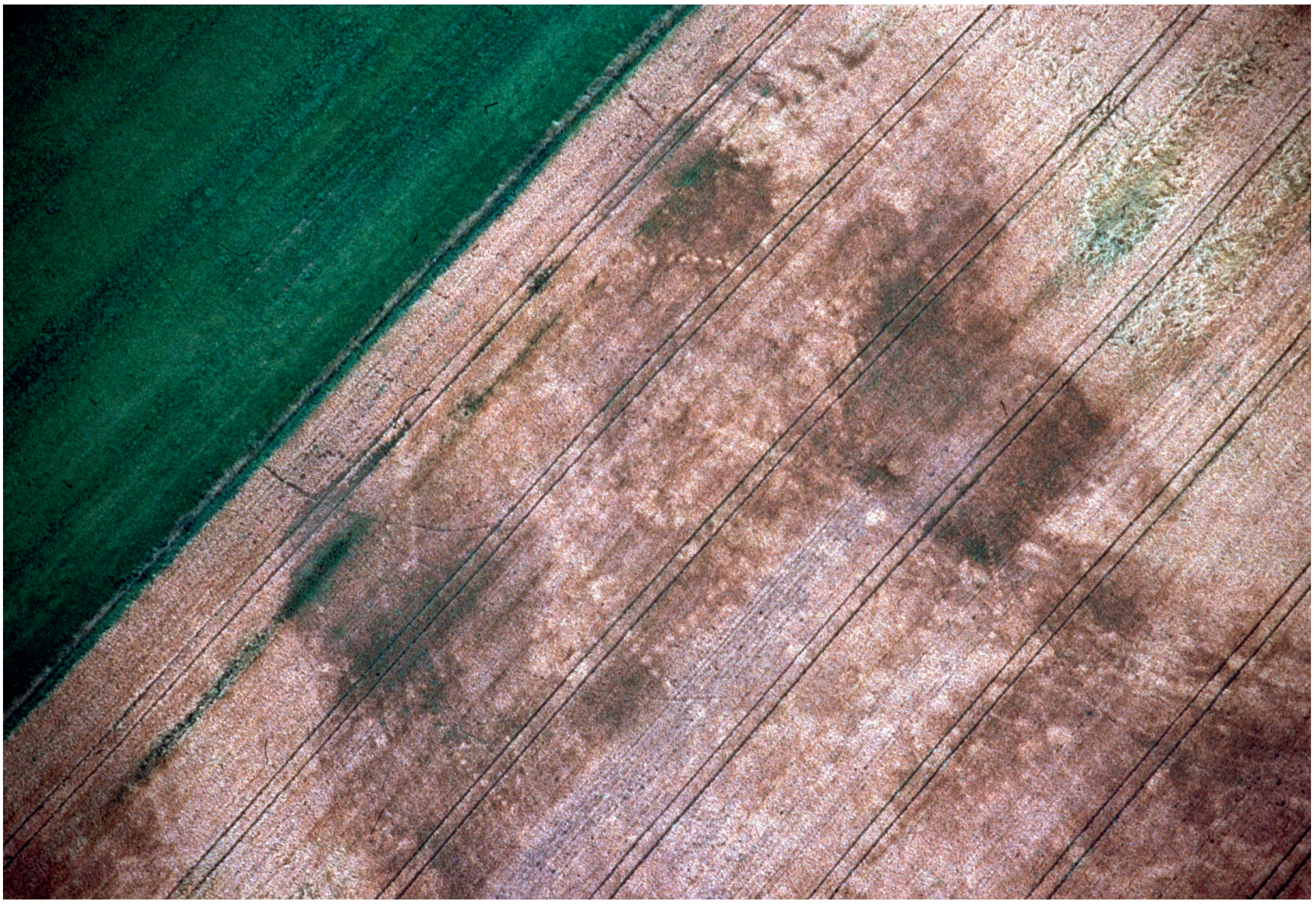
The SERF Project began with a review of the aerial photographic record for Forteviot and the wider SERF study area, undertaken in collaboration with the RCAHMS aerial survey and drawing teams. This included working with the historic oblique air photos, as well as the production by Dave Cowley and Kevin Macleod of a new transcription of the cropmarks in the fields south of Forteviot, which we used extensively during our excavations from 2008 onwards (Figure 1.5, and in a simplified form, Figure 2.5). This revealed features that until then had not been recorded or identified on air photos, including cropmarks indicating palaeochannels and possible tree throws amidst the numerous anthropomorphic features. To demonstrate the efficacy of repeat photography, a 2013 sortie undertaken by HES after the fieldwork discussed in this book was completed, identified and recorded a fourth henge monument (Henge 4, location shown on Figure 2.5). For this reason, Henge 4 does not appear on previously published transcriptions (for instance Noble and Brophy 2011a).

A broad collection of archaeological sites and cropmark features fall under the site name 'Forteviot' in the National Record of the Historic Environment (NRHE), to the extent that this can become rather confusing. Table 2.1 lists the cropmarks relevant to this volume that have individual entries in Canmore; most unexcavated sites have only limited interpretation (perhaps only having been recorded once), but there are also overlaps and duplication. In some cases cropmark sites have no description in Canmore, and/or have vague interpretations (such as 'cropmark (period unknown)'), while in other cases the exact location is unclear because of a lack of identifiable points on the relevant photographs. Sites that we excavated are indicated in Table 2.1, and more detailed accounts of each excavated site's form and interpretive history is given in Chapters 4–7. The location of each site and preferred nomenclature for each monument is also shown in Figure 2.5.

These sites are distributed across three fields, all to the south of Forteviot. The fields, west to east, were named for convenience Dronachy, Manse, and Bowling Green, with prehistoric cropmarks concentrated in Dronachy, and the early medieval in Bowling Green (field names shown in Figure 1.5). The relative lack of cropmarks in the Manse Field between has been evident right back to the first aerial surveys of this area, although a few sites (such as Henge 4) have been identified at its north end. Geophysical survey undertaken during the SERF Project suggests there genuinely is a paucity of subsurface archaeological features in this middle field (see section 2.4). Another factor in understanding the archaeology in these fields is the depth to which ploughsoil truncation has occurred due to modern deep ploughing; investigations by the SERF Project within the village have led us to estimate that between 0.5m and 1m depth of archaeology may have been destroyed by the plough (SERF2, section 2.7). This may be another factor in cropmark variability.

Our understanding of the extent of the cropmark complex has been shaped by a series of episodes of reconnaissance and interpretation. The bulk of the sites, both prehistoric and early medieval, were identified, as previously noted, between 1973 and 1978 by CUCAP, RCAHMS, and Dewar. The sites were given NRHE (then NMRS) numbers based on the 1:10,000 map sheet for the area: NO01NE 29 through to 36. This includes St Joseph's sites 1–6 (1978). Sporadic additions to these 'core' sites were made over subsequent decades. This includes the unhelpfully classed 'Cropmark (date unknown) and pit-alignment' (site

Figure 2.6 Pitted enclosure and pit-alignment (Canmore ID 68303) recorded from the air by RCAHMS in 1988, exact location unknown (SC 1119069; ©Crown Copyright: HES)



NO01NE 58), first photographed in 1986 and again in 1992, while a pit-alignment (NO01NE 83) was spotted in the Manse Field in the consecutive dry summers of 1992 and 1993. Most intriguingly, a complex timber or pitted enclosure with internal subdivisions was recorded adjacent to the boundary between the Manse and Bowling Green fields during a CUCAP sortie on 25 July 1981, and then twice by RCAHMS in 1988 and 2003 (Figure 2.6). Unfortunately, we cannot be sure of the exact location of this site; there is no doubt that this cropmark would have been an excavation target had we been able to locate it securely. NRHE site records NO01NE 169, 219 and 238 are effectively duplicates of earlier assigned site numbers (Table 2.1), albeit with updated site classifications reflecting the results of our investigations. Finally, a sortie in July 2013 identified two new elements of the complex, Henge 4 and a square enclosure (NO01NE 246 and 247).

The nature of the archaeological features at Forteviot inevitably leave them vulnerable to plough damage and erosion (this is why they have been recorded as cropmarks), even though most are Scheduled Monuments (and have been since February 1979) (see Table 2.1 for scheduling information). One of the aims of the SERF Project was to evaluate the condition of the cropmarks, document instances of plough damage, and make recommendations about the future protection and management of this nationally important site. Given that all three fields are in a potato-planting regime (with associated deep ploughing happening once every five years) this is especially timely, and the results of this aspect of the project are summarised in section 9.3.

2.3.2 Previous work on prehistoric Forteviot

The SERF Project excavations at Forteviot took place in a vacuum of information about the precise nature of the prehistoric occupation of the area denoted by the cropmark complex. This was despite the considerable attention that had been given to recording these sites from the air over four decades. Assertions about the prehistoric legacy and its impact on Iron Age, Roman and Pictish understanding of this landscape (Driscoll 1998; Aitchison 2006) had inevitably been based on the superficial interpretation of cropmark evidence alone, a process that can be fraught with difficulties and challenges (Brophy and Cowley 2005a). While these interpretations have been shown by our excavations to have been largely correct, a range of additional features of note, the expansion of the suspected prehistoric chronology of Forteviot, and several unexpected intersections between the Neolithic and early medieval periods, have been discovered that go far beyond anything that could be inferred from simply looking intensively at aerial photographs. Nonetheless, analysis of the cropmarks was vitally important in shaping our excavation strategies.

No significant fieldwork had been undertaken at Forteviot before our investigations, other than a largely uninformative geophysical survey carried out by a team from the University of Glasgow in 1994 (section 2.4) and limited fieldwalking (again, characterised by generally negative results (eg Hallyburton and Brown 2000)). Research and interpretation of the Forteviot complex was largely restricted to desktop analysis, repeat aerial reconnaissance, and cropmark mapping. As noted already, Forteviot was viewed by St Joseph (1978, 48–9) as being in the 'native' tradition of prehistoric timber monuments, with the 'stockade' or 'Neolithic defended enclosure' and henges highlighted by him as significant chronological indicators. Yet beyond this, the Forteviot cropmark complex had little visibility within literature about the British Neolithic – until the SERF Project – making only fleeting appearances in gazetteers and overviews of henge monuments and enclosures (eg Harding and Lee 1987, 409–12). This is typical of the way that cropmark sites have generally been overlooked or underplayed within British Neolithic studies (Barclay 1993; 2003; Darvill 1996; Brophy 2007a), despite their huge potential, and is also indicative of a general lack of research into prehistoric Forteviot pre-SERF.

The Forteviot palisaded enclosure is included in the relatively few syntheses of such monuments. In considering the role and function of the West Kennet palisade enclosures, Wiltshire, Whittle (1997, 158–63) included a brief discussion of analogous sites in Britain and Ireland. Forteviot, Dunragit in Dumfries and Galloway, and Meldon Bridge in the Scottish Borders featured (but not nearby Leadketty), and a description and plan of Forteviot were included in this discussion. The plan is a simple one and shows only the boundary and no other associated features, although these are briefly mentioned in the text; the site is discussed as a late Neolithic enclosure defined by 'spaced posts in individual postpits' (*ibid*, 160). Gibson's (2002) comprehensive review of Neolithic palisaded enclosures identified Forteviot as one of fewer than twenty such sites in Britain, with a brief description of the recorded evidence, a reproduction of St Joseph's plan,

Table 2.2 The Forteviot ‘henge’ enclosures: differing classifications and gazetteer numbers

St Joseph 1978	Harding & Lee 1987	Harding & Lee interpretation	NRHE classification	NRHE Number (see Table 2.1)	SERF interpretation (*excavated)	SERF1 chapter
Site 1	No number	No number	Enclosure (period unassigned) / Henge (Neolithic/Bronze Age)	NO01NE 30	Henge 2*	6
Site 2	310	Probable henge	Henge (Neolithic/Bronze Age) (possible)	NO01NE 31	Henge 3	
Site 3	311	Causewayed barrow	Enclosure (period unassigned) / Henge (Neolithic/Bronze Age)	NO01NE 32	Ring-Ditch*	7
Site 4	312	Probable henge	Henge (Neolithic/Bronze Age) (possible), Timber circle (Neolithic)	NO01NE 33	Henge 1*	4, 5
Site 5	314	Causewayed barrow	Ring-ditch (period unassigned)	NO01NE 34		
	313	Possible mini-henge	Henge (Neolithic/Bronze Age) (possible), Timber circle (Neolithic)	NO01NE 33	Mini-henge*	4
	na	na	Henge	No01NE 246	Henge 4	

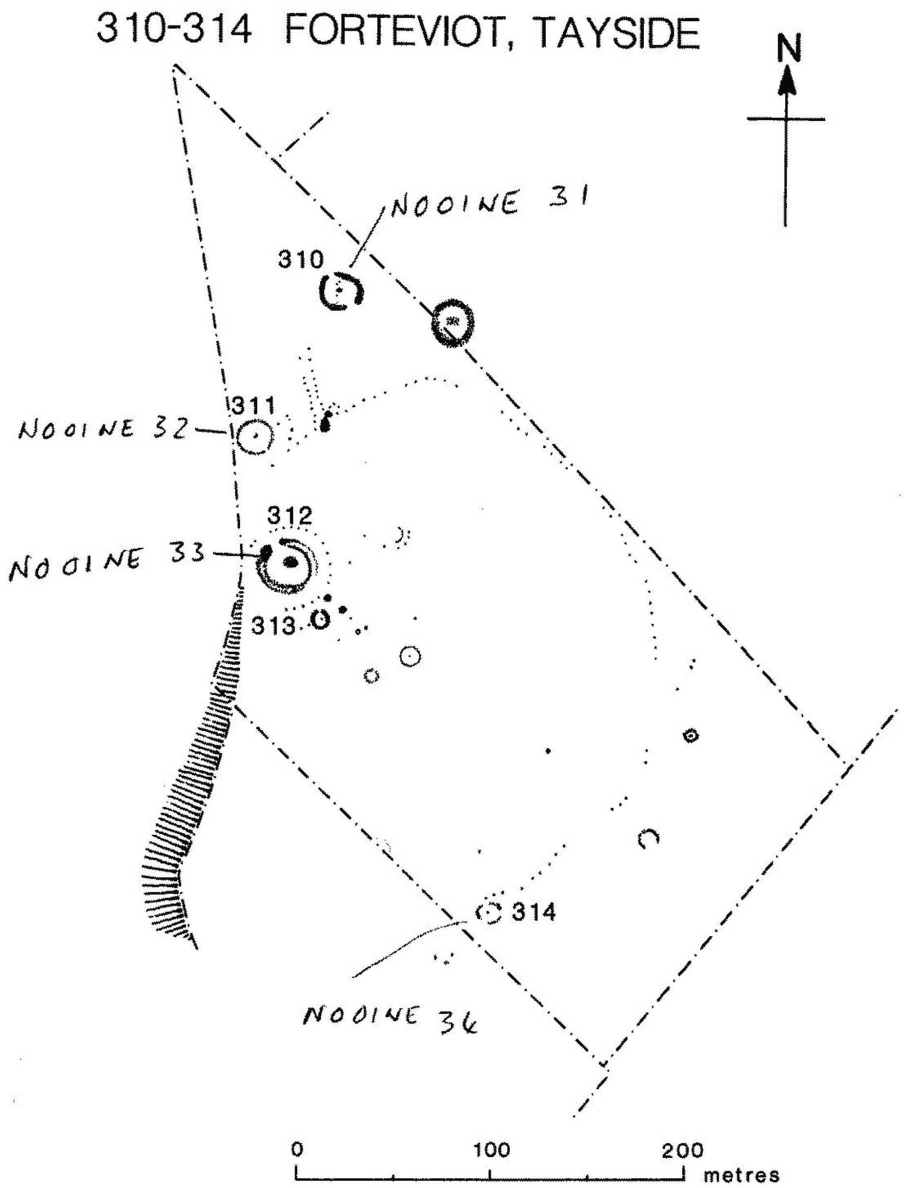


Figure 2.7 Transcription of the Forteviot complex with hand annotated numbers from the NRHE (after Harding and Lee 1987, 411)

and a note that dating of the site to the Neolithic was by 'analogy' (*ibid*, 18). Had he been working with excavation evidence, Gibson would have included Forteviot in his Type 1 class: a boundary constructed from individual posts and postholes, dating to the later Neolithic, from 3000 BC onwards (Gibson 1998; 71–2; 2002, 5). Gibson also argued that the avenue at Forteviot (and similar sites) would have restricted views into the enclosure (eg 2002, 9–10; 2004; see Figure 3.31).

Forteviot has also been mentioned in excavation reports of superficially similar monuments. The contextualisation of Meldon Bridge, excavated between 1974 and 1977 ahead of road widening, included a synthesis of similar sites in Britain (Speak and Burgess 2000, 110–14). This included analysis of similarities and differences between Meldon Bridge and Forteviot. Such sites were concluded to be defensive in nature (*ibid*, 114). A version of the St Joseph 1978 transcription was reproduced. Elsewhere, Forteviot was only mentioned in passing as a possible parallel for the large Neolithic earthwork and timber enclosure at Blackshouse Burn, South Lanarkshire, excavated in 1985–86 (Lelong and Pollard 1999, 46), despite this site subsequently finding its way into most syntheses of palisaded enclosures in Scotland (Noble and Brophy 2011a; Millican 2016a; 2016b).

The henge monuments (the number of henges being dependent on how one interprets the cropmarks) have fared a little better. These were included in Anthony Harding and Graham Lee's (1987) overview of henge monuments of Great Britain. Here, Forteviot was characterised as one of seven 'henge clusters' in Britain potentially indicative of a 'ritual concentration' (*ibid*, 43–6). (It is worth noting that three of their other henge clusters, Stonehenge, Wiltshire; Dorchester, Dorset; and Llandygái, Gwynedd (English: Llandegai), were, like Forteviot, preceded by Neolithic cremation cemeteries (Noble and Brophy 2017).) In Harding and Lee's gazetteer, five possible cropmark henges at Forteviot were identified, Sites 310 to 314 (Harding and Lee 1987, 409–12; Table 2.2). SERF excavations show well the perils of cropmark interpretation: what we call Forteviot Henge 2 was not included in the Harding and Lee list as it appeared as a cropmark to be a barrow (in fact, this was only after its conversion from a henge, see section 6.3). It was, however, illustrated (Figure 2.7) and the key thing here is that the monuments *were* included in the discussion. The proximity of the henges to a palisaded enclosure was noted.

Surprisingly, the Forteviot cropmark henges have been excluded from most other lists and overviews of henge monuments, appearing neither in Jan Harding's *The henge monuments of the British Isles* (2003) or Clare's extensive list of 315 'sites sometimes described as henges' (1986, 310–14). Curiously, Clare did include a simple plan depicting the Forteviot complex in an illustration showing 'large diameter sites' (*ibid*, 295) but here the focus was, ironically, the palisaded enclosure, not the henges. The Forteviot henges were also 'unaccountably ignored' (Alcock and Alcock 1993, 235) in Wainwright's 1989 book *The henge monuments: ceremony and society in prehistoric Britain*. Reviews of henges that have been recorded in Scotland such as Barclay's (2005a) discussion of the history of the henge (and hengiform) class did not explicitly mention Forteviot but foreshadowed some of the issues explored by the SERF Project in terms of cropmark interpretation, circular monument classification, and chronology.

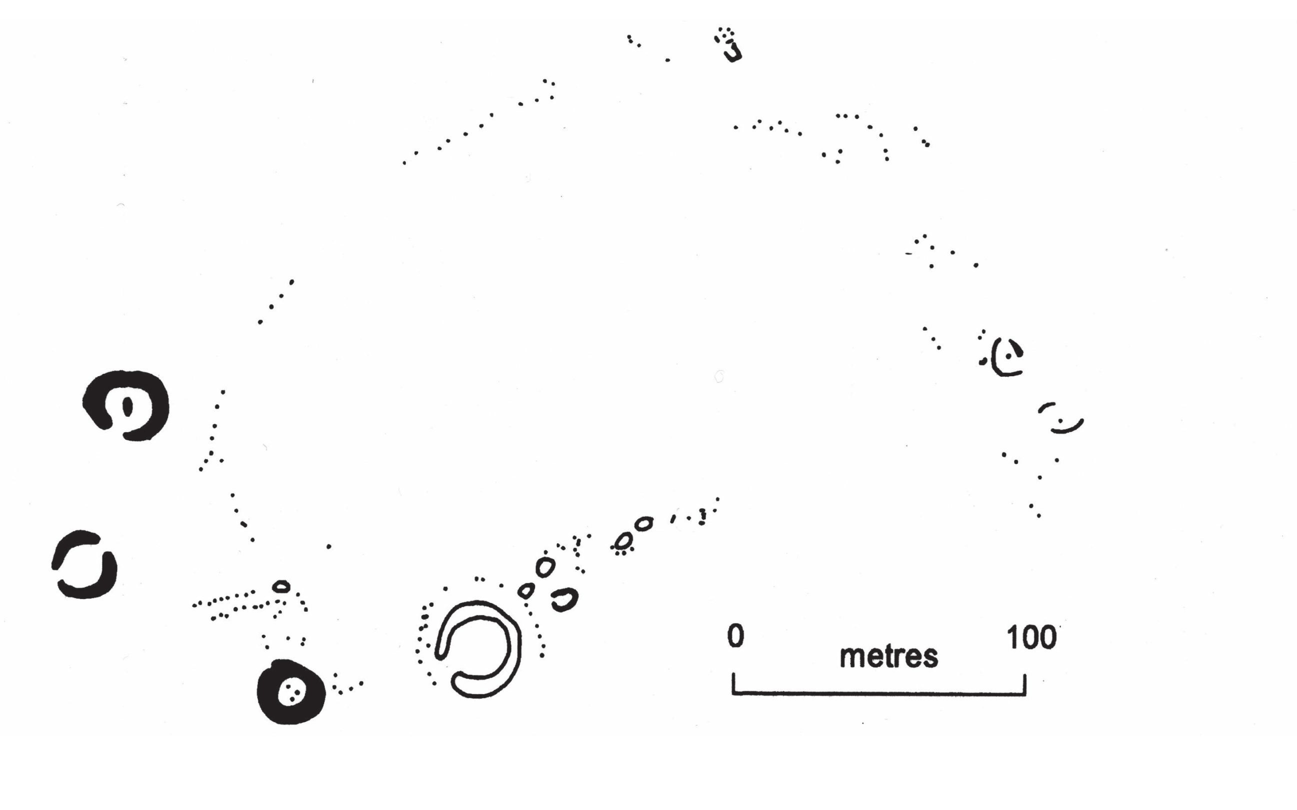
More broadly, overviews of evidence for the Neolithic (and prehistory) in the place we now call Scotland have made little of this remarkable cropmark complex, and where mentioned it has been fleetingly and (understandably) cited as a parallel for the already excavated Meldon Bridge. Forteviot was not mentioned at all in one of the standard textbooks on Scotland's archaeology of the 1980s (Ritchie and Ritchie 1981) although Meldon Bridge is touched on in isolation, being described confusingly as, 'such a unique site that it is difficult to class it either as domestic or ceremonial' (*ibid*, 43) and later as a 'defensive enclosure' (*ibid*, 89). Forteviot is only briefly mentioned in Kinnes' seminal 'Circumstance not Context' overview, as a parallel to the excavated Meldon Bridge. However, he noted that in terms of interpretation 'no sufficient explanatory mechanism has been advanced' (Kinnes 1986, 29). Contra Ritchie and Ritchie, Ashmore (1996, 82) asserted that Meldon Bridge is not unique, having a close parallel in Forteviot. He concludes, 'perhaps ritual and prosaic use were mixed with a midsummer fair'. None of these sites is discussed by Oram in *Scottish Prehistory* (1997) and nor do Meldon Bridge or Forteviot appear in the 'Gazetteer of Monuments' included in that volume.

Gordon Barclay, a leading researcher into the Neolithic of eastern lowland Scotland and cropmark sites in the 1980s to 2000s (Ralston 2016), included Forteviot in a range of his syntheses of aspects of Neolithic sites and monuments found in Scotland. For instance, he afforded a paragraph to palisaded enclosures in his popular illustrated textbook *Farmers,* *temples and tombs* (2005b, 45), describing Meldon Bridge and Dunragit and mentioning Forteviot, but not assigning a function to these enclosures. Barclay's important review of Neolithic enclosures in Scotland (2001b, 149) includes a brief discussion of the 'Forteviot complex' with its range of 'hengiform or barrow features' within the palisaded enclosure. Here, a transcription of the cropmarks is also reproduced although unlike earlier publications this is based on RCAHMS mapping; curiously, the complex is depicted with the north to the left (*ibid*, 150; Figure 2.8). In this overview, Barclay makes the pertinent statement that the lack of excavation at such sites had resulted in the limited development of 'an enclosure tradition' as part of Scotland's Neolithic (*ibid*, 145), a situation his paper began to remedy. The site was not mentioned in a further, brief, overview of Scotland's Neolithic (Barclay 2003). It is worth noting that Forteviot is not mentioned in any overview of Bronze Age Scotland or Britain either.

The paucity of information and consideration of Neolithic Forteviot is something that even SERF Project directors have been guilty of! In an updated response to the Kinnes (1986) overview, Brophy noted Forteviot even more briefly than Kinnes and added nothing to its interpretation or significance (2007a). In a detailed discussion of the development of Neolithic monument complexes, Noble (2006, chapter 6) does not mention Forteviot at all, focusing largely on sites that had at that time been excavated, but the points raised about the establishment of monuments in places with an ancient significance, and on routeways, are both pertinent to sites discussed in this volume. It is also worth noting that SERF excavations stimulated broader and deeper studies of various aspects of the Forteviot cropmark complex, outwith core SERF publications. Younger, for instance, undertook PhD research into henge monuments, with Forteviot Henge 1 as a case-study (2015; 2016a; 2016b), while Millican has offered a comprehensive and detailed overview of the palisaded enclosure in various publications (2009; 2016a; 2016b); both researchers were site supervisors during the SERF Project.

The proximity of the Forteviot's apparently prehistoric monuments to much later cropmark traces and the presence of this place in historical accounts has led to consideration of this site beyond prehistoric literature. Early accounts of the cropmark square barrows at Forteviot made no mention of its neighbouring prehistoric monuments (Whimster 1981, 344, 415). However, the significance of the co-location of a 9th-century AD royal residence and cropmarks of square barrows with the prehistoric cropmark complex at Forteviot was developed substantially at the University of Glasgow in the 1980s. Driscoll, in the context of Pictish reuse of this landscape, described the

Figure 2.8 Plan of the Forteviot palisaded enclosure, unusually depicted with north to the left of the image (after Barclay 2001, 150, fig 11.4 upper)



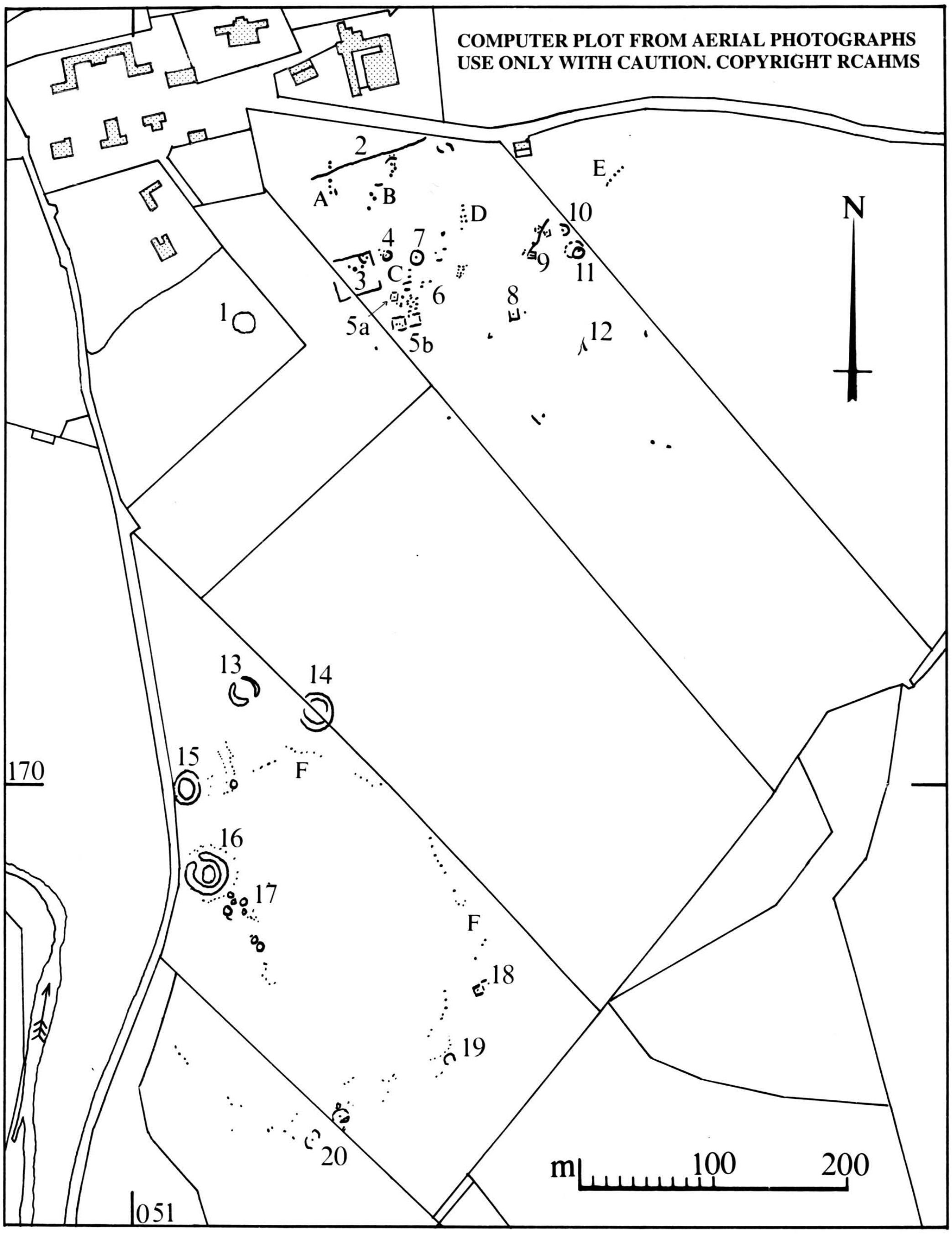


Figure 2.9 An early RCAHMS transcription of the Forteviot cropmark complex that includes the eastern early medieval components of the complex. (This was first published in Alcock & Alcock 1993, 232, illus 10) (SC 710005; ©Crown Copyright: HES)

cropmarks as 'one of the most substantial complexes of Neolithic ritual monuments in Scotland, including at least two henges, a timber enclosure over 200m in diameter and numerous barrows' (1998, 151). Alcock and Alcock (1993), when discussing their fruitless excavations north of the village of Forteviot in 1981 to find Cináed's 9th-century palace, included detailed reference to the prehistoric cropmarks south of the village which, they argued (as did Driscoll), played a role in the legitimisation and power strategies of a newly emergent royal class in the early medieval period. A key outcome of their project was the production of a new 1991 RCAHMS transcription and interpretation of the Forteviot cropmarks which included prehistoric and later features (Brown in Alcock and Alcock 1993, 231–4). Prehistoric elements of the cropmark complex were allocated numbers 13–20 while the palisaded enclosure was marked F in Brown and MacLeod's interpretive transcription (Figure 2.9). Frustratingly, these numbers and letters – unlike those denoting early medieval features – were not defined in the accompanying legend. However, Alcock and Alcock do note that this cluster of cropmarks likely consists of Neolithic and early Bronze Age monuments, including henges and a palisaded enclosure (1993, 235–6).

Prehistoric Forteviot also features heavily in the historian Nick Aitchison's book *Forteviot: a Pictish and Scottish Royal Centre* (2006, 48–50). The Neolithic and Bronze Age monument complex is discussed in more detail than in any work by a prehistorian to that date. This discussion includes detailed dimensions of the cropmark enclosures, a consideration of the avenue and directionality of this 'ritual landscape', and even the inclusion in the discussion of the Mijas Cairn, an upstanding potentially prehistoric burial mound located just to the south of the cropmarks (see Figure 1.5) which no prehistorian had previously thought fit to mention or include in accounts of Forteviot's ensemble.

In sum, as the SERF Project began, it was broadly understood that the cropmarks represented a complex of ceremonial monuments of late Neolithic date, with hints of early Bronze Age burial monuments (the latter rarely mentioned), but this was based on cropmark morphology and analogy alone. Forteviot appeared as an exemplar of such a monument complex in a review of notable cropmark and air photography sites in Britain (Darvill 1996). Darvill gives a description of the cropmarks, noting the unusual proximity of 'hengiform' and 'stockaded enclosure', and drawing parallels with Meldon Bridge. A rare reproduction of an aerial photograph of the cropmarks (taken in July 1977) is included (*ibid*, 190–1). The celebration of Forteviot as an outstanding cropmark site is ironic as it appears to be the very existence of these sites in this abstract form that for three decades consigned them to a minor role in Neolithic studies. It was timely, then, for Aitchison (2006, 50) to note, the 'archaeological features detected from the air hint at the richness of Forteviot and provide obvious targets for archaeological investigation', which began in earnest in the year those words were published.

2.3.3 The Earn valley in the Neolithic and early Bronze Age

Kenneth Brophy and Gordon Noble

The cropmarks at Forteviot do not exist in isolation. Like much of lowland eastern Scotland, the prehistoric evidence in the valley of the River Earn is characterised by rich cropmark archaeology with upstanding remains restricted to the odd serendipitously surviving monument in the ploughzone and a scattering of cairns, enclosures and later prehistoric settlement remains in the uplands. Despite the richness of the prehistoric archaeology in this valley, investigation has tended to focus on individual sites rather than landscape synthesis (with exceptions being the RCAHMS inventory *South-east Perth* (1994) and Millican's PhD thesis (2009), both largely cropmark focused). Here, we will briefly review evidence for sites contemporary with the late Neolithic and early Bronze Age phases of activity at Forteviot. In Chapters 8 and 9, and SERF3, the implications of the work at Forteviot for our understanding of the valley of the Earn in the 4th and 3rd millennia BC will be considered in depth.

Early Neolithic monumentality is the Earn valley is found largely in the western, upper valley (Figure 2.10). There are four cropmark cursus monuments around Crieff and Comrie for instance: three timber variants (Bennybeg, Craggish, Tullichettle), and one earthwork cursus (Broich) (Brophy 1999; 2015). Craggish and Tullichettle, situated on either side of the Water of Ruchill, an Earn tributary, were elongated rectangular enclosures defined by timber posts, each at least 170m long (Millican 2016a, 118, 121); several standing stones are evident nearby (Brophy 2015, 145). Bennybeg is an unusual cursus, consisting of a rectangular enclosure 110m by 35m, defined by posts/pits, with bowed sides, and a pair of 'horns' at the northern end (Darvill 1996, 183; Figure 2.11). Cropmarks in the vicinity include a possible mini-henge and a pit-circle, with all sites in the shadow of a prominent igneous outcrop, Bennybeg Craig (Brophy 2015, 170). Broich cursus was excavated in advance of the construction of a new school between 2006 and 2009 (Cachart and Perry 2009). Cropmarks showed this cursus was a massive enclosure, at least 800m long, up to 135m wide, and defined by irregular ditches; a break on the eastern ditch is filled with the cropmarks of a timber circle. The ditches were segmented, wide and shallow (no more than 0.85m deep but up to 3m across) (Brophy 2015, 114–15) and the cursus appears to terminate in the south overlooking the Earn (Brophy 1998, 101); the northern extent of this monument is unknown. Two radiocarbon dates from hazel charcoal were ascribed to the ditch, both in the 37th to 34th century cal BC (Cachart and Perry 2009, 5). Although at the time of writing unpublished, it is clear Broich cursus (and the timber cursus variants, which would have been built in the early centuries of the Neolithic (Brophy and Millican 2015)), represent monumentality on a scale not evident in the Forteviot end of the valley at this time.

The cropmark record provides further evidence for other early Neolithic sites in the Earn valley, with a

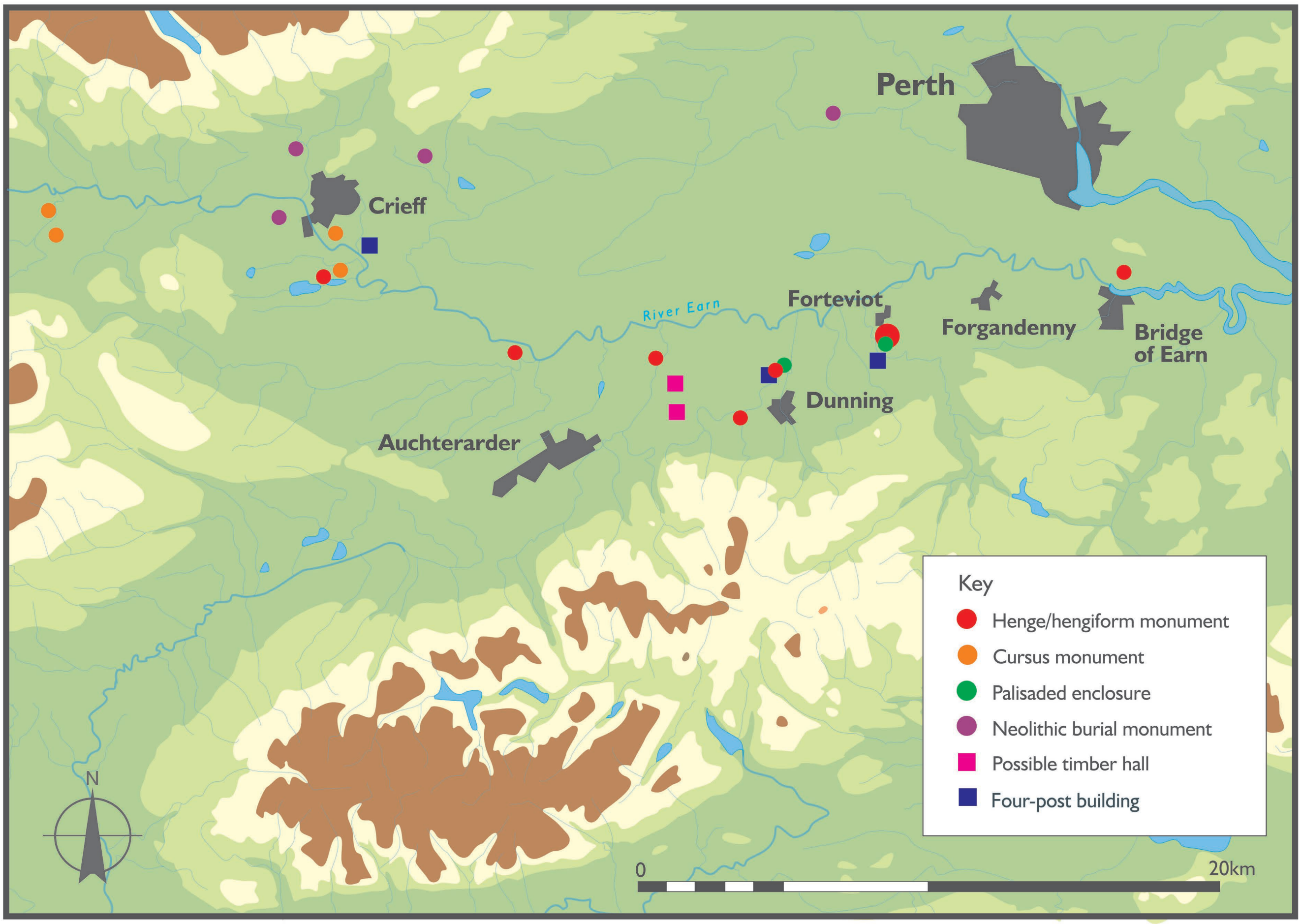


Figure 2.10 Location of main Neolithic sites in Strathearn (by site type)

possible timber hall identified at Westerton, midway between the towns of Auchterarder and Dunning. This site is defined by twelve large pits (probably postholes) defining an area *c* 29m by 9m (Millican 2009, figure 6.21) which could date to the beginning, or end, of the 4th millennium BC depending on whether it was a roofed or unroofed structure (Brophy 2007b). A further pitted enclosure has been identified as cropmarks at Hall of Aberuthven, 500m from Westerton (Brophy 2007b, 80; Millican 2016a, 103). This larger site, oval in plan and measuring 35m by 12m, was also likely to have been timber-post defined. Although probably not a roofed structure (there is no indication of internal roof support features), this cannot be ruled out, the structure being within the morphological range for timber halls (Brophy 2007b; 2016). A large interrupted ditched enclosure *c* 100m diameter at Leadketty, near Dunning, also a cropmark site, had in the past been interpreted as an early Neolithic causewayed enclosure (Barclay 2001b, 151; Oswald *et al* 2001, 39). However, SERF excavations there in 2013 failed to find evidence for the date of this enclosure; it seems more likely it represents Iron Age activity (SERF3); internal scattered pits, hollows and post-alignments could be indicative of prehistoric settlement of virtually any period.

Evidence for early Neolithic settlement and farming remains rare. No buildings of this date have been confirmed in the valley of the Earn, although a small rectangular, post-defined structure excavated at Pittentian in 2011, whilst undated, shares morphological traits with Neolithic buildings found elsewhere in northern Britain (Becket 2011; Brophy 2016). Lithic scatters will probably not help, with only a few in the valley of Neolithic character (Wright 2012) and these remain un-investigated. A possible proxy indicator of settlement – pits – are surprisingly rare, although clusters of pits containing broken Neolithic Carinated Bowl pottery and carbonised material were excavated during SERF excavations at Wellhill and Cranberry, both near Dunning, between 2014 and 2016 (SERF3). Four pits were identified beneath the bank at North Mains henge, although one contained cremated human bone, and the excavator suggested that these pits may

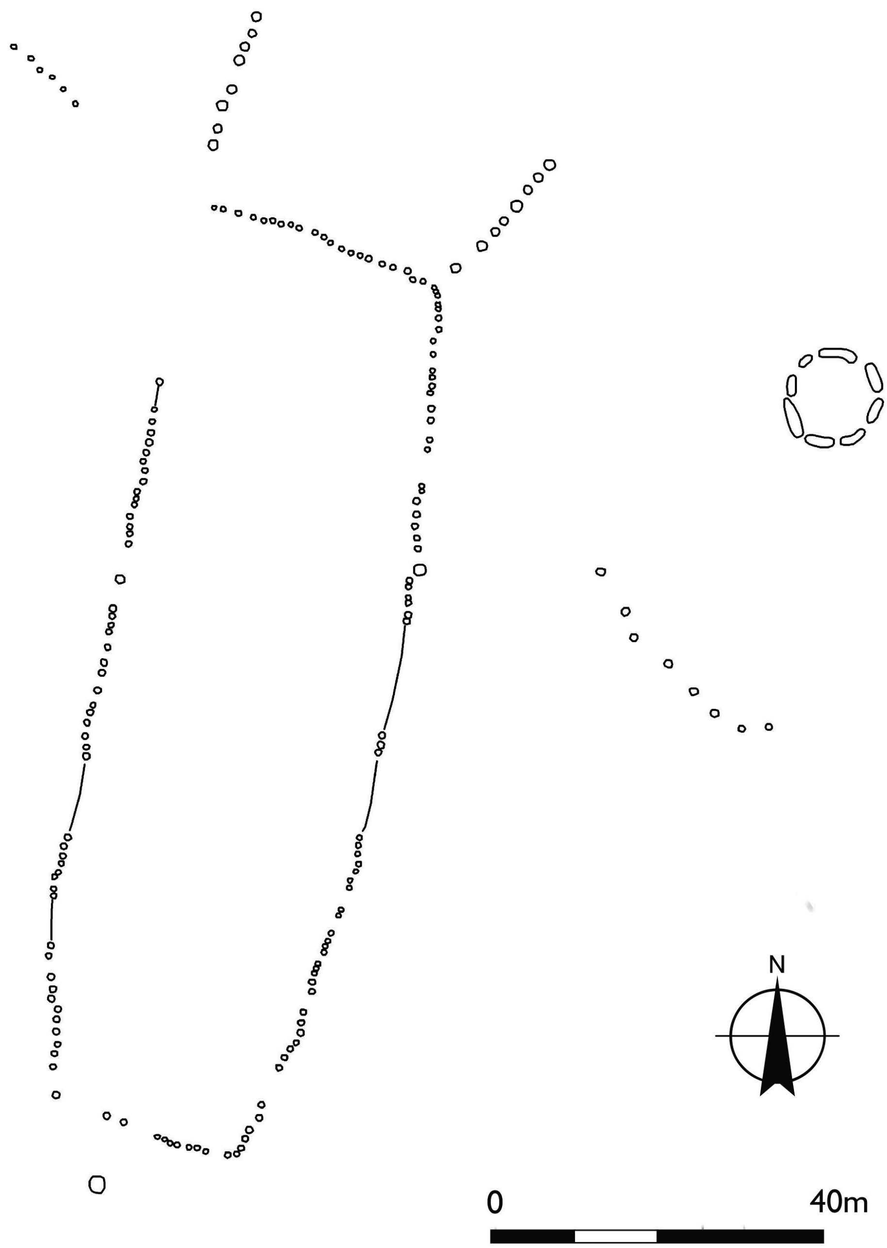


Figure 2.11
Transcription of the Bennybeg timber cursus monument (Kirsty Millican)

have had a 'ritual' purpose (Barclay 1984, 273). There is also limited evidence in the Strath for Neolithic farming practice, although the identification of putative ardmarks and field ditches of possible Neolithic date at Wellhill and Cranberry (Brophy and Wright forthcoming), and documentation of what Barclay termed 'cultivation ridges' underlying the early Bronze Age barrow at North Mains (1984, 191), represent a considerable concentration of farming evidence within a Scottish context (Brophy and Wright forthcoming). The absence of 'domestic' evidence in the area, aside from possible late Neolithic four-post buildings (see below), should not necessarily be read as evidence for absence. A relative lack of developer-funded excavations in the Earn valley may account, in part, for a lack of Neolithic settlement traces in the valley (Brophy 2016 offers context). Where topsoil has been removed during SERF and other investigations, such evidence can be found, although largely in the form of pits, but such interventions remain relatively rare.

There are a few upstanding monuments of possible early Neolithic date in the valley. Two megalithic burial monuments, a chambered cairn at Cultoquhey and long cairn known as Rottenreoch, are located close to Crieff. Material excavated from the largely ruinous chambered cairn at Cultoquhey in the 1950s (Henshall 1972, 475–6) was recently dated, suggesting use of this monument for burial in the period

3620–3370 cal BC (GrA-26922 4680±40BP) (SCARF 2012a, section 3.3.3.1) and thus roughly contemporary with Broich cursus 3km to the south-west. Rottenreoch is a substantial stone and earthen mound, some 60m in length, with several cists protruding, but has not been subject to excavation (Henshall 1972, 475). One further chambered cairn, Kindrochet, is located south of Loch Earn and so just beyond the geographical scope of this review; this monument was excavated by Childe in 1929–1930 (Childe 1931). A possible long barrow has also been identified – a long mound opened in the 18th century near the church at Monivaird; urns and a polished stone axe were supposedly recovered from a possible cist (NSA 1845, 740). Located 1km north-west of Crieff, this denuded monument is known, appropriately in the context of this project, as St Serf's Water.

The cropmark record might also augment our understanding of burial practice at this time. A site identified at Thorn, near Auchterarder, has been interpreted morphologically as a possible long barrow, while at Broich Road Farm, adjacent to the cursus, a similar cropmark has been interpreted as a 'long mortuary enclosure', a little-understood site type usually associated – on the basis of very little evidence – with early Neolithic burial practice (Loveday 2006, 59ff; Brophy 2015, 138–40).

We have a better understanding of 3rd millennium BC activity in the valley of the Earn thanks to a series of excavations, most notably Barclay's investigation of a henge monument and barrow at North Mains, Strathallan, in 1978–1979 in advance of airfield construction. These sites were located roughly half-way between Crieff and Dunning, on the south side of the Earn. Here Barclay identified a multi-phase henge monument that included a timber circle of huge posts pre-dating the henge earthworks, with Beaker and Food Vessel-accompanied burials later inserted into the henge monument (Barclay 1984; Younger 2016a). The investigation of the adjacent earthwork barrow was a *tour de force* of excavation, with Barclay unpicking a complex sequence of stake-structures and earth dumps. Cremation burials and a burial associated with a jet-spacer necklace were found within the structure, which dated to the last centuries of the 3rd millennium BC (Barclay 1984). Excavations at North Mains, as well as several mini-henges in the valley, added much to our understanding of the transition from the late Neolithic to early Bronze Age in terms of ritual monumentality and burial, topics so relevant to our work at Forteviot. Mini-henges excavated include the multi-period stone setting and henge-ditched-enclosure at Moncreiffe in the eastern end of the valley (Stewart 1986). Investigations of two ring-ditch cropmarks ahead of pan-busting at Belhie, north of Aberuthven, in 1988 (Figure 2.12) identified a Beaker-associated mini-henge and an enclosed cremation cemetery (Ralston 1988). Cropmarks at Belhie include at least two further probable 3rd-millennium BC enclosures, one associated with a standing stone, which remain unexcavated (Harding and Lee 1987, 402). During the SERF Project, beyond Forteviot, mini-henges were excavated at Leadketty in 2012 and Millhaugh in 2017 (SERF3). Taken together, these sites, along with cropmark examples such as those adjacent to Bennybeg Craig, indicate a complex series of different roles and forms for these superficially similar small enclosures in the middle to second half of the 3rd millennium BC.

Timber structures of circular form may well have been a significant component of the 3rd millennium in the valley of the Earn, with various examples and variants identified as cropmarks and by excavations. Several possible timber circles are listed by Millican (2008; 2009, 174–206), some of which may be Neolithic monuments. However, few are greater than 10m in diameter and so may well be Bronze Age or Iron Age roundhouses, such as the ephemeral example excavated within the Broich cursus (Cachart and Perry 2009). Timber circles may also take the form of late Neolithic four-post buildings, and such a site was excavated in 2011 in advance of power-line pylon construction at Pittentian, just east of Crieff and the Broich cursus. With a maximum diameter of 22m, and an internal post-ring, this structure could be regarded as being either a free-standing monument or a roofed building; it was associated with Grooved Ware pottery (Becket 2011). A similar, but smaller, Grooved Ware-associated building was excavated as part of the SERF Project Phase 2 at Leadketty in 2012 (Brophy 2016, 218–19; SERF3). Similar cropmark examples such as Green of Invermay, Thorn, Loanhead, Middle Powside, and Mains of Huntingtower may also be late Neolithic in date and belong to an increasingly recognised four-post timber building tradition (Noble *et al* 2012).

Upstanding late Neolithic to early Bronze Age monuments are more common across the valley although few have been excavated, so their exact chronological currency remains unclear. There are eleven stone circles in the upland zone of the valley. Morphologically, some such as Dunmoid, Ferntower,

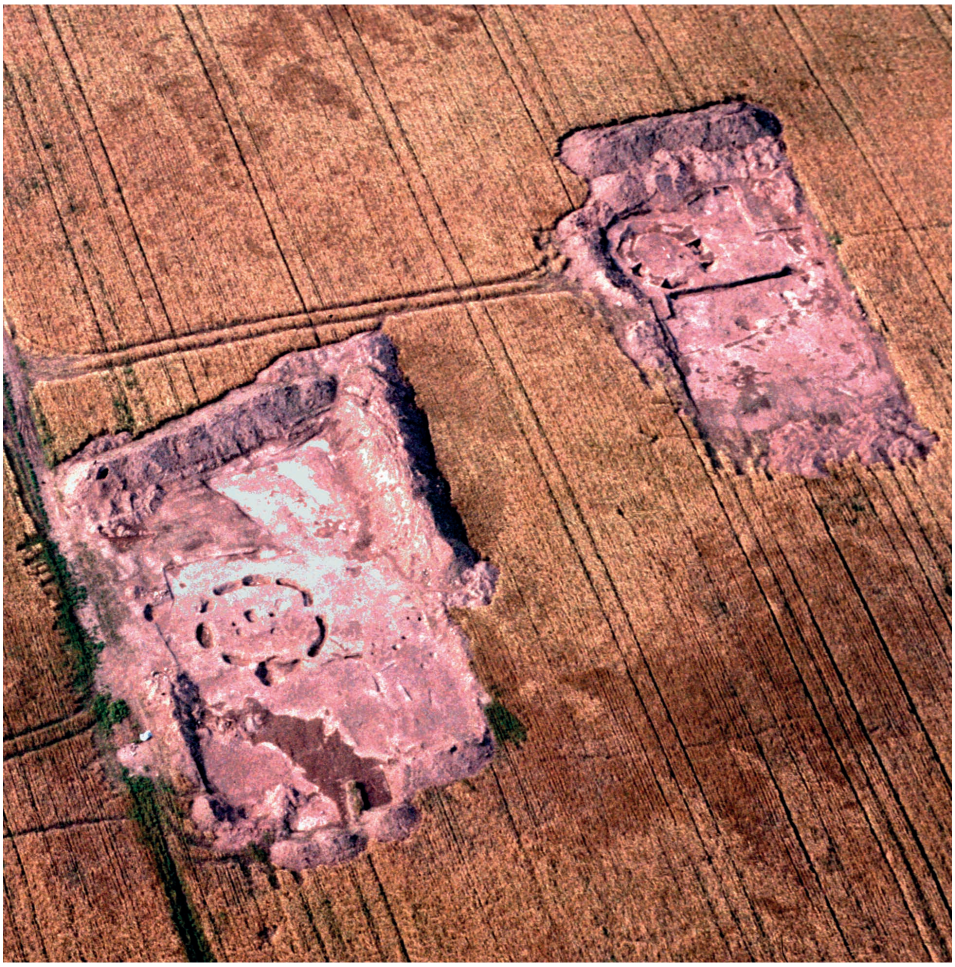


Figure 2.12 Aerial photograph showing the Belhie excavations in 1988 (SC 342834; ©Crown Copyright: HES)

and Easthills appear to belong to the four-poster stone circle tradition and are thus likely to date to the 2nd millennium BC (Burl 1988). Others are harder to categorise, being poorly preserved in many cases. Standing stones are fairly evenly distributed across the valley, some in river terrace locations such an example just north of Dunning (Figure 2.13), near the Leadketty cropmark complex. Once again, we have no clear idea of exactly when these were erected although as noted, some stand in close proximity to cropmark enclosures such as Craggish cursus and at Belhie. These offer context for the fallen/broken standing stones identified at Forteviot (see Chapters 4 and 7).

Upstanding cairns and barrows of early Bronze Age date are more common than Neolithic cairns, and not restricted to upland locations, although few have been dated or subject to modern excavation. Two cairns near Forteviot of unknown date, Mijas and Jackschairs, were surveyed during Phase 1 of the SERF Project. Jackschairs is located beside a later fortified enclosure and has a diameter of 14m and a height of 1.2m (SERF4). The Mijas cairn (Figure 2.14), which is situated just to the south of the Forteviot cropmark complex, measures 22m across and 1m high; during survey no surrounding ditch was identified. Using a morphological rule of thumb suggested for dating prehistoric round mounds from field observation alone (Barclay 1999a, 24–5), Mijas is more likely Neolithic, Jackschairs probably Bronze Age. The location and significance of Mijas cairn or barrow is returned to in section 8.7. During Phase 2 of the SERF Project, a Bronze Age kerb-cairn at Millhaugh, west of Dunning, was investigated (SERF3); this had been suspected to be a Neolithic barrow (Barclay 1991). A range of other cairns and mounds in the study area have been identified as probable prehistoric burial sites, although in some cases, such as the mound at Sair Law, near Crieff, it is unclear whether these are natural or artificial (Barclay 1999a, 24–6; Brophy 2010). The significance of this ambiguity was reinforced by excavations at Abercairney in 1983, where a stone coffin containing an inhumation burial, flint scraper, and jet necklace was inserted into a glacial knoll (Rideout 1987).

Variability of burial practice in the 3rd millennium BC is attested to by SERF excavations at Forteviot, Millhaugh, Wellhill, and Cranberry (for the latter three, see SERF3), as well as discoveries attested to in

Figure 2.13 Dunning standing stone (photo: K Brophy)

Figure 2.14 Mijas cairn viewed from the south-east

antiquarian records, reported in the pages of *National Statistical Accounts*, *Ordnance Survey Namebooks*, and early journal accounts. There are numerous such instances in the SERF Project study area alone, some in close proximity to our excavations. For instance, a cist was identified at Kildinny, next to the road east of Forteviot, in 1917; it contained skull and jaw fragments, seventeen loose teeth, and a scatter of pebbles that were deemed to be of some significance to the excavator (Coates 1918, 36), while stone coffins were uncovered at Leadketty in 1844 (OSNB 1859–62, Perthshire Book 26, 33). Such discoveries, often lacking exact locations, and with limited information about finds, add a sense of depth if not exactitude to our study. The same can be said for the discovery of stone objects of prehistoric date. For instance, stone axes from Strath Earn are largely stray finds, and although not closely concentrated in any one location, some general patterns are evident. Stone axes are most common in the upper and lowermost zones of the Earn, particularly in the stretch of landscape from the eastern side of Loch Earn to around Crieff. There is a small cluster of axes around Dunning and also where the Earn joins the Tay near Abernethy. Notably, not a single axe has been found in or around Forteviot itself; our excavations have not changed this situation. Where they have been documented, such finds are largely without secure context or even an exact findspot.

In summary, the balance of evidence suggests ongoing low-level utilisation of the upland fringes of the valley, primarily for the purposes of burying the dead and erecting megaliths, across the 4th and 3rd millennia BC. We can presume the uplands were also used for summer grazing of cattle. Conversely, the lowland (largely cropmark) evidence tells a story of large-scale monument construction projects, and extended periods of activity in a few key locations. Paradoxically, a consistent factor that runs across this 2000-year narrative is that we have much better evidence for the dead than the living, with settlement archaeology for the most part eluding us, but variable monuments of death and burial evident in the area. The focus of attention appears to have shifted from the Crieff-Comrie area in the early Neolithic, downstream to the Forteviot-Dunning area in the late Neolithic, although this pattern is by no means clear-cut (Pittentian and North Mains do not fit easily in this scheme). More broadly, the valley of the Earn during this extended period in many respects is typical of what we know of eastern lowland Scotland (summarised in RCAHMS 1994; Barclay and Maxwell 1998; Brophy 2007a), with the main exception being the paired massive late Neolithic palisaded enclosures at Forteviot and Leadketty. These exceptional and rare sites suggest that something remarkable was going on during the 3rd millennium in this part of eastern Scotland that had no parallel in mainland northern Britain.

2.4 Geophysical survey

Tessa Poller

Throughout the course of the SERF Project various geophysical survey techniques and resolutions were used at Forteviot with mixed results (Figure 2.15). The sand and gravel subsoils of the old Tayside region are notoriously unpredictable when it comes to geophysics. Sharpe and Johnson (1998, 77), reporting on geophysical survey undertaken on similar conditions at Littleour, Perth and Kinross, noted that:

> the major problem, particularly in relation to earth resistance survey, is the non-uniform nature of deposits over small areas. These deposits consist of boulders, through gravels and sands, down to silt- and clay-sized particles. Random distributions of lenses of material of different sizes occur … This can create considerable difficulties … when attempting geophysical survey.

More globally, there is still a gap in our knowledge of how the possible myriad of geological and environmental factors affect geophysical survey results (Cuenca-García *et al* 2018). Unsurprisingly, since many of the factors that influence geophysical results also affect cropmark production, the SERF surveys often confirmed the archaeological evidence already identified from aerial photographic analyses rather than detecting many new features. Aerial photography and geophysics complement each other to provide a deeper understanding of the character of the archaeological evidence. In the discussion below, see Tables 1.1 and 2.1 for further information on each site code used.

The SERF Project was preceded by a small-scale magnetic and earth resistance geophysical survey undertaken by Paul Johnson of the Department of Archaeology, University of Glasgow, in 1994.

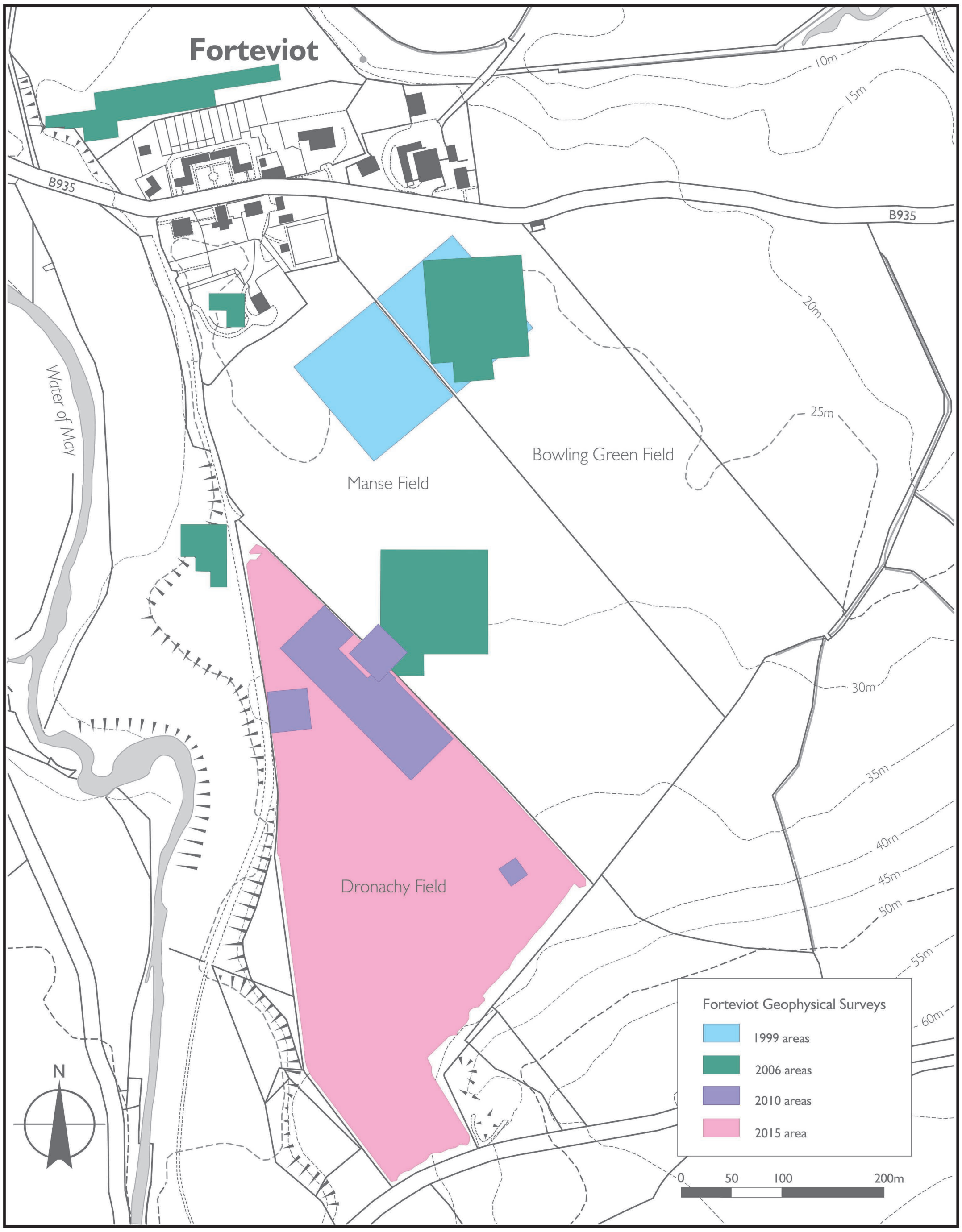


Figure 2.15 Areas of geophysical survey carried out by the University of Glasgow / SERF Project / SENSYS between 1994 and 2015

Unfortunately, a report was not written at the time and we have very few details of the survey methodology. Nonetheless, by examining the raw data we can see that the earth resistance survey, which covers the Manse and Bowling Green fields, was conducted with a GeoScan RM15, recording readings every 0.5m in zig-zag mode. This data has been minimally processed using GeoPlot 3.0: the grids have been edge matched, a separate grid cut and pasted in position, and the data clipped to emphasise the differences between the low and high resistance readings (150/190 ohms for the Manse Field and 260/420 ohms for the Bowling Green Field) (Figure 2.16). The results reveal the circular enclosure (NO01NE 35) in the Manse Field to have a high-resistance interior within a singular lower-resistance circular feature defined by the edge of the ditch. A probable pit feature (low resistance) is located just off-centre. Extending from the south-west edge of the enclosure ditch, a small arc, also of low resistance, may be archaeologically significant. Only after the recent aerial identification of a henge in this field (NO01NE 246) was it noticed that part of its ditch was recorded as subtle low-resistance features, up to 4.5m wide, in the south-west end of this survey. To the north-west

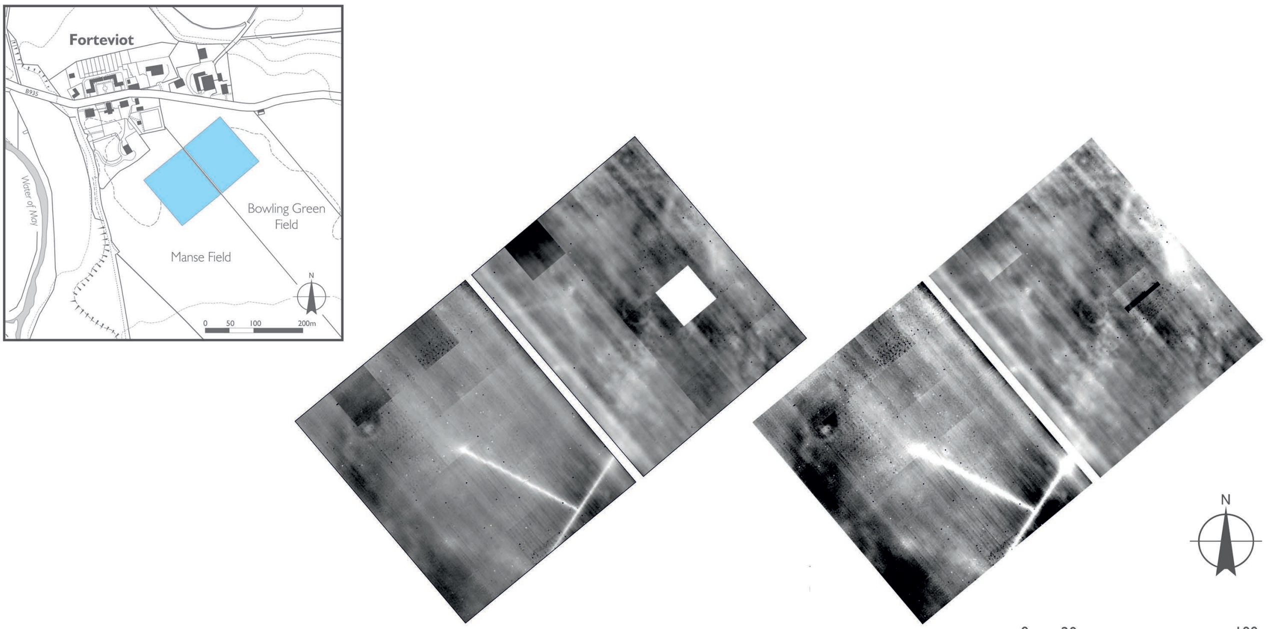


Figure 2.16 Raw and processed results of University of Glasgow's 1994 resistivity survey in the Manse and Bowling Green fields

and south-east of the henge the resistance is very high, suggesting a stonier spread of material defining its immediate context. Throughout the survey area there are patches of lower resistance, which may represent other cut features that are less well defined. Within the Bowling Green Field the recent plough marks are very prominent. Despite this, the ditch of the square enclosure (NO01NE 29) and one of the large circular barrows are visible as bands of low resistance. These features are also identifiable as slightly negative magnetic bands in the gradiometry results (Figure 2.17). The gradiometric survey was carried out using a GeoScan FM36 meter, with readings taken every 0.5m. The data was processed with GeoPlot 3.0. A zero mean traverse was first applied to all grids, the data was then despiked (X1/Y1) and lastly interpolated in both X and Y. Further elements of the early medieval cluster of cropmarks (eg NO01NE 29) can be identified, but show largely as understated responses (SERF2).

As part of the SERF Project, three further episodes of geophysical survey were carried out in the fields around Forteviot, utilising mainly earth resistance and gradiometry techniques conducted at varying degrees of resolution and extent. The results of this work relevant to prehistoric Forteviot are summarised here.

In 2006, a pilot phase of fieldwork, funded by the British Academy, was undertaken. This consisted of limited test pitting to establish topsoil depths and the nature of the subsoil (outwith Scheduled areas), and earth resistance and magnetometer survey of five areas around Forteviot. The 100m by 100m survey area in the Manse Field (for location see Figure 2.15) was directly relevant to the prehistoric cropmarks, partially covering Forteviot Henge 2. The earth resistance survey was undertaken using a GeoScan RM15 with a probe separation of 0.5m. Readings were taken every metre. The gradiometric survey was conducted with a single probe Bartington GRAD601 fluxgate gradiometer and readings taken every 1m (traverse) by 0.25m (sample). The raw data of this has unfortunately been lost, but the report from the surveyor notes the processing procedure that was conducted. Using GeoPlot 3.0

> the resistivity data was clipped (using ±2 standard deviations) and edge matched, and subsequently processed with a uniform high pass filter using X- and Y-radii of 10 … The magnetometry data was clipped (using absolute values from ±15 to ±25), uniformly assigned a zero mean for the grid dataset, and despiked to remove spurious anomalies. To remove 'striping' of the data, a zero mean was also established for the traverses. (Malcolm 2006)

The magnetic results were limited for this area (Figure 2.18), with the partially visible enclosing ditch of Henge 2 just detectable as an arc of variable magnetism. The other few highly magnetic anomalies in this survey are most likely to be responses to small

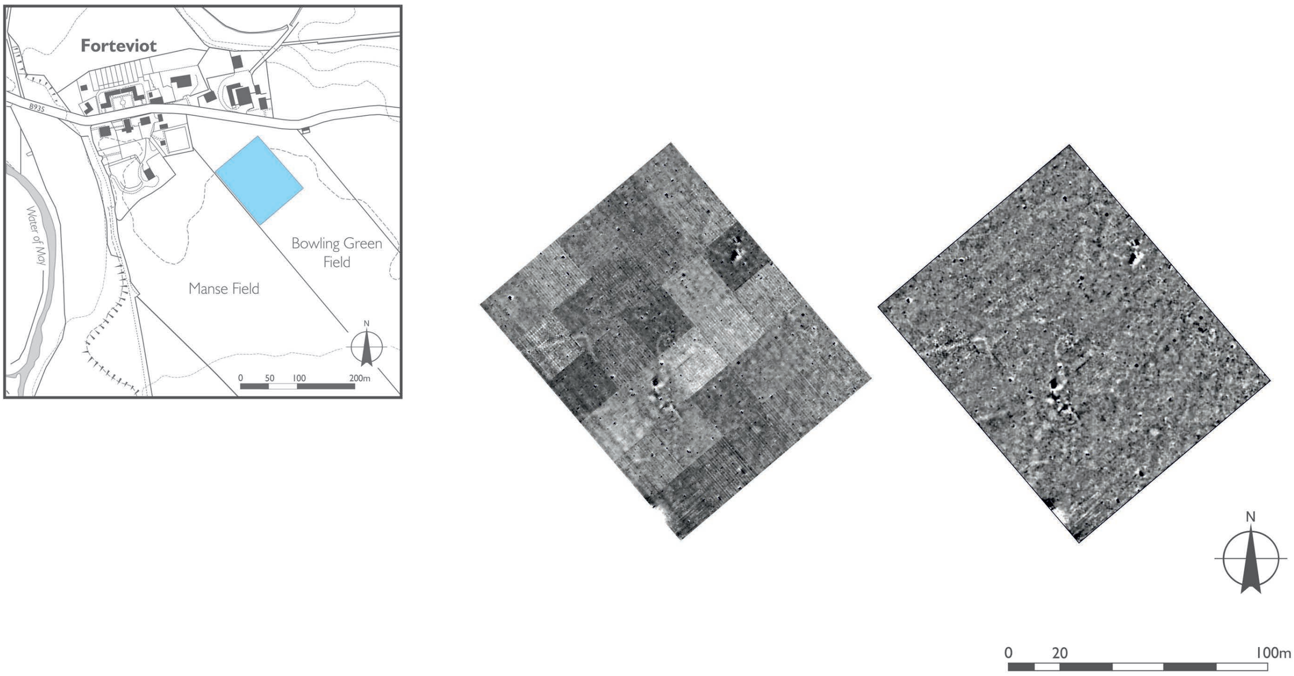


Figure 2.17 Raw and processed results of University of Glasgow's 1994 gradiometer survey in the Bowling Green Field

pieces of metal or igneous stone. The earth resistance survey identified the henge ditch as a band of low resistance (Figure 2.18). Variation in resistance is apparent across the survey, but no archaeological features can be identified as the results are dominated by plough marks running perpendicular to the field boundary. The other geophysical surveys undertaken during this season were in Forteviot village and over the early medieval cropmark cluster in the Bowling Green Field (eg SERF2, section 3.1).

A second and more successful geophysical survey season was undertaken in 2010, this time

Figure 2.18 Results of the resistivity and gradiometer surveys from SERF geophysics in 2006 in the Manse Field

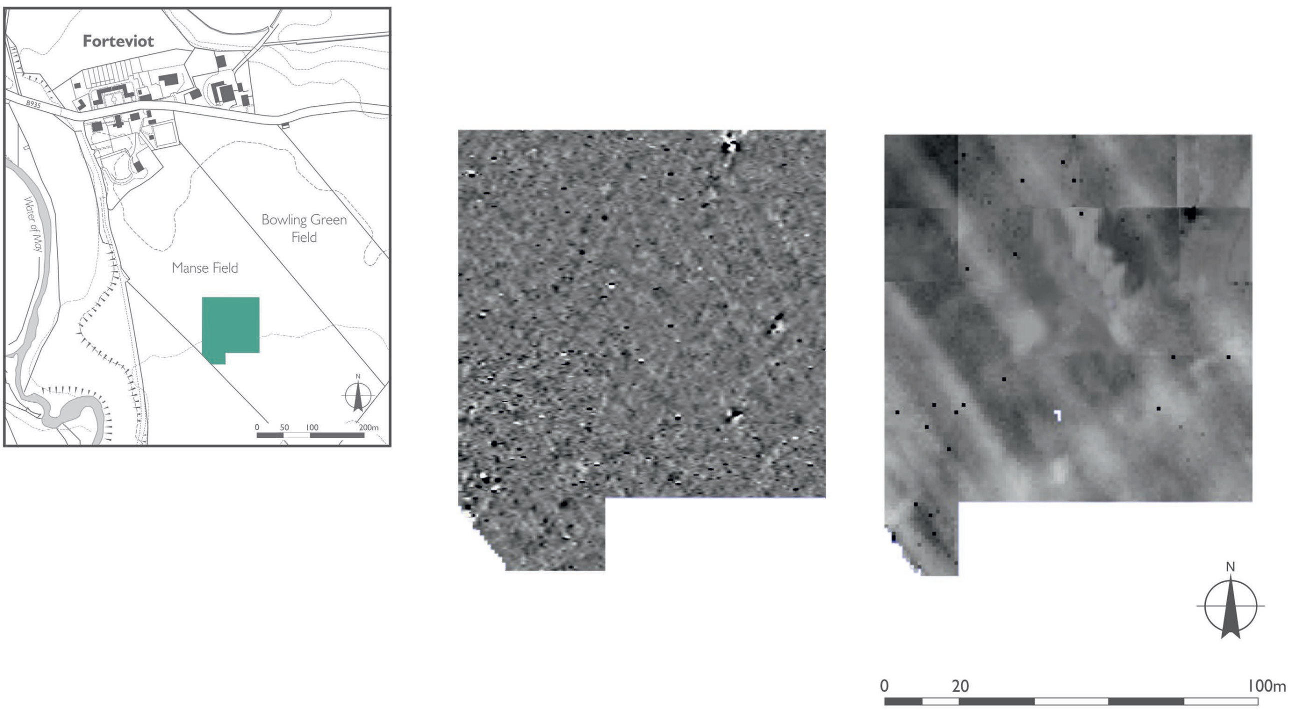


Figure 2.19 Cuenca-García undertaking GPR survey in the area of Trench F, 2010

predominantly covering the Dronachy Field in 2010 (for location see Figure 2.15). This survey was undertaken in several stages over the spring and summer months. The initial stage covered the four areas targeted for excavation, but was also guided by the PhD research of Carmen Cuenca-García (2012). This research set out to test systematically a combined approach using geophysical techniques and soil characterisation to understand the proxy responses of archaeological features. Cuenca-García applied a variety of geophysical techniques (earth resistance, magnetometry, frequency domain electromagnetics (FDEM) and ground-penetrating radar (GPR)) over the location of the ring-ditch (Figures 2.19 & 2.20), both during pre-excavation and after the ploughsoil was stripped (*ibid*; Table 2.3). Different geophysical results were considered with respect to soil chemical concentrations (total phosphate and multi-element analysis), texture, pH, conductivity, organic matter content, and magnetic susceptibility from samples of archaeological deposits, topsoil and subsoil. The overarching results not only provided a nuanced understanding of the character of the archaeological features surveyed at this site, but also began to develop a better understanding of how the setting of a site may affect geophysical datasets (Cuenca-García *et al* 2013).

Cuenca-García's work determined that the ploughsoil had a large effect on detecting archaeological features cut into the subsoil in this environment (Cuenca-García 2012, 329–31). With the understanding that in most cases survey has to take into account the obstructing nature of the ploughsoil, she concluded that to obtain the best results it was necessary to use a variety of techniques. When each is deployed in an effective way the results can complement each other to describe a more detailed picture about the archaeological features (*ibid;* Figure 2.21). In the case of gradiometry, one of the most commonly and often uncritically employed techniques in archaeology, the ideal would be to take readings at very close intervals (Cuenca-García 2012, 329). Rapid, large area survey methodologies, like the one conducted in 2006, which employ wide survey intervals (such as 1m by 1m) would be too 'coarse' to characterise the archaeology adequately in this environment. Furthermore, from the chemical analyses, Cuenca-García (2018, 65) determined there was no anthropogenic enrichment of the soils associated with the ring-ditch. This lack of enrichment, perhaps due to the 'ritual' nature of the enclosure, also contributed to the difficulty of discerning the archaeological features from the surrounding 'natural' soils. Other details about how the soil and survey environment at Forteviot affected

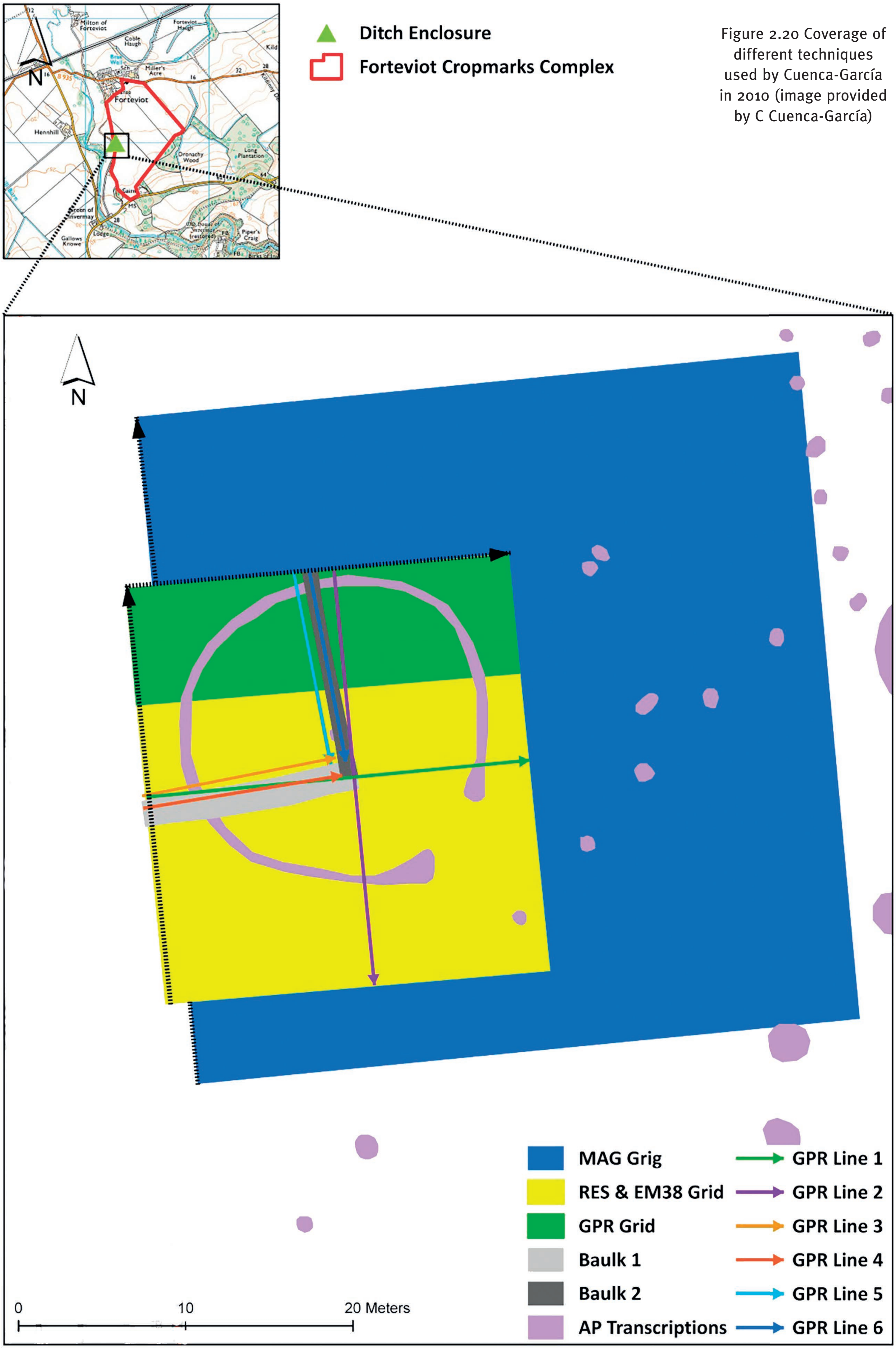


Figure 2.20 Coverage of different techniques used by Cuenca-García in 2010 (image provided by C Cuenca-García)

Table 2.3 The interface of geophysical and geochemical survey at Scottish archaeological sites (source: Cuenca-García 2012, table 7.1)

Technique	Date	Instrument	Traverse spacing	Sampling interval	Survey mode	Notes
Gradiometry (a)	30/05/2010	Bartington Grad 601-2 & 1	0.5m	0.125m	Parallel (uni-directional) traverses & lower sensor *c* 20cm above the surface & 0.03nT/m (resolution)	The survey was carried out before the stripping of the topsoil
Gradiometry (b)	14/06/2010		0.25m			The survey was carried out before the stripping of the topsoil
Gradiometry (c)	26/07/2010					The survey was carried out before the stripping of the topsoil
Earth Resistance	22/07/2010	Geoscan RM15 & MPX15	0.5m	0.5m	Zig-zag traverses	0.5m and 1m probe spacing / x1 range (sensitivity range). The survey was done during a sunny and dry afternoon after a day of heavy rain & a wet morning
GPR-450 MHz	25/06/2010, 26/06/2010, 17/07/2010, 19/07/2010	Sensors & Software PulseEKKO 1000	0.25m	0.05m	Parallel (uni-directional) traverses, continuous mode, time window=150ns, stacks=16, samples=200ps, average velocity used during collection=0.1m/ns	The survey was carried out before the stripping of the topsoil
Single GPR-450 MHz	27/07/2010					The survey was carried out during a sunny & dry day before & after the stripping of the topsoil
	11/08/2010					The survey was carried out after a day of torrential rain over the baulks and over the immediate stripped areas
FDEM (a)	22/07/2010	Geonics EM 38	1m	1m	Parallel (uni-directional) traverses, vertical mode & inphase & quadrature components logged. The instrument was connected to a GPS (RTK)	The survey was carried out on a wet morning and after a day of torrential rain & before the stripping of the topsoil
FDEM (b)	26/07/2010					The survey was carried out after the stripping of the topsoil

the results of different geophysical techniques used has been synthesised in Cuenca-García (2018).

Alongside Cuenca-García's gradiometric survey of the ring-ditch, three other small, targeted, pre-excavation surveys were undertaken (Poller 2010). These surveys explored Henge 2, the avenue and northern boundary of the palisaded enclosure, and a square barrow on the southern boundary of the same. During excavation, an additional area which covered a broad swathe of the north-east section of the palisaded enclosure as well as Henge 2 was surveyed (for location see Figure 2.15). For these surveys a double Bartington Grad 601 was employed (Figure 2.22) and measurements were taken every 0.250m along the traverse and sampled every 0.125m. All the gradiometer survey data was downloaded in Grad601 software and imported into GeoPlot version 3.0 for processing. Over the ring-ditch survey area a high pass filter was applied, followed by a zero mean traverse on all the grids to reduce the striping effect between sensors, and then the data was clipped to absolute readings of 25/+25nT. Zero mean traverse processing was also applied across the other survey areas and the data clipped to absolute readings of 20/+20nT.

Although the results largely identified features that were already known via the cropmarks, they provided more detail about the character of the features and the background geology (Figures 2.23 & 2.24). The ditches of the henges were clearly defined, and in both cases a large, pit-like feature was identified in their centres (which accorded with our excavations at Henge 1 in 2008–09). Small, strong, positive magnetic features, putative pits or postholes, are visible surrounding both Henge 2 and 3. Strong dipolar anomalies within the ditch of Henge 2 may be metallic objects or discrete areas of intense burning. Several other very strong, circular dipolar anomalies are in the rough location of the postholes of the palisaded enclosure, and therefore may represent specific and intense

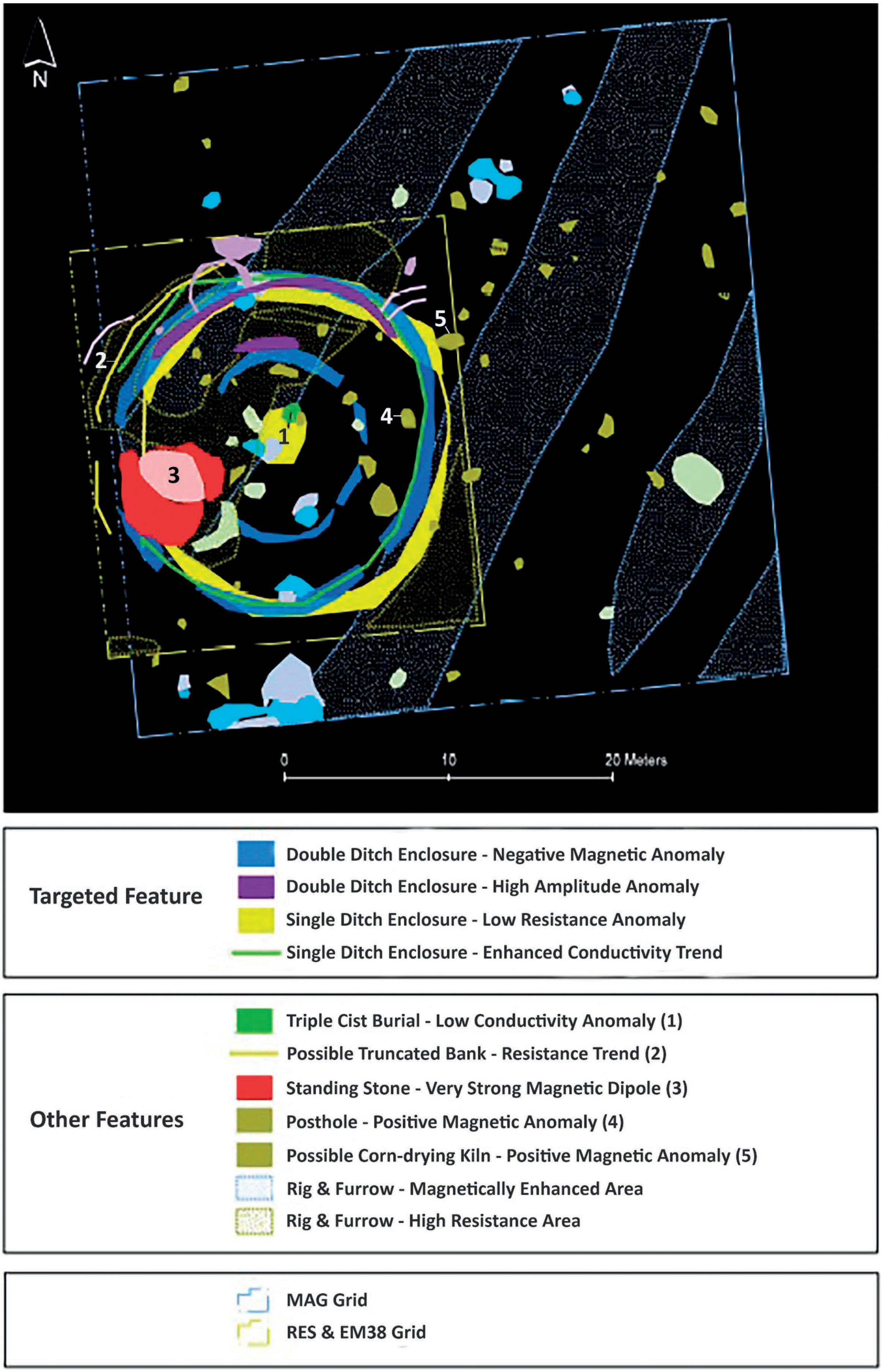


Figure 2.21 Interpretative diagram showing results of Cuenca-García's survey work (image provided by C Cuenca-García)

Figure 2.22 Gradiometry survey in 2010: Bartington Grad 601 in use

burning events related to these postholes. The traces of a subtle positive magnetic arc in association with the line of postholes of the palisaded enclosure hints at the possibility of a bank or ditch (section 3.5.2). A very strong and substantial magnetic feature was detected towards the south-east end of the survey. Although not as discrete, this feature is of similar size to the large magnetic response of the igneous boulder excavated on the edge of the ring-ditch and may therefore also be an igneous stone setting or, alternatively, an area of intense burning. The survey in 2015, discussed below, suggests that this anomaly may be part of a much larger alignment.

In February 2015, a large-scale geophysical survey, funded by HES, was carried out across various fields in the SERF study area by SENSYS (Wright and Poller 2015). The targets were fields with cropmarks at Baldinnies, Leadketty, Wellhill, and parts of Roman Temporary Camps at Dunning and Forteviot, as well as the Dronachy Field in Forteviot; a total of 51 hectares was surveyed (Figure 2.25). The survey was undertaken using a multi-channel Magneto MX V3, which has sixteen fluxgate gradiometers towed on a quad bike (Figure 2.26). The probes were 0.25m apart and the position of readings recorded using differential GPS. SENSYS processed the data by checking the co-ordinates and filtering the data through MatLab software. The data was then imported to MAGNETO software where it was geo-referenced and interpolated. The data was delivered to the SERF project as processed greyscale geo-referenced TIFFs (Figure 2.27).

This survey managed successfully to identify the ditches of the henges as strong magnetic features. Comparatively, the ditch of Henge 1 is characterised by more variable positive and negative magnetic readings. As revealed by excavation, this is due to the stony infill of the ditch (see section 5.5). The ring-ditch was also recorded, with the location of the stone socket and fallen standing stone (see section 7.2.3) registering as a strong positive response, as had also been the case in the 2010 survey. (The socket had, in between times, been excavated, but the fallen monolith had been left *in situ* and reburied at the end of the 2010 season.)

One of the most intriguing results of this survey was the identification of at least seven very strong and notable magnetic anomalies, four of which appear to form an evenly spaced arc located to the south of Henge 1 but within the large palisaded enclosure. The others, located to the east and north-east of Henge 1, may also be part of this arc or another related alignment. These anomalies may be the location of substantial igneous stone (such as the one excavated on the edge of the ring-ditch) or areas of intense burning.

In summary, it took time and effort to understand how to get the most out of geophysical survey in this environment. In many ways, by the time we got to grips with the methods it was too late to feed into our excavation programme here, but the work has highlighted important lessons for any future work in this area. There is further potential for the geophysical results produced by, and in conjunction with, the SERF Project.

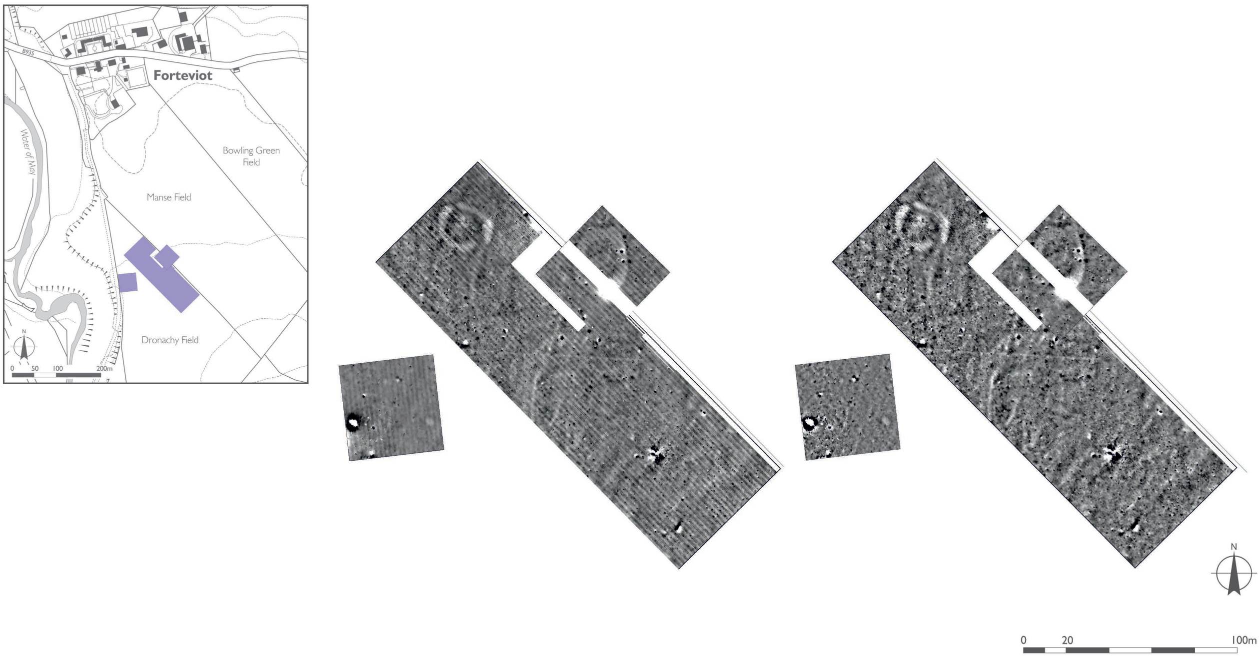


Figure 2.23 Raw and processed data from the SERF Project Bartington Grad 601 survey in 2010, focused on Henge 2 and the palisaded enclosure

Figure 2.24 Interpretation of the SERF Project Bartington Grad 601 survey in 2010, focused on Henge 2 and the palisaded enclosure

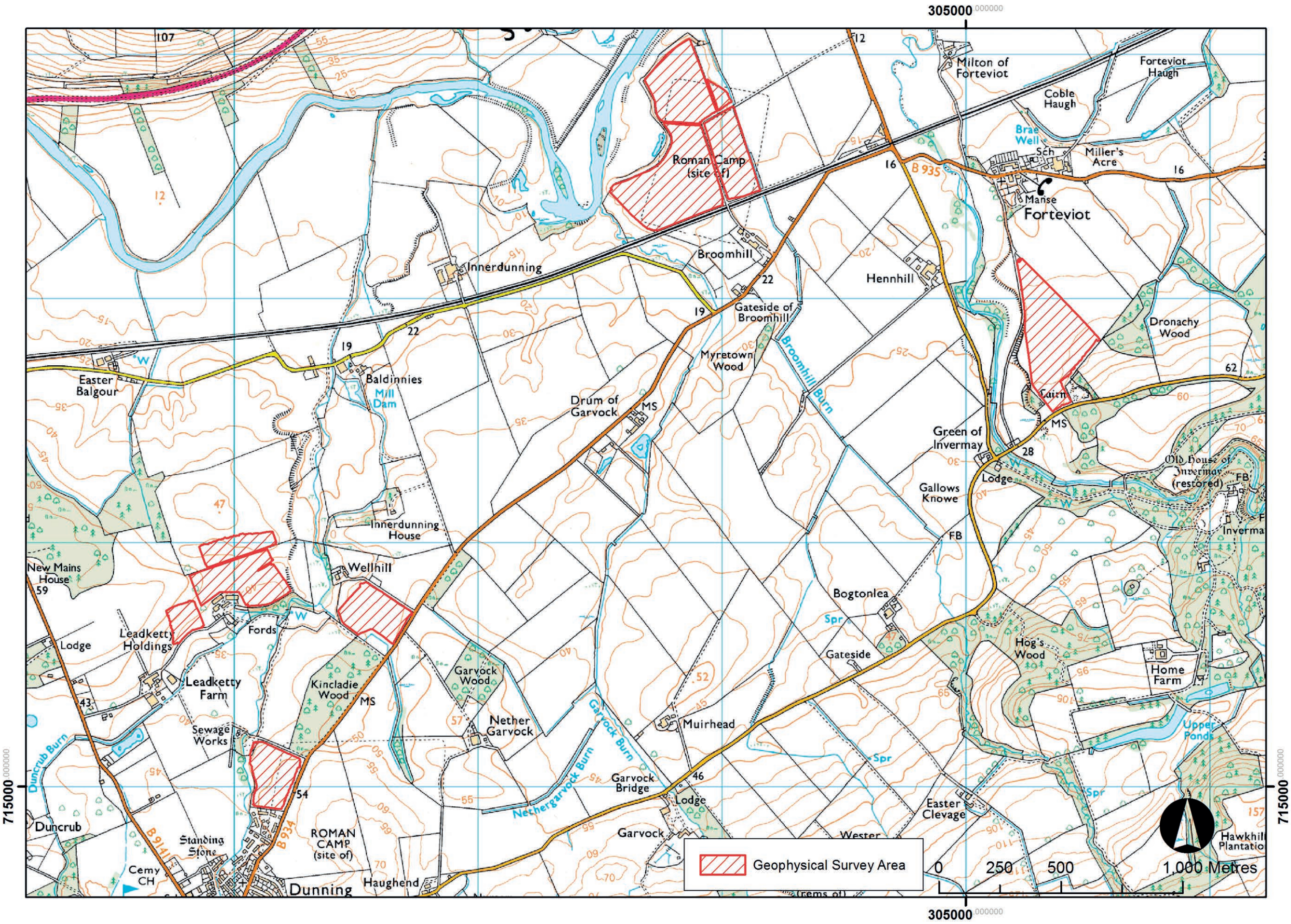


Figure 2.25 Location map of area surveyed by SENSYS

Figure 2.26 SENSYS Magneto MX V3 used in the large-area survey in February 2015 (photo: G Konieczek, SENSYS GmbH)

Figure 2.27 SENSYS survey processed results from Forteviot (© SENSYS)

2.5 Specialist analysis method statements

A team of specialists worked on environmental material and samples recovered during the SERF excavations, and to avoid repetition, methodology statements are included here in relation to botanical analysis, dating, and phosphate samples. Analytical notes regarding material culture and cremated bone can be found in relevant sections of excavation Chapters 4–7.

2.5.1 Botanical and environmental analysis

Susan Ramsay

During the course of the SERF Forteviot excavations, hundreds of bulk and spot samples were taken in line with SMC agreements and project designs for each excavation. These were a representative sample of the deposits that were excavated. Post-excavation archaeobotanical analysis had the following objectives:

- recover carbonised macroplant material for AMS radiocarbon dating to place the different features from which they derive into a chronological framework;
- identify and interpret botanical evidence in terms of the utilisation of local environmental resources for food, fuel, construction or other purposes;
- provide evidence for the intensity and type of any agricultural practice and environmental change through time.

Samples were processed by flotation for the recovery of carbonised remains, using sieves of mesh diameter 1mm and 500μm. This work was largely undertaken by project technicians and supervised students as part of their training.

Dried flots and sorted retents were examined using a binocular microscope at variable magnifications of 4 – 45. For each sample, estimation of the total volume of carbonised material >4mm was made and modern contaminants were scored using a scale of 1–3 'plus' marks. For each sample, a representative percentage of the total charcoal present was identified. All carbonised and uncarbonised seeds (probably modern) were also identified and any other identifiable remains were noted.

The testa characteristics of small seeds and the internal anatomical features of all charcoal fragments were further identified at 200 magnification using the reflected light of a metallurgical microscope. Reference was made to Schweingruber (1990) and Cappers *et al* (2006), and the extensive botanical reference collection held at the University of Glasgow. Vascular plant nomenclature follows Stace (1997) except for cereals, which conform to the genetic classification of Zohary and Hopf (2000).

2.5.2 Radiocarbon dating and Bayesian analysis

Derek Hamilton and Gordon Noble

One of the most important tasks we had from the start of the SERF Project was to ensure that we had a suitable chronological resolution and a framework within which to situate our results. To this end, with the support of HES, we were able to embark on an ambitious and extensive programme of radiocarbon dating. During the timespan of the project it became standard in the sector to move beyond 'visually inspected dates' alone and undertake Bayesian modelling (Bayliss 2007), so earlier dates were later incorporated into such models. In this section, we will outline the dating methodology and nomenclature adopted by the SERF Project and associated publications. Specific dates and models for individual sites will be discussed in the relevant chapters throughout the rest of this volume. The main periods under consideration in this volume are the late Neolithic, Chalcolithic (Copper Age), and early Bronze Age (roughly the period 3000–2000 cal BC) (see Table 8.1 for an overview of the sequence at Forteviot), although renewed 'historical' chronological precision (cf Whittle 2017) is breaking down these fixed time-period categories.

A total of 151 radiocarbon dates are available from features excavated over the course of the five field seasons of Phase 1 of the SERF Project. Over 60 of these dates directly underpin the narrative within this volume. Later prehistoric and early medieval dates are at times also referred to, due to the nature of the long-term significance of most of the sites that we excavated. All individual dates are presented in the text as calibrated to 2 sigma (95%) error range, calibrated years BC, BP determinations and with lab code.

All the samples were submitted to the Scottish Universities Environmental Research Centre (SUERC) in East Kilbride between 2007 and 2013. The samples were all single entities of short-life material (Ashmore 1999), and included charcoal, preserved plant macrofossil remains, and human and animal bone. All the non-cremated bone samples were pretreated following

Table 2.4 All relevant radiocarbon dates calibrated using Oxcal 4.1

Site Code	Lab Code	Context	Description	Material Dated	Radiocarbon Age BP	$\delta^{13}C$ ‰	Results expressed at 2 sigma (highest percentage)	Results expressed at 2 sigma (2nd highest percentage)
G	SUERC-21564	159	Charcoal layer in base of palisaded enclosure avenue posthole 031	Charcoal: *Quercus*	4155 ± 40	-25.2	2880BC (95.4%) 2610BC	–
G	SUERC-21565	150	Lower fill of palisaded enclosure avenue posthole 125	Charcoal: *Quercus*	4250 ± 40	-25.9	2930BC (62.3%) 2840BC	2820BC (33.1%) 2670BC
G	SUERC-21566	126	Upper fill of palisaded enclosure avenue posthole 125	Charcoal: *Alnus*	3120 ± 40	-25.0	1500BC (95.4%) 1290BC	–
G	SUERC-21570	121	Slumped layer on east side of palisaded enclosure avenue posthole 031	Charcoal: *Quercus*	3965 ± 40	-25.7	2580BC (95.4%) 2340BC	–
G	SUERC-21571	118	Charcoal near base of palisaded enclosure avenue posthole 031	Charcoal: *Quercus*	4065 ± 40	-26.2	2700BC (79.9%) 2470BC	2860BC (12.1%) 2810BC
G	SUERC-21572	103	Major charcoal layer in avenue post 031	Charcoal: *Quercus*	4140 ± 40	-24.2	2880BC (95.4%) 2580BC	–
G	SUERC-21573	032	Upper fill of palisaded enclosure avenue posthole 031	Charcoal: *Quercus*	4025 ± 40	-24.7	2670BC (92.8%) 2460BC	2840BC (2.6%) 2810BC
G	SUERC-21574	044	Upper fill of palisaded enclosure avenue posthole 043	Charcoal: *Corylus*	4065 ± 40	-25.8	2700BC (79.9%) 2470BC	2860BC (12.1%) 2810BC
G	SUERC-21575	112	Ramp fill of palisaded enclosure avenue posthole	Charcoal: *Quercus*	4070 ± 40	-24.9	2700BC (77.0%) 2480BC	2860BC (13.8%) 2800BC
G	SUERC-45555	166	Fill pf palisaded enclosure posthole	Cremated bone: human bone	3976 ± 29	-19.4	2577 (94.6%) 2457BC 2418 (0.8&) 2409BC	2565 (34.9%) 2533BC 2495 (33.3%) 2468BC
G	SUERC-45556	166	Fill pf palisaded enclosure posthole	Cremated bone: human long bone	3992 ± 29	-23.3	2575 (95.4%) 2467BC	2566 (43.7%) 2525BC 2496 (24.5%) 2474BC
E	SUERC-23236	230	Fill of clay lined pit 206	Charcoal: *Corylus*	4945 ± 30	-25.8	3780BC (95.4%) 3640BC	–
D	SUERC-23237	334	Postpipe of timber circle posthole 332	Charcoal: *Quercus*	4065 ± 30	-27.7	2700BC (84.0%) 2480BC	2850BC (10.3%) 2810BC
D	SUERC-23238	311	Upper burnt 'turf' layer in Henge 1 ditch	Charcoal: *Corylus*	3790 ± 30	-25.1	2310BC (94.1%) 2130BC	2340BC (1.3%) 2320BC
D	SUERC-23242	364	Lower fill of pit containing cist capstone 348	Charcoal: *Alnus*	2355 ± 30	-27.2	520BC (95.4%) 380BC	–
D	SUERC-23243	370	Lower fill of Henge 1 ditch	Charcoal: *Corylus*	3725 ± 30	-25.0	2210BC (95.4%) 2030BC	–
D	SUERC-23244	345	Upper fill of henge 1 ditch	Charcoal: *Alnus*	3810 ± 30	-24.5	2350BC (93.9%) 2130BC	2400BC (1.5%) 2380BC

Site Code	Lab Code	Context	Description	Material Dated	Radiocarbon Age BP	δ ¹³C ‰	Results expressed at 2 sigma (highest percentage)	Results expressed at 2 sigma (2nd highest percentage)
D	SUERC-23245	363	Charcoal band in Henge 1 ditch	Charcoal: *Corylus*	3615 ± 30	-25.6	2040BC (93.4%) 1890BC	2120BC (2.0%) 2090BC
D	SUERC-23246	333	Outer packing of timber circle posthole 332	Charcoal: *Quercus*	4005 ± 30	-27.5	2580BC (95.4%) 2460BC	–
D	SUERC-23247	342	Lower layer of burnt turf in Henge 1 ditch terminal area	Charcoal: *Alnus*	8290 ± 30	-23.9	7480BC (87.1%) 7250BC	7230BC (8.3%) 7190BC
D	SUERC-23248	362	Lower fill of Henge 1 ditch terminal area	Charcoal: *Alnus*	3880 ± 30	-24.3	2470BC (94.0%) 2280BC	2250BC (1.4%) 2230BC
D	SUERC-29175	573	Dark deposit within terminal of mini-henge ditch 511	Charcoal: *Salix*	7925 ± 30	-25.2	6920BC (76.6%) 6680BC	7030BC (18.8%) 6930BC
D	SUERC-29176	609	Fill of Henge 1 ditch in vicinity of the dagger-burial	Charcoal: *Corylus*	3650 ± 30	-25.1	2140BC (95.4%) 1930BC	–
D	SUERC-29177	639	Clay dump at base of henge 1 ditch	Charcoal: *Quercus*	4165 ± 30	-24.7	2820BC (75.9%) 2630BC	2880BC (19.5%) 2830 BC
D	SUERC-29178	643	Lower fill of Henge 1 ditch	Charcoal: *Quercus*	3790 ± 30	-25.5	2310BC (94.1%) 2130BC	2340BC (1%) 2320BC
D	SUERC-29179	645	Lower fill of Henge 1 ditch	Charcoal: *Alnus*	3780 ± 30	-26.9	2300BC (92.5%) 2130BC	2090BC (2.9%) 2050BC
D	SUERC-29180	617	Cremation deposit 616	Charcoal: *Ulex/ Cytisus*	235 ± 30	-24.5	AD1630 (48.1%) AD1690	AD1730 (35.3%) AD1810
D	SUERC-29184	628	Cremation deposit adjacent to stone socket 565	Charcoal: *Alnus*	4240 ± 30	-26.7	2910BC (66.9%) 2850BC	2810BC (24.9%) 2750BC
D	SUERC-29185	641	Fill of small cremation pit 651	Charcoal: *Alnus*	4315 ± 30	-26.4	3020BC (95.4%) 2880BC	–
D	SUERC-29186	617	Cremation deposit 616	Cremated Bone: Human Lower long bone shaft fragment	4275 ± 30	-22.6	2930BC (94.1%) 2870BC	2810BC (1.3%) 2770BC
D	SUERC-29187	628	Cremation deposit near stone socket 565	Cremated Bone: Human Upper long bone shaft fragment	4175 ± 30	-22.0	2820BC (73.1%) 2660BC	2890BC (20.7%) 2830BC
D	SUERC-29188	641	Fill of small cremation pit 651	Cremated Bone: Human Long bone shaft fragment	4370 ± 30	-21.2	3040BC (85.0%) 2900BC	3090BC (10.4%) 3050BC
D	SUERC-29189	530	Lower fill of pit 529	Cremated Bone: Human femur	4180 ± 30	-25.7	2820BC (73.6%) 2660BC	2890BC (21.8%) 2830BC

Site Code	Lab Code	Context	Description	Material Dated	Radiocarbon Age BP	δ ¹³C ‰	Results expressed at 2 sigma (highest percentage)	Results expressed at 2 sigma (2nd highest percentage)
D	SUERC-29195	626	Lower fill of big pit 531 in centre of Henge 1	Charcoal : Corylus	3855 ± 30	-25.1	2460BC (79.9%) 2270BC	2260BC (15.5%) 2200BC
D	SUERC-29196	801	Sandy deposit in NW corner of dagger-burial cist	Charcoal: *Betula*	3690 ± 30	-27.0	2150BC (90.4%) 1970BC	2200BC (5.0%) 2160BC
D	SUERC-29197	807/804	Bark from dagger-burial cist interior	Bark: cf *Betula*	3740 ± 30	-27.1	2210BC (92.0%) 2030BC	2280BC (3.4%) 2250BC
D	SUERC-29198	2000 / SF1017	Organic deposit of plant stems and material within dagger-burial cist interior	Seeds: cf *Filipendula ulmaria*	3590 ± 30	-28.7	2030BC (95.4%) 1880BC	–
D	SUERC-29199	2007 / SF1017	Compressed plant material in dagger-burial cist interior	Flower: *Filipendula ulmaria*	3740 ± 35	-30.0	2230BC (89.7%) 2030BC	2280BC (5.7%) 2240BC
D	SUERC-29200	806 / SF1020	Wooden bowl fragment from dagger-burial cist interior	Wood: cf *Salix*	3705 ± 30	-28.8	2200BC (94.4%) 2020BC	2000BC (1.0%) 1980BC
F	SUERC-37891	5007	Oval ditch segment near possible entrance of enclosure, ring-ditch inner ditch 5061	Charcoal: *Quercus*	4120 ± 35	-25.5	2780 (70.3%) 2577BC	2872 (25.1%) 2802BC
F	SUERC-37886	5076	Fill of pit or tree throw feature 5105 cut by triple cist	Charcoal: Corylus	5035 ± 35	-25.8	3950 (90.0%) 3760BC	3742 (5.4%) 3714BC
F	SUERC-37887	5076	Fill of pit or tree throw feature 5105 cut by triple cist	Charcoal: *Corylus avellana* nutshell	5140 ± 35	-27.6	3998 (59.6%) 3915BC	3877 (30.4%) 3804BC
F	SUERC-37890	5053	Lower postpipe of palisaded enclosure posthole 5052	Charcoal: *Quercus*	4080 ± 35	-25.0	2704 (62.6%) 2561BC	2861 (16.6%) 2808BC
F	SUERC-37758	5668	Postpipe of palisaded enclosure avenue posthole 5530	Charcoal: *Quercus*	4150 ± 30	-25.6	2823 (76.7%) 2627BC	2876 (18.7%) 2829BC
F	SUERC-37759	5572	Postpipe of palisaded enclosure posthole 5518	Charcoal: *Quercus*	4080 ± 30	-24.5	2699 (67.2%) 2565BC	2857 (16.1%) 2811BC
F	SUERC-37760	5572	Postpipe of palisaded enclosure posthole 5518	Charcoal: *Quercus*	4010 ± 30	-26.9	2581 (94.4%) 2468BC	2617 (1.0%) 2611BC
F	SUERC-37763	5682	Charcoal lens at base of palisaded enclosure posthole 5592	Charcoal: *Quercus*	4045 ± 30	-26.2	2635 (90.1%) 2475BC	2834 (3.6%) 2818BC
F	SUERC-37767	5682	Charcoal lens at base of palisaded enclosure posthole 5592	Charcoal: *Quercus*	4090 ± 30	-26.1	2703 (65.6%) 2567BC	2860 (19.3%) 2808BC

Site Code	Lab Code	Context	Description	Material Dated	Radiocarbon Age BP	δ ¹³C ‰	Results expressed at 2 sigma (highest percentage)	Results expressed at 2 sigma (2nd highest percentage)
F	SUERC-37768	5660	Postpipe of palisaded enclosure avenue posthole 5506	Charcoal: *Quercus*	4055 ± 30	-25.5	2671 (89.1%) 2480BC	2836 (6.3%) 2815BC
F	SUERC-45557	5059	Primary fill of southern cist compartment in triple cist	Cremated Bone	3600 ± 29	-22.8	2030 (95.4%) 1889BC	2016 (14.1%) 1996BC 1980 (54.1%) 1913BC
H	SUERC-37867	6087	Fill of Henge 2 ditch 6010	Charcoal: *Salix*	3935 ± 35	-25.5	2496 (87.7%) 2299BC	2565 (7.7%) 2532BC
H	SUERC-37779	6094	Fill of posthole 6065 within Henge 2	Charcoal: *Quercus*	4215 ± 35	-24.5	2814 (60.2%) 2678BC	2904 (35.2%) 2840BC
H	SUERC-37780	6094	Fill of posthole 6065 within Henge 2	Charcoal: *Quercus*	4145 ± 30	-23.0	2876 (95.4%) 2623BC	–
H	SUERC-37781	6074	Fill of posthole 6073 within Henge 2	Charcoal: *Quercus*	3920 ± 30	-24.9	2480 (95.4%) 2297BC	–
H	SUERC-37782	6074	Fill of posthole 6073 within Henge 2	Charcoal: *Quercus*	3915 ± 30	-25.3	2475 (95.4%) 2298BC	–
H	SUERC-37866	6140	Fill of Henge 2 ditch 6010	Charcoal: *Salix*	3575 ± 35	-24.7	2029 (87.1%) 1874BC	1844 (5.1%) 1816BC
H	SUERC-37788	6140	Fill of Henge 2 ditch 6010	Charcoal: *Corylus*	3310 ± 30	-26.7	1681 (95.4%) 1516BC	–
H	SUERC-45563	6030	Cremation in Food Vessel within small cist	Cremated Bone: Human long bone	3632 ± 25	-22.6	2027 (68.2%) 1958BC	2124 (7.1%) 2053BC 2043 (88.3%) 1919BC
C	SUERC-37769	7065	Lower fill of palisaded enclosure posthole 7035	Charcoal: *Quercus*	3970 ± 30	-25.6	2515 (90.1%) 2453BC	2377 (32.%) 2350BC
C	SUERC-37770	7066	Postpipe of palisaded enclosure posthole 7006	Charcoal: *Quercus*	4070 ± 30	-25.6	2696 (65.9%) 2551BC	2537 (15.3%) 2491BC
C	SUERC-37771	7066	Postpipe of palisaded enclosure posthole 7006	Charcoal: *Quercus*	4090 ± 35	-24.8	2710 (61.7%) 2565BC	2864 (19.3%) 2806BC
C	SUERC-37777	7083	Lower fill of palisaded enclosure posthole 7033	Charcoal: *Quercus*	4120 ± 30	-25.1	2777 (70.4%) 2578 BC	2866 (25.0%) 2804BC
C	SUERC-37778	7083	Lower fill of palisaded enclosure posthole 7033	Charcoal: *Quercus*	4165 ± 30	-25.6	2820 (75.8%) 2633BC	2881 (19.6%) 2832BC

the protocols of Stenhouse and Baxter (1983), while the cremated bone (the bulk of the bone material that we found) was pretreated following Lanting *et al* (2001). The pretreated material was then combusted to CO_2 (Vandeputte *et al* 1996), which was cryogenically purified and converted to graphite using the method of Slota *et al* (1987). The graphite was then pressed into aluminium target holders for subsequent Accelerator Mass Spectrometry (AMS) analysis (Xu *et al* 2004; Naysmith *et al* 2010). The SUERC laboratory maintains rigorous internal quality assurance procedures, and participation in international inter-comparisons (Scott 2003) indicate no laboratory offsets, thus validating the measurement precision quoted for the radiocarbon ages.

The unmodeled radiocarbon results are listed in

	τ2											
τ1 *τ1<τ2*	*start: Cremation Cemetery*	*end: Cremation Cemetery*	*start: Palisaded Enclosure*	*end: Palisaded Enclosure*	*start: Henge 1*	*end: Henge 1*	*start: Henge 2*	*end: Henge 2*	*dig: Cist*	*[332]*	*[6065]*	*[6073]*
start: Cremation Cemetery		100%	99%	100%	100%	100%	69%	100%	100%	100%	100%	100%
end: Cremation Cemetery	0		71%	99%	100%	100%	59%	100%	100%	99%	65%	100%
start: Palisaded Enclosure	0	29%		100%	100%	100%	55%	100%	100%	99%	42%	100%
end: Palisaded Enclosure	0	0	0		95%	100%	21%	100%	99%	21%	0	95%
start: Henge 1	0	0	0	5%		100%	4%	100%	100%	2%	0	26%
end: Henge 1	0	0	0	0	0		0	100%	0	0	0	0
start: Henge 2	31%	42%	45%	79%	96%	100%		100%	99%	71%	43%	93%
end: Henge 2	0	0	0	0	0	0	0		0	0	0	0
dig: Cist	0	0	0	1%	0	100%	1%	100%		0	0	5%
[332]	0	1%	1%	79%	98%	100%	29%	100%	100%		1%	100%
[6065]	0	35%	59%	100%	100%	100%	57%	100%	100%	99%		100%
[6073]	0	0	0	5%	74%	100%	7%	100%	95%	0	0	

Figure 2.28 Order matrix for the results from the Bayesian analyses of radiocarbon dates from the prehistoric features. The matrix shows the probabilities that any one event occurred prior to another. The probability that the event in the left column occurred before event across the top is X (for instance, the probability that *dig: Cist* occurred before *[6073]* is 5%)

Table 2.4. These are conventional radiocarbon ages (Stuiver and Polach 1977), quoted according to the international standard set at the Trondheim Convention (Stuiver and Kra 1986) and calibrated with the internationally agreed curve of Reimer *et al* (2009) using OxCal v4.1 (Bronk Ramsey 1995; 1998; 2001; 2009). The date ranges in Table 2.4 have been calculated using the maximum intercept method (Stuiver and Reimer 1986) and quoted in the form recommended by Mook (1986) with the endpoints rounded outward to ten years for errors of 25 or more years and rounded to five years for errors less than 25 years. The probability distributions seen in Figure 2.28 were obtained by the probability method (Stuiver and Reimer 1993).

Subsequently, some of these radiocarbon dates were subjected to Bayesian chronological modelling (Buck *et al* 1996), undertaken using the program OxCal v4.2 (http://c14.arch.ox.ac.uk/). Details of the algorithms employed by OxCal v4.2 are available in Bronk Ramsey (1995; 1998; 2001; 2009) or from the online manual. The correlation between the OxCal model and data is gauged by the agreement indices, in particular the A_{model}, with values higher than 60 indicating good agreement (Bronk Ramsey 1995). The results of the model are 'posterior density estimates', which are expressed in calendar years and presented in *italics* as probability ranges with end points rounded to the nearest five years. The algorithms used in the model can be derived from the OxCal keywords and bracket structure shown in the probability distribution plots. It should be emphasised that the posterior density estimates produced by modelling are not absolute, but rather they are interpretative estimates which can and will change as further data become available and as other researchers choose to model the existing data from different perspectives.

Dates will be presented in more detail within the relevant chapters in this volume. It is worth noting that while human activity in the Forteviot area spreads over some 6000 years, the archaeological features excavated are not spread evenly throughout this time period. There were periods of intense activity, and other periods which left no archaeological record, notably much of the 2nd and 1st millennia BC. This intermittent signature of human intervention in the landscape does not mean that occupation or settlement was intermittent – presumably people lived in and exploited this fertile landscape continuously but acted in ways that did not impact on the archaeological record. However, the interplay between the two periods of most activity, and the long gap between, is a recurring theme in SERF1 and SERF2. In this book, we also recognise that despite the limitations of traditional time periods, we will, from time to time, use these. To that end we have utilised the following: Mesolithic (pre-4000 cal BC); early Neolithic (4000–3000 cal BC); late Neolithic (3000–2500 cal BC); Copper Age (2500–2250 cal BC); early Bronze Age (2250–1750 cal BC). Most of the focus in SERF1 is on the 30th to 20th centuries cal BC.

2.5.3 Phosphate analysis

Gert Peterson

Phosphate samples were taken in several putative mortuary contexts during the course of the SERF excavations, in order to identify chemical traces of bodies in the absence of human remains. Phosphate samples were taken in three locations: the dagger-burial within Henge 1 (section 5.3.2); the central compartment of the triple cist; and the floor of a pit containing a Beaker pot. The latter two were located in the interior of the ring-ditch (section 7.3.5). In each case, spot samples were taken on the corner of a notional grid of 100mm squares.

The samples were processed following the Analytical Procedure for the Molybdenum Blue Colorimetric Method (Bethell and Mate 1989). Soil samples were completely air dried (at room temperature). Each sample was then ground into a powder using a mortar and pestle which were cleaned between samples to prevent any carry over. The powder was then passed through a 106µ Endicott sieve. A sub-sample was taken of each sample weighing approximately 0.2g, weighed out using a Sartarious TE124S balance and placed in a Pyrex tube. The sub-samples were then heated to 550°C in a Carbolite CWF 11/6 furnace for 60 minutes before being re-weighed to determine loss on ignition in the resulting material. The samples were then placed in clean Pyrex test tubes and 25ml of 1N HCI (Hydrochloric acid) was added before samples were boiled for 60 minutes in a Grant water bath. After cooling, samples were passed through filter paper into 100ml volumetric flasks and filled with de-ionised water. A 15ml sample was then extracted and poured into a 50ml volumetric flask which was again filled up to the mark with de-ionised water. Between each transfer, the pipette was flushed out thoroughly with de-ionised water two or three times to avoid contamination. Six phosphate standard dilutions were made up as follows: 1ml of standard solution, reagent D, was combined with 30ml of de-ionised water in a 50ml volumetric flask. This was repeated with 2, 3, 4, 5 and 10ml of reagent D. A blank flask filled only with de-ionised water was also prepared. Then 5ml of the developing solution (reagent C) was dispensed through a Pressmatic into all samples as well as standards and the blank. All samples were treated in sequence to ensure that all had the same time-exposure of 30 minutes by the time they were tested for absorbance in the colorimeter. De-ionised water was added up to the line on each volumetric flask and the solution poured into plastic beaker to ensure even mixing. A sample of 3.5ml was then extracted and deposited in a clear plastic cuvette. The pipette was flushed 2–3 times in de-ionised water between samples. After 30 minutes the samples were measured in the colorimeter (Fisher Scientific model 45) set to read absorbance at a wavelength of 680nm. The blank was used to 'zero' the instrument.

A graph of micrograms of P for each of the six standards was plotted on the x-axis against the absorbance on the y-axis and a graph produced using Microsoft ExcelTMP. Contents (in micrograms) were calculated by adding the absorbance values to the value of the sample value of the y-axis. These results were then inserted into the following equation to give the values as micrograms per kilogram of soil:

$$\frac{\text{sample micrograms P} \times \text{volume of digest}}{\text{weight of soil} \times \text{volume of aliquot}}$$

where the:

sample micrograms P is the value calculated from the graph using the best fitting line through the standards;

volume of digest is 100 ml;

weight of soil is usually 0.2g;

volume of aliquot was 15ml.

The method described is the most common laboratory technique for the measurement of phosphates in archaeological samples, based on Murphy and Riley (1962) with various small alterations. The results of these analyses are perhaps not as reliable as we would have hoped. In the course of running the analysis of the above samples it was decided to test the repeatability of the methodology and two similar procedures were carried out on the same set of samples. This caused results that did not concur with the first run of tests in detail although the general trends remained the same. These discrepancies may be due to methodological problems or equipment defect (200 cuvettes were discarded after scrutiny).

2.5.4 Ceramic analysis

Neil Wilkin, Ana Jorge, and Alison Sheridan

The recording and analysis of this relatively small but important assemblage was undertaken in accordance with the recently revised General Policies and Guidelines for Analysis and Publication of the *Prehistoric Ceramic Research Group* (2010), following an initial assessment of the material in early 2011 (Wilkin 2011). The pottery analysis was carried out using a hand-lens and a handheld digital microscope (20–40 and 200 magnification) where necessary. Fabric colours are described with reference to the Munsell colour system (1976).

The research questions that informed the analysis can be summarised as follows:

- What are the key properties and characteristics of the Beakers and Food Vessel represented at the three sites (in terms of the range of fabric, form, completeness, condition, manufacture, decoration and surface treatments)?
- How many Beaker vessels are represented by the sherds from Henge 2?
- How can the study of fabric, form, sherd size, abrasion and *comparanda* contribute to understanding the nature of the deposition of Beaker pottery at Henges 1 and 2 and the ring-ditch?

Table 2.5 Summary of Beaker vessel names used in this volume, and relationship to vessel numbers in initial archival ceramics reports. Table compiled by Ana Jorge

Final Beaker vessel numbers used in this volume	Description	Context and Small Find (SF) numbers	Ana Jorge archive report vessel numbering	Neil Wilkin archive report (Wilkin 2011) vessel numbering
VESSEL 1	Beaker from pit within Ring-ditch interior	Context 5064: 5014	VESSEL 2	VESSEL 1 DOUBLE ENCLOSURE
VESSEL 2	Beaker sherds from Henge 2 ditch	Context 6087: 6037, 6044, 6047, 6048, 6049, 6050, 6052, 6053, 6054, 6055, 6056, 6084 Context 6080: 6024, 6026, 6027, 6029, 6032, 6034, 6037, 6039, 6044, 6047 Context 6113: 6082	VESSEL 1 AND 3 excluding 6029 and 6036 from Context 6080 Note: there are 2 sherds labelled 6029	VESSEL 4 HENGE 2
VESSEL 3	Beaker sherds from Henge 2 ditch	Context 6080: 6036	none	none
VESSEL 4	Beaker sherd from Henge 2 ditch	Context 6080: 6029	none	none
VESSEL 5	Beaker sherds from posthole within Henge 2	Context 6018: 6011, 6012, 6014, 6013, 6015, 6018, 6035 (base), 6038, 6040, 6041, 6042, 6043, 6057, 6058, 6061, 6062, 6063, 6064, 6068, 6069 (body), 6070, 6076, 6077, 6078 Context 6039: 6017, 6020	VESSELS 6, 7 AND 6/7 Except 6069 (base)	VESSEL 1 HENGE 2
VESSEL 6	Beaker sherds from posthole within Henge 2	Context 6013: 6016, 6021, 6022, 6030 Context 6101: 6073?	VESSEL 4	VESSEL 6 HENGE 2
VESSEL 7	Beaker sherds from Henge 1 terminal ditch area	Context 352: 164, 165, 167, 174, 175, 176, 178	VESSEL 5	VESSEL 1 HENGE 1

- What are the best *comparanda* for the Beakers and Food Vessel from Henges 1, 2 and the ring-ditch?
- How does the pottery from Forteviot fit within the current regional and national research themes regarding ceramic deposition and ritual practices involving ceramic vessels?

We were fortunate in that the Beaker assemblage of prehistoric pottery from Forteviot was looked at by three different experts. However, through this process, different vessel numbering systems were used by each specialist. For the avoidance of confusion should the archival material be consulted, the different number systems are summarised in Table 2.5, which also confirms the final vessel numbering used in this monograph and subsequent publications. Aside from seven Beakers, two further vessels were found during our excavations: a Neolithic chafing vessel and a Bronze Age Food Vessel.

2.6 A foundation to build upon

As we shall see in this volume, the SERF Project has moved us far beyond the superficial statements possible from the analysis of cropmarks that were recorded over a period of three decades at Forteviot. Cropmarks present a remarkable insight into buried and denuded archaeological traces, while geophysical survey has the ability to broaden and nuance our knowledge, but in reality only excavation can put flesh on these bones. St Joseph first flew over Forteviot 34 years before our excavations commenced. In doing so, he engaged with the paradox of cropmark archaeology, documenting the faintest of traces, temporary colour-changes in crop patterns in the field that in fact represented substantial features that had endured for thousands of years. And it is to the excavation of the focal point of his interpretation, the palisaded enclosure, which we first turn our attention to.

3

The rise and fall of Forteviot palisaded enclosure

Gordon Noble and Kenneth Brophy

with contributions from Iraia Arabaolaza, Angela Boyle, Aoife Gould, Derek Hamilton, Stephany Leach, Cathy MacIver, Kirsty Millican, Susan Ramsay, and Dene Wright

3.1 Introduction

The palisaded enclosure is the grandest expression of prehistoric monumentality at Forteviot, and the first element of the cropmark complex to be recognised from the air. The sheer scale of this monument, and amount of timber required to construct it, would have had a transformational impact on the surrounding environment and given this place the feel of a construction site whilst it was being built (and perhaps during its use as well). In this chapter, we will report on the results of excavations carried out in 2007, 2008, and 2010 that focused either on the boundary or the interior of the palisaded enclosure. Henge 1 and the associated timber circle within the palisaded enclosure will be discussed in Chapters 4 and 5.

Beyond the use-life of the palisaded enclosure, we have also been able to identify activities happening in this location centuries before the first timber posts were erected, suggesting the enclosure was a fresh monumental element in an already established place of significance. In turn, this location attracted further acts of construction, both within and outwith the boundary of the enclosure. New funerary engagements in the early Bronze Age likely occurred as the monument gradually fell apart, while the impact of its boundary may have continued for millennia. Evidence for the longer-term story of this place will therefore be considered in this chapter.

The implications of our excavation results will also be explored. The Forteviot example is one of up to six such sites found in the place we now call Scotland (Millican 2016a, 47–52), but more broadly is one of a series of similar enclosures known across north-western Europe with close parallels in England, Wales, and the Baltic region of Scandinavia (Gibson 2002; Noble and Brophy 2011a). One of these related sites is Leadketty, located 4km to the west, also on the south terrace of the Earn, where SERF excavations took place in 2012 (see Noble and Brophy 2015; SERF3). Therefore, the investigation of the Forteviot palisaded enclosure has the potential to shed light on late Neolithic large-scale monumentality locally, regionally and beyond. What our results, and information from similar sites, tell us about the Forteviot palisaded enclosure will also be discussed here in section 3.5, with broader themes explored in Chapter 8.

Finally, a few words on nomenclature. Sites known from the Neolithic period as 'palisaded enclosures' need not have been defined by an unbroken fence; as we will see, Forteviot almost certainly was not. Palisaded enclosures in later prehistoric contexts tend to denote fenced settlement (or perhaps defensive) sites and thus there is potential for some confusion here. However, we will continue to use the term palisaded enclosure in this volume, for the sake of consistency with the broader Neolithic literature and monument typology (the term having been in use since the 1970s (Alex Gibson pers comm)).

3.1.1 The cropmark evidence

Before discussing the excavations, we will return to the cropmark evidence. The history of the identification,

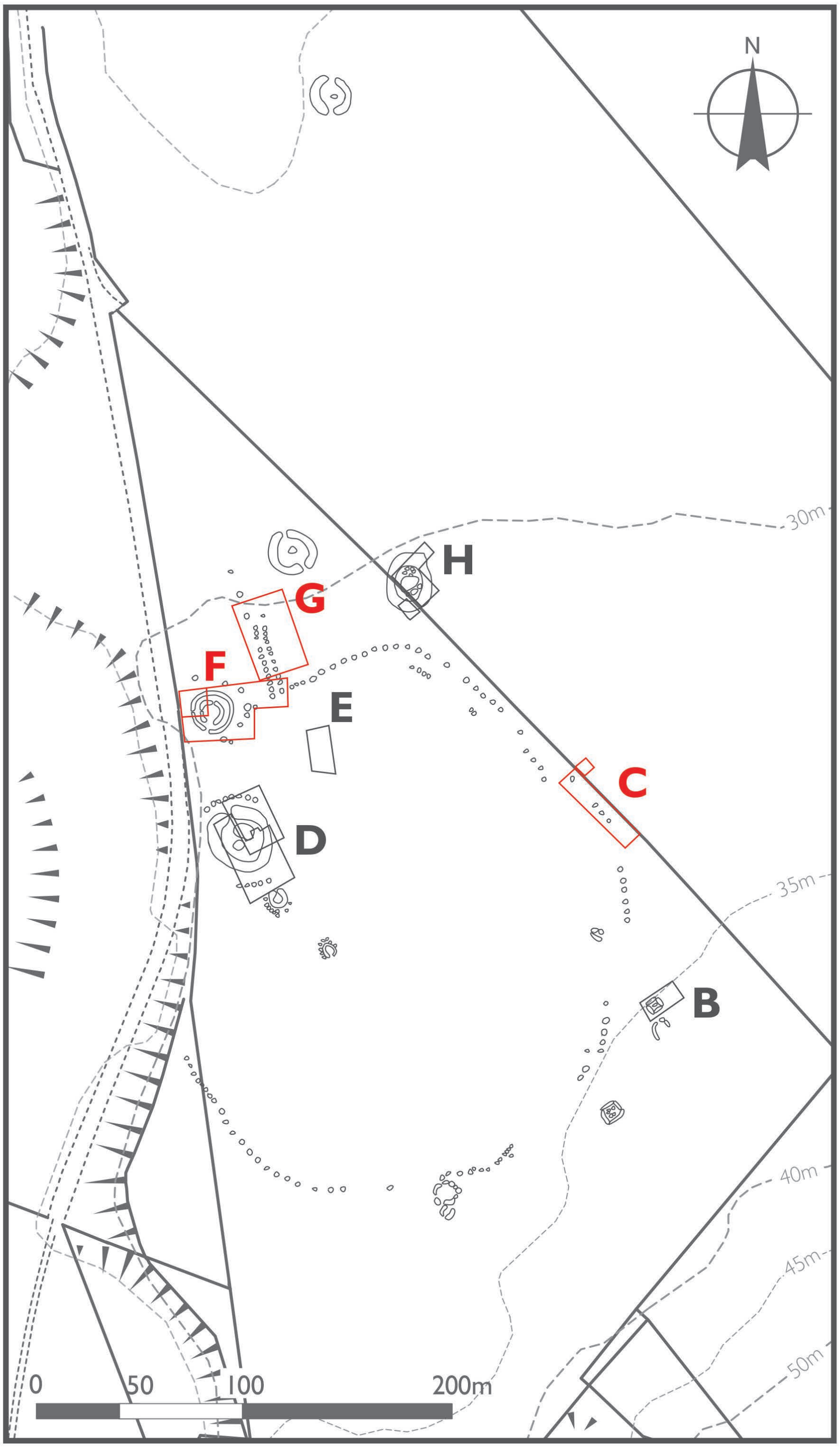


Figure 3.1 Plan showing the location of the trenches discussed in Chapter 3, overlain on the cropmarks (Tree throw 232 is not shown on this plan)

and interpretation, of the Forteviot cropmark complex has already been discussed in Chapter 2. Here, we will look at the cropmarks themselves in a little more detail, with reference to Figures 2.5 and 3.1. The depth and clarity of information revealed by the cropmarks is evidenced by the correct interpretation of this monument made before excavations occurred.

As a cropmark, the palisaded enclosure is defined by an irregular line of individual pits or post-pits (Figure 3.2) which define a subcircular to oval enclosure measuring 265m north to south by 220m, enclosing an area of roughly six hectares or fifteen acres (St Joseph 1978; Gibson 2002, 18; Millican 2016a, 100, no. 11). The western side of the enclosure appears to be defined by the natural escarpment overlooking the Water of May. It is possible that this 'missing' stretch of some 150m of the boundary was removed by river erosion post-monument construction

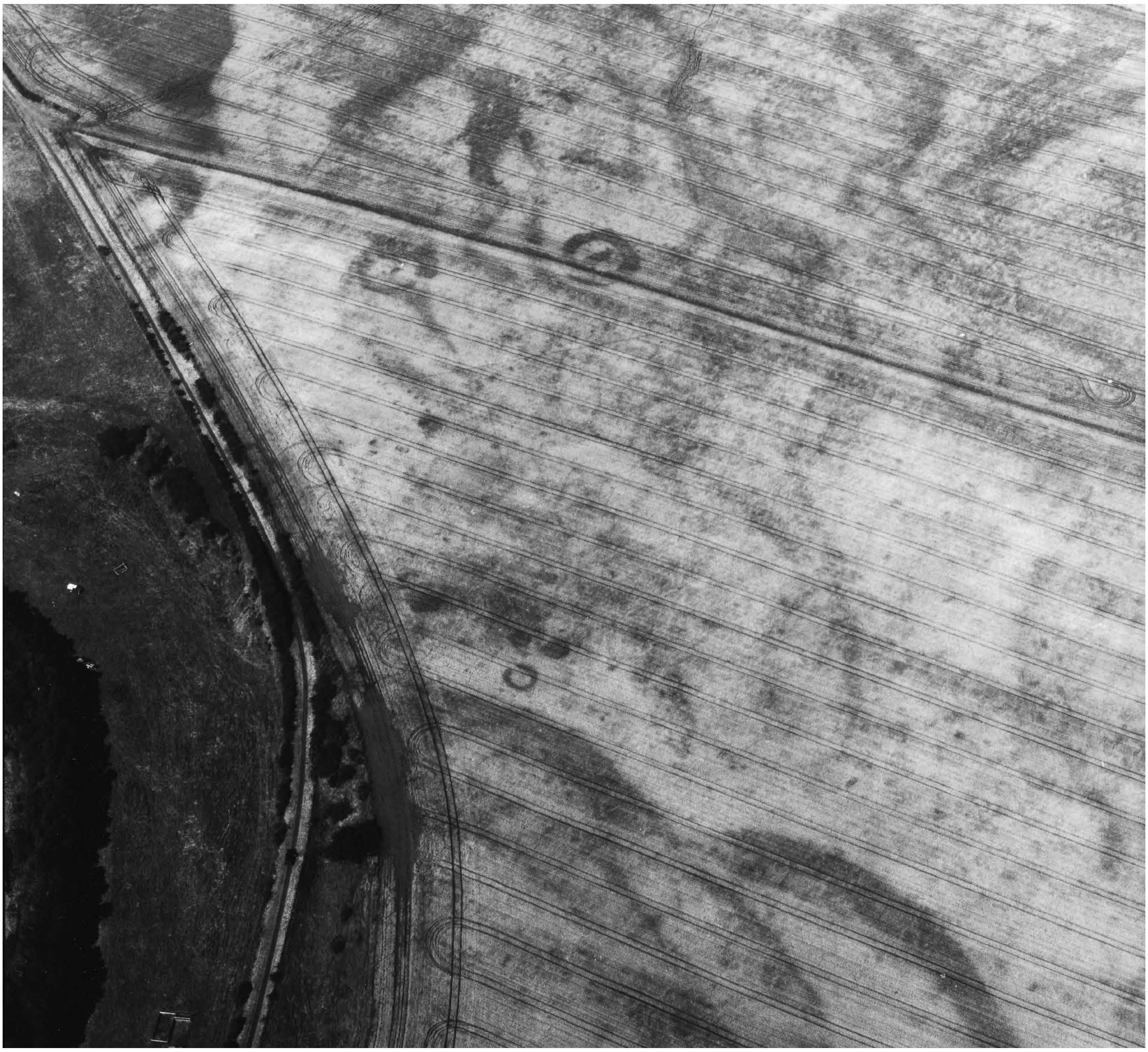


Figure 3.2 Aerial photograph showing the palisaded enclosure avenue and boundary, and Henges 1 to 3, as cropmarks (C10791; ©Crown Copyright: HES)

(see section 2.2.1), but calculations in this chapter assume this not to have been the case, and that the timber boundary was never a complete circuit; this boundary, including the avenue, has a length of some 675m (had this once been a complete circuit, it would have had a circumference of *c* 825m). The boundary appears incomplete on the south side of the monument also, but it is more likely that this is a gap in the cropmark record. As a cropmark, the enclosure appears to be defined by widely spaced post-pit features which excavations confirmed are large postholes. These are between 4m and 6m apart so when complete the monument would have consisted of between 130 and 150 posts (contra Noble and Brophy 2011a, 70, where we over-estimated this figure). The form of this boundary is irregular, with 'wobbly' sections and variable spacing between posts, irregularities not uncommon across Neolithic monuments in Britain. In the north-east sector of the monument, there is a hint on some air photos of a double line of postholes forming the boundary, but this was not found to be the case through our excavations or geophysical surveys (section 2.4). The formal entrance to the enclosure appears to have been via an avenue on the northern side; as a cropmark this measures 4m to 6m wide and consists of some ten pairs of post-pits, running north-north-west from the enclosure boundary for about 30m.

One of the striking characteristics about the complex at Forteviot is the quantity and variety of cropmarks

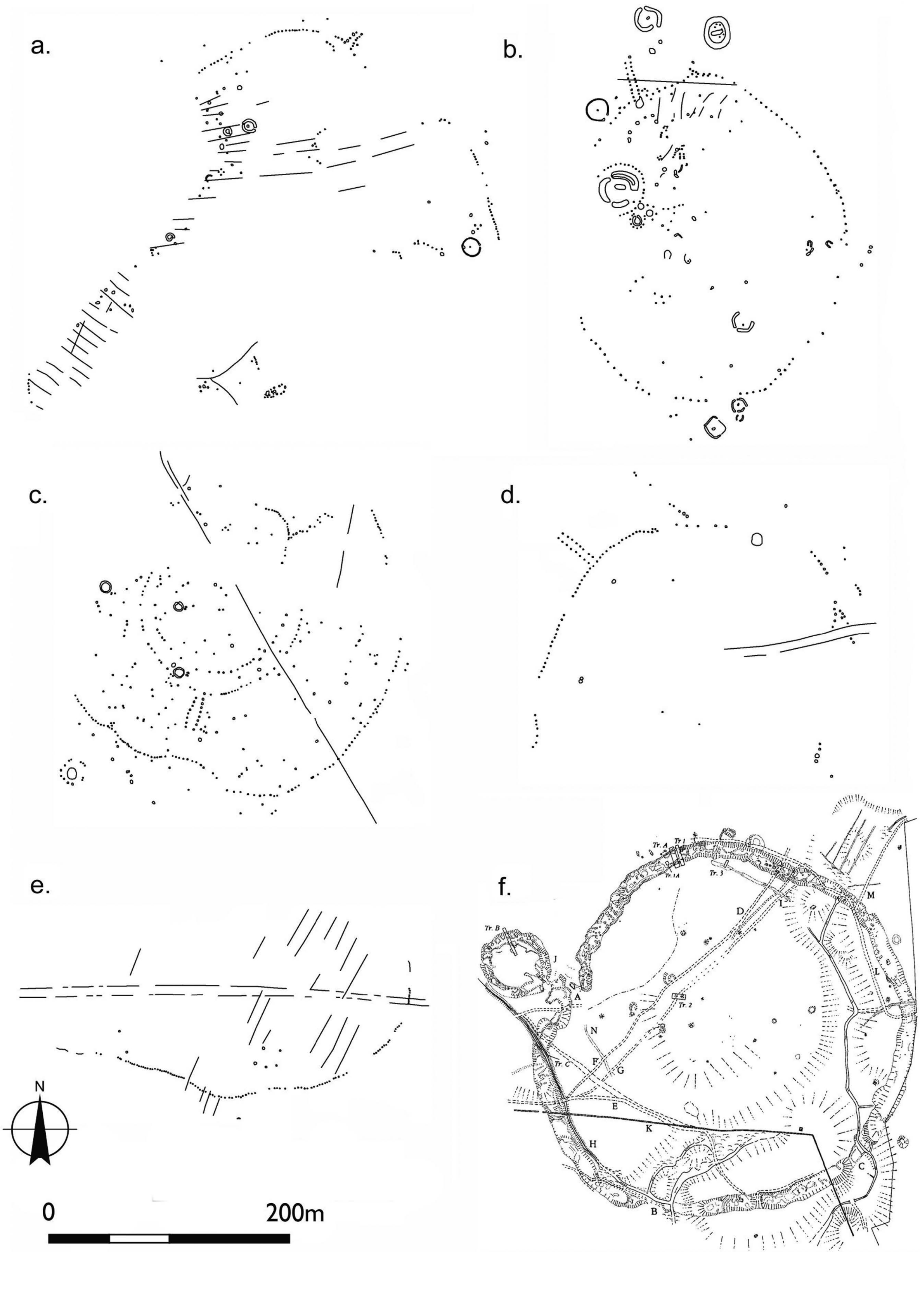


Figure 3.3 Transcription of Scotland's palisaded enclosures: a) Leadketty; b) Forteviot; c) Dunragit; d) Meldon Bridge; e) Kinloch; and f) survey plan of Blackshouse Burn (Millican 2016b, 157, figure 8.9)

in this location, both within the palisaded enclosure but also on its exterior, seemingly hugging the boundary. The most notable cropmark features within the enclosure are a large henge monument (Henge 1) and surrounding timber circle located in the north-western zone of the interior. These features, along with what appears to be a mini-henge and timber circle immediately to the south, were excavated in 2008 and 2009 (discussed in Chapter 4). One other internal 'feature' was also subject to excavation in 2008 (section 3.2.1), a putative trapezoidal timber setting in the northern-central interior, identified by Millican during her PhD research (2016a, 127–8). Millican noted a range of other possible features revealed by cropmarks, including a second mini-henge and timber circle to the south of the aforementioned example (*ibid*, 109), assorted pits/postholes of various shapes and arrangements, and some small ring-ditch settings, with the entrance zone of the enclosure being especially busy (Figure 3.3b). Interpretations of the cropmarks are divided on some aspects of the interior cropmarks here. For instance, St Joseph depicted Millican's second mini-henge as a barrow (1978, 49), the RCAHMS 1991 transcription (Figure 2.9) opted for two large pits or small barrows in this location (Alcock and Alcock 1993, 232), while the 2008 RCAHMS transcription went with the hengiform interpretation (Figure 2.5); this seems the most likely explanation. This latter transcription is comparable with Millican in the detail offered for the cropmarks within the palisaded enclosure although again the most cohesive features, all of which have already been described, are in the northern half of the enclosure.

A series of cropmark enclosures and features have also been recorded close to the boundary of, but outwith, the palisaded enclosure. All these sites are discussed in more detail elsewhere in this volume and/or in SERF2, so only a summary is presented here. Three henges (Henges 2–4) and a ring-ditch are located to the north, with two of these excavated as part of the SERF Project (discussed in Chapters 6 and 7). The ring-ditch feature appears almost to overlap with the boundary of the palisaded enclosure in some imagery, although this was shown not to be the case during our excavations in 2010. Other sporadic pits are evident as cropmarks, a few of which were investigated during the excavation of the avenue in 2007 (section 3.3.3). St Joseph (1978, 50) noted three cropmark sites to the south of the palisaded enclosure, which he picked out as of interest (numbers 5 and 6 on Figure 1.2), one a 'penannular ditch', the other a grouping of two or three square barrows. The interpretation of the 1991 RCAHMS transcription added other features here: two further ring-ditches (Alcock and Alcock 1993), which could be considered further possible barrows. The consensus, then, is that a later prehistoric or early medieval cemetery was located on the fringe of the Neolithic enclosure (eg Whimster 1981, 415), an interpretation supported by excavations of two square barrows in 2010 (Trench B on Figure 3.1, and SERF2, section 4.2).

At least nine palaeochannels were identified across the interior of the palisaded enclosure during the analysis of oblique aerial photographs of Forteviot (clearly visible in Figure 2.4 for instance). These features are, as discussed in section 2.2.2, the remains of old channels from braided rivers of the post-glacial period. These had a substantial impact on the recognition of features during the 2007 season of excavations at the avenue (evident in Figure 3.12, below) and so we took note of 'natural cropmarks' in our excavation planning. In the same spirit, the identification of several tree throws (large holes left by fallen or uprooted trees) during the 2007 season of excavation (some depicted on RCAHMS transcription Figure 1.5) led to the tentative identification of such features in the cropmark record; a nice feedback loop with cropmark interpretation and excavation informing one another. Several clusters of these large oval pits are evident in the southern half of the palisaded enclosure interior; these groups have shared alignments, which may indicate, were these to be tree throws, that they were felled in one event (perhaps a storm). On the other hand, these features could be anthropomorphic pits; such are the vicissitudes of interpreting cropmarks.

3.1.2 Digging the palisaded enclosure

The palisaded enclosure was investigated in several places (Figure 3.1). Three trenches were located over aspects of the monument boundary: one focused on the avenue (Trench G), a second on the eastern boundary (Trench C), and a third on the junction between avenue and boundary (Trench F). The latter trench enabled the interior 'entrance zone' of the palisaded enclosure to be exposed. A fourth trench focused on the putative trapezoidal timber setting within the northern-central interior area of the enclosure (Trench E). The results of these excavations will be reported on in this chapter, and evidence for later activity discovered during these excavations explored in depth in SERF2, section 5.2.

3.2 Pits, posts, and deposition

with Kirsty Millican

At Forteviot we identified a range of features pre-dating the palisaded enclosure. Most are reported on elsewhere in this volume, notably a cremation cemetery and possible stone setting (section 4.3), and a putative rectangular timber setting pre-dating Henge 2 (section 6.2). Several radiocarbon dates within features hint at activity in the Mesolithic (section 4.2) and early Neolithic, the latter discussed in this section. Little can be said about how extensive pre-enclosure pit-digging was at Forteviot because firm dates and associated diagnostic material for such features were few and far between, so the majority of pits found during the excavations remain – unsatisfactorily – features of unknown function and origin (section 3.3.3). As noted above, a range of pits of different shapes and sizes was identified in the form of cropmarks by aerial reconnaissance at Forteviot, and it is likely that these represent a combination of prehistoric and historic pits, postholes and tree throws, examples of all of which were found during our excavations.

3.2.1 Early Neolithic pit, and possible pit cluster

Investigation of the interior of the palisaded enclosure was limited outside areas of major monumental components, due to a broader strategic focus on structures. The extensive area enclosed by the enclosure boundary mitigated against large-scale sampling. Only one trench was opened that focused on the interior of the enclosure (Trench E), located in the north-central interior of the palisaded enclosure 30m north-east of Henge 1 (Figure 3.1). The rationale behind the location of this trench was to explore a putative trapezoidal pit or post setting identified as a cropmark; other examples in the cropmark record have been interpreted as possible open-ended Neolithic timber structures (Millican 2016b, 148–9).

Within Trench E, which measured 20m north to south by 10m, nine cut features were identified (Figure 3.4), four of which were relatively large, but shallow, pits. These features may well be elements of the putative trapezoidal setting, although none held a post and they were not as convincing as a grouping on the ground as they appeared from the air. The largest was Pit 206, *c* 2.7m across, 0.5m deep, and probably oval in plan (Figure 3.5). Excavation was hindered by its location on the baulk, waterlogging during excavation, and the presence of a field drain. However, it was possible to identify a primary gravel silt (fill 231), followed by the deposition of carbonised organic material which formed a thin, amorphous spread to one side of the feature (fill 230); this deposit, consisting largely of carbonised oak with small quantities of hazel and willow, produced the only radiocarbon date we have for this group of features, 3780–3650 cal BC (4945 ±30 BP; SUERC-23236). It is possible that after this deposit the pit was sealed with a deposit of pink clay (fill 205). Three further pits were identified near Pit 206. Each (208, 217 and 228) was of a similar subcircular plan and size, between 1.4m to 1.9m

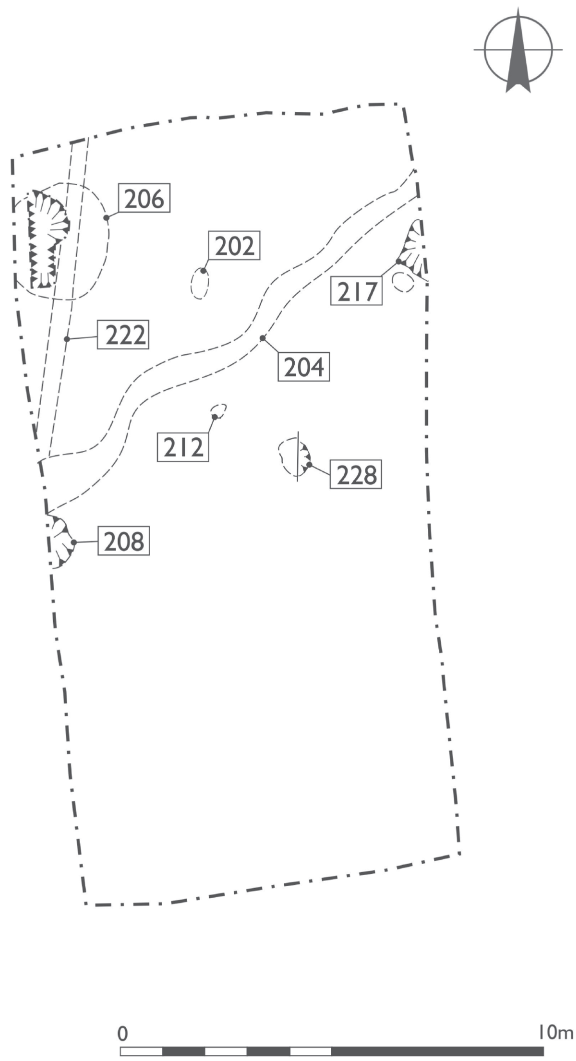


Figure 3.4 Post-excavation plan of Trench E

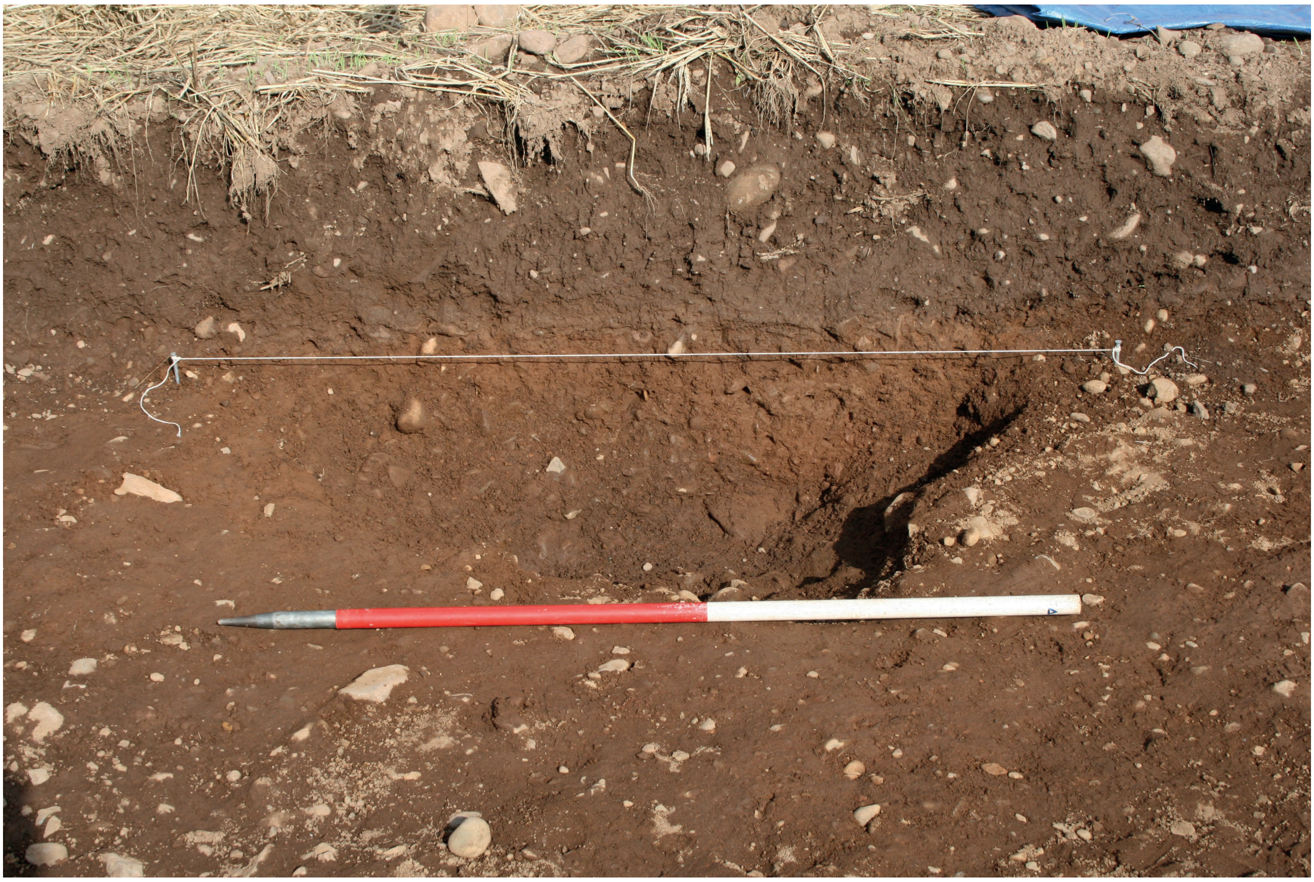


Figure 3.5 Pit 206 during excavations

across, no more than 0.4m depth, and with a north to south long-axis. None of these features contained any finds, while fills were largely primary gravels and sterile silt clays, indicative of natural backfilling, making both the origin and relationship of the pits to one another difficult to ascertain.

One possible posthole was identified, *c* 10m south of this group of four pits. Posthole 212 was a shallow oval feature measuring 0.19m by 0.12m, with steep sides, a round bottom and depth of *c* 0.15m. The single fill (213) was a dark brown sandy loam with large stone inclusions (possible packing stones) and charcoal staining. The other feature investigated in this trench resolved itself into an amorphous probable Tree Throw 232 (for discussion on similar features see 3.3.4), while a thin wash of silt (207) lay across much of the trench.

3.2.2 Discussion

The disparate collection of features found across all our trenches at Forteviot (described also in section 3.3.3) is indicative of the miscellaneous pits and postholes that are commonly discovered during open-area excavations. In the absence of dating evidence and artefacts, few of these features can be assigned to the early Neolithic with any confidence although it would be a surprise if Pit 206 was the only example from this period. On the other hand, one would have expected diagnostic ceramics to back up this interpretation; Carinated Bowl sherds are commonly found in 4th-millennium pits across mainland Scotland (Sheridan 2016) and this ceramic style was in use within the local area at this time for instance at Wellhill (Brophy and Wright forthcoming; SERF3). There is also a dearth of radiocarbon dates, with inadequate materials identified to facilitate these. It is interesting to note that the only other early Neolithic radiocarbon dates gathered at Forteviot (aside from Pit 206) were two associated with Tree Throw 5105 (sections 3.3.4 and 7.2.4). Given the quantity of radiocarbon dates generated during the SERF Project at Forteviot, that only three belong to the early Neolithic suggests activity here was on a low level, with pit-digging and (perhaps) tree clearance the focus. This contrasts with clusters of early Neolithic pits at Wellhill, 4km to the west (Brophy and Wright forthcoming).

It would not be surprising to find a fair number of early Neolithic pits in this location, however, given that pit-digging appears to have been a common occurrence in locations that would subsequently become monumentalised later in the Neolithic across Britain (eg Ray and Thomas 2018, 183–4). Such pits have often been associated with structured or rule-bound deposition (Thomas 1999; Anderson-Whymark and Thomas 2012), but may also have been key indicators of place-making activities (cf Pollard 1999). In other cases, pits appear to have been associated with domestic activity, either individually or in clusters (cf Brophy 2016), although the indicators of domestic as opposed to ritual deposition within pits is at best ambiguous, and indeed such a division may not have existed in prehistory (Brophy and Noble 2012a).

Little was found at Forteviot that pointed clearly in any direction with regards the role of early Neolithic pits other than perhaps Pit 206, and even then, this feature is a study in ambiguity. The recovery of carbonised oak, hazel and willow from within suggests deposition, perhaps of a material used elsewhere for hurdling or simply fuel for a fire, although whether this was domestic refuse or a ritually charged offering (or both) is unclear. It could also be argued that repeat waterlogging of this feature during excavation hints that this pit might have acted as a crude spring or well. Digging into clay-rich natural deposits may indicate that this place was used for the sourcing of clay, perhaps for making pots or daub (although no ceramics or daub of this date have been found at Forteviot). This pit had a complex biography. It was a focus for deposition and possibly also extraction and was perhaps sealed by clay at the end of its use-life, although the clay may have been washed here naturally. This feature seems to have been of importance, but at some point, perhaps, became taboo or was put beyond use. However, we cannot connect this stratigraphically or chronologically with any of the features around it; they may or may not be part of the same phase of activity and so there is no firm evidence for place-making pit-digging here.

In the absence of anything other than speculative narratives, we can take solace from the fact that palisaded enclosures in general appear to have been monuments that were preceded by activities such as pit-digging and deposition. Such activity was especially intense at Meldon Bridge, where the excavators noted that pits 'containing Neolithic material occurred sporadically over the whole site, normally in clusters of three or more pits or, more rarely, solitary features' (Speak and Burgess 2000, 10). Radiocarbon dates placed some of these pits in the early Neolithic, and others contemporary with the 3rd-millennium BC palisaded enclosure, while many other features yielded no evidence for function or date, as at Forteviot. Unlike most Forteviot pits, however, features at Meldon Bridge were often found to contain carbonised material suitable for single entity dating, such as hazelnut shells, as well as potsherds and occasional single burnt bone fragments. The ceramic associated with some clusters of these features was generally Impressed Ware (known as Meldon Bridge style), which straddles the early and late Neolithic. Speak and Burgess interpreted these pits as ritualistic in character, 'remnants of the first ceremonial activity on the site' (2000, 105), indicated by unusual practices such as potsherds pressed into the side of some pits. More recently it has also been suggested, without it has to be said much basis in evidence, that the Meldon Bridge pits could have been associated with settlement activity (ScARF 2012a, section 3.3.2.2). Certainly a different order of pre-enclosure activity is evident at Meldon Bridge as compared to Forteviot.

At Dunragit, extravagant and coherent evidence for early Neolithic activity was discovered in the form of a timber cursus monument. Elements of the cursus had been visible as a cropmark, but not identified as such until excavations in 1999 and 2001 (Thomas 2015, 21ff). The monument consisted of an arc of timber posts forming the only known terminal, with two parallel lines of postholes running away from it in a south-westerly direction. The cursus was defined by timber posts, with an overall dimension of at least 75m by 35m (its full length is unknown). The monument's destruction (by a combination of fire and neglect) has been dated to 3760–3630 cal BC (4890 ± 35BP; SUERC-2103) (*ibid*, 146), which is very much in line with the early Neolithic origins of similar monuments (Thomas 2006; Brophy and Millican 2015). At least one pit pre-dated the cursus, and Mesolithic lithics collected during Thomas's excavations suggest this location was frequented long before the palisaded enclosure complex was constructed, with the cursus pre-dating this later Neolithic monument by between 800 and 1000 years (Thomas 2015, 147–8).

At the time of writing, the radiocarbon dating programme associated with the Leadketty palisaded enclosure is ongoing, but little of early Neolithic date has thus far been identified either associated with, or within, this massive monument (cf Noble and Brophy 2014; SERF3). However, within 1km of the enclosure, at a site called Wellhill, a cluster of Neolithic pits with an extensive assemblage of Carinated Bowls and apparently associated ardmarks and a field ditch were identified during SERF excavations in 2014 (Brophy and Wright forthcoming; Alexander *et al* forthcoming;). More broadly, pre-palisaded enclosure activity appears to have been the rule, not the exception (Gibson 2002, 11). Therefore, the identification of an isolated pit (perhaps part of a cluster) and assorted other pits (and possibly postholes) that may date to the early Neolithic at Forteviot, is consistent with the pit-digging and timber post erection evident at similar sites elsewhere.

How should we interpret the commonplace discovery of such activity in locations that went on to become enclosed? One of the challenges that any investigation of this phenomenon faces is to find a causal connection between such early, sporadic acts, and large-scale monumentality centuries later; co-location could, in theory, be unrelated and coincidental, a product of excavation rather than intentionality in the Neolithic. Evidence for continuity is difficult to establish. Yet such meaningful connections have been made in relation to pit-digging traditions at ceremonial monuments and complexes elsewhere. There is a rich tradition of such practices in eastern lowland Scotland (Brophy and Noble 2012a), notably at Balfarg, Fife, where groups of early Neolithic pits used for deposition of broken potsherds and carbonised material were cut centuries before enclosures and cairns were constructed in the same locations here across the 3rd millennium BC (Mercer 1982; Barclay and Russell-White 1994). Other local examples include North Mains henge, upriver from Forteviot, where several pits were dug in advance of henge construction (Barclay 1984, 126). Pit-digging and the deposition of axe fragments, regarded as ritual activities, occurred in advance of the construction of the timber/stone circle and henge monument at Cairnpapple, West Lothian (Piggott 1948; Barclay 1999b).

Therefore, the scant evidence we have for pre-palisaded enclosure activity at Forteviot *could* be argued to indicate 4th-millennium place-making, although this supposition depends more on the regional tradition of such activities than evidence from Forteviot itself. Furthermore, at the turn of the millennium activity here was stepped up in scale and significance, with pit-digging being replaced by the erection of big oak posts, at least one standing stone, and the establishment of a cremation cemetery. These embellishments are the subject of the remainder of this chapter, and Chapters 4–7.

3.3 Forteviot palisaded enclosure

Befitting a monument characterised by its boundary, investigation of the palisaded enclosure largely focused on the postholes that mark it out. Over three trenches and two seasons of excavation, we exposed and planned 31 postholes on the boundary and entrance avenue of the palisaded enclosure (for locations of these trenches, see Figure 3.1). Of these, we fully excavated eight postholes, and a further nineteen were excavated to half-section, in line with SMC conditions. Posthole details are summarised in Table 3.1. This represents an approximately 20% sample of the monument boundary, with some 120m of boundary investigated including all the avenue.

3.3.1 Palisaded enclosure boundary

(with Cathy MacIver and Aoife Gould)

Six postholes were investigated on the eastern boundary in Trench C: from north to south, Postholes 7006, 7012, 7040, 7021, 7033 and 7035 (Figure 3.6). Five postholes were exposed along the northern boundary of the enclosure in the entrance zone within Trench F, as well as two which also formed the southern end of the avenue (the 'junction postholes') (Figure 3.7). These were (east to west) Postholes 5504, 5530, 5538, 5613, 5518, 5592 and 5052, the first two being the junction postholes. Of these thirteen postholes, all except 5613 were excavated to at least half-section.

The postholes on the eastern boundary of the enclosure were, on average, slightly less substantial than the avenue and northern boundary posts; they were spaced between 4m and 5m apart. The postholes varied considerably in size, from 0.8m by 0.6m in plan, to 2m by 1.1m, with average depth 1.1m (Figure 3.8). Most showed traces of stone packing and oak charcoal in lower fills; postpipes, where evident, ranged in width from 0.65m to 0.85m. The profile of these features suggests they once held large oak posts that subsequently rotted *in situ*; some posts had been charred at the base prior to erection. Posthole taphonomy was not consistent: Posthole 7040 had homogenous and disturbed fills, suggesting the post was removed. Ramps to assist with post erection were

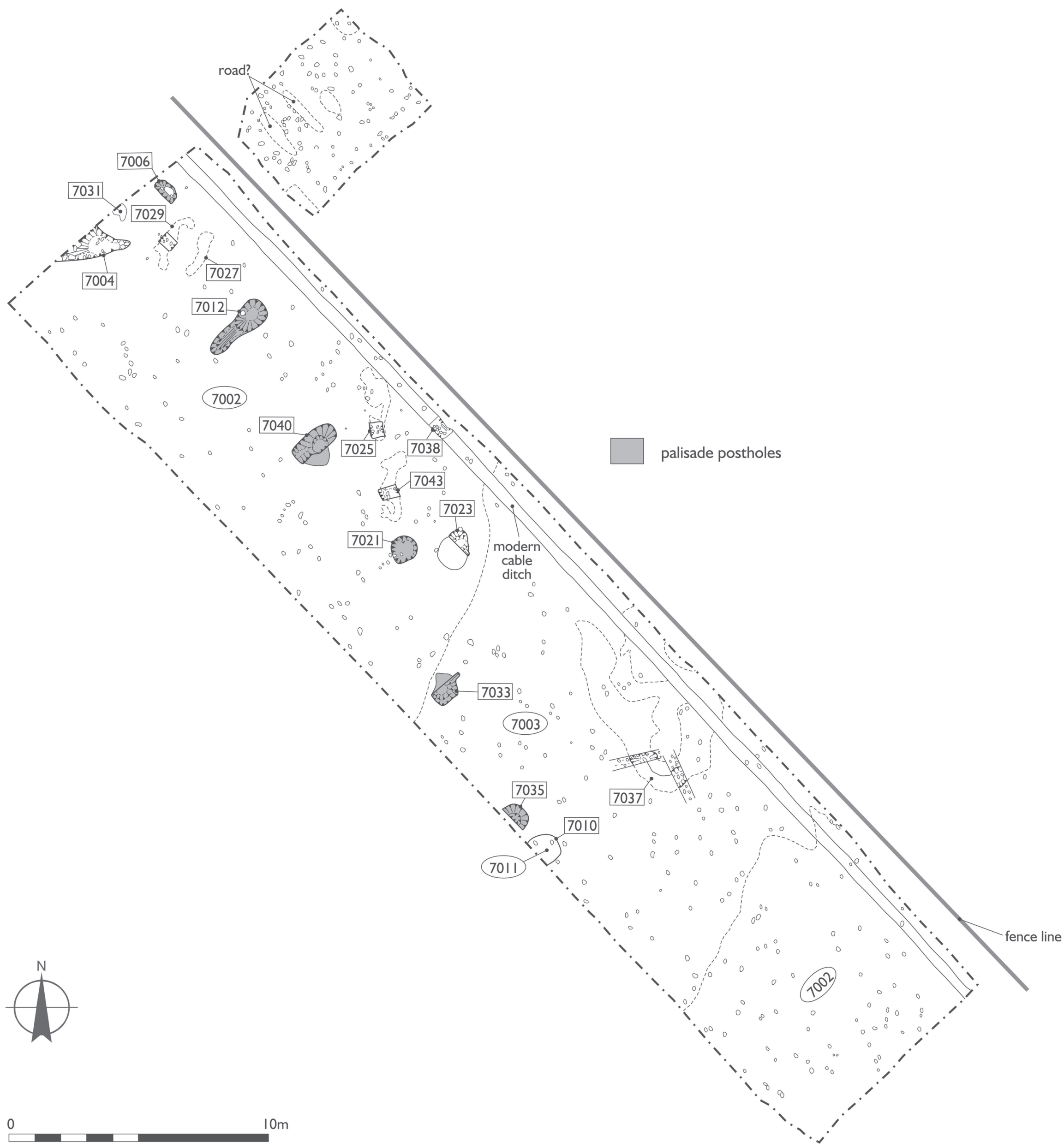
Table 3.1 Summary of the postholes on the boundary and avenue of the palisaded enclosure that were exposed and planned during SERF excavations in 2007 and 2010. Unexcavated feature information is based only on the feature in plan and so is provisional. Junction posts in bold

Posthole	Location	Excavation	Dimensions	Depth	Postpipe?	Ramp axis
076	E Avenue	Half-section	1.8 1.5	1.15	0.45	E/SE
146	E Avenue	Half-section	1.31 1.09	0.63	0.65	No ramp
139	E Avenue	Half-section	1.45 1.45	0.9	No	S/SE
187	*E Avenue*	*Unexcavated*	*1.5 0.8*	*na*	*Unknown*	*SE?*
125	E Avenue	Half-section	1.35 1.32	0.62	0.6	E/SE
188	*E Avenue*	*Unexcavated*	*1.0 0.6*	*na*	*Unknown*	*SE?*
043	E Avenue	Half-section	2.1 1.8	1.04	0.8	E
132	E Avenue	Half-section	2.23 1.43	0.7	No	E
5506	E Avenue	Half-section	2.06 1.9	1.3	0.8	NE
5504	**E Junction**	**Half-section**	**2.65 1.7**	**1.5**	**1.0**	**No ramp**
041	W Avenue	Half-section	1.2 0.9	0.83	0.85	W
037	W Avenue	Half-section	1.4 0.7	0.7	0.6	N?
035	*W Avenue*	*Unexcavated*	*2.0 1.0*	*na*	*Unknown*	*W?*
031	W Avenue	Half-section	2.16 1.1	0.83	0.7	W
022	W Avenue	Fully excavated	1.3 1.25	0.7	0.7	W
013	W Avenue	Fully excavated	2.4 0.9	0.8	0.55	W/NW
007	W Avenue	Fully excavated	2.2 1??	1.1	0.9	W
024/5542	W Avenue	Half-section	2 1.2	0.5	0.5	W
5526	W Avenue	Half-section	1.5 1.4	0.88	0.74	W
5530	**W Junction**	**Half-section**	**2.83 0.66**	**1.16**	**0.64**	**NW**
5538	NW side	Half-section	2 *c* 1	1.1	0.4	W
5613	*NW side*	*Unexcavated*	*⇠1.5 1.0*	*na*	*Unknown*	*Unclear*
5518	NW side	Fully excavated	1.6 1.05	1.2	0.5	NW
5592	NW side	Fully excavated	1.2 x 1.2	1.12	*c* 0.5	NW
5052	NW side	Half-section	2 0.66	0.94	*c* 0.5	W
7006	E side	Fully excavated	0.8 0.5	1.05	0.68	No ramp
7012	E side	Fully excavated	2 1.1	1.2	Unclear	W
7040	E side	Half-section	0.8 0.6	0.8	No	W?
7021	E side	Fully excavated	1.18 1.18	1	0.55	No ramp
7033	E side	Half-section	1.45 1.45	1.3	No	E?
7035	E side	Half-section: W half under baulk	1.3 ⇢ 0.7	1.3	*c* 0.45	No ramp

identified for some postholes, the most obvious on the west side of Posthole 7012, indicating in this instance the post had been erected from the monument interior. Overall though the orientation and presence of ramps was inconsistent in this sector of the monument, nor was any indication found of the postholes being re-cut or repaired. Two smoothed or polished stones and a polished (possibly worked) quartz pebble (SF7004, 7005 and 7006) were found within one of the lower fills in Posthole 7012. Radiocarbon dates from these postholes suggest they were in use in the late Neolithic (section 3.4). Mixed charcoal and charred grain deposits were identified in the upper deposits within three postholes here, 7006, 7033 and 7033, the latter producing charred grain that was dated to the 5th or 6th century AD, material which seemingly entered this feature long after the post had fully rotted.

The postholes defining the northern boundary of the enclosure to the west of the avenue were similarly variable in size, shape and form (Figure 3.9). The five postholes excavated here ranged in size from 2m by 0.66m (oval in plan) to 1.20m across (circular), and 0.94m to 1.20m deep. Each contained packing stones and at least three had clear postpipes or decay cones,

Figure 3.6 Post-excavation plan of Trench C



indicative of *in situ* post rotting; postpipes were all around 0.5m across. Two postholes, 5518 and 5592, had traces of oak charcoal in the lower fills of the postholes, consistent with pre-erection charring. Ramps were not present in all examples, but where they could be identified, were on the north-west or west side of the main cut, suggesting posts were erected from outside the enclosure. No finds were made in any of these postholes, although 5538 contained fragments of burnt bone in its upper fill, a phenomenon noted at several avenue postholes (section 3.3.5).

The largest posts encountered on the boundary of the palisaded enclosure were, significantly, those at the junction with the avenue, 5504 and 5530 (Figure 3.10). Posthole 5504, the easterly of the two, measured 2.65m by 1.70m in plan, with the long axis north to south (Figure 3.11). The hole was 1.5m deep with steep sides and a rounded bottom. Packing stones (Fill 5623) and a postpipe *c* 1m across (5575) were identified in section. Oak charcoal towards the base of the feature may indicate charring of the post before erection. Posthole 5530 was tear-drop-shaped in plan, measuring 2.83m north-west to south-east by 0.66m,

Figure 3.7 Post-excavation plan of the eastern area of Trench F and Trench G. The western area of Trench F is shown in Figure 7.4

the length augmented by the largest ramp encountered on any posthole on the boundary, orientated to the north-west. The posthole was 1.16m deep. The taphonomic story of this feature was obscured by an animal burrow, although evidence for voids created by post rotting, stone and clay packing, and post charring, were all evident. Neither of these postholes contained any finds. The significance of these junction posts will be considered later. Radiocarbon dates from the postholes in this area of the enclosure suggest that they

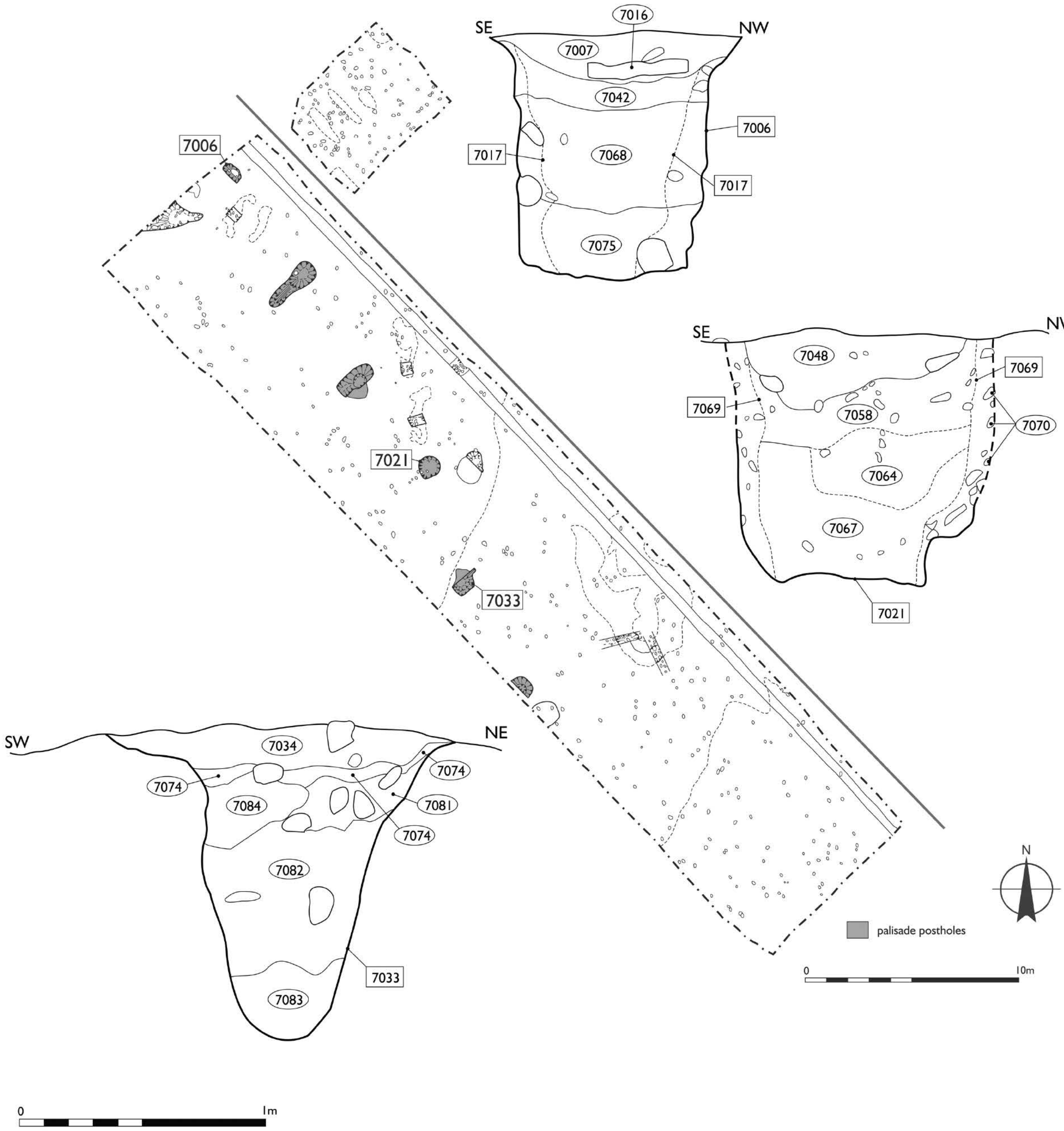


Figure 3.8 Sections of postholes from Trench C: left to right, 7021, 7006, 7033

were in use in the late Neolithic. Single fragments of hazel, a hazelnut shell and some carbonised willow were found in the upper fill of Posthole 5052, probably later intrusions or deposits.

3.3.2 Palisaded enclosure avenue

The avenue of the enclosure was first explored in 2007, in Trench G; the most southerly posts on the avenue were revealed three years later in Trench F (see Figure 3.7). The eastern side of the avenue was obscured by a palaeochannel, an amorphous linear band of silt (Figure 3.12); consequently, these postholes were challenging to identify and excavate. In total, we revealed eighteen avenue posts, nine on each side, and excavated all but three of them, mostly to half-section (Table 3.1). The 'junction posts' were discussed in the previous section and mark the southern extent of the avenue. The eastern side of the avenue is 30m long and consists of the following postholes (north to south):

Figure 3.9 Palisade boundary Posthole 5538 during excavation

Figure 3.10 Section drawing of postholes on the northern border of the palisaded enclosure, including junction features 5504 and 5530 with location of each indicated on the site plan (Fig 3.7)

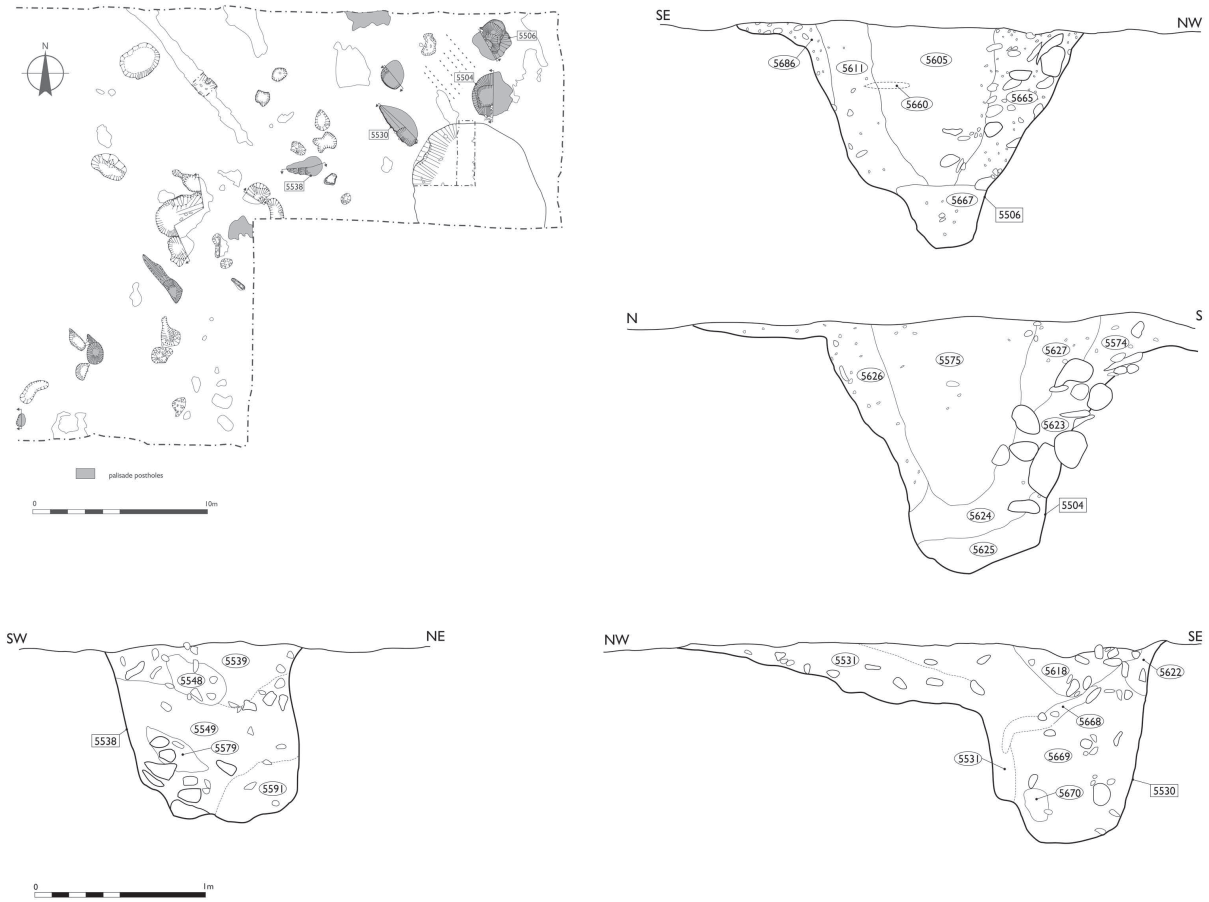


Figure 3.11 Large ‘junction’ Posthole 5504 during excavation

Figure 3.12 View of Trench G from the (former) RCAHMS hi-spy camera showing the avenue once excavation was completed, and the silt band evident running across the trench (DP 029896; ©Crown Copyright: HES)

076, 148, 139, 187, 125, 188, 043, 132 and 5506. The western side of the avenue is 32m long and consists of these postholes (north to south): 041, 037, 035, 031, 022, 013, 007, 024/5542 and 5526.

The postholes on both sides of the avenue were variable in depth. For example (excluding the junction postholes), on the east side of the avenue postholes varied considerably from 0.62m to 1.30m deep, although on the west it was consistently in the 0.8m to 0.9m range with few exceptions. There was no obvious pattern to the depths of postholes, so if we are to use this as a correlate for post height, no grading along the avenue is evident, although the posts marking the junction could have been much larger. Posthole size and form varied also, from circular to subcircular to oval, while size on the west side of the avenue ranged from 1.2m by 0.9m across (northernmost Posthole 041), to a circular post-pit around 1.35m in diameter (125), to a very large ramped posthole measuring some 2.1m by 1.8m (043). Post spacing was also more variable on the west side of the avenue, ranging from 3m to 5m (measured from posthole centres), while on the east side it was consistently 4m. Although the east side of the avenue was, therefore, more regular in various respects, one relatively small posthole (146) lies slightly off-line, to the extent that it was initially not considered part of the avenue (for instance, see Noble and Brophy 2011a, figure 8).

In almost all cases, the avenue cut features showed traits of these being postholes, with the presence of postpipes, decay cones, ramps and/or packing stone fills (Figure 3.13). As with the boundary of the enclosure, there were no signs of re-cuts or secondary post erection. In most cases, postpipes were evident, or less commonly, weathering cones. Where postpipes were evident, they ranged in diameter from 0.5m to 1m, indicating the girth of the posts that once stood in these features. Not all posts appear to have been allowed to rot *in situ*; most of Posthole 139 was filled with stones so roughly packed that voids were evident amidst this material (Fill 166), indicative of removal of the post disturbing packing stones (or less likely, rounded stones were dumped into the feature once the post had gone) (Figure 3.14). Posthole 132 had a homogenous fill, suggestive of post removal, and within this feature an anomalously large boulder and quantities of fire-cracked stone (respectively 133 and 145) were found. The boulder may have been deposited after the post was removed or had decayed, or it may simply have been an unusually large packing stone that was used opportunistically.

Artefacts were scarce. A sherd of possibly Neolithic pottery (SF014) was recovered from a lower fill of avenue Posthole 139, while a deliberately chipped agate pebble (SF5525) was found in Posthole 5506, as was a second potsherd (SF5522), found amidst the packing stones (and so may have been incorporated accidentally) (section 3.3.5). Small quantities of oak charcoal were recovered from the lower fills of many postholes, suggestive of post charring before erection; radiocarbon dating from this material suggested the posts were erected in the late Neolithic. Several features had cremated bone fragments in their upper fills, more commonly than anywhere else on the palisaded enclosure boundary; these are discussed in section 3.3.5 and were almost certainly late additions to these features. Alder, hazel and willow charcoal in small quantities was found within the upper fills of avenue Postholes 043 and 125, again material which seems to have found its way into these features after the post had largely, or wholly, rotted.

Several features were identified along the line of the avenue and could be related to the structure. Three cut features were identified immediately adjacent to, and on the north edge of, western avenue postholes (Figure 3.7). These features were paired with avenue posts: avenue Posthole 031 was accompanied by smaller feature 033, Posthole 037 with 039, and Posthole 041 with 109 (Figure 3.15). Each of these smaller features was in the order of 0.5m in diameter in plan, and between 0.25m and 0.35m in depth; we were unable to determine if these had been postholes or pits. The recurring pairing of these features with postholes is suggestive of a relationship and this will be discussed further below.

3.3.3 Miscellaneous pits and postholes

In each trench, a range of cut features was identified; these were not part of the palisaded enclosure boundary itself but indicative of activity in these locations that could pre-date, post-date or be contemporary with the late Neolithic monument. The earlier discussion on the nature of pre-palisaded enclosure features (section 3.2.1) almost certainly appertains to some, but not all, of the features discussed here.

Excavations in Trench G identified a range of cut features on either side of the avenue (shown in Figure 3.7). Most were pits, a few postholes, and none produced any dating evidence, finds, or had a stratigraphic connection with any features that were part of the avenue. It seems likely that some features in this

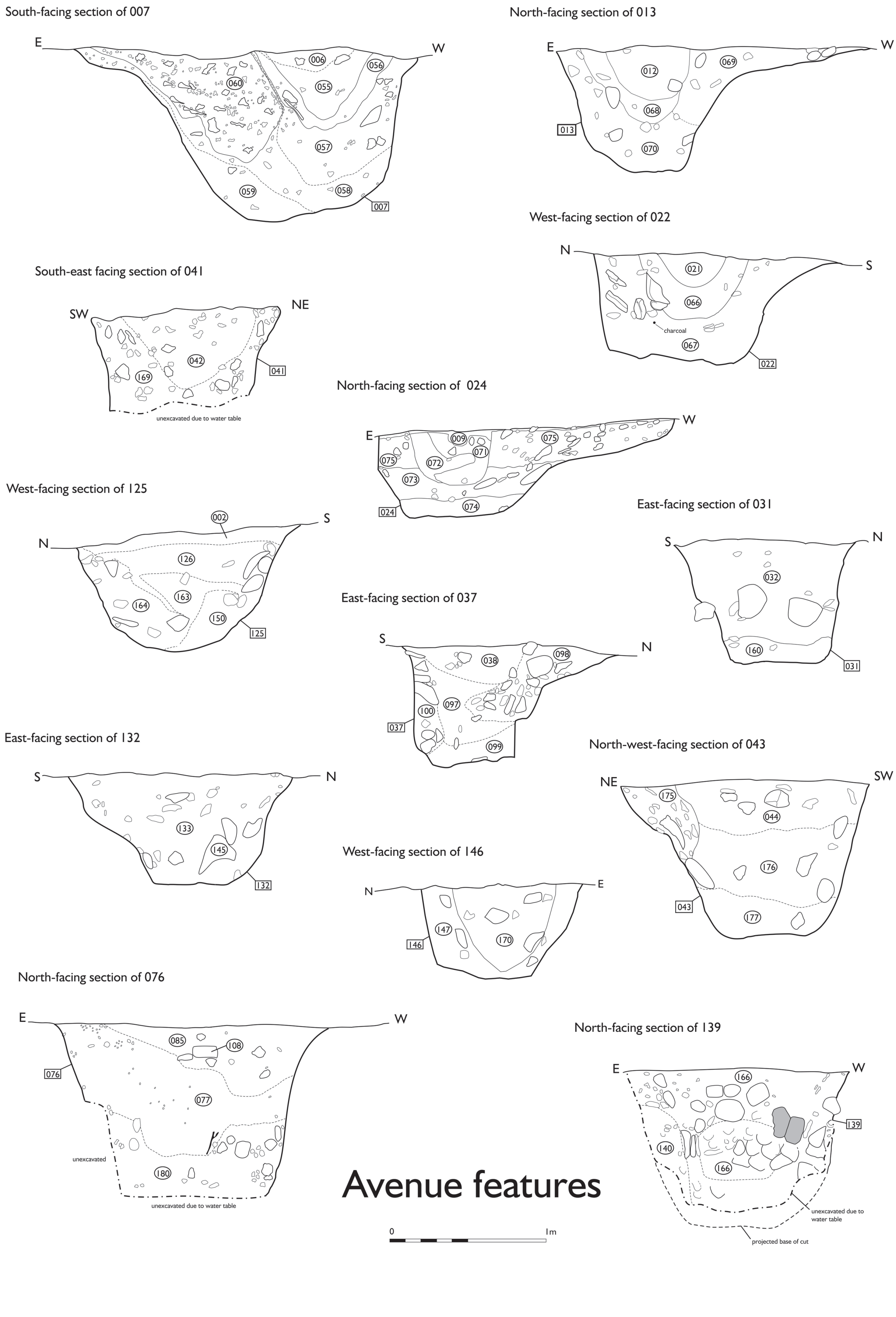


Figure 3.13 Selection of sections through palisaded enclosure avenue postholes

Figure 3.14 Posthole 139 during excavation showing disturbed fills

Figure 3.15 Big posthole / small posthole arrangement (postholes 031 and 033)

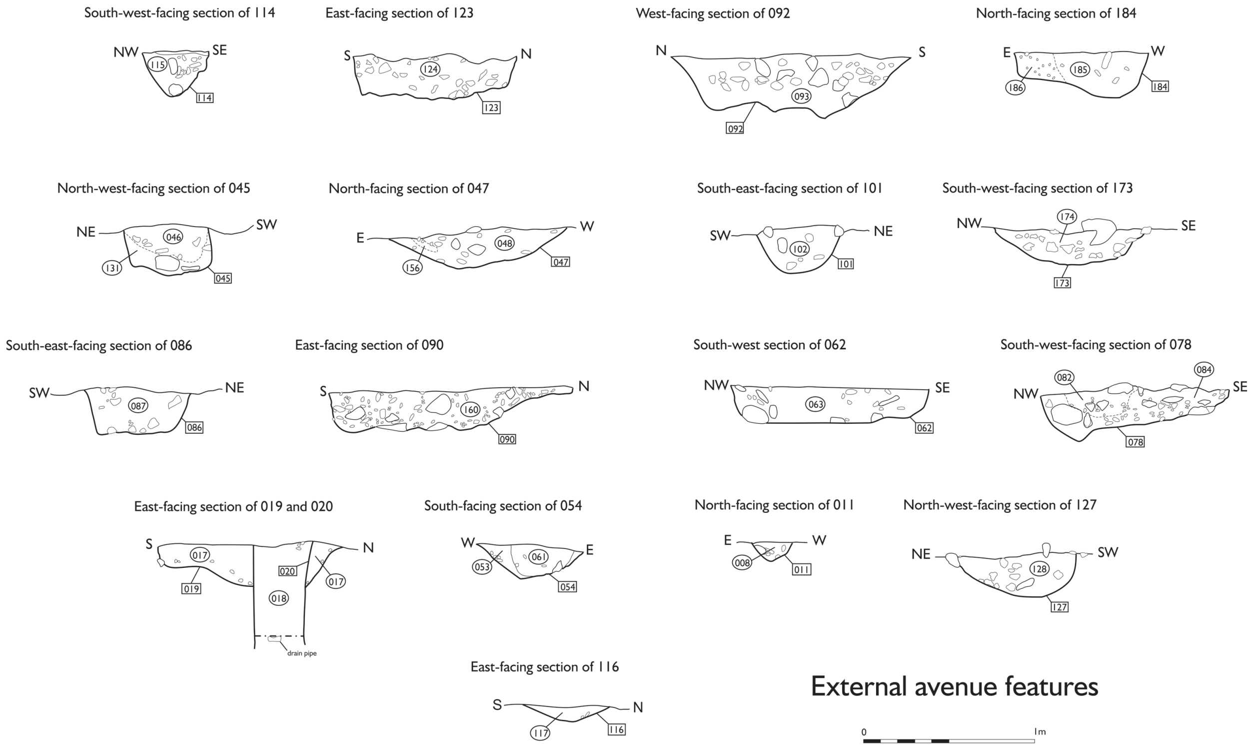


Figure 3.16 Sections of pit features found around the avenue

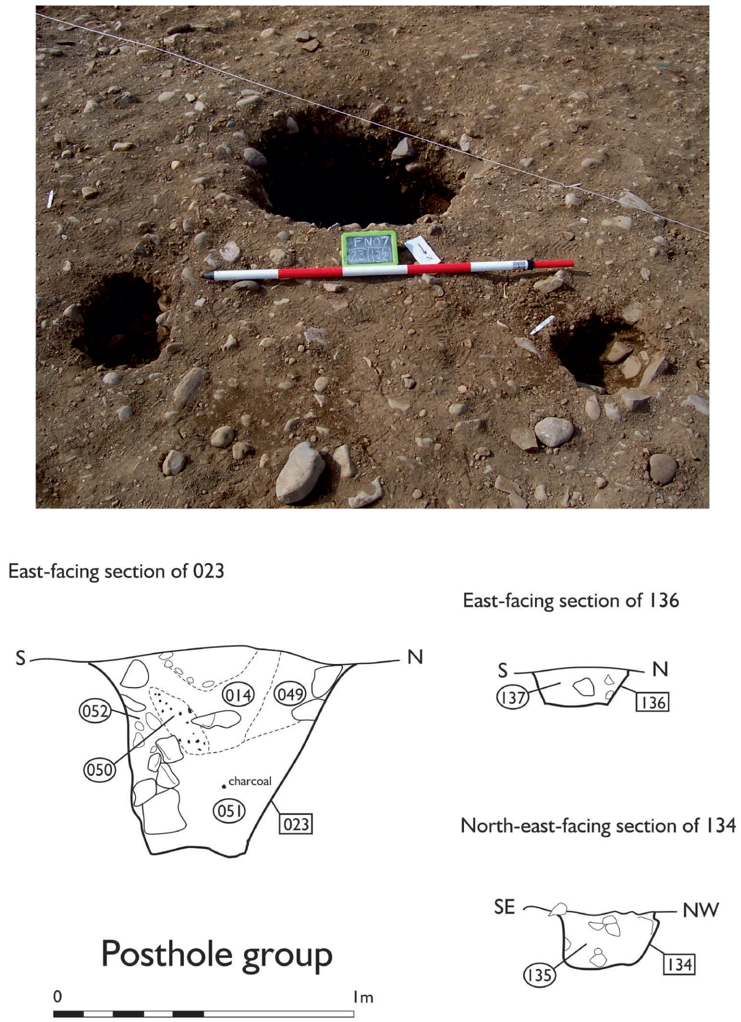


Figure 3.17 Triple post-setting adjacent to the avenue of the palisaded enclosure: post-excavation photograph and section drawings

Figure 3.18 Features between postholes 007 and 132: pre-excavation photograph and section drawing

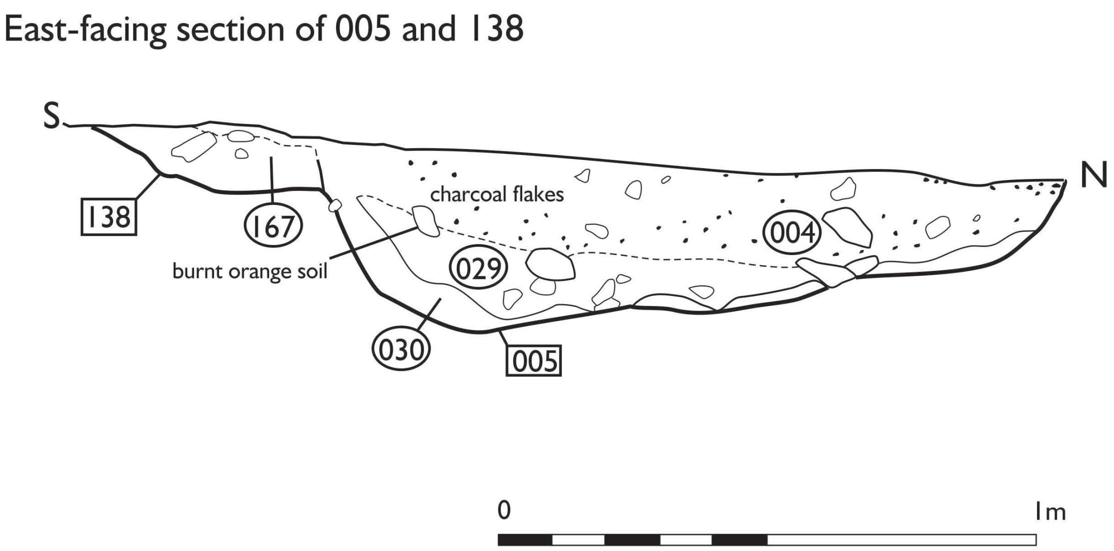


Figure 3.19 Giant but shallow pit just inside entrance zone of the palisaded enclosure during excavation

group were at least contemporary and related to one another. These features have been given the pejorative label miscellaneous throughout this volume and their significance and part in the Forteviot story may never be known; most excavations reveal such loose ends. It is also worth noting that not all these features were excavated and some appear to have been tree throws (section 3.3.4); three were shown by radiocarbon dating to be of early medieval date (section 3.5.4).

At least fifteen small pits were identified in the vicinity of the avenue, usually in pairs. Within 10m of the eastern side of the avenue, three pairs of pits (Pit Pairs 063–079, 086–090 and 092–143) were all excavated, either fully or to half section. These features, all between 1m and 2m apart from their partner, were typically linear to oval in plan, 1.0m to 1.4m long and in the order of 0.7m to 0.8m across, no more than 0.3m deep, with steep sides and irregular bases, and largely sterile silt fills that suggested natural silting occurred (Figure 3.16).

A triple post-setting of unknown date, consisting of Posthole 023 and possible Postholes 134 and 136, was located *c* 7m east of the northern extent of the avenue. This setting appears to have focused on Posthole 023, which was circular in plan, 0.80m across, U-shaped in profile and with depth of 0.62m. Amidst multiple fills was a postpipe (014) 0.5m across and packing stones (052). At the base of this feature was a compact dark brown silty clay fill (064) that had the appearance of a decayed turf, perhaps placed on the base of the feature as a post pad. The other two features, which could be interpreted as pits or postholes, 134 and 136, were much smaller, subcircular in plan, less than 0.40m in diameter, both 0.18m deep, and with a single mid-brown silty gravel fill (135/137). These three features all sat comfortably within a square metre and appeared to be a cohesive setting (Figure 3.17). We cannot be sure of the date or function of this setting. Was this a shrine or 'totem pole' arrangement, a forerunner to the grander monumentality to come, or was it simply a modest structure literally in the shadow of the giant enclosure posts?

Several features were located *within* the avenue, clustered towards either end of the structure. It is tempting to see the space between the parallel post-lines as a focus for activity and deposition, not merely a corridor for movement, although none of these features could be linked to the avenue structurally or chronologically.

To the north was small Pit 028 (between avenue Postholes 037 and 139), just 0.60m by 0.25m with long axis almost north to south, and depth of no more than 0.20m; this feature contained a single dark brown silt loam fill. Pit 152 was 1m to the south-west of avenue Posthole 076, and was bowl-shaped, 0.46m across, 0.14m deep and largely filled with rounded

Figure 3.20 Linear slot feature 7025/7043 in Trench C

pebbles. A larger feature, Pit 148, was less than 1m south of Posthole 146 and just off-set from the line of the avenue; it was 0.80m across, asymmetrical in profile and 0.35m deep, with two stony silt fills (149 and 168). Despite the proximity of this disparate group of features, no obvious connection could be made between them. At the southern end of the avenue, two intercutting features were identified in the gap between Postholes 007 and 132 (Figure 3.18). Irregular Slot 138, which ran from the centre of the avenue westwards, was no more than 0.2m deep and 0.4m across and was cut by large oval Pit 005. This latter feature contained a large quantity of charcoal and was subsequently radiocarbon-dated to the early medieval period (see section 3.5.4 for details). It was not possible to determine the date or function of Slot 138. Immediately to the south, between avenue Postholes 5526 and 5506, was a feature initially interpreted as a tree throw (5508), although subsequent re-evaluation suggests this is more likely to be a pit, measuring 1.55m by 0.90m (long axis parallel to the avenue), only 0.17m deep and of similar character to many sterile linear pits found in this area, including the aforementioned paired pits. A further linear feature, 5528, located equidistant between the junction postholes, was unexcavated although it appears to have been cut by Pit 5502; this substantial feature, with a diameter of just over 7m (Figure 3.19), indicates activity probably later than the Neolithic, having produced material consistent with metalworking waste, and will be returned to in section 3.5.4. Having said that, the location of this pit so close to, and on the line of, the entrance is worthy of note.

A wide range of assorted features was identified north, south, and along the line of the northern palisaded enclosure boundary, although no dates or artefacts were retrieved from any of these (see Figure 3.7). The interpretation of these features, in the absence of chronological indicators, is problematic. Some features were simply free-floating and amorphous, such as the shallow Pit 5666, located 7m north of boundary Posthole 5518. Other features were clustered together, like a group of Pits or Postholes 5564, 5566, 5568, Posthole 5646 and Tree Throw 5540 located adjacent to palisade Posthole 5613 and set in a rough arc straddling the enclosure boundary. During the excavation, as a group these features were interpreted tentatively as a semi-circular post-setting, although given the variability and form of the features and the uncertainty caused by this discovery so close to the baulk, this seems unlikely. Only one of these features had a convincing postpipe, 5646, a substantial feature some 1.00m across in plan, with depth 0.46m, and containing evidence for a postpipe 0.30m across (5647) and packing stones (5676, 5677). The other features were smaller pits, with one of these, Pit 5568, sitting on the line of the boundary between Postholes 5538 and 5614. Tree Throw 5540 is discussed below.

A second palisade Posthole 5538 also had spatially associated features of unknown date, in this case nine scattered pits and postholes, mostly to the north, seven of which were investigated during the 2010 season. Two similarly sized small pits, 5534 and 5642, were identified immediately to the south of Posthole 5538, both subcircular and around 0.5m in diameter in plan; both had silt fills (5535, and 5643/5644 respectively) but no sign of a postpipe. Within 1m north of boundary Posthole 5538 was shallow, ramped Posthole 5640, no more than 0.25m deep, with a postpipe (5641) some 0.25m across, packing stones (5687) and a ramp on the west side. This feature was accompanied by similarly sized putative Posthole 5536 immediately to the north, with possible postpipe (5663) also 0.25m across. Shallow Pit 5648 was also found 1m north of Posthole 5538. Two further features were located 5m north of Posthole 5538. Both Pits 5656 and 5654 were of similar size and appearance, oval in plan in the range 1.0m by 0.6m, no more than 0.2m deep, and with silt and gravel fills. There is no evidence to connect any of these features, and while a rough alignment was identified at the time of excavation, consisting of features (north to south) 5534, 5642, 5640, 5536 and perhaps 6556, this was just one of many ways of joining these dots on the plan. It was unconvincing both in terms of layout and the variable features this group contains.

Additional features were scattered across this area, most of which were indeterminate pits. Two such features were investigated immediately to the west of boundary Posthole 5592. One of these was small Pit 5630, the other possible Posthole 5620; neither lay on the line of the boundary itself. Two pits were located between 3m and 4m south of boundary Posthole 5518. One feature, 5550, appeared to be a disturbed animal burrow, the other, Pit 5553, was little more than a shallow scoop. A cluster of nine small features was planned between 6m and 8m south of Posthole 5518 although only one, Pit 5580, was tested by excavation. This was an amorphous pit, 1.00m by 0.60m in extent, 0.34m deep, and with a single gravel silt fill, 5581. Other features in this area were, in some cases, little more than stakehole size, and may have been the result of animal burrowing.

Two large pits, 5514 and 5512, both packed full of burnt material, were identified to the north of the palisade line and were thought, at the time of excavation, to be prehistoric. However, these were subsequently dated to the 1st millennium AD and may relate to early medieval cremation pyres (see section 3.5.4; SERF2, 5.2). Features identified in the vicinity of the ring-ditch (Trench F) will be considered in Chapter 7.

Three miscellaneous features, as well as several possible tree throws (3.3.4), were investigated near the postholes on the eastern boundary of the palisaded enclosure. Pit 7023 was located 2m to the south-east of palisade boundary Posthole 7021, and so outwith the enclosure. This was a large pit, circular in plan and 1.4m across, with maximum depth 0.7m and a bowl-shaped profile. Several silt and silt clay fills shed little light on the taphonomy of this pit although it probably filled naturally. A more unusual feature, defined by Slots 7025 and 7043, was identified running for about 5.5m north-east to south-west, stopping at the palisade boundary at one end, and possibly truncated by a modern cable ditch and the field boundary at the other end (Figure 3.20). A break between the two slot sections of less than 1m may be the result of truncation or evidence that these were two distinct features in alignment with one another. These slots were 0.6m to 0.7m across, and both 0.4m deep, with an indication of a packing fill (7044/7046) most obvious in the westerly of the two ends of the slot, 7043, perhaps indicating that this feature at one time held a wooden fence. These slots may have no relationship with the palisaded enclosure, but it is reminiscent of a post-line that ran up here at an acute angle to an entrance gap on the west side of Holywood North cursus monument, Dumfries and Galloway; this was interpreted by the excavator as a means to control and direct access into that enclosure (Thomas 2007, 186–8) although no obvious equivalent entrance gap was found in the palisaded enclosure boundary.

3.3.4 Tree throws

Several possible and probable tree throws (holes where trees once stood but were felled) were found in the vicinity of the palisaded enclosure boundary and interior; a few have already been mentioned. The identification of such features during our excavations, the location of some in particular, and the possible

Figure 3.21 Section drawings of a selection of tree-throw features excavated in the vicinity of the avenue

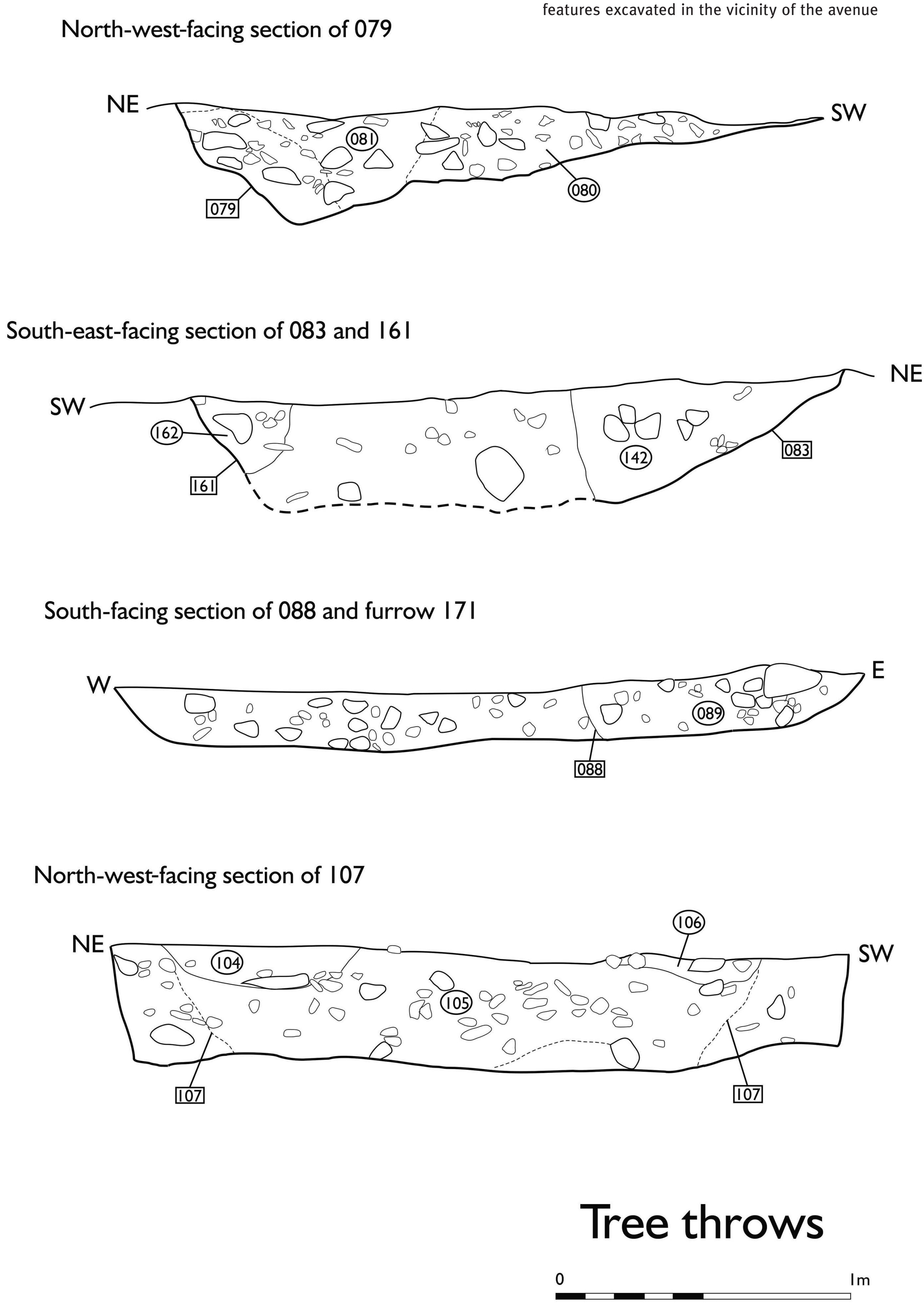


Figure 3.22 Photograph showing a tree throw in early stages of formation after a large tree in Argyll blew over (K Brophy)

preponderance of tree throws suggested by the cropmark evidence, suggests these features are worthy of consideration, although tree throws are not always considered in cultural terms (cf Evans *et al* 1999, 241; Noble 2017, 102). It is important, however, to make the point before discussing these features that we have no sense of their chronology, with one exception. We also have no way to determine whether these represent trees that fell over through natural means (death, disease, wind) or were cleared anthropomorphically; nor is it easy to identify what type of tree stood within each hole. (It is tempting to connect them to monument construction, evidence for oak felling, but such a direct link cannot be made on the evidence we found.)

Tree throws are relatively easy to recognise archaeologically although tricky to excavate and difficult to date securely. Evans *et al* (1999, 242) describe the classic appearance of these features caused by a tree falling over: 'deep crescent-/'banana'-shaped pits (*c* 0.3–0.5m deep, produced through the kicking of the roots down into the subsoil), sometimes augmented by the slighter ring of the full root circle to produce 'D' and circular configurations' in plan. They have distinctive sections, with disturbed gravels and silt accumulation fills and a feature profile that has a steep-to-vertical slope on one side, and a gentle slope on the other (Figure 3.21). These can be very large features and would have potentially been accompanied by a dead tree with vertical root pad for decades, and then remained an open hollow long after the tree/timber was removed or rotted (Figure 3.22). Material found within these features may be invasive and so must be treated with caution.

During the Forteviot excavations discussed in this volume, we partially or fully excavated at least twelve probable and possible tree throws (the locations of which are shown in Figure 3.23); others were identified in plan but not excavated. The majority were around the avenue, the largest example in this area being Tree Throw 083/161, located 7m north-northwest of the posthole at the north end of the west side of the avenue, 041. This tree throw showed as a cropmark (as do some others). This feature was assigned

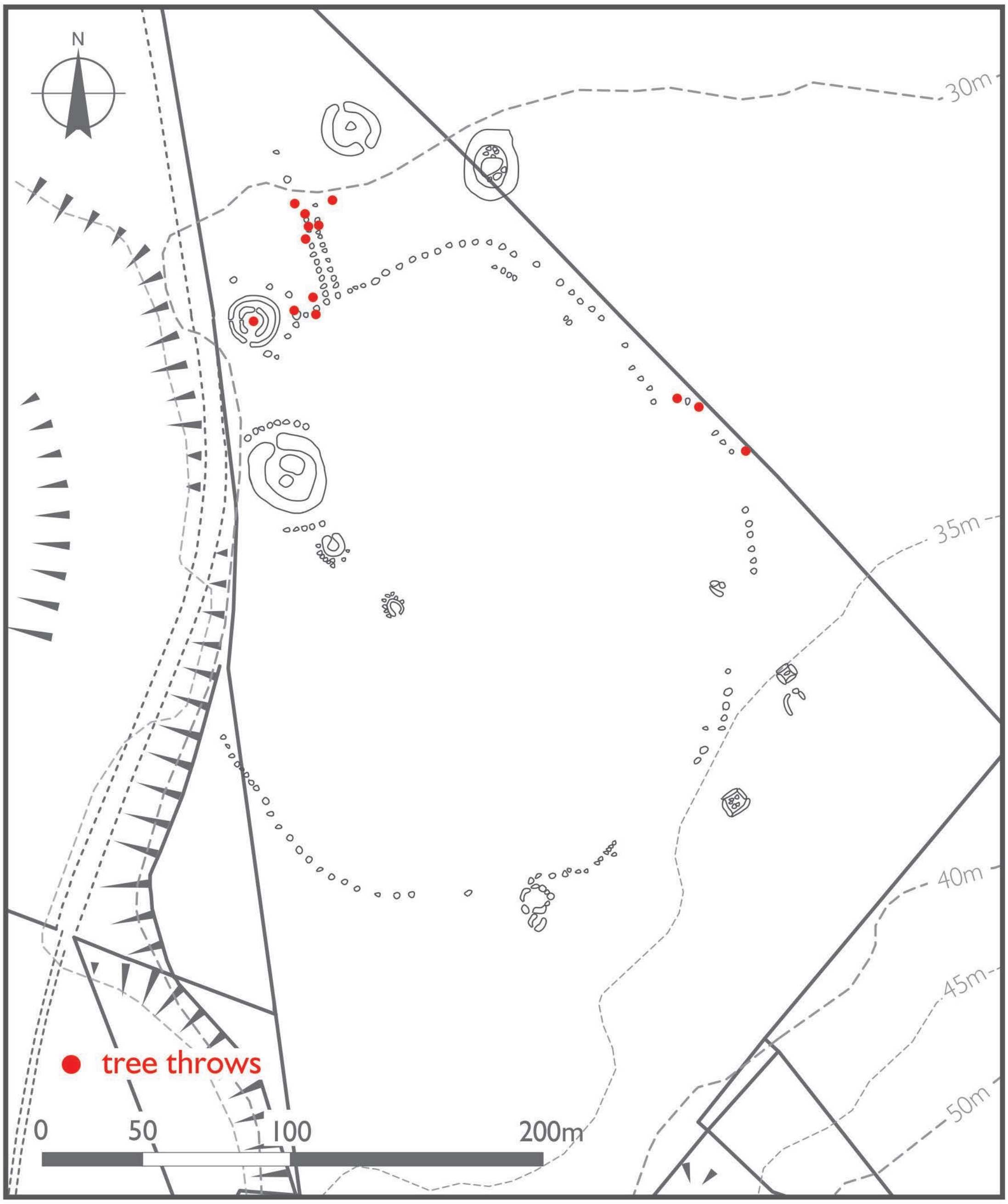


Figure 3.23 Location of probable and possible tree throws across our trenches in the Forteviot complex

two cut numbers initially as it appeared to be two distinct arcs of silt-gravel, with the feature only resolving itself through time into a substantial D-shaped feature measuring some 3.0m by 0.9m and up to 0.42m in depth (Figure 3.24). A similar interpretive journey was undertaken for Tree Throw 107, situated 1.5m north of avenue Posthole 041 and on the line of the avenue, a suggestive position that leaves the tantalising possibility that a living tree marked one end of the avenue. A piece of agate, possibly worked, was recovered from this feature (SF13). Tree Throw 110 was located between avenue Postholes 041 and 037, again on the western line of the avenue, and may have been cut by putative post-support feature 039 (although this relationship was not tested by excavation). A direct stratigraphic relationship was identified between tree throws in only one instance: eastern avenue Posthole 076 cut Tree Throw 151, therefore placing the posthole later than the formation of the tree throw. This tree throw was found to contain small amounts of mixed charcoal: oak, alder and willow. Three tree holes were also excavated around the boundary of the northern side of the palisaded enclosure in Trench F. The excavated examples varied in size and form, with one tree throw, 5516, cut by a large early medieval pyre Pit 5514.

A further three tree throws (north to south, 7004, 7027/7029 and 7037) were identified near the eastern

Figure 3.24 Tree throw 083/161 during excavation, showing the classic crescent-shaped plan of such features

boundary of the palisaded enclosure (location on Figure 3.6). All were substantial features in terms of plan size if not depth, with the largest, 7004, being 2.35m by 1.70m across, with maximum depth 0.25m. Tree throw 7027/7029 was positioned on the line of the boundary, between Postholes 7006 and 7012, located slightly nearer to the former; this large tree throw was some 2m in diameter with a central gravel fill almost indistinguishable from the natural. Possible Tree Throw 5031 was 0.6m north of palisade Posthole 5052 (shown on Figure 7.4); this had a classic banana shape in plan, was 2.20m long, 0.90m wide and 0.35m deep with a single gravel-silt fill (5015); did a tree here form part of the palisaded enclosure boundary? The cropmark evidence suggests further possible tree throws are identifiable in the southern half of the palisaded enclosure interior, in groups, rather than scattered across the area, suggesting at one time there were a lot of big trees in this location.

Is it possible that the enclosure was constructed to 'fence in some rather special trees' (Tim Darvill pers comm)? This is difficult to substantiate as it is unclear when most of the trees at Forteviot were alive. One probable tree throw (5105, described in section 7.4.2) located outside the palisaded enclosure produced two early Neolithic radiocarbon dates (amongst the earliest dates we recovered from the Forteviot excavations) sourced from hazel charcoal and carbonised nutshell. Although the nature of the features means that invasive material could have found its way into the hollow over an extended period after the tree fell, this suggests at least some of the trees were Neolithic or earlier, that human activity was happening in the vicinity at this time, and perhaps woodland clearance was once of those activities. Botanical evidence has been unable to shed light on the type(s) of trees represented by these, or any of the other tree throws, investigated.

Is there any anthropomorphic significance to the discovery of these tree throws? Without a secure chronology we cannot be sure, but excavations within Neolithic enclosures elsewhere in Britain where tree throws have been found provide direct and circumstantial evidence for human-tree interactions during this period. A cluster of tree throws that appear to have

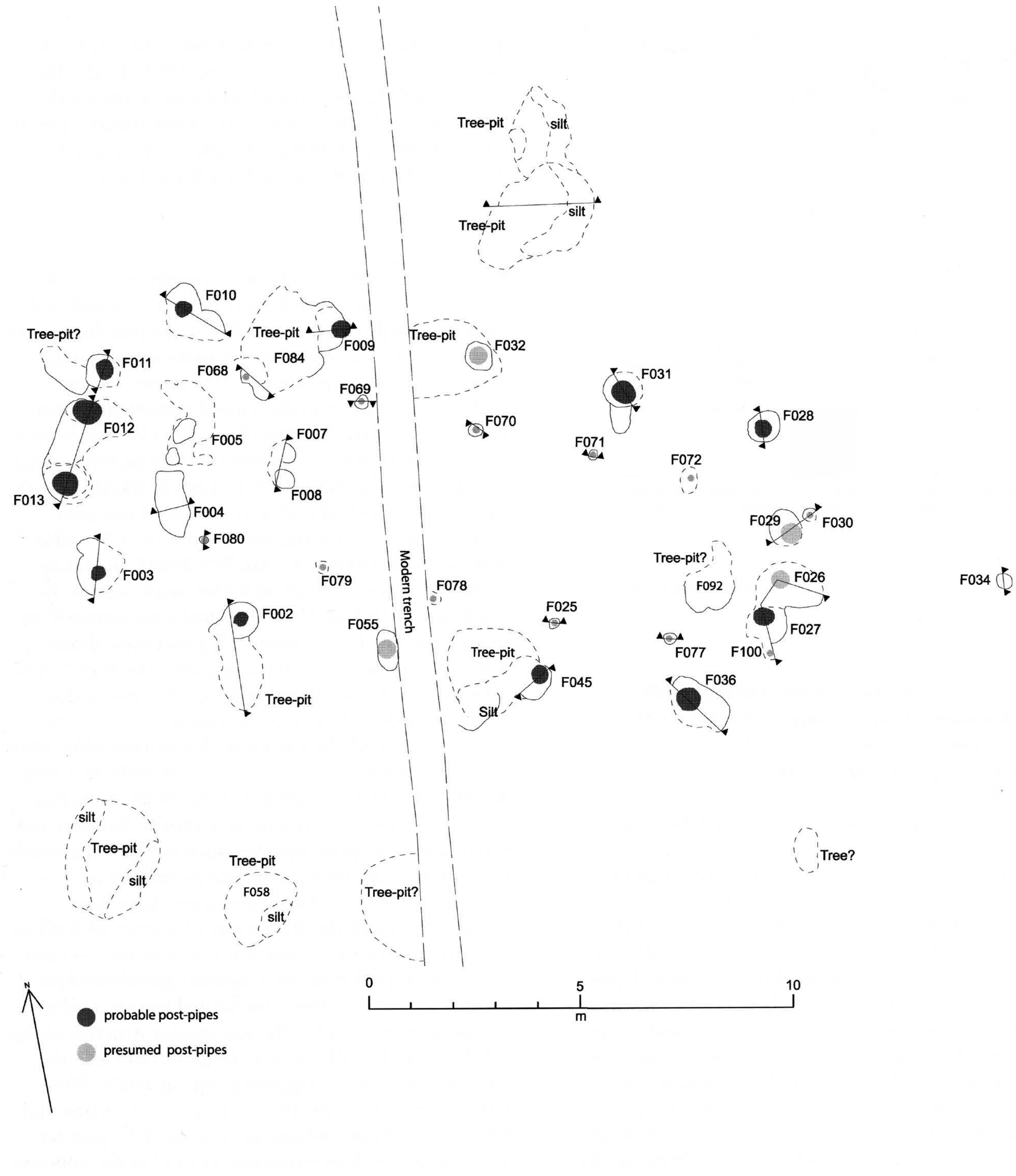


Figure 3.25 Plan of the Neolithic timber rectangular enclosure at Carsie Mains, Perth and Kinross, showing the interplay between tree throws and postholes (after Brophy and Barclay 2004)

resulted from a single storm (all have the same orientation) were found within the Drayton cursus, Oxfordshire; the excavators suggested that the cursus route was in part shaped by this historic weather event (Barclay *et al* 2003, 66). Noble (2017, 102) notes that tree throws were 'part of the everyday environments encountered in the Neolithic', perhaps not surprising in landscapes where tree cover was gradually being denuded (Edmonds 1999, 23) and so as well as being extant in the landscape for quite some time, they also appear to have been places of deposition (Evans *et al* 1999). In some cases, tree throws have been found in close association with pits and other places of Neolithic deposition, such as at Eton Rowing Course, Buckinghamshire, where tree throws sat side-by-side with middens and were used for deposition of occupation debris (Allen *et al* 2013). Although a deposition strategy was not convincingly evidenced at Forteviot, at least one tree throw (5105) was open when people were using this location in the early Neolithic, and the agate chip found within Tree Throw 107 may have been deliberately placed there; there is no reason to suppose that other such features were not extant at this place as monumentality developed. Having said that, we should be cautious about over-interpreting tree throws in Perth and Kinross (and indeed elsewhere); examples at Duncrub, 5km west of Forteviot, which had shown as cropmarks were shown by excavation in the 1990s to be the remnants of a plantation shown on 19th-century mapping (Gordon Barclay pers comm).

The inclusion of living tree(s) at the northern end of the avenue and on the eastern boundary of the enclosure is a distinct possibility, with a parallel of sorts to be found in the excavation of a late Neolithic rectangular timber setting and timber circle at Carsie Mains, Perth and Kinross. Here, a large tree throw was identified in a position within the rectangular structure where one might have expected to find an axial post and the excavators argued that a tree may have stood within this apparently ceremonial structure (Brophy and Barclay 2004). Furthermore, a cluster of tree throws was found at this site; postholes cut, and were cut by, tree throws, suggesting a complex interplay of (oak?) trees and oak posts in this location around the turn of the 3rd millennium BC (Figure 3.25). The preponderance of tree throws around the the *end* of the Forteviot avenue (four sat near or on the avenue alignment, one cut by a posthole) suggests if nothing else that the avenue terminated in a place that had at one time been a grove of trees, perhaps in living memory. The relationship between woodland, trees, oak and monumentality will be explored later in this chapter.

3.3.5 Finds from within the postholes

The postholes at Forteviot are distinguished by the lack of artefacts found in them, to the extent that during the excavation we entertained the idea that the areas of the palisaded enclosure where we investigated had been kept deliberately 'clean' or at least were places where deposition was inappropriate. Indeed, almost all artefacts found across the sites discussed in this volume were early Bronze Age or later, with few earlier objects identified in a secure context; most lithics, for instance, were recovered from the topsoil and silt bands (Wright 2012). The abraded potsherds are discussed in the next section and probably ended up in these postholes by accident.

This contrasts sharply with the large assemblage of lithics and ceramics of late Neolithic date found at Meldon Bridge, although almost none of this material was found within palisaded enclosure postholes (Speak and Burgess 2000, 12). Sherds of Grooved Ware were found within one palisaded enclosure posthole at Leadketty (Noble and Brophy 2014) while materials recovered from postholes on the inner post-ring setting at Dunragit include sherds of various Grooved Ware pots, with a suggestion that the pots were curated 'above ground' before deposition (Thomas 2015, 110ff). Lithics were also recovered from various postholes at Dunragit, including a fragment of a sandstone axehead and oblique arrowhead of non-local flint (*ibid*, 124–5). The excavator identified instances of rulebound deposition, objects placed in key 'junction' postholes, and in general deposition occurred in later phases of the use-life of the posthole, rather than being placed in primary fills.

Pottery

Kenneth Brophy

Two possible small sherds of pottery were found in eastern avenue postholes; in both cases the sherds were undiagnostic. One was recovered from a lower fill of avenue Posthole 139 (SF014), although this abraded object was found in a feature which was badly disturbed by post removal. A small abraded sherd (SF5522) was found in Posthole 5506 in a post-packing fill. In both cases these could be from a Neolithic vessel and resemble sherds found in association with Henge 1 (section 4.5.4).

Lithics and stone tools

Dene Wright

A small assemblage of lithics and coarse stone objects was found in the postholes of the palisaded enclosure at Forteviot. A split pebble (SF5518) was found in a lower fill of Posthole 5538, on the northern boundary line. This is undiagnostic but shows a human hand at work. A piece of agate (SF5525), possibly worked, was found in the eastern avenue Posthole 5506, in the same fill (5611) as the potsherd. In a lower fill (7018) of eastern boundary palisade Posthole 7012, various stone objects were found during excavation that were considered to be worked, namely two stones with a smooth face and worked edges (SF7005; SF7006) and quartz pebbles that had possibly been polished (SF7004). Finally, one worked piece of pitchstone was found in the topsoil during the excavations of the avenue; this is of note if nothing else because it was the SERF Project's first recorded find (SF001) although it was not in a secure context and can tell us little more.

Cremated bone

Iraia Arabaolaza, Stephany Leach, and Angela Boyle

Cremated bone was identified in upper deposits/fills and postpipes (but not packing fills) of five postholes on the avenue of the palisaded enclosure, but in only one feature associated with the boundary (and that was adjacent to the junction with the avenue). None of these was in quantities or concentrations that could be described as typical burial deposits. This contrasts with Dunragit where an un-urned adult female and sheep cremation burial of late Neolithic date was found within a palisaded enclosure posthole (McKinley 2015, 127–8).

Cremated bone was recovered from the upper fills and/or postpipes of three postholes on the east side of the avenue, 043, 125 and 139, and one on the west side, 041. These are all in the northern half of the avenue. The quantities of cremated bone were very small in two cases eg 0.2g in 041 and 0.6g in 125. Larger quantities, relatively speaking, were identified in Postholes 043 (46g) and 139 (76g). Even these latter amounts are less than 5% of the weight that would be represented by a complete human adult cremation in a modern crematorium (McKinley 1993) and therefore these are far from complete burials, suggesting token deposits of cremated remains (Boyle 1999, 176). These may have been selective, with under-representation of skull fragments identified (Boyle 2007). Cremated bone found in Postholes 043 and 139 probably represent adult remains, although whether the same, or different, persons is unknown. Interestingly, some, but not all, of the cremated bone in Posthole 139 was abraded, suggesting taphonomic variability. It could be that these represent two cremations that happened at different times, differential storage of some remains from the same individual, or that disturbance of this hole during post removal was followed by, or linked to, accumulations of material swept or washed into posthole hollows.

Burnt bone was also found in one northern boundary posthole, 5538, the feature on that boundary closest to the avenue, in the same fill as a split pebble was found. Two fragments of cremated bone were found in the same lower section of the postpipe (5549) with a combined weight of 1.4g in total (Arabaolaza 2011), and although it was not possible to determine if this was human or animal bone, the 'texture and morphology are … consistent with human bone' (Leach 2012, part 2, 14). Although neither fragment was large, they appear to tell an intriguing story, differing from one another in terms of firing history and taphonomy. One fragment (SF5535) showed a high degree of thermal alteration indicative of high cremation temperatures; the bone fragment was also eroded and smoothed, suggesting that it moved through sediment or was disturbed after deposition. The other fragment (SF5514) was much less eroded and abraded (*ibid*). This mirrors the taphonomic variation identified for the larger cremated bone assemblage gathered from avenue Posthole 139.

The incorporation of limited and perhaps specially selected quantities of bone in the upper fills and postpipes of the palisaded enclosure avenue postholes, and one entrance zone posthole, suggests that small fragments of cremated bone found their way, by human or natural action, into the weathering cones of the posts as they decayed, perhaps even after the posts had largely disappeared or decayed. The more frequent inclusion of cremated bone in avenue Posthole 139 may be associated with the deliberate removal of this post, while the anomalous treatment of the dead indicated by variable erosion levels of a few deposits suggests that a complex mixture of deposition, erosional action and perhaps even curation was at work here. We have speculated elsewhere that deposits of cremated bone may have been explicitly associated with the end of the life of the monument, or individual posts (Noble and Brophy 2011a, 79). This practice was identified at Dunragit as well, with smaller deposits of cremated bone deposited in postholes apparently after post removal (Thomas 2001, 139–40; 2004, 103–4). Unfortunately, we were unable to secure radiocarbon dates for these remains, so we can only speculate that this happened when the postholes were still identifiable but the timber posts partially or wholly decayed. The deposition of these remains in the entrance area (and not the boundary) is telling, and suggests perhaps a connection with movement, the avenue of the palisaded enclosure maybe marking a transition between the world of the living and the place of the ancestors.

Whether this was associated with early Bronze Age, or much later, funerary activity, remains open for debate. Charcoal from species such as alder, hazel and willow, also from upper posthole fills, was in some cases dated to the 1st millennium AD; this is consistent with pyre material and indicates that cremation was carried out in the vicinity in the early medieval period (see further evidence for this in section 3.5.4 and SERF2, 5.2).

3.4 Radiocarbon dates

with Derek Hamilton

In this section we will consider dates derived from material, largely *Quercus* charcoal, from within the palisaded enclosure postholes. Two dates fall in the 1st millennium BC and so have not been modelled here, but are discussed in section 3.5.4 and SERF2, section 5.3. The dates and contexts from which they were sourced is tabulated and presented in Table 2.4.

3.4.1 The dates

A total of 22 radiocarbon results are available from eleven postholes associated with the palisaded enclosure, representing features from the avenue, junction and the northern and eastern sections of the boundary (Figure 3.26). In all but three instances, the results are from samples of charred oak sapwood that likely derive from the outer rings of the post that filled the hole in antiquity. In four cases, two measurements on separate fragments have been made as a quality check on the security of our assumptions. If the samples do derive from the same post, we would expect the radiocarbon ages to be statistically indistinguishable. These pairs of measurements were subsequently combined to form new mean measurements for their respective contexts.

SUERC-37769 is on charred oak from the lowest fill (7065) of palisade Posthole 7035, a posthole on the eastern boundary. SUERC-37768 is a result on charred oak in a thin lens (5660) at the base of the postpipe (5605) of Posthole 5506, which is the most southerly feature on the east side of the avenue. SUERC-37890 is from charred oak in the lower fill (5053) of northern boundary Posthole 5052. SUERC-37758 is on charred oak from a lens (5668) of charcoal midway up postpipe (5669) in one of the junction postholes (5530). SUERC-21574 is on hazel charcoal in the upper fill (112) of the east side of the avenue post (043). There are two results (SUERC-21565 and -21566) on charred oak and alder charcoal, respectively, in sequential fills of eastern avenue Posthole 125. SUERC-21565 is from a lower fill and likely represents material from the post, while SUERC-21566 is from an upper fill and likely to be from later infilling of the depression after the post was removed or decayed.

There are multiple results from a few postholes on oak sapwood charcoal that is thought to derive from the actual post. Since the fragments in each of the postholes should be essentially the same actual age, they have been combined here to form a mean measurement.

There are two results (SUERC-37759 and -37760) from charred oak in the fill of the postpipe (5572) of northern boundary Posthole 5518. The results are statistically consistent (T'=2.7; v=1; T'(5%)=3.8) and have been combined to form mean 5518 4045 ±22 BP.

There are two results (SUERC-37763 and -37767) from charred oak in a lens (5682) of charred material of northern boundary Posthole 5592. The results are statistically consistent (T'=1.1; v=1; T'(5%)=3.8) and have been combined to form mean 5592 4068 ±22 BP.

There are two results (SUERC-37770 and -37771) from charred oak in a middle fill (7066) of eastern boundary Posthole 7006. The results are statistically consistent (T'=0.2; v=1; T'(5%)=3.8) and have been combined to form mean 7066 4080 ±22 BP.

There are three results (SUERC-37772, -37777, and -37778) from fills in eastern boundary Posthole 7033. SUERC-37777 and -37778 are on charred oak from the lowest fill (7083), while SUERC-37772 is on hazel charcoal from a stony middle fill (7081). The results from the lowest fill (7083) are statistically consistent (T'=1.1; v=1; T'(5%)=3.8) and have been combined to form mean 7083 4143 ±22 BP.

There are six results from contexts in the western avenue Posthole 031. SUERC-21571 is on charred oak near the base of the post. SUERC-21570 is a result on charred oak recovered from slumping layer (121) on the east side of the post. SUERC-21573 is charred oak in the upper fill (032). SUERC-21575 is from charred oak in the ramp fill (112) of the post. Finally, SUERC-21564 and SUERC-21572 both come from a thick deposit of charcoal at the base of the posthole. These six results come from material in a variety of contexts and are not statistically consistent (T'=15.7; v=5; T'(5%)=11.1), suggesting that the material is of different actual ages.

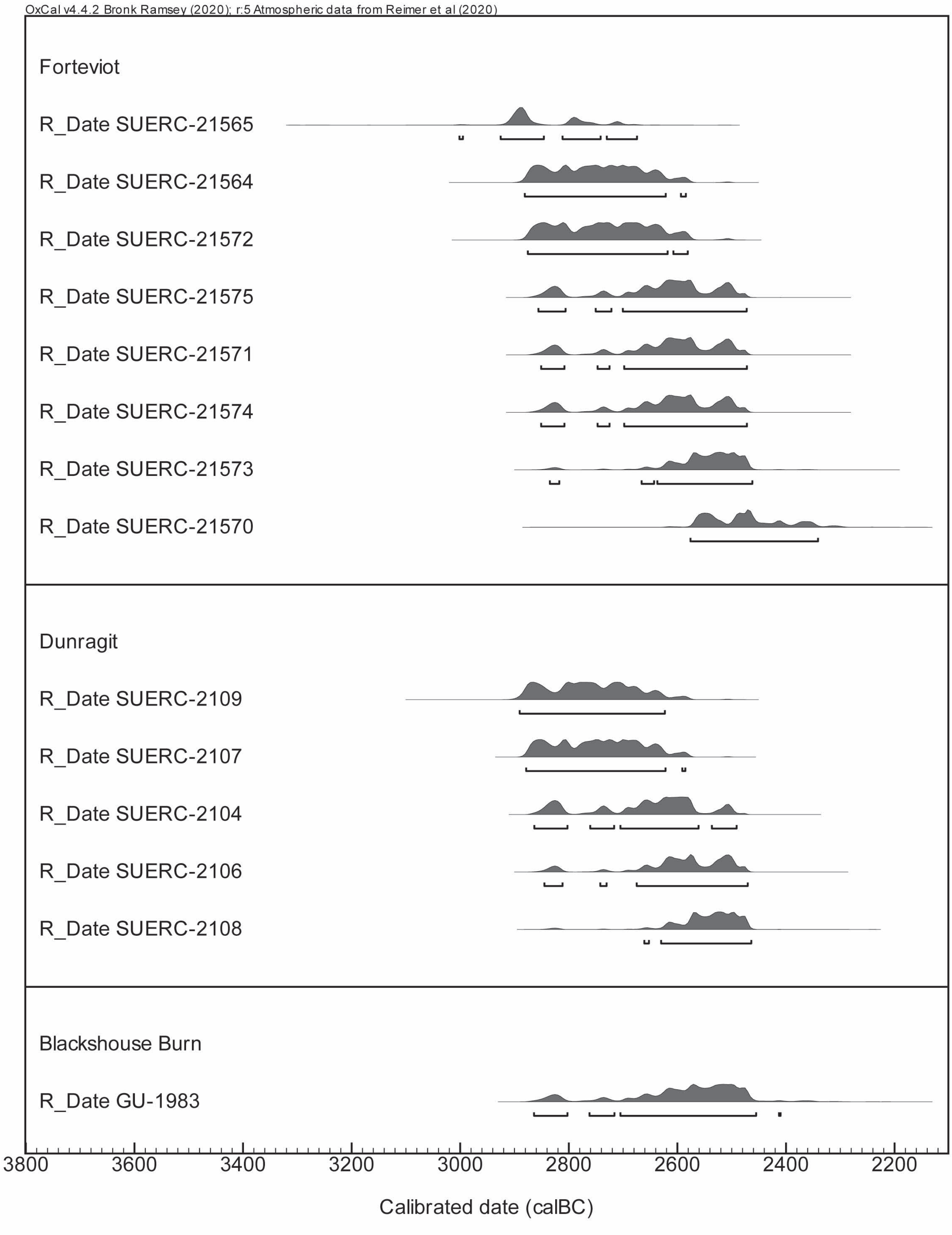


Figure 3.26 Radiocarbon dates associated with Neolithic palisaded enclosures in Scotland except for Meldon Bridge given the problems with those dates discussed in Section 3.4.3 (dates are given at 95% probability; data from this volume Table 2.4; Thomas 2015; Lelong & Pollard 1999, table 2; image prepared by Phil Barratt)

In the field, the interpretation was that this posthole was used once, and that the stratigraphy of the deposits within it should be chronologically secure. The radiocarbon dates are not in disagreement with this notion, when looked at as age versus depth, where generally the older dates are lower in the posthole. The inconsistency of the measurements, however, is in sharp disagreement with the sampling strategy that aimed to select outer tree-ring material thought to date to very near the death of the tree, as it suggests some longevity to the material. There are two plausible scenarios: either the posthole was reused and the material is from different trees, and so of different dates, or that some samples were selected in error and not all the results are on outer rings, with some from inner rings of 'old' wood (eg basal charcoal material may be from the more inner rings of the tree that were charred and exposed there). It is, unfortunately, very difficult to determine which of the two is more likely. The field interpretation of Posthole 031 being a single 'event' fits with the broader observation that there was no clear evidence of post replacement in any of the excavated postholes. A model combining all the calibrated probabilities from results in these postholes, while excluding completely the two results from the base of (031) (SUERC-21564 and -21572), however, resulted in a lower agreement index (A_{comb}=0.4%; n=11; A_n=21.3%), further supporting the notion that there was some longevity to the use of the palisaded enclosure with a degree of refurbishment.

3.4.2 Modelling

As a result of the complications related to untangling some of the taphonomic questions surrounding the palisaded enclosure, the modelling has erred on the

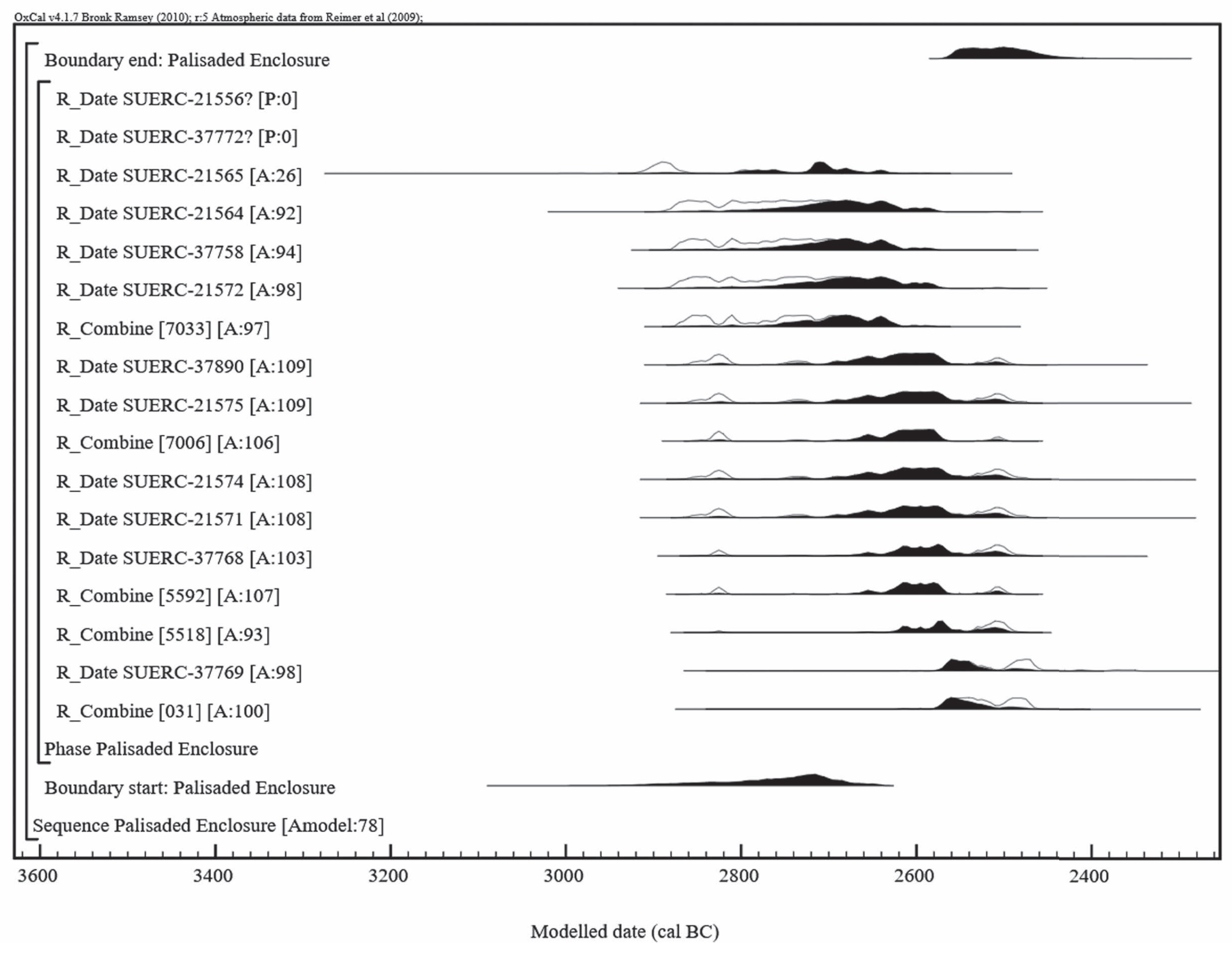


Figure 3.27 Chronological model for the Palisaded Enclosure. Each distribution represents the relative probability that an event occurred at some particular time. For each of the radiocarbon measurements two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model used. The other distributions correspond to aspects of the model. For example, the distribution '*start: Palisaded Enclosure*' is the estimated date for the start of this enclosure activity, based upon the radiocarbon dating results. The large square 'brackets' along with the OxCal keywords define the overall model exactly

side of caution and places the results in an unordered group. In this way it is possible to estimate the earliest and latest date for the palisaded enclosure. This modelling approach is more conservative, but also more robust, than combining the results, while arbitrarily rejecting those from individual postholes that bring the overall agreement index down.

The model for the palisaded enclosure has been used to produce a number of estimates that correspond to the two different archaeological scenarios presented above: single phase versus refurbishment over a period of time. If the palisaded enclosure was a single construction that did not undergo further repair or refurbishment, the model estimate for the latest date of the samples provides the best estimate for the monument construction in *2575–2490 cal BC* (*95% probability*; Figure 3.27; *build: Palisaded Enclosure*), and probably in either *2570–2540 cal BC* (*31% probability*) or *2525–2495 cal BC* (*37% probability*).

The alternative way to approach estimating the date of the palisaded enclosure is to consider that the enclosure may have been repaired and refurbished over time, such that the radiocarbon-dated samples are representative of the outer rings of the various timbers that were placed in the postholes during its use. Given there is a chance for 'old' wood to be in the postholes (eg circumstance with Posthole 031), this approach estimates that the palisaded enclosure was constructed in, or after, *2865–2635 cal BC* (*95% probability*; Figure 3.27; *start: Palisaded Enclosure*), and probably in *2780–2670 cal BC* (*68% probability*). The palisaded enclosure went out of use, in this scenario, in *2570–2480 cal BC* (*95% probability*; Fig. RC-X; *end: Palisaded Enclosure*), and probably in either *2565–2535 cal BC* (*28% probability*) or *2520–2485 cal BC* (*40% probability*).

3.4.3 Dating the palisaded enclosures of northern Britain

This is by far the largest set of radiocarbon dates for any palisaded enclosure in northern Britain and the results are broadly in line with the chronological range that we have from similar 'Type 1' and the variant 'Type 2' palisaded enclosures found across Britain (Gibson 2002), with the caveat that some modelling of our dates falls slightly later. Gibson noted that Type 2 (closely spaced post) sites such as Hindwell, Powys, and Greyhound Yard, Dorchester, Dorset, 'form a remarkably uniform group clustering within a date range of approximately 2800–2600 cal BC' (*ibid*, 6). Forteviot is more closely aligned with the Type 1 morphology (widely spaced posts), for which the dates are less conclusive: Gibson suggested this architectural form could have spanned the 3rd millennium although this observation was skewed by the dates from Meldon Bridge (see below). More broadly, the dates concur with the prevailing wisdom that large palisaded enclosures of this period are of the late Neolithic, although unlike some other sites, such as nearby Leadketty, there is no Grooved Ware association.

The dates for the other palisaded enclosures found in Scotland are fewer than perhaps one might expect (Figure 3.26). Only four radiocarbon dates related to the palisaded enclosure were achieved from the 1970s excavations at Meldon Bridge. These samples were from mixed material, have been revised since they were initially calculated, and mostly have large statistical error ranges (Speak and Burgess 2000, 7; Ashmore 1999) so must be treated with a degree of caution; three of the dates were described in the final report as 'unhelpful' (Speak and Burgess 2000, 110). Discussion on the dates could be regarded as confusing, with in the end a date of 2600–1900 (GU-1048), derived from mixed charcoal in post packing being regarded as the most representative of monument construction. An earlier date, 3100–2600 (Har-796), from roundwood, was regarded as being in a secure posthole context but disregarded as being a guide to when the monument was constructed for reasons that are unclear (*ibid*, 110). It should be noted, however, that this date is more in line with those derived from similar sites. The dating of Dunragit is much less contentious: the monument was probably built in the period between the 29th and 27th centuries BC and in use for between 25 and 350 years; this data is based on seven results from four features (Thomas 2015, 141–3) spread across a massive monument complex of multiple palisade rings. One date has so far been gained from hazel charcoal recovered from the postpipe of a posthole on the palisade at Leadketty, dating to 2828–2474 cal BC (2 sigma at 95.4%, 4035 ±29BP SUERC-59116).

In other words, the dates emerging from the monuments in Scotland with morphological similarities to Forteviot, that is Dunragit, Leadketty, and Meldon Bridge, suggest that these sites were all constructed in the 29th to 26th centuries BC, and this chronological range broadly concurs with the construction of similar monuments in southern Britain (Noble and Brophy 2011a). Forteviot appears to belong to the latter part of this period, and so may be a late example; it is also, apparently, a short-lived monument although its construction had long-term implications for this place.

3.5 The lifecycle of a palisaded enclosure

The processes behind the creation of timber monuments in the Neolithic are rarely considered in detail (Gibson 2002; 2004; 2005). This is in part due to the nature of timber monuments – we rarely deal with anything other than the highly decayed remains of these structures, with postholes proxies for posts. The lack of engagement with the processes of construction may also be due to a wider trend of focusing on the final form of a structure rather than the social narratives involved in building and construction (McFadyen 2006; Richards 2009; 2013). At Forteviot the traces of the palisaded enclosure (and other timber structures) have allowed us to begin to understand processes of construction, decay and destruction that formed the biography of such monuments. This section considers this biography, drawing on evidence from similar sites elsewhere in Britain where this helps us to understand what was found at Forteviot. A broader discussion of the palisaded enclosure phenomenon, the implications of our excavation results, and thoughts on the relationship between woodland and monumentality in the Neolithic, are explored elsewhere (Noble and Brophy 2011a; 2014; Noble 2017).

3.5.1 Construction

Postholes and the materials found therein can offer a clue as the size of post and type of wood used. For instance, the depth of postholes can be used to infer how tall posts were, or at least what maximum height could have been supported securely (assuming this was a criterion builders took into consideration; on the basis that few, if any, posts seem to have fallen over then it probably was). There is a generally accepted rule of thumb that it is feasible for a well-packed posthole to support a post at ratio 1:3.5 to 1:4; in other words, for every 1m depth below ground, 3.5m to 4m could be supported *above* ground (see Wainwright and Longworth 1971, 220–5; Mercer 1982, 149). Given truncation of anything up to 1m since the Neolithic at Forteviot (section 2.3.1), and the fact that large tree trunks have a low centre of gravity, the figures used in this discussion may well be a conservative estimate (Gibson 2005, 107–8). A second method of calculating post height based on ramp length (Mercer 1982, 149–50) was not used at Forteviot due to the inconsistent survival (or original use of) of ramps.

The deepest posthole excavated was 'junction' Posthole 5504 at 1.5m depth. This hole could have safely held a post of up to 6m in length, 4.5m of which would have been above ground. If we factor in plough truncation of between 0.5m and 1m in this field, this hole could theoretically have held a post between 8m and 10m in total length. The avenue seems potentially to have consisted of shorter posts than the boundary of the enclosure. Above-ground heights for avenue posts, based on the depths of excavated features, could have been on average up to 2.7m on the west side, and on the east side 2.4m, whereas the northern and eastern boundaries of the enclosure had, on average, postholes that could have supported posts of between 2.8m and 4.5m (although a few postholes on the eastern boundary could have held posts over 5m in height). The two junction posts could have been between 3.5m (5530) and (as already noted) 4.5m (5504) high. These figures are similar to those suggested by the big boundary postholes found at Leadketty (Noble and Brophy 2014), while posts at Meldon Bridge were on average 4.25m above ground level according to Gibson's (2002, 15) re-assessment of the data. Posts were 'of a similar size' to Meldon Bridge at Dunragit (Thomas 2015, 163). These large posts are dwarfed by some that may have stood at sites of the same date in England and Wales (Figure 3.28). Posts at Hindwell and West Kennet, Wiltshire, may have been up to 7m high above ground (Gibson 2002, 15), Greyhound Yard, Dorchester, Dorset, 9m high (Woodward *et al* 1993; Gibson 1998, 74) and those at Mount Pleasant 6m to 8m in height (Whittle 1997, 154).

Another way to estimate the size of posts used is to consider the postpipe, which, where visible, gives an indication where a post once stood but rotted *in situ*. This should, in effect, tell you the girth of the post. These were not always evident during excavation, but where they were recorded they suggest a monument defined by posts of variable scale. The biggest post again appears to have been set in junction Posthole 5504 which was 1m across, suggesting that a massive post drawn from a mature oak would have been inserted into this hole. The postpipes on the east side of the avenue had diameters of between 0.6 and 0.8m, while those on the west side ranged from 0.5m to 0.9m, with this once again hinting at the irregular appearance the avenue must have had. Where identified, postpipes on the eastern boundary section of the palisaded enclosure were similar to those of the avenue, while those on the northern boundary were of the

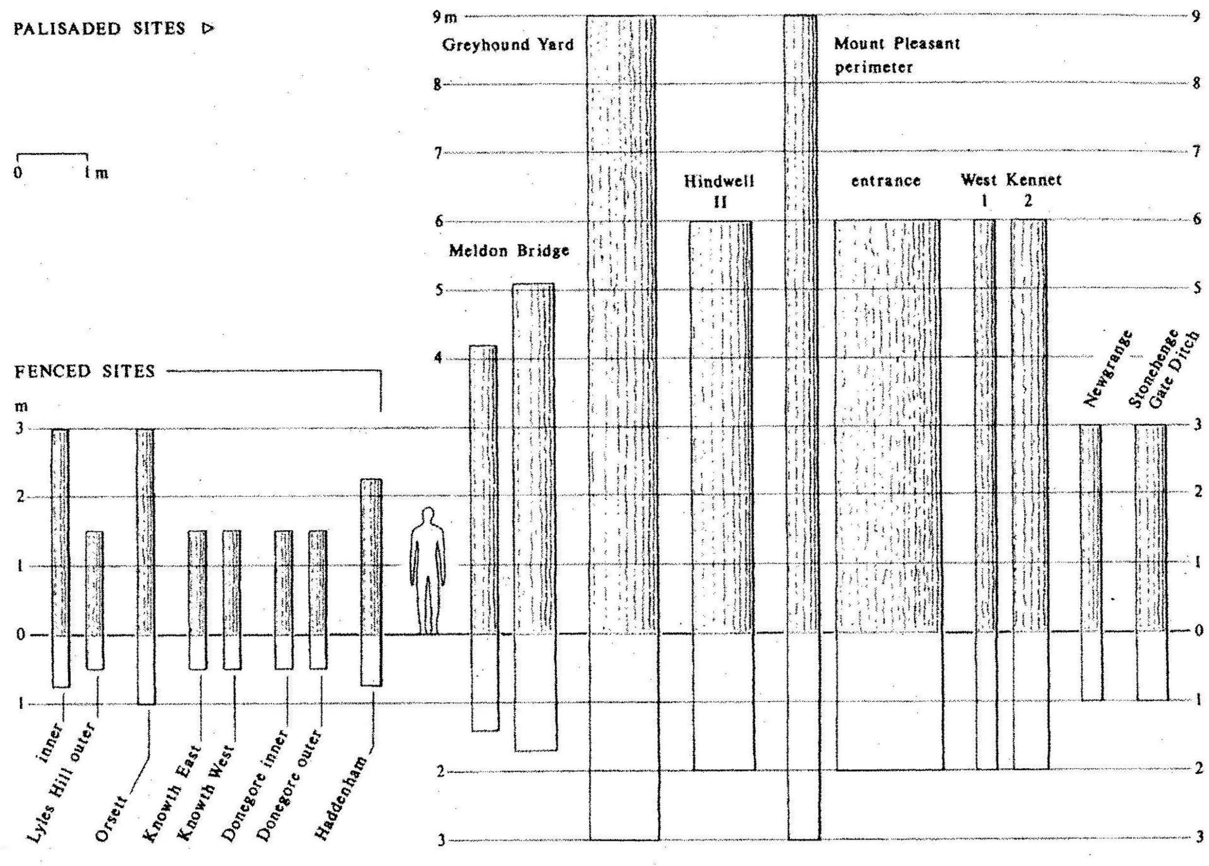


Figure 3.28 Diagram showing the relative maximum size of oak posts that could have defined a range of Neolithic enclosures in Britain (Gibson 1998)

same order. Posts of this girth would have by no means been unusual in a British Neolithic context and again this concurs with what we know about palisaded enclosure architecture elsewhere.

What type of wood was used for the posts? Typically, timber Neolithic monuments in Britain were constructed of oak (Gibson 1998; 2002; 2005; Noble 2006; 2017; Brophy 2015; Millican 2016a; 2016b) and this appears to have been the case at Forteviot. Although the posts themselves did not survive, where large quantities of charcoal were found deep in post-holes it was always oak (Ramsay 2007; 2010) and there is no doubt that the posts that stood in these holes were substantial oak timbers. The first step in constructing the monument would therefore have been sourcing wood for the build. While oak was an important element of the forest cover in the valley (Hulme and Shirrifs 1986) it will have by no means dominated the forest (Tipping 1995). Even in Neolithic woodland, oak trees of the sizes and straightness needed for a monument of this type may have been dispersed across a wide area. Hence deliberate choices and planning lay behind the selection of materials and these choices would have had consequences for how easy it would be to move the tree to the building site. It is even possible that woodland was being managed to promote the growth of tall straight trees to make posts from (Tim Darvill pers comm).

Once identified, suitable trees would need to be felled. The way in which the trees for timber monuments in the Neolithic monuments were cut down is not fully understood (cf Noble 2017) and it is almost impossible to determine from the archaeological record (essentially tree throws) whether trees were felled by natural events (such as storms) or through human intervention (by chopping trees down, or ring-barking) (Moore 1997; Edmonds 1999, 23ff). Felling a large mature oak tree with stone axes would have been a difficult and time-consuming task (see Figure 8.4). In Amazonia it is reported that felling with stone axes could take days or weeks for larger trees (Descola 1996, 153). Experimental stone-axe felling has also demonstrated the simple fact that cutting down trees has a great degree of risk associated: the larger the tree the riskier the undertaking (Olausson 1982, 56, 68). There is evidence that axes were used on trees in the Neolithic. At Blackshouse Burn, South Lanarkshire, a late Neolithic enclosure often characterised as a parallel for Forteviot (eg Millican 2016a, 100), unusual environmental conditions led to the preservation of the actual stumps of a small number of oak timbers. The best-preserved stump from Posthole 140 had clear axe marks and a V-shaped basal profile strongly suggestive of felling by axe. The timber in this case was at least 0.4m in diameter (Lelong and Pollard 1999).

It seems likely that the cutting down of the larger trees would not have been an endeavour undertaken lightly. The time, labour and risk involved in the process of felling large trees suggests that this was not an expedient sourcing and use of raw materials. On the contrary, this was a technically and physically difficult endeavour, obviously a purposeful and significant use of a material difficult to source, and hence perhaps a cosmologically powerful undertaking (Noble 2017). The felling of the larger trees for the monument may have taken on a competitive element, perhaps even part of initiation events amongst the younger members of the communities drawn to help build this monument (as Richards 2009 has argued in relation to megaliths). The felling of trees would also have likely happened in less dense patches, or the edges, of woodland for practical reasons.

However, it is likely that not all trees were felled by axes; other longer-term strategies could have been adopted, such as ring-barking which could take a decade or more to weaken, then kill, a tree, making it easier to pull over (Edmonds 1999). Another possibility is fire setting although it is next to impossible to determine whether trees were deliberately cleared by fires or those fires were accidentally started (Moore 1997). The wet nature of northern British woodlands and the often-lush understorey and woodland floor vegetation would have made fire setting difficult. Although we cannot date the tree throws found at Forteviot, none indicated that the tree had been set alight. It may also be that the opportunistic gathering of trees felled by natural events such as storms and gales was adopted as a strategy for pragmatic reasons, given the number of trees needed for this building project. Such building material may have been viewed as a supernatural gift.

Given the scale of posts suggested by the postholes, these are likely to have been sections of tree trunks from mature oak trees. The number of trees that would have been required to provide posts depends on how the wood was cut. Gibson suggested that tall oaks could have provided enough length for two posts to be cut (2002, 14), but using the information that mature oak trees can grow to the order of 21–30m tall (Startin 1978, 153; Whittle 1997, 154), Thomas suggested that five or six posts could be harvested per tree to construct the triple palisade setting at Dunragit (2015, 163). This means that anything from 25 to 150 trees might have been felled and/or collected to construct the palisaded enclosure at Forteviot, which may well have involved ranging far and wide in the mixed woodland to find suitable trees. More were felled at other enclosures: an estimated 519 posts on average 1m across were erected at Greyhound Yard, Dorchester, Dorset, for example (Woodward *et al* 1993, 355), although Thomas's efficient tree-exploitation theory meant he argued that as few as 60 trees could have provided enough timber to build Dunragit's triple enclosure (2015, 163). Given that Whittle (1997, 154) calculated that dense oak woodland could have provided in the region of 100 to 200 suitable trees of less than 0.5m diameter per hectare, the impact on the surrounding landscape depended very much on post-cutting strategies and local woodland densities (Noble and Brophy 2014). Gibson (2002, 15) calculated that two hectares of woodland would have been cleared of oaks to construct the Meldon Bridge palisaded enclosure. However, we have no sense of the oak density within the woodland around Forteviot in the first half of the 3rd millennium BC, or how monument construction affected this.

Estimations for the weight of individual posts are difficult, with several variables to take into consideration, including whether the wood is green or dry, and the specific species of oak. Wainwright and Longworth (1971, 220) suggest a figure of 67 pounds per cubic foot, or 1073.34kg per cubic metre (Mercer 1982, 152), for 'green' oak. Further research in this area would be beneficial. Moving and working with tree trunks would therefore probably have had to be a balance between enough drying time to minimise the effort to move them, and not too much drying which would make splits in the wood more likely. Post raw material may have spent some time lying around at the felling, or monument, location. Posts of 0.8m girth and 8m length that probably stood at Hindwell palisaded enclosure would have weighed around 4.8 tonnes (Gibson 1998; 2002) and some of the posts at Forteviot, such as the one supported in junction Posthole 5504, were of that order. Even the smallest posts envisaged at Forteviot would have weighed in excess of 2 tonnes.

Such estimates involve a degree of subjectivity and speculation. For instance, estimations regarding the length of timber and weight of wood required to construct the Meldon Bridge enclosure vary across three different accounts of the site (Burgess 1976; Speak and Burgess 2000, 108–9; Gibson 2002, 14–15). The total amount of wood that had to be sourced and shifted for Forteviot to be built was very likely in the low hundreds of tonnes, perhaps of the order of that estimated to have been needed to construct the Southern Circle at Durrington Walls (260 tonnes, Harding 2003, 75).

Once fallen, these trees would have to be moved to the site, and even allowing for preparation of post-sized chunks of trunk at the tree-felling location, this task would have very much been on a par with moving big stones to construct megalithic monuments. Whether this would have been done using rollers (pulled by people and perhaps also oxen) or floating the timbers downriver or other means is uncertain. This would have been even more difficult if timbers were encumbered with root pads, branches and foliage, with the former evident at Holme-on-the-Sea, Norfolk (more commonly known as Seahenge), a timber circle that was preserved by waterlogging. This site gives us further unique insights into the construction process: the central oak stump had two holes cut into it to allow a rope made of honeysuckle to be tied to the tree (Brennand and Taylor 2003), suggesting that this post was hauled to its destination. Atkinson (1956, 109ff) argued that it would have taken dozens of people (he assumed men) to drag a two-tonne timber post, and this was using a sled and rollers across a flat surface as opposed to manoeuvring it through woodland and up and down slopes. Experimental archaeology has tended to focus on the movement of megaliths (see Harris 2018), so this assertion in relation to wooden posts remains untested. The process of dragging partial trees to the construction site should not be viewed merely as a utilitarian, dangerous and brutal job. For sites such as Forteviot and Holme, the movement of the timbers is likely to have been a dramatic spectacle and may have drawn large crowds, and in turn become part of the biography of individual posts, and the monument (Richards 2009; 2013). If oxen were pulling on ropes, their mobility may also have been a by-product of post movement, their consumption associated with monument construction sites; feasting following cattle movements appears to have been a significant element of society in the 3rd millennium BC from Wiltshire to Orkney (eg Viner *et al* 2010). More speculatively, it is not impossible that some trees were 'walked' to site as has been suggested for the movement of *moai* on Easter Island (Lipo *et al* 2012). Posts may also have taken on the personality of the ancient oaks and/or the places they were sourced from, adding further richness to biographies, timber 'pieces of places' (after Bradley 2000a and see Brophy 2015, 199).

The end of this process (the length of time of which we cannot tell) would have been the arrival of a post on site, either pre-prepared or requiring further modification, endowing this place with the sights, smells and sounds of a carpentry site. It is at this stage that the bases of the posts may have been charred in order to try to make the posts more durable (Atkinson 1985). We found extensive evidence for this within postholes across the monument (Ramsay 2007; 2010) with fourteen posts potentially charred. Postholes 041, 132, 125, 5504, 5506, 5526, 5530, 5518, 5538, 5592, 5052, 7006, 7033 and 7035 had oak charcoal, mostly in small quantities, in their lower fills. At Meldon Bridge, like Forteviot, extensive deposits of charcoal were also found in some of the palisade postholes. The most dramatic example was posthole B03, which had a deposit of charcoal almost 0.3m thick at the base of the posthole. In this case, however, the charcoal was of small diameter which the archaeobotanists noted was representative of small twigs and branch trimmings (Griffiths and Roberts 2000). The excavators suggested that this may represent the final trimming of timbers on site, with the residues burnt and then thrown into the pits. No such material was recovered in the lower posthole fills at Forteviot, while charcoal deposits in the lower fills of some postholes at Dunragit were viewed by Thomas (2015, 157–8) as indicative of selective but not wholesale pre-erection post-charring. At other sites, such as Greyhound Yard, charcoal was identified in the postpipes and interpreted as the burning of the non-earthfast elements of the timbers (Woodward *et al* 1993, 30, 355). On the other hand, at Blackshouse Burn, no evidence of the burning or charring of these posts was identified in the surviving oak stumps (Lelong and Pollard 1999).

Digging postholes would have been a laborious task, something that was made clear to us in excavating them with the benefit of metal tools. The largest posthole, junction feature 5504, was 2.65m by 1.70m including ramp, and conceivably anywhere between 1.5m and 2.5m in depth (depending on truncation) and dug into gravel; a rough calculation suggests that the volume of this hole is something in the order of

6.5 and up to as much as 11 cubic metres. Using Startin and Bradley's (1981) calculation that three people could excavate 0.7 cubic metres (or a cubic yard) in an hour using Neolithic-style non-metal tools (two digging, one shifting spoil), this posthole alone could have taken between four and eight hours to excavate, with the spoil moved an unknown distance away (unless there was a bank, see below). Digging would have been done using tools of stone, wood, antler, and bone, and postholes may have been cut bespoke to posts as they arrived and were being prepared as they show considerable variation in depth, width and ramp provision. Large, late Neolithic monuments of the order of Forteviot are generally regarded as having required tens of thousands of worker hours to construct (eg Startin and Bradley 1981; Darvill 2010, 158), although fewer than 100,000 (Whittle 1997, 154–5); in all these calculations, team sizes and actual build duration are unknown.

Ramps may have helped in the erection of posts. 'Heavy wooden posts would simply have been rolled into place and toppled into their sockets using the ramps, before being pulled upright and packed into place' (Thomas 2015, 156). The use of ropes and other organic digging tools is speculative, but there seems no reason to quibble with Thomas's assessment other than how easy he makes it sound. As Thomas also noted (*ibid*), plough truncation means that the ramps we can see would have been longer, and where there are no ramps, such features may have been ploughed away. The orientation of ramps tells us on which side of the feature the post was erected from, and conceivably might also give a clue as to which direction large posts were dragged from for erection.

Ramp orientation at Forteviot was predominantly outwards, which is logical given the increasing difficulty in post manoeuvrability that would have been presented by the emergent lines of posts, especially along the avenue. All ten postholes on the west side of the avenue had ramps orientated in the west to north sector, while eight of ten ramps on the east side of the avenue were all on the eastern side of these features (the other two postholes had no clear ramp). Where evident, ramps on the northern boundary postholes were all orientated towards the north to north-west, and it was only the eastern boundary that appears to have been irregular in terms of ramp orientation and presence of ramp (see Table 3.1). There is also some indication that packing, as at Meldon Bridge, was used strategically to avoid weakening the post in the direction of the ramp (a phenomenon called 'shuttering' by Speak and Burgess (2000, 17)). Ramps may have not been used for every posthole for similar reasons: they can become weak points in timber constructions, an argument that was made by the excavators at Meldon Bridge to explain the variable direction of ramps along the perimeter of that monument (*ibid*, 17), although in that case this weakness would have been exacerbated by the posts being connected by a fence or palisade, which does not appear to have been the case at Forteviot.

For most late Neolithic palisaded enclosures, excavations (and cropmark analysis) have shed some light on working methods, labour organisation and even the nature of the bonds that held the builders together. Irregularity of the boundaries of many Neolithic monuments, defined by both posts and earthworks, has often been regarded as indicative of social bonding and collaboration, facilitated by a big building project that could not have been achieved by one community alone (eg Andersen 1997; Barrett 1994; Brophy 2015; Pollard and Reynolds 2002). The coming together of diverse individuals and groups of people to construct the palisaded enclosure at Forteviot is hinted at by the differing character of the component parts of the monument. The architecture was anything but regular in terms of posthole size and post arrangement, whilst not all posts were fire-treated. Irregularities in the construction methods have been noted at other palisaded enclosures such as Meldon Bridge, where, for instance, the ramps of the palisade postholes varied in construction method, size, pitch and orientation (Speak and Burgess 2000, 17). Such variety may reflect different people working here at different times, but also the natural range of wood that would have been arriving on site, where that wood was coming from, and even be a product of the period over which construction occurred. It may be that different social groups or factions were responsible for the erection of individual timbers that they had brought to the 'construction site'. There might have been a competitive element to this, with each community aiming to outdo one another with the size of the tree sourced for building, the way in which the tree was subsequently treated, and even the location within the monument at which the post might be placed. Variability in post size and treatment, and the scalloped appearance of the outer two palisade fences at Dunragit, led Thomas (2015, 160) to suggest that, 'the monument was created by an aggregation of semiautonomous social units, rather than a tightly integrated hierarchical entity'. In other words, construction style, and post, differences could be viewed as reflecting the coming together of groups with varied experience of utilising differing methods of building according to group affiliation, tradition and skill. More broadly, a major element of the significance of these monuments is likely to have been the power and influence of individuals and groups involved to organise and facilitate the whole process.

In sum, the construction of the Forteviot palisaded enclosure was no mean feat. It would have required the felling, and/or gathering, of dozens of large mature oak trees amidst living woodland, and then the preparation of the wood and the dragging of it to the appropriate location on site. Once on site, further post preparation continued, as deep postholes were dug, and finally the post would have been erected with a good deal of effort. We have no sense of how long this process might have taken from start to finish, but it would not be unreasonable to mark this period in years. At each stage of the process, there was the danger of injury and we have no way of knowing how many people helped in this process, never mind how many were killed or injured to make the monument a reality. Clearly, many individuals and multiple skills must have been required for the construction of these enclosures. Indeed, this may have been the main purpose of these monuments – to bring together wider communities in the act of building (Brennand and Taylor 2003, 62), and we must not forget the support work that would have gone on all the while, from making fresh tools, to feeding the workforce. We will now turn to the appearance of the monument that so many worked so hard to construct.

3.5.2 Appearance of the monument

In the caption accompanying a reconstruction drawing of Balbridie early Neolithic timber hall, Aberdeenshire, reproduced in his popular account of Scotland's Neolithic, Barclay (2005b, 14) cautions that, 'everything above ground is conjecture'. The same health warning must be applied to any attempt to visualise Forteviot palisaded enclosure, although we have enough evidence from the form and arrangement of postholes, and the contents found therein, to be able to make useful observations. Our reconstruction drawing of the monument in its pomp (Figure 3.29) is a mixture of fact-based content and educated speculation, but we feel it gives a good sense of what this enormous enclosure could have looked like in the middle of the 3rd millennium BC.

The excavated postholes allow us to speculate on the character of the palisaded enclosure boundary. It consisted of widely spaced, large, free-standing oak posts, with uprights spaced between 3m and 6m apart. The post spacing and posthole depth varies enough for us to suggest that the monument might have had an irregular appearance, with posts of differing height and girth forming the boundary. Of course, it is possible that all posts were of the same height when erected, with bespoke postholes dug to the correct depth to allow this effect. It is also possible that differential truncation across the field has distorted our view of how the monument might have looked. However, given the evidence we have on site, it would seem reasonable to suggest this imposing line of posts had an above-ground height of between 2.5m and 4.5m with variations across the monument. The posts themselves would have been essentially oak trunks and may or may not have had bark on them, although debarking is a lengthy process and no evidence for this was found with the environmental material recovered from within the postholes. The posts may also have had branches, and initially foliage, such that they still looked like trees (perhaps looking dead or as if it were winter); or all branches may have been removed. Posts might also have been painted or carved (Figure 3.30); had carved pointed ends (as visualised in Speak and Burgess 2000, 19); or had objects hung from them; we simply cannot tell. The possible inclusion of living trees on the boundary and the avenue may have added to the effect that this was a monument consisting of rearranged trees, blending in with any surrounding woodland that remained.

The avenue would have been a significant and distinctive element of the appearance of the monument. The avenue meets the enclosure at a strange angle, protruding from the enclosure at about 45° to the east of where it would be had the two been arranged perpendicular to one another. There is also a sense of the avenue curving slightly to the east towards its northern end. Such 'gunsight entrances' as Thomas (2015, 156) calls them, have been identified at the palisaded enclosures at Meldon Bridge, Dunragit, Leadketty, and Walton, Powys (Gibson 1999, 8), although only the latter replicates the peculiar angle at which the avenue meets the enclosure at Forteviot. Initially felt to be a defensive feature at Meldon Bridge (Burgess 1976) (an interpretation that was subsequently revised (Speak and Burgess 2000)), more recent interpretations have focused on control. Gibson has argued avenues controlled the line of vision into the

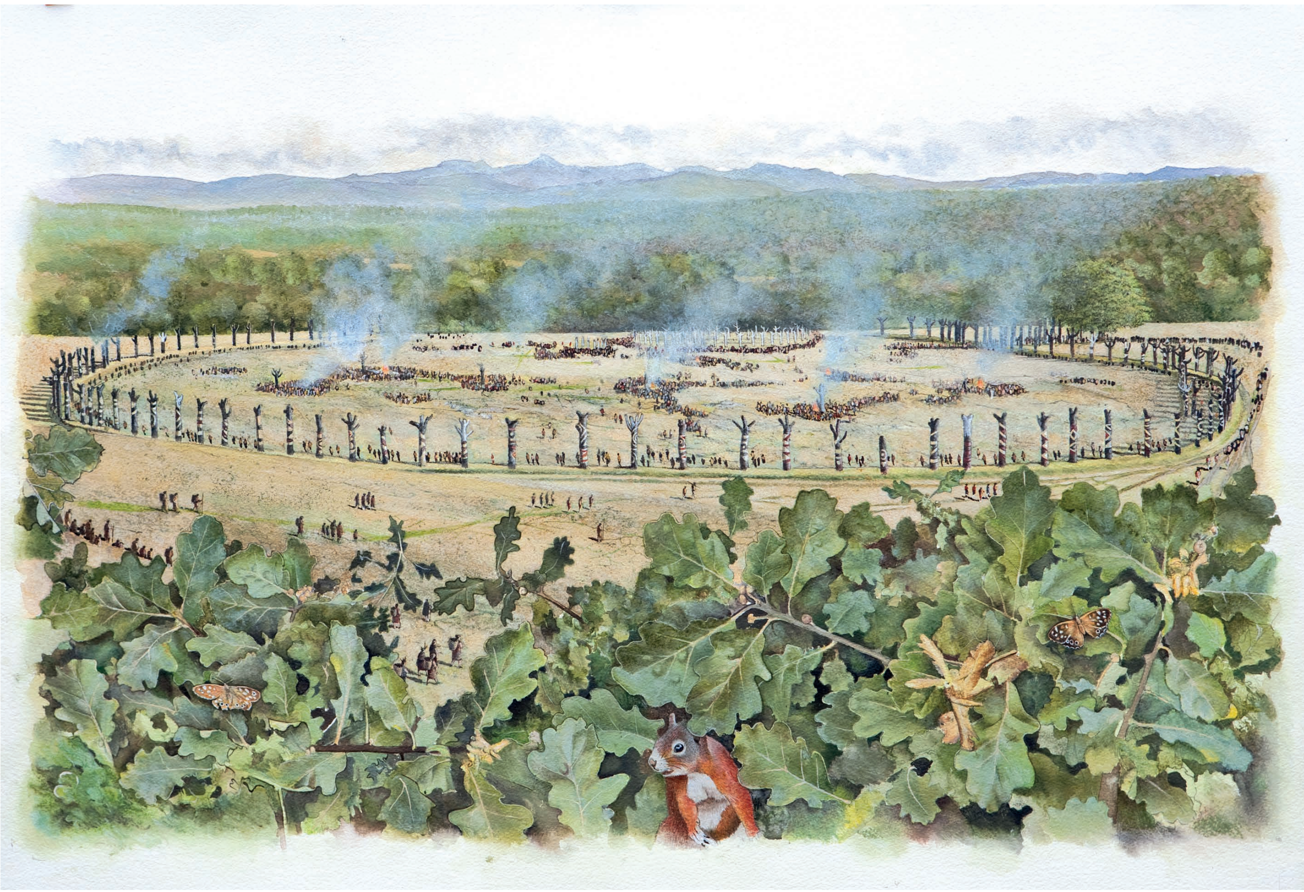


Figure 3.29 Reconstruction drawing by David Simon of the Forteviot palisaded enclosure during use and soon after construction. The appearance of the posts in particular is speculative

monument, with 'visual corridors' into select zones of the interiors of these enclosures afforded which for the most part appear to ignore known locations of significance within (Gibson 2002, 9–10; 2004, 163). At Forteviot, the view into the interior from outside the avenue would have been just to the east of the cremation cemetery and Henge 1 location (Figure 3.31). Looking externally, it should also be noted that the avenue aligns towards the northern horizon line and the mountains of highland Perth and Kinross, although this does not appear to accord with any specific astronomical phenomenon. This alignment appears to have retained residual significance in the henge group that subsequently emerged at Forteviot (section 8.7).

The avenue would have impacted on senses other than vision, and the experience of moving along the avenue would have been heavily influenced by its form, which, it could be argued, shared similarities with woodland. As posthole depth and post girth varied, a mixture of post sizes might have been used, and the differences between the east and west sides could have given the impression of natural irregularity rather than ordered anthropomorphism, with the difference created (east-west/right-left) perhaps having its own significance. The arrangement of the posts in a staggered formation would have created its own effect: when walking straight along it, the next post to be passed would alternate between left and right, as opposed to posts being directly opposite one another or paired, and this may have been akin to walking through trees, with the narrowness of this structure reinforcing this feeling alongside the possible inclusion of one or more living trees and foliage left on posts (Figure 3.32). This short journey would have led to the big reveal, coming out into the vast expanse of the monument's interior (in effect a large woodland clearance), after passing the largest posts on the monument's boundary. A pair of huge entrance posts was also identified at Mount Pleasant (Wainwright 1979, 50), while cropmark evidence suggests the postholes along the avenue at Dunragit were 'larger than those elsewhere in the enclosure' (Thomas 2015, 156), a situation also evident at Forteviot. The largest posts excavated at Leadketty were also at the junction end of the avenue (Noble and Brophy 2014, 70). We cannot rule out these portals being wooden trilithons or doorways.

However, we should be cautious about assuming

Figure 3.30 Replica timber circle posts: (a) Painted posts with bones attached, Archaeolink Prehistory Park, Aberdeenshire; (b) carved post at Maelmin heritage trail, Northumberland (K Brophy)

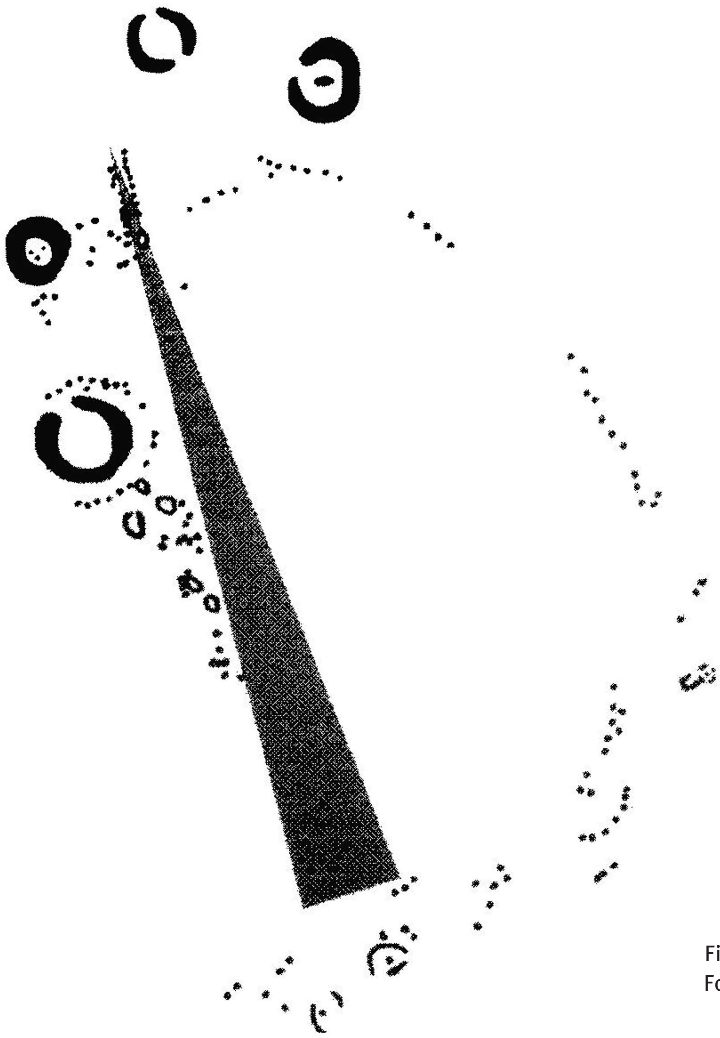


Figure 3.31 The visual corridor into the Forteviot palisaded enclosure from the exterior along the avenue (Gibson 2004)

Figure 3.32 Visualisation of the boundary and avenue at the Forteviot palisaded enclosure with a living tree forming part of the structure (© Alice Watterson)

this avenue space was simply about controlling and stage-managing entry to the enclosure. As noted above, there are various pits within the avenue of unknown date and function, which could indicate this was a place of deposition, although this does not preclude its role as an entranceway. It is also possible that the avenue was at one point a free-standing timber setting, although this is not supported by excavations at similar structures elsewhere in Britain (eg Gibson 1999; Thomas 2015).

At other palisaded enclosures, evidence has been found for fences or smaller posts between the main posts which would have given these enclosures the feel of a continuous bounded enclosure. At Meldon Bridge, the postholes were spaced 4m from each other, with two smaller postholes identified between, suggesting a fence or stockade was supported by this arrangement of posts (Speak and Burgess 2000). Similar evidence was found at Dunragit, where the outer two palisade rings were described by Thomas (2015, 160) as being 'effectively fences' (although the interior ring of posts was free-standing). At Leadketty, although only a short section of the enclosure boundary was explored, a clear pattern was identified: postholes were only 2.6m apart and alternated between very big postholes and much smaller ones, again suggestive of these posts supporting a fence or screen (Noble and Brophy 2014, 70). Variations on these fence and palisade structures have commonly been found at similar monuments in Britain (Gibson 2002, 8).

Forteviot therefore does appear to be unusual amongst such sites in apparently consisting of a visually porous boundary. Gibson has argued that the presence of an avenue should be taken as a strong hint that the enclosure must have 'presented the onlooker with a solid boundary' (Gibson 2002, 8). However, it could equally be argued that the presence of the avenue simply acted as a means to ensure entry to the enclosure was correctly performed – without such guidance, entry could have been affected between any two perimeter posts. Nor do we know if there were any social sanctions for crossing the boundary in the wrong place, or whether there was a physical boundary there or not (an argument that could also be applied when thinking about access to stone circles). Certainly, no inter-post postholes were identified at Forteviot, although we cannot rule out there having been such features once, now lost to plough truncation. The three small postholes identified on the western line of the avenue, each immediately to the north of an avenue posthole, are more likely indicative of running repairs than fence-line supports due to their location (section 3.5.3). Small quantities of carbonised hazel and alder charcoal were found in the upper fills of several postholes on the avenue and boundary of the palisaded enclosure which Ramsay (2007; 2010) has suggested might be remnants of light wicker fences or screens fixed between posts. However, the quantities found make this theory difficult to substantiate, and in some cases, hazel deposition seems to be associated, tentatively, with deposits of cremated bone, so they may relate to funerary pyres; at least some of this material has been dated to the 1st millennium AD.

There is one further intriguing aspect to the appearance of the monument: was the enclosure bounded by an earthwork component as well as the oak posts? Such a feature is depicted in David Simon's reconstruction drawing at our suggestion (Figure 3.29). Inevitably, due to the forces of time and modern ploughing, such a feature would be unlikely to survive into the 21st century century AD, but the presence of a feature from the historic period, pre-dating modern mechanised ploughing, provoked our thinking on this matter. A trackway runs northwards from the Dunning to Forgandenny road, across the cropmark zone, continuing through the village, past the Mill of Forteviot, to the former ford and ferry over the Earn at Coble Haugh (which was replaced by the present stone bridge in 1766) (SERF2, 2.2; Figure 5.12). The field boundary between the Dronachy and Manse fields also follows the course of this road, which is no longer extant but can be traced back to maps from the 18th century (SERF2, 2.2). Intriguingly, the trackway and field boundary appear to respect the line of the palisaded enclosure east boundary, to the extent that they run parallel to one another and only 3m to 8m apart for some 125m. (A section of this track was exposed in Trench C (section 6.6).) It would seem logical to suggest that this arrangement is because the boundary, in some form, was extant when the trackway was established. We do not know when the track was first used, but it would seem more likely that a low bank rather than postholes was visible after a period of millennia. This may also explain the presence of several Pictish square barrows in close proximity to the southern boundary of the enclosure, notably staying to the south of this line.

Here, we find some parallel with the Blackshouse Burn enclosure. This monument in an early incarnation consisted of a double ring of oak posts, spaced 8m apart, set into a bank of stones which was revetted on the exterior side (Lelong and Pollard 1999, 27). It is not inconceivable that a low bank could have been thrown up using the considerable up-cast from the postholes at Forteviot as they were being excavated, and this would have offered additional support for the posts, a means to further control access to the interior space of the enclosure, and a minimising of the effort needed for spoil removal. The possible fence slot found between Postholes 7020 and 7041 stops just short of where one might expect a bank to run, although the nature of this feature is unclear. This might, however, offer evidence for an alternative access point to the monument, or the screening of activity in this location. As noted above, when dealing with cut features and so-called negative archaeology, everything above ground is conjecture.

3.5.3 Decline and fall

There is no doubt that the palisaded enclosure at Forteviot, even using conservative estimates for the size of the posts, would have been a visible presence in this locality for many centuries, perhaps longer, albeit for most of that time in various states of ruination. As we have seen, it is even possible that elements of the boundary were identifiable features on the ground for millennia. Here, then, we consider the decline of the physical form of the palisaded enclosure. One intriguing aspect of the ruination of this monumental enclosure is that not all posts appear to have met the same fate: some were left to rot *in situ* while others were removed from the posthole completely; it is conceivable a few were destroyed by fire (post fates are summarised in Table 3.2) suggesting some kind of decommissioning process.

The taphonomy of postholes is a subject open to debate; their interpretation is based on recorded sections and is an art rather than a science (Figure 3.33). A historiography of the way that archaeologists got to grips with the biography of cut features found on excavations is presented by Reynolds and Barber (1984), who emphasised that a close reading of the dynamic soils held within, and overlying, real and 'ghost' (negative) archaeological features, is necessary. This advice built on lessons learned from pioneering excavations of Neolithic timber post monuments such as Durrington Walls, Wiltshire (Wainwright and Longworth 1971) and North Mains (Barclay 1984), where the excavators recognised and interpreted information from posthole sections as representative of a post having rotted where it stood.

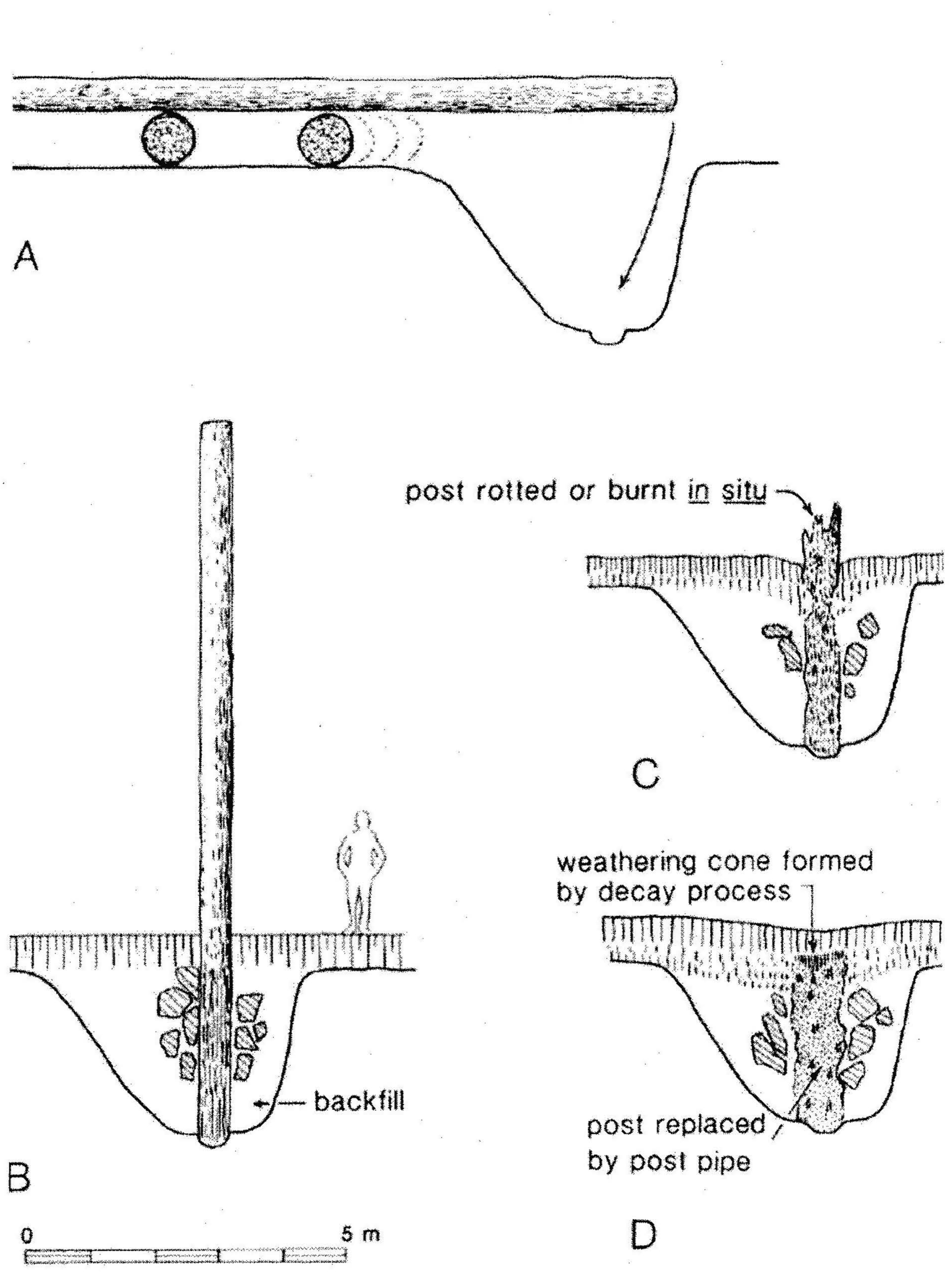


Figure 3.33 Posthole taphonomy (Whittle 1997)

Thus, through recording soil changes and analysing cross-sections of pits and postholes, we are able to interpret how the Forteviot features came into being, from the initial digging of a hole to its excavation by us: as Reynolds (1994, 21) put it, 'the life and death of a posthole'. The evidence for the former presence of postholes at Forteviot was thus not simply recovered in the form of undisturbed *in situ* packing stones which once surrounded the post like a glove around a hand, but also postpipes identified in section and plan, that is, the silts collected in the void left as the post decayed. In rare cases, decay cones were identified. A

Table 3.2 Summary of our interpretation of the most likely fate of posts (using a format from Thomas 2015, 157)

Excavated east side of the avenue posts

076	Rotted *in situ*
146	Rotted *in situ*
139	Post removed
125	Rotted *in situ*
043	Rotted *in situ*
132	Post removed
5506	Rotted *in situ*
5504	Rotted *in situ*

Excavated west side of the avenue posts

041	Rotted *in situ*
037	Rotted *in situ*
031	Rotted *in situ*, but *could* have been burned
022	Rotted *in situ*
013	Rotted *in situ*
007	Rotted *in situ*
024/5542	Rotted *in situ*
5526	Rotted *in situ*
5530	Rotted *in situ*

Excavated northern boundary postholes

5538	Rotted *in situ*
5518	Rotted *in situ*
5592	Rotted *in situ*
5052	Rotted *in situ*

Excavated eastern boundary postholes

7006	Rotted *in situ*
7012	Post possibly removed
7040	Post removed / fell
7021	Rotted *in situ*
7033	Rotted *in situ*
7035	Rotted *in situ*

decay cone is essentially a void within a posthole where a post decayed, being narrower at the bottom than top, thus having a cone shape in section, with the term often used interchangeably with postpipe. Through such analysis we were also able to identify post removal in disturbed, irregular fills within holes, and differentiate between post burning and pre-erection post charring.

As most posts appear to have rotted *in situ* at Forteviot, we will consider this process first. Posts probably fell over as they weakened leaving a stump *in situ*, so post-survival could have taken on several different forms and stages; posthole hollows may have endured for centuries more. How long might all this have taken? Calculations have been used for other oak monuments of the Neolithic in this regard. Considering the large, complex post structure at Durrington Walls Southern Circle, Wainwright and Longworth (1971, 224–5) argued that oak post decay could be measured at an average rate of 15 years per two inches (50mm) of post diameter. Using this rule of thumb, the biggest posts at Forteviot could have survived for up to 300 years (in the case of junction Post 5504) and more typically between 150 and 240 years across the rest of the boundary. These figures are a little higher than estimations for post survival given by Speak and Burgess (2000, 109–10); they suggested the big posts at Meldon Bridge might have stood for only 50 to 100 years (a more likely estimate for Forteviot in our view). It is likely that some of the bigger posts at both Dunragit and Leadketty would have matched those at Forteviot for longevity; excavations at the latter site recorded some fine decay cones (Figure 3.34) associated with the entrance avenue postholes (Noble and Brophy 2014). Hindwell palisaded enclosure boundary posts could have survived for up to 200 years, Mount Pleasant up to half a millennium (although this refers to some *massive* posts; Gibson 2002, 11). Wainwright and Longworth (1971, 24) postulated an alternative scenario for post removal: that posts were cut off near the ground and the stumps left to rot. However, this would have taken a good deal of hard work and there is no reason to believe this methodology would have been widely adopted, if at all (cf Speak and Burgess 2000, 20).

The longevity of Neolithic boundary posts and fences may have been extended by running repairs such as replacing old posts; such a practice is evident in the earlier Neolithic at sites such as timber halls and cursus monuments (Barclay *et al* 2003; Brophy and Millican 2015). Post-replacement in some instances around the Dunragit palisaded enclosure boundaries suggests it was not all just the one-way traffic of 'dilapidation and decay' (Thomas 2015, 168). We have little evidence for this practice at Forteviot, but it is credible to imagine circumstances where ailing posts might have been propped up in some way, as was the case in the west side of the avenue. The chronological discussion around the interpretation of the dates of avenue Posthole 031, one with a paired smaller posthole, also leaves open the possibility that post-replacement may have been evident in this one instance (section 3.4.1). The three small features found abutting avenue postholes may have held smaller posts that, following one line of interpretation, were added

Figure 3.34 Posthole 3006 from the Leadketty palisaded enclosure avenue during excavation, showing a very clear postpipe

as supports to keep the big posts from falling over. No re-cut postholes were found on the boundary at Leadketty or Meldon Bridge either (although at the latter site the excavators were reluctant to rule out post replacement due to plough truncation (Speak and Burgess 2000, 110)). At Dunragit, the documented 'two-phase' postholes might have been indicative of more than just running repairs; this may have been the creation of entirely new iterations of the timber enclosure (Thomas 2015, 160–1).

As noted, not all posts were left to rot. Some may have been pushed over by grazing cows scratching themselves, as is currently happening at a timber circle replica monument on Arran (Brophy *et al* 2018). A few posts seem to have been removed entirely, probably dug out or 'rocked' and pulled out, thus leaving the packing stones and other fills disturbed; in such cases, no postpipe would form. The clearest example of this was avenue Posthole 139, which unlike most of the other postholes we excavated had a loose stony central fill with voids between stones, probably disturbed and collapsed packing material. With no indication of a re-cut related to 'digging out' (as found at Dunragit, Thomas 2015, 164), it is more likely this post was rocked and removed, a demanding process. A second avenue posthole, 132, did not display an obvious postpipe and may also represent an instance of post removal, although this is a less clear example. Eastern boundary Posthole 7040 had asymmetrical fills suggesting the post at least leaned (or slumped) to one side, if it was not completely removed, and Posthole 7012 had no obvious postpipe although the fills do not appear disturbed; theoretically this post could have been removed. It is possible that posts fell over as opposed to being removed although it is difficult to see the circumstances where this could have happened unless the posthole was inadequately sized or the post erected poorly; Posthole 7040 was unusually small and set into a friable, loose gravel subsoil, so in this instance the post may have been weak from the day of its erection. Post removal was also identified at Meldon Bridge in one instance; the 'section of D01 suggests its post was pulled out' (Speak and Burgess 2000, 110). At Dunragit, Thomas (2015, 157) listed at least fourteen of the postholes that showed evidence posts were either dug out or withdrawn, the latter being 'rocked out'; this situation was complicated by the fact that posts were not necessarily treated the same way in two phases of use of the same postholes. Post removal, alongside post decay and burning, were all identified at Mount Pleasant palisaded enclosure (Wainwright 1979; Greaney *et al* 2020, figure 5). Post removal at all of these sites may simply have happened before a post was about to collapse and the timber set aside, but it is also possible that timbers were removed from their sockets (at considerable effort) so they could be used or erected elsewhere.

The use of fire in connection with post erection and removal is more contentious, with quantities of charcoal found within postholes indicative of either the treatment of the post with fire before erection or burning of the post at the end of its life. The burning down of large oak post structures appears to have been a common practice in the early Neolithic in Britain, an activity that would have used up a lot of fuel resources (Noble 2006; 2017; Brophy and Millican 2015). It was evident, for instance, in some of the timber cursus monument postholes at Dunragit (Thomas 2015, 147). For West Kennet palisaded enclosure, Whittle (1997, 158) argued that charcoal evidence in postholes suggested this late Neolithic timber monument ended in a 'massive conflagration', with posts burned above ground and charcoal accumulating amidst the stumps and postholes. Thomas (2015, 156–62) spent a good deal of time exploring the taphonomic histories of the postholes at Dunragit and concluded that only a few posts were burned down, with most charcoal recovered related to post charring. No evidence for post burning was found at Leadketty.

There is little convincing evidence to support post burning at Forteviot, with all but one posthole having only small quantities of charcoal, and such material found in lower fills all oak charcoal, with no other wood found that we might associate with the fuel required to burn down such a post. Posthole 131, on the western side of the avenue, was the most complex posthole found in the monument and contained much higher levels of charcoal (over 600 oak fragments) than in any other palisade posthole, concentrated in its basal layers (Fills 103, 118 and 159). Even then, our interpretation of this feature still suggests it is most likely this charcoal entered the hole with the post, rather than falling in after the post was burned; this may have related to fire being used to fell the source oak tree (Tim Darvill pers comm), although we cannot completely rule out the burning of this one post (Ramsay 2010). Several postholes had carbonised material in the upper fills which was not oak but in small quantities; these are more likely to represent invasive later deposits than relate to the monument itself and where dated are too late to be associated with extant posts (further discussed in 3.5.4).

The differential treatment of posts in the decline of palisaded enclosures such as Forteviot, Dunragit, and Mount Pleasant might be viewed as an extension of the variability in posts and postholes themselves, perhaps indicative as Thomas (2015, 158) suggests of different group interests being played out through time. Such treatment is not exclusive to palisaded enclosures, and it could be argued more tentatively that the fates posts met – rotting, burning, felling – mirror the practices of Neolithic woodland clearance (Brophy 2015; Noble 2017). Posts could, for instance, have retained the biographies of the trees that they were made from, each post having a life-history of its own pre-dating (and perhaps post-dating) the monument that it was erected to define. Regardless of the exact details, at some point, perhaps several generations after the Forteviot palisaded enclosure was constructed, it would have begun to look rather ramshackle and was left to collapse, even as new monuments continued to be built in and around it. This does not mean that this place lost its power and significance – as we shall see, ruination simply became an arena for new forms of practice.

3.5.4 Later use of this location

(with Stephany Leach and Susan Ramsay)

As we have seen already in this chapter, hints of later activity were identified both in the palisaded enclosure postholes and in the vicinity of the avenue and boundary of the monument. These traces and features will be explored in more depth in SERF2, chapter 5, but are summarised briefly here. Despite the probable longevity of elements of the palisaded enclosure boundary, we have little stratigraphic evidence for activity in and around the postholes in the Bronze and Iron Ages or even later; this contrasts with the henge monuments (Chapters 5 and 6). One date, derived from alder charcoal in the upper fill (126) of avenue Posthole 125 stands anomalously in this respect, being from the middle of the 2nd millennium BC (1500–1290 cal BC (3120 ±40 BP); SUERC-21566 (GU-17836)); this comes in the middle of a lacuna in activity at Forteviot (Table 2.4), and remains unexplained.

Figure 3.35 Early medieval pyre pit 5512 during excavation

Perhaps the most dramatic features associated with later activity were three closely spaced pits in the entrance zone (5514 and 5512) and within the southern end of the avenue (005) (Figure 3.7). Each was an amorphous oval in plan, measuring from 1.7m by 0.8m (005) up to 3.5m by 2.4m (5514), with all about 0.5m in depth and with steep sides and a rounded bottom (Figure 3.35). During excavation these features were interpreted as being places of pyre material deposition, with concentrations of carbonised material throughout the fills being of an entirely different character to any other features in and around the palisaded enclosure boundary. Pit 005, for instance, gave very high readings when a magnetometer was passed over it during excavation and burning *in situ* seems likely, while the other pits produced chunks of burned wood and charcoal up to 100mm in length, and fragments of cremated bone were also recovered within 5512 (in fill 5513) and 5514 (fill 5600).

Botanical analysis showed that Pit 005 contained a large volume of mainly alder and hazel charcoal, while traces of birch and roundwood were evident. Carbonised wheat and barley grains, sedge and rose seeds, and a wild radish pod fragment were also recovered (Ramsay 2007). Mostly alder and hazel charcoal, with some oak and birch, was present in Pit 5512, including some large fragments, while Pit 5514 contained a diverse charcoal assemblage of alder, birch, hazel, oak and willow, with the addition of heather-type charcoal in the lower fill (5600). Barley was also found in both pits as well (Ramsay 2010). Radiocarbon dates for all three features suggested they belonged to the 7th to 9th centuries AD. Pit 5514 also contained two portable cup-marked stones of unknown date and origin (SF5519 and SF5520) indicating either the incorporation of prehistoric material within later features, or that these had some role in fire-lighting (Figure 3.36).

The cremated bone further helped our understanding of these features. Some 33g of bone was found in the upper fill of Pit 5512 (fill 5513), material which suggested a MNI of one person, but it could not be confirmed that all elements came from the same person. The bone here did not show signs of erosion. A much smaller quantity of cremated bone was recovered from 5600 (a lower fill within Pit 5514), some eroded and other pieces lacking erosion, suggesting taphonomic variability (Leach 2012, part 2, 15–19). All three pits thus contained charcoal of a type and quantity consistent with pyre material, and cremated bones indicative of primary deposition of partial remains of bodies, probably taken direct from the pyre, suggesting cremation practice occurred here in at least two waves some 3500 years apart, with a late Neolithic cremation cemetery nearby (Chapter 4).

In the same vicinity as these pyre pits (less than 10m south of Pit 005 and the avenue/boundary

Figure 3.36 Stone with carved hollow or cup-mark found in Pit 5514

junction) was the massive Pit 5502. Only the north-west quarter was investigated, the feature being circular in plan, 7.1m in diameter and shown to have a maximum depth of 0.6m (Figure 3.19). The fill largely consisted of a washed-in silt and the feature may have been cut into a band of clay in the natural subsoil; at times, when open, it was probably waterlogged. Two pieces of slag were recovered from near the top of the fill (SF5505 and SF5506) and carbonised alder and ash recovered from this fill are consistent with metal-working waste, these wood types being ideal for charcoal production (Ramsay 2010, and see Gale and Cutler 2000). It is likely, then, that this feature is the result of activity much later than the Neolithic period, and the scale (in plan, if not depth) is reminiscent of the early medieval pits dug into the centres of Henges 1 and 2 (sections 5.6 and 6.6). The curious location of this feature suggests that when it was open, the palisaded enclosure avenue that aligns on it was still to some extent extant, and thus a controlled approach to this feature is hinted at.

As noted above, material including cremated bone, carbonised hazelnut shells and non-oak charcoal were recovered from the upper fills of a few palisaded enclosure postholes. Where dated, this material was shown to belong to the 1st millennium AD (except for date SUERC-21566 noted above). At some Neolithic sites with big postholes, such as Dunragit and Durrington Walls South, deposition appears to have followed soon after the post decay or removal left a 'ragged crater', interpretable as an act of ritual decommissioning (Ray and Thomas 2018, 183). The motivation may have been similar at Forteviot, but carried out at some distance in time. Upper fills of avenue Postholes 125 and 043 contained mixed species of wood including alder, hazel and willow, while in northern boundary Posthole 5052 single fragments of carbonised hazel and hazelnut shell, and a small quantity of willow were found. Eastern boundary avenue Postholes 7006 and 7035 had some hazel and smaller quantities of alder in the upper fills, as did Posthole 7033, along with carbonised oats and six-row barley grains. The carbonised grain assemblage suggests that the upper deposits within these postholes were not Neolithic in date, an observation confirmed by radiocarbon dates from this deposit of the 5th–6th century AD (1590 ±30 BP; SUERC-37772 and 1615 ±30 BP; SUERC-37773 (Table 2.4)). This date appears to reflect material being placed, or washed, into the postholes long after the post was gone and the monument decommissioned, but at a time when such large features may still have been extant in the form of shallow hollows. We cannot assume all later deposits (including carbonised wood and cremated bone) in postholes were of this late date. Cremated bone in the upper fills of postholes (discussed in section 3.3.5) may well also be indicative of much later activity being found in much the same position in postholes as carbonised non-oak and grains; the materials present and taphonomic variability have echoes of the contents of pyre pits 005, 5512 and 5514. In other words, it is likely that the non-oak charred material identified in the upper fills of some of the features are from later incorporation of material into the voids left by the decayed posts, in some cases perhaps indicative of cremations taking place in the vicinity.

3.6 A monumental legacy

The palisaded enclosure at Forteviot was one of the most substantial monuments in Britain during the second quarter of the 3rd millennium BC. The relative rarity of these structures would have ensured that this was a place of religious and political significance in the dynamic final centuries of the Neolithic. The construction of this monument would have taken a considerable period of time, perhaps in the order of years or decades, and would have been costly in terms of labour, time, and resources, as well as emotional and spiritual investment. The transformation of the local woodland landscape would have accompanied the construction of the monument, with scores of tall and ancient oak trees being cleared by one means or another to help make it happen. The erection of all these posts, a dangerous and demanding endeavour, created a completely new meaning for this place from what went before. The durability of this enclosure would ensure that it would continue to act as – at the very least – a backdrop to activities for centuries and shape the use of this place for millennia.

4

Ever-decreasing circles: from cremation cemetery to henge

Gordon Noble, Kenneth Brophy, and Rebecca Younger

with contributions from Derek Hamilton, Stephany Leach, Kirsty Millican, Alison Sheridan, Neil Wilkin, and Dene Wright

4.1 Introduction and background

The most intensive and long-lived activity that we found at Forteviot was concentrated in and around Henge 1, within the western half of the palisaded enclosure. This monument, and the activities that came both before and after it, are the subject of the next two chapters. The vagaries of the cropmarks, evident even before we broke the surface of the ground, did not adequately prepare us for the complex array of cut features and the depth of archaeology we found, indicative of activity that took place (non-continuously) over a period of almost 4000 years.

In this chapter, after a look at the tantalising Mesolithic evidence, we will focus on the Neolithic and Chalcolithic use of this location (and to an extent early Bronze Age activity), with description and discussion of the largest Neolithic cremation cemetery thus far identified in northern Britain, a possible stone setting, and enclosures subsequently constructed around this place: a timber circle followed by an earthwork henge monument. A neighbouring penannular enclosure and related timber setting will also be considered. The chronological overlaps between these activities and the palisaded enclosure, the arena within which all this was situated, will also be considered.

The following chapter will focus on an early Bronze Age dagger-burial found within Henge 1. Later activity (covered in depth in SERF2, Chapter 5), namely the digging of a very large pit within the middle of the henge in the early medieval period, and the apparent levelling and re-working of the henge at an unknown time will also be briefly described in this and the following chapter, as these actions inevitably impacted upon our ability to understand prehistoric use of this location.

4.1.1 The cropmark evidence

Henge 1 is located within the palisaded enclosure, 70m south-south-west of the palisaded enclosure avenue entrance zone, 50m south of the ring-ditch (Chapter 7), and 25m east of the escarpment that defines the western side of the palisaded enclosure (Figure 4.1). As discussed in section 2.3.1, Henge 1 was amongst the first cropmark sites recognised at Forteviot, annotated '4' by St Joseph in his original transcription (Figure 1.2). He depicted what he called this 'penannular enclosure' (St Joseph 1978, 50) in a rather stylised manner, with a regular, albeit at times tenuously defined, ditch, surrounded by a circle of 22 pits or postholes; the dimensions of this site were given as *c* 44m across. It next appeared in the Harding and Lee corpus of 1987, (gazetteer no. 312, see Table 2.2). They essentially reproduced St Joseph's plan (Figure 2.7), characterising the cropmark as a 'probable henge' with internal diameter *c* 22.5m and ditch width *c* 5m. RCAHMS field staff later characterised the site as a Class 1 henge (that is, having one ditch and one entrance). The most recent transcriptions (see for instance Figures 2.5 and 4.1) depict the henge as around 45m in diameter from outer ditch edges (the ditch as a cropmark being in the order of 3m to 6m in width), with an assumption that the overall monument size would have been augmented by an external bank of unknown dimension. The site was named

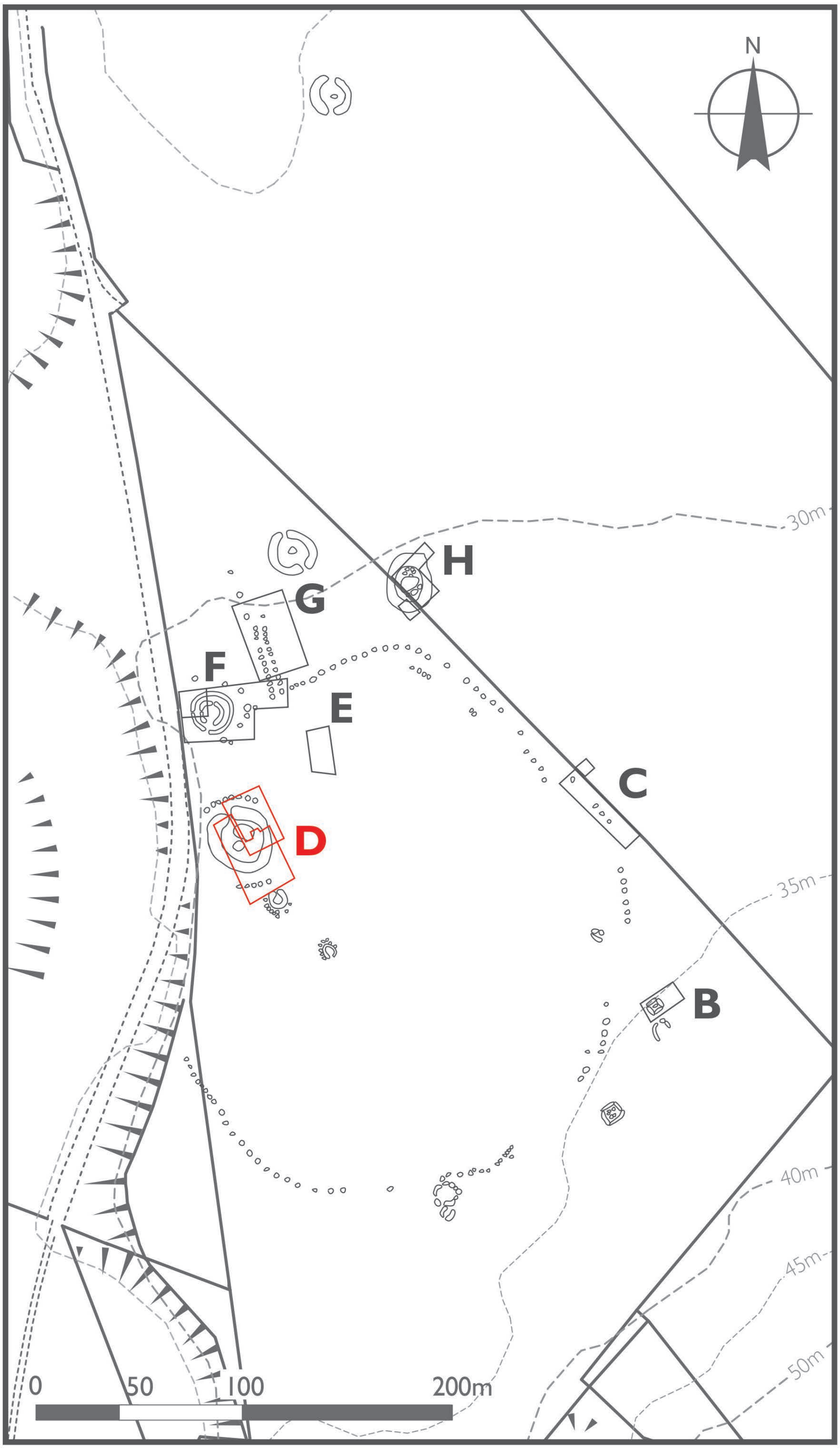


Figure 4.1 Plan showing the location of the trenches discussed in Chapter 4, overlain on the cropmarks

Henge 1 during the SERF Project, and this has come to be used to identify this enclosure in the broader literature (Brophy and Noble 2012b; Noble and Brophy 2017; Younger 2016a; 2016b).

The cropmark evidence accumulated over several decades suggested, pre-excavation, that this was a medium-sized classic henge monument with a broad ditch, restricted interior space, and single entrance on the north-north-west side. However, henge monuments are generally more than just a ditch and bank (Harding 2003; Younger 2016a) and the henges at Forteviot are no exception. Closer analysis of the

Figure 4.2 Aerial photograph from 1984 showing Henge 1 as a cropmark. Evident is a light void within the henge ditch east of the entrance gap, internal features and perhaps disturbance related to the cist / cairn. The southern arc of the timber circle and mini-henge are also evident (SC 1705595; ©Crown Copyright: HES)

cropmarks suggested some features of note that became targets for excavation (Figure 4.2). The henge boundary as a cropmark is irregular, with the southern boundary unclear in most aerial photographs, perhaps suggesting variable depth or some obscuring feature. A 'light' band running north to south along the interior of the eastern ditch was difficult to explain from the cropmarks alone and again suggested something unusual about the monument in this location. Harding and Lee (1987, 417) noted that there was a, 'large off-centre mark in the interior' (not recorded by St Joseph even though he drew similar features within two other Forteviot henges). This large blob was also documented in the RCAHMS 1991 transcription in the eastern half of the henge interior as up to 10m across (Alcock and Alcock 1993; Figure 2.9); in the more recent RCAHMS transcription this had become two blobs, one oval and about 10m by 8m, the other circular with a diameter of 5m towards the south-west ditch. Cropmarks of an irregular circle of post-pits surround the henge, generally spaced between 4m and 6m from the exterior edge of the ditch in the location where the bank must have been. This setting as a cropmark was interpreted as a timber circle, albeit an unusual arrangement as such timber settings were usually located *within* henge monuments (cf Gibson 2005; Millican 2008), as was the case at nearby North Mains, Strathallan (Barclay 1984).

The henge is not the only cropmark in this location. St Joseph (1978, 50) also recorded two large pits and a 'tiny enclosure' with surrounding pit-circle, immediately to the south, with the timber circles around this small penannular enclosure potentially overlapping the larger timber circle boundary to the north a little. Variations on this cluster of features were subsequently recorded in various air photos and transcriptions of Forteviot due to the nature of the cropmarks in this location and obfuscation caused by palaeochannels. This group of features was also a target for SERF excavations (section 4.6).

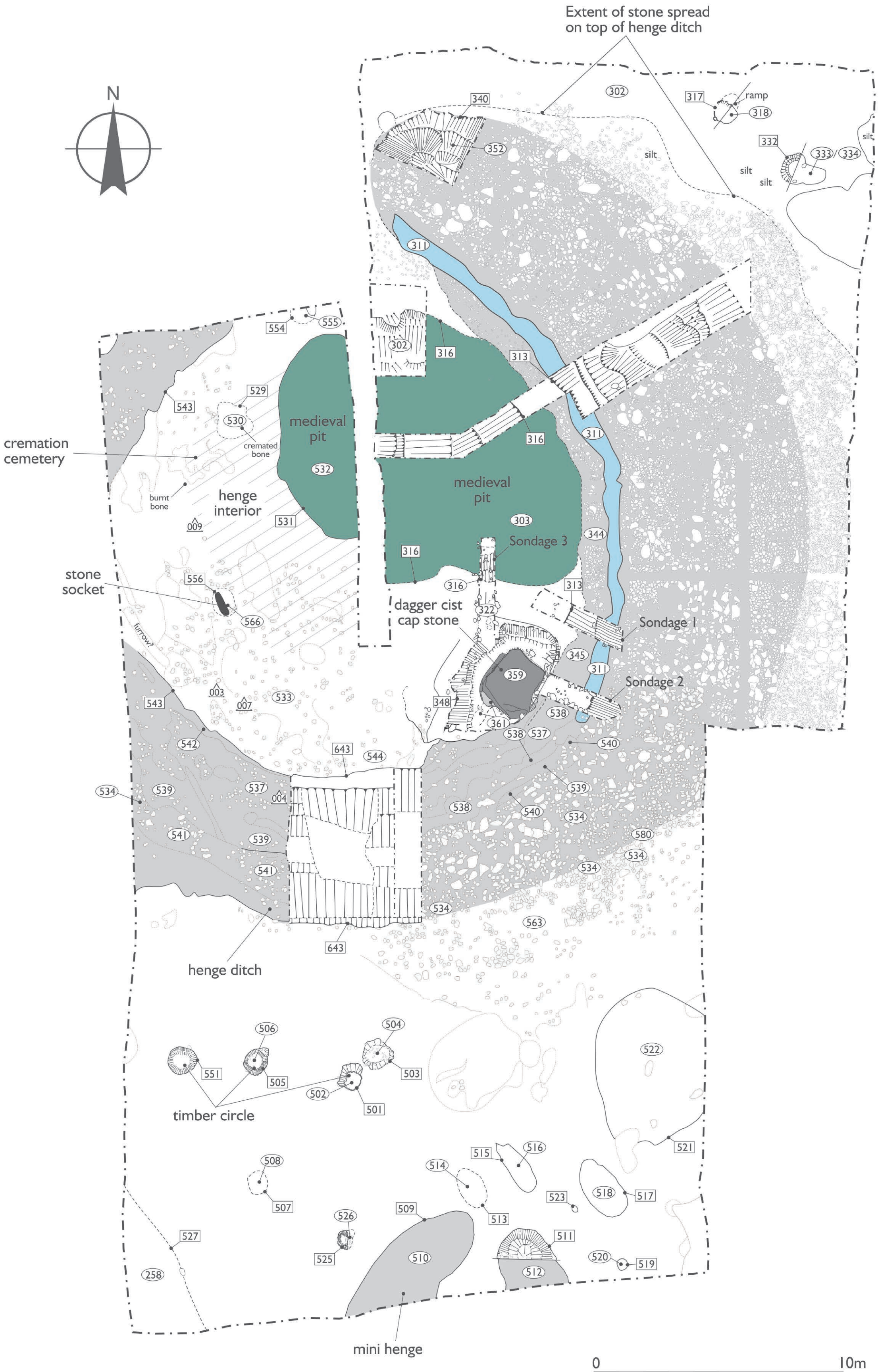


Figure 4.3 Post-excavation plan of Trench D based on two seasons of excavation in 2008 and 2009

4.1.2 SERF excavations 2008 and 2009

Henge 1 was excavated over two seasons, in 2008 and 2009, with two overlapping trenches combined to give Trench D (Figures 1.6 and 4.3). Some 95% of the henge interior, one terminal and the entrance area, a large proportion of the ditch, and a sample of areas south, east and north outwith the ditch were investigated; parts of the north and south sides of the timber circle were also revealed, as was the northern half of the mini-henge to the south. In total, an area of some 1250m² was exposed. During the 2008 season, the cist slab overlying the dagger-burial was uncovered and we returned to lift this in 2009; this was the point of overlap between the trenches (Chapter 5).

4.2 No Mesolithic inheritance?

with Dene Wright and Derek Hamilton

How far back in time can we push the story of Forteviot? In terms of material culture, we cannot, with any certainty, go back beyond the early Neolithic (section 3.2). However, we did recover tantalising hints of Mesolithic activity in the form of four radiocarbon dates from residual deposits at Forteviot. Two dated samples were found in Neolithic to Bronze Age contexts during the 2008 and 2009 excavations. The first of these, 7480–7250 cal BC (8290 ±30 BP; SUERC-23247), was derived from carbonised alder recovered from the primary fill of the ditch terminal of Henge 1. The other, 6920–6680 cal BC (7925 ±30BP; SUERC-29175), from willow charcoal, was found in a lower fill of the mini-henge ditch. In both instances it is likely that this material dated either from a disturbed Mesolithic deposit that was washed into the henge ditch during an episode of natural silting or was redeposited when the ditch was dug. The other two dates (SUERC-22849, SUERC-22840) were recovered from carbonised material recovered from early medieval graves and seem likely to have been incorporated into these features due to later disturbance associated with grave-digging (SERF2, section 5.5).

None of these dates in itself indicates anything other than the death and subsequent carbonisation of wood and/or hazelnut shells in the 8th and 7th millennia cal BC in this vicinity. The carbonisation need not even have been anthropomorphic, and within the context of minimal evidence for the Mesolithic in Perth and Kinross (Wright 2012), this is a plausible scenario. However, a bolder reading of this scant evidence is that these materials indicate this location was occupied by hunter-gatherers, and this makes sense in the context of the more recent discovery of an alignment of Mesolithic pits of broadly similar date 4km to the west at Wellhill, a site itself located within 1km of the late Neolithic palisaded enclosure complex at Leadketty (Noble and Brophy 2014; SERF3). Thus there are hints of major late Neolithic centres in the Earn valley being in places of significance in the Mesolithic, although we are not at the stage (at Forteviot at least) where we can see a causal connection between the two, and no Mesolithic material was recovered at excavations in the Leadketty enclosure itself. Such evidence is equally scant for other palisaded enclosures in northern Britain, with one scalene triangle microlith found during investigations at Meldon Bridge for instance (Speak and Burgess 2000, 9). An isosceles triangle microlith of early Mesolithic origin was recovered from a posthole in the inner post ring at the Dunragit palisaded enclosure; other bladelets from pits there may also have been of Mesolithic date (Healey 2015, 124).

Little more can be said at this stage about the nature and intensity of a hunter-gatherer presence in the Forteviot area without a sustained campaign of fieldwalking and testing of any concentrations of lithics identified. While there are scant traces of activity in the Mesolithic at Forteviot, for the time being we cannot argue with much confidence that this monument complex had its origins in that period.

4.3 Marking the land with the dead: Forteviot late Neolithic cremation cemetery

The defining act in the evolution of this place into a major ceremonial centre, long before the construction of the palisaded enclosure, was the establishment of a cremation cemetery here at the beginning of the 3rd millennium BC. The late Neolithic cemetery was discovered as part of the excavations of the Henge 1 interior during the 2009 season of fieldwork. Upon initial discovery, it was assumed that these cremations were Bronze Age insertions into the henge interior (reflected in our reporting at the time eg Brophy and

Noble 2009), but radiocarbon dating, and material culture associations, led to a re-evaluation of this assumption. This cemetery was in fact established between *3080 and 2900 cal BC* (section 4.3.6, Fig 4.16: *Boundary Start: Forteviot Cremation Cemetery*), while the enclosing henge monument was constructed centuries later in the Chalcolithic; in other words, both phases of activity came at pivotal periods of social change. In the discussion that follows, we have used the terms 'cremation burial' and 'burial deposits' even when the remains recovered were clearly not representative of a complete person; we note the problematic nature of these terms (eg Gibson 2016).

4.3.1 The cremation deposits and their arrangement

All cremated human remains were discovered in the western half of Henge 1, between large Pit 316/531 of early medieval date, and henge ditch 543 (Figure 4.4). Both these later cut features may well have truncated the cemetery. This area of the monument interior was obscured by an amorphous thin silt spread covering an area some 14.5m north to south by 9.0m and up to 0.2m deep (550, 560, 646, 647) which concealed several cut features and cremation burials. In all, nine discrete cremation deposits were recovered, some in pits, representing eighteen individuals (summarised in Tables 4.1 and 4.2). These were arranged in an arc-shaped setting which loosely established a curve that was subsequently followed by the much later henge ditch inner edge 3m to 4m to the west; this relationship suggests the cremation cemetery was marked in some enduring way, such as by an earthen mound. Further, smaller quantities of cremated bone were found outwith secure contexts within the silt spread itself; these were probably disturbed by later ditch- and pit-digging activity and/or ploughing. It is therefore likely our excavations did not reveal the true extent of the cemetery, either spatially or in terms of the individuals buried there. Some of these cremation deposits were associated with calcined bone pins and one with a small ceramic vessel, while a broken standing stone was also identified.

Large Pit 529, the most northerly on the arc of cremation-related features, was a repository for several deposits of cremated remains (Figure 4.5). This pit was 1.50m east to west by 1.26m, steep-sided and round-bottomed with maximum depth of 0.50m. The upper silty fills of this feature (530, 595, 596) each contained discrete cremation deposits and two had calcined bone pins (pin distribution is summarised in Table 4.3). These deposits of burnt bone may have been placed in the pit in organic containers which have now decayed, such as wooden bowls or skin bags, as they retained a reasonably clear degree of separation. In at least one case they were in a circular arrangement, with stones placed between to separate them clearly. Further cremation deposits were evidently added at a later stage, one each in two small pits cut into the western side of Pit 529 when it was largely back-filled. These were Pit 650, a shallow scoop containing a small cremation deposit (640) associated with a small ceramic pinch-pot, and Pit 651 which held a cremation deposit (641) associated with three calcined bone pins. Both oval pits were small, little more than 0.40m by 0.25m, and maximum depth 0.20m. Four further concentrations of cremated remains were found within the silt layer around 2m to the south-west of Pit 529, two of which could have been deposited at the same time (558 and 560). The two further deposits, 631 and 632, were found in a slight depression in the natural, but none of these four sets of cremated remains appears to have been associated with cut features or artefacts. Cremated bone fragments found in other silt layers in this area, such as 550, did not appear to be cohesive deposits.

The next cut feature on the arc of cremation cemetery features was Pit 565, located 6.5m to the south of Pit 529. The full extent of this pit was not fully excavated due to time constraints, but we were able to show that it was oval in plan, 1.2m north to south by 1.0m, steep-sided and at least 0.4m deep. This pit contained a large upright sandstone slab measuring 0.80m long and 0.16m thick (Figure 4.6). The slab appeared to have been broken in antiquity as the upper surface had been shattered, with its original size unknown. It is possible that this slab was a standing stone that stood in this pit before, and probably during, the life of the cremation cemetery. Immediately beside this slab was found a small angular piece of sandstone, perhaps a fragment of this upright deposited, or left, in the pit. Three distinct cremation deposits were arranged around the base of this monolith stump, one (628) appearing to preserve the outline of the container the deposit had been buried in – a round, probably wooden, vessel (Figure 4.7). Of the other deposits in Pit 565, burial 576 was one of the largest deposits of cremated bone identified in the cemetery, while 566, as with the other cremations in this feature, was associated with bone pin fragments.

A final cremation burial (617) was identified 3m east of Pit 565 within the silt spread; this was the only

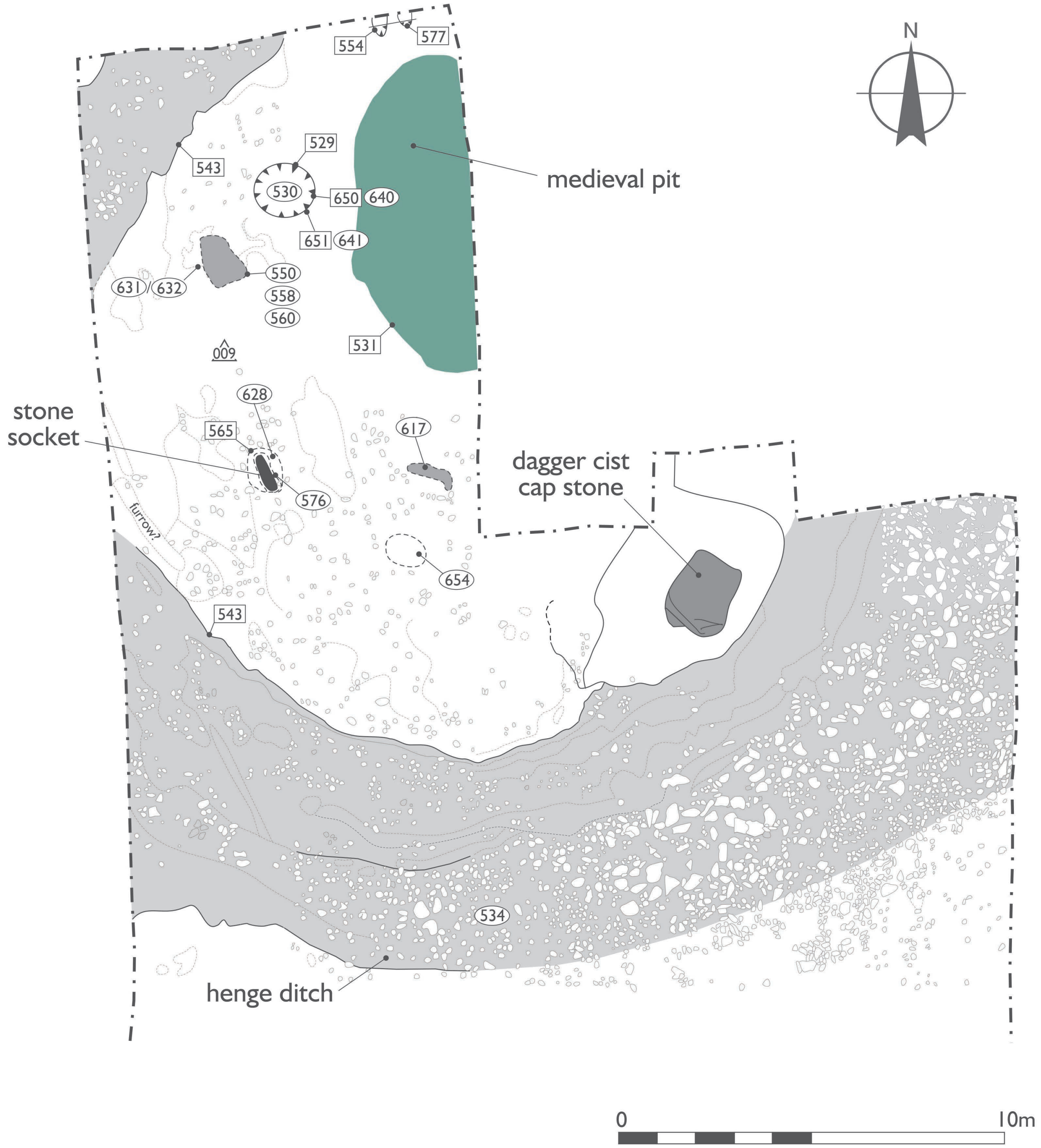


Figure 4.4 Plan showing the cremation cemetery and associated features (after Noble and Brophy 2017, figure 3)

Table 4.1 Features associated with the cremation cemetery at Forteviot (Noble and Brophy 2017, table 1)

Feature	Feature type	Cremation deposits	Finds
[529]	Large pit 1.5 m diameter, 0.5 m depth	Fill 530: MNI 2 Fill 595: MNI 2 Fill 596: MNI 1	Deposits (595) and (596) each contained a fragment of a calcined bone pin (see Table 4.3 for a summary of bone pin discoveries)
[650]	Scoop adjacent to [529]	Fill 640: MNI 1	Small pottery vessel (see Section 4.3.3)
[651]	Scoop adjacent to [529]	Fill 641: MNI 4	Calcined bone pin fragments
(550)	Spread	Fragments	
(558)	Spread below 550	MNI 2	
(560)	Spread below 550	MNI 1	
(631)	Scoop	MNI 2	
(632)	Scoop	MNI 1	
[565]	Stone socket 1.2 m diameter (this pit was not completely excavated and so the total depth and cut profile are unknown). Contained a large sandstone slab 0.8 m wide and 0.16 m thick surviving to a depth of at least 0.2 m	Context 566: MNI 1 Context 576: MNI 3	Calcined bone pin fragments
(628)	Deposit around stone socket [565]. (628) was well-defined and circular in plan, hinting at placement within an organic vessel	MNI 1	Calcined bone pin fragments
(617)	Spread	MNI 2	Calcined bone pin fragment

[ ] numbers = cut; ( ) numbers = fill or deposit

Table 4.2 Detail of analysis of all cremation deposits in the cremation cemetery (Noble and Brophy 2017, table 2)

Feature	Context	Sample no(s)	Weight	Max frag size mm	Taphonomy: colour, fissures, erosion etc.	Bioprofile details	Artefact association	Type of deposition
Large pit [529] containing multiple cremated deposits	530	1049	772 g	53 mm	Mainly white–light brown, fissures, transverse, patina, delamination & curved transverse fractures, little evidence of erosion	MNI 2: one young child 2–6 years; one adult – sex undetermined but medium to robust bone fragments present, cranial sutures unfused where present, more indicative of a young–middle adult	None, blue/ green stain on cranial bones	Burial
Large pit [529] containing multiple cremated deposits	595	1040, 1046	812 g	47 mm	Pale grey–white, range of fractures as (530), slight erosion on few fragments, mainly lacked erosion	MNI 2: one older infant/ young child; one adult – robust, middle adult?	Bone pin fragment	Burial
Large pit [529] containing multiple cremated deposits	596	1053	106 g	34 mm	Mostly grey–white, but some black trabecular fragments, mostly transverse fractures, some erosion	MNI 1: older child/ adolescent or very gracile adult based on bone fragment proportions only	Bone pin fragment	Burial? disturbed?
Small pit [650] cutting [529]	640	1067	74 g	25 mm	Black, grey to white for cranial fragments, postcranial dark brown trabecular, white cortical, some erosion, range of fractures as (530)	MNI 1: young child, incomplete representation of skeletal regions, but cranial and postcranial present and all fragments consistent with this one individual	Small pottery vessel	Burial? disturbed?

Feature	Context	Sample no(s)	Weight	Max frag size mm	Taphonomy: colour, fissures, erosion etc.	Bioprofile details	Artefact association	Type of deposition
Small pit [651] cutting [529]	641	1070	2004 g	84 mm	Pale grey–white, range of fractures indicative of fleshed cremation, little evidence of erosion, dentition and small elements indicate meticulous collection for deposition	MNI 4: two adults – one robust, one gracile; two children – one older child, one younger child; developmental stress in child's dentition, possible perimortem trauma on adult cranium	Bone pin fragments	Burial
Upper silt deposits above (558) & (560)	550	1016, 013	8 g	34 mm	White–fissures and most fragments heavily eroded	Only a few fragments of bone: robust cortical bone and one gracile phalanx (finger bone)	None	Disturbance residue?
Cremation (558)	558	1013, 1044	417 g	86 mm	Grey–white, sample 1013 and SF 37 far more fragmented and eroded than 1044 main sample, range of fractures indicative of thermal alteration of fleshed remains	MNI 2: NB: almost all of the fragments indicate a robust adult, probably young adult as sutures open and bone dense; only one bone fragment, incomplete child size hand phalanx indicates the presence of a child	None	Burial, disturbance /admixture
Cremation (560)	560	? Number missing	370 g	54 mm	White, heavily eroded fragments, similar to material from disturbed contexts, yet weight and element representation more suggestive of primary burial, perhaps with some disturbance or redeposition indicated; this assemblage exhibits a different taphonomic history to other primary depositions	MNI 1: the fragmented bones are consistent with a middle adult of medium build, indicated by partial closure of the cranial sutures and dense bone	None	Disturbed burial or redeposited / secondary deposition
Cremation deposits (631/632)	631	1052, 1056	654 g	52 mm	Grey–white, some erosion, fissures and fractures consistent with high level of thermal alteration, most regions of the skeleton represented but collection does not appear as meticulous compared to other deposits or some disturbance / redeposition indicated	MNI 2: young adult – dense bone, open sutures, of medium build; one older child, only partially represented – disturbance?	None	Disturbed primary burial deposit?
Cremation deposits (631/632)	632	1057	93 g	29 mm	Dark grey–white, fissures and fractures consistent with thermal alteration, little erosion. Dark brown/black spotting probably manganese staining from depositional environment	MNI 1: adult, likely associated with 631 context – few fragments unrepresentative of primary deposit of cremated individual	None	Associated with 631

Feature	Context	Sample no(s)	Weight	Max frag size mm	Taphonomy: colour, fissures, erosion etc.	Bioprofile details	Artefact association	Type of deposition
Stone socket [565]	566		48 g	32 mm	Dark brown–white, some erosion, transverse, curved transverse, stepped, and patina fractures indicate high degree of thermal alteration of fleshed remains	MNI 1: few fragments only, not complete representation, cranial sutures partial closure indicative of middle adult, robust long bone fragments	Bone pin fragment	Disturbance residue?
Stone socket [565]	576	1027, 1048	1945 g	52 mm	Light brown–white, approximately half the assemblage exhibited moderate erosion, the other half lacked erosion, thermal related fractures, but comparatively less fragmented than other assemblages in this area	MNI 3: two adults – one robust, one gracile; one older child, most of the regions of the skeleton represented, subadult material under-represented	Bone pin fragment	Possible multiple burial, disturbed, or single deposition with disturbance/ admixture
Cremation within organic vessel in association with stone socket [565]	628	1050	212 g	34 mm	Light brown–white, little evidence of erosion, fracture pattern as (566)	MNI 1: young adult, long bones fused, open cranial sutures, gracile build, not all areas of the skeleton represented	None	Found within vessel outline, disturbed deposit or minimal collection of remains?
Cremation (617)	617	1041	1144 g	39 mm	Light grey–white, extensive fissures and thermal-related fractures, moderate degree of erosion	MNI 2: one gracile adult; one older child or adolescent	Bone pin fragments and blue/ green spot staining	Possible dual burial

Figure 4.5 Cremation pit 529 half-sectioned

Table 4.3 Summary of bone pins from the cremation cemetery (Noble and Brophy 2017, table 3)

Pin no.	Feature	Context	No. of fragments	Shaft diameter (mm)	Bulb diameter (mm)	MNI with pin	Age	Primary or disturbed context
1				5.5	6.3			
1		641		5.5				
1				4.0				
1				4.0				
2	Pit [651]	641	9 (now 7, from refits)	5.5	6.5	4	2 adult, 2 subadult	Primary
2				5.4				
2		641		4.4				
3				5.2				
3				5.0				
4	Spread			5.8	7.3	2		
4		617	3 (now 2, from refits)	5.8			1 adult, 1 subadult	Primary
4a				5.5				
5	Pit [529]	595	1	4.5		2	1 adult, 1 subadult	Primary
6	Pit [529]	596	1	6.5		1	1 subadult	Disturbed
7	Standing stone socket [565]	576	1	5.5		2	1 adult, 1 subadult	Primary
8	Standing stone socket [565]	566	1	3.4		1	1 adult	Disturbed

Figure 4.6 The putative broken standing stone in Pit 565

cremation deposit not to lie on the arc of features and was found only 1m from the edge of medieval pit 531. An unburnt fragment of a regular flint blade (from Sample 1041) was recovered from this feature (617) and may have been a grave good (section 4.3.5). Here, human remains were found amidst a cluster or deposit of small stones (Fill 616) and minimal bone fragments were also recovered from within adjacent silt spread 599.

Not all the features located on this arc contained cremated bone. A pair of pits, 554 and 577, were located on the trench baulk 5m to the north-east of cremation Pit 529. Both were irregular ovals, similarly sized (at least 0.70m across in both cases) but shallow (less than 0.16m) and containing sterile silt fills. These were reminiscent of the pit pairs excavated near the palisaded enclosure avenue (section 3.3.3). No other prehistoric cut features (other than the cist Pit 348, section 5.2.1) were found in the interior of Henge 1. A single sherd of highly abraded prehistoric pottery (SF45, see Figure 4.29) was found on the surface of a modern plough furrow halfway between stone-hole Pit 565 and the concentration of five cremation deposits which included 631 and 632.

Figure 4.7 Cremation deposits *in situ* during excavation: (a) cremation deposit 640/1; (b) cremation deposit 628

4.3.2 The cremated human bone

Stephany Leach

Both direct and indirect evidence can be retrieved from archaeological excavations relating to the multiple stages of the cremation ritual and funerary process, from corpse preparation, pyre construction, burning of the body, sorting, selection and collection of burnt remains and associated funerary/grave goods, to the primary and perhaps secondary deposition of these remains (Mayne Correia and Beattie 2002; McKinley 2000; 2013). At Forteviot, we have direct evidence for activities that occurred after the cremation process. This summary account is supplemented by more detailed analysis of the cremated bone assemblage from Forteviot (Leach 2012; see also Noble and Brophy 2017).

Following methodologies outlined by Brickley and McKinley (2004), the material was sorted according to skeletal categories. Where possible, fragments were identified to a specific element, or zone of an element (Knüsel and Outram 2004), to assist with calculation of minimum number of elements (MNE) and therefore minimum number of individuals (MNI) within the sample. Although the cremated remains were disarticulated, possibly commingled and extremely fragmentary, the basic principles of age-at-death estimations and sex assignment were applied to the relevant identified fragments and the bone was also assessed for any signs of pathology or trauma. The weight of recovered cremated bone was also analysed in all cases. Cremated remains were macroscopically assessed in terms of bone surface colour, level of distortion or shrinkage, and fracture and cracking or fissure patterns to analyse pyre technologies and the biographies of the cremated remains.

The excavations within Henge 1 in 2009 identified nine discrete cremation deposits; in addition, extensive spreads of more dispersed cremated bone were recovered within silty deposits across the western interior zone of the henge (the circumstances of discovery are outlined above). The total weight of human cremated bone recovered was 8722g from nineteen contexts associated with the identified cremation cemetery (summarised in Tables 4.1 and 4.2, locations in Figure 4.4). The osseous evidence is suggestive of primary depositions or burials of cremated bones of several individuals, with some disturbance also evident.

Cremated remains in and around Pit 529

The largest number of deposits of cremated remains was found in association with large Pit 529 and the small pits cut into this feature, 650 and 651. In total the MNI estimate represented in the cremation deposits within these three cut features is between eight and ten individuals. These comprise four adults, including young and middle adults, one very young child or older infant, one adolescent, and two to four children.

Three discrete cremated bone deposits were excavated in Pit 529 and one each in the two smaller pit fills. The cremated bone identified from 529 included a minimum of two individuals – an adult and child – in Fill 530 (Figure 4.8), at least two individuals in 595, and one individual, perhaps a young child or gracile adult, in 596. Secondary Pit 650 was found to contain the remains of at least one child in Fill 640; the small amount of cremated bone (only 74g) may indicate the impact of later truncation. A fracture was noted in an adult cranial fragment in this deposit on the frontal region of the cranial vault. The outline, morphology and fracture surface – the smoothness, colouration and linear trajectory – all combine to indicate the presence of a perimortem (occurring around the time of death) trauma. The characteristics were indicative of a radiating fracture, commonly the result of blunt force injury to the cranium (Gurdjian *et al* 1950; Kaufman *et al* 1997). This is the feature that the small pottery vessel was recovered from. The remains from Fill 641 within Pit 651 represented the largest quantity of cremated remains recovered from a single context in the cremation cemetery, with a minimum number of four individuals identified (two adults and two children). Fragments of three pins were also recovered from this small feature. Dentition relating to the subadults in this context exhibited a developmental stress indicator in the form of linear enamel hypoplasia often associated with weaning stress (Roberts and Cox 2003). However, as the remains have been subject to intensive fire and recovered in a fragmentary and incomplete state, in these circumstances classification should remain tentative.

Figure 4.8 The cremated bone assemblage from deposit 530 during analysis

Spread of disturbed cremation deposits within silt layers

Silt deposits (558, 560, 631, 632) produced substantial quantities of cremated bone indicative of a disturbed primary deposit. Layers 550, 561, 593 contained only minimal amounts of bone, suggestive of disturbance 'residue' from primary deposits in this area. A fine early Neolithic leaf-shaped arrowhead (SF57; Figure 4.14, below) was found within silt layer 593 although the relationship between this and cremated bone in the vicinity was unclear. Cremated bone in deposit 558 represented the remains of a minimum number of two individuals (an adult and a child), albeit the child was represented by a single finger bone. Only one individual was represented in deposit 560, with the remains having a more 'bleached' or weathered/eroded quality than other cremated bones on-site, indicative of a different taphonomic history to other primary deposits. Variation in post-depositional environment or a delay in deposition of the cremated remains of this individual may be indicated. Deposits 631 and 632 represented a minimum number of two individuals, a young adult and an older child. The quantity of cremated bone in relation to the primary deposits identified in this area is less than those recovered from Pit 529. The assemblages from this area also exhibited a slightly higher level of surface erosion and fragmentation. This may be due to increased level of disturbance of these deposits, a harsher post-depositional environment (with burials not placed in any obvious cut feature), or it may relate to the level of 'effort' made during collection of material from the pyre.

Cremation deposits in and around stone socket 565

Several cremation deposits were located next to the standing stone stump. These include 628, a primary burial that appears to have been deposited within a round organic container (Figure 4.7). The total weight of human bone for this deposit was 212g, which is rather 'underweight' for a primary burial within this cremation cemetery, but within the normal range for archaeological cremation deposits (McKinley 1993; 2013). The cremated bone fragments consistently represented a young adult of gracile build. Fill 576 produced almost two-thirds of the bone assemblage recovered from this area, 1945g, and represents one of the highest concentrations of cremated bone found at Forteviot. A minimum number of three individuals was identified: two adults – one robust and one gracile in build – and an older child. Most of the regions of the skeleton were represented for each of the individuals identified, suggestive of multiple primary deposition, although post-depositional disturbance or admixture cannot be excluded as a possible scenario for the commingling of these remains. Small amounts of cremated bone (31g) were also recovered from the fill around the snapped standing stone (Fill 653), and an oval patch of dark silt (566) contained disturbed remains of a cremation (44g) including a fragment of a bone pin.

Cremation deposit 617

Three further contexts (599, 616 and 617) containing cremated human remains were identified to the east of stone-hole 565, all derived from a silt layer. The first two contexts represent only a few highly eroded fragments. The main deposit of cremated human bone derived from this area came from deposit 617 and represents a minimum number of two individuals: one gracile adult and one older child or adolescent. A total of 1144g of cremated bone was recovered, the fragments exhibiting a moderate amount of erosion. These remains possibly represent a primary deposition of the cremated remains, followed perhaps by a certain degree of post-depositional disturbance, this deposit not being placed within any obvious cut feature.

Discussion

A total of 8722g of cremated bone was recovered during the excavations within the western half of Forteviot Henge 1 in 2009. The calculated minimum estimate of individuals for the sampled area of the cemetery is eighteen; eleven adults and seven subadults. Due to the high degree of fragmentation and commingling of remains, it was not possible to assign sex to any of the adult remains with a high enough degree of certainty. However, the general build of an individual was noted for the adults within this death assemblage and a range of robust to gracile bones noted (Table 4.2). Although these results are based on a sample gained from only partial excavation of the original extent of the cemetery, and post-depositional disturbance of remains is indicated, a broad demographic range is represented. The range of this constructed age profile, including young and older children, adolescent and young to middle adult individuals, suggests this place of burial was not the preserve of a specific demographic group, but generally reflects the death profile of a community, although no babies or neonates were positively identified. There is one instance of an individual perhaps having suffered a head wound around the time of death but no other indications of violence, injury or ill health.

There are a few characteristics of the analysed cremated bone worth noting here. Firstly, almost all bone exhibited a high degree of thermal alteration; most of the fragments were highly calcined or oxidised, indicated by the pale colouration of the bone. Fracture patterns, in particular the curved transverse fractures or muscle shrinkage lines, indicate the deceased were placed on the pyre while still fully fleshed. This was especially evident in the cremation deposit found in silt layers 558 and 617, and deposits found within and around Pit 529. The evidence thus indicates an efficient pyre with sufficient resources to allow for lengthy periods of burning at high temperatures (ten hours minimum at up to 1200° according to Williams 2004, 271). McKinley (1995, 459), noted a similar efficiency in the cremation process (and thorough collection for deposition of remains, also evident at Forteviot), while analysing some of the cremated bone excavated from Stonehenge.

Secondly, the remains shed light on the process of gathering and depositing the cremated bone. Careful, meticulous and time-consuming collection of remains from the pyre site is indicated by the presence of two distal hand phalanges or 'fingertip' bones in context 595; wrist bones, small bones of the hands and feet and dental fragments from context 641 also indicate a careful process of bone collection from the pyre site. This also suggests the organic vessels in which the bones and teeth were placed were adequate to contain the remains effectively without accidental loss. However, this was not uniform across the assemblage and there is a suggestion that remains from deposits 558, 560, 631 and 632 were less rigorously gathered, while deposit 626 was 'underweight'. Varying levels of fragmentation of the remains also suggests slightly differing treatment of human remains upon collection, and it is worth noting that the context of deposition varied between burials as well.

Thirdly, there is an unusually high preponderance of commingled remains compared to other prehistoric cremations. At Forteviot, just over 50% of the cremation deposits analysed consisted of two or more individuals. This is evident in a range of deposits which contained a minimum number of two individuals (530, 558, 595, 617, 631), three (576) and even four (641). Differential erosion and post-cremation treatment suggests not all commingled remains were of individuals who died or were cremated at the same time; remains may have been gathered at a later date, or curated. For instance, remains found in 560 had a 'bleached' or weathered/eroded quality, suggesting they were deposited some time after the cremation took place. Analysis of the remains of the three individuals represented in deposit 576 suggests approximately 50% of the bone fragments exhibited a degree of surface erosion, while the remainder lacked evidence of such modification. This implies some level of disturbance or a differential taphonomic history for half of this assemblage. McKinley (1994, 100–2; 1997, 142) suggests that where such burials occur, they usually consist of an adult and child, and for the most part this accords with Forteviot. The inclusion of a child's finger bone with the cremated remains of an adult (in deposit 558) is a powerful indicator of the kinds of relationships that may have been maintained amongst the dead at Forteviot.

4.3.3 Bone pins

Stephany Leach and Alison Sheridan, with Kenneth Brophy

Sixteen fragments of burnt worked bone pins were identified within the cremated bone assemblage from the cremation cemetery, from six contexts (summarised in Table 4.3; Figure 4.9). Refitting the fragments revealed that some eight or nine pins are represented (Figure 4.10). Fragments of three of these pins came from the feature with the largest estimated number of individuals present (two adults, two children) and the heaviest cremated bone weight, namely deposit 641 within Pit 651. For all but two pins, the shaft fragments are cylindrical in shape, and where present and undamaged, the heads of the pins are rounded and slightly bulbous. The pins are unperforated. While most are straight, three are curved – including Pin 8, the slenderest pin – and this curvature will have resulted from distortion during the cremation process, as discussed below. The diameter of the shafts at their widest point ranges from 3.4mm to 7.0mm and the average shaft diameter is 5.2mm; the pin head or bulb thickness ranges from 6.3mm to 7.3mm. The best-preserved example, Pin 1, was over 125mm long and could originally have been up to 150mm in length. The pins are long and slender, tapering to a sharp point, and are of a type known as 'skewer' pins (Atkinson *et al* 1951, 72). It was not possible to determine the mammal species or the body part from which the pins had been made (Noble and Brophy 2017, 10), and since they are calcined, ZooMS (ZooArchaeology by Mass Spectrometry) is unlikely to succeed with species identification.

As noted above, all the pin fragments exhibit evidence of thermal alteration – they are white, hard and brittle, and some exhibit cracking and deformation – indicating that they had passed through the pyre and had been collected along with the cremated

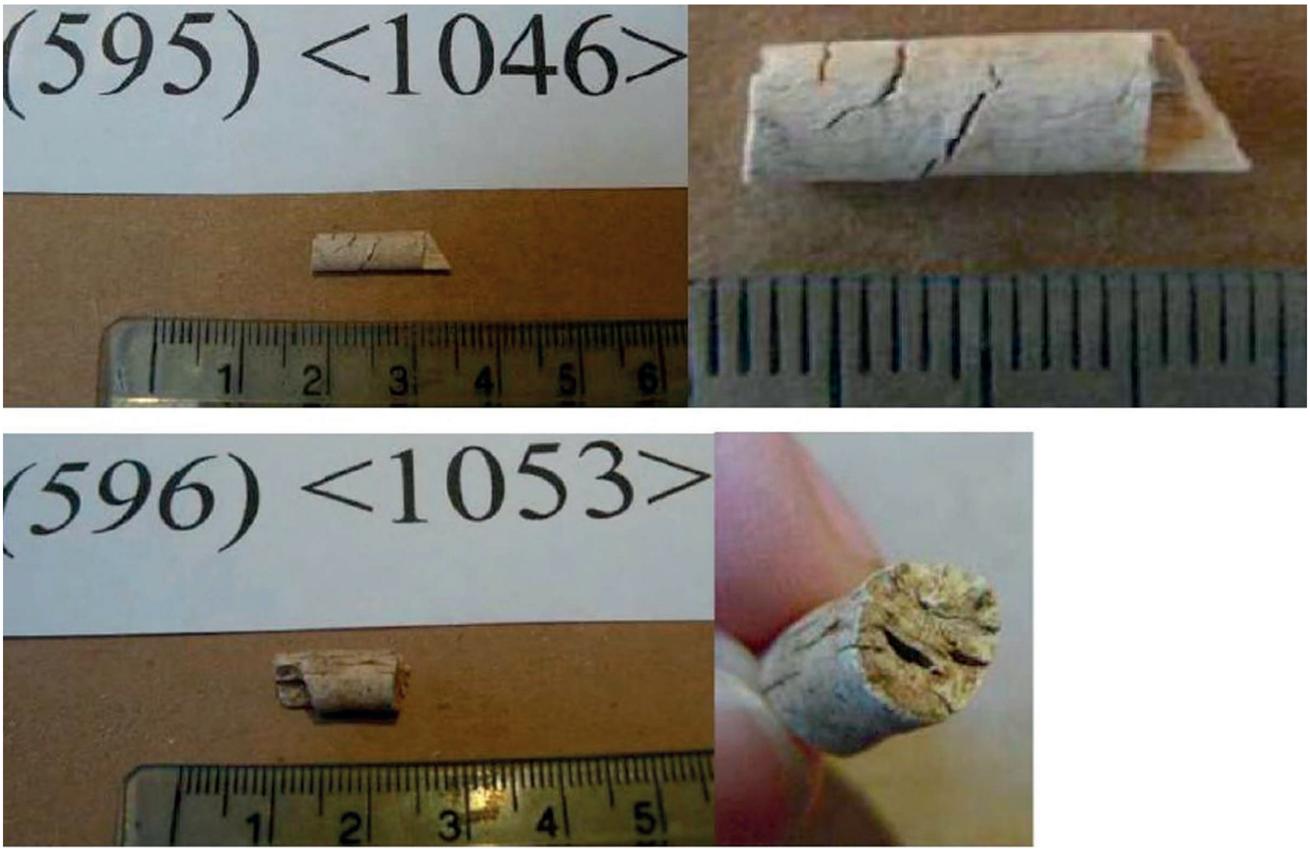


Figure 4.9 Photograph of the bone pins

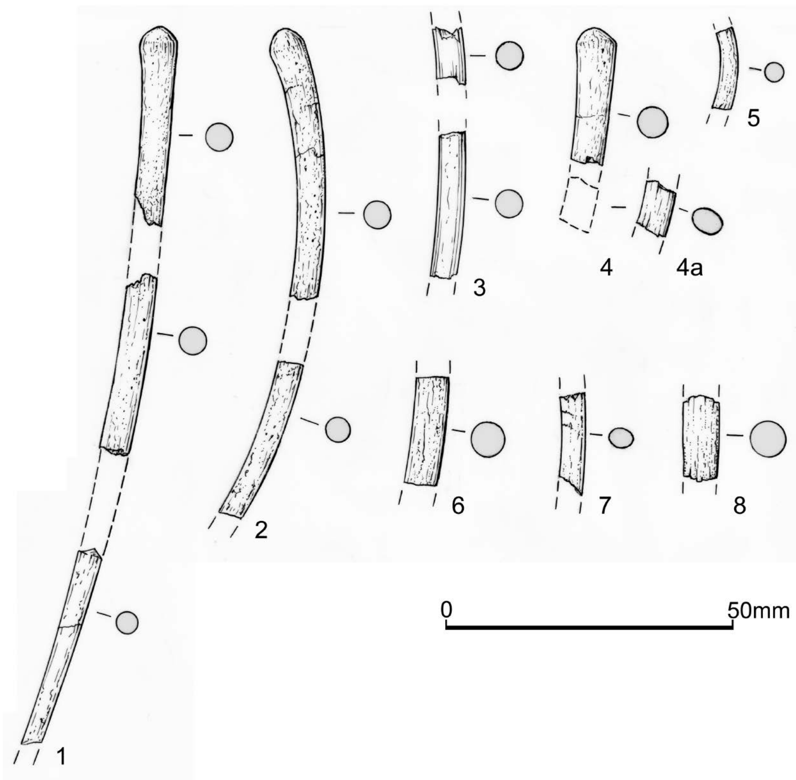


Figure 4.10 Drawing by Marion O'Neil of the Forteviot cremation cemetery bone pins (© National Museums Scotland)

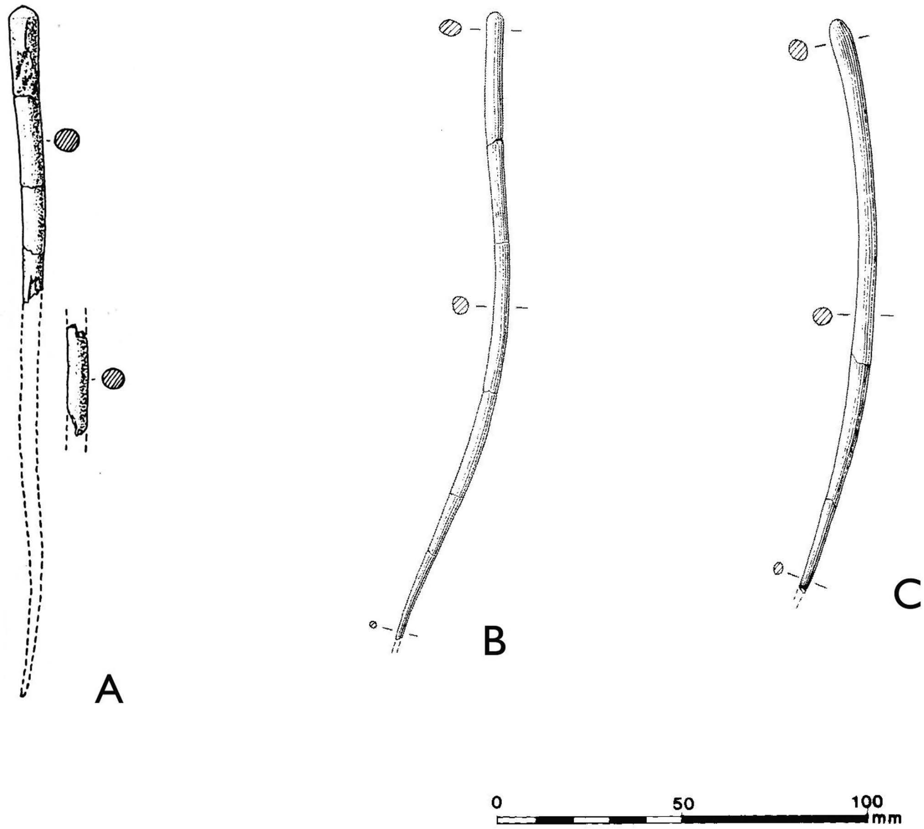


Figure 4.11 Drawings of bone pins from other late Neolithic cremation cemeteries: (a) Cairnpapple Hill (Barclay 1999, 28); (b) Stonehenge No 9; (c) Stonehenge No 10 (Montague 1995, 413)

remains. They are highly likely to have been used to pin the garments in which the deceased were cremated. That the curvature of some of the pins was the result of burning, and was not an original design feature (*contra* Montague 1995, 409), has been demonstrated through experimental cremation of a long, slender antler pin by one of the authors (Sheridan 2010a). The pin was straight when it was used to pin together the funerary garment that was wrapped around a pig corpse and placed on the pyre, but after the cremation it came out curved.

It was not possible to discern any patterning between the size or thickness of the pins and the age of the deceased, and in only two instances (Pins 6 and 8) were pins found in association with a single person's remains (a subadult and an adult respectively).

Bone skewer pins are known from middle to late Neolithic and from early Bronze Age funerary contexts (Figure 4.11). Few additions can be made to the list of pins compiled by Atkinson *et al* (1951, 142–4). They are usually found in association with cremated human remains, the geographically closest example being two from a pre-henge Neolithic cemetery at Cairnpapple (Piggott 1950, fig. 14; Barclay 1999b; Figure 4.11A). One of those pins has been radiocarbon-dated to 3350–3020 cal BC (SUERC-25561, 4470±35 BP: Sheridan *et al* 2009) and this appears to pre-date the Forteviot pins. No other examples of similar style to the Forteviot pins have been discovered in Scotland; while Atkinson *et al*'s 1951 list included Orcadian pins from Quoyness and Skara Brae, these are markedly different in design from skewer pins and they do not provide valid *comparanda* for the Forteviot examples (Noble and Brophy 2017, 11).

The skewer pins found with cremated human remains in and near the Aubrey Holes at Stonehenge (Montague 1995) display striking similarities, in both form and dimensions, to those found at Forteviot (Figure 4.11B and C), with both cemeteries being closely contemporary (see below). The maximum, minimum, and average shaft diameters of the (at least) six pins recovered from Stonehenge, 4.0mm–6.9mm and 5.3mm respectively, are almost identical to the Forteviot pin dimensions. All the Stonehenge pins were burnt and associated with late Neolithic deposits of cremated human remains. These pins were possibly made from long bone shafts of cattle or red deer. Some of the pin fragments at Stonehenge also exhibited a degree of curvature, like the Forteviot fragments; as noted above, Montague's claim that this was part of their original morphology, rather than the result of warping during cremation (*ibid*, 409), can be challenged given the clear evidence of the phenomenon that has been obtained from experimental cremation.

Six calcined skewer pins were found at Sites I and II at Dorchester-on-Thames, Oxfordshire, each associated with a deposit of cremated human remains (Atkinson *et al* 1951, 142; Kinnes 1979, 19; Whittle *et al* 1992, 196). These pins are generally in a much less-fragmented state than the pins from Forteviot and Stonehenge, although they are comparably twisted and bent. One short skewer pin was made from the tooth root of a large ox or aurochs (Atkinson *et al* 1951, 115), while the others are of bone. Another Neolithic site with bone skewer pins is Duggleby Howe, East Yorkshire, where an unburnt example was found behind the back of an adult unburnt skeleton (Burial C) and dated to the centuries around 3000 cal BC. Three further pins (two skewer, one side-looped, all calcined) were also identified at this site. These were associated with some of the 53 deposits of cremated remains found in the mound at Duggleby Howe, and although the dating of these remains is problematic, they are believed to have been deposited during the first quarter of the 3rd millennium BC (Gibson and Bayliss 2009, 39, 69–70). The remainder of similar plain bone skewer pins have been found with unburnt human remains (Atkinson *et al* 1951, 142–3).

As noted above, it is generally believed that such pins were used on funerary garments worn by the deceased on the pyre. Parker Pearson has suggested that pins may have been an element of specialist clothing or robes worn by the elite at Stonehenge – 'religious specialists' (Parker Pearson 2012, 201). The imbalance between the number of deceased individuals and the number of pins at Forteviot is typical, and in general there are fewer of the latter. It seems that either pins were not suitable, or needed, for everyone, or else alternatives such as wooden pins or other means to fasten garments were used in some cases. The association of bone pins with children at Forteviot is, however, rare: usually skewer pins are found with the remains of adults (Whittle *et al* 1992; Garwood and Barclay 2011, 401).

Atkinson *et al* (1951, 72) suggested that such pins have a recurring Grooved Ware association, and while it is true that many were clearly in use at the same time as Grooved Ware and associated artefact types, it needs to be emphasised that none has actually been directly associated with Grooved Ware. That said, the incised decoration on the small 'chafing dish' from Aubrey Hole 29 at Stonehenge (Cleal 1995, fig 192) has elements in common with incised Grooved Ware, and Grooved Ware sherds were found in the primary ditch fill at Stonehenge; Grooved Ware was also recovered from the old ground surface and ditch fill at site I, but not in direct association with any of the deposits of cremated remains. In this respect it is worth highlighting that the small, cup-shaped 'chafing vessel' from Pit 650 at Forteviot, described below (section 4.3.4), is definitely not from the Grooved Ware tradition. Moreover, no enclosed cemeteries of cremated remains have been found in Orkney, where Grooved Ware originated, and these facts, together with the seemingly early date for the dated antler pin from Cairnpapple, raise the question of whether the tradition of burying cremated remains in cemeteries such as the one at Forteviot had its origins outside, and prior to, the Grooved Ware tradition (cf Kinnes 1979; Parker Pearson *et al* 2009). The cultural associations of bone skewer pins will be returned to below and in section 8.3.

4.3.4 Pottery chafing vessel

Alison Sheridan

Eight sherds and six fragments, constituting around 90% of a small pot, were found in association with the cremated remains of a small child and fragments of three pins within Pit 650. The pot is hemispherical and cup-like, with an upright and pointed rim, tapering body and a slightly flattened round base (Figures 4.12 and 4.13). The rim diameter is *c* 56mm, the estimated height is 38mm, and the maximum wall thickness is 9mm. The pot was made by pinching up a lump of clay; perhaps as a result, its surface is slightly uneven. The fabric has sparse inclusions (*c* 3–5% in density), consisting of subangular and rounded fragments of stone up to 3.0mm by 2.5mm in size; these have been burnt to a whitish colour, with one fragment speckled grey and cream. The pot has been thoroughly oxidised: its exterior is buff and light brown, the core is buff, and the interior is buff and light pink. The sherds and fragments are soft and abraded. All of this points to the pot having been burnt on the pyre, and this may indicate its function: it may have been a chafing vessel, used for carrying burning embers with which to light

Figure 4.12 Photograph of the reconstructed chafing vessel. The diameter of this vessel is 56mm, height 38mm, and wall thickness up to 9mm (© National Museums Scotland)

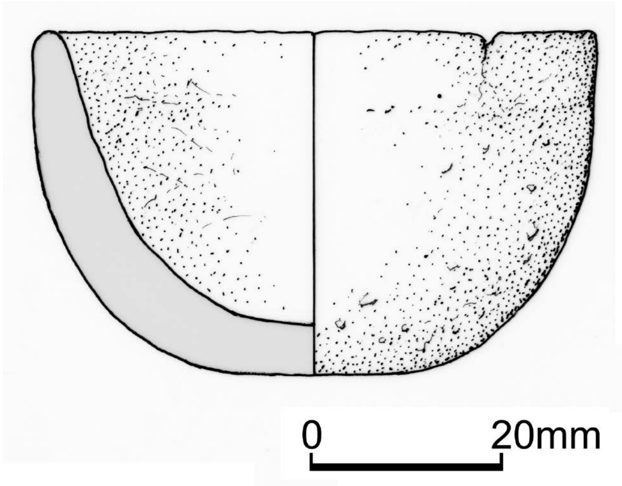


Figure 4.13 Drawing of the chafing vessel (Marion O' Neil; © National Museums Scotland)

the pyre – a function that has been postulated for similarly small vessels, so-called 'accessory vessels' or 'cups', found in early Bronze Age funerary contexts in Britain (Mortimer 1905; Gibson 2004).

The implication is that having served their purpose in helping to get the pyre lit, such vessels were placed on the burning pyre. There are also late Neolithic *comparanda*, on the Isle of Man (eg at the cemetery at Ballateare where cup-like pots have been associated with Ronaldsway cinerary urns: Bersu 1947, 166) and in southern England. The latter comprise two similar small, shallow dished objects, one decorated with an incised design and found associated with cremated remains in one of the Aubrey Holes at Stonehenge (Cleal 1995, 360–1), the other found at Wareham House, Dorset (Parker Pearson 2012, 318). Further probable examples have been identified by Claire Copper (pers comm) from barrows at Bincombe 27 (Grinsell 1982, 34) and Wilsford G50 (Piggott 1938, 105). Ros Cleal has suggested (1995, 361; A Barclay 1999, 74 and figure 4.32) that two tiny pots from pits with Grooved Ware at Barrow Hills, Radley, Oxfordshire, may well be additional examples of this type of object.

The Forteviot pot is the earliest ceramic vessel from a securely dated context to be identified at the site. Its stylistic affinities are with the early Neolithic Carinated Bowl tradition, and even though that tradition had effectively died out well before 3000 BC, the evidence from Meadowend Farm, Clackmannanshire has shown that undecorated hemispherical cups were still in use towards the end of the 4th millennium BC (Sheridan 2016; 2017, 12). As noted above, the Forteviot pot's design owes nothing to the Grooved Ware ceramic tradition.

4.3.5 Lithics

Dene Wright

The early Neolithic fine leaf-shaped arrowhead (SF57; Figure 4.14) found within silt layer 593 is made from baked siltstone, and shows indications of invasive bifacial retouch. The tip is missing, which most likely happened during manufacture. It measures 25mm by 17mm by 3mm and is stylistically similar to a leaf-shaped arrowhead (SF79) found in the lower fills of the henge ditch on the south side of the monument (section 4.5.5). There is a reddish patch on one side, possibly iron staining (Alison Sheridan pers comm),

Figure 4.14 Photograph of the baked siltstone arrowhead (© National Museums Scotland)

making this a visually distinctive object. The second lithic recovered from the zone of the cremation cemetery was a medial fragment of a regular flint blade recovered from within a sample (1041) of cremated bone taken from deposit 617. It was not burnt and so not on the pyre with the deceased but may have been buried with the human remains.

4.3.6 Dating the cremation cemetery

Derek Hamilton

Four of the nine cremation deposits excavated in the area bounded by the ditch for Henge 1 were radiocarbon dated (Table 2.4; Figure 4.15). A sample of cremated bone (SUERC-29188) and alder charcoal (SUERC-29185) were dated from small cremation Pit 651 which contained the remains of four individuals and fragments of three pins. These two results are statistically consistent and could be the same actual age (T'=1.7; v=1; T'(5%)=3.8).

There is another pair of results on cremated bone (SUERC-29186) and a fragment of gorse/broom charcoal (SUERC-29180) from a cremation deposit 616/617.

SUERC-29180 (617) is late/post-medieval in date. This cremation deposit was in the area within the henge most disturbed by later activity, and this fragment of charcoal is likely to have been incorporated into the feature through later disturbance. The

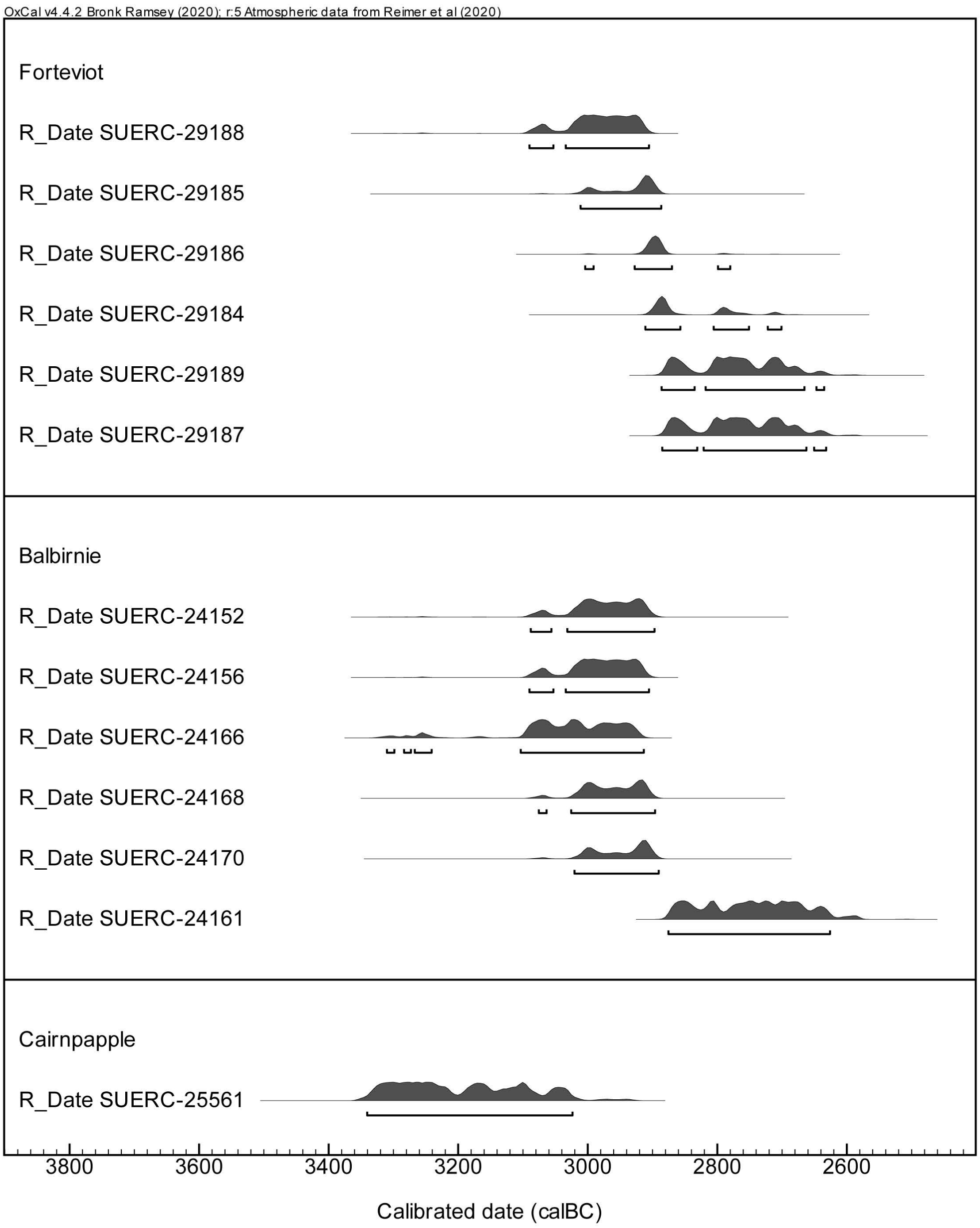


Figure 4.15 Radiocarbon dates associated with Neolithic cremation cemeteries in Scotland (dates are given at 95% probability; data from this volume Table 2.4; Gibson 2011, table 2; Sheridan *et al* 2008; image prepared by Phil Barratt)

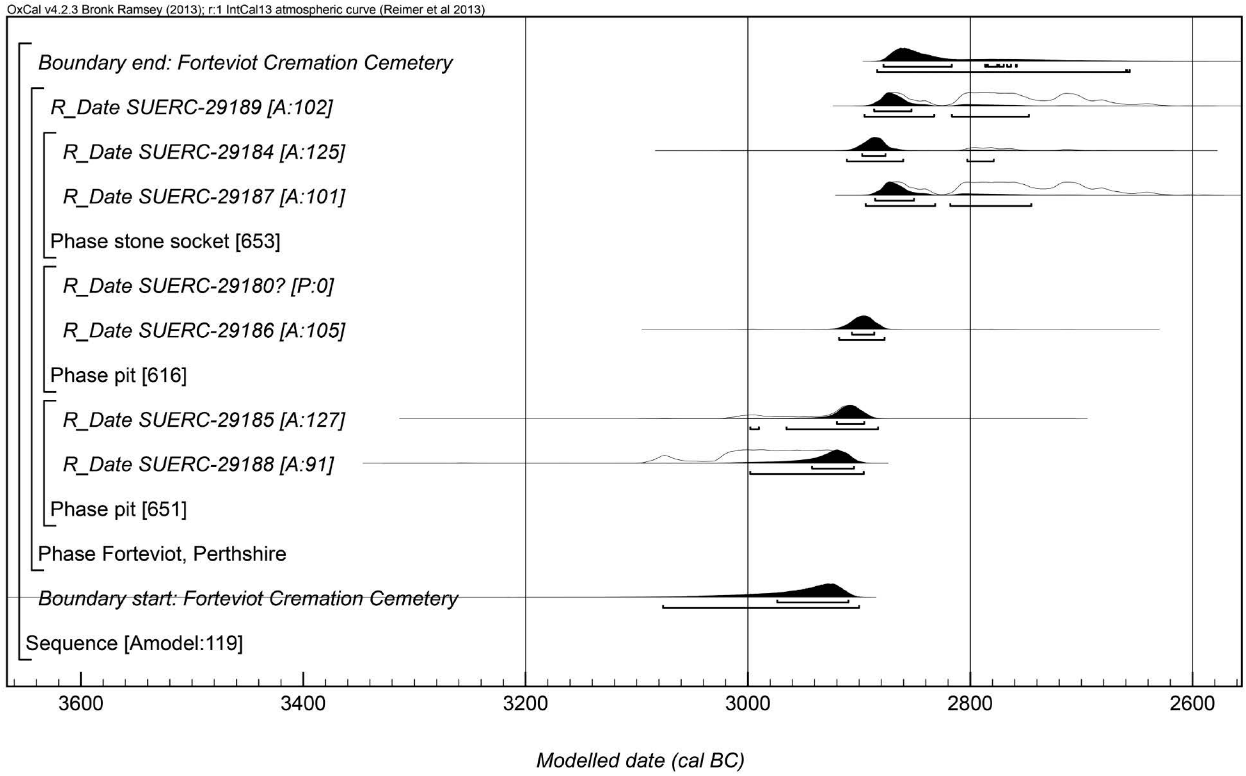


Figure 4.16 Chronological model for the dated cremation activity at Forteviot. Each distribution represents the relative probability that an event occurred at some particular time (prepared by Derek Hamilton, from Noble & Brophy 2017, figure 9)

charcoal in this feature was inconsistent with prehistoric pyre material (Ramsay 2009, 2) reinforcing the suggestion it entered the context by way of disturbance. It has been excluded from any further modelling.

There are also two results on cremated human bone (SUERC-29187) and a fragment of alder charcoal (SUERC-29184) from Fill 653 adjacent to the standing stone stump. The two results are statistically consistent (T'=2.3; v=1; T'(5%)=3.8) and could be the same actual age.

A final result (SUERC-29189) is available on cremated bone recovered from Pit 529.

After excluding SUERC-29180, the remaining radiocarbon results do not pass a χ^2 test (T'=32.7; v=5; T'(5%)=11.1) suggesting that there is some longevity to the activity associated with the cremation cemetery.

The Bayesian modelling of the dates for the cremation cemetery (Figure 4.16) suggests that it was established in the period *3080–2900 cal BC* (*95%*), and probably in *2975–2910 cal BC* (*68% probability*). The cremation activity at Henge 1 may have ended in *2890–2650 cal BC* (*95%*), and probably in the period *2880–2755 cal BC* (*68% probability*).

4.3.7 The practicalities and politics of cremation rites at Forteviot

Kenneth Brophy and Gordon Noble

The cremation deposits found at Forteviot, once we had established the chronology of the burials, took on a greater significance in the story of this place than we had initially envisaged. The modest burials of the cremated remains of adults and children in this location, carried carefully from pyres an unknown distance away, set in chain a series of events that concluded with the establishment of a rich dagger-burial the best part of a millennium later just a few metres away. Here, we will consider what the evidence from Forteviot and similar sites can tell us about the appearance, role and significance of this cemetery. Broader implications related to place-making and socio-ideological change in the late Neolithic will be discussed in section 8.3.

The form and full extent of the cemetery remains unknown. The cremated deposits, at least some of which were in organic vessels, appear to have been placed in a series of pits set into an arc arrangement (although we will never know if this was originally a

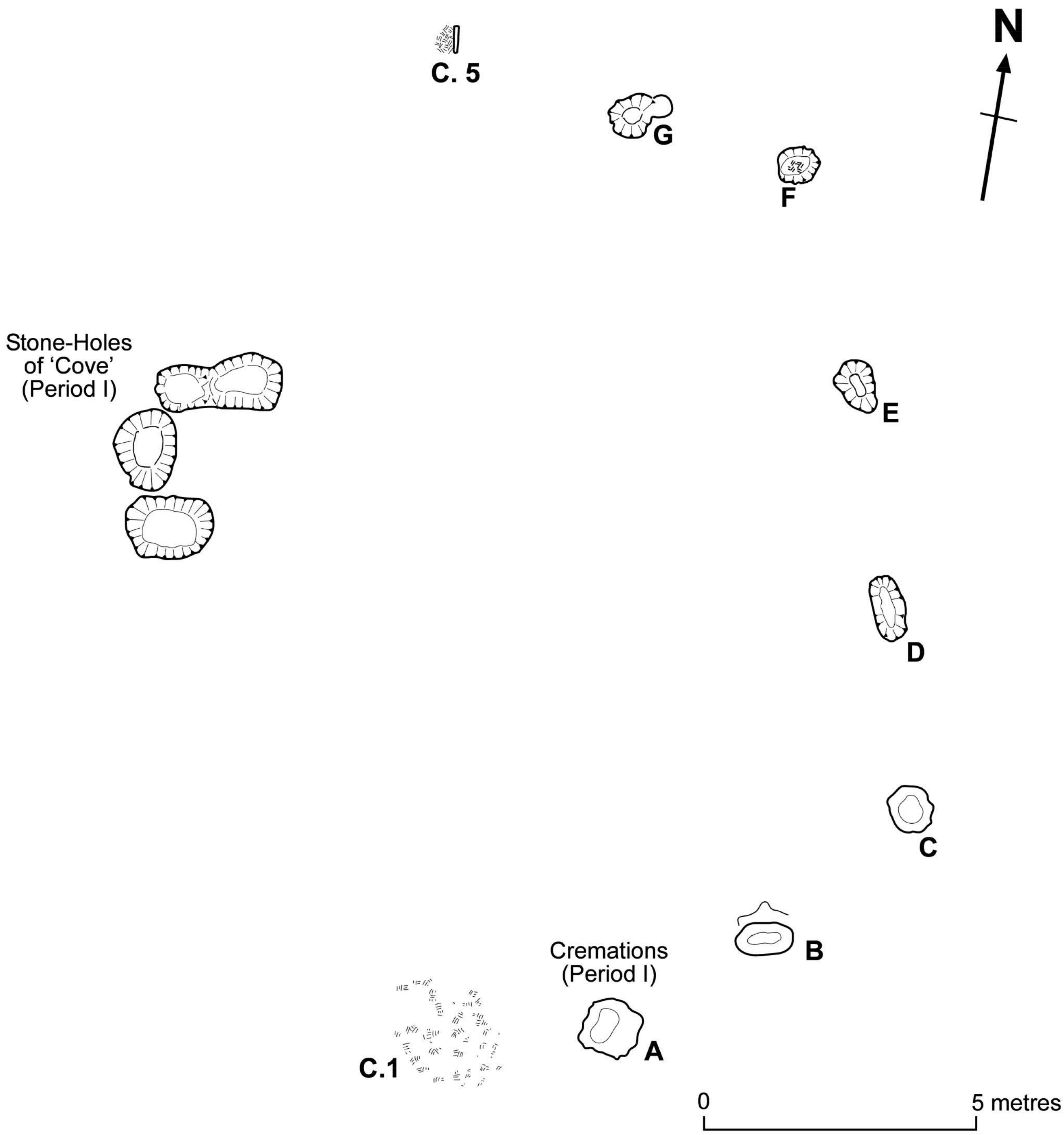


Figure 4.17 The arc setting of features at Cairnpapple Hill associated with cremated human remains (redrawn from Piggott 1948 and Barclay 1999 by Alison Sandison, after Noble & Brophy 2017, figure 19)

complete circle of features). This arrangement echoes other late Neolithic cremation cemeteries identified in Scotland; an arc of pits which may or may not have held standing stones at Cairnpapple resembles the arrangement of features identified at Forteviot (Piggott 1948; Figure 4.17). Some cremated bone deposits, however, were not associated with a cut feature. It is possible this indicates that burials were secured with an earthen mound, perhaps of multiple phases, the silt layers on site representing the lower horizons of that feature. The final mounded appearance of the cemetery is also hinted at by the uncanny replication of the arc of cremation-associated features in the henge ditch suggesting the timber circle and then the henge were constructed to enclose concentrically a low mound. This may explain why there is no timber circle within the henge (as is the norm where such monuments occur together). Some early Bronze Age cremation cemeteries (such as Balneaves Cottage, Angus, and nearer by, Belhie) were contained within small penannular enclosures, and we cannot rule out a similar arrangement at Forteviot, replaced by the later and much larger henge ditch.

The broken standing stone tells us that at least one monolith stood here, erected before cremations were placed within its socket, but broken at an unknown point in antiquity, probably before cremation deposits were placed beside it. There is no obvious disturbance of those burials (including the coherent circular deposit 628), suggesting human remains were placed in this hole following the breaking of the standing stone along with at least one fragment of the stone. It is possible that a larger stone setting or circle once stood at Forteviot; Pit 529 could have held a standing stone that was simply removed before its use for burials. The association between this monument, and a buried probable late Neolithic standing stone 60m to the north (section 7.2.3), is unclear, but adds weight to the suggestion multiple monoliths stood here in the Neolithic.

Associations between cremation burials and standing stones in the late Neolithic is a common theme in eastern lowland Scotland. The remains of the snapped standing stone at Forteviot lends weight to Piggott's (1948) suggestion that standing stones also stood at Cairnpapple albeit we cannot be sure of how these might relate chronologically to the Neolithic cremation deposits found there (Barclay 1999b; Younger 2016a). If there was a stone circle here, it too, like Forteviot, was dismantled and re-purposed, with at least one monolith built into a Bronze Age cairn on site (Piggott 1948; Barclay 1999b). The stone circle at Balbirnie, Fife, in a location where another late Neolithic cremation cemetery has been identified, was more enduring, with the stones remaining in place even after the insertion of a series of Bronze Age burials and the conversion of the site into a cairn (Gibson 2011, 63). At Orwell, Perth and Kinross, a cremation deposit found near the top of a standing stone socket (one of a pair of megaliths) has been dated to 2875–2580 cal BC (4180 ± 35BP; SUERC-18309). Finds from the 19th century in the vicinity suggest that these megaliths may have been an enduring focus for burial (Ritchie 1974, 8–9; Sheridan 2008, 201). It is possible that Pit 529 actually held a timber post rather than a standing stone, and associations between late Neolithic cremation burials and timber structures are not unheard of, with examples of this found at Raigmore, Highland (Simpson 1997) and Balfarg Riding School, Fife (Barclay and Russell-White 1994).

While the form and extent of the cemetery is unknown or unclear, we can say a little more about the funerary rites that were undertaken here, although we have little sense of where this process had its public focus – the pyre. Nearly all the late Neolithic cremation cemeteries in Britain are plough-truncated sites, meaning that actual pyre sites are absent. Even with preserved ground surfaces, pyre sites are notoriously hard to identify (McKinley 1997). However, it is likely that the pyres would not be far from the final places of deposition of materials from that pyre; at Stonehenge, for instance, McKinley (1995, 461) notes that some of the cremations in the Aubrey Holes included pyre debris which may imply at least some of the cremations were actually carried out at the monument itself. Material found associated with cremation deposits at sites such as Dorchester-on-Thames is often indicative of pyre material, gathered up with human remains (cf Atkinson *et al* 1951, 33). Charcoal recovered with cremated bone at Forteviot suggests pyre material of oak and alder (Ramsay 2009, 2). Such carbonised material may have had a power of its own, or been taboo, with a requirement for disposal in an appropriate manner and place.

The highly unusual chafing vessel gives a sense of a mechanism for fire-starting, suggesting a ceremonial formality to events, and the subsequent association of this vessel with the burial of a child is intriguing. It could be argued that this was a child's small pot, re-purposed for the funerary rite and buried as a grave good; however, it could also have been made specifically to serve a pyre-lighting role (Graham Taylor pers comm). The presence of calcined pins mixed with cremation deposits suggests they were, like the pot, burned on the pyre. It is likely the pins formed part of the funerary ensemble, either in the form of a 'shroud' pin, or an item of decoration, jewellery, or a clothing or hair accessory. They suggest that some of the dead may have been dressed in particular ways for the cremation events, either suitable for such a death, or formal dress representing a social role or position. Pins did not accompany all individuals and clothing may have been one of the ways in which individuals were differentiated in life *and* death.

The process of burning the body of a family and community member on a pyre would have been a visceral and memorable experience (see Figure 8.2) and may have played a significant role in place-making and mythologising this location (Brophy *et al* 2018). Williams (2004, 271) has written vividly about the destructive forces of fire on the body as it burns on the pyre, pointing out that, 'as the body was heated, the evaporation of the bodily liquids may have occurred so speedily that jets of steam sprayed from the body' and 'the bony frame of the body and the skull' would quickly be revealed. Cremation as a practice would presumably, have been, a public spectacle and it has recently been argued (Brophy *et al* 2018) that the emotional and sensory experience of witnessing the pyre up close may have generated 'flashbulb memories' that mythologised the person, time and place of the cremation.

There are several traits of the burials at Forteviot that hint at pyre processes and subsequent events. A striking element of the Forteviot cremations is the inclusion of very small bones in the cremation deposits – clearly much effort had been expended collecting the remains of the dead from the pyres. All the Forteviot cremations also exhibited evidence for a high degree of 'pyre efficiency' – the pyres had been well made, and plentiful firewood was used to ensure burning for the extended period at high temperatures needed to get the job done. The material remains of the dead were clearly important to the mourners at Forteviot. Most cremation deposits included very small bones such as the fingertip bones as in context (595) or the wrist bones, small bones of hands and feet and dental fragments in (641). These examples indicate careful and meticulous collection of remains from the pyre site(s). At Dorchester-on-Thames, the lack of wood charcoal and the clean nature of the bones suggests that at least some of the cremated bones had been washed prior to deposition (Atkinson *et al* 1951, 46–7). The proper and careful treatment of the dead was an important part of the ceremonies conducted at late Neolithic monument complexes (Parker Pearson *et al* 2009; Noble and Brophy 2017), which again highlights the importance of the dead and their material remains in the acts of commemoration conducted in these landscapes.

Taphonomic variability identified at Forteviot suggests that not all remains were treated in the same way after cremation; different periods of time between burning and interment were also evident. Most of the cremated remains had a fresh appearance suggesting that remains had been picked from the cremation pyres and then buried soon after burning, but one deposit, with a 'bleached' or weathered appearance (560), suggests some examples may have lain exposed for a period of time before being collected. Differential levels of abrasion could also be explained by disturbance, weather conditions or even pyre efficiency. We would argue that the generally fresh remains suggest that some cremation deposits were kept safe in containers prior to being deposited along with another cremated individual's remains at a later date. It is possible that a motivation for doing this was allowing the remains of certain people to be buried together, i.e. two people who died some period apart (eg parent and child) but who had to be connected in death. This time lag and the curation of bones may also have been an opportunity for some remains to be kept back, or used in other contexts, as keepsakes or for memorialisation purposes (eg ground up and put into pottery, or used as an amulet); it is worth reinforcing in this context that no burials at Forteviot consisted of complete remains of individuals despite the care taken to collect very small bones. Once again, however, the pyre and weather conditions during the cremation process can mean that some of the body turns to ash and blows away; thus there is more than one potential explanation for incomplete sets of calcined remains (Alison Sheridan pers comm).

What is also striking about the Forteviot cremations is the deposition of multiple individuals in the same acts of deposition. This appears to have been a very deliberate and unusual act, for the repeated occurrence of mixed adult and child cremations is rare. In an analysis of over 4000 prehistoric cremation burials, McKinley (1997, 130) found only 5% were of more than one individual; the proportion is 50% at Forteviot. In this respect, it seems likely that the mixed deposits of cremated remains at Forteviot were part of a deliberate statement of the relatedness or lineage of the dead. The Forteviot burials appear to have been an attempt to express tangibly the importance and interlinked nature of those buried, whether they were from the same family or not (the nature of these remains means that we cannot determine any familial connection). Such commingling was noted by the excavator at the early Bronze Age henge and barrow at nearby North Mains, Strathallan (Barclay 1984); here the excavator made the point that mixing of remains might have happened unintentionally had the same pyre site been in use (*ibid*, 186), which might also explain taphonomic variability at Forteviot. However, other factors of care and preponderance still suggest it is more likely this was a deliberate strategy.

The development of the Forteviot cremation cemetery appears to be informative with regards to the ways in which burial may have been used to materialise specific genealogies or histories of the dead in the late Neolithic. These histories and genealogies may have helped legitimise social and political constitutions at this socially fluid juncture in prehistory (Lewis 1962, 35). Indeed, through the collective burial of individuals the identities of the dead could be distributed and amalgamated, perhaps even taking on a group or 'dividual' quality rather than commemorating defined individuals (Brück 2004a; Fowler 2004). This may go some way to explaining the lack of grave goods at Forteviot (other than the pottery). In this respect, we should recognise the power of cremation to reduce the individual identity through the destructive process of the cremation pyre, allowing the group and collective identity to be emphasised and materialised, which differs from collective views on the individual and Bronze Age burial practice (cf Barrett 1994).

We also know that this location was used for several generations. Modelling of the dates suggest the cemetery may have been in use for between one and six generations (68% probability, Noble and Brophy 2011, 14). Stratigraphic relationships at Forteviot also indicated that some burial deposits were placed in the ground later than others although the periods of time in between are impossible to tell. There is evidence for long-term use of cemeteries elsewhere, including Stonehenge, Cairnpapple, and Dorchester-on-Thames, suggesting the repeated use of a few special locations for cremation over several generations. Likewise, at Balbirnie radiocarbon dating suggests several secondary cremation deposits were inserted after the initial phase of use in the 31st to 29th century BC. It is, however, difficult even with current levels of radiocarbon dating technology to construe the numbers of people buried at specific points in prehistory. It may be that late Neolithic cremation cemeteries started with relatively modest numbers of cremations that built up over time with successive interments. Alternatively, a large number of burials may have been put in place initially, followed by only occasional secondary additions in the coming decades. More than likely, differing sites varied in this regard, with variable strategies for memorialising the dead and different circumstances surrounding inheritance amongst the living in operation in different communities across Britain. However, through time, all of these cemeteries did become major monument complexes or complex monuments (Noble and Brophy 2017), a theme taken up in section 8.3.

Who were the people whose remains were placed with such care here? Parker Pearson (*et al* 2009; Parker Pearson 2012) has suggested that the Stonehenge Neolithic cremation cemetery may have been founded by a ruling elite whose hereditary hold on power was secured through a monopoly on subsequent monument building at Stonehenge. Atkinson (*et al* 1951, 79) argued for a similar scenario, suggesting that the cemetery populations at Dorchester-on-Thames represented no more than one or two families depositing their dead over a number of generations, proposing that this tallied with the size and structure of the cremation monuments, none of which exceeded the capabilities of a single family to construct. It is possible that the burials at Forteviot may have been from a founding family or lineage whose kin had important roles to play in the development of the Forteviot monument complex built over the subsequent generations (Noble and Brophy 2011b, 799). The demographic evidence from the analysis of the mortuary population supports this. As Leach highlights above, the people buried at Forteviot reflect the common death profile of a community rather than burial of a specific demographic or social group as might have been expected had these all been a religious class or elite. Similarly, as McKinley (1995) has argued for the Stonehenge cremation cemetery, the rigorous collection and treatment of cremated remains is further indication of the status of the interred.

The cremation activity discovered within Henge 1 is not the only evidence we have for cremation at Forteviot although nowhere else are such large and formal burial deposits evident. Radiocarbon dates are limited for fragments of cremated bone found in the upper fills of palisaded enclosure postholes and pyre pits in the entrance zone of the palisaded enclosure, although all of these were later than the cremation cemetery and some belonged to the early medieval period (section 3.5). As we will argue in Chapter 8, the establishment of the cremation cemetery at Forteviot appears to have been a pivotal event that catalysed a chain of events which spanned that enormous period. The first significant indication of this was the enclosing of the cremation cemetery location within timber and earthwork enclosures.

4.4 The timber circle

As noted above, cropmarks of what appeared to be a timber circle with a diameter of up to 45m enclosing the henge ditch were identified in the early seasons of reconnaissance over Forteviot (St

Table 4.4 Summary of the postholes on the boundary of the timber circle that were exposed and planned during SERF excavations in 2008 and 2009. Unexcavated features have not been included as these were obscured by silt bands

Posthole	Location	Excavation	Dimensions	Depth	Postpipe?	Ramp axis
317	North side	Half-section	0.95 × 0.95	0.7	No	NE?
332	North side	Half-section	1.6 × 1.2	0.8	0.5	E
551	South side	Fully excavated	0.9 × 0.9	0.58	0.35	No ramp
505	South side	Fully excavated	1.1 × 1.1	0.93	0.26	NNE
501	South side	Fully excavated	0.90 × 0.85	0.79	0.35	NNE

Joseph 1978). This monument was investigated in Trench D over two seasons of excavation (Figure 4.3). In total, seven postholes of the timber circle were identified and planned within these trenches. Two were on the northern boundary, Postholes 317 and 332, both excavated to half-section; five were on the southern boundary, three of which were excavated (west to east, Postholes 505, 501 and 551) and two unexcavated (634, 613). Summaries of the dimensions of each of these features can be found in Table 4.4 (and see Figure 4.18). Radiocarbon dates subsequently showed this to be a monument of the late Neolithic, post-dating the palisaded enclosure and pre-dating Henge 1. St Joseph (1978) suggested that the timber circle was defined by 22 posts; that being the case we investigated 20% of the features of the boundary.

4.4.1 The timber circle postholes

The two postholes on the north side of the circle were 4m apart from one another, and 5m to the north-east of henge ditch 340. Not enough of this area was exposed to establish any other information about post-hole spacing here. Cut feature 317, the westerly of the two, was 0.95m in diameter with a maximum depth of 0.70m (Figure 4.18). A possible ramp was observed during initial trowelling on the north-east side but could not be confirmed during excavation. This feature had a single homogenous fill (318) and no clear post-pipe or packing stone concentrations, which may suggest either the post was removed or, less likely given its location, that this was not a posthole. Posthole 332 was a little larger, measuring 1.2m in diameter, with a clear ramp extending 0.4m on its east side; the post-hole had a maximum depth of 0.8m. A postpipe 0.5m

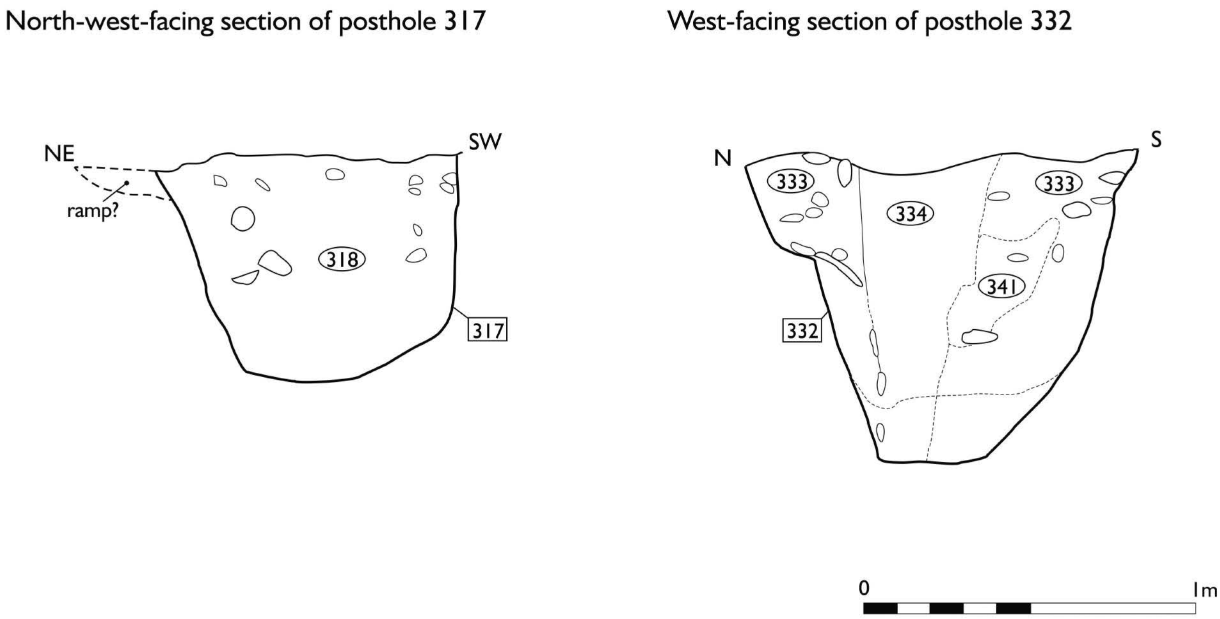


Figure 4.18 Sections of two of the timber circle postholes

Figure 4.19 Team members standing in excavated postholes on the south side of the timber circle

across, with oak charcoal inclusions (334), was evident set towards the north side of the feature, suggesting that the post had been charred before erection and decayed *in situ*; packing stones were also identified.

The postholes on the southern arc of the timber circle were more irregularly spaced, between 2m and 6m apart (Figure 4.19), with some features obscured by silt bands and possibly remnant material from the henge bank (which probably came to cover the footprint of the timber circle). Each of the excavated postholes (501, 505, 551) was more or less circular in plan, ranging from 0.9m to 1.0m in diameter, and with depths ranging from 0.58m to 0.93m. There was evidence for postpipes and packing stones in all three excavated postholes, with postpipes in the order of 0.25m to 0.35m across. Within one of the postholes, 501, the postpipe fill (536) was recorded in section at an angle some 40° from vertical, suggesting that the post slumped to the south at some point. Oak charcoal in these postholes, in small quantities, indicates pre-erection post charring. There was no evidence of post burning or removal in this part of the monument, suggesting the posts were left to rot *in situ*, with one slumping to the side. No clear ramps were noted, although there may have been one on the north side of Posthole 501; posts here were perhaps not large enough to need ramps.

No artefacts were found in association with any of the features of the timber circle other than a regular flint blade (SF83) found in the lowest fill (506) of Posthole 505. Two dates from Posthole 332 indicate construction in the period 2620–2475 cal BC; both dates (4065 ±30 BP; SUERC-23237 and 4005 ±30 BP; SUERC-23246) were derived from oak charcoal probably related to charring before erection, although no indication of this practice was found for any of the other postholes that formed part of this monument. The number of dates was not sufficient to do any further modelling.

4.4.2 Other features on the perimeter of the timber circle

No cut features were identified that could definitively be connected to the construction and use of the timber circle, although two features were identified on the perimeter of the monument, both on the southern boundary. Pit 503 was located 0.3m to the east-north-east of Posthole 501. This feature was circular in plan, 1.60m across and only 0.22m deep, with a shallow bowl-shaped profile. The single fill (504) was silt which appeared to have washed into this scoop naturally. A large, unexcavated silt-topped feature, 521, with a roughly circular plan and diameter of 10m, was located where one would have expected at least one further timber circle posthole to be located (to the east of Posthole 501). This may have been a large pit that post-dated the posthole, or a silt spread that obscured it; the latter is more likely as cropmarks suggest a posthole of similar nature to the others should be located here. A few other stray features were identified to the south of the timber circle boundary and these will be discussed in relation to the mini-henge in section 4.6.

4.4.3 Before the bank: making sense of the timber circle

The timber circle was a substantial monument, some 45m in diameter defined by in the order of 20–22 posts; there is no reason to believe from cropmark evidence that this enclosure was not a complete circuit. This is at the upper end of the diameter that such monuments reach, with some 80 now known in the place we now call Scotland (Millican 2008). The evidence from the excavated postholes suggests that modest posts up to 0.5m in diameter defined this structure, while posthole depths (using the 1:3.5 ratio discussed in section 3.5) suggest timbers could have been up to 3.5m or so in total length, with 1.8m to 2.5m of that above ground. Ramps were ephemeral if present at all, highlighting that these were posts that could probably have been moved and erected by a small team without too much effort or danger. The extent of plough truncation here is unknown, so posts could have been taller and heavier. Observations about the possible appearance of such posts – carved, painted, with and without foliage – with reference to the palisaded enclosure in section 3.5.2 apply here also.

Limited carbonised material recovered from these features means that although we cannot be sure what wood type was used for the posts, most charcoal recovered was oak (Ramsay 2009). One posthole, 332, had large quantities of oak charcoal in the lower fills, while other postholes had modest quantities; this is probably indicative of post charring before erection. Taken alongside evidence for other Neolithic timber circles (Gibson 2005; Millican 2008, 7), we can be confident that oak posts defined the Forteviot monument. In each case where a postpipe was identified, it seems the post rotted *in situ*, and none of the postholes was re-cut or reused. One post, in Posthole 501, appears to have slumped against the side of the posthole before rotting away, suggesting a gradual decline or disturbance of the monument. There is only one posthole where hints of post removal or disturbance are evident. In this respect, it is worth noting the proximity of the timber circle to the henge ditch, suggesting that the posts stood in a location that later became the henge bank; whether the bank 'replaced' the posts or subsumed them is unclear. Given the size of the posts, we would have expected them to be able to stand for many decades (using the Wainwright and Longworth calculation (1971, 224–5)). Radiocarbon dates for the timber circle, and henge construction, allow either possibility for the henge bank/timber circle relationship.

Timber circles are a relatively common component of the late Neolithic monumental suite in eastern lowland Scotland, with examples in the valley of the Earn including one within North Mains henge (Barclay 1984). Where timber circles and henges are co-located, timber circles are almost always the earlier of the two (Gibson 2005, 46), but the location of the timber circle outwith a henge as is the case at Forteviot is unusual. The function of these structures is generally regarded as ceremonial, these being structures that would have been free-standing timbers with no roof. Gibson (2005, 108–9) has speculated on the possible presence of wooden lintels connecting timber posts at some sites but this is essentially unprovable. In the context of Forteviot, the timber circle appears to be evidence (in tandem with the palisaded enclosure) for closing down, controlling access to, or simply marking the significance of the location of the cremation cemetery (cf Millican 2008, 29), which until timber monument construction must have been an open and presumably accessible place. The cremation cemetery would have been located almost centrally within the timber circle, and it likely that the post boundary (and similarly the henge ditch) mirrored the cremation cemetery layout or mound-edge (if there was a mound). This process was augmented and taken to a new level with the construction of a henge monument, in effect replacing the timber circle and curtailing and controlling access to the cemetery further.

4.5 Henge 1

The major target of the 2008 season of excavation was the north-east quadrant of Henge 1, with the remainder of the interior and more of the boundary investigated in 2009 (Figure 4.1). Despite being in the ploughzone, with no visible traces on the surface, and having suffered considerable plough damage (section 9.3), the archaeological remains found associated with the henge were considerable and complex. Today the henge appears as a small rise in the field due to its location on a low glacial knoll or ridge (Figure 4.20); this is augmented by a good deal of stone at this point which could be either vestigial cairn material associated with early Bronze Age burial, activity within the henges or related to later activity. Events post-dating the henge were to have a substantial role in our ability to understand Henge 1, with disturbance due to insertions and pit-digging in the interior, and possible attempts to fill the ditch with stones/level the monument. These will be discussed in depth in Chapter 5 and SERF2, Chapter 5 but are summarised here. This area was also subject to post-medieval ploughing, with rig-and-furrow traces surviving in the trenches and evident as cropmarks across this area.

A sample of features was excavated in line with SMC conditions and time constraints across two seasons in Trench D (with detail shown in Figure 4.3). The henge ditch was investigated in six places. In 2008

Figure 4.20 Henge 1 sits on a small rise: taken during the 2008 season of excavation, this photograph shows the relative high-point the site occupied on this river terrace

we explored a quadrant through deposits on the north side of the eastern terminal of the henge (Terminal Section), and a slot was cut across the ditch on the west side of the monument (Henge Section 1). In 2009 we opened a large slot across the ditch on the south side of the monument (Henge Section 2). In addition to these full-ditch investigations, the ditch was also explored on the interior side in three places, just to the north, immediately to the east, and to the south-east, of the dagger-burial location; these explored the relationship between the cist-related features and the henge ditch. Although we excavated a wide range of features both within and outside the henge, all of which are discussed in this and the next chapter, none was demonstrably contemporary with the henge earthwork phase; therefore, although the earthwork draws the eye and is the feature that gives this element of the Forteviot complex its name, it is worth bearing in mind that the 'henging' of this location was just one part of a complex and extended story (Brophy and Noble 2012b; Younger 2016a).

A rubble spread was evident across much of the northern and eastern areas of Trench D; it appears to have covered most of the henge ditch (extent shown in Figure 4.3) but did not extend to the inner ditch edge, and continued beyond the outer edge of the ditch and beyond the scope of our excavations. It is likely that this material caused the north to south 'void' in the cropmark of the ditch as noted earlier in the chapter, and the cist cairn probably obscured the southern ditch as a cropmark. This rubble varied in content, but generally consisted of broken basalt, broken sandstone slabs and rounded stones and pebbles, set into a dark brown loam matrix (Figure 4.21). In places this had the appearance of a cobbled surface or yard although there were no coherent structures identified amongst this material. Where it was investigated by section (allocated fill numbers 320, 324, 325, 338 and 541), it was shown to be up to 0.7m thick, consisting of stones up to 0.5m across, some of which were plough-scarred (this damage is discussed in section 9.3). A range of objects was found in this (re)deposited layer, and we will return to these, and the nature of this deposit, in Chapter 5.

Another interesting characteristic of the henge ditch was that several of the fills, where not obscured by the

Figure 4.21 Rubble upper fill of the henge ditch, looking from the north-west towards the excavated terminal of the henge ditch

Figure 4.22 Photograph showing the henge ditch 'outcropping' on the trench surface, with burnt turf ditch fill 311 visible as an arc running across the trench interior

Table 4.5 Henge 1 ditch sequence summary

Phase	Interpretation	Terminal	Section 1	Section 2 W facing	Section 2 E facing	Sondage 1	Sondage 2	*Material culture*	*Representative dates*
Rubble capping	Later levelling & ditch filling activity	324, 325	320	541, 546	*Not present*	338	*Not present*	*Glass droplet, Burnt bone, Lithics, Jet*	*Post-medieval*
Pink clay layer, silts	Final natural silt fills	327	319	579, 540	536, 567, 540	339	372?		
Burnt turf & related fills	Deposition of burnt material from henge interior	328	311	619, 538	619, 538	345	346, 347, 354, 607, 608, 609		*2350–2130* *2310–2130*
Cist cairn material	Cist inserted into henge						349		*2100–2000*
Silt-gravels, bold = clay rich / iron pan layers	Long-term natural accumulation & waterlogging in open ditch	337, **352**	**344**, **367**, 368, 370	600, 567, 570, **630**, **580**	**574**, 600, 579, 570, 567	350?	**638**, 639	*Beaker* *Abraded potsherds* *Burnt bone*	*2820–2630*
Charcoal deposit	Depositional acts	362?	363		644				*2479–2280* *2040–1890*
Primary fills	Natural fills tumbling into open ditch	365, 342	371, 369	645	602, 643	**Layers beyond limit of excavation**			*2310–2030* *2300–2130*
Ditch cut	Ditch digging	340	313	543	543				*Middle 3rd millennium BC*

rubble layer, were visible on the surface of the trench, rather like the way that sloping sedimentary bands are depicted on geological maps; in other words, distinctive clay-silt and burned sloping layers were arranged in an arc that in effect defined the boundary of the interior of the henge (Figure 4.22). These fills (notably 311, 344 and 345) were recognised in the various sections excavated into the henge ditch, which allowed us to make connections across the site. Bands of fills were also evident in the southern side of the henge during wet conditions and in the dark, when viewed by torchlight, presumably due to moisture levels in the soil at night. This rather odd occurrence suggests a degree of truncation of the ditch fills – something has sliced off the upper portion of the ditch – as otherwise one would expect the ditch to be defined by the last layer of deposits within or spread over it. What this might relate to, along with the rubble layer, will be returned to in section 5.5.

In the following description of the henge ditch sections, comparative phasing, dating and fill numbers are presented in Table 4.5.

4.5.1 The henge ditch

The main section (Henge Section 1) excavated through the henge ditch was located 13m from the terminus on the east side of the monument (Figure 4.23). The section was 2m wide across the henge ditch and extended west into the henge interior through the middle of large Pit 316. The henge ditch (here numbered 313) was 7–8m wide, around 1.6m deep, and with a rounded-to-flat base. (We overcut the ditch into the gravel natural, reflected in initial recording of the monument eg Brophy and Noble 2008; Noble and Brophy 2011b; corrected in Figure 4.24.) The ditch was noticeably steeper on the inner (west) side, with a more gradual sloping profile tailing off towards the henge exterior. The effect of the steeper inner side of the ditch was heightened by the fact that the henge interior ground level was slightly higher than the exterior. There were no indications of re-cuts although radiocarbon dates hinted at disturbance at some point in time.

The primary fill, 371, was essentially redeposited gravel and probably tumbled back into the ditch even

Figure 4.23 Henge ditch Section 2 on the south side of the monument at an early stage of excavation. There is very little rubble in this area of the monument

as it was being cut. Above this was a thick deposit of clay-silt (369) which was accumulated material washed into the ditch naturally; this is thicker towards the shallower exterior wall of the ditch, suggesting some of this material came from the bank. Immediately above this was a concentrated thin spread that consisted entirely of hazel charcoal (363), presumably a one-off deliberate deposit, sealed by another deposit of clay silt with charcoal flecks (370). Dates derived from carbonised hazel in these fills, 2040–1890 cal BC (3615 ±30 BP; SUERC-23245) and 2210–2030 cal BC (3725 ±30 BP; SUERC-23243), placed them in the early Bronze Age. Two clay-silt deposits (367, 368) of a similar nature to one another continued the sequence above (370); compact pockets of iron pan found in Fill 367 suggested the ditch was prone to waterlogging and it is likely that these natural fills, taken together being almost 0.8m deep, took some time to accumulate. These layers were followed by the deposition of a compact layer of pink clay-silt (344) across the entirety of the ditch which was more likely natural than anthropomorphically derived.

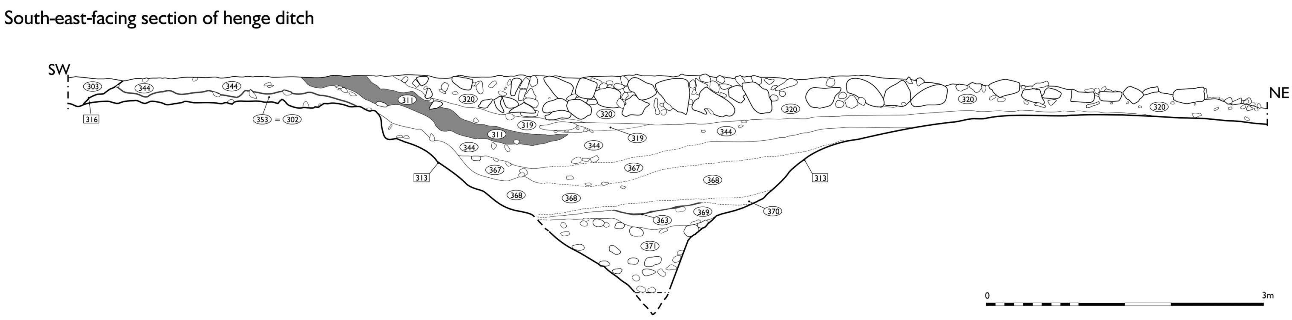


Figure 4.24 South-east-facing Section 1 through the ditch on the east side of the monument

Atop this was a distinctive layer of carbonised material, 311, probably a burnt turf deposit. Botanical analysis suggests carbonised material in this layer included mixed species (hazel, alder, oak, cherry type, willow) but also grass/sedge rhizomes (underground stems), the latter indicative of turf. This was irregular and probably thrown or dumped into the ditch in clumps from episodes of digging and burning within the henge interior; this layer only extended 2.8m into the ditch fill on the interior side. This equates to the burnt layer evident in plan along the interior lip of the eastern henge ditch shown in Figure 4.3. A single radiocarbon date of 2310–2130 cal BC (3790 ±30 BP; SUERC-23238) for this deposit from hazel charcoal is earlier than the dates from the primary fill deposits; this suggests that this is residual material related to an earlier burning event. On top of dump 311, a further layer of pinkish clay was deposited across the whole ditch, which in effect sealed in all previous deposits. The ditch was topped by the thick layer of mixed rubble (here called 320) discussed above. In section here, the deposit was 9.0m across, up to 0.7m deep, did not cover the inner edge of the henge ditch and extended beyond its outer lip. Voids within the rubble suggest that this was a rapid depositional event that happened when the ditch was still visible, albeit considerably shallower than when first cut; it probably relates to relatively modern agricultural improvements (section 5.5).

Two small sondages were placed across the ditch in 2008; neither of these extended across the complete width of the ditch. Sondage 1 was positioned to investigate a section of the henge ditch extending 2.5m from the interior lip of the ditch (cut 313) and was located within 1m to the north of dagger-burial cist Pit 348. The earliest fill that was recorded here was clay-silt 350; above this was a layer of burnt material 345 which accorded with the very similar 311 further to the north, including containing carbonised grass or sedge rhizomes as well as alder charcoal. A similar radiocarbon date of 2350–2130 cal BC (3810 ±30 BP; SUERC-23244), from alder charcoal, was also derived from this material. Overlying this was a pink clay (fill 339), and the henge ditch here was topped off by rubble layer 338 which did not extend to the interior lip of the ditch.

Sondage 2 was located to the south and explored the relationship between the dagger-burial cist Pit 348 and the henge ditch; it extended *c* 2.3m from the cist pit towards the centre of the ditch. Excavation of this sondage began in 2008 and was completed in 2009.

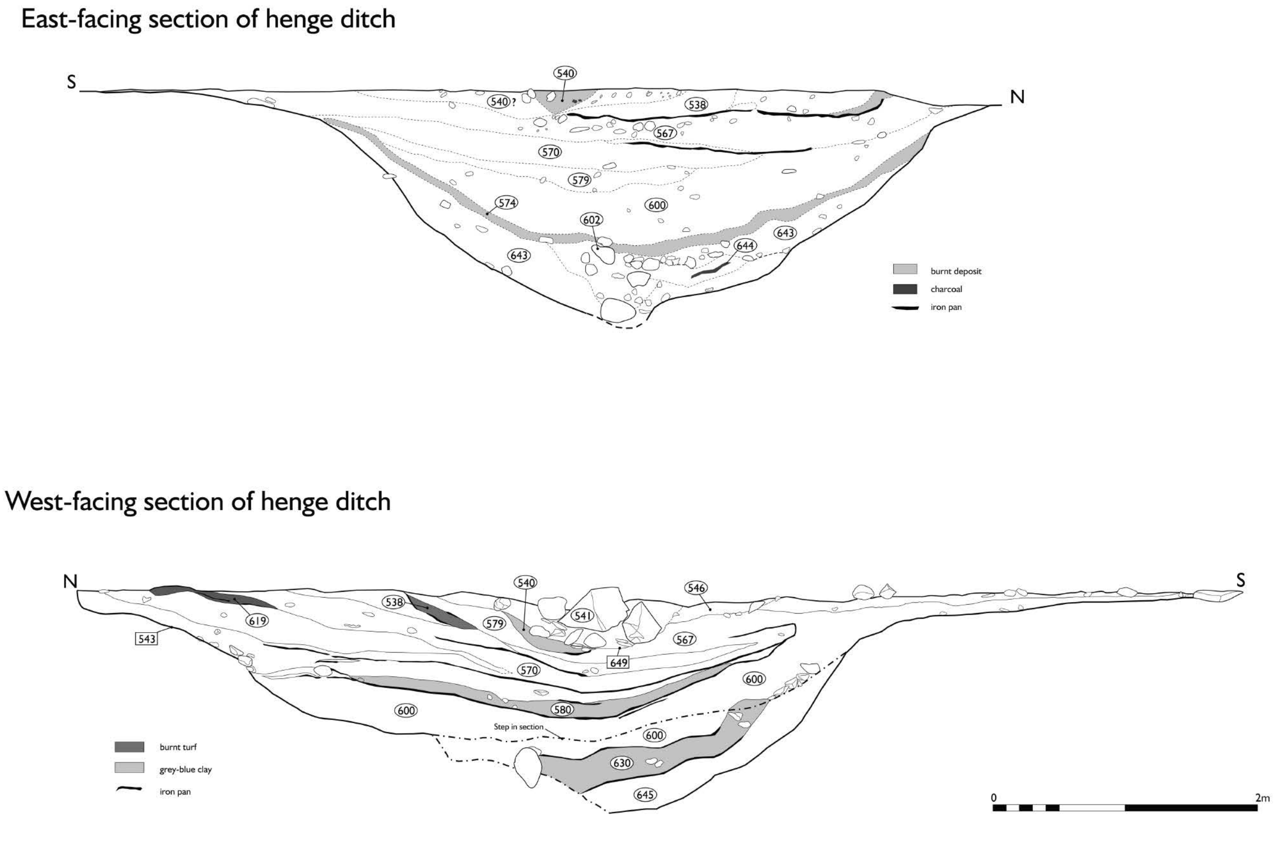


Figure 4.25 Sections through the ditch on the south side of the henge: (a) east-facing; (b) west-facing

Figure 4.26 East-facing section through the ditch on the south side of the henge (Section 2) after excavation

Here, the henge ditch (cut number 313 / 543) sequence became entangled with activities associated with the cist. It was shown that the cist pit cut the henge ditch (see Figure 5.5). The earliest fills associated with the henge ditch here were gravel layers 638 and 639; these were natural accumulations in the ditch, and oak charcoal from the earlier of the two (638, with a clay component in the gravel) gave a surprisingly early radiocarbon date of 2820–2630 cal BC (4165 ±30 BP; SUERC-29177). Immediately above these two fills was cairn material associated with the cist burial (349) which extended 1.4m into the ditch inner lip; this was then followed, as in the other places we investigated around the henge ditch, by deposition of burnt turf fills (346, 347, 607, 609), with a thin silt fill (608) amidst these depositional events. This suggests that while the cist pit post-dates the digging of the henge ditch, the burned turf depositional phase of activity within the henge ditch came *after* the cist burial had been sealed by a cairn. The sondage did not reach as far as the spread of rubble (numbered 534 in this area), so the upper ditch fills identified were 311, 345, 372, and 538, in keeping with other areas where this ditch was investigated.

In 2009, a wide section (5m across) was excavated through the henge ditch in the southern sector of the henge ditch (Henge Section 2). The ditch (here called cut 543) had a maximum depth of 1.8m, varying from 7m in width to almost 9m in width towards the east. The profile of the ditch was symmetrical in the east-facing section but had a steeper external side on the west-facing section, the opposite of the profile identified in Henge Section 1. The two profiles (Figure 4.25) revealed slightly different fills, but the same general picture. The primary fills were a series of silty gravels (fills 602, 643, 645) from natural silting; two fills (643 and 645) returned radiocarbon dates (from oak and alder charcoal) in the Chalcolithic to early Bronze Age, being 2310–2030 cal BC (3790 ±30 BP; SUERC-29178) and 2300–2130 cal BC (3780 ±30 BP; SUERC-29179); charcoal flecks were also identified in fill 602, suggesting fire(s) in the vicinity. These gravels varied in thickness and coarseness across the ditch base, from 0.5m to 1.0m in depth. A discrete deposit of charcoal (644) was found amidst these lower deposits on the inner slope of the ditch (in the east-facing profile area only), probably a one-off act of deposition comparable with deposit 363 found in Henge Section 1.

Immediately above these primary deposits, layers consisting of sticky blue-tinted clay (574, 630) and clay-silt with an iron pan component (580) were encountered, within sequences of silts and silt-gravel fills (which included layers 562, 567, 570, 574, 579 and 600). These fills were over 1m in depth in total and suggest that the henge ditch was open for a considerable period of time, during which it was subject to natural silting and episodes of waterlogging; in the case of the east-facing section (the most westerly area of the henge ditch investigated) this continued until the henge ditch was almost completely full which must have taken many centuries (Figure 4.26), perhaps longer (iron pan bands were identified within the top 0.5m of the ditch fills). Two abraded small sherds of prehistoric pottery were found in the silt fill (562, SF39 and SF50). Towards the upper fills, there is evidence for several episodes of deposition of thin layers of burnt material (deposits 619, 538, 540): these trended towards the henge interior, suggesting this is where they originated from. They may relate to specific episodes of burning and digging within the henge, with periods of natural silting in between (eg 546, which was associated with a small sherd of prehistoric pottery, discussed in section 4.5.4 and see Figure 4.29). As the rubble layer petered out in this area of the henge ditch, it was only recorded here in the west-facing section (fill 541, matrix 546). It consisted of basalt and sandstone rubble and cobbles, and in this location extended 2m across the centre of the ditch and to maximum depth 0.4m; the largest (and very heavy) stones here appeared to have sunk into the ditch fills beneath them.

4.5.2 The henge terminal and entrance area

A quadrant measuring 3.5m by 3m on the north side of the eastern terminal of the henge was excavated (Figures 4.3 and 4.27). Here, henge ditch 340 had steeply sloping sides, probably a U-shaped profile, and quickly reached 1.6m depth (Figure 4.28). The total width of the ditch here was unknown as we did not excavate across the entirety of this feature, but in plan it appeared to be narrower than the remainder of the ditch in the trench. Eight different fills were identified, in a relatively simple sequence (summarised in Table 4.6). The earliest deposit appears to be a discrete deposit of ashy material (342) including oak and alder charcoal, which, as noted in section 4.2, returned a Mesolithic date (8290 ±30 BP; SUERC-23247) suggesting that this was redeposited material, perhaps from a disturbed old ground surface that eroded into the ditch. This was followed by two silt-clay layers, 365 and 362, both with charcoal inclusions, the latter of oak, alder and cherry type. The lower of the two (365) had layers of pink clay and appeared to be primary fill washed into the ditch soon after it was dug. The deposit above, 362, returned the oldest radiocarbon date for basal layers from Henge 1 of 2470–2280 cal BC (3880 ±30 BP; SUERC-23248) and may date the earliest activity associated with the construction of the henge. In the layer above (352), seven sherds of a comb-decorated Beaker of probable early form (25th–22nd century BC; Wilkin 2011) provides further dating evidence (see below). Iron-pan deposits in this same fill suggest episodes of waterlogging in the ditch. Above 352, two later fills (337 and 328) were identified, the latter of which consisted of burnt turf – a good match for a similar dumped deposit of redeposited turf (eg 311) found elsewhere in the ditch. The ditch was finally filled in with a diffuse layer of rubble and soil (324, 325), in a layer up to 0.4m thick. This seems to have been the tapering of a thicker deposit of the same material elsewhere in the ditch (such as 320) and did not extend across the whole of the henge

Figure 4.27 Henge terminal area during excavations

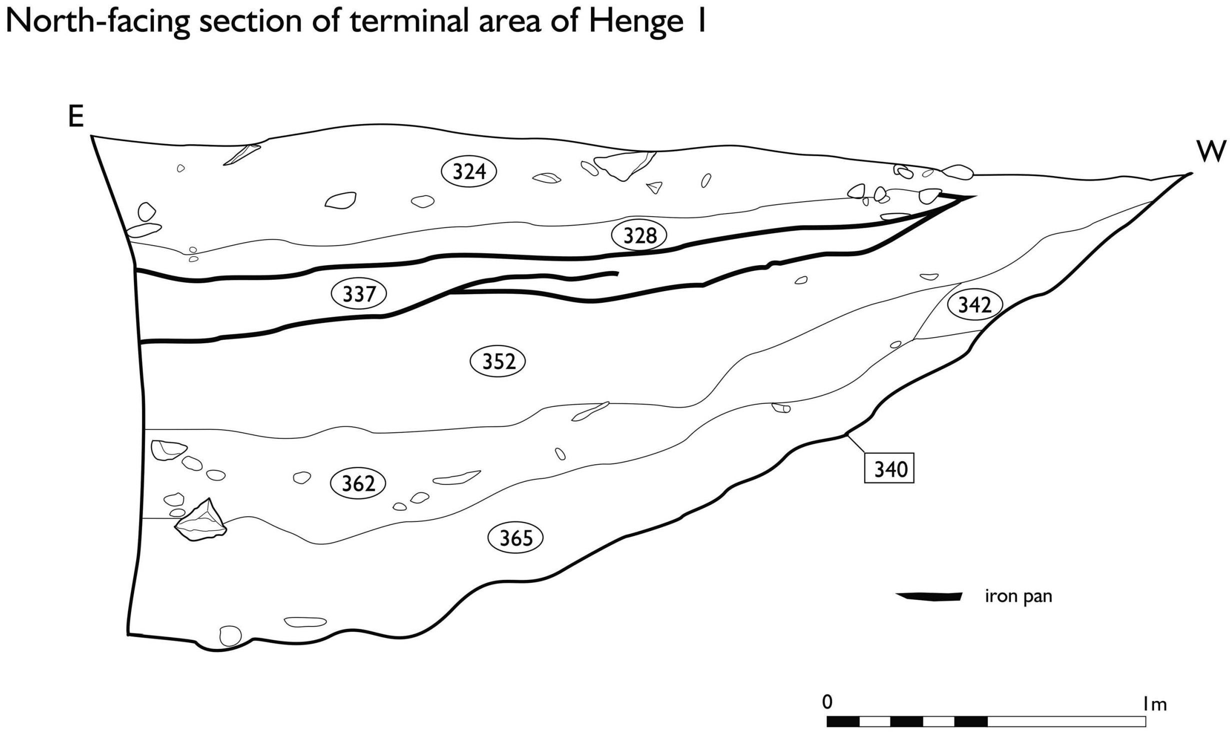


Figure 4.28 North-facing section drawing of the terminal area of Henge 1

ditch in this location. Some 9g of eroded cremated bone were found amidst this rubble layer; these represented fragments of an adult skull and long bone(s) representing a MNI of one person (although it is unclear if they all belonged to the same person) and either found their way here accidentally, or were a token deposit.

Based on the cropmark evidence, the entrance gap in the henge monument appears to be narrow, perhaps only 2m to 3m wide. In the small area outside the entrance that we exposed in 2008, only one cut feature was found. This was irregular and shallow Pit 330 which was oval in plan, measuring 1.30m north to south by 0.75m, and 0.25m deep; it had a single fine silt fill (331). This pit appeared to cut the henge ditch although the relationship was not entirely clear. There was no indication, as was found at Henge 2, of the henge causeway being removed (section 6.3.1).

4.5.3 Henge bank

No definite traces of a henge bank were found, which was not surprising given the plough truncation and probable post-medieval levelling of the site. However, a spread of dark brown to orange silt (layer 612) in the eastern area of the trench immediately to the south of the henge could represent the denuded remnants of the base of the south-east portion of the henge bank. This deposit was in the order of 0.10–0.15m thick; it partially obscured timber circle Posthole 613 and extended beyond the baulk of Trench D (see Figure 4.3). On the northern side of the henge ditch, the cut for Posthole 332 of the timber circle was indistinct and this may have been due to the presence of some vestigial bank material overlying it. The width and scale of the bank remains unknown, although we could speculate, as has been documented for henges elsewhere, that the bank was at its largest at the entrance zone (Harding 2003, 63ff). The accumulation of natural silts and gravels within the henge ditches suggests that more material was entering from outside than inside the henge, another indication that a bank once stood near the ditch exterior edge.

4.5.4 Pottery from the henge ditch and within the henge

Neil Wilkin and Kenneth Brophy

Two small sherds of highly abraded prehistoric pottery were recovered from silt fill 562 in the henge ditch on the south side of the monument (Figure 4.29). These sherds (SF39 and SF50) were small, measuring less than 10mm across. Both are probably wall sherds

Figure 4.29 Photograph of several abraded possible Neolithic sherds found in association with Henge 1 (left to right: SF39; SF50; SF45) (photo: Jan Brophy)

whose thickness suggests they were from different vessels. Neither sherd had decoration nor any other diagnostic traits, although one (SF39) has a profile that hints it may have come from a round-based vessel (Gavin MacGregor pers comm). The appearance and location of both is consistent with these sherds being washed into the ditch naturally after having lain about on the surface for a period. A third abraded sherd was recovered from the surface of modern plough furrow 652 (SF45, from Fill 569). This is a larger wall sherd of similar character to the ditch sherds and was also undiagnostic, but contained clear quartz inclusions within its fabric.

Seven small Beaker sherds were recovered from fill 352 in the terminal area of the henge ditch (Figure 4.30). These represent a very small proportion (less than 10%) of a thin walled (*c* 6mm) Beaker with a fine texture and sparse inclusions. This pot has been allocated Vessel number 7 in the Forteviot assemblage (Table 2.5). The fabric is a pinkish orange (5YR 7/6) exterior surface, an incompletely oxidised black core and a greyish interior; traces of a black fire-cloud, the product of open-air firing, are present on a single sherd. The small number of sherds prevents comment on the overall form of the vessel but a sherd from a profile carination (SF6021) would appear to indicate that it had a relatively sharp angle at the belly. Decoration has been applied using a subrectangular toothed comb with *c* 1.5mm teeth set close together (*c* 1mm) in order to create encircling horizontal lines (with rows *c* 2.5–3.5mm apart). A second comb with more closely separated teeth (less than 1mm) has been used to create short, interrupted horizontal 'dashes' (*c* 5mm/3–4 teeth in length). The resulting motifs correspond with Clarke's (1970, 424–5) Basic European, Motif Group 1 and Primary Northern British/Dutch, Motif Group 2 but are relatively generic and enduring decorative motifs throughout the course of the British Beaker tradition.

Ferrous deposits are visible on the exterior and/or interior surfaces of three sherds. This corresponds with the iron-panning noted by the excavators and their suggestion that standing water and waterlogging occurred in the lower fills of the henge ditch as it silted naturally (discussed above). Indeed, in connection with the small proportion of the vessel represented, it is worth noting that these conditions may not have been conducive to the survival of ceramics from this context and/or that these conditions may have obscured sherds within a ditch that was otherwise being actively kept free of material culture.

The small size and number of sherds prevents detailed discussion of typological *comparanda*. The evidence for the enduring and generic decorative

Figure 4.30 Beaker sherds from the henge ditch terminal area

Figure 4.31 Arrowhead SF79: an early Neolithic flint leaf-shaped arrowhead with invasive bifacial retouch found in the ditch of Henge 1

motifs does not present a mismatch with the tentative evidence for a relatively sharp carination and could belong to a vessel of Needham's 'Low'- or 'Tall-Mid Carinated' forms (equivalent to Clarke's (1970) European, Wessex/Middle Rhine and Northern British/Middle Rhine groups and Lanting and van der Waals' (1972) Step 1–2) but this identification cannot be certain. If the vessel does indeed belong to a 'Carinated' group then it is more likely (but not guaranteed) to date to the first two or three centuries of the second half of the 3rd millennium BC (ie the Chalcolithic: cf Needham 2005, 183–8) and this fits in with the radiocarbon dates we have associated with henge ditch fills (section 4.5.6). Finally, the deposition of Beaker sherds within henge ditches has parallels, with nine examples identified in Scotland alone (Wilkin 2016).

4.5.5 Lithics from the henge ditch

Dene Wright

Few lithics were identified within the henge ditch. Two were found within the rubble layer that capped the henge ditch and thus were not in a secure context. This included a weathered flint subangular scraper (SF06) on the south side of the henge (within rubble henge ditch fill 534) and a late Neolithic flint oblique arrowhead (SF20) which was recovered from within a cobble-like zone of the rubble capping over the henge east ditch. This artefact has semi-invasive direct retouch to all three sides and inverse retouch to the butt and left-hand side. This arrowhead shares similarities with an oblique arrowhead found at the Neolithic horned chambered cairn at Ormiegill, Caithness (Clarke and Sharples 1985). An early Neolithic flint leaf-shaped arrowhead with invasive bifacial retouch (SF79; Figure 4.31) was recovered from the lower fill of the henge ditch on the southern side of the monument; this fine object likely predated the henge ditch digging by quite some time and may have washed in naturally (a similar arrowhead was identified in the vicinity of the cremation cemetery; section 4.3.5).

4.5.6 Henge 1 radiocarbon dates and modelling

Derek Hamilton (with Kenneth Brophy)

There are eleven results from the fills of the Henge 1 ditch and the large pit within the centre of the henge (Table 2.4 and Figure 4.32); the latter are discussed in section 5.5.

There are three sequences of dates from excavations in 2008. In the main ditch section from 2008 there is a result (SUERC-23243) on hazel charcoal from the lower fill (370) followed by a result (SUERC-23245) on hazel charcoal from fill (363), a discrete band of charcoal. In the area of the ditch terminal there is a result (SUERC-23247) on alder charcoal from the basal layer of burnt turf (342) and a second (SUERC-23248) on alder charcoal from a lower fill (362). The basal date is Mesolithic and likely derived from an old ground surface as represented by the redeposited turf and has been excluded from the modelling. A fragment of alder charcoal from an upper fill (345) produced SUERC-23244, while one of hazel charcoal in a higher fill (311) produced SUERC-23238.

There is a sequence of dates from the main section of ditch dug in 2009. A fragment of alder charcoal from the lower fill (645) in ditch (543) produced SUERC-29179, while a fragment of oak charcoal slightly higher in the profile from fill (643) produced SUERC-29178.

In Sondage 2, SUERC-29177 is a result on oak charcoal in a dump of clay (639) at the base of the henge ditch and below the cist (returned to in section 5.3.8). The nature of the deposit suggests that this may have been redeposited, and the substantially early date on the context serves to strengthen this interpretation. The result is treated as only providing a *terminus post quem* for the context. A fragment of hazel charcoal was dated (SUERC-29176) from a burnt deposit that overlay the fills of the cut.

Based on the modelling, the ditch for Henge I was probably constructed in *2460–2230 cal BC* (*95% probability*; *start: Henge 1*), and probably in *2385–2270 cal BC* (*68% probability*) (Figure 4.33). The dagger-burial cist was dug into the ditch in *2285–2245 cal BC* (*10% probability*; *dig: Cist*) or *2235–2090 cal BC* (*85% probability*), and probably in *2205–2130 cal BC* (*68% probability*). The henge ditch was no longer in use by *2030–1845 cal BC* (*95% probability*; *end: Henge 1*), and probably by *2000–1925 cal BC* (*68% probability*).

There are some anomalies in these dates which is to be expected for a wide, deep ditch that was open for many centuries. For instance, noticeably lower fills in the terminal area of the henge ditch appear to be earlier than dates from other parts of the ditch. This suggests that the terminal area was kept clean, and open, for longer. One date from hazel charcoal of 2310–2130 cal BC (3790 ±30 BP; SUERC-23238), from an upper fill layer (311), is earlier than the dates from the primary fill deposits in the henge ditch in the same excavation area. Tentatively this could be explained as relating to burning events occurring within the henge, rather than the date of deposition within the henge ditch. Finally, there are surprisingly early and anomalous dates from the ditch primary fills (eg SUERC-29177). This material is likely to represent redeposited material, like the upper turf layers, which probably represent material dug out from the centre of the henge. These anomalies in the dating for this henge ditch do not, however, detract from the probable construction date, and are related to taphonomic processes.

These modelled dates suggest that the henge monument was constructed in the *25th to 23rd century cal BC*, and probably in the earlier part of that range given the dating of the dagger-burial. This places the construction of the henge monument in the Chalcolithic. This

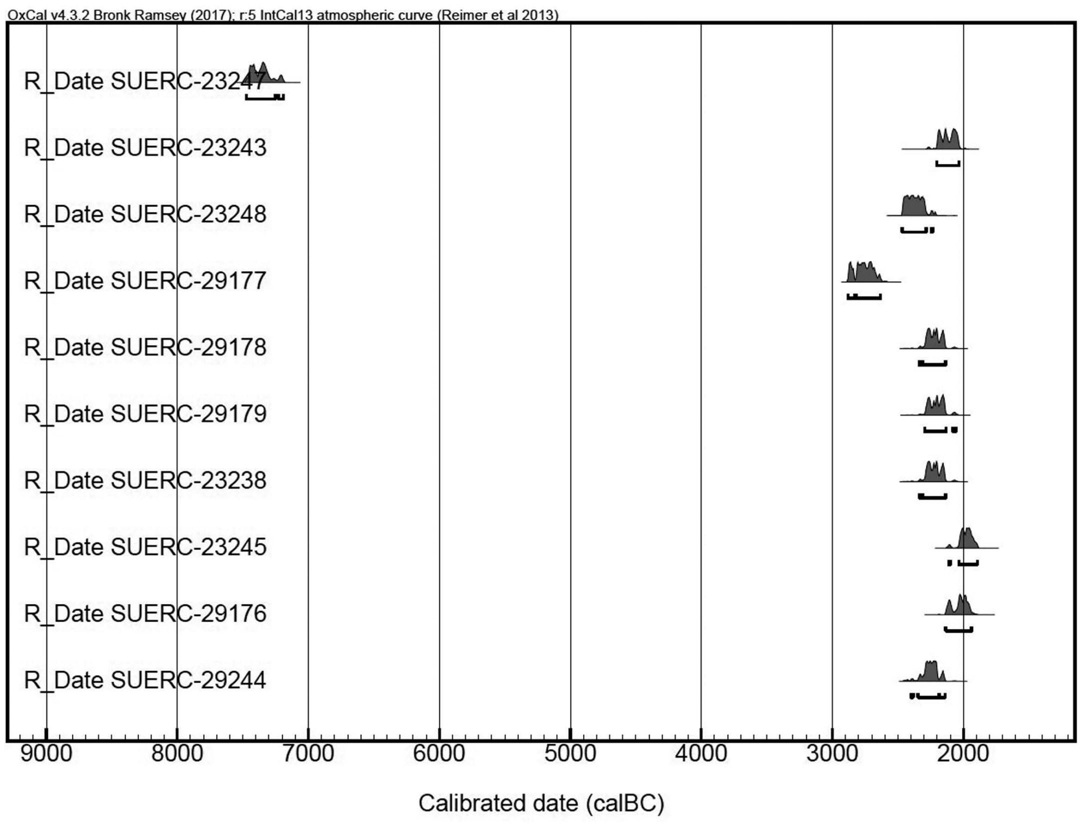


Figure 4.32 Radiocarbon dates associated with the henge ditch

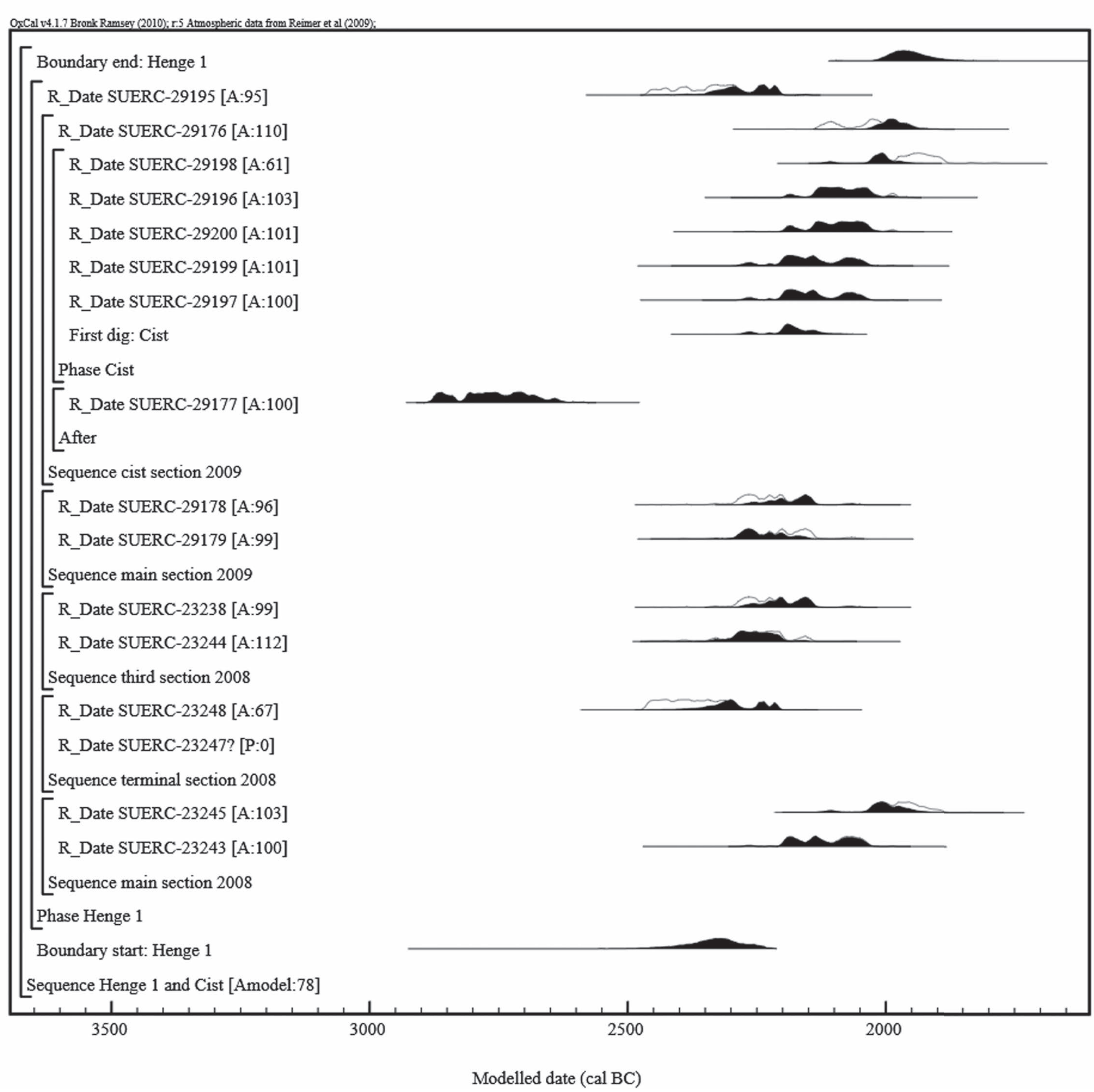


Figure 4.33 Chronological model for Henge 1. The model structure is defined by the brackets and the keywords. The format is as described in Figure 3.27

is in line with most recent overviews of henge monuments in mainland Scotland (Barclay 2005a; Brophy and Noble 2012b; Younger 2016a; 2016b) but slightly later, and often much larger, than the classic henge monuments of southern Britain (Harding 2003).

4.5.7 More than just a ditch and bank

Forteviot Henge 1 would have been a substantial earthwork, with ditches and a bank of a scale disproportionate to the area enclosed, a common characteristic of classic henges. It is more or less circular in plan, enclosing a circular internal space 22m across within ditches between 6m and 8m wide. The ditch was at least 1.8m deep, and as with other aspects of this site, a depth of 0.5m to 1m over and above this may have been lost due to plough truncation. We would have expected there to be a bank outside the ditch, and circumstantial evidence for this was discovered. If this reflected the scale of the ditch, from which material would have been quarried to throw up the bank, the outer earthwork could have been up to 6m to 8m wide and perhaps as much as 2m high; it is possible that relict posts from the timber circle were embedded within, and protruded from, the bank. The monument measured 35m north to south by 30m from the outer edges of the ditch, and with an added bank we could speculate the entire earthwork was some 50m to 60m across (Figure 4.34). The construction of this monument, in often rough gravel subsoils, would have been a substantial project, all labour being undertaken by hand and by a considerable work team.

We have no direct evidence whatsoever for activities that happened within the henge when it was first constructed although it may be the case that it was constructed simply to limit access to the cremation cemetery location (or contain this feature). The eastern half of the interior was almost entirely dug out in the early medieval period, while the south-east quadrant was dominated by the dagger-burial and cairn; the only material found in the eastern half of the henge interior related to the earlier cremation cemetery. It is possible that when the henge was originally constructed, a low mound sealing in the cremations took up some or all the interior, for the aforementioned reason that the ditch follows the arc of features associated with the cemetery. Thus there may have been little scope to dig pits or erect posts within the henge itself without slighting earlier features.

The best clue we have for activities within the henge monument comes from the ditch fills. The depositional sequence suggests that several phases of filling occurred, some deliberate, others periods of natural silting (summarised in Table 4.6). The general picture is patchy across the monument, but it is possible to identify a rough sequence of events. Ditch digging was followed by a period of natural filling as gravels tumbled back into the ditch, and this was followed, perhaps relatively quickly, by the deposition of burned material in a few spots, in such volumes and consisting of materials consistent with hearths or small fires; charcoal flecking evident in early silt, clay and gravel fills confirms the sense fires were lit in the vicinity. Other deposits consisted of differing wood types, suggesting

Figure 4.34 Reconstruction drawing by David Simon of the Forteviot henge group; Henge 1 is the most distant. This drawing shows the ruinous palisaded enclosure and the henges in use before their conversion to burial monuments

differing burning events on different occasions; some dominated by hazel, others with no hazel. A lengthy period of the ditch lying open followed, with silt and gravel accumulating over time, and intermittent and multiple events of waterlogging (perhaps seasonal) also evident via iron pan and sticky clay layers. It was at some point during this sequence (when the ditch was approximately half backfilled) that the dagger-burial cist pit was excavated, cutting, and spilling cairn material into, the partially filled henge ditch. Across the eastern half of the henge there followed a turf-burning and deposition event, with the disposition of clods and clumps of burnt old land-surface turf (perhaps even material capping the old cremation cemetery barrow-mound) in the inner side of the ditch suggestive of the burning and turf being thrown into the ditch from the henge interior. Discrete burnt deposits followed from time to time across more of the henge, as the ditch almost completely silted up. Finally, and again across the eastern half of the henge, the ditch was filled and levelled with a layer of rubble and cobbles.

The chronology of these events suggests that the henge monument construction and use was confined to the Chalcolithic and early Bronze Age; there is no evidence that the henge was constructed during the Neolithic.

Material culture within the ditch hints at both accidental inclusion and deliberate deposition. Two abraded sherds of possibly Neolithic pottery found washed into the southern ditch of the henge suggest small fragments of broken pot were lying about; these were similar in character to a third sherd found lying on the subsoil within the cemetery area. The deposition of sherds representing part of one AOC Beaker in the terminal seems more likely to be deliberate. Henge terminals appear to have been a regular focus for deposition (Harding 2003, 66–7). This is regarded as being indicative of the special, transitory and/or liminal nature of entrances and thus such objects are viewed as deliberate, ritually charged deposits. More specifically, Beaker sherds are not uncommon deposits in henge monument ditches. Sherds of AOC Beaker were identified in the modified terminal area of Forteviot Henge 2 for instance (section 6.4), while remains of various AOC and All-over-Comb (AOComb) vessels were found in the ditch of the henge-like enclosure at Balfarg Riding School (Barclay and Russell-White 1994, 92, 183, 196–7; Cowie in Barclay and Russell-White 1994, 126–9). In that case, it was argued that the pottery found its way into the ditch by natural processes due to the ditch remaining open for some time, rather than them being indicative of deliberate deposits (Barclay and Russell-White 1994, 127). Wilkin (2016), in an exhaustive review of Beakers found in middle to late 3rd-millennium BC monument contexts has noted nine sites where Beakers were associated with later Neolithic and Copper Age non-funerary monuments across Scotland (see Figure 6.17). The dating of henge monuments found in mainland Scotland means that we should be cautious about assuming Beaker deposits in henge ditches reflect the actions of a new ideological order imposing themselves on the old 'henge-related culture' of the late Neolithic (Harding 2003, 110–12) – the henges at Forteviot are *not* Neolithic. The significance of these practices and the evolution of henges will be taken up in more detail in Chapter 8.

The function of henge monuments, as with timber circles, is regarded as being ceremonial (Harding 2003, chapter 2; Cummings 2017, 201–3). A trait that many henges share is controlling movement, for instance restricting physical access via a narrow entrance and sub-divided internal spaces (Barrett 1994; Thomas 1996). This is the case at Forteviot in terms of the narrow entrance gap, although too little of the interior survives to assess how space may have been divided; however, the insertion of the dagger cist in the far interior of the henge fits this broader pattern of exclusion and privacy. If there was a barrow or traces of the cremation cemetery inside the henge, movement in the interior may have been further restricted, stage-managed or awkward. Such exclusion is reinforced by the henge bank, which offers a physical as well as a metaphorical boundary defining the social differences between those allowed inside the henge, and those excluded and standing outside; able to listen in to, but not see, what is happening inside the enclosed space, or watch fires and smoke emerging from over the bank. This act of henging would have further removed access to the ancient burial spot by removing the visual affordances of the timber circle; this space was being shut down (Brophy and Noble 2012b). A narrative that has increasingly been developed with regards to henges is that they were keeping something *in*, rather than keeping someone *out*, with the bank-ditch arrangement suggesting this (Warner 2000; Barclay 2005a; Bradley 2011). The transformation of the space around the cremation cemetery at Forteviot fits this narrative, with the significance of the ancestral burials located here transforming through time, the enclosing and henging being material manifestations of a change perhaps from sacred to taboo.

The henge at Forteviot seems to have had elemental significance. Ditch fills show recurrent evidence for waterlogging, which suggests that at least for periods (perhaps seasonally) the ditches contained standing water. Richards (1996) has suggested that henge ditches in some cases may have made symbolic allusions to water in the landscape, his classic example being the Orcadian henges at Stenness, Brodgar and Maes Howe. For these sites, Richards has argued that the monuments acted as a microcosm of the landscape with the ditches (which all, he suggests, would have been prone to waterlogging) representing the nearby lochs of Stenness and Harray. Thomas has noted the watery location of Pict's Knowe henge, Dumfries and Galloway: at times this monument may only have been accessible by boat (2007, 264). There is also clear evidence for fire at Forteviot, an argument made by Younger with relation to the role henges might have played in memory and commemoration in prehistoric societies (2016b). Burning appears to have happened during the life of this henge monument, and deposits in the ditches point to both small-scale and large fires.

The construction of henges as an act of commemoration (*ibid*) would have involved change and continuity, fire and water, life and death, all evident in this place which was far more than a henge earthwork. However, the story neither starts, nor stops, with the ditch and the bank. The broader implications for our understanding of henges will be returned to in Chapter 8.

4.6 Mini-henge and mini-timber circle

with Kirsty Millican

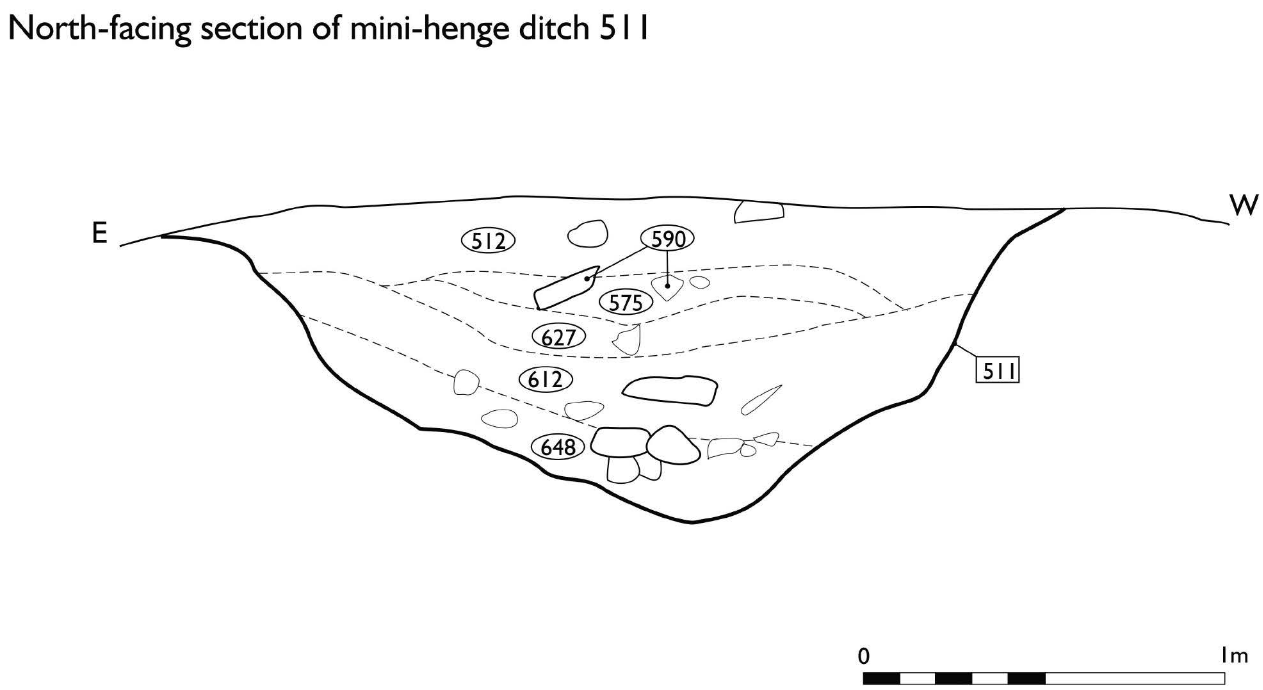
To the south of Henge 1 lies a 'mini-henge', a feature that had again been identified previously as a cropmark (Figure 4.3). Only the northern side of this feature was included within Trench D, but this allowed one terminal and the entrance area to be investigated. This is essentially a small penannular enclosure some 9m across (not including any putative bank which might have extended this monument to up to 15m in diameter), defined by a ditch and with a single entrance gap 1m across. The internal defined space would have been no more than 4m across, and we found no indication (in the trench) of any internal features. This small enclosure to an extent mirrors the much larger Henge 1 located 12m to the north. Both have single entrance gaps on the northern side, and thus have more or less the same internal orientation, both appear to have had timber circles around them, and in both the scale of the earthworks is disproportionately large for the area enclosed (total ditch width to enclosed space ratio for the henge is *c* 16m : 22m, for the mini-henge it is almost 5m : 4m).

The ditch was investigated at the eastern terminal. Here, the ditch (cut 511) was 2.3m across, had a U-shaped profile and was up to 0.9m deep (Figures 4.35 and 4.36). The primary fill, a silt-gravel (648), was found only on the east side of the ditch profile and may represent initial slumping of the external bank (no longer extant) into the ditch. Subsequently, silts washed into the feature which were assigned to five further distinct fills – from lower to upper – 642, 627, 575, 590 and 512. The latter fill had a high proportion of small stones and *may* have been a deliberate deposit. No material culture was found within the ditch, and a single 7th-millennium BC radiocarbon date (SUERC-29175) from willow charcoal in a fill midway up the section (575) seems likely to represent re-deposition of Mesolithic-dated material from an ancient ground surface, an eventuality also identified in a lower fill in the Henge 1 ditch.

Cropmark evidence, going back to St Joseph (1978), suggests that this mini-henge had a pit- or post-circle around it (Figure 1.2). Three small postholes were identified that probably form the northern side of such a setting, the remainder of this structure being located beyond the southern baulk of the trench. Of the three, one (Posthole 525) was excavated. This was located *c* 2.3m north-west of the mini-henge ditch and was shown to be a posthole of the same scale as the larger Henge 1-related timber circle. It was 1.10m by 0.85m across in plan, 0.70m deep and had a large postpipe (Fill 606) that was 0.70m across, taking up a considerable proportion of the posthole. Packing stones were also evident (526) and it appears that the large post that stood in this feature rotted *in situ*. The other two features that appear to be part of this timber setting were the similarly sized 519, located almost 4m to the east of the eastern ditch, and smaller feature 523, which was almost 4m from the mini-henge ditch. This is a structure that remains more convincing as a cropmark than in the trench, but taken together the postholes suggest a timber circle some 12m in diameter. We have no sense of the relative chronology of

Figure 4.35 The Forteviot mini-henge pre-excavation

Figure 4.36 North-facing section drawing of the mini-henge ditch 511



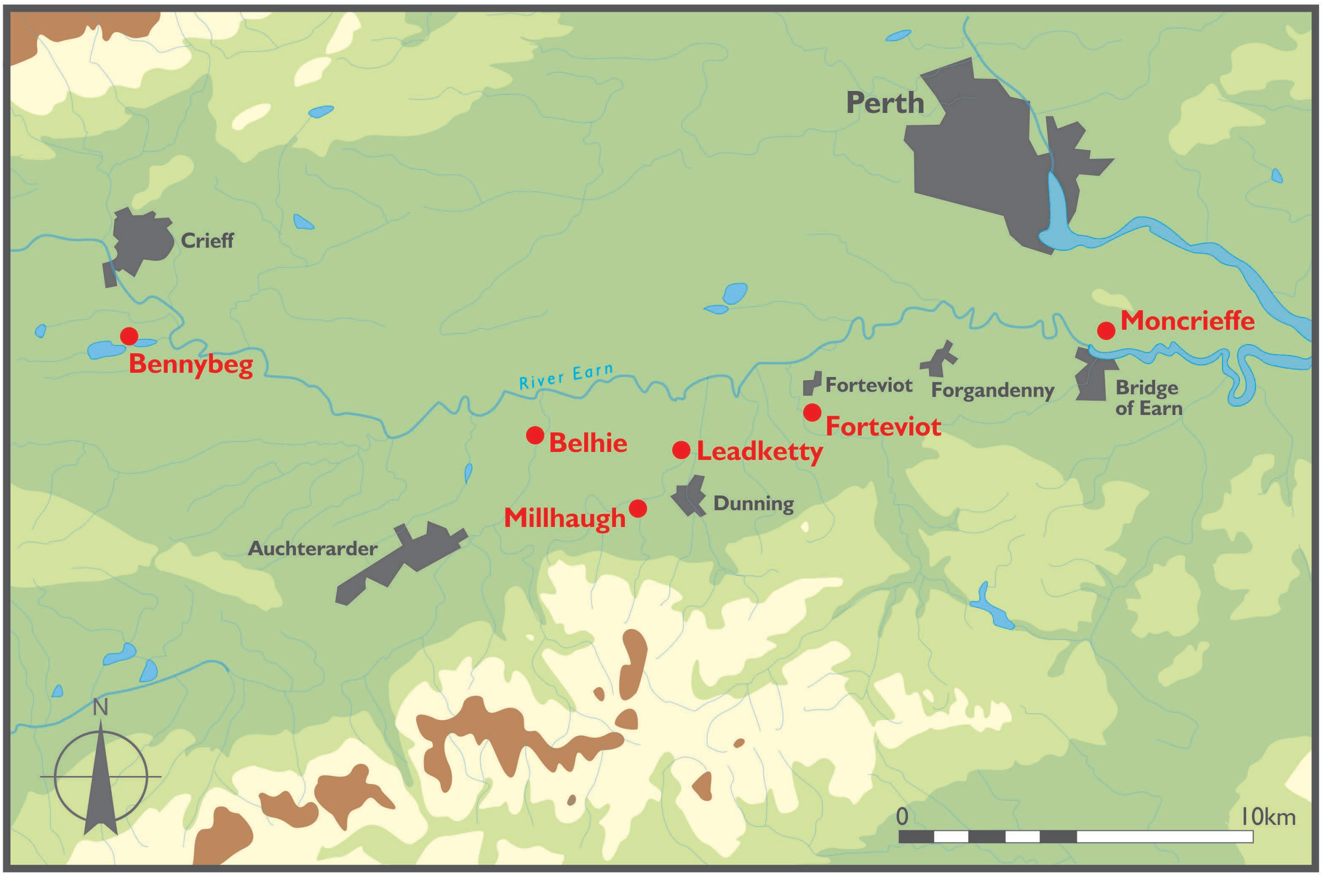


Figure 4.37 Map showing location of mini-henges in Strathearn. All except the cropmark site Bennybeg have been confirmed by excavation

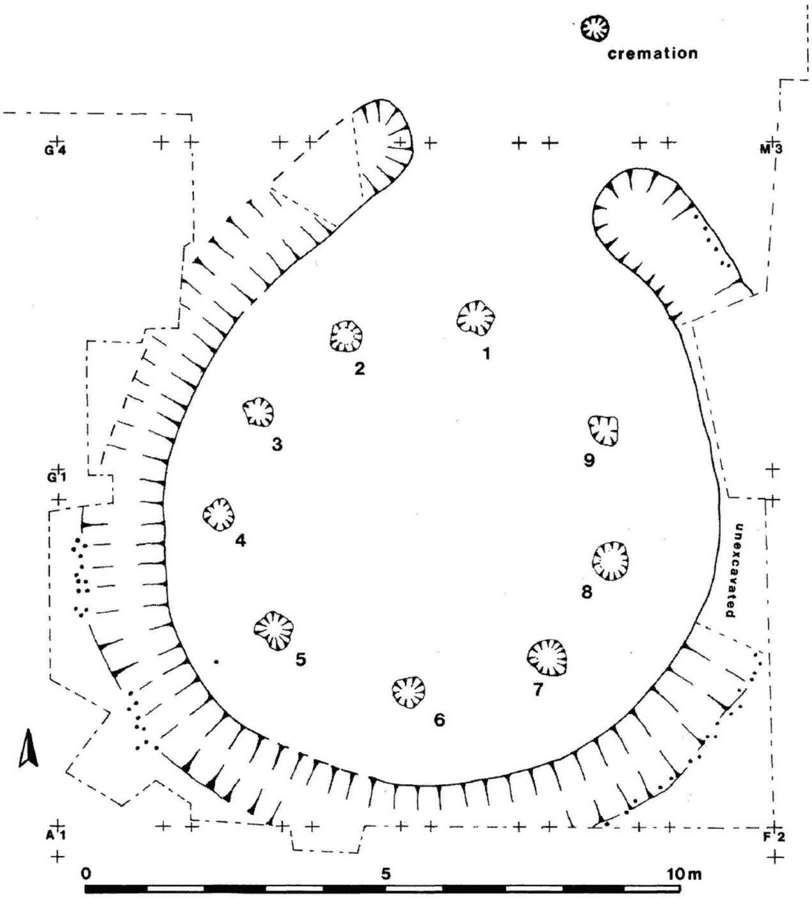


Figure 4.38 Plan of the mini-henge at Moncrieffe (Stewart 1985, 130, illus 4)

Figure 4.39 Millhaugh mini-henge during SERF Project excavations in 2017

this in relation to the smaller and concentrically arranged mini-henge, nor how the posts and any putative henge bank might have related to one another. It is worth noting, albeit based on one example, that the posts here may have been the same size as those of the timber circle, despite being associated with a much smaller earthwork.

A series of other features identified in this zone of the trench may or may not relate to the henges and timber circles. None of these was excavated. They include two possible tree throws (515 and 517), a large surface spread of charcoal (518), and a possible pit or posthole (514), oval in plan and located only 0.5m from the mini-henge entrance, but off-set to the west. The latter was in a location where we might have expected to find a timber circle posthole. A silt spread in the south-west corner of Trench D (deposit 528) may be the edge of a palaeochannel.

Mini-henges, or small penannular ditched enclosures, are common components of monument complexes across Britain, although there is a good deal of chronological and functional variation evident. Harding and Lee (1987, 37) define henges with diameters of less than 14m (ditch to ditch as they were largely dealing with cropmark sites) as being mini-henges through a statistical analysis of all henge-like sites in Britain. However, Barclay (2005a) has suggested that the term mini-henge is a misnomer, and he was able to show that henges (in Scotland at least) appear to represent a continuum of diameters with no obvious cut-off point between larger and smaller enclosures. Here, we will continue to use the term mini-henge as it is widely recognised. Harding (2003, 27–9) suggested that similar structures in the south of England were early in the henge-building sequence (ie late Neolithic) and often associated with cremated human remains. This was evident at four mini-henges that formed part of the Dorchester-on-Thames monument complex; all were slightly larger than the Forteviot example and were constructed as either complete ditches or conjoined pits (Whittle *et al* 1992). However, similar enclosures have been shown to have fulfilled a range of different purposes, from open enclosures of unknown function, to mortuary structures, to footings of circular buildings. They also have a broad chronological range: while some sites are clearly late

Neolithic, others have been dated to the early Bronze Age – Bradley (2011) excavated a series of small henge-like enclosures in Sutherland and Caithness, all upstanding monuments, which were shown to belong largely or wholly to the 2nd millennium BC.

When trying to make sense of the Forteviot mini-henge, we can look to a series of local morphological parallels. At least four mini-henges have been excavated in the Earn valley alone (Figures 4.37 and 4.38), each with a different biography. Moncrieffe was excavated in 1974 in advance of motorway construction; this small stone setting was shown to sit within a penannular ditched enclosure. The ditch was slight, defined an internal space some 9m across, and was associated with sherds of Beaker. The monument also contained a small timber circle, and this early phase of activity was followed by cairn construction, a stone setting, and in the Iron Age evidence for metalworking (Stewart 1986). Two cropmark mini-henges were excavated as part of Phase 2 of the SERF Project. The larger of the two, Leadketty, was investigated in 2012 (SERF3). Here, an area 8m north-west to south-east by 5.8m was enclosed within a ditch that was up to 4m wide and 0.7m deep. The ditch was re-cut at least once at some point to be much narrower, 2.4m wide and 0.8 deep. A single entrance gap 0.9m wide was identified on the south-east side and a huge posthole was located within this enclosure. This feature was 2.45m in diameter, had a depth of at least 1.5m, and postpipe and packing stones within the feature suggest it held a post that was up to 1m in diameter. Charred oak was found near the bottom of this posthole dated to the second half of the 3rd millennium, 2351–2196 cal BC (3824 ±30 BP; SUERC-65637). Given the logistical difficulty of manoeuvring such a post, the working assumption is that this post pre-dated the enclosure and thus offers a tentative *terminus post quem* for the mini-henge. As with the Forteviot example, the Leadketty mini-henge was located within a late Neolithic palisaded enclosure.

A cropmark mini-henge at Millhaugh was excavated in 2017 in the final season of SERF fieldwork (Wright 2017; Figure 4.39). This site was first identified as a cropmark in 1984 and initially interpreted as a ring-ditch of unknown date and function. Excavations showed it to be a circular single-entrance ditched enclosure, the ditch 1.75m across and 0.55m deep, defining an internal area of less than 4m diameter, and with total ditch-to-ditch width of about 8m. Ditch fills suggested there had been an external bank. Two pits were later cut into the largely backfilled ditch. No objects or radiocarbon dates were associated with this enclosure. Finally, two ditched enclosures, recognised initially as a cropmark group (Harding and Lee 1987, 402–5), were excavated at Belhie in 1988 in advance of pan busting. One was a small penannular enclosure, 6–8m in diameter within a ditch of 2m width, associated with a pit containing Beaker sherds and interpreted by the excavator as a mini-henge (see Figure 2.12). An adjacent, slightly larger enclosure was shown to be an enclosed cremation cemetery surrounded by a complete but segmented ditch and associated with urn pottery (Ralston 1988); two other similarly sized ring-ditches or possible mini-henges have also been identified here in the cropmark record, while other cropmark examples exist in the valley.

The mini-henges of the Earn valley offer no clear indication as to the purpose and date of the Forteviot example other than it seems likely all are early Bronze Age; some have Beaker associations, others appear to have been empty, perhaps ceremonial enclosures and one was built to contain a massive oak post. There is no direct evidence of cremation burials or urns at Forteviot, unlike another local potential parallel at Balneaves Cottage, Angus. This was a single-entrance ditched enclosure, 10m in diameter, found to enclose a series of pits containing urns with cremated human remains that dated to the middle of the 2nd millennium BC (Russell-White *et al* 1992). A range of other superficially similar Bronze Age monuments (in terms of size and/or form) across eastern Scotland has been identified by Bradley (2011, 167ff) from Croft Moraig to Pullyhour henge, Caithness; he focuses, however, on the long-term sequences evident at these sites, with broader connections to 'classic' henge traditions maintained through architectural echoes of larger monuments, and also notes a recurrent similarity in plan and in some features to roundhouses (*ibid*, 179–80).

In sum, 'mini-henge' is a label that encapsulates a range of sites of the early to middle Bronze Age, found across much of (mostly) eastern Scotland (and indeed Britain), with a shared series of architectural traits but used for various purposes. Architectural form and functionality need not be connected. The Forteviot mini-henge does not appear to have been a mortuary enclosure, although we were unable to explore all the interior, while the possible timber circle element sets this apart from most sites of a similar morphology. If we are to follow Barclay's (2005a) logic in relation to henge diameter, then perhaps for this particular site it is simplest to suggest that it was a small henge monument, constructed to accompany, or mimic, its larger neighbour (Henge 1). Unlike the big henge, however, the mini-henge offered a private space with very limited access. We will return to the broader issues of henge typology and chronology in Chapter 8.

4.7 To be continued…

Over a period of several centuries, and in the order of twenty generations, several significant developments took place in this location – the erection of a standing stone or stone circle (at what point in time remains unknown), the replacement of standing stone(s) with the establishment of a cremation cemetery and possible barrow or mound, the construction of two timber circles, and the digging of extensive earthworks to create large and small henge enclosures. This location also became enclosed within a palisaded boundary in the first half of the 3rd millennium cal BC. Each of these phases of activity represented the impact of new ideologies and social hierarchies on this location, tying Forteviot into wider traditions of practice and belief. During this very long period the site moved (in our terminology) from the late Neolithic to the Chalcolithic to the early Bronze Age, becoming an incarnation of the ideologies of each. The broader implications Forteviot has had on our understanding of Neolithic cremation cemeteries, timber monuments and henge earthworks will be returned to in Chapter 8. However, we will now turn to the next phase in the life of this place: the choreography of the act of interring a rich single inhumation burial.

5

The Forteviot dagger-burial and Henge 1 modification

Gordon Noble, Kenneth Brophy, and Alison Sheridan

With contributions by Esther Cameron, Ewan Campbell, Trevor Cowie, Anne Crone, Stephen Driscoll, Pieta Greaves, Allan Hall, Derek Hamilton, Eva Hopman, Matt Knight, Jennifer Miller, Stuart Needham, Peter Northover, Sonia O' Connor, Gert Petersen, Susan Ramsay, Alan Saville†, Chris Standish, Annelou van Gijn, Lyn Wilson, and Dene Wright

5.1 The cemetery re-made

In the 22nd century cal BC (Figure 4.33 *First Dig: Cist 2205–2130 cal BC* (68% probability)) a dramatic alteration of the Henge 1 interior occurred. A large pit was dug into the partially filled henge ditch in the southern interior of the enclosure within a few metres of where the cremation cemetery had been established almost a millennium previously. Within this pit, large sandstone slabs were arranged to form a cist, in which was placed a rich burial with a range of grave goods including a dagger in its sheath. The grave was then sealed beneath a massive capstone, and finally a cairn was raised over the cist. The use-life of Henge 1 did not end with the insertion of this burial; further activity is evident in the 1st millennium AD and modern period. However, the insertion of the cist appears to have marked the beginning of the end of the prehistoric phase of significance at Forteviot identifiable in the archaeological record.

This chapter will focus on the cist grave known in the literature as the Forteviot dagger-burial (eg Noble and Brophy 2011b). As well as describing the contents and architecture of the burial, we will also consider how we might interpret the individual buried here and the significance of the interment. Given that the excavation, analysis and interpretation of this feature was by far the most complex aspect of the entire SERF Project, and the constrained space within this monograph, this is necessarily a summary account, to be followed by a comprehensive publication (Brophy *et al* in prep). We will conclude the chapter with a brief discussion of subsequent activity and modifications of the Henge 1 location.

The insertion of a cist into the interior of Henge 1 is part of a sequence of henge modifications at Forteviot, documented also in the following chapter when we consider Henge 2. However, this grave epitomises in more detail than any other feature of the Forteviot complex the ways in which the past and the character of sacred places continued to be harnessed to add legitimacy and a sense of place to lineages in the Earn river valley towards the end of the 3rd millennium BC.

5.1.1 Discovery and excavation of the cist

The cist was identified within the interior of Henge 1 during 2008 and fully excavated one year later. In 2008, a thin stony spread (layers 305/322) consisting of rounded boulders covering an area some 4m by 2.5m was identified within the henge interior, at the southern edge of the trench; Sondage 3 (see Figure 4.3) was cut into this to investigate the nature of the spread. One edge of the cist capstone was located within this sondage, although at that stage its significance was unclear; however, this became the focus of our investigation. The sondage was extended, revealing in plan the massive sandstone slab (Figure 5.1). Unfortunately, due to time constraints the slab had to be covered over again with geotextile and backfilled

Figure 5.1 First view of the cleaned cist capstone in 2008, before we knew what, if anything, lay beneath

Figure 5.2 Crane lifting the cist slab during the 2009 season

Figure 5.3 The cist interior being examined by Gordon Noble in the minutes after it was opened

until one year later, when comprehensive excavation began.

Excavation of this feature began with the careful removal of the large sandstone slab by crane (Figure 5.2). This revealed a rectangular void, and it was immediately apparent that this was an intact cist (Figure 5.3). Inspection of the contents on the cist floor suggested the presence of both copper alloy and organic materials, so Pieta Greaves of AOC Archaeology Group was called in to help with the excavations under the auspices of (at that time) Historic Scotland. The contents of the cist were carefully recorded and excavated over the following 24 hours. In some cases, material was lifted in blocks to be excavated under laboratory conditions while samples were also taken for flotation and phosphate analysis.

5.2 The architecture of the cist

Although the contents of Bronze Age graves often become the focus for analysis and attention, it is important that the architecture of the place of burial is also given due consideration. Therefore, before considering the grave goods, this section describes the various elements of the cist structure: the pits, the cist slabs (side and capstone), and the cairn. Their relative locations are shown in Figure 5.4.

5.2.1 The cist pit

The cist was set within a pit, which deepened towards the centre for the cist slabs (Figures 4.3 and 5.5). The pit (348) measured 5.7m north to south by at least 3.3.m, had steep sides, a flat bottom and a maximum depth of 0.6m. On its southern and eastern sides, the pit was cut into the henge ditch (here allocated number 543) to a maximum extent of 1.4m. This cut was made after the henge ditch had backfilled with gravels (638, 639) to a depth of at least 0.75m, suggesting that by this stage the ditch had been open for a considerable period. The cist was set within a smaller cut dug into the base of Pit 348. This smaller cut (813) was very much designed to contain the cist neatly; it was

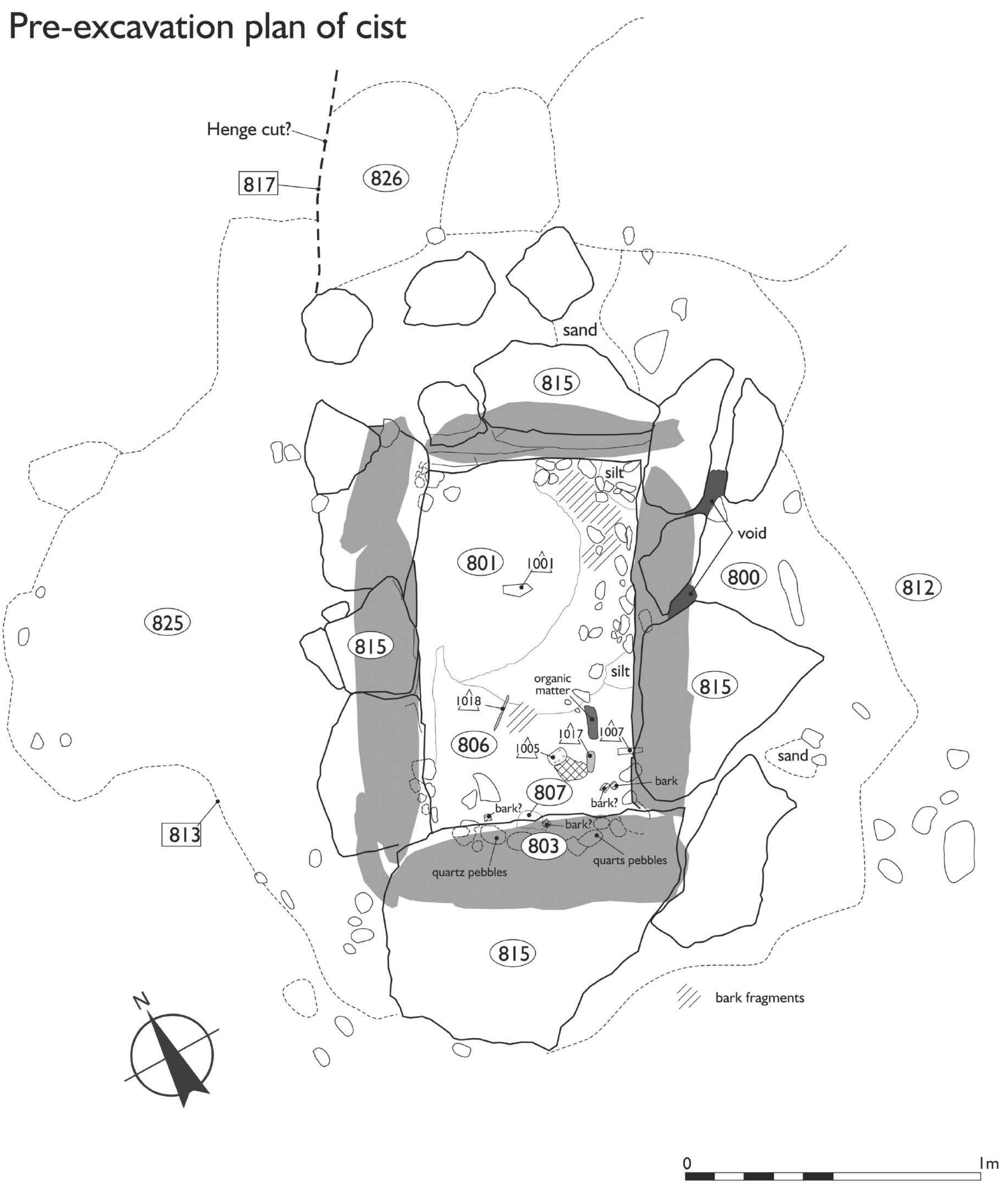


Figure 5.4 Annotated plan of the cist and its contents

subrectangular and measured 3.00m north-east to south-west by 2.18m, with vertical sides, an irregular base cut into a band of sand in the natural, and a depth of 0.70m beneath the base of Pit 348 (and therefore over 1m beneath the henge interior ground surface). It seems likely that the larger, upper portion of the pit was required to facilitate the subterranean containment of the cist capstone, as well as accommodate the capstone, and so this seems to have been a carefully planned construction project.

5.2.2 The cist

The cist was constructed using five large, light-brown to grey sandstone side-slabs, defining an internal open space that measured 1.20m by 0.75m with the long axis north-east to south-west; the cist slabs themselves had a maximum height of between 0.7m and 0.8m (Figure 5.6). Three sides of the cist were defined by single slabs, the exception being the north-western long side which was formed from two slabs abutting

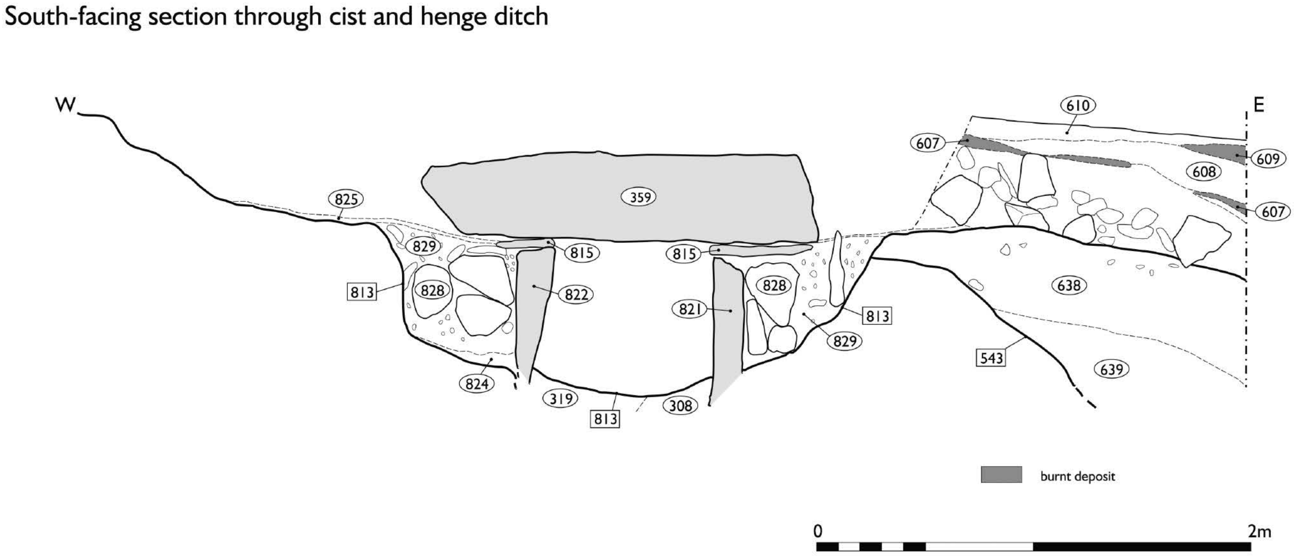


Figure 5.5 Section drawing through the cist showing cist pit, cist, capstone, henge ditch

one another (context 822). The slabs were clearly selected for their shape and size, being relatively narrow in relation to length and three were distinctively shaped, tapering towards one end (Table 5.1; see Figure 5.7). The cist side-slabs, along with the capstone, may have been sourced from within 1km of the site (see section 5.2.3 and Figure 5.12).

The cist base was irregular and consisted of the fine, clean sand which is the natural subsoil at this depth in this location. This floor also rose up around the sides of the cist, due to soil percolating through the cist sides. A mound of fine sand was identified in the north-western area of the cist interior, perhaps accumulated due to the actions of ants; multiple body parts of ants were found amongst various samples taken from the cist. However, this might also been a deliberate deposit as part of a wooden bowl was found on it, which may have been used to scoop sand into the cist (section 5.4.2). Quartz pebbles were concentrated at the southern end of the cist, where we presume the head to have been placed, and there were also areas with partial pebble cobbling in the northern half of the cist; for more on this surface, see section 5.3.1.

The cist had clearly been constructed with great care and a mind to its future stability and water-tightness. The three slabs defining the long sides of the cist (821, 822) were partially set into the sandy natural; it seems unlikely that they sank into the sand over time as slabs at the short ends of the cist (820, 823) remained on the surface. This arrangement ensured that despite variability in stone height, the cist itself was arranged with a flush and level top upon which to rest the

Figure 5.6 The cist slabs viewed from above during excavation

Table 5.1 Cist slab summary

Cist slab	Context No.	Length × thickness	Height	Shape
North-east	820	0.92 × 0.19m	0.59m	Tapers towards north end
South-east	821	1.26 × 0.22m	0.70m	Tapers towards north end
North-west south	822	1.12 × 0.22m	0.68m	Tapers towards south end
North-west north	822	0.52 × 0.15m	0.40m	Rounded base
South-west	823	0.98 × 0.28m	0.49m	Rectangular, narrows towards base

capstone. Each slab was laid so the corners were formed by slabs overlapping one another adding to the structural integrity of this stone box.

As the side slabs were not rectangular, in some instances additional chock stones were added to the sides to fill in gaps, presumably once the cist frame had been constructed. This was most evident at the south-western short end where a large round boulder had been fitted beneath the cist slab on its western side. In the north-east corner of the cist, five small stones had been crammed into a gap left by the tapering of the slab in that location, while a similar arrangement was noted at the northern corner where an angular gap was filled with a split stone specifically broken to fit the gap (830), supplemented by quartz pebbles (Figure 5.7). Clay luting was also identified in some of these gaps, with clay pushed into spaces in the cist structure and beneath side slabs, perhaps having the objective of additionally supporting and/or sealing the structure.

The cist was supported by robust material backfilled into the space between the cist slabs and the side of Pit 813. This consisted of large, angular basalt fragments and rounded boulders (up to 0.5m in length), within a matrix of coarse gravel (fills 828 and 829). This filled the entirety of the pit outwith the cist structure itself, and so in places was up to 0.7m in depth. This packing fill was very similar to the cairn material overlying and surrounding the capstone (section 5.2.4) and may have been from the same

Figure 5.7 South-east cist slab, tapered at one end, with quartz pebbles used to fill gaps in this side of the cist. The north-east corner is to the left side of the image

Figure 5.8 South-west end cist slab, which some team members felt may have had a faint carved symbol(s)

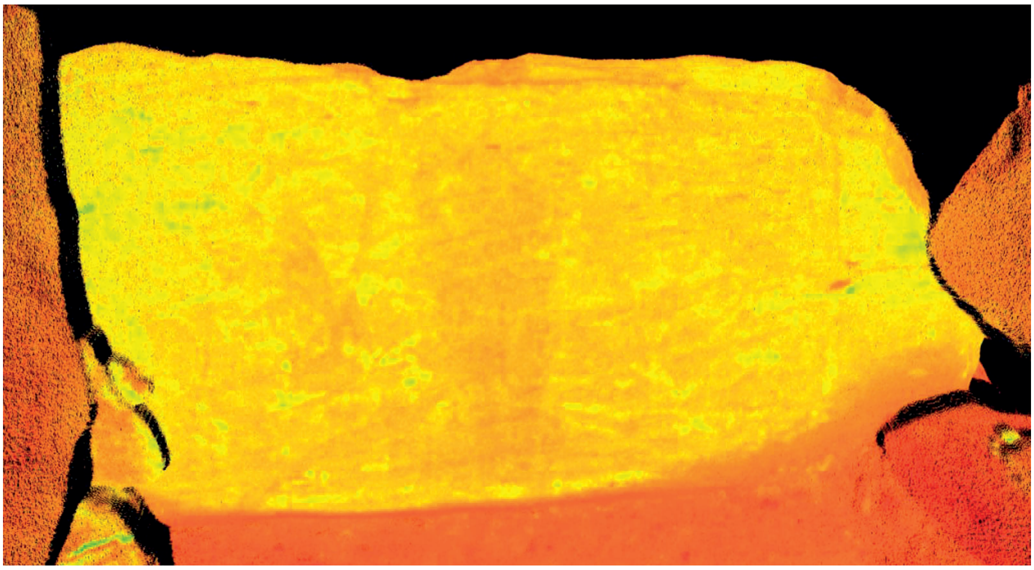


Figure 5.9 Image from laser scanning of the south-west end cist slab showing no obvious carved symbol (© HES)

source, suggesting a coherent construction project. Two large quartz pebbles were placed together towards the top layer of packing at the southern head end of the cut, perhaps echoing the quartz pebble arrangement on the cist floor at its southern end (see below). Finally, a series of thin sandstone slabs were laid atop the cist side slabs around the complete circuit of the structure, concealing the packing around the cist (Figure 5.4). The largest of these 'levelling stones' was at the south-west end of the cist; it extended far beyond the cist slab (measuring 0.8m north-east to south-west by 1.0m, and about 0.06m thick). The capstone was laid directly onto these stones with a fine spread of sand (800) and silt (818, 824) on top of them, perhaps to cushion the blow of the heavy capstone. It is possible that these levelling slabs may also tell us something about the choreography and aesthetic of the burial ceremony. They will have supported the weight of people gathered at the cist who were involved in lowering the body and grave goods into it (see Figure 8.8).

During the excavation, some team members and visitors claimed to discern carvings of one or more axeheads/daggers on the south-west end slab (head end) of the cist (Figure 5.8). Subsequent laser scanning by the HS digital documentation team (Figure 5.9) failed to show any conclusive carvings on this slab and it is likely that this effect was caused by natural markings on the stone. However, these natural impressions may have been one reason why this stone, and specific surface, was selected for inclusion at the head end of the burial.

5.2.3 The capstone

Ewan Campbell

The capstone (395/805) is formed from a single massive bed of coarse reddish-purple arkosic sandstone, from the Lower Old Red Sandstone (Lower Devonian), Scone Formation (section 2.2.1). It measures 2.2 × 2.1 × 0.4m, and is slightly trapezoidal in shape. The slab is estimated to weigh around four tonnes. It was laid on top of the levelling stones and silt/sand layer as discussed above, covering all of Pit 813, and contained within larger Pit 348. The upper and three of the side surfaces had been weathered before burial, but the lower surface and one end are fresh. This end shows stepped fractures where the bed had been broken (Figure 5.10). The sides at least partially follow the lines of joint planes. It is clear from the examination of these surfaces that the slab had originally been chosen because it was at the surface of an outcrop and was already outlined by joint plane fractures. The slab was then levered out of the outcrop by driving wedges under it to separate it from the underlying bed, fracturing the one side that was still attached to the outcrop.

Attempts were made to source the quarry for the capstone. An initial search of outcrops to the north of the River Earn (where the largest outcrops of Scone Formation in the area occur) failed to reveal a good match for the rock-type. A subsequent search along the Water of May found a much more promising series of outcrops. The lowest of these, and closest to the site of the cist, showed all the features found in the cist slab in terms of lithology, bed thickness, and jointing pattern. It seemed clear that a few slabs had been removed from this outcrop, leaving scars that approximated to the shape and size of the cist-slab (Figure 5.11). Smaller slabs had also been removed and these could have been used for the side slabs of the cist. The outcrop is sited just below the old bridge of the now

Figure 5.10 Capstone side showing quarry fracture

Figure 5.11 Possible quarry site for cist capstone on the bank of the Water of May (photo: E Campbell)

disused section of the Dunning to Bridge of Earn road (NO 0556 1624), 0.9km to the south of the burial. Getting the slab to its destination would have represented a considerable task, even allowing for the utilisation of the most straightforward route along the river terraces and a natural slope leading up to the terrace upon which the cist is located (Figure 5.12). One significant problem would have been crossing the May, which is quite steep-sided at the quarry location on the south side of the river. As it currently appears, the Water of May does not seem likely to have been able to accommodate a raft carrying such a large stone (as has been attempted experimentally in relation to moving bluestones to Stonehenge (John 2008)). However, experimental work has demonstrated even large stones can be moved over awkward terrain with relatively small teams of workers and/or oxen albeit with a lot of hard work and danger (Atkinson 1956, 109; Parker Pearson 2012, 266–8; Harris 2018). Richards (2009; 2013) has made a persuasive case that moving big stones in the landscape would have been socially memorable journeys, and the timing of the journey and arrival of this stone to the burial location in relation to the death of the individual buried in the cist would have been a significant factor in the nature of the memories created here. This is also indicative of the status that the deceased was accorded.

The quarry-faced underside of the capstone, that is the side facing the burial, had an unusual motif pecked upon it (Figures 5.13 and 5.14) which must date to at least the time of the burial, having been carved at some point between the time the stone was quarried and its positioning over the cist. The motif has been pecked onto the surface of the sandstone capstone, towards the centre; it would have been located above the presumed foot end of the burial. The symbol consisted of a ‘footprint’ or ‘club’ motif, from which a pecked line emerges and terminates in a pecked double-oval ‘eye’ motif; this could also be interpreted as a lozenge. On the other side of the ‘footprint’ there is a suggestion of a further short pecked line curving in the opposite direction from the line on the opposing side. In total, this motif (or two motifs) spanned an area measuring 0.4m by 0.5m.

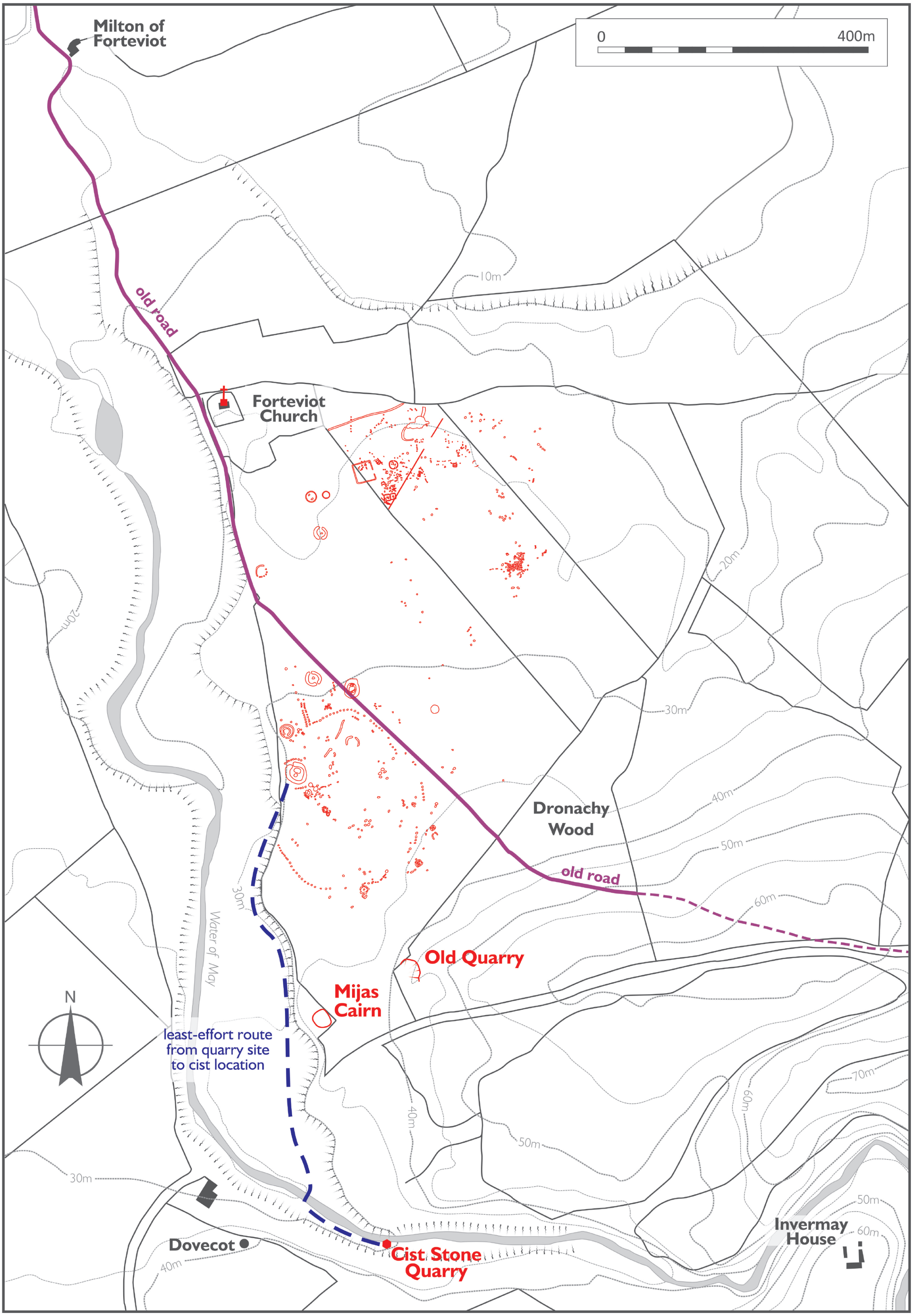


Figure 5.12 Map showing the relative location of putative quarry site to the cist location, the least-effort route to get from the former to the latter, and the old routeway from Invermay to Forteviot

Figure 5.13 Detail of motif carved onto the underside of the capstone

Figure 5.14 Ewan Campbell recording the motif on the cist slab, which he first identified

Figure 5.15 Cairn material pre-excavation in 2008

5.2.4 The cairn

Kenneth Brophy and Ewan Campbell

The cist and capstone were then covered, and Pit 348 filled with large pieces of quarried basalt, rounded water-worn stones and a gravel matrix (349, initially identified in Sondage 3 in 2008). This amorphous layer, some 0.6m thick, spread across an area measuring some 6m in diameter (Figure 5.15). This material was very similar to the packing which supported the cist within Pit 813 and, as noted above, it may well have come from the same source. The basalt may have been sourced from nearby Dronachy Ridge where a modern quarry exists today (although the significance of this source and material is unclear), and the rounded pebbles collected from the nearby Water of May (Figure 5.12). The stone-work is likely to have formed the base of a cairn covering the cist, which had been extensively disturbed and removed to foundation level by the time of our excavation (perhaps due to the modifications of the henge that happened much later in the sequence of the use of this location, discussed below in section 5.4.6). The original height of this cairn is unknown, but slumped cairn material found in the henge ditch fills suggest it was clearly larger and higher in prehistory than it is now. It represents a major investment in labour – the largest stone within the rubble fill was 1.1m in length and the basalt had been quarried and dragged to the site for the purposes of covering the cist.

5.3 Inside the cist

A series of objects, materials and samples were recovered from the interior of the cist (see Figures 5.4 and 5.16), and these will be discussed in this section. These are summary accounts of the results of a series of analyses undertaken by a large team of specialist contributors; fuller and more detailed accounts can be found elsewhere (Cameron *et al* 2013; Noble and Brophy 2011b; Brophy *et al* in prep). Some of this material was lifted in blocks and retrieved after micro-excavation and analysis in the laboratory. Block Lift 1 contained the dagger, Block Lift 2 contained the small knife and fire-making kit, both located in the southern half of the cist; Block Lift 3 consisted of birch bark and was removed from the central area of the cist.

5.3.1 Beneath the body

Kenneth Brophy, Jennifer Miller, Susan Ramsay, and Alison Sheridan

As noted above, the floor of the cist largely consisted of a natural band of fine and clean sand. Pebbles had been deliberately placed onto the cist floor: these (deposits 804, 810, 811) were almost all less than 50mm across, rounded and possibly gathered from a river or streambed. They were not evenly spread, being more common on the eastern and southern portions of the cist floor (Figure 5.16). In the eastern half of the cist these pebbles had the look of a cobbled surface. Between a quarter and one third of the pebbles recovered from within the cist were quartz, including one of the most striking elements of the burial, an arc of large quartz pebbles (up to 100mm long) against the southern end of the cist, which in effect would have formed a halo around the head of the deceased which we assume to have lain here (Figure 5.17; section 5.3.2). This recalls a similar pebble setting found in association with a Bronze Age cremation burial at Balfarg Riding School: here the cremated remains were 'surrounded by a "halo" of stones, containing a high proportion of quartz' (Barclay and Russell-White 1994, 198).

Fragments of birch bark (Figure 5.18) were found across the cist floor. These were poorly preserved in most areas, but where found in close proximity to copper alloy grave goods, they appeared to be better preserved and partially mineralised (a general trend for organics found within the cist). One of the better-preserved areas of bark was identified immediately above a concentration of rounded pebbles on the cist floor, suggesting the birch followed the pebbles into the cist in chronological sequence. The structure of the birch bark appeared to suggest that it had been laid in two opposing directions, perhaps forming a lattice-work. However, due to its poor state of preservation it was difficult to determine whether the bark had simply been laid in large pieces or if wide strips had been woven into some form of matting either for use (along with wooden stick fragments found in the cist (section 5.3.5)) as part of a bier to transport the deceased to

Figure 5.16 Detailed photograph of cist contents before excavation (east to the top)

Figure 5.17 Halo of quartz pebbles at the south-western end of the cist

Figure 5.18 Birch bark (left) *in situ* on the floor of the cist; (right) being block lifted from the cist

the cist, or as matting to cover the cist floor before the corpse was placed on it. The fact that other strips of birch bark were found overlying the dagger and diagonal to its blade (Cameron *et al* 2013, 26) might strengthen the argument that the bark strips had indeed been matting, and that matting was laid over the body as well as under it.

Small quantities of pollen and leafy shoots of heather were also recovered from the southern half of the cist; these may have been intrusive but could be interpreted as remnants of additional floor-covering (Ramsay and Miller 2012). The possible inclusion of birch leaves in the grave, perhaps another floor-covering material, was indicated by the identification of the bodies of a weevil and *Cixius* insects amongst samples from the cist. Overall the insect remains were scarce in the cist contents analysed (Geoff Hancock pers comm), which may suggest that the body and associated grave goods were not left uncovered for long within the cist before the capstone was put in place – although it could be argued, to the contrary, that the abundance of meadowsweet remains in the cist, along with a pile of sand located at the back of where the body had been (together with a wooden bowl that could have been used to scoop it into the cist), suggest measures to conceal and cope with the process of decomposition.

The presence of animal skin or hide is suggested by the discovery of occasional fragments of skin with hair among material collected from behind where the head of the corpse is believed to have lain (indicated in Figure 5.28). It raises the question as to whether there could have been an animal-skin lining on the floor of the cist – or else whether the body might have been wrapped, or dressed, in animal skin. These possibilities will be returned to later, in the discussion of skin/hide fragments found above the fire-making kit (section 5.3.4).

5.3.2 The 'body'

Lyn Wilson, Allan Hall, Gert Petersen, Susan Ramsay, Jennifer Miller, and Alison Sheridan

The evidence for the former presence of a body inside the cist is virtually all circumstantial and based on chemical traces left behind by the decomposed remains. The only direct evidence for surviving remains consists of 21 tiny bone and fingernail fragments found within the material in the immediate vicinity of the dagger, plus seven small fragments of bone and four small fragments of tooth enamel, found in the area where the head is believed to have lain at the southern end of the cist. These remains were found by Susan Ramsay and Jennifer Miller, during their analysis of block-lifted samples.

Various chemical traces confirming the former presence of a body were also recovered. Phosphate spot samples taken every 50mm on the floor of the cist (for methodology see section 2.5.3) strongly indicate that a flexed or contracted body did once lie in this grave with torso in the southern half (Figure 5.19). Analysis showed a distinct group of higher phosphate readings at the east side of the cist and extending to the north-east, covering an area *c* 0.80m by 0.55m maximum. This, along with the arrangement of the grave goods, suggests the body was flexed or contracted ('crouched') and laid on its left side with the head to the south, facing west (Figure 5.19). This observation is reinforced by both the finds of small bone, nail, and tooth enamel fragments and the disposition of grave goods, with the majority concentrated within a dark,

Figure 5.19 Making sense of the arrangement of the body within the cist. Left: results from phosphate analysis of the cist floor; Right: interpretive plot of the body with key grave goods marked

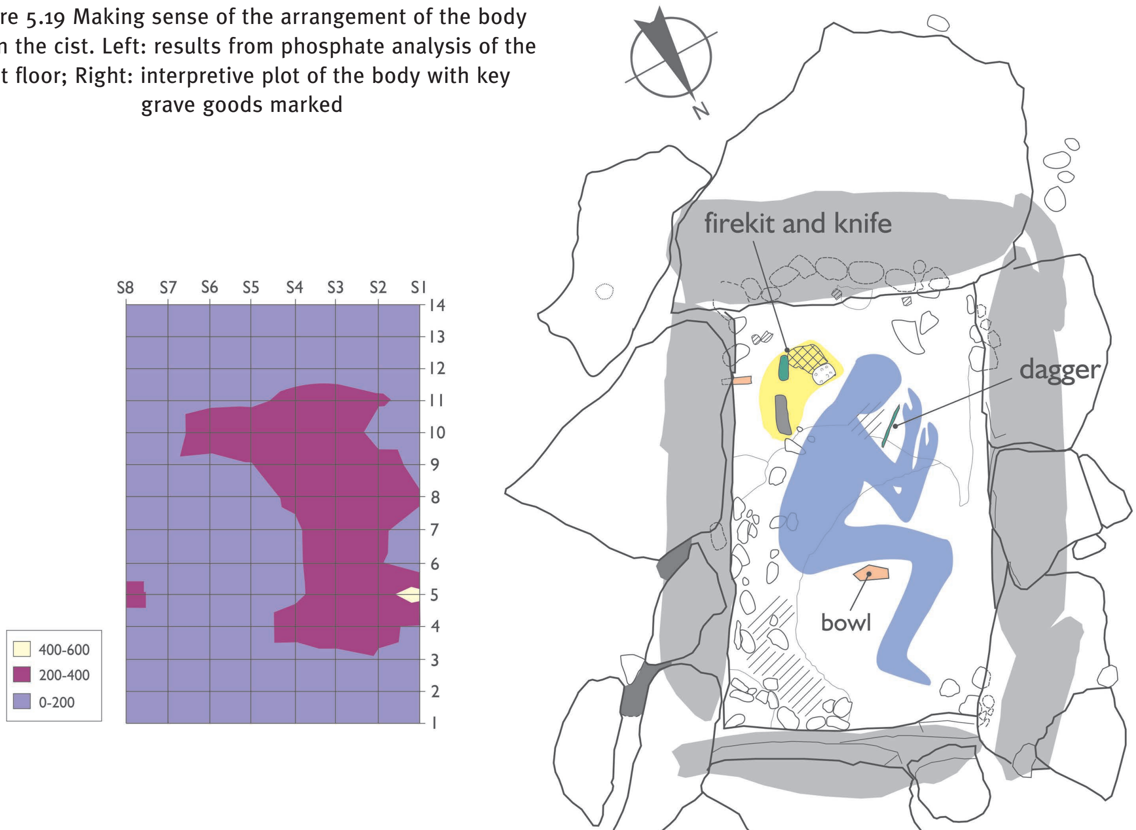


Figure 5.20 White staining on the north-east end cist slab and packing stones

Figure 5.21 Preparing to take phosphate samples from the floor of the cist. Note white precipitate on the stone in the corner of the cist

organic-rich layer (807) covering an area some 0.5m by 0.4m in the southern half of the cist. The presence of the 'halo' (or 'pillow') of quartz pebbles here further indicated that the southern end of the cist was where the head was placed.

The former presence of bone within the cist was confirmed through the study of cream-to-white staining found on the cist side slabs and on some pebbles on the cist floor (Figures 5.20 and 5.21). The staining underwent a series of analyses, including

Powder X-Ray Diffraction (XRD), Scanning Electron Microscope (SEM) analysis and oil immersion petrology with results and full methodology published elsewhere (Hall *et al* 2014). The tests demonstrated that this powder was a calcium phosphate hydroxide called hydroxyapatite, essentially a precipitate of mammalian bone of the kind sometimes found on the walls of lead-coffins (eg Charlier *et al* 2008), and also found in the sporadically waterlogged early Bronze Age cist at Langwell Farm, Strath Oykel, Highland (Lelong 2015). It was concluded that the white staining was dissolved bone, 'presumably human', which 'dissolved in a pool of acidic body fluid and [was] re-precipitated' on the cist slabs (Hall *et al* 2014, 13). It seems, therefore, that the conditions within the cist were not conducive to the survival of human bone, but this may have in turn impacted positively on the survival of other organic materials.

Several white greasy blobs of material were recovered from the floor of the cist during excavation and in laboratory analysis of samples and micro-excavation of block-lifted material (Figure 5.22). Chemical analysis revealed that these were fine gypsum crystals (A Hall pers comm), rather than adipocere (body fat), as initially believed. Further traces of gypsum were found on fragments of animal skin in the area of the fire-making kit (section 5.3.4). While gypsum is known to have been used elsewhere as a white pigment in Neolithic and Early Bronze Age contexts – for example at Thornborough, North Yorkshire, where it may have been used to coat the banks of henges to render them brilliantly white (Thomas 1955; Harding 2012; 2013, 77ff) – at Forteviot it is more likely to be a natural precipitated product of the decomposition of the human body, along with the hydroxyapatite. Precipitation of gypsum as part of the human remains degradation process has been documented for late Bronze Age human remains from a cave in Menorca; there it was interpreted as having resulted from the oxidation of organic sulphur from the bodies, which later precipitated with the calcium present in the cave substrate (Bergadà *et al* 2015).

Figure 5.22 Sample of white greasy material found on cist floor (© National Museums Scotland)

If this interpretation of the disposition of the body in the cist is correct – that is, that the individual had been laid on the left side of the body, with legs and arms drawn up – then, along with the range of grave goods present in the cist (as discussed below), this strongly points to the sex of the individual as having been male. The arrangement of bodies in Chalcolithic and early Bronze Age graves associated with Beakers and Food Vessels in north-east Scotland and east Yorkshire has been analysed by Alexandra Shepherd (2012; see also Parker Pearson *et al* 2019, chapters 3 and 5), and while the 'male on the left, female on the right' pattern that was characteristic of Chalcolithic Beaker graves declined after *c* 2200 BC, nevertheless it did persist in some early Bronze Age graves.

5.3.3 The dagger

Alison Sheridan, Esther Cameron, Sonia O'Connor, Pieta Greaves, Peter Northover, Chris Standish, Jennifer Miller, Trevor Cowie, and Matt Knight

In the southern half of the cist, in front of where the chest of the deceased is believed to have been and among a mass of organic material (almost wholly meadowsweet plant remains), were found the remains of a bronze dagger in its sheath, its tip pointing roughly towards the chest of the deceased. If, as seems likely, the body's arms had been flexed, the dagger would have been positioned close to (or in) the hands (see Figure 5.19), and this suggestion is strengthened by the discovery of fingernail fragments, along with a few tiny fragments of bone, in the mass of organic material in the immediate vicinity of the dagger. Lying diagonally over the dagger were the remains of thin strips of birch bark that could have been part of matting, placed over the body as suggested above (Figure 5.23). A CT-scan showing a side view of the dagger reveals that the hilt was found at a slight angle to the blade (Figure 5.24), that the blade curves minimally, and that near where the blade tip would have been, it kinks. The significance of these features will be discussed below.

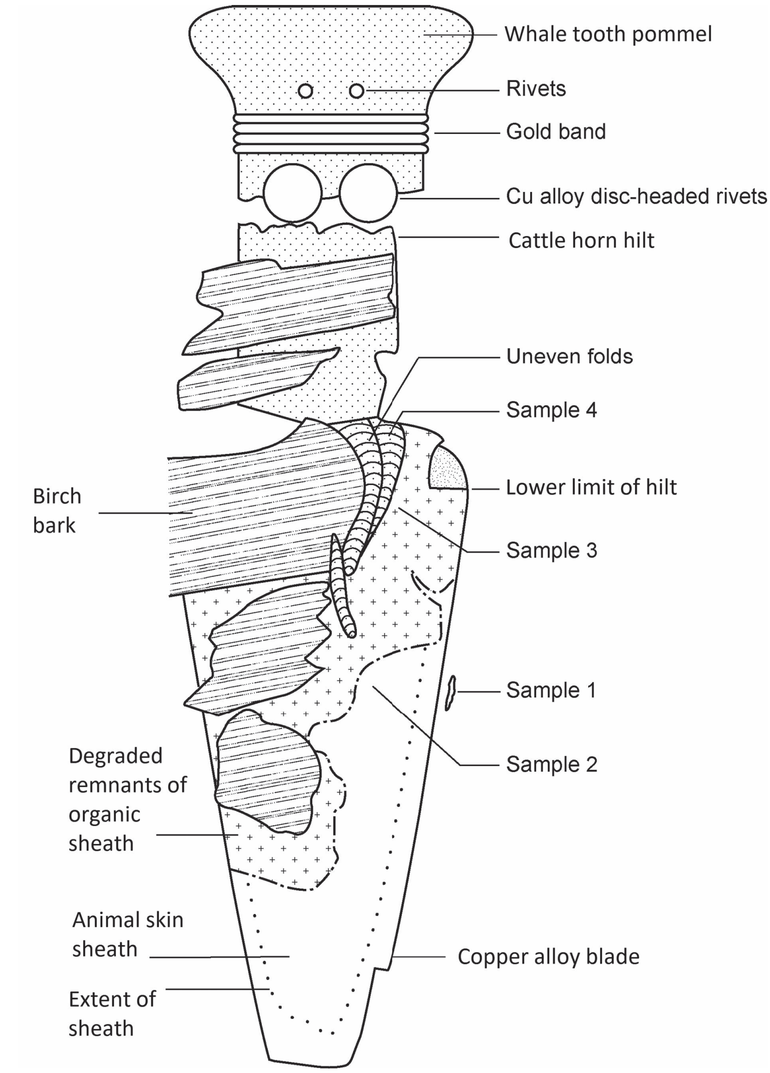


Figure 5.23 Schematic drawing of the Forteviot dagger showing the main elements of this object and locations where key samples were taken from. The birch bark fragments were overlying the dagger but were not part of the sheath (drawing after Esther Cameron)

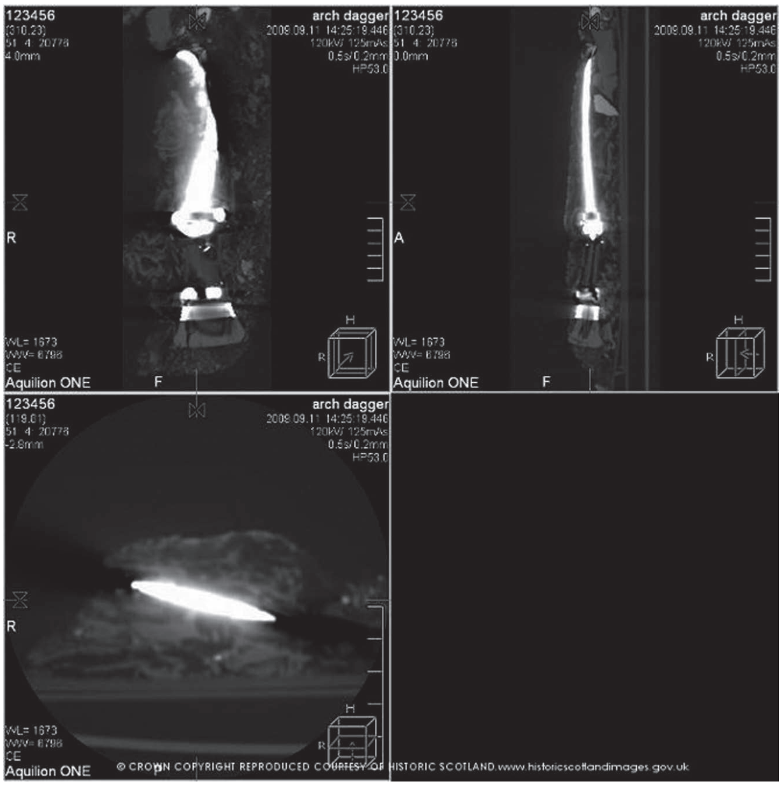


Figure 5.24 CT scan showing various views into the block of material in which the dagger was contained. The top right image clearly shows the dagger blade was bent and that the hilt was found at a slight angle to the blade (image courtesy of NHS Lothian)

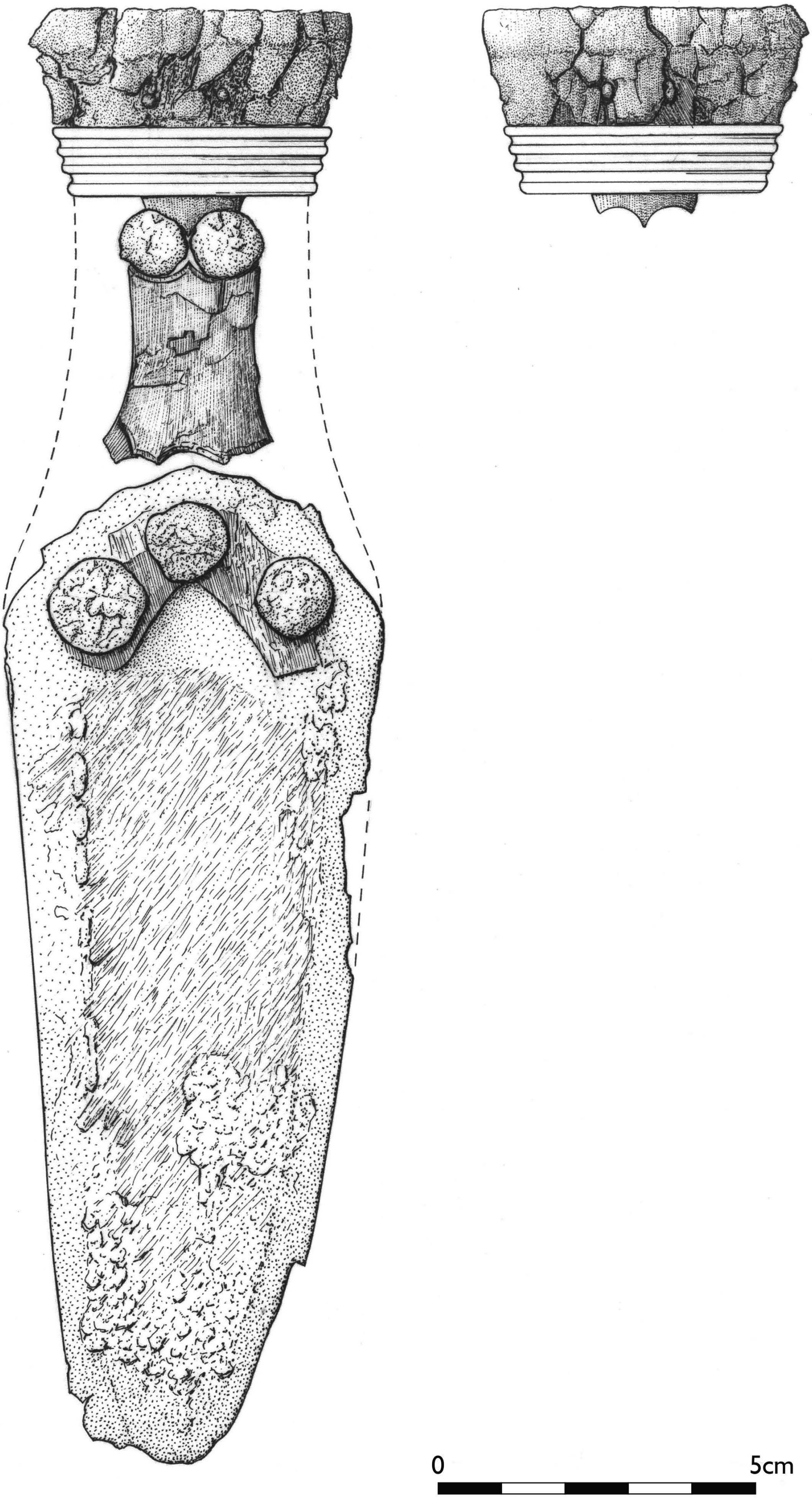


Figure 5.25 Drawing of the Forteviot dagger by Marion O'Neil (© National Museums Scotland)

The dagger consists of a large, flat, butt-riveted bronze blade and a composite hilt made from horn, gold and sperm whale tooth; the remains of a sheath made from shaved calfskin, its hair side towards the blade, were found on the blade area. The blade is almost complete, missing the tip and part of the sides through corrosion; its surviving length is 155mm and its maximum width, at the lower two of its three rivets, is 60.2mm. Its original length was probably in excess of 180mm (Figure 5.25). Its thickness ranges from 3.6mm at the top of the blade to just 1.8mm at the other end, close to where the tip would have been. As noted above, there is a distinct kink towards the tip and a very slight curvature to the rest of the blade, seen most clearly in the CT-scan image. The blade is flat, thinning towards its edges, and it has a slender, flattish ellipsoid section. The butt is rounded, with three rivets following its curvature. The sides are straight and the tip is likely to have been gently pointed. The three rivets are round-sectioned and have gently domed heads. Their length (excluding excrescence from corrosion products) ranges from 13.8mm to 15.6mm and their diameter at their waist ranges between 11.0mm and 11.3mm; they broaden towards the ends, to a maximum width of 18.3mm on one rivet. The corroded state of the blade ruled out any sampling for metallographic analysis, so nothing can be said about the blade edge in terms of grain size and hardness.

Compositional analysis, by Chris Salter (Oxford Materials Characterisation Services) for Peter Northover, of samples drilled from the blade and from two of the rivets, using electron probe microanalysis with wavelength dispersive spectrometry (EPMA-WDS), confirmed that the metal is indeed tin bronze (Cameron *et al* 2013, table 1). It is very probable that the measured tin content of the blade, 7.74%, is an underestimate, due to the corroded state of the metal, and that the true value is probable nearer 9–10%. The compositions of the blade and the rivets suggest a mixing of two types of bronze scrap that would have been available locally to the workshop that made it. Correlation with published analyses and with the typology of Scottish early Bronze Age metalwork (Coles 1969) suggests an origin for the metal outside Scotland since bronzes with arsenic as the main impurity and with small amounts of nickel, silver and, sometimes, antimony, are associated with flat axeheads of northern Irish style and decoration. The copper is likely to have come from the Ross Island copper mine

Figure 5.26 Esther Cameron taking a sample from the dagger handle area

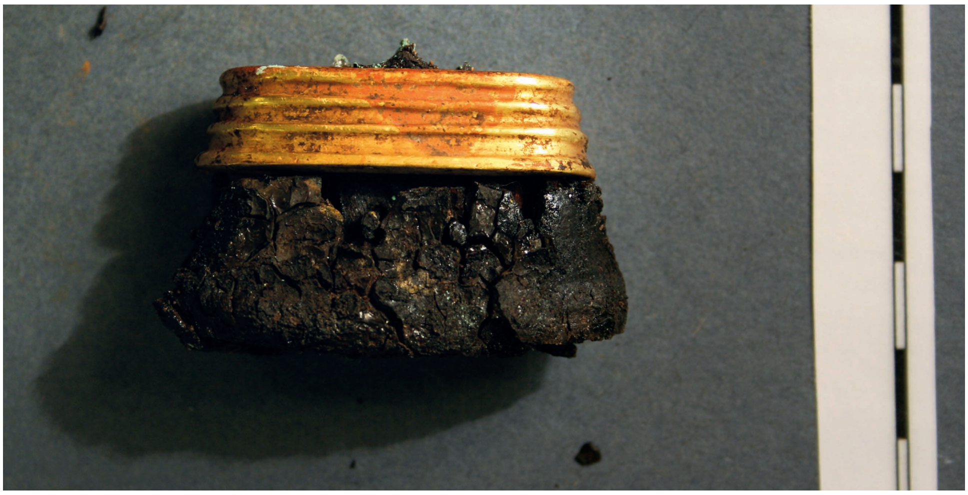


Figure 5.27 The pommel with gold band attached (© National Museums Scotland)

in County Kerry, south-west Ireland, while the ultimate source of the tin is likely to have been Cornwall or Devon. The question of where the dagger was made will be discussed below.

The hilt consists of two plates of cattle horn which, in addition to being riveted to the blade by the three aforementioned rivets, were also riveted to each other (with two bronze rivets) and were attached to the pommel by two dowels. Below the pommel is a band of corrugated sheet gold. While the horn grip had shrunk in antiquity, its original width and thickness can be estimated from the width of the gold pommel mount and the length of the rivets: at its top it will have been around 38.6mm wide, while at its bottom it will have been wide enough to cover the broadest part of the blade, so will probably have been around 61mm wide. In thickness it will have been around 13mm. Its sides are likely to have been gently concave. At its top it narrowed to fit into a slot on the underside of the pommel, while at its bottom it was shaped into a broad W shape, with the blade rivets close to its lower edge. Identification of the material as cattle horn was confirmed through microscopy and SEM imaging (undertaken by Sonia O'Connor and Esther Cameron (Figure 5.26)); the grain of the horn ran parallel to the long axis of the dagger (see Figure 5.23). The plates had probably been cut from the hollow base of a horn and, given their size, this is more likely to be cattle horn than sheep horn, although it is not possible to rule out the possibility that it was from a large goat. The two metal rivets that served both to fix the horn plates together and to anchor the gold pommel band are squarish in section and measure 16.4mm and 16.7mm in length, with waist widths of 7.2mm and 8.6–10.2mm, respectively.

The pommel band (Figure 5.27) consists of a seamless hoop of sheet gold, its top and bottom edges folded back, with three horizontal corrugations. It measures 11.05mm in height, 43.70mm wide at its top, 38.60mm wide at its bottom and around 18mm front to back. The sheet is *c* 0.3mm thick. The ridges of the corrugations have a high sheen. Sporadic reddish staining on the surface relates to post-depositional chemical transformation of copper in the gold. The band had been supported by a ring of horn, itself corrugated − thereby suggesting that the gold band may well have been pressed into this to form the corrugations. Tiny flecks of gold had spalled off from the interior of the band onto this support. The horn band had been cut from the tip of a horn, but it was not possible to determine whether this had been the same horn as used for the hilt plates, or horn from another individual or species.

The gold was analysed compositionally using EPMA-WDS and by ICP-AES/MS (inductively-coupled plasma atomic emission spectroscopy/mass spectroscopy) – the work being arranged by Peter Northover and undertaken by Chris Salter and by ESG (Environmental Scientifics Group) – and also by Chris Standish using lead isotope analysis. The EPMA-WDS and ICP-AES/MS analyses used by Northover revealed that the hilt band was seemingly made from unalloyed natural gold − the copper in it may relate to a natural alloy (although one cannot altogether rule out the possibility that copper had been deliberately added); such a choice is typical of early Bronze Age gold in objects such as lunulae (Taylor 1980). The trace elements relevant to the composition of the gold are mercury, nickel, lead, palladium, platinum, antimony, and tin; their concentrations (in parts per million) are listed in Cameron *et al* 2013, table 2. Of note for the sourcing of the gold are the values of 21ppm palladium, 0.5ppm platinum and 580ppm tin. Chris Standish's analysis revealed that the lead isotope composition of the Forteviot pommel band is indistinguishable from that of Irish early Bronze Age gold artefacts. This suggests that the pommel band was manufactured from the same metal pool used to produce goldwork (including lunulae) in Ireland during this period, and by consequence was produced from gold originating from the same or similar ore sources. The most plausible source area is south-west England, specifically Cornwall (Standish *et al* 2015). A source in Scotland can be ruled out.

The pommel (Figure 5.27) has a flat top, flattish-oval in plan, and a gently bulbous lip; below this it curves in towards the top of the gold band. Its maximum width is around 50.5mm and its height is 19.0mm; its breadth (front to back) was 20.0mm when first found, narrowing to around 18mm where it abuts the pommel band. The underside had been partly hollowed out to accommodate the horn plates; drill holes relating to the beginning of this hollowing-out process are visible. The shape of the socket thus created echoes that of the top of the pommel. Two small dowels, around 2.3mm across, survive *in situ*; these will have secured the pommel to the grip. Their material has tentatively been identified by Sonia O'Connor as horn. The material of the pommel is heavily degraded, but microscopic examination by Sonia O'Connor revealed a circular nodule, beside an area with a lamellar structure, that is diagnostic of sperm whale tooth ivory (Cameron *et al* 2013). It is assumed that the whale had been beached, rather than hunted.

Traces of a sheath were found on the dagger blade, apparently stopping immediately below the bottom of the hilt. Microscopic examination and SEM imaging by Esther Cameron concluded that the material had been a shaved animal skin, probably from a calf (to judge from the diameter of the mineralised casts of hairs), with the hair side closest to the blade. While there was no evidence for stitching, a ridge of mineralised material noted along one side of the blade where it started to narrow to its edge is suggestive of a seam, and there may have been another near the other edge of the blade.

The dagger is of Masterton type (Gerloff 1975), falling within Stuart Needham's Series 2 (butt-riveted, flat-bladed daggers), sub-series E, Masterton (Needham 2015). Its pommel falls within his 'Class 2' (long oval socketed pommel-pieces with trapezoidal face profile: *ibid*, 45 and fig 3.2.3). The 22nd-century cal BC radiocarbon dates for material from the Forteviot cist are exactly in line with the currency of this dagger and pommel type (2150–1950 BC: Woodward and Hunter 2015, 462). The gender associations of daggers are overwhelmingly male, not only in Scotland (Baker *et al* 2004, table 4) but in Britain more widely (Woodward and Hunter 2015, tables 11.21–2).

The fact that the hilt appeared to be out of horizontal alignment with the blade, and the blade was gently curved with a more pronounced kink near its tip, raises the question as to whether the dagger had been deliberately damaged – 'ritually killed' – when it was deposited in the cist, to remove it from the realm of the living. While in theory the kinking of the tip could have resulted from use, and the slight bending of the blade could have resulted from a number of factors, it is harder to account for the misalignment of the hilt in accidental terms. Rather, this could have been caused by wrenching it upwards or downwards with some force. Deliberate damage to the knife is also suspected (section 5.3.4).

As for where the dagger is likely to have been made, a clue may be provided by the fact that four out of the only five known early Bronze Age gold pommel-mounts have been found in Scotland (at Skateraw, East Lothian, Collessie, Fife and Blackwaterfoot, Isle of Arran, North Ayrshire [Henshall 1968; Gerloff 1975] as well as at Forteviot) – the fifth being found at Topped Mountain, County Fermanagh in Northern Ireland (Brindley 2007, 85). While the daggers in question may not all be contemporary, those from Skateraw and Collessie are likely to have been made around the same time as the Forteviot example. Even though the gold used to make the Forteviot pommel-band did not come from Scotland, it may well be that the dagger was made in Scotland, using imported raw materials. The gold need not have been procured from Cornwall, but rather obtained via contacts with Ireland, and the same is true of the tin in the bronze. We know that the copper in the dagger originated in south-west Ireland, and it could well be that the metal for the blade and rivets had been imported from Ireland in the form of bronze, with the tin already alloyed with the copper. As for the origin of the sperm whale ivory, while whales are known to have been stranded a considerable distance up the River Tay, both in prehistory and in the very recent past, it is unlikely to be possible to identify where the whale died. It will certainly have been an exotic material at Forteviot. A surprisingly high proportion of early Bronze Age pommels are of cetacean material, given its scarcity: out of fifteen pommels from English find-spots studied for the *Ritual in Early Bronze Age Grave Goods* project, at least six (30%) are of cetacean bone

(O'Connor 2015), and in Scotland the pommel of the dagger from Ashgrove, Fife, is of sperm whale ivory (Henshall 1964; 1968; species identification confirmed by Sonia O'Connor). This, along with the use of gold, underlines the precious and prestigious nature of the Forteviot dagger.

The broader significance of the dagger, both within the overall narrative for Forteviot and more generally, is discussed below (section 5.4).

5.3.4 Cluster of objects found towards the southern corner of the cist

Alison Sheridan

In a location that would have been near to, and behind, the head of the deceased, was found a cluster of items (Figure 5.28). This comprised a small knife with a horn handle and traces of a sheath; a fire-making kit; and two fragments of what appears to be animal hide, with an impression of what had probably been a string bag or pouch on the side nearest the fire-making kit and a deposit of gypsum on the other. There was also a concentration of compressed meadowsweet remains in this area, as described below (5.3.6), and fragments of birch bark were also present. The wooden sticks, previously mentioned in the discussion of a possible bier structure, were found immediately next to this cluster; whether it was in some way associated with it (eg as a stiffener for the mouth of the string bag/pouch) is unclear.

The small knife

Alison Sheridan, Esther Cameron, Peter Northover, Stuart Needham, Matt Knight, and Trevor Cowie

The heavily corroded blade of this knife was found lying partly underneath the fire-making kit, with its tip pointing away from the kit (Figure 5.29). The flat, butt-riveted blade consists of two main fragments – the tip and most of the rest of the blade – plus smaller fragments including part of the butt end that was found inside the organic handle. One of the three copper alloy rivets that would originally have fixed the butt end to the handle was recovered near the handle;

Figure 5.28 Annotated diagram showing relative location of objects clustered in south-west corner of the cist

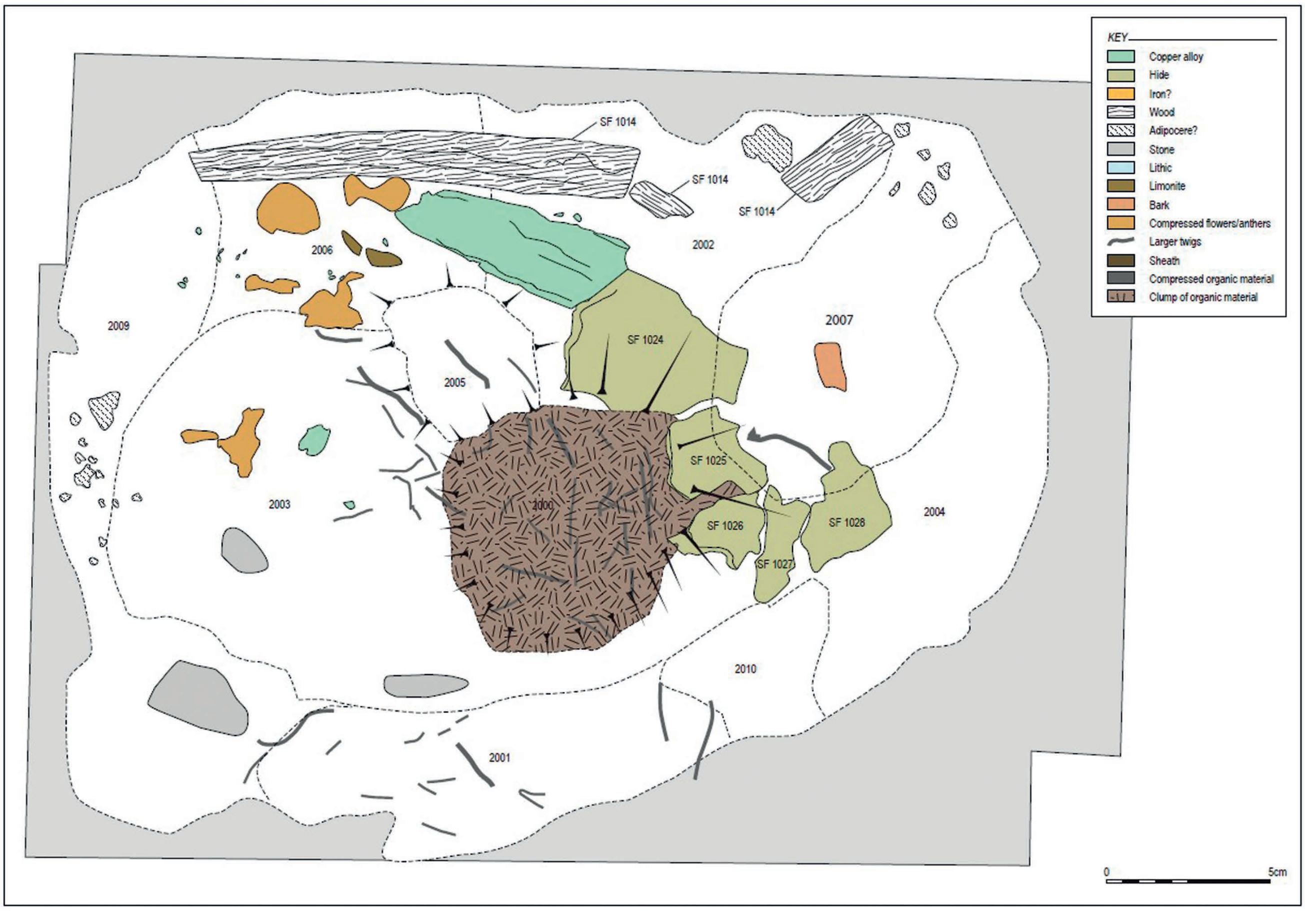


Figure 5.29 Small knife after conservation. The blade is 96.5mm in length (photography by Mark A Hall, courtesy of Perth Museum & Art Gallery)

the other two rivets were not present. The blade will have had a shallow, almost straight butt with curving edges and at the tip it will have narrowed to a gentle point. In cross-section it is a very slender ellipse. It is not entirely clear whether the edge of the blade would have been bevelled; it might have been. Most of the edge and original surface of the blade had corroded away; there is just one small area that retains the smoothness and sheen of the original surface. The overall length of the blade is estimated at 96.5mm; its maximum width is 39.6mm; and its maximum thickness, 1.4mm. The detached rivet – which is much smaller than the rivets associated with the dagger – had been made using a square-sectioned rod. It is 7.3mm long and narrows from 4.7mm × 5.0mm at one end (and 4.3mm × 4.2mm at the other) to 3.5mm × 2.7mm at its waist; in section it is rectangular at one end and polygonal at the other. The three closely set rivet holes at the butt of the blade have diameters of *c* 3mm.

Regarding the breakage of the blade, while its thinness will have made it vulnerable to post-depositional breakage, the circumstances of its discovery are such that it seems much more likely that at least one of the breaks – across the bottom of the handle – had been deliberate, and a part of the funerary ritual. This would also account for the fact that only one of the three original metal rivets was present. While the handle end of the knife had been lying under the fire-making kit, the latter will not have been sufficiently heavy to stress the blade to cause the handle to snap off. The detachment of the blade tip could, however, conceivably have occurred post-deposition, given the thinness of the blade and its heavily corroded condition.

The blade is too thin and too corroded to allow any sampling for compositional or metallographic analysis, and although the rivet was sampled, no meaningful data could be obtained. It is assumed – on chronological grounds, and with regard to *comparanda* (Needham 2015) – that both the blade and the rivet are of copper alloy.

Traces of fibres and of a darker, patchy layer of organic material overlying these, found on the blade, had the appearance of hair and skin and they are likely to have belonged to an animal-skin sheath. The traces were too slight to be sampled.

The remains of the handle, which had shrunk to a triangular shape with concave sides, were found during analysis by Esther Cameron to consist of two plates of horn which will have been riveted together, as well as being riveted to the blade. The species of the horn was not identified, but in principle ZooMS should be capable of determining whether it is bovine or caprine. No trace of a pommel was found but it is assumed that it may have been wood; by the same token, the rivets (or rather, pegs) used to fix the pommel to the handle may well have been of wood, since no tiny metal rivet was found.

Typologically, the knife falls within Stuart Needham's Series 7 (of Chalcolithic and early Bronze Age daggers and knives) and, more specifically, within his 'Series 7A' (encompassing butt-riveted, small blade implements with flat blades: Needham 2015). Such artefacts are known to have emerged during Needham's 'Period 2' (ie 2200/2150–1950 BC: Woodward and Hunter 2015, 461). The dates obtained for the Forteviot cist are wholly in line with this, and the deliberate breakage of the knife across the bottom of its handle is paralleled in at least 23 cases (Needham 2015, 37). Associations between knives and daggers are, however, very rare, underlining the importance of the Forteviot find. Knives seem to be a unisex possession during the

Figure 5.30 Replica of the small knife used in the *Cradle of Scotland* exhibition. The blade is 96.5mm in length (© SERF Project)

early Bronze Age: in a sample of eighteen individuals from this period in England who were associated with either a dagger or a knife/knife-dagger, four have been identified as female (Woodward and Hunter 2015, 522, tables 11.21–2). It is possible that the Forteviot knife had formed part of the fire-making kit as described below, being used to trim wood or to cut kindling material. A replica of the small knife, made by Neil Burridge for the *Cradle of Scotland* exhibition, is illustrated here (Figure 5.30).

Fire-making kit

Kenneth Brophy, Esther Cameron, Eva Hopman, Alan Saville†, Alison Sheridan, Annelou van Gijn, and Dene Wright

Found beside the eastern side slab of the cist, and partly on top of the small knife, was a group of objects that appear to represent a portable fire-making kit. These objects were initially investigated by CT scan before being micro-excavated in the lab (Figure 5.31). This kit consisted of a piece of sulphuric iron ore, a flint strike-a-light, and traces of punk (*Fomes fomentarius*, commonly known as hoof fungus (Figure 5.32)) which may have acted as primary tinder. It is also possible that some of the birch bark found in the cist could have been used to help cultivate a flame as secondary tinder, or punk (Cave-Brown 1992). As discussed below, stains from a netting textile that occur on two fragments of animal hide on top of the fire-making kit may indicate that the kit had been contained in a net bag or pouch. The component parts of this kit can be paralleled across prehistoric Europe and in the ethno-historic past (Sorensen *et al* 2014; Teather and Chamberlain 2016) but the presence of all these component parts is unique for the 3rd millennium BC in Europe. Chalcolithic and early Bronze Age fire-making equipment discoveries in Scotland are presented below in Table 5.4 and Figure 5.49.

The flint strike-a-light is made of grey flint and measures 77mm in length, with a width of 34mm, and thickness 15mm (Figure 5.33). There is a lightly pitted, hardened, smooth chalky cortex on the right lateral side from the medial to the distal end, and traces at the distal end. This object appears to have been made to be used as a strike-a-light, with no evidence that it was a re-purposed tool, as has been found in other instances (Sorensen *et al* 2014). Analysis of wear on the flint, and comparison with known prehistoric strike-a-lights from across Europe, indicate that this flint was used to create sparks, although it had not been heavily utilised, perhaps being struck between 100 and 200 times (van Gijn and Sorensen 2013) and thus used to light fewer fires than that number (sparks are rarely created or effective immediately; Cave-Brown 1992). Analysis suggests that the Forteviot strike-a-light functioned using the so-called stone-on-stone friction method (Sorensen *et al* 2014); in other words, the flint would have been scraped across the iron ore, rather than being struck against it, to create sparks that would in turn drop on to and ignite the punk tinder (Figure 5.34). Once achieved, the flame can be cultivated with the addition of secondary materials, probably a soft wood (Cave-Brown 1992) such as the birch bark found within the cist.

Experimental archaeology has shown that flint and iron ore are an effective combination for generating sparks, with the dried tinder placed no more than 100mm from the source of the spark (Graves-Brown 1987; Sorensen *et al* 2014). In this case, the scraped object was an irregular and fragmentary yellow-brown

Figure 5.31 Micro-excavation of the block of material containing the fire-making kit and knife (photo: Tessa Poller)

Figure 5.32 Hoof fungus on birch at Portmoak Moss, located *c* 20km south-east of Forteviot (© M J Richardson, CC BY-SA 2.0)

Figure 5.33 Flint strike-a-light (photo: Jan Brophy)

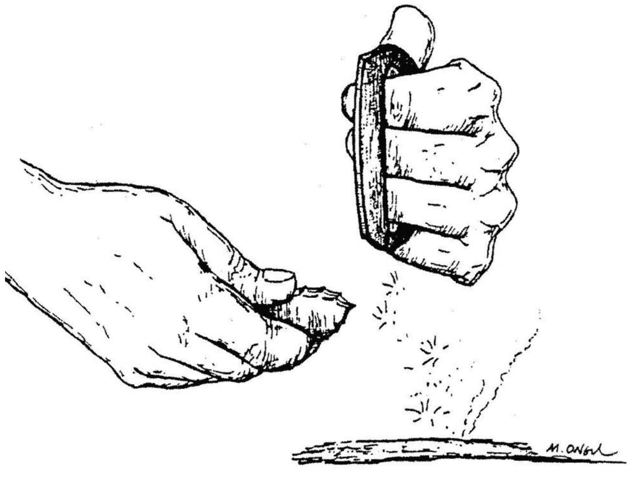


Figure 5.34 Sketch showing how the fire-making kit might have worked (Cave-Brown 1992)

roughly textured ovoid pebble that measured 65mm × 50mm × *c* 30mm (Figure 5.35) and appeared to be a nodule that had been split in half. SEM analysis of this mineral showed it to consist of iron, potassium and sulphur (along with phosphorus surface impurities) suggesting that it is jarosite, a sulphur-rich iron ore, or limonite, a yellow iron ore (Allan Hall pers comm). This stone was in a bad condition upon discovery, being cracked and fragmented. Typically, fire-making kits include an iron ore of some kind, such as iron pyrites (Cave-Brown 1992) or haematite (Hardy 1889).

Figure 5.35 Limonite from fire-making kit. This object measures 65mm × 50mm × *c* 30mm (© National Museums Scotland)

Fragments of animal skin or hide and stains left by probable net bag or pouch

Esther Cameron and Alison Sheridan

Two small buff-coloured fragments of what appeared to be animal skin, the largest one measuring 70mm × 45mm × 2.5mm, were found on top of the fire-making kit in the cluster of items near to where the corpse's head would have been (Figure 5.36). On the underside of each – that is, the side nearest the fire-making kit – are faint, regular criss-cross lines, lighter in colour than the rest of the surface. These are likely to be stains produced by contact between the skin/hide and a piece of network fabric. Their proximity to the fire-making kit suggests that the kit may have been contained within a string netting bag or pouch. On the other side of the skin/hide is a deposit of gypsum, probably a natural precipitate as discussed above.

As for species identification of the fragments of animal skin/hide, under a binocular microscope, a vague skin-like structure was visible in section, and there are several small holes on the outer surface, probably made by burrowing insect larvae. Under much higher magnification in a scanning electron microscope, the fibrous 3D weave characteristic of skin could be discerned, and the thickness of the skin and the dense packing of the fibres suggest that this was calf or deer skin. There are no signs of any stitch-holes in the fragments.

It may be that these fragments came from a deerskin or calfskin that had been laid over or wrapped around the corpse. The presence of such a covering could help

Figure 5.36 Two small buff-coloured fragments of what appeared to be animal skin. The largest measures 70mm × 45mm × 2.5mm (© National Museums Scotland)

to account for the compacting of the dense meadowsweet remains noted in the heap of items in this part of the cist. The practice of depositing animal hides – usually ox-hides – over bodies in early Bronze Age and Chalcolithic cists is attested from several other places in Scotland and beyond, including Broomend cist 1, Inverurie, Aberdeenshire, where an ox-hide had been placed over the flexed bodies of two adults, probably both male, in a cist associated with two Beakers and other grave goods (Watkins 1983, table 4; for associated radiocarbon date, see Parker Pearson *et al* 2019, table 4.10). Variations in the practice include the placing of the hide of an aurochs or (much less likely) European bison on the floor of an early Bronze Age cist at Masterton, Fife (Watkins 1983, table 4; here, the grave goods associated with the male and female suspected to have been present in the cist include a Masterton-type dagger, the same type of dagger as seen at Forteviot). A further variation is attested at Langwell Farm, Strath Oykel, Highland, where an adult female had been buried wrapped in a cattle hide and placed in a cist; a fabric of some kind, made of twined plant material, had covered all or part of the body (Lelong 2015). The Langwell Farm cist is contemporary with the Forteviot one and, although undated, the Masterton cist is probably also contemporary.

It is unclear whether the two fragments of skin/hide found above the fire-making kit are related to the tiny fragments of skin/hide that were found during palaeoenvironmental examination of material taken from just above the cist floor, in an area of dense pebble flooring near where the head would have lain. If they are, then this raises the possibility that the body could have been wrapped in a skin/hide, as at Langwell Farm. Alternatively, the fragments could relate to one or more garment, with the ones found above the fire-making kit possibly even coming from a cap, given the proximity of the head. An additional possibility is that they had been part of a bag or pouch, but it seems unlikely that the fire-making kit would have required both a strong bag and an outer bag.

5.3.5 Wooden objects

Anne Crone and Kenneth Brophy

Several wooden objects were found in the cist: two sticks (SF1007 and SF1014), and remnants of two wooden bowls (SF1001 and SF1008). The stick fragments were found with the bundle of objects in the southern half of the cist. Bowl SF1001 was found in the northern half of the cist, in a location that would have been behind the knees of the deceased, on the low sand mound. SF1008 was located in the southern half of the cist with the bulk of the other grave goods (Figure 5.4). Replicas of the bowls were made for the *Cradle of Scotland* exhibition in a recreation of the grave (see Figure 5.42). These objects have been examined both macroscopically and microscopically. The standard approach to sampling waterlogged and desiccated wood for species identification was adopted, ie the removal of thin slices of wood from the transverse, tangential, and radial sections using a razor blade. However, the condition of the wood was such that, with one exception (SF1007), it was impossible to obtain a viable slice in which the cell structure could be seen.

Figure 5.37 Wooden bowl fragment SF1001 (© National Museums Scotland)

Two thin, roughly rectangular lengths of wood were recovered in the southern corner of the cist (Figure 5.4). The larger, SF1014, was 135mm long and 14mm wide at its maximum, while SF1007 was 85mm long and 17mm wide, although both had suffered from post-deposition shrinkage. While it was not possible to identify the species of the wood, the radial structure of the wood was visible on the transverse section and the grain was visible on the surface of the objects. It was thus possible to determine that the objects had been radially split from a length of small roundwood. The surfaces are too degraded to see any other form of woodworking. Neither object is complete; both ends of SF1014 are broken while the ends of SF1007 are decayed. It is therefore not possible to determine whether they are part of the same object. Their overall morphology is the same but their dimensions are not comparable, although this may be because of differential desiccation. These are worked objects, but we cannot be sure if they are part of the same stick. It is possible that these were part of a birch bier that may have lain in the grave, or were perhaps elements of string bags or pouches.

SF1001 was a single fragment of a vessel (Figure 5.37): it is 78mm wide along the curvature of the rim and the body survives to a depth of 42mm. At the rim the wall of the vessel is 9mm thick and appears to taper to a thickness of 6mm but this might be as a result of desiccation. The profile of the vessel is better preserved at the rim which is a simple, flat shape. Some 20mm below the rim is a possible shoulder, or carination. It was possible to obtain thin sections for identification, but they were very fragile and broke up easily. Consequently, the species identification is tentative; uniseriate rays, simple perforation plates and a scattered pore-pattern were observed and suggest that it may be willow (*Salix* sp). The cell structure was clear enough to be able to determine that the vessel had been fashioned from a half-log in such a way that the grain of the log ran parallel with the rim. This is the traditional alignment for both carved and turned vessels because it ensures that the vessel does not crack radially. The surfaces are so desiccated that there is no surviving evidence to indicate whether it had been turned or carved. The shape of the vessel has been distorted during burial so it is not possible to determine its original size or shape although it may have been a shallow bowl. There are deposits of a white powdery material on the interior of the vessel, but this is also present on the broken edges of the fragment; these are probably precipitated material from the decayed corpse (section 5.3.2).

Vessel SF1008 was found in five fragments: one large, the others smaller (some fragments are visible in Figure 5.16 in the top right-hand corner of the cist). Some of the edges are fresh breaks so it may originally have been one piece, but it was not possible to fit them together. These fragments were more waterlogged than the other wooden objects and the cell structure appears to have all but decomposed, to the extent that their texture was similar to humified peat. Despite this, the grain was visible on the surfaces and on the freshly broken edges, and it was possible to determine that they too were fragments of a wooden vessel converted in the same fashion as SF1001, ie from a half-log. The largest piece is 60mm wide along the curvature of the rim and the body survives to a depth of 35mm. It is 9mm wide at the rim and the wall of the vessel narrows to 6mm. It has a corrugated appearance; there are ridges along the rim and on both the external and, more noticeably, on the internal surface. The grain of the wood conforms to the corrugations suggesting that they are not as a result of deliberate carving, for instance, but have resulted through compression in burial or possibly from pressure of materials around it.

There are few pre-Iron Age wooden vessels in Britain (see Earwood 1993) although these are much more commonly found in the mainland Europe (Jockenhövel 2013). A handled small wooden bowl or drinking vessel was found during excavations in advance of Heathrow Terminal 5. This *populus* (Poplar) vessel was recovered, with other wooden objects, from a waterhole and dated to the second half of the 2nd millennium cal BC (Leviers 2010, 161). A basketry container found within a cist burial at Whitehorse Hill, Dartmoor, has been interpreted in various ways but might have been a round-bottomed bowl made of lime-bast fibres (Cartwright *et al* 2016). This corpus has been added to substantially, however, by remarkable discoveries at the late Bronze Age settlement site at Must Farm, Cambridgeshire. Here, a combination of fire and waterlogging ensured the survival of a wide range of wooden objects with some 50 containers including bowls and buckets (Knight *et al* 2019, 656; Michael Bamforth pers comm).

It is tempting to suggest that the wooden bowls within the cist at Forteviot contained food or liquids buried with the dead. However, the location of the willow bowl behind the legs of the deceased and away from the other grave goods (focused on the torso) may also have some significance. The bowl could have been used to scoop sand into this area of the cist to deal with post-mortem decomposition, hence the spatially associated pile of sand. Also of note is that this is the position that Beakers are often found in cist graves (Tim Darvill pers comm), pointing to a possible cultural association of the deceased.

5.3.6 Flowers

Susan Ramsay and Jennifer Miller

Amongst the fire-making kit was a mass of organic material that was lifted with Block 1 for analysis in the laboratory (see Figure 5.4). Subsequent botanical analysis (Ramsay and Miller 2012) has shown that this mass of material is composed almost entirely of the preserved stems, leaves, flowers, buds and seeds of *Filipendula ulmaria* (meadowsweet) flowers placed with the body during the burial ritual (Figure 5.38). Smaller quantities of meadowsweet were also found in the bulk samples and from the area of the dagger. The pollen spectra from the cist was also overwhelmingly dominated by meadowsweet pollen (Table 5.2); the identification of heather being a rare exception. Meadowsweet flowers in June to September, suggesting that the burial took place during the summer months (Figure 5.39; Rose 1981). Small fresh shoots of heather were also identified from the grave, which may narrow down the burial event to July to August when heather is in flower (*ibid*). The meadowsweet was preserved in solid 'lumps' suggesting that something had compressed the flowers *in situ* – perhaps a cloth or hide covering the burial which had not survived. Pollen associated with the organics in the cist was also analysed, showing an open environment with evidence of grazing. The pollen signature may, however, relate to the place where the meadowsweet was sourced (usually in damp and watery places (Clapham *et al* 1973)) and consequently may reveal little about the environs surrounding the burial.

The most important botanical finding from this site is the incontrovertible evidence for bunches of meadowsweet flowers having been placed into the cist as a floral tribute (Noble and Brophy 2011b). Evidence for meadowsweet, in the form of pollen, has been found from several Bronze Age cists in Scotland, including Ashgrove, Fife (Henshall 1964), North Mains, Strathallan (Barclay 1984), Westbank of Roseisle, Moray (Dickson and Dickson 2000), Beech Hill House, Coupar Angus, Angus (Stevenson 1996), Loanleven, Crieff, Perth and Kinross (Tipping 1995), Sketewan, Aberfeldy, Perth and Kinross (Tipping 1995), Dalgety Bay, Fife (Whittington 1994), and Sandfjold, Orkney (Tipping 1995). Examples are known from elsewhere albeit rarely. *Filipendula* pollen was identified from within the Bronze Age cists at Whitehorse Hill, Dartmoor (Fyfe and Perez 2016), and Fan Foel, Carmathenshire (Hughes and Murphy 2013) for instance.

In some cases, the pollen was recovered from Beaker residues or samples from other material culture, or alternatively from the cist floors. However, in none of the above was any macrofossil evidence for meadowsweet flowers found, although several authors argued that the pollen was evidence for floral tributes within the cists. This case was made, for instance, for pollen recovered from Whitehorse Hill where it was concluded that flowers were deliberately deposited with the burial

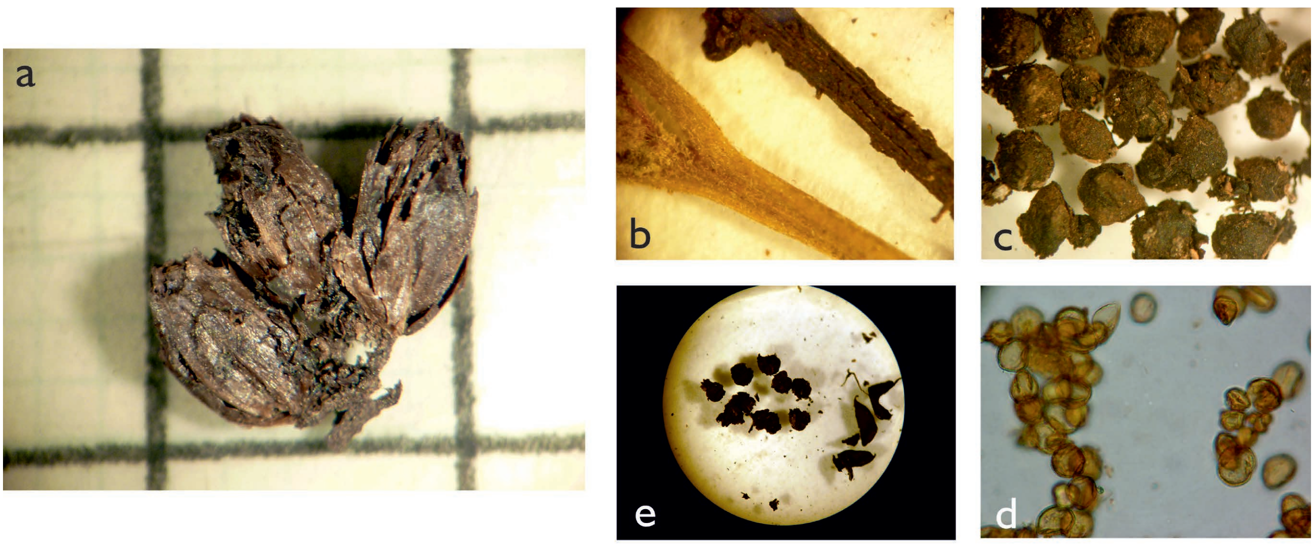


Figure 5.38 Selection of parts of the meadowsweet plant found in the cist: (a) flowers (scale: grid is 2mm boxes); (b) stem (with reference); (c) buds; (d) pollen; (e) seeds and seed heads

Table 5.2 Pollen counts from Forteviot Cist SF1017 (Block lift 1) (compiled by Susan Ramsay and Jennifer Miller)

	Context	2000	2002	2003	2004	2005	2006	2007	2008	Totals	%
	Sample	014	021	042	007	050	046	005	060		(-Filip)
Trees & Shrubs	Common name										
Alnus	alder	-	3	-	-	1	1	3	-	8	+
Betula	birch	8	2	1	5	2	4	4	2	28	1
Coryloid	hazel/bog myrtle	2	-	-	-	2	5	4	3	16	1
Pinus	pine	1	-	-	-	1	-	-	-	2	+
Quercus	oak	4	4	2	5	3	1	2	3	24	1
Salix	willow	1	1	-	-	-	-	-	-	2	+
Heaths & Herbs											
Anthemis type	chamomile type	9	219	72	17	94	22	21	44	498	26
Apiaceae	carrot family	55	14	14	77	46	31	32	97	366	19
Aster type	daisy type	1	7	-	-	5	3	1	4	21	1
Brassicaceae	cabbage family	-	2	-	-	-	-	-	-	2	+
Calluna vulgaris	heather	2	1	1	4	6	3	3	3	23	1
Caryophyllaceae	pink family	-	-	-	-	2	-	3	2	7	+
Cirsium	thistle	1	-	-	-	-	-	-	-	1	+
Cyperaceae	sedge	13	2	7	8	13	4	5	19	71	4
Filipendula	meadowsweet	>35,000	>17,000	>18,000	>84,000	>45,000	>22,000	>19,000	>50,000	>290,000	n/a
cf Filipendula	*cf* meadowsweet	>15,000	>9,000	>9,000	>42,000	>24,000	>12,000	>11,000	>16,000	>138,000	n/a
Galium type	cleavers type	-	-	-	1	-	-	-	-	1	+
Lactuceae	dandelion type	1	2	-	-	-	-	-	-	3	+
cf Melampyrum	*cf* cow wheat	-	1	-	-	-	-	-	-	1	+
Mentha type	mint type	21	6	8	10	10	8	-	15	78	4
Plantago lanceolata	ribwort plantain	10	6	2	3	3	6	1	4	35	2
Poaceae	grass	102	48	60	97	99	48	23	106	583	31
Ranunculus acris type	meadow buttercup type	3	6	3	7	12	12	2	9	54	3
Potentilla type	cinquefoil type	-	1	-	1	2	2	-	-	6	+
Rumex acetosa type	common sorrel type	13	5	14	6	-	2	2	2	44	2
Stachys sylvatica type	hedge woundwort type	13	1	4	8	10	3	1	7	47	2
Succisa	devil's bit scabious	5	2	1	3	9	-	7	4	31	2
Trifoilium	clover	-	-	-	-	1	-	-	-	1	+
Valeriana officinalis	common valerian	-	3	-	4	-	-	-	1	8	+
cf Veronica type	*cf* speedwell	1	-	-	-	-	-	-	-	1	+
Ferns											
Pteridium aquilinum	bracken	1	-	-	-	-	1	-	-	2	+
Filicales	ferns	2	-	1	-	1	2	-	-	6	+
Charcoal											
10 – 25 μm		-	2	6	3	6	3	1	3	24	
26 – 50 μm		-	1	1	1	3	3	5	3	17	
51 – 75 μm		-	-	-	1	-	-	-	3	4	
Total pollen & spores (excl. FIlipendula)		330	326	187	256	322	158	114	325	1890	

Figure 5.39 Meadowsweet plant, Oughtonhead Common, Hertfordshire (© CC Peter O'Connor, CC BY-SA 2.0)

due to an 'absence in the wider environment of *Filipendula*' (Fyfe and Perez 2016, 61). Other possible sources for the meadowsweet pollen in funerary contexts were put forward by Dickson (1978), who suggested that honey or mead may have been the original source of the pollen, whilst Dineley and Dineley (2000) showed that meadowsweet may have been added to prehistoric ale as a preservative. However, the latter explanation is not likely in the case of Forteviot given the quantities and range of plant parts that were discovered (M Dineley pers comm).

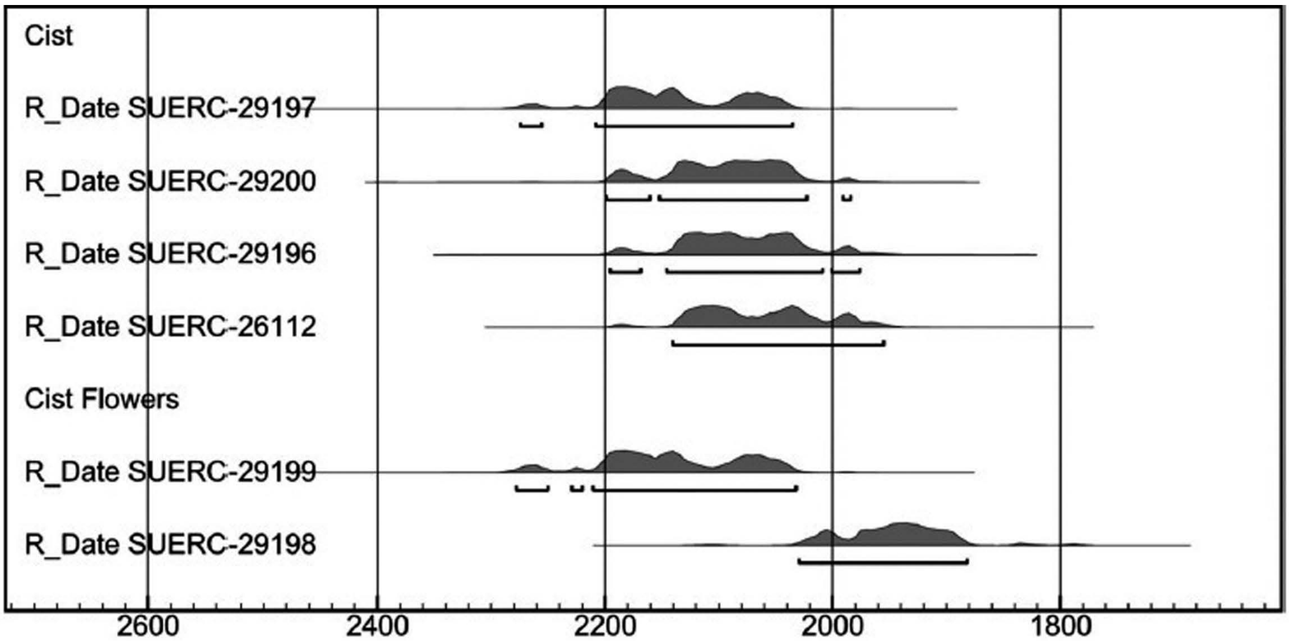
5.3.7 Dating summary and chronology

Derek Hamilton

There are five radiocarbon results from samples recovered from within the cist from a variety of different materials (Table 2.4; Figure 5.40). The preservation within the cist was exceptional in that there are organic remains preserved that are neither charred nor waterlogged. The results include: SUERC-29197 on what appears to be birch bark in an organic silty material (807/804) in the centre of the cist; SUERC-29200 on a fragment of probable willow wood, also from an organic deposit in the centre of the cist (806); SUERC-29198 and -29199 on the seeds and flower of a meadowsweet plant; and SUERC-29196 on a fragment of birch charcoal from a sandy deposit (801) in the north-west corner of the cist.

The results that come from the cist are not statistically consistent (T'=16.1; v=4; T'(5%)=9.5) and this suggests that the material is of different actual ages. If SUERC-29198 is excluded as a potential outlier measurement, the remaining results are statistically consistent (T'=2.0; v=3; T'(5%)=7.8). The modelling of the remaining dates suggests the cist was constructed sometime between *2285–2090 cal BC* and most probably in the 22nd century BC (*2205–2130 cal BC, 68% probability*) (Figure 5.41).

Figure 5.40 Radiocarbon dates associated with the dagger-burial



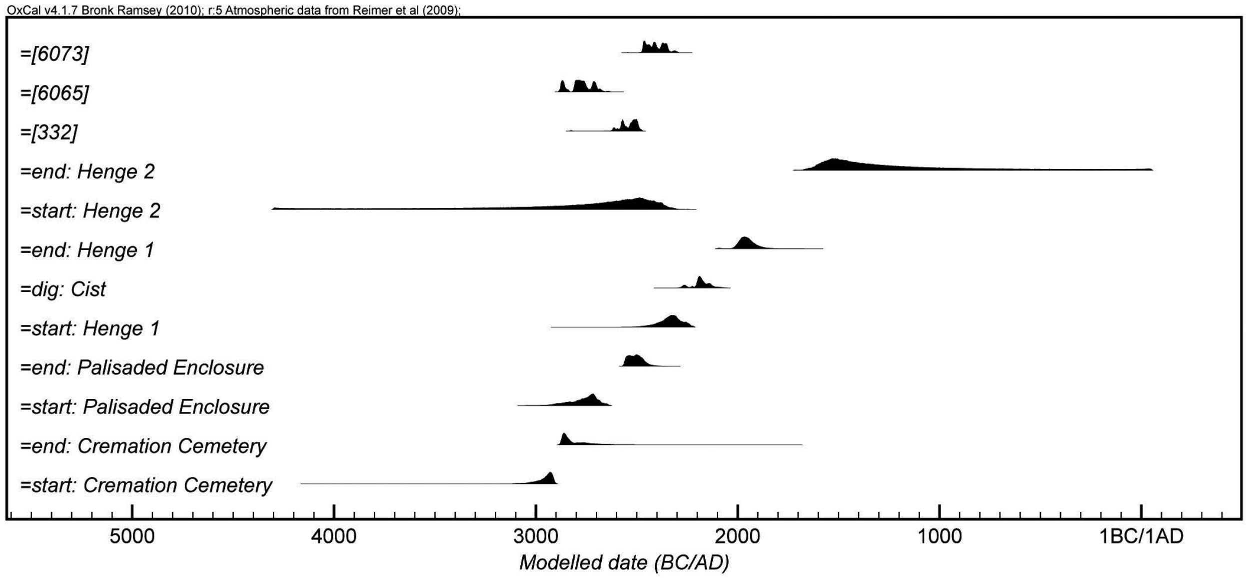


Figure 5.41 Probability distributions of radiocarbon measurements for the cist burial within the context of other major phases of activity at Forteviot. Each distribution represents the relative probability that an event occurred at some particular time. 'End' and 'Start' is the estimated date that activity began based on radiocarbon dating results that are listed in Table 2.4

5.3.8 The cist recreated

Kenneth Brophy and Stephen Driscoll

In preparation for the *Cradle of Scotland* exhibition, a reconstruction of the dagger-burial at Forteviot was created, using a combination of creative imagery and replica objects made by Neil Burridge and Mark Vyvyan-Perry (Figure 5.42). A series of replica objects were made for this display – two wooden bowls, the dagger (Figure 5.43), small knife (Figure 5.30), and fire-making kit components. Organic aspects of the

Figure 5.42 The cist display that was part of the *Cradle of Scotland* exhibition. In this reconstruction the body was wrongly laid on the right-hand side and dagger in the wrong location (photography by Mark A Hall, courtesy of Perth Museum & Art Gallery)

Figure 5.43 Replica Forteviot dagger that was commissioned for the *Cradle of Scotland* exhibition. The blade is 155mm in length (photography by Mark A Hall, courtesy of Perth Museum & Art Gallery)

Figure 5.44 The conserved Forteviot dagger that was put on display in the *Cradle of Scotland* exhibition (photo: A Holland)

assemblage of materials from the cist were also added, namely dried meadowsweet stems, leaves and flowers laid on the 'body' and some rolls of birch bark. The dagger replica was in part based on a reconstruction of the dagger found at Ashgrove, Fife (Henshall 1964) and currently on display in the National Museum of Scotland. This reconstructed scene was problematic in the sense that the body was laid on the wrong side and some objects were in the wrong place. Also on display as part of this exhibition was the conserved and re-assembled Forteviot dagger itself (Figure 5.44).

5.4 Interpreting the Forteviot dagger-burial

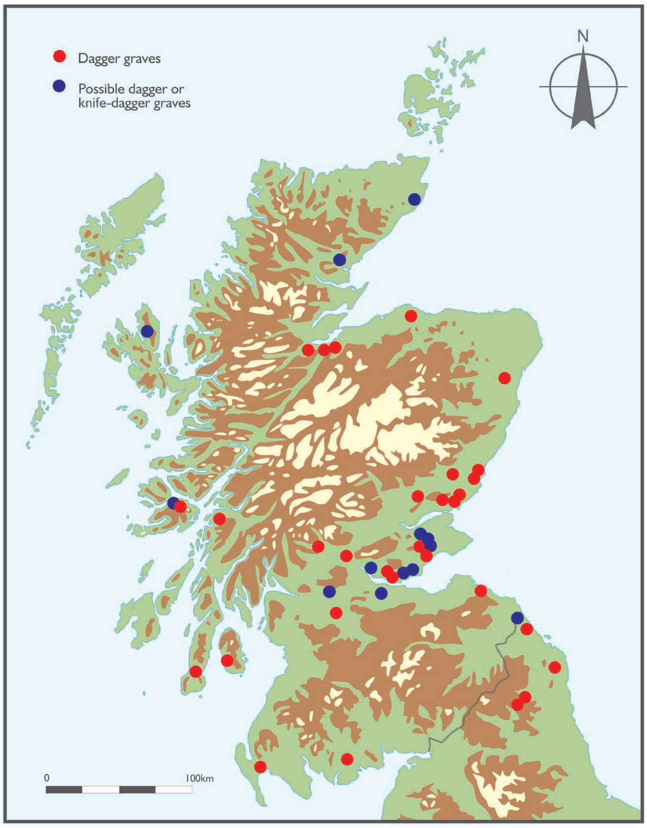
The dagger-burial is a fascinating discovery with significant implications for our understanding of early Bronze Age burials in Britain and beyond. This one cist alone contained the most complete fire-making kit of its era in Europe, two of the three wooden Bronze Age bowls from mortuary contexts in Britain, the first positive evidence for floral tributes in a burial of this age in Britain and Ireland, and a unique rock-art motif. The richness of this discovery is in no small part due to the remarkable organic survival of materials within the cist which gives insight not only into early Bronze Age funerary practices but also taphonomic processes in the sealed environment of the stone cist. The burial should also be viewed within the broader sequence of events at Forteviot, where it fits well with the general trajectory of social and ideological change that was played out across the complex towards the end of the 3rd millennium cal BC. In this section we will explore some of the key aspects of the excavation of the Forteviot dagger-burial, while we will place the burial within the broader Forteviot sequence in Chapter 8.

5.4.1 Early Bronze Age dagger graves

The Forteviot dagger grave is the 28th example of its kind known from Scotland; 26 were listed by Alison Sheridan in 2003 (Baker *et al* 2004, table 4) and since then another has been found, at Lockerbie Academy, Dumfries and Galloway (Sheridan and Northover 2011). A number of other early Bronze Age dagger graves are known from elsewhere in Britain (eg Woodward and Hunter 2015). Graves containing knives or 'knife-daggers' are less common; thirteen Scottish examples were listed in 2003 (Baker *et al* 2004, table 4), and a further example was found more recently at Braefoot Farm Cairn, North Lanarkshire (Sheridan 2018), so the Forteviot example constitutes the fifteenth. Forteviot is one of only three early Bronze Age graves in Scotland where both a dagger and a knife/knife-dagger have been found, the others being Gilchorn in Angus and Masterton in Fife (Henshall 1968). Elsewhere, a broadly contemporary example is known from Bishop's Waltham in Hampshire, and a few later examples from southern England are also known (Stuart Needham pers comm).

Scottish early Bronze Age graves with daggers or knives have been found in the eastern lowlands (Figure 5.45), with a notable concentration in Fife and Angus, but few have been found in Perth and Kinross (Baker *et al* 2004, table 4). Chronologically, these burials tend to fall into the period 2200–1950 cal BC (eg Cressey and Sheridan 2004, 78; Table 5.3). There is some variability in burial form, dagger typology, and grave good associations, but a few of these sites are especially informative in helping to contextualise and understand the Forteviot dagger-burial.

Figure 5.45 Location of Bronze Age burials with daggers and / or knives found in Scotland (after Baker *et al* 2003, 110, fig 12.1)



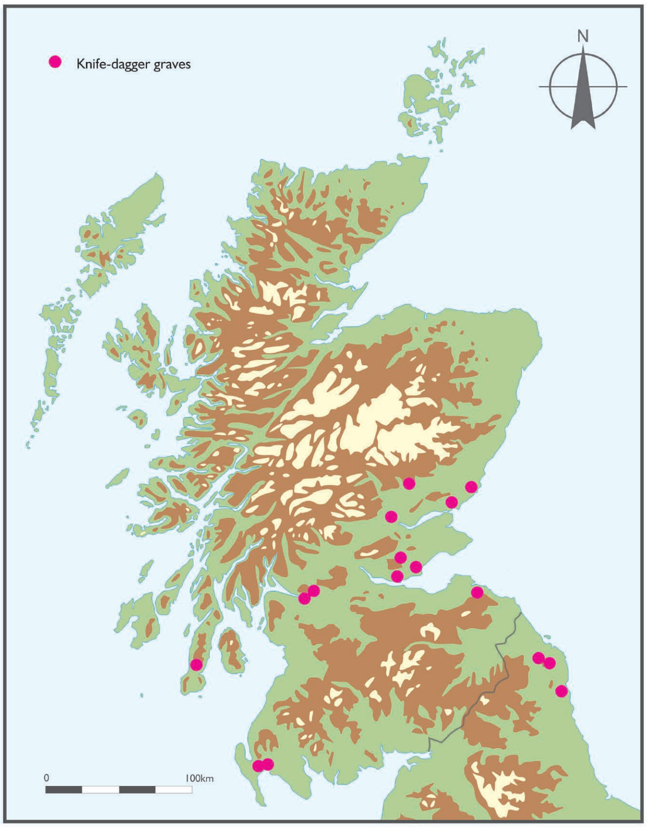


Table 5.3 Radiocarbon dates associated with contents of graves with flat-riveted daggers (data from Baker *et al* 2004, 109, and Table 2.4)

Findspot	Lab code	Sample Material	Yrs BP	Calibrated dates 1σ	Calibrated dates 2σ
Forteviot	SUERC-29197	Bark, unburnt	3740 ± 30	2210BC (92.0%) 2030BC	2280BC (3.4%) 2250BC
	SUERC-29198	Seeds: cf *Filipendula ulmaria*	3590 ± 30	2030BC (95.4%) 1880BC	–
	SUERC-29199	Flower: *Filipendula ulmaria*	3740 ± 35	2230BC (89.7%) 2030BC	2280BC (5.7%) 2240BC
	SUERC-29200	Wood: cf *Salix* (bowl fragment)	3705 ± 30	2200BC (94.4%) 2020BC	2000BC (1.0%) 1980BC
Gravelly Guy, Oxfordshire	UB-3122ir	Human bone, unburnt	3709 ± 35	2190-2180 (2.0%) 2150-2030 (66.2%)	2200-2010(91.0%) 2000-1970 (4.4%)
Barrow Hills, Radley, Oxfordshire	OxA-4355	Human bone, unburnt	3785 ± 90	2400-2380 (2.7%) 2350-2120 (56.2%) 2100-2030 (9.4%)	2500-1950 (95.4%)
Collessie, Fife	OxA-4510	Ox skin from dagger scabbard	3690 ± 80	2200-2160 (9.3%) 2150-1950 (58.9%)	2350-1750 (95.4%)
	GrA-19054	Human bone, cremated	3695 ± 45	2150-2020 (62.8%) 2000-1980 (5.4%)	2210-1940 (95.4%)
Rameldry, Fife	GU-9574	Skin from scabbard	3725 ± 40	2200-2160 (18.2%) 2150-2110 (14.9%) 2100-2030 (35.1%)	2280-2250 (3.4%) 2230-2220 (1.0%) 2210-2010 (88.2%) 2000-1970 (2.9%)

One of the closest parallels for the Forteviot grave is that at Ashgrove, Fife, from a cemetery of four cists found during house construction (Henshall 1964; 1968). The dagger grave was contained within the most carefully made and largest cist of the group. Great care had been used in the construction of the grave, with the cist stones neatly made from four split sandstone blocks; the joint of each had been luted with clay and the sealing of the grave had been so successful that the interior was dry and free of soil upon discovery (Henshall 1964, 166–7). Like Forteviot, the grave was covered with a very large stone slab and the cist pit had been dug significantly below ground-level. There were some suggestions of a pebble floor, but the bottom of the cist was largely the natural gravel. The individual inside was tightly contracted on its left side with head to the north-east, facing south-east (Figure 5.46). The Butterwick-type dagger within the cist lay in a position suggesting 'the hilt had been grasped in the hand, the tip pointing to the chest' (*ibid*, 167). The dagger had a sheath of animal skin and a pommel probably made from a sperm whale ivory (species identification confirmed by Sonia O'Connor). The grave also included a Beaker found placed against the eastern side slab of the cist. The individual in the grave was identified as a male around 55 years of age. Large quantities of plant remains were also found at Ashgrove – these survived best in the chest area around the dagger and included a 0.3m long fern rhizome that had lain over the body.

At Rameldry Farm, Fife, a cist burial dug into the side of a natural knoll was found to contain the crouched inhumation of a man aged 40–50, buried wearing a garment adorned with six V-perforated buttons made of jet and lizardite. Behind the shoulder of the individual was located a dagger, with a horn hilt and a scabbard lined with animal skin. The burial lay on a bed of pebbles. The dagger grave at Masterton, Fife, provides further variation. This cist was larger than many others, and that plus the presence of a jet necklace, a pair of armlets, and a small blade, led Henshall and Wallace to suggest that this had been the double burial of both a male and a female (1963, 152). The cist was found on the summit of a slight knoll and was well made, the joints being luted with grey clay, and the whole covered by two large capstones. In the north-east part of the cist, two bronze armlets, a fragmentary bronze blade, a decayed wooden object and a necklace of jet beads were found. A bronze dagger was located by the southern side slab. The body or bodies within the cist had decayed away, but fragments of bone were found inside the armlets and near the dagger. Fragments of a fibrous material and a dark stain found across the floor of the cist suggests that the hide of a large mammal had covered the floor (*ibid*, 151).

Dagger graves have also been recorded outwith the eastern lowlands, such as at Seafield West, Highland, where an unusual boat-shaped hollowed tree-trunk grave was found (Cressey and Sheridan 2004). Inside, a badly preserved crouched inhumation was found, along with a bronze dagger of 'Butterwick' type. The dagger was made from Irish copper and had a wooden and cattle hide scabbard. Pollen sampling of the grave found the assemblage was dominated by the pollen of dogwood (*Cornus*), buttercup (*Ranunculus undiff*), alder (*Alnus glutinosa*), hazel/myrtle (*Corylus avellana type*) and bracken (*Pteridium aquilinum*) that was suggested to have come from a covering or mat for the body or from floral tributes (Clarke 2004, 76). The more recent discovery of another Butterwick-type dagger at Lockerbie Academy, Dumfries and Galloway, was found in a pit sealed by a massive capstone weighing something in the order of 6 to 7 metric tonnes (Kirby 2012, 29). This cist contained a barbed and tanged arrowhead, and although no body was found, darker material in the southern end of the grave pit was interpreted as a possible body stain (*ibid*). The dagger had a horn hilt, a bronze pommel band decorated with horizontal grooves, and a sheath made of animal hide.

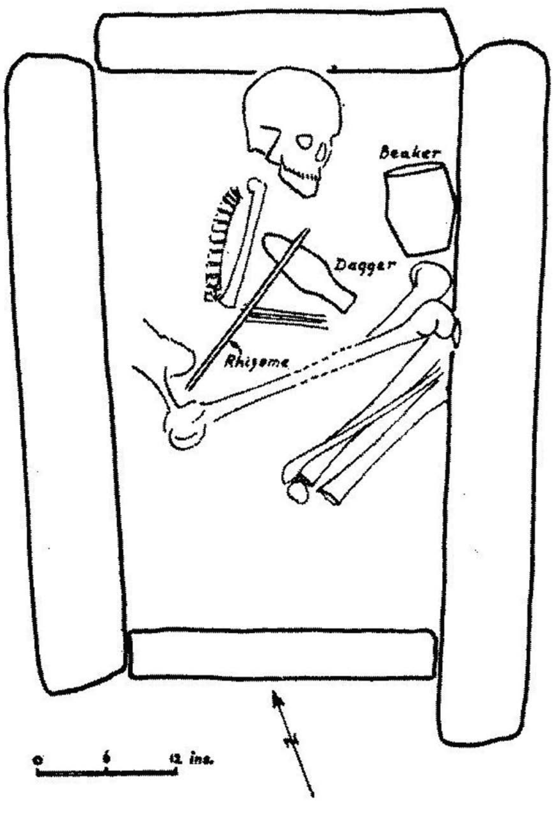


Figure 5.46 Plan of the dagger-burial excavated at Ashgrove, Fife (from Henshall 1964, 168, figure 3)

There are only four reliably sexed dagger graves in Scotland – these are all males over 30 (Baker *et al* 2004, table 4; Wilkin 2009, table 5.1). The only reliably sexed graves with a knife or knife-dagger in Scotland are those from Kirkcaldy, Fife, also a mature male, around 50 years old (Baker *et al* 2004, table 4) and Braefoot, North Lanarkshire, an adult male. (Note, however, that in England there are examples of associations with women, and at Masterton the position of the very small blade in the cist suggests that it had probably been associated with the woman believed to have been buried there.) It is also worth noting that the preponderance of identified individuals buried with fire-making kits in this era were mature males (Teather and Chamberlain 2016, 192). The disposition of bodies within dagger graves is rarely known due to the poor survival or recording of the human remains – the four examples from Scottish contexts where preservation allows identification of these details suggests a preference for burials on the left side with head direction somewhere between the north and east (Wilkin 2009). This accords with the pattern for dagger graves elsewhere in Britain: Alexandra Shepherd (Tuckwell 1975, 103; Shepherd 2012) has found that in Yorkshire, individuals in dagger graves tended to be placed on their left side with their heads to the east or north-east and facing south. The placement of male bodies on their left side is also a feature of Chalcolithic Beaker funerary practice (Tuckwell 1975; Shepherd 2012), and although the 'male on left, female on right' norm seems to have broken down somewhat by the beginning of the Bronze Age, it appears to have persisted in the case of dagger graves.

The Forteviot example is the first dagger-burial to have been found within a henge monument. More typical contexts for dagger graves include cist cemeteries and beneath cairns. However, dagger graves were not always the primary burials at individual sites: at Gask Hill, Collessie, Fife, the dagger with associated cremation remains was found near the edge of a large kerbed cairn centred on a cist containing an inhumed individual and a Beaker (Henshall 1968, 168). The cairn was enlarged when the dagger grave was added to the site. Other examples, such as Carlochan, Dumfries and Galloway and Skateraw, East Lothian, appear to have been the primary (and central) interments under massive cairns (Baker *et al* 2004, table 4). However, cist burials (without daggers) within henges are not uncommon, with good local parallels at Cairnpapple Hill and North Mains for instance.

None of the other dagger graves has quite the level of preservation evident at Forteviot or at Ashgrove, both of which had abundant plant material and partial preservation of animal hide objects. The dagger grave at Bishopmill in Moray was said to contain an ox-hide like that at Masterton, but the portions of hide found were by the dagger and could have been part of a sheath rather than a floor or body covering (Gerloff 1975, 75, no. 129). The only other example of plant material are the leaves of sweet woodruff found in a 'knife-dagger' grave, cist 2, at Kirkcaldy, Fife, with the inhumation of a male aged around 50 years old (Baker *et al* 2004, table 4; Childe 1944), but this relative paucity of organics is almost certainly due to taphonomic processes.

It is important to bear in mind that the Forteviot dagger-burial and other dagger graves described above were part of a wider phenomenon. The origins of the tradition of placing daggers with individuals in the grave may be sought in Bell Beaker practices adopted from continental Europe (Parker Pearson *et al* 2019, chapter 4). The earliest in Britain are tanged copper daggers as found with the Amesbury Archer (Needham 2012, 13; 2015; Fitzpatrick 2011, 120–7). The real profusion of dagger graves, however, dates to the last centuries of the 3rd millennium BC, during Needham's 'fission' horizon (Needham 2005, 206), a development also associated with the appearance of fire-making kits as a grave good. This was a time of major diversification of artefacts deposited with the dead and funerary traditions (Needham 2015, 21). Dagger-burials are found in southern Britain and in Ireland (eg, at Topped Mountain, County Fermanagh: Brindley 2007, 85), though in Ireland they appear to have been exceptionally rare – daggers are much more common as hoard finds. In England there are regional clusters of dagger-burials in Central Wessex, Peak District, Thames Basin, and in Northumberland, and burials can include flint as well as metal daggers (Gerloff 1975; Frieman 2015). The predominant placement of bodies within dagger graves in England is on the left side, but orientation in variable – this is generally with heads to the north, but in northern England the minority were orientated towards the south, as at Forteviot (Needham 2011). Like the Scottish examples, mature males dominate the relatively few graves where sexing and ageing of the body is possible (cf Needham 2004).

5.4.2 The anatomy of a burial

All the evidence found at Forteviot suggests that the burial of this individual took a good deal of planning and involved a significant amount of labour, craft and resources, perhaps appropriate in light of interpretations of dagger graves as being the resting places of high-status individuals (Henshall 1964; Baker *et al* 2004) and symbols of 'male leadership' (Needham 2004, 243). The grave itself was located within an earthwork enclosure that may have been several centuries old, literally digging into and altering this ancient sacred space, with the cairn covering part of the henge interior and spilling into the ditch. It was also located within 10m of the founding cremation burials that, even if the details of which were not known about in the early Bronze Age, could have been the source of legend, although the cairn did not overlap with the extent of this older cemetery as far as we could tell. It seems probable that the henge bank was still standing to a fair height at this time (the ditch was only partially backfilled) and thus the stones that made up the cist and the massive capstone must have been dragged through the narrow entrance of the henge (no simple task), to take their place in the deepest space of the henge interior. That the capstone and other slabs were probably dragged from the riverbed almost 1km away simply adds to the time resource that went into making this grave; the henge entrance was on the opposite side of the monument, adding to the distance this stone would have had to have been moved.

The burial pit was dug deeply into the earth and the cist constructed well below ground level. The cist was prepared by partially covering its floor with pebbles that may have been taken from the same riverbed as the slabs used to construct the cist; an arc of quartz pebbles surrounded the area where the head would be laid. The underside of the capstone was adorned with a design. The dead man may have been carried to the cist on a bier, and was either lowered into position on the bier, or was taken off and laid down on birch-bark matting on the cist floor. Other plant material had been laid down as a kind of 'bedding', and heather, and perhaps also bunches of meadowsweet, may have been placed as a kind of 'pillow'. There might also have been an animal skin/hide on the floor above the birch-bark bier/matting, or else the body may have been wrapped or dressed in that (see below). The person (probably a man) was laid on their left side, with head at the southern end of the cist, facing west, and legs and arms drawn up.

Attention then shifted to the careful placement of objects and materials around and on top of the body, perhaps a combination of possessions and symbols. A large, prestigious bronze dagger with a gold pommel band and a sperm whale ivory pommel – both rare and precious materials – in a sheath probably made from shaved calfskin, was placed with its tip facing towards his chest. The dagger may have been broken during the mortuary ceremony before placement in the cist. If, as seems likely, the body's arms had been flexed, the dagger would have been positioned close to (or in) the hands, and this suggestion is strengthened by the discovery of fingernail fragments, along with a few tiny fragments of bone, in the mass of organic material in the immediate vicinity of the dagger. Behind his head was placed a small knife, a net bag containing fire-making equipment, and a wooden bowl. Large amounts of meadowsweet were strewn on and around the body – possibly partly as a way of masking the smell of his body as it began to decompose. His cist would have been left open for some time, to allow mourners to see his body. It may be that some body fluids escaped from the lower part of the body and had to be masked by scooping in a pile of sand, using a second wooden bowl as a scoop; it was left on top of the pile of sand. The body may then have been given a deer- or calfskin 'blanket', and covered with birch-bark matting before the massive capstone was lowered over the cist. A large cairn of quarried basalt and river-rounded cobbles was then raised over it – an operation that was probably accompanied by a considerable amount of ceremony and effort. After that, out of the sight of the living, the body quietly decomposed and elements of it precipitated as hydroxyapatite and gypsum. From time to time, water and insects seem to have entered the cist from below, and through gaps in the side slabs, impacting on the survival of materials in the grave.

The cairn had a diameter of about 6m and may have been several metres in height when first constructed, almost certainly visible from outside the henge monument within which it was constructed. The scale of this burial demanded that its construction would have been arduous and logistically challenging. For instance, moving the capstone slab would have been a monumental task in itself, because it was, as with other dagger graves such as Lockerbie and Ashgrove, disproportionately massive when compared to the rest of the grave structure (Henshall 1968); a much smaller slab would have sufficed.

The colour white was emphasised in the dressing of this grave in the form of quartz and flowers. The 'halo' of large quartz pebbles (Figure 5.17) was placed to frame the head and upper body of the individual, mirrored by quartz pebbles within the packing material outside the cist near the head. Quartz pebbles and chips were relatively common inclusions in Neolithic and Bronze Age burials, both as 'grave goods' or part of the cairn matrix (for examples in Scotland see Ritchie and MacLaren 1972; Jones 1999; Bradley 2000b; Warren and Neighbour 2004). The significance and occurrence of quartz deposition in the Neolithic and Bronze Age has been discussed at length elsewhere (eg Darvill 2002; Scarre 2002, 236–7; Fowler and Cummings 2003, 4–6; Reynolds 2009, often drawing on the work of Berlin and Kay 1969, usually with regards colour symbolism). A less discussed property of quartz is worth raising here. Large quantities of quartz blocks and fragments at Hendraburnick Quoit, Cornwall, led the excavators of this site to explore the possibility that quartz's 'luminescent properties … reflect[ing] both moonlight and firelight' (Jones and Goskar 2017, 288; cf Bradley 2005, 112) was the reason for quartz accumulation here. Quartz is also triboluminescent, in other words, when smashed or worked it glows (Jones and Goskar 2017, 112ff); this may have facilitated night-time rites in prehistory, but also has an affinity with the fire-making (ie light-making) context of the deceased at Forteviot.

The rock-art found on the underside of the cist capstone is enigmatic. The freshness of the motif suggests that it was carved specifically for use in this grave, perhaps at the time of death. The motif may have been carved on the slab when it was still an exposed outcrop or at the graveside. It is possible to argue that the symbol was buried face down in the grave for the benefit of the deceased and not the mourners. The inclusion of rock-art of both Neolithic and early Bronze Age date in cist burials, usually on side slabs or capstone undersides, is not uncommon.

Carvings on early Bronze Age cist slabs are very rare, with examples usually restricted to abstract cupmarks. The multiple axe-carvings on the cist slab beneath the Nether Largie North cairn, Kilmartin Glen, Argyll and Bute (RCAHMS 2008) is a notable exception, although here the carvings are naturalistic, unlike the abstraction found at Forteviot. The southern end cist slab at Balblair, a Bronze Age cairn found in advance of quarrying near Inverness, Highland, was carved with a series of abstract motifs including 'asymmetrical linear decoration', scoring, and cupmarks (Dutton *et al* 2008; Figure 5.47). The Forteviot motif bares little similarity to symbols from these cists, or the passage-grave tradition, such as those found on megaliths across northern Britain (Simpson and

Thawley 1972; Figure 5.48). With the eye of faith, aspects of the Forteviot motifs share similarities with motifs carved onto a decorated slab found within a Bronze Age cemetery at Knappers, West Dunbartonshire (Ritchie and Adamson 1982), and on cist slabs at Catterline, Aberdeenshire (a Beaker cist, Reid and Fraser 1924, 30), and Black Heddon, Northumberland (cremation urn in a cist, Tate 1865). Evans and Dowson (2004, 105–6) note that reuse of stones with Neolithic-style carvings (spirals and cup-and-rings) in Bronze Age burials is not unknown in eastern Scotland and usually reflects rock-art in the wider landscape; however, the Forteviot symbol is quite unlike abstract cup-and-ring mark rock-art in Highland or Perth and Kinross, so it seems more likely this symbol was carved within the cultural tradition of the deceased.

The cairn itself, although now large denuded, may also offer insights into the nature of this burial and the death rites. The material used to construct the cairn – as well as support the cist side slabs – seems to have come from at least two different sources: probably river-worn sedimentary rocks and quarried basalts. This suggests that the monument was being constructed from different parts of the land, notably the river and (probably) the hills to the south. Were these from specific places of importance to the deceased? This is not an uncommon scenario. Mortimer (1905, 6) identified materials from three different sources in the mound overlying the Barrow C37 dagger grave at Towthorpe, East Yorkshire. Brück (2004a, 321) has suggested the material variability of Bronze Age burial monuments was a means of 'mapping out in the grave of personal and community biographies', much in the same way as Richards (2013) has argued that large Neolithic stone circles were conglomerations of the different places that the megaliths were quarried from.

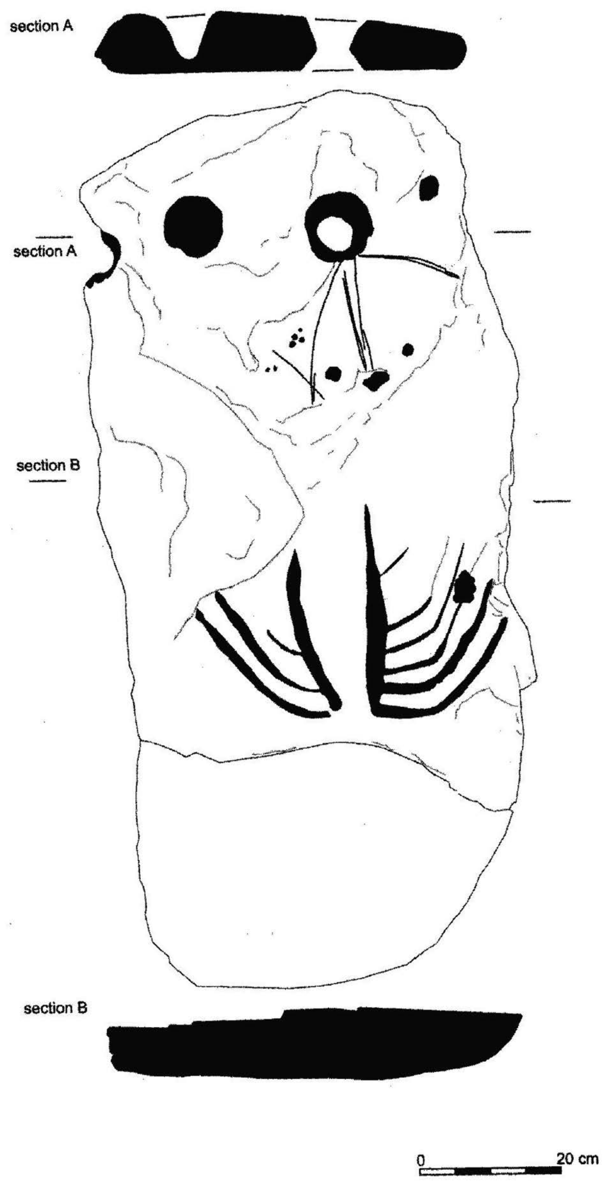


Figure 5.47 Carved end slab from the Bronze Age cist at Balblair Wood, Highland (from Dutton *et al* 2008, illus 4)

5.4.3 Rest in peace

Barrett (1994) and Brück (2004b) have argued objects in graves may express emotional bonds between the living and the dead, and this is particularly pertinent for studying the Forteviot dagger-burial. The individual here was obviously treated with great care and formality that may have helped the mourners deal with the loss and discontinuity created by the death of this individual. The emotive qualities of the burial are perhaps best illustrated by the identification of the meadowsweet flowers within the grave. As noted above (section 5.3.6), this was the first direct physical evidence for flowers placed with a Bronze Age burial in Britain (only pollen has been found previously), and not just a few flowers, but bunches of them. The unusual survival of these flowers allows us to speculate that meadowsweet was placed in other early Bronze Age burials where only pollen has been found. As well as pollen evidence for meadowsweet in other graves (discussed above), we have proxy evidence for lime and sweet woodruff plants, both also having small white flowers, within other dagger graves in the eastern lowlands of Scotland.

It is an easy assumption to make that placing flowers in and on a grave is a universal human reaction to death, although Parker Pearson (1999, 11) notes that the tradition of cut flowers placed in and on graves,

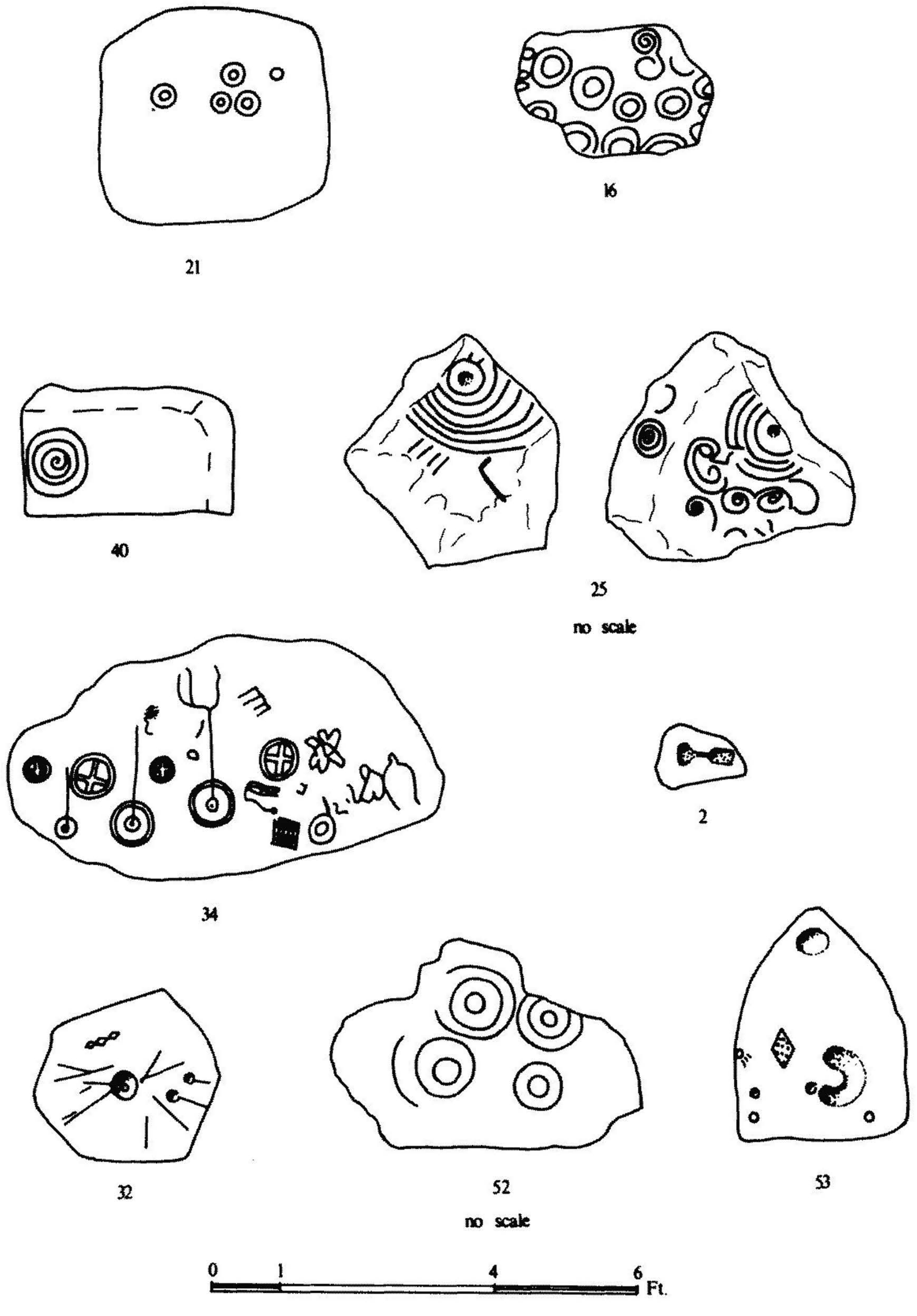


Figure 5.48 Passage Grave-style motifs (from Simpson and Thawley 1972, figure 6)

representing 'short life', probably has its origins in 16th-century (AD) England. We cannot assume that meadowsweet (and similar plants) were used in this way in the Bronze Age. Flowers may have had a pragmatic purpose, masking the odour of a body that decayed as the grave was being constructed (the types listed above are all pungent), or could have had a close association with death. Meadowsweet has other properties that may have been in the minds of the mourners. The plant traditionally has important medicinal properties, containing salicylic acid, which, in the modified form acetylsalicylic acid, is the drug that is now routinely known as aspirin (the name of that drug is derived from the original Linnaean name for the plant, *Spiraea ulmaria* (Dickson and Dickson 2000)). Plants containing salicylic acid would have been valuable in the past for treating a wide range of illnesses, having the same properties as the drug aspirin: pain relief, reduction in fever, anti-clotting and anti-inflammatory (Darwin 1996, 149; Telford 2019, 246). Perhaps the flowers were placed because of the healing properties of the plant, an association either in life (healer or shaman, see below), or to be used in the afterlife. Darvill (2016a) has argued that the Copper Age Amesbury Archer (cf Fitzpatrick 2011) sought the healing properties of the Stonehenge bluestones due to various ailments he had, and his burial near these stones reflected this; do the flowers at Forteviot also indicate a person who had health problems? Nieszery (1992, 368) has suggested, due to the recurring association in graves of mature males with fire-making kits, that older men with impaired mobility may have been tasked with fire maintenance, exactly the kind of person who might benefit from concoctions based on meadowsweet. On the other hand, the placement of these flowers may indeed have had the same commemorative and caring connotations that giving flowers retains today and we should not rule this out (cf Noble and Brophy 2011b).

There are other indications that this was a burial that was attended to with care, perhaps love. The presence of the birch bark suggests the use of a bier for carrying the corpse to the grave; or the bark may have simply been a covering for the grave floor, providing a 'cushion' for the body within its stone coffin. The presence of biers can be paralleled at other early Bronze Age graves such as Sutton Veny, Wiltshire (Thomas 1999, 160) and Barnack, Cambridgeshire, where the burial may have been covered with a hide or blanket and the body was placed on a bier and laid to rest with a dagger, wrist guard, and Beaker (Donaldson *et al* 1977, 227). Whittle *et al* (1992, 183) identified possible biers or wooden stretchers in several Bronze Age graves at Dorchester-on-Thames (including a dagger-burial at site XII), a monument complex with parallels to Forteviot. The vision of the body, carried here on a wooden stretcher, adds to the evocative nature of the funerary rite, although where the body would have started this journey is not known.

At Forteviot no other plant materials survived in quantities within the cist, but very small amounts of birch leaves and leafy heather shoots could also have been part of a floor covering for the grave. The presence of matting and/or flooring at Forteviot highlights the potential links between the placing of the deceased in the grave and symbolism of sleeping or resting. The heather, for instance, was found in the location around where the head would have been laid and has a parallel in a putative 'pillow' of fibrous small animal hair – identified as possible stoat hair – that was located in a cist with a Food Vessel at Cunninghar, Tillicoultry, Clackmannanshire (Robertson 1895; Ryder in Henshall 1964; Alison Sheridan pers comm). The possible matting or even bedding in the base of the Forteviot grave is widely, if sporadically, paralleled in other graves where rare organic survivals have contributed to our picture of burial arrangements within Chalcolithic and early Bronze Age burial cists. At Ashgrove, Fife, large quantities of plant remains were found consisting of leaf fragments and birch bark, along with plant tissue, including rushes and abundant sphagnum moss. The most likely interpretation of this material is that it derives from a form of 'bedding' for the dead (Henshall 1964). Other organics, such as the sweet woodruff leaves found in the knife-dagger grave at Kirkcaldy, Fife (Childe 1944), could be interpreted as remnants of bedding or a cover for the body.

Brück (2004a, 318) highlights other examples of wrapping or bedding for the dead in Bronze Age contexts. The floor of a cist at Sandhole Quarry in Aberdeenshire, for example, had a layer of sphagnum moss on the floor slabs (Warsop 1997, 139–40). Sphagnum moss and other plant remains were also found in a dagger grave at Amesbury, Wiltshire and fern leaves had covered a grave at Shuttlestone, Derbyshire (both referred to in Henshall 1964, 173). The burial of an individual in an oak coffin with a dagger at Gristhorpe, also Derbyshire, was, according to the 19th-century account of Williamson, laid on a 'vegetable substance' described as rushes, and was 'wrapped in animal hide fixed at the chest with a polished bone pin' (quoted in Melton *et al* 2010, 805; 2013). These rare survivals suggest that the dead were treated with care and the abundant plant material, occurrence of hides in some burials, and body posture all indicate that the dead were placed as if they were asleep in a bed – a bed that would act as their eternal resting place.

5.4.4 The spark of life

The discovery and contents of the fire-making kit within the Forteviot cist are arguably of international significance, being perhaps the most complete kit of this kind of Copper or Bronze Age date in Europe, with the possible exception of the kit found with the so-called 'Ötzi the Iceman' in the Alps (Spindler 1994). Five component parts of the fire-lighting kit were found at Forteviot: the flint strike-a-light (or striker); iron ore strike-stone; punk (primary fungus tinder), spunk (secondary birch bark tinder); and associated net or skin bag. The only confirmed example of a Copper or Bronze Age body found in continental Europe with tinder is Ötzi (Spindler 1994; Teather

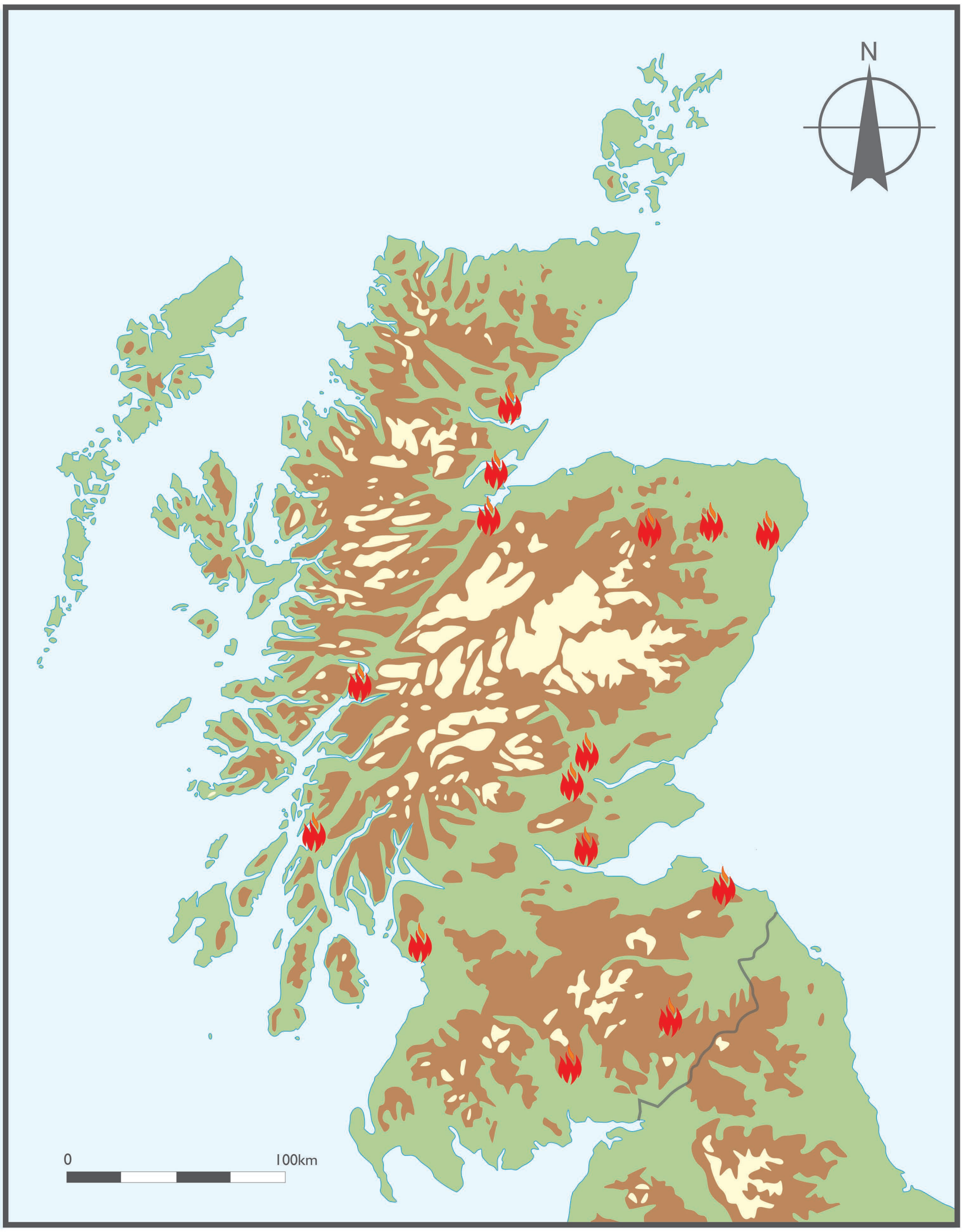


Figure 5.49 Map showing the location of Chalcolithic and Bronze Age fire-making kits from Scotland (data from Teather and Chamberlain 2006, compiled by Eva Hopman)

and Chamberlain 2016, 191) although his findspot is not a grave context. A flint strike-a-light, sphagnum moss, and possible remnants of an animal-skin bag were found in the primary burial at Barrow 85, Amesbury, Wiltshire (Newall 1931). Palaeolithic fire-making kits occasionally had multiple material components (Stapert and Johansen 1999; Sorensen *et al* 2014), while two concentrations of *Fomes fomentarius* identified at the Mesolithic site of Star Carr, Yorkshire have been associated with fire-lighting (Robson 2018, 444).

Over 50 fire-making kits have been found in Bronze Age mortuary contexts across Britain, all but one (where dated) from the period 2500–1500 cal BC. The most common period of usage and burial is between 2200 and 2000 cal BC (Teather and Chamberlain 2016, 188), within which Forteviot falls. In a comprehensive analysis of this group of discoveries, Teather and Chamberlain (2016) note that they are almost always associated with males (90% where sex has been confirmed), 72% were found with inhumation burials, and there is a tendency towards the placement of such kits in 'rich' graves. Forteviot is one of fifteen Bronze Age burials that have been found in Scotland containing a strike-a-light fire-making kit (Teather and Chamberlain 2016, 193–6; Figure 5.49; Table 5.4); of these, half were associated with an inhumation, one with cremation, one – Dornoch Nursery,

Table 5.4 Prehistoric fire-making kits found in Scotland (after Teather and Chamberlain 2016, with additional research by Eva Hopman)

Site	County	NGR	Context	Body details	Fire-making kit	Accompanied artefacts	Reference
Aberdour Road (Dunfermline) 3	Fife	NO 1173 8637	Cist (part of a cemetery)	Inhumation, Adolescent	Strike-a-light and piece of pyrite (half of round nodule)	Food Vessel, flint slug-knife	Close-Brooks *et al* 1972
Auchencairn, Gawin Moor	Dumfries and Galloway	NX 9430 9127	Cist	None found	Oblong flint implement with rounded end	Beaker	Abercromby 1916; Clarke 1970, 443
Corran Ferry	Highland	NN 0209 6338	Cist	None found	Flint strike-a-light	Beaker	Campbell 1890; Clarke 1970, 517
Culduthel Mains	Highland	NH 6662 4224	Cist	Inhumation	Brown-yellow flint; 'pyrite'	Flint arrowheads, stone bracer, amber bead, bone belt ring	Harrison 1980, 92–3; Clarke *et al* 1985, 174
Dornoch Nursery	Highland	NH 7980 9081	Cist with 'massive capstone'	Crouched inhumation, cremation	Flint strike-a-light and iron ore nodule	AOC Beaker, barbed-and-tanged arrows, bracer, Grooved Ware potsherds	Ashmore 1990
Flowerburn	Highland	NH 736 602	Cist (cemetery?)	Cremation	Burnt round-nosed flint flake/scraper with pyrite 'half egg'	'Crude' pot	Mackenzie 1885
Forteviot	Perth and Kinross	NO 0526 1693	Cist	Indication of crouched inhumation	Iron ore, flint strike-a-light, punk / tinder material	Two bronze daggers, flowers, wooden bowl, birch bark	Noble and Brophy 2011b; this volume
Freefield	Aberdeenshire	NJ 6789 3162	Beneath a cairn	None found	Iron ore and flint strike-a-light	Beaker	Clarke 1970, 443
Hoprig	Scottish Borders	NT 758 707	Cist	Inhumation	Red haematite, rubbed down and polished on one side	Three burnt flints (one a 'scraper for hides')	Hardy 1889
Lesmurdie	Moray	NJ 4004 3325	Cist	Inhumation (individual of older age due to worn teeth)	Three flints and badly preserved iron oxide	Urn	Robertson 1854, Clarke 1970, 443
Newmill, Bankfoot	Perth and Kinross	NO 085 324	Grave-pit with coffin or organic lining	None found	Flint 'fabricator'	Beaker, flint knife	Watkins and Shepherd 1979, 38–9; Clark *et al* 1985, 174 and fig 4.2
Teindside	Scottish Borders	NT 4414 0869	Cist	None found	Flint flake and rounded iron pyrites	Food Vessel	Greenhill 1877, 266; Rosehill 1870

Site	County	NGR	Context	Body details	Fire-making kit	Accompanied artefacts	Reference
Townhead	North Ayrshire	NS 268 421	Cist	None found	Nodule of 'ferruginous matter', poss flint striker?	Food Vessels	Morrison 1971
Udny Green	Aberdeenshire	NJ 886 265	Cist	Male inhumation	Iron pyrites	Beaker, flint knife, fragment of pegmatite rod	Murray and Shepherd 2007
Upper Largie	Argyll and Bute	NR 833 993	Grave-pit, possibly once had a wood lining	None found	Flint fabricator or strike-a-light with extensive abrasion	Beakers and 'knife'	Cook *et al* 2010, 181

Highland – had a mixed-burial accompaniment (Ashmore 1990), and in the others no body was recovered, as was the case at Forteviot. None of these other kits was found in the same grave as a bronze dagger; eight were found with Beakers, three with Food Vessels, and one with Grooved Ware. The contexts varied as well, these burials being placed in pits and in cists, both single burials and in cemeteries.

Some fire-making kits show surprising similarities to the Forteviot assemblage, such as in the case of a kit from Rudston, East Yorkshire, and Flowerburn, Highland. Both pyrite pieces in these graves were made from a rounded nodule, cut in half, as was the case at Forteviot (Greenwell 1877, 265; Mackenzie 1885). In both cases, a groove has developed along the cut surface from rubbing with the flint striker, as is obvious on the pyrite nodule from Hoprig (Hardy 1889). The geographically closest example to Forteviot was found in a cist that was part of a cemetery found at Aberdour Road, Dunfermline, Fife, in 1972 (Close-Brooks *et al* 1972). Here, the kit was found with a crouched adolescent inhumation burial, as well as a Food Vessel and 'slug knife'. The fire-making kit was located at the pelvis and consisted of a flint 'strike-a-light and a piece of iron ore' (*ibid*, 123) (Figure 5.50). The location of the objects allowed the excavators to suggest that the kit may have been 'kept in a leather bag suspended from the waist belt' (*ibid*, 127), although no organics were found in association with the burial. Clarke (1970, 184) suggested that fire-making kits, together with tinder and other small equipment, would have probably been held by a small pouch fastened to the waist; such bags have also been identified from prehistoric burials in Denmark (Frei *et al* 2017).

The Forteviot fire-making kit also contained punk, or tinder, in the form of dried amandou (horse hoof fungus: *Fomes fomentarius*). This can be easily sourced and transported and could be used to start a fire. This material would have acted as a primary tinder, in other words it would not burn, but rather smoulder, to then be used to light wood (a secondary tinder such as birch bark) and start a fire (Cave-Brown 1992). Cave-Brown (*ibid,* 53) outlines the various stages that would have been required to process such material to enable it to catch a spark. This focused on the corky flesh within the fungus, which had to be removed through soaking (for two days) or boiling (two hours), then pounded, stretched and manipulated to a leather-like consistency. The punk would then be dried and partially charred. Ötzi was found with a bar-shaped flint implement in a animal skin bag which also held pyrite particles, and a piece of *Fomes fomentarius* fungus (Egg *et al* 1993; Stapert and Johansen 1999, 768) indicating the portability of this material.

Fire-making kits are not the sole preserve of the Bronze Age (Stapert and Johansen 1999; Sorensen *et al* 2014). The ability to make and move fire would have been fundamental across human prehistory (and into the historical periods), although the significance of the material culture and the person whose task it was to undertake fire-making probably changed through time. Needham (2005, 209) has suggested that in the British Chalcolithic, but more commonly the early Bronze Age (from 2250 cal BC onwards), fire-making kits were part of an emergent repertoire of grave goods, which also included tall-necked Beakers, wrist guards, bone/antler spatulas, copper daggers, flint daggers, and stone sponge fingers. This is part of what Needham has termed the *fission horizon* in the last centuries of

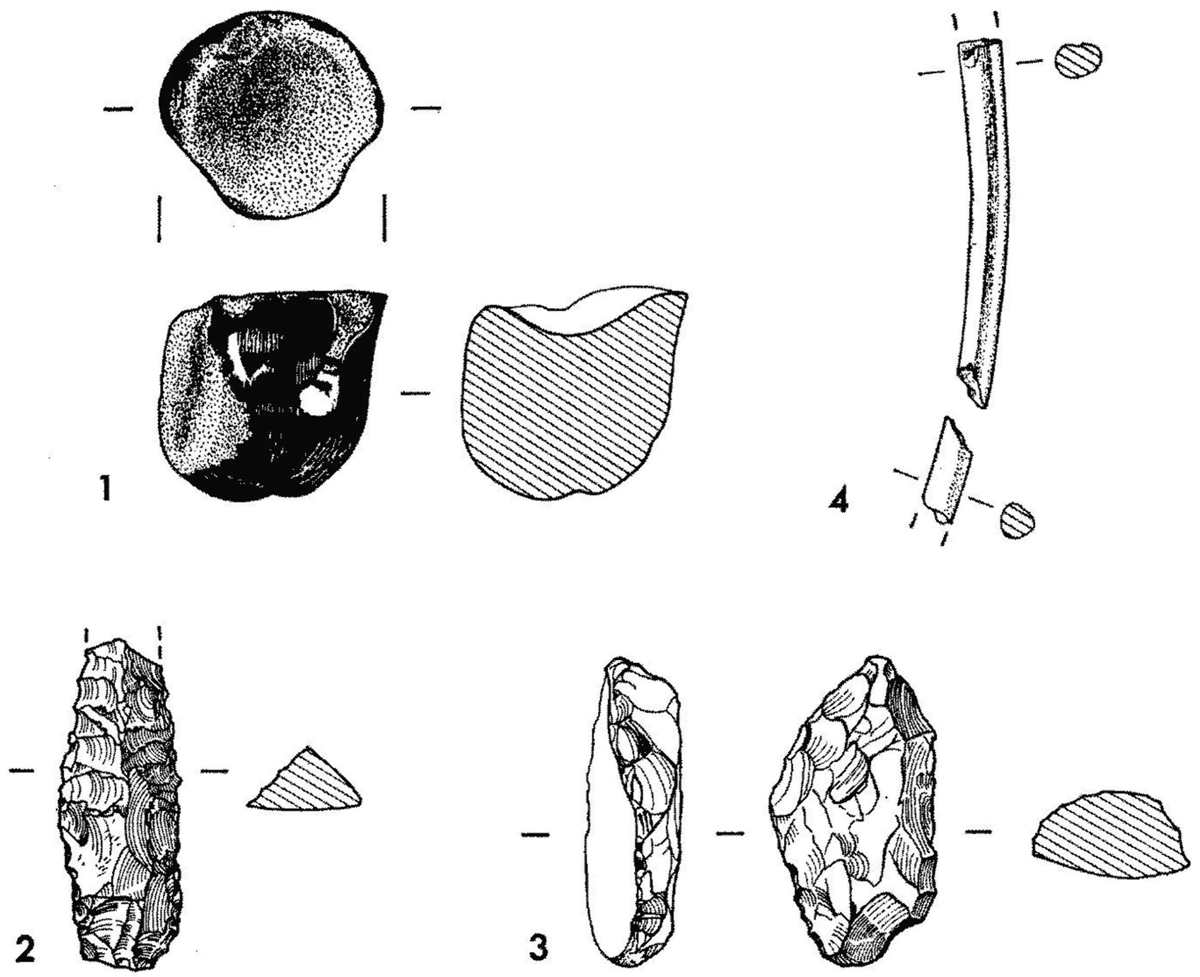


Figure 5.50 The Aberdour Road cist fire-making kit components. 1 is iron ore, 2 is a flint knife, 3 the flint striker, and 4 is a bone pin (from Close-Brooks *et al* 1972, fig 4, 129)

the 3rd millennium BC (see section 8.6). Interestingly, however, daggers and fire-making kits were not overlapping material traditions according to Needham (*ibid*). This is because the association of fire-making kits with bronze daggers is rare across Britain, examples in England including only the barrows at Angrowse Mullion, Cornwall (Borlase 1872) and Dowe Lowe, Derbyshire (Bateman 1848, and see Evans 1897, 313–14). Therefore, we should be cautious about the broader social and cultural meanings of such kits because they appear in such variable contexts with fluid meanings and associations between categories of object.

The fire-making kit would have been an essential part of prehistoric life – fire is, of course, fundamental for cooking and warmth. Given this importance it is perhaps surprising that fire-making kits are not more common in Bronze Age contexts, although they may be difficult to recognise as coherent kits when deposited in any context other than a burial. Their rarity may in part be due to other methods of making fire being available, such as wood-on-wood friction methods (Cave-Brown 1992), and also because a range of flint and metal-blade objects could have acted as impromptu strike-a-lights without these necessarily being recognised in the archaeological record. The Forteviot flint striker was perhaps unusual in this respect as it seems to have been made to serve this role rather than being a recycled object. The association of this type of fire-making kit with the individual buried in the Forteviot cist may be another indicator of the status of this person in life: this would have been a practical tool for everyday life, but also a transformative technology. The ability to create a spark using only two pieces of stone must have been (and still is) a remarkable act that can have a magical air to it. The kit may also have enabled this person to travel around, set up camp, and not be dependent on bulkier fire-making tools such as 'bows'; such mobility would be in keeping with the apparent Beaker associations of many of these kits. On the other hand, as noted above, fire-making may rather have been associated with older men who *lacked* mobility. Teather and Chamberlain (2016) have argued that fire-making kits should be considered in terms of the afterlife as well as life before death: the 'final journey for these Bronze Age men may have been perceived of as lonely and cold, with little comfort along the way' (*ibid*, 202). The spark of life may also have been required to illuminate the afterlife and the placement of this group of objects with the deceased at Forteviot may be one further indicator of the care that seems to have infused this burial.

5.4.5 Who was the dead person?

Gibson (2016, 57) has provocatively asked of the prehistoric dead in Britain: who were these people? This is also a fundamental question when trying to make sense of the absent individual laid to rest in the cist at Forteviot. Traditionally, archaeologists have interpreted dagger graves, along with other 'rich' Chalcolithic/early Bronze Age graves, in relation to the importance and status of the man who was interred in the grave. This has been very much a male focus, with any bodies found with a dagger or knife-dagger that can be sexed showing the deceased was a (usually older) male (Gerloff 1975; Baker *et al* 2004; ScARF 2012b, section 2.2). As noted above, fire-making kits are also almost always buried with men (Teather and Chamberlain 2016), adding to the masculine associations of the Forteviot cist. In this section, we will consider how we might interpret the status of the dead in the cist at Forteviot, and to what extent such powerful male narratives are helpful here.

Focus has inevitably dwelt on the status of men and their weapons, the supposed martial role of some of the objects placed in these graves. Needham (2004, 243), for example, suggests that the dagger was a major symbol and 'encapsulation of male leadership' in many regions of prehistoric Britain. This focus on the individual and status has been a common theme in Bronze Age archaeology (cf Shennan 1982; Thorpe and Richards 1984; Clarke *et al* 1985; Baker *et al* 2004, 109). In the 1970s and 1980s, social position in the early Bronze Age was interpreted as being attained and expressed through the acquisition of prestige goods and the occurrence of these in individual graves directly expressed an individual's status (Brück 2004b, 309). Hence, the quality and number of grave goods was seen as a direct reflection of the individual's personal wealth and position in the community (eg Randsborg 1973; Shennan 1975).

Associated with the focus on status and the individual in Bronze Age archaeology has been another persuasive interpretive tradition that ascribes a warrior ethos to a number of high-status burials in Bell Beaker and later burial traditions. This is due to the recurring occurrence of artefacts that *may* be associated with violence and warfare – the bow and arrow, bracer and dagger in individual graves dating to the later 3rd millennium BC. Indeed, Treherne (1995) (and others) has specifically linked the beginnings of the metal age with transformations in ideology that emphasised a male warrior ideal, suggesting this period heralded a more explicitly 'militaristic' society. To critique these ideas is not to ignore the evidence for violence in this period – the presence of arrowheads lodged in the skeletons of certain Bronze Age burials such as that found in the ditch at Stonehenge is physical evidence for violent encounters in prehistoric society (Pitts 2001, 112), but such examples are also known from Neolithic contexts and do not necessarily indicate major changes in the nature of prehistoric society.

Turning to the dagger itself, across Europe most scholars have interpreted the dagger as a weapon. Needham (2011) identified the dagger as the epitome of the warrior ethos of the Bronze Age (and see also Melton *et al* 2010, 810), highlighting the primary role that such supposed indicators of warfare have played in our interpretations of the social structure of the Bronze Age. Wilkin (2009, 89) connects the ability to acquire fine artefacts and exercise control over raw materials used to make items such as daggers with authority earned through violent engagements involving the blades. A link to ritualised combat, like that suggested for the use of halberds, has also been expressed (O'Flaherty 2007). Others have had more muted or nuanced views on the connections between daggers and violence: Harding (2006, 506–7), for example, expressed doubts over the routine use of daggers in combat, joining Shepherd (2012, 166) and Case (2004) in linking daggers to hunting rituals where the dagger was used to deliver the *coup de grâce* to animals. Case (2004) has highlighted the unsuitability of daggers as stabbing weapons, arguing that they are too thin and the wrong shape for this purpose and that they are more likely to have been for cutting or slashing. Some daggers may have been used as utilitarian cutting tools before becoming grave goods (Heath 2012, 129).

A similar critique has been developed by the Scandinavian prehistorian Skak-Nielsen (2009), who has argued that daggers were unsuitable weapons – they were not the same shape as later examples, lacking the long, pointed design seen subsequently. Moreover, wear-patterns from Central European and from Britain suggest that daggers were used for cutting rather than stabbing and were routinely sharpened. Instead, Skak-Nielsen persuasively suggests that daggers were implements for the slaughter of animals in routine or ceremonial acts (*ibid* 352). Rock-art and stele from southern Europe may support a cultic dimension to the use of the dagger and Skak-Nielsen suggests that halberds too were used in ritual slaughter and sacrifice. Given that ritual authority is a key source of power in traditional societies, the presence of the dagger within the Forteviot burial may add important nuances to the suggestions that elaborate burials such as this indicate people of higher status (eg Hedeager 1999, 151). If this was a high-status person then it may have been access to the gods and ability/authority to act in sacrifice that lent this individual their status and authority in the social groups who lived in the Earn valley.

Yet while the provision of grave goods was a significant aspect of Chalcolithic and early Bronze Age burials (Brück 2004a, 308), we must remember these objects can be interpreted in a variety of ways. Grave goods, for example, may not always have belonged to the deceased – they might have been gifts from mourners or objects used in mortuary rites associated with the funerary ceremony itself (Barrett 1994, 116–19, 121–3; Woodward 2000, 113–15, 119–20; Jones 2002). We need not assume that daggers held the same significance in prehistory as they appear to now. Furthermore, grave goods may not directly reflect status or identity. Brück has highlighted the role objects play in expressing emotional bonds between the living and the dead (Brück 2004b, 179). These more recent interpretations consider the relational qualities of funerary ceremonies, and the role mourners would have played in orchestrating the occasion. The deceased at Forteviot, as has been noted above, was treated with great care and formality and different people who took part in the funerary process would have had different rights and responsibilities in connection with the dead and their display. An important element of the funerary process is dealing with the loss and discontinuity created by death and while status may be one concern for those in control of the mortuary process, it is likely to be only one concern, and cross-culturally of variable importance (Brück 2004a, 309).

The continued relational quality of burials in the Chalcolithic and early Bronze Age is underlined by the occurrence of cemeteries, and it is within cemeteries that many dagger-burials have been found. The sequences of interment at Bronze Age mounds and in other contexts suggests an understanding of lineage and place within a social group was still of over-riding importance in the burial practices of the later 3rd to 2nd millennium BC (Garwood 1991). Ultimately, it was 'relationships with friends, kinsfolk, and neighbours, and with significant places, that made early Bronze Age people who they were' (Brück 2004a, 325). This is directly relevant to Forteviot, both in the proximity of the earlier cremation cemetery, and the emergence of a barrow cemetery here in the latter half of the 3rd millennium BC (see Chapter 8).

There are alternative ways of interpreting the individual at Forteviot, other than as a warrior, chief or hero. The objects and materials found with this individual also suggest strong connections with healing and pain relief. As noted already, meadowsweet plants and flowers have such traditional associations, and may have been used in much the same way as we now use aspirin. Other organic materials found in the grave have also been ascribed healing properties within folk medicine traditions, and it seems likely that people in prehistory may have been aware of and exploited items such as birch bark and willow. Wooden bowls could have been used to contain unguents or liquids (perhaps buried with the deceased), while willow and birch both have pain-relief associations (eg Bartram 1995, 57). Telford (2019, 230) notes that *Fomes fomentarius*, part of the fire-making kit, may have had an alternative purpose, being used in Classical and European folk medicine for wound dressing (Grienke *et al* 2014, 566). This is intriguing because sphagnum moss found in the Ashgrove cist was interpreted by Lambert as a 'surgical dressing … perhaps … used to staunch a wound in the chest' (in Henshall 1964, 172; Warsop 1997, 140).

Animal skin bags or pouches, found in association with fire-making kits in prehistoric Denmark, show evidence for having contained other objects unrelated to fire-making (eg Frei *et al* 2017), materials that one might associate with a medicine man, shaman or ritual specialist. The fire-making kit itself could have been used to help in the preparation of plants and minerals for medicinal purposes and its component parts could have served dual roles such as a cutting tool and, as noted, wound packing. Even the inclusion of quartz pebbles around the head could be interpreted as having some remedial significance (Franks 2016, 137–40). As Telford (2019, 230) concludes, 'the contents of the [Forteviot] cist are consistent with an in-depth knowledge of medical minerals and plants perhaps possessed by the deceased'. We should, therefore, be cautious about rushing to conclusions about the status and source of power of the person buried in this grave, although it seems incontrovertible that this man's death mattered.

5.4.6 The slighting of Henge 1

The creation of the dagger-burial at Forteviot had monumental implications, with the trajectory of the henge monument within which it was inserted changed forever. As with nearby Henge 2, where the henge entrance ditch appears to have been dug out and the henge mounded over towards the end of the 3rd or beginning of the 2nd millennium BC (section 6.3.1), so the cist and cairn within Henge 1 marks a radical architectural and psychological turning point. These henge modification events appear to have happened at more or less the same time, although in different ways – a cairn and inhumation burial in a formal cist at Henge 1, an improvised cist, cremation, and possible earthen mound at Henge 2, and there is no evidence that access into Henge 1 was changed at this time. Such processes might both be characterised as mounding (Brophy and Noble 2012b) and at both henges Bronze Age funerary activity appears to have been accompanied by digging into and sealing parts of the Chalcolithic henge earthworks, acts which were surely calculated to have an impact for ideological reasons. This may have related to the individuals (possibly a young adult female at Henge 2, and an older man in Henge 1) themselves, and/or wider social and religious changes at the time.

The cist pit was dug into the ditch of Henge 1, and the cairn would have overlapped both the henge ditch and part of the interior of the enclosure. We cannot be sure what else lay within the henge at this time: there may have been a mound already, associated with the cremation burial, while the eastern half of the henge was subject to later disturbance (section 5.5). A remarkably similar arrangement was evident at Cairnpapple Hill henge, where a Bronze Age cairn 'slighted' the henge ditch (Piggott's Period IV 'cairn enlargement'; Piggott 1948). In this case, the largest and final version of the cairn in the henge interior overlapped the partially backfilled ditch on the west side of the henge, with an urn containing cremated remains cut into the inner lip of the ditch; Barclay (1999b, 41) called this Cairn 3 and it appears to have covered several later urned burials as well as aggrandising the cairn that already stood in this location but previously did not overlap with the henge ditch. It is interesting to note in plan (Figure 5.51) that the exterior kerb of Cairn 3 more or less coincided with the outer lip of the ditch. At both Forteviot 1 and Cairnpapple the cairn and associated burial were located in the far reaches of the henge interior, about as far from the entrance(s) as one could get.

After the cist was inserted into Henge 1 at Forteviot, the nature of deposits in the henge ditch changed, from gravel silts and occasional deposits of burned material placed or thrown into the ditch, to the widespread deposition of burnt turf/soil horizons in the upper fills (notably concentrated around the cairn) (Table 4.5, sequence discussed in section 4.5.1). These seem to be associated with large-scale burning and perhaps de-turfing of the henge interior, with resultant materials being dumped into the henge ditch from the interior of the monument, covering the eastern side of the cist cairn. This dramatic series of events within the henge is completely different from anything we have evidence for before the cist burial and henge modification. Therefore, we could interpret the burial as prompting a different set of activities within the henge than had previously been permitted which may have involved the ongoing modification of the monument through fire and the stripping of soil, turf and weeds, keeping the interior of the old henge looking fresh. These are the last archaeologically detectable acts within this monument until the late Iron Age.

5.5 After the dagger-burial

Subsequent use and further modification of the henge monument some two millennia later dramatically altered what would, by then, have been a ruinous earthwork and cairn. These actions should be viewed in the broader context of the early medieval reuse and investigation of this monument complex. These later actions will be briefly discussed here, and in more depth in SERF2, chapter 5.

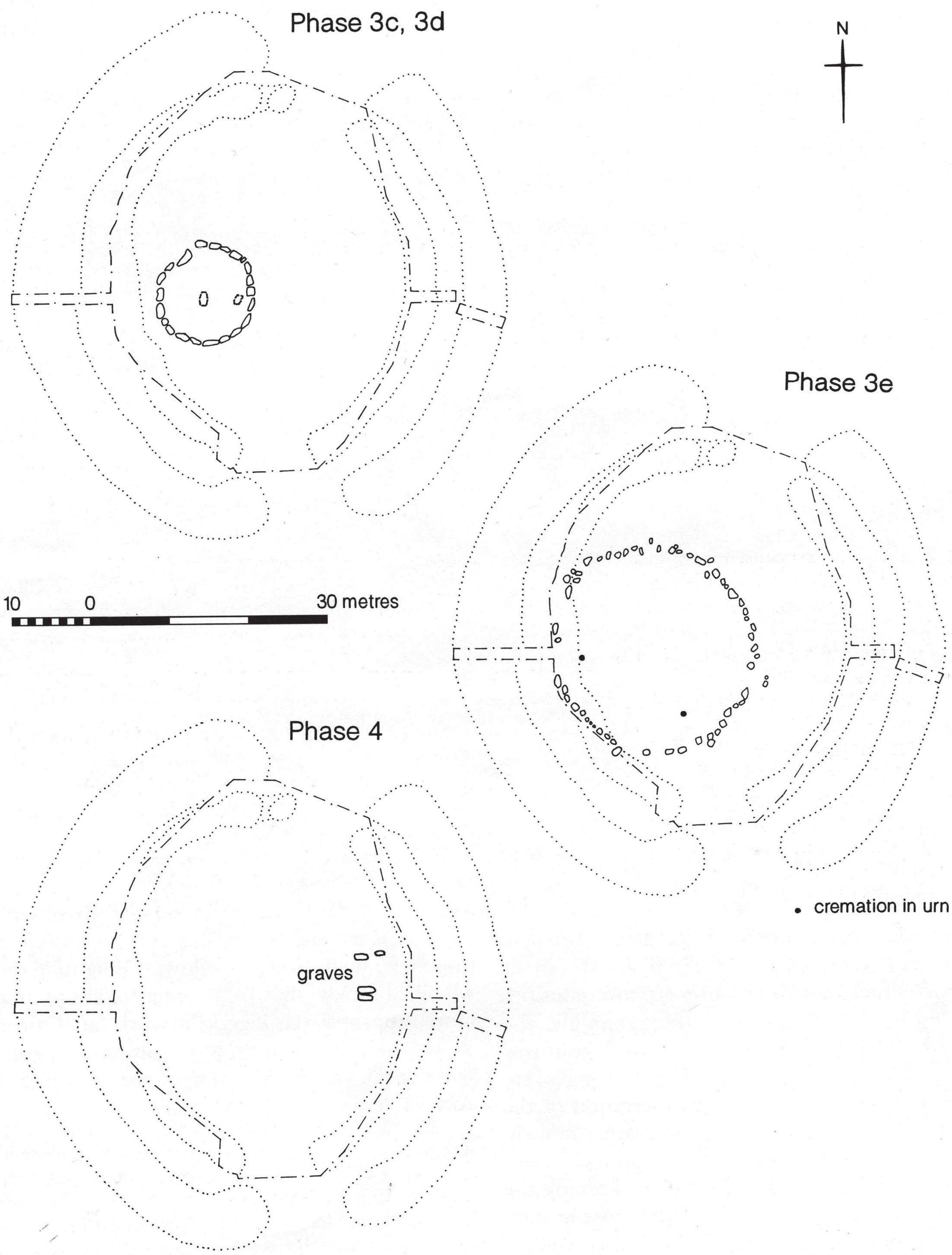


Figure 5.51 Barclay's reworked phasing of Cairnpapple Hill showing the interplay between henge ditch and cairn building (Barclay 1999, 44)

Much of the interior in the eastern half of the henge monument was composed of a large cut feature, which was shown through excavation to be a large pit. This feature is visible as a cropmark and has parallels in Henge 2 (excavated, shown to be early medieval, see section 6.6). Cropmark evidence suggests the same may be the case for the interiors of Henges 3 and 4. This pit, 531, was investigated via a narrow sondage across the eastern half in 2008, and through the removal of the north-west quarter in 2009 (Figure 4.3). Excavation showed that in at least two locations, Pit 531 cut the ditch of Henge 1. The

Figure 5.52 Photograph of the large Pit 531 within Henge 1

feature was a massive circular pit (316 / 531), 10.5m in diameter, with maximum depth of 1.5m (Figure 5.52). The sides were initially shallow, leading to a flat bottom, with a noticeably subrectangular depression in the centre measuring 1.3m north-west to south-east by 1.4m. This appears to be a cohesive single cut rather than a re-cut within the pit base. The large pit appears to have been backfilled in a series of different events, with a relatively shallow primary silt fill (620) suggesting that it was not open for a prolonged period. Above this was a series of dark brown to black silt fills with charcoal inclusions (604, 615) and a discrete deposit of charcoal-rich silt (611, 626); above these was a dump of stones slumping towards the centre of the pit. The upper 0.85m of fills consisted of silt and silt gravels (532, 545, 548) which appear to have been deposited rapidly; these were found to contain a Roman amphora sherd and medieval white gritty ware pottery (SERF2, 5.4). Radiocarbon dates suggest that this pit was opened sometime in the 5th to 7th century AD, around the same time as the pit within Henge 2 (section 6.6; SERF2, 5.1).

This early medieval intervention into the henge monument disturbed prehistoric features and materials. It cut the inner henge ditch on the east side of the monument, and almost certainly disturbed the eastern extent of the ancient cremation cemetery. Fortuitously, the cist was not affected, almost certainly because of the presence of the cairn material which the early medieval pit diggers avoided. However, it is tempting to speculate that early medieval people may have found something in this large pit and removed it, perhaps other burials. The interpretation of this and the equivalent features elsewhere within the Forteviot henges as crude 'robber pits' appears the most logical conclusion, with the motivation not only to establish new identities but also to forge connections with the past (SERF2, 5.5).

At some later point the henge and cairn appear to have been substantially altered. As noted in the previous chapter (section 4.5), a spread of rubble and stones masked much of the eastern and southern ditch of the henge, extending north to south for some 35m and running beyond the eastern baulk of Trench D (Figures 4.3 and 4.21). Essentially the henge ditch appears to have been largely filled to a depth of 0.7m with this deposit of rubble consisting of broken basalt and sandstone slabs, rounded pebbles and a dark loam matrix (320, 321, 324, 325, 338 and 541). At least some of this was sourced from a quarry located 325m to the south-south-east (location shown on Figure 5.12), while some is probably cairn material. The most likely explanation is that this represents a deliberate act of levelling by filling in hollows and dismantling the cairn, probably associated with post-medieval agricultural improvements. It was probably also at this time that the standing stone beside the nearby ring-ditch was levelled (section 6.6). A range of random materials was found in this layer including a late Neolithic flint oblique arrowhead (SF20) recovered from pebble-rich deposit 321 (section 4.5.5), a fragment of a bangle of oil shale or canneloid shale (SF13, Fraser Hunter pers comm), a blueish glass droplet (SF110), alder charcoal, and coal or cinder fragments. This suggests disturbance and redistribution of residual material during the reworking of the henge, a process that has continued ever since through repeated annual ploughing, sometimes at depth (SERF2, 2.7).

5.6 A powerful place

The location that we prosaically call Henge 1 was a remarkable place, one with such power that it attracted activities spanning thousands of years. During these long millennia there were fallow periods, but also several instances of radical reworking of its physical form and function. This was a place for the burial, and perhaps extraction, of the dead and rich material culture, and much labour and resources were spent on defining, redefining and transforming this location. The close proximity of the dead of two very different cultural traditions, centuries apart, is testament to the enduring source of power that this location had. This was only one of four henges at Forteviot, hinting at the intensity and duration of activity in this place in prehistory, and beyond. It is to another one of those henges that we now turn.

6

Henging, mounding, and blocking: Henge 2

Kenneth Brophy and Gordon Noble

with contributions from Derek Hamilton, Ana Jorge, Stephany Leach, and Neil Wilkin

6.1 Introduction and background

Neolithic and Bronze Age activity was not restricted to areas within the palisaded enclosure. Cropmark evidence, as outlined in section 2.3.1, indicates at least four hengiform enclosures to the north. The investigations of these form the basis of this chapter (Henge 2) and the next (ring-ditch), both sites having complex and lengthy biographies. Henge 2 is indicative, once again, of the broader impact that fashions within British prehistory had on activity at Forteviot, connections being evident with traditions of timber monumentality, henge construction and modification, ceramic styles, and funerary activity. Activities in this location span the middle and later centuries of the 3rd millennium BC. However, as was the case at Henge 1, our understanding of what happened at this place in those centuries has been compromised by activities that took place in later prehistory and the early medieval period. These later actions will be covered briefly here as and when relevant and discussed in more detail in SERF2, chapter 5.

6.1.1 Cropmark evidence

Henge 2 was a key element of the cropmark complex according to St Joseph (1976; 1978). The site was his number 1 (Figure 1.2, Table 2.2), described as 'a ditch, some 4m wide, [that] encloses a circle 30m in external diameter' and interpreted as a possible 'Bronze Age ritual structure' (1978, 50). St Joseph depicted a small, centrally placed feature in his drawing, not mentioned in the accompanying text. This internal feature was not on the 1991 RCAHMS transcription, which showed this site as a penannular ditched enclosure with entrance on the west side (Alcock and Alcock 1993; Figure 2.9). Curiously, this site was excluded from Harding and Lee's henge corpus (1987, 409ff); they depict the site as the cropmark of a ploughed-out barrow with unbroken surrounding ditch and central burial (Figure 2.7). Perhaps unsurprisingly then, until our excavations, the NRHE classification for this site was the non-committal 'enclosure'.

Closer analysis of the cropmarks in advance of our excavations (Figure 6.1) allowed room for doubt about these prior depictions and interpretations. Our working interpretation was that the cropmarks here indicated an oval enclosure, measuring 22m east to west by 29m, with an internal space 14m east to west by 17m, and defined within a broad ditch some 4m to 6m wide. No entrance gap on the west side was identified, but on the northern boundary the ditch noticeably widens to almost 8m across in two 'bulges', between which the ditch narrows again; the cropmark is also slightly darker here, suggesting the boundary of this enclosure underwent alteration. Subsequently, excavation showed this to be the case, the cropmarks here crudely depicting the conversion from a penannular to unbroken boundary ditch. This means that earlier interpretations, despite being contradictory, were correct, differentially giving primacy to one or other phase of this monument's history. The internal 'blob' (measuring 10.0m by 5.5m with long axis just south of east to west) consumed a considerable proportion of the enclosure interior, and shared close comparison to what we encountered in the cropmark record and excavation of Henge 1. Several other smaller internal features were identified through a close reading of the cropmarks: possible postholes or pits, arranged in no discernible pattern. No other features were identified

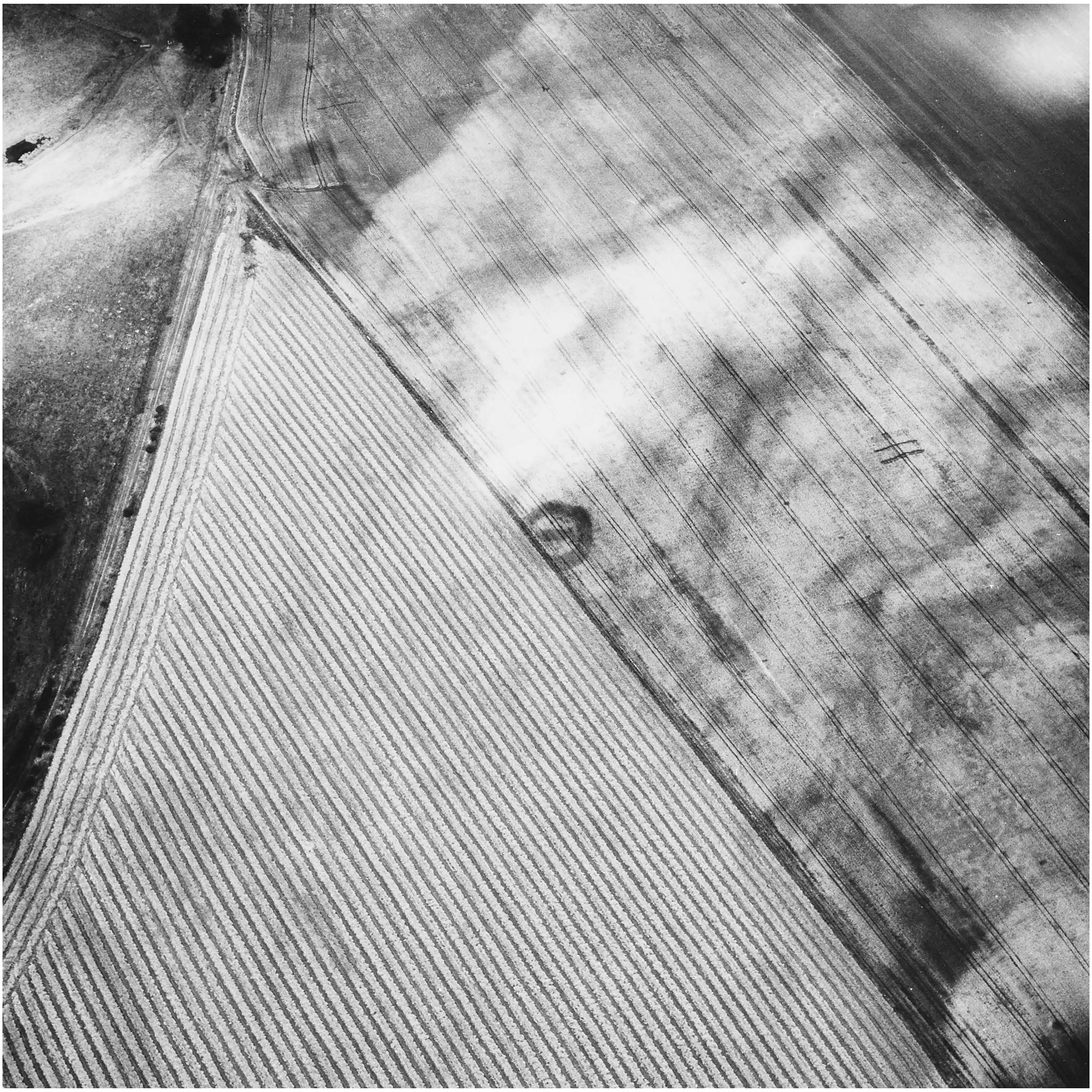


Figure 6.1 Henge 2 as a cropmark in 1986, showing the irregular ditch on the northern side, large linear internal pit, and possible internal postholes (SC 1705455; ©Crown Copyright: HES)

in the immediate proximity of this site, which is located 20m north of the palisaded enclosure boundary.

6.1.2 SERF excavations 2010

Henge 2 was excavated over a single season in 2010 (Trench H, Figure 6.2), one of three trenches opened over aspects of the Forteviot cropmark complex that year (Figure 1.4). The henge is bisected by the field boundary between the Dronachy and Manse fields, with the trench on the north-east side of this boundary; it was L-shaped and covered an area of *c* 350m^2 (Figures 6.3 and 6.4). A small square extension, measuring 7.5m on all sides, was opened on the west side of the field boundary; this area was only stripped and planned. (NB: this trench extension was not shown on previously published plans of the site eg Noble and Brophy 2017, figure 1.)

The trench was located to enable the investigation of almost all the enclosure interior, and sections of the northern and southern boundary. The excavated area was extended on the south side to allow investigation

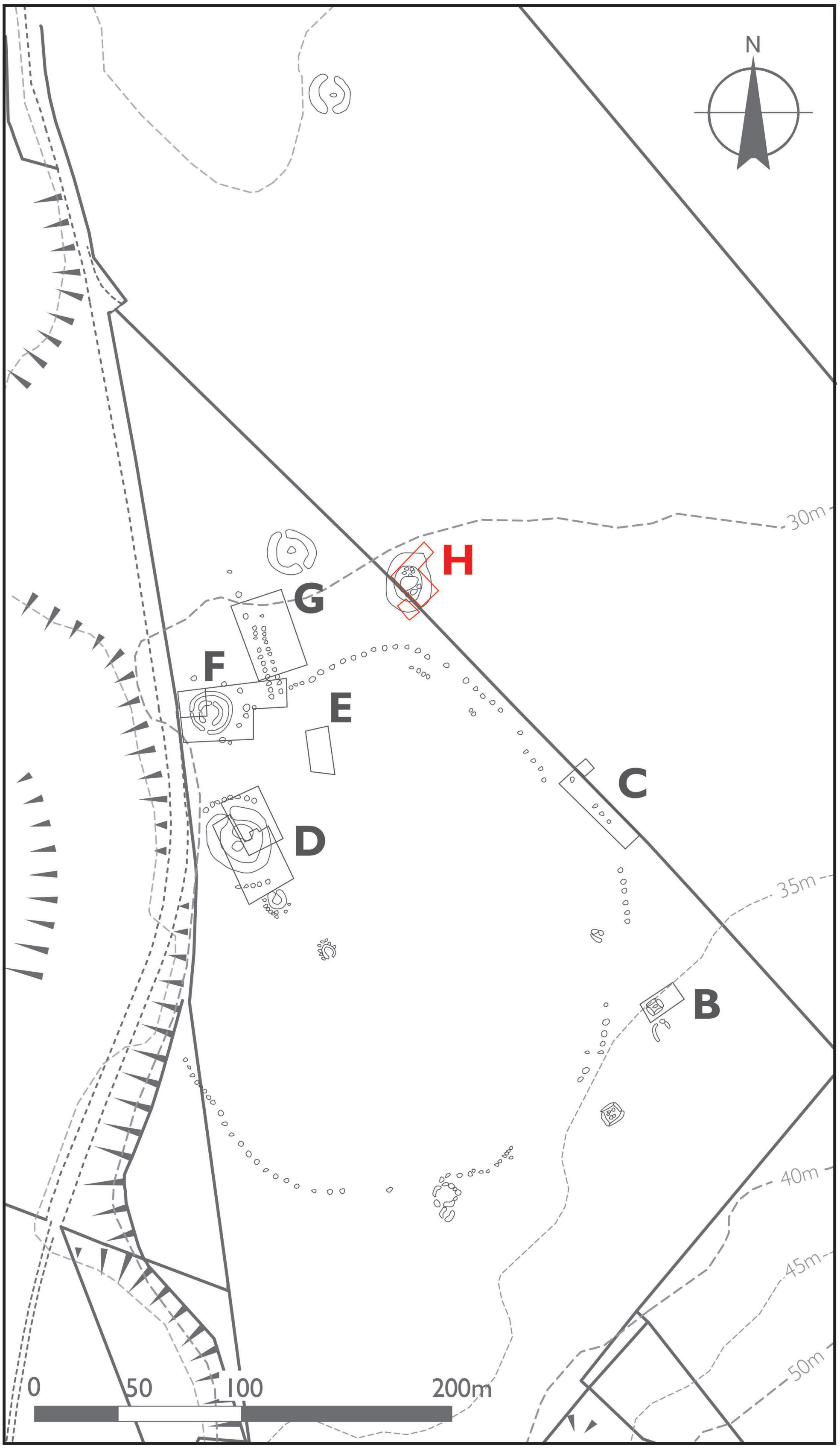


Figure 6.2 Plan showing the location of Trench H, the focus of Chapter 6, overlain on the cropmarks

of the relationship between the henge and post-medieval trackway that runs along the field boundary (section 3.5.2). Geophysical survey was carried out in advance of the excavation of this trench (section 2.4). This showed the henge ditch clearly but was less informative about internal features of the monument other than the large central blob or pit feature which showed up strongly (Figure 2.24).

Figure 6.3 Post-excavation plan of Trench H

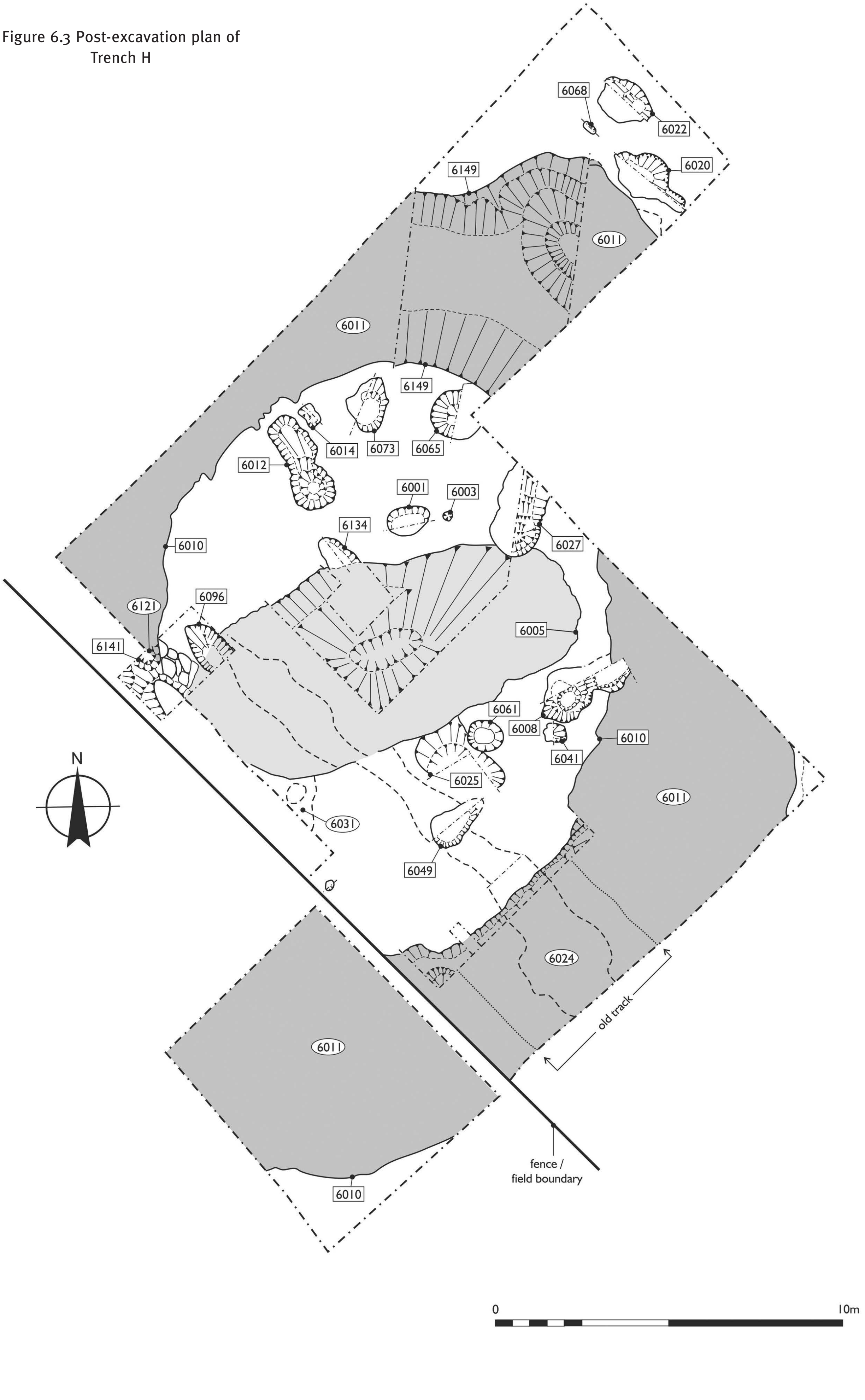


Figure 6.4 Drone view of Trench H during excavations (© Flying ScotsCam)

6.2 Timber setting

Within the henge monument, eight large postholes were found, which for the most part accorded with our reading of the cropmarks. These appear to represent a pre-henge timber setting, constructed perhaps only a few generations after the establishment of the Neolithic cremation cemetery located 150m to the south-west within Henge 1. This may be the earliest phase of timber post erection at Forteviot, although the dating was not conclusive (section 6.2.3). The postholes did not resolve themselves with confidence into a coherent structure; this is in part due to truncation by the massive 1st millennium AD Pit 6005 (section 6.6; SERF2, section 5.1). During the excavation and since, we considered various post arrangements, from a rectangular setting (perhaps even a building) to a timber circle, but none of these options 'works' satisfactorily. Some of these possibilities will be considered below. Suffice it to say that the identification of a coherent pattern to this timber structure is something of a 'join-the-dots' exercise where we cannot even be sure that all the posts were contemporary. The identification of a large assemblage of broken sherds of several All-Over-Corded (AOC), and one All-Over-Comb, Beakers, at various key locations in relation to the postholes (and henge), sheds light on the afterlife of this structure.

6.2.1 The postholes

Within Henge 2, eight postholes were identified and excavated to half, or full section. Details of each of these posts is given in Table 6.1, and locations shown in Figure 6.3. Six of the postholes survived relatively intact within the trench: these were (clockwise from the north-western quadrant of the henge interior) Postholes 6012, 6073, 6065, 6027, 6008 and 6049. Two further postholes survived only in the form of truncated ramps, with the bulk of the feature removed by later pit digging: these were Postholes 6134 (towards the centre of the henge interior) and 6096, adjacent to the western ditch of the henge. These were almost certainly erected before the henge ditch was cut, with the ramp of Posthole 6008 cut by Henge ditch 6010 and 6065 damaged by the later alteration of the henge entrance. Several pits and other features were identified within the henge interior, discussed in various sections across the remainder of this chapter.

The postholes were generally similar in size (Figure 6.5). Four (6008, 6012, 6027 and 6065) were classic postholes, with clear evidence for a postpipe, packing stones, ramp, and pre-erection post charring. No postpipe was documented in a fifth ramped posthole, 6049. In plan these features were *c* 1.1m to 1.3m in diameter and had maximum depths of between 1.10m and 1.45m. Postpipes were up to 0.6m across, suggesting these holes held substantial posts that rotted *in situ* (Figure 6.6) although the post within 6049 may have been removed. Ramps were evident for all, usually with a stepped profile, with the ramp for Posthole 6012 some 1.7m long, suggesting large posts were being inserted into the postholes. The ramps did not have a common orientation, but all pointed outwards from the timber setting. Two further possible postholes were identified through cut features which appeared to be ramps truncated by large Pit 6005. These cuts, 6096 and 6134, are of a scale that suggests they were similar in size to the other five complete postholes. A large siltstone slab was found within 6096, possibly disturbance related to early medieval pit digging and/or remnants of post-packing.

Oak charcoal was found in the lower fills of Postholes 6027 and 6065, evidence for probable post charring, but there was no indication any posts had been burned. Postholes 6012 and 6065 contained smaller amounts of mixed charcoal, with a very small quantity (4.9g) of cremated human bone fragments found in the upper fill 6013 of Posthole 6012. These were bagged with a piece of charcoal and a Beaker potsherd and include a small fragment of adult proportion tibia and a further upper limb bone fragment, probably radial shaft. This bone had moderate levels of erosion and may have been a token deposit (Leach 2012, part 2, 27ff). Other sherds of AOC Beaker were found in the upper fills of Posthole 6012, and in the ramps and postpipes of Posthole 6027, having been placed (or less likely, fallen in) once the posts had largely or wholly decayed and the features were little more than shallow hollows. Carbonised material from Posthole 6049 consisted wholly of blackthorn type, which could not have come from a charred post but may represent a deliberate deposit, residual material associated with post preparation or removal (Ramsay

Table 6.1 Posthole description summaries for Henge 2

Posthole	Excavated?	Dimensions	Depth	Postpipe	Ramp axis
6008	Half-section	2.1 × 1.11m	1.3m	0.37m	ESE
6012	Completely excavated	2.85 × 1.25m	1.13m		NNE
6020+	Half-section	3.0 × 1.5m	0.65m		SSE
6027	Half-section	2.4 × 1.3m	1.45m	0.6m	NE
6049	Half-section	1.50 × 1.12m	1.34m	No	E
6065	Half-section	1.5 × 1.5m	1.0m	0.6m	NE?
6073	Half-section	1.36 × 1.06m	0.71m	0.2m	NNE?
6096	Ramp only	Unknown			N
6134	Ramp only	Unknown			N

+ Located outside the henge, possible posthole

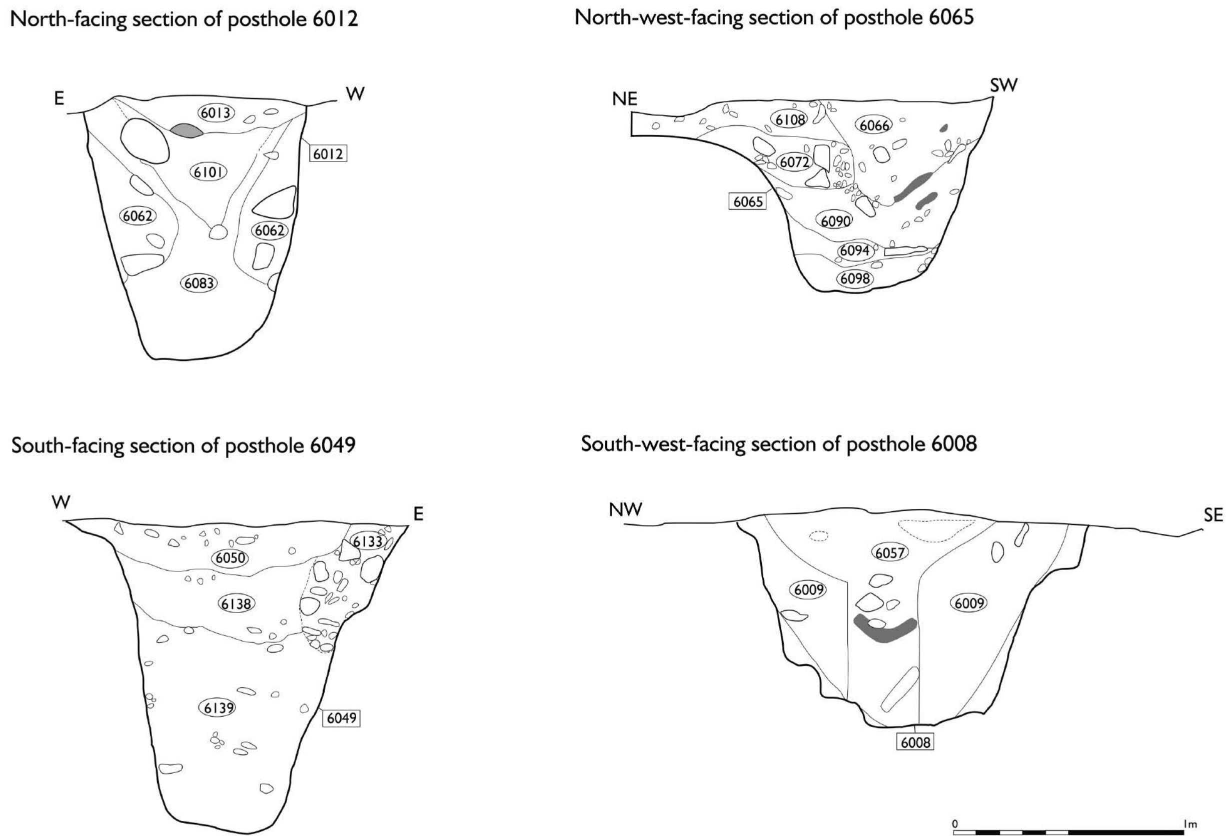


Figure 6.5 Selection of posthole sections from within Henge 2

Figure 6.6 Posthole 6049 during excavation

2010), or perhaps a fence that once stood here. Posthole 6049 was cut by adjacent amorphous Pit 6025 (section 6.2.2). Two radiocarbon dates from oak charcoal within the fills of Posthole 6065 suggest this post was erected in the late Neolithic: 2885–2675 cal BC (4215 ± 35BP; SUERC-37779 and 4145 ± 30BP; SUERC-37780).

One further posthole was identified within Henge 2, 6073, located equidistantly between Postholes 6012 and 6065, 1.5m north-east of the former, north-west of the latter, and smaller than those already discussed. This feature was 1.06m across, with a ramp extending this by 0.30m on the north-north-east side; it had maximum depth 0.71m and a postpipe (6074) that was only 0.20m across. This oak charcoal-rich post-pipe was slumped at an angle towards the eastern side of the feature, suggesting the post fell to the side, or was pushed over, perhaps while burning. Radiocarbon dates suggest that this posthole was not contemporary with the larger postholes in the vicinity, with two dates on oak charcoal placing this feature at 2475–2310 cal BC in the Chalcolithic period (3920 ± 30BP; SUERC-37781 and 3915 ± 30BP; SUERC-37782).

6.2.2 Miscellaneous internal henge features

A few pits were found in the area enclosed by the henge monument. Not all of these can be stratigraphically, chronologically or structurally related to the postholes and henge, nor do we have a date for most of them. The largest non-posthole feature was amorphous Pit 6025, roughly peanut-shaped in plan, measuring 1.4m south-east to west, by 1.2m, with shallow sides leading to a deeper depression in the centre of the pit base, reaching maximum depth 0.65m. It is possible that this was once a posthole that was completely re-worked into a larger, but shallower, pit (Figure 6.7). It is cut by adjacent features, including Posthole 6049 (meaning 6025 pre-dates at least this timber post), as well as early Bronze Age pit 6061, within which was placed a Food Vessel and cremation deposit (section 6.5) and big Pit 6005. The upper fill of Pit 6025 (6030) contained traces of birch and oak charcoal. This feature may represent the earliest activity in this location.

Pit 6001 was identified amidst postholes in the northern half of the henge interior and excavated to half-section. This feature was located almost exactly halfway between Posthole 6027 and ramp (and putative posthole) 6134 and measured 1.5m east-south-east suggest to west-north-west by 1.0m, with depth of up to 0.5m. This feature was not a posthole and contained almost no carbonised material although the fills (such as 6028) did contain a high proportion of stones which may have been placed there deliberately. Smaller Pit 6003 was located 0.40m to the east-south-east and was little more than a scoop 0.04m in depth.

Two shallow pits were found near the large postholes. Pit 6014 was identified 0.20m to the north of Posthole 6012; this was a scoop measuring 0.70m

Figure 6.7 Pit 6025 during excavation

north-south by 0.45m, only 0.10m deep, and contained dumps of charcoal (fills 6015 and 6029). Here, the charcoal was dominated by hazel, with smaller quantities of birch and willow, and could be interpreted as dumped hearth sweepings or related to one-off fire events (Ramsay 2010). Finally, Pit 6041 was recorded almost abutting Posthole 6008 on its south-west side; this feature was 0.60m across and no more than 0.16m deep with a sterile silt fill (6040).

A possible tree throw, cut by big Pit 6005, was identified near the baulk in the western half of the trench, but this silt spread (allocated context 6031) was not tested by excavation. Other activity within the interior of Henge 2 was found to post-date the henge and will be discussed later in the chapter.

6.2.3 Chronology of the timber posts

Derek Hamilton

Four results (Table 2.4; Figure 6.8) are available from fragments of charred oak that represent outer sapwood rings of the posts from two postholes (6065 and 6073) in the interior of Henge 2. Since the fragments in each of the two postholes should be essentially the same actual age, they have been combined here to form a mean measurement.

The two results from (6065) (SUERC-37779 and -37780) are statistically consistent (T'=2.7; v=1; T'(5%)=3.8) and combine to form mean (6065) 4180 ±22 BP.

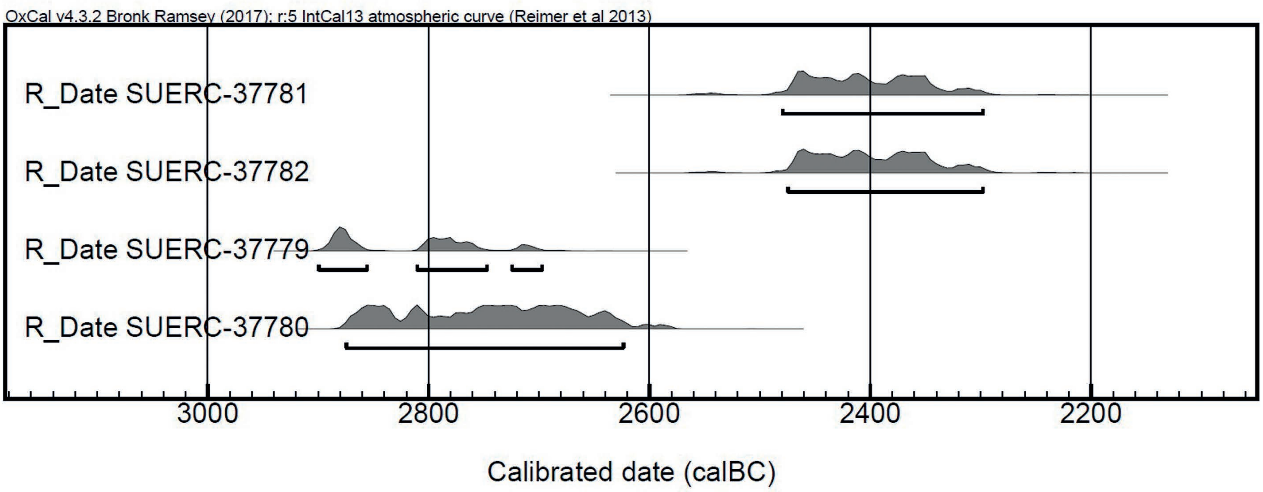
The two results from (6073) (SUERC-37781 and -37782) are also statistically consistent (T'=0.0; v=1; T'(5%)=3.8) and combine to form mean (6073) 3918 ±22 BP.

There is a significant difference in the calibrated dates from the pairs of dates from these two contexts. The calibrated date for (6065) is 2885–2675 cal BC (95% confidence; R Combine (6065)), while the date for (6073) is 2475–2310 cal BC (95% confidence; R Combine (6073)). This appears to be consistent with the differing nature of these two features, the earlier having been a more substantial posthole, and both having very different post histories. As these dates in effect relate to two posts erected some distance in time apart, there are not enough dates to produce a robust model and estimate for the beginning and end of use, as well as the overall span of activity, of either feature.

6.2.4 Making sense of the timber setting

It seems likely that four to seven posts stood in this location in the late Neolithic (in a place where at least one large pit had been dug previously), and these would have been substantial posts. Given posthole depths of between 1.0m and 1.5m (not allowing for plough truncation, thus making these figures conservative), these holes could have supported posts of between 3.5m and 6.0m above ground level. It appears that the posts would have been *c* 0.6m in girth and made of oak (based on charcoal found at the base of postpipes), so could have weighed between two and four tonnes, hence the requirement for carefully constructed stepped ramps. Erection and sourcing of these posts would not have been easy, and observations made in section 3.5.1 apply here also. We cannot say

Figure 6.8 Radiocarbon dates associated with the timber setting



any more about their appearance but it seems likely that all posts stood until they rotted, a process that might have been delayed by charring the bases of the posts. Posts of this size could have taken several decades to break or fall over, and the postholes would have endured longer as hollows.

It is not entirely clear what the timber posts here represent in terms of a coherent structure. When the site was initially excavated, we entertained the idea that they were part of a rectangular setting measuring some 8.5m north to south by 4.0m (Brophy and Noble 2010). The axis of this putative structure was north-north-east by south-south-west. In this interpretation, the eastern side of the enclosure consisted of postholes 6065, 6027 and 6008, while the western side was much sketchier, in the form of posthole 6012, the middle post represented by a truncated ramp (6134), and a dependence on the interpretation of amorphous Pit 6025 as being a dug-out posthole. Small posthole 6073 appeared to be in a 'gable-end' position halfway between either side, and Pit 6001 was similarly equidistant between the sides of this putative structure in an axial position. Although such structures are not uncommon in the centuries around 3000 cal BC in eastern lowland Scotland (cf Barclay *et al* 2003; Brophy and Barclay 2004; Brophy 2007b; Millican 2016a; 2016b), further reflection cast serious doubt on this interpretation. The radiocarbon dates suggest posthole 6073 was not of the same date as larger posthole 6065, and also differed in post history and form from the other larger postholes. It seems unlikely that Pit 6025 held a post, and this pit in any event is cut by Posthole 6049, a feature which has much in common with the other big postholes. Posthole 6049 would not work as the south-west corner of this structure, being too far to the south. The closest parallel to such a structure within a hengiform enclosure, Brownsbank, South Lanarkshire, is far more coherent (Brophy and Noble 2006) and so on balance it seems that this was not a rectangular timber structure. The suggestion that this was a four-post 'square in circle' arrangement (Susan Greaney pers comm; and see Noble *et al* 2012; Darvill 2016b) also falls in light of dating and feature interpretation in our view. There is no clear resolution of this structure into a timber circle either, another element of the late Neolithic repertoire in eastern lowland Scotland (Millican 2007); this was an initial thought we had pre-excavation based on timber circle-henge relationships both at Forteviot (Henge 1) and North Mains (Barclay 1984).

Perhaps a different perspective is required. Another way to look at the posts that stood here is that they had no structure as such. Viewed in the context of wider monumentality in the late Neolithic at Forteviot (and elsewhere (Darvill 2016b)) this makes sense. It is possible that these posts were being erected at around the same time as the construction of the palisaded enclosure, and we note the similarities between the posts used to build the boundary of that monument and the timber setting in the Henge 2 location: these postholes could have held oak posts of similar size, were ramped, had evidence for post-base charring and had no Neolithic material culture left in them. The timber setting and the post boundary are only 20m apart; it is tempting to see these two construction projects as being related. Were these posts that were not needed for the main project, and yet the builders were compelled to erect them once dragged to this place? Was this perhaps a shrine used by the monument builders, consisting of single or pairs of posts? The search for architectural coherence or symmetry in this setting is perhaps not helpful in making sense of this scatter of postholes.

A smaller post (6073) was erected in this location, perhaps a few centuries later, and at a time when the old oak posts were either gone or in a ruinous state. This post might not have stood for long, being of small proportion, and at some point it burned and fell, or was knocked over. Furthermore, cut feature 6020 (see section 6.3.2), of similar depth and form, suggests a post of similar stature stood just outside what was, or became, the henge entrance area, and taken with 6073, may indicate a second phase of post erection in this location. This sequence of events, perhaps associated with pit digging, fires and/or deposition, could be viewed as an attempt to revitalise a place of old oak posts, and it may well be no coincidence that the 6073 post was in use in the Chalcolithic, around the same time as the enclosure of this place within henge earthworks. This modest post would have been located within 0.5m of the inner lip of the henge ditch (or even closer dependent on the extent of modern plough truncation) had they been contemporary. (Older posts 6073 and 6065 would have been set in such a way that they would have partially blocked the entrance to the earthwork had they still stood, another reason to suppose they were gone by this time.) The connection between old posts and the new henge appears to have been significant within a fresh ideological climate, with the relict postholes and henge ditch connected through the deposition of pottery, and it is to this monument and those ceramics that we now turn.

6.3 Henge 2

The considerable ditch of Henge 2 was investigated in one large section, 5m wide, on the northern side of the monument, with the objective of examining the area that appeared anomalous as a cropmark (discussed above). The ditch, in plan, confirmed the cropmark evidence, narrowing rapidly from 7m to 5m width, with a rounded bulge to the eastern side of the narrower stretch of ditch (evident in Figure 6.4); the equivalent western bulge was mostly outside Trench H. The two visible ditch sections helped us to conclude that there had been henge terminals and an entrance causeway here once, but that this had been removed by a second cut completing the circuit of the henge ditch, turning this monument into a ring-ditch. The motivation to do this could have been the adaptation of the henge into a barrow, which may have been constructed over a Food Vessel-accompanied burial (section 6.5).

In this section, the henge ditch and causeway removal will be described, along with nearby features, while a more general discussion of the form and evolution of this monument will be considered after the Food Vessel burial and Beaker assemblage, both key elements in the evolution of form and function of this place, have been considered.

6.3.1 The henge terminal ditch and the barrow ditch

The henge entrance area was investigated through a single slot trench measuring 5m in width; this exposed two sections. The west-facing section allowed investigation of the bulge in the henge ditch (cut 6010, Figures 6.9 and 6.10). This is interpreted as the original henge ditch and the initial sequence of fills belong only to this iteration of the monument. It appears to have been when this henge terminal area was backfilled to a depth of 0.7m to 0.9m that the adjacent henge causeway was dug away, resulting in a further ditch being cut *between* the ditch terminals. This second, smaller ditch was captured in the east-facing section (cut 6149, Figures 6.11 and 6.12). It was not possible to identify the extent of this second ditch in plan; it may have been part of a more general reworking of the henge ditch around the complete circuit of the monument but was more likely restricted to the space between the henge terminals as it was not identifiable as a re-cut in the west-facing terminal ditch section. In effect this was the point at which the monument was converted into a barrow and the fills within both excavated sections aligned in composition and sequence, suggesting the second ditch was cut to the same depth as the older henge ditch.

The initial henge ditch (6010) was 1.7m in depth, 6.0m in width and with an asymmetrical profile, steeper on the outer than the inner face. Primary fills in the west-facing section largely consisted of gravels, varying in grade from pea to coarse (6132, 6107, 6113, 6106 and 6144); these represent material tumbling back into the henge terminal ditch and form the lower 0.7m fill depth, so they accrued over a considerable period. Immediately above these gravels, and towards the inner side of the ditch, were relatively discrete layers of gravel with a dark brown silt matrix and containing fragments of what appeared to be shattered stone (fills 6080, 6087 and 6113); these were probably thrown or placed deliberately into the henge terminal area. Beaker sherds from three vessels were found within these deposits. Layer 6087 produced a single radiocarbon date of 2496–2299 cal BC (3935 ± 35BP; SUERC-37867) from willow charcoal, thus placing it in the Chalcolithic, consistent with the ceramic assemblage. The volume of willow charcoal in layer 6080 suggests the burnt remains of a wicker object or basket may have been placed within the ditch at this time (Ramsay 2010). Above this level the fills were increasingly silty (eg 6071, 6054), with one notable lens of a darker silt fill (6041) at 0.9m depth (not recorded in section). Again, these deposits may have washed in naturally, although 6041 may have been a placed deposit.

The ditch that was cut to complete the circuit (6149) was 4.5m wide and 0.9m deep, with a symmetrical profile of shallow sides and flat bottom. Fills identified in both excavated sections were of a similar sequence and nature after this point, suggesting the henge ditch, and additional blocking trench gradually filled at the same time through the same processes. This barrow ditch backfilled naturally and slowly with silty material washed in. Primary fills within the barrow ditch (on the base of 6149 and in mid-fills of 6010) included gravel silts 6129, 6150, 6060, and 6061. The place in the sequence of Fill 6140, consisting of dark brown silt with hazel and willow charcoal flecks, is unclear as no re-cut was evident in the west-facing section. This could be interpreted as deposition associated with the

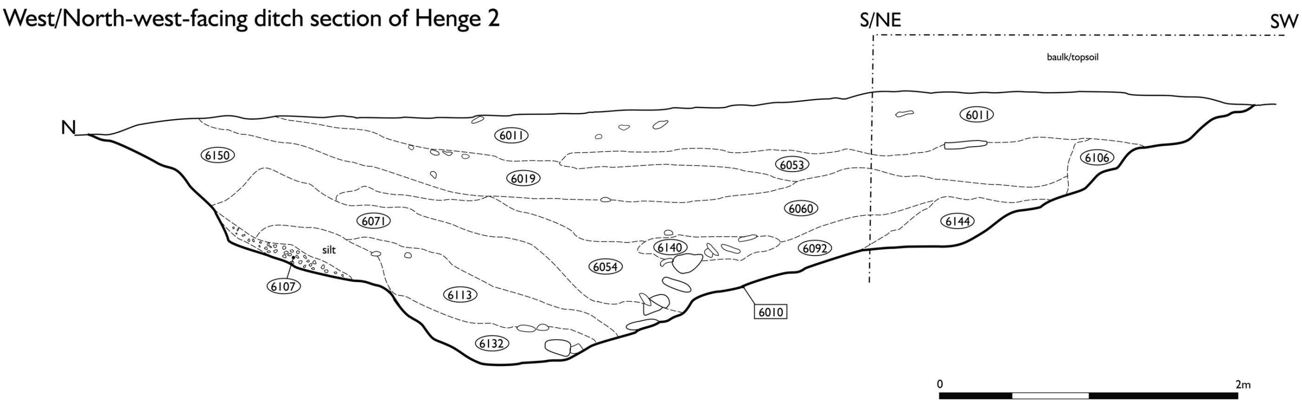


Figure 6.9 West-/north-west-facing ditch section of Henge 2. The section line here includes in part the trench baulk: see Figure 6.3

Figure 6.10 West-facing section through the Henge 2 ditch during excavations

act of henge moderation (it underlies primary blocking trench fill 6060 found in both excavation sections). Two radiocarbon dates (SUERC-37866 and SUERC-37788) from 6140 charcoal gave determinations *c* 250 years apart (see section 6.3.3). A group of late Iron Age or early medieval objects found in the upper silt fills (6011/6019) of the ditch indicate that aspects of this monument remained visible and attracted deposition some two millennia after initial construction (section 6.6; SERF2, section 5.4).

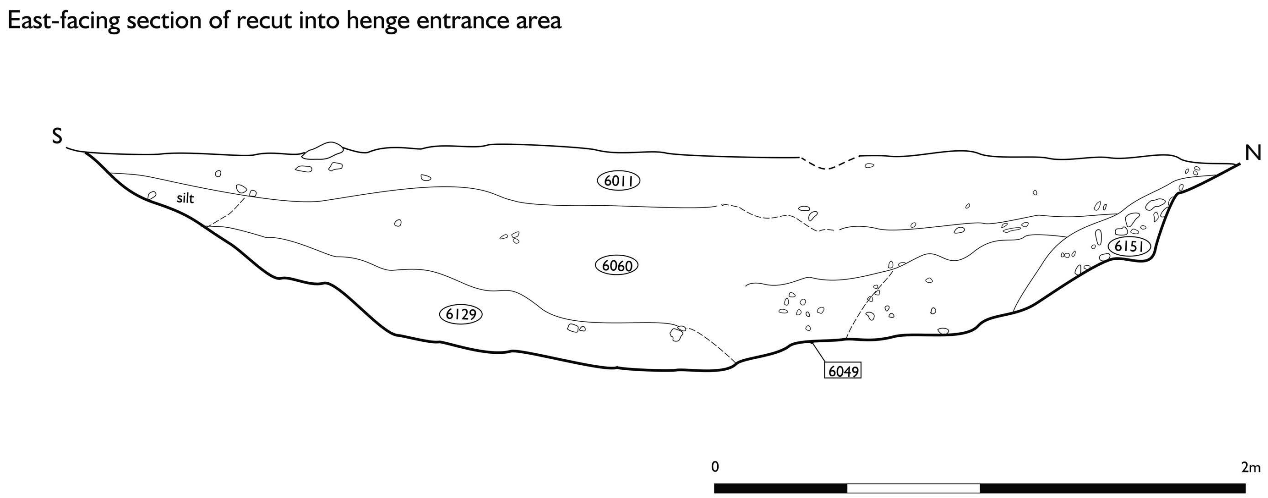


Figure 6.11 Section drawing of cut that removed the Henge 2 causeway

Figure 6.12 East-facing section through the ditch at Henge 2, which shows the original henge cut, and the later cut associated with causeway removal

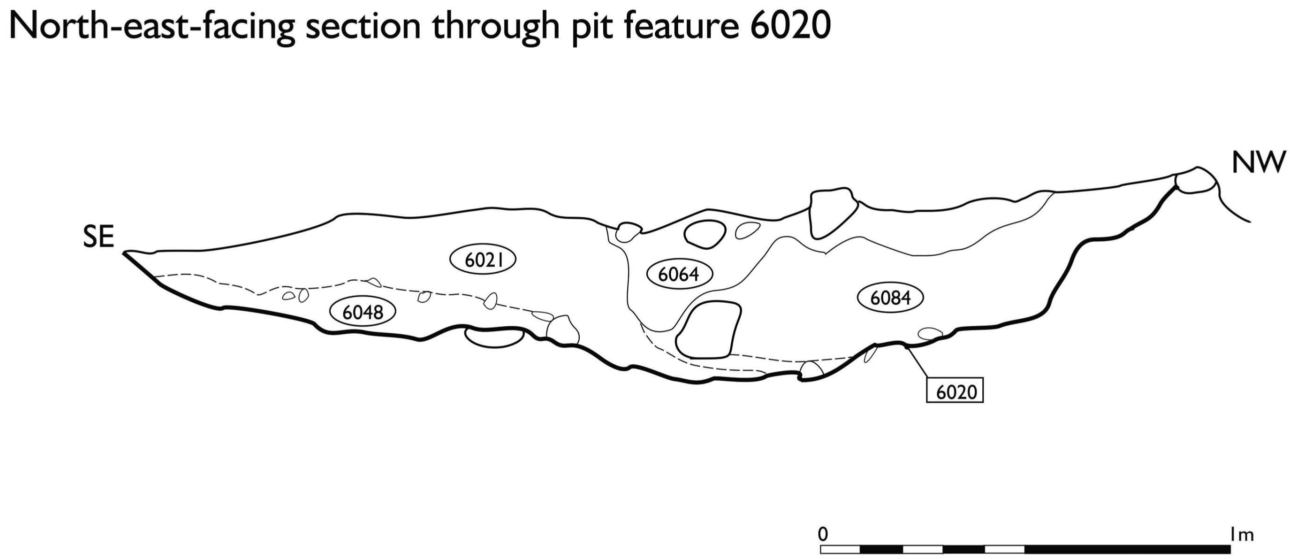


Figure 6.13 North-east-facing section through pit feature 6020

6.3.2 Miscellaneous external henge features

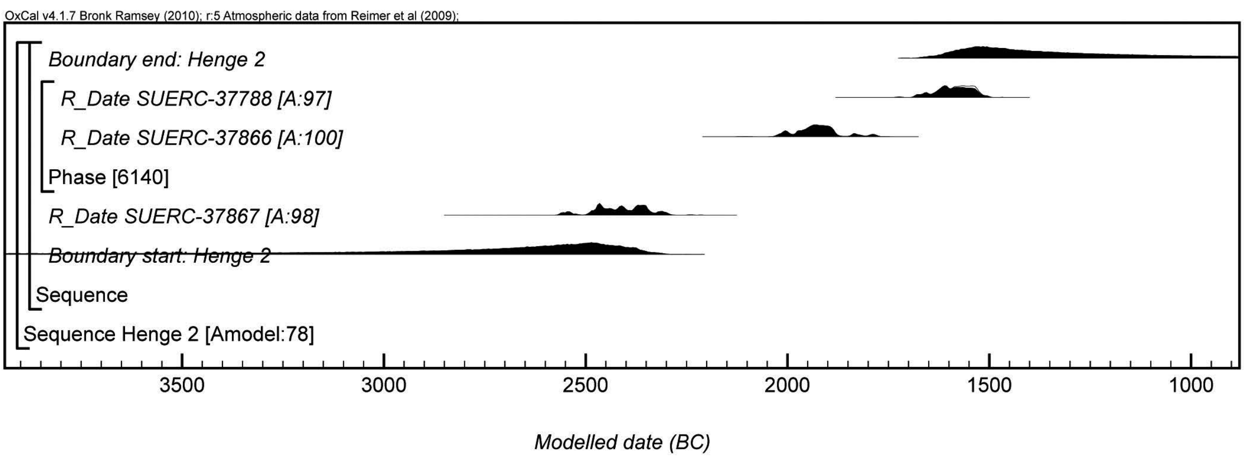
Three cut features were identified outside the modified henge entrance location (see Figure 6.3). Two (6020 and 6022) were large, elongate shallow pits with no stratigraphic or chronological association discernible with the henge/barrow. The most northerly, Pit 6020, was 3.0m north to south by 1.5m across in plan, and with a sloping base reaching a maximum depth of 0.6m towards the southern extent of the cut (Figure 6.13). It is possible that this is a truncated, ramped posthole, with a possible postpipe (6064) 1.0m across towards the centre and with width 3.0m by 1.5m. This feature shares morphological similarities with Posthole 6073 in the henge interior (see above). It was located only a few centimetres from the exterior lip of the henge ditch terminal. Pit 6022 was located 1m to the north-east and measured 2.12m north to south by 1.10m across in plan, and had a depth of only 0.20m, with two silt fills (6023, 6036). The third feature in this location was small Pit 6068, only 0.15m across and 70mm deep, probably a natural hollow. These features were found where we would have expected a henge bank to be, but no trace of such a feature survived.

6.3.3 The chronology and modification of Henge 2

(with Derek Hamilton)

Henge 2 is a monument that underwent significant modification. Ditch stratigraphy is backed up by the chronological sequence indicated by the few radiocarbon dates from, and material culture found in, the

Figure 6.14 Chronological model for Henge 2. The model structure is defined by the brackets and the keywords. The format is as described in Figure 3.27



ditch. Our understanding of the sequence of this monument will be briefly discussed here, with features and material culture discussed below also pertinent to the narrative. A broader consideration of henge typology and evolution across the second half of the 3rd millennium BC is discussed in Chapter 8 (see also Brophy and Noble 2012b; Younger 2016a).

Three radiocarbon dates (Table 2.4; Figure 6.14) were derived from the sequence of fills in the henge terminal and dug-out causeway section of the monument. There is one result (SUERC-37867) from a fragment of willow charcoal in a charcoal-rich layer (6087) above the basal gravel fills. This deposit contained Beaker pottery sherds, carbonised material and split pebbles, and here the ceramics more or less accord with the date of 2496–2299 cal BC (87.7%). Above layer deposit 6087, two results (SUERC-37866, 2029–1874 cal BC (87.1%) and -37788, 1681–1516 cal BC (95.4%)) were derived from willow and hazel charcoal respectively, from a possible primary fill or deposit associated with the barrow ditch-cutting episode, 6140. These two results are separated by more than 250 radiocarbon years which suggests either a mixed deposit in antiquity or that the material intruded into the deposit later. However, both accord with a hypothesis that the henge entrance blocking happened right at the end of the 3rd millennium or in the first half of the 2nd millennium BC and may have been related to the insertion of one or more burials into the centre of the henge.

6.4 The Beaker assemblage and its implications

Neil Wilkin and Ana Jorge

A relatively small but significant assemblage of Beaker pottery comprising of 94 sherds (weighing approximately 570g) and numerous crumbs was identified in features within Trench H (Figure 6.3). It is likely that these sherds represent five Beakers. The majority of the sherds (*c* 98%) were recovered from a concentrated area (*c* 10m by 13m) within the henge enclosure close to the northern causeway entrance, namely in deposits placed into the henge ditch 6010 after initial gravel silting had taken place, and the upper fills of two postholes in the timber setting (6012 and 6027). While the digging of the postholes and ditch were probably not contemporary activities (see above), the deposition most likely was. How the Beaker sherds found their way into these features is of great significance; this will be considered below alongside parallels and chronological information revealed by the pottery assemblage.

6.4.1 The Beakers

All the Chalcolithic and Bronze Age vessels found during the Forteviot excavations have been assigned to a universal sequence of vessel numbers, after analysis of overlapping aspects of the assemblage by several different specialists. Three Beakers appear to have been placed into the henge ditch, albeit in varying quantities: Vessel 2 is represented by a fair proportion of the pot, and Vessels 3 and 4 by a few sherds. (It was decided to allocate separate vessel numbers to 3 and 4 because both consisted of rim sherds that could not be reconciled with those found representing Vessel 2 or each another.) Two Beakers were found in relation to the timber setting postholes: Vessel 5 (in Posthole 6027) and Vessel 6 (Posthole 6012). These vessels will be discussed in turn. Further *comparanda* and relative dating evidence are discussed in section 6.4.3. (Vessels 1 and 7 as listed in Table 2.5 are from different sites at Forteviot.)

CATALOGUE

VESSEL 2 (HENGE DITCH 2010 FILLS 6080, 6087 AND 6113) (SF NOS: 6037, 6044, 6047, 6048, 6049, 6050, 6052, 6053, 6054, 6055, 6056, 6084, 6024, 6026, 6027, 6029, 6032, 6034, 6037, 6039, 6044, 6047 AND 6082)

Some 27 sherds representing approximately 15% of a large fine AOC Beaker vessel found across henge ditch terminal fills 6080 and 6087. The vessel's estimated rim diameter is *c* 200–260mm and the average wall thickness is 7.5mm (range: 6.5–9.0mm) (Figure 6.15a). It is difficult to reconstruct the overall profile of the vessel from the rim sherd alone as its angle cannot be fixed, and a range of profiles are possible between a bowl (with height substantially less than rim diameter) to a taller vessel with swelling, globular belly. Parallels for both can be found among the AOC corpus (Clarke 1970, figures 1–41), although the latter is more common. The rim has a bevelled interior that becomes a flattened interior angle with a squared protruding exterior which shows evidence of ancient chipping and abrasion, possibly incurred during use.

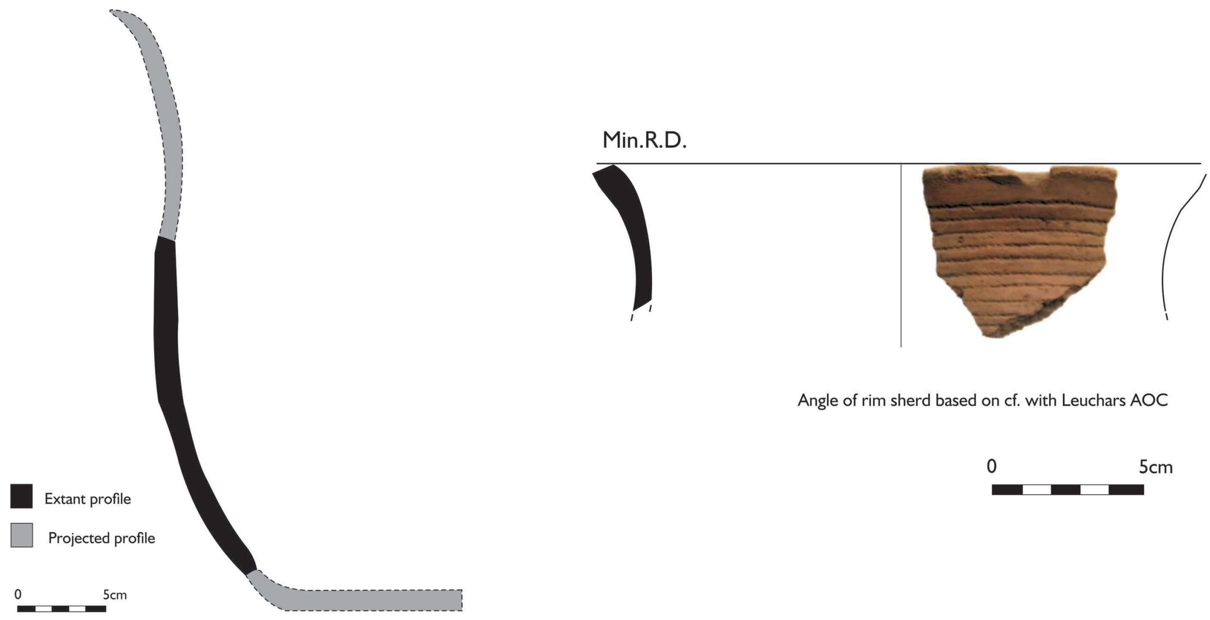


Figure 6.15 Beaker pot profiles: (a) Vessel 2; (b) Vessel 5 (drawn by Neil Wilkin and Lorraine McEwan)

Sherds of the vessel derive from two principal contexts and this is reflected in their size and exterior surface condition. Sherds from the stony deposit (6087) are smoother and less abraded on the exterior surfaces (and therefore have different colouring) compared to those from the overlying deposit (6080). The difference in abrasion is likely to be due to different post-depositional/taphonomic conditions rather than actions before or during deposition. Indeed, similar variation occurs on the exterior (but not the interior) surface of a largely complete AOC vessel deposited in a grave at Upper Largie, Kilmartin Glen, Argyll and Bute (Sheridan 2010b, 180–1; cf colour photographs of 'Pot 3': Alison Sheridan pers comm). However, taphonomy does not explain the difference in sherd size.

The vessel was originally light orange brown (7.5 YR 7/6 to 7.5 YR 7/8) both on the interior and exterior. The sherds show no trace of the black/grey core synonymous with rapid (open-air) firing and instead have a uniform buff-coloured core that indicates complete oxidation. This suggests that the firing time was sufficient for the complete burning of the carbonaceous material in the clay, unusual for vessels produced in an open firing and therefore unusual for the vast majority of prehistoric ceramics including Beakers. The complete burning reflects several factors including the porosity and density of the fabric, the temperature reached in firing, and the rate of firing, and is more usually associated with kiln firing (Hodges 1962; Gibson and Woods 1997, 52–9, 119, 216, figs 29, 69). There is currently no evidence for updraft or pit kilns during the Chalcolithic and Bronze Age so skilful management of the firing conditions or the qualities of the clay (eg the sand content) seem more likely explanations. Either way, it seems fair to suggest that considerable skill, time and fuel were expended in firing this vessel relative to most prehistoric fabrics. The surface has been slipped and burnished and inclusions are in general rare, with sparkling fine sand grains similar to the fabric of Beaker Vessel 5. In contrast to Vessel 5, however, smoothing and burnishing were carried out more carefully and preceded decoration.

The vessel is decorated with all over twisted cord impressions (AOC) applied relatively crisply and neatly, with fewer interruptions and clearer cord impressions than on Vessel 5, although several lines are not completely horizontal and there is evidence of smudging in isolated areas, most notably from below the carination. It is in general typologically similar to Beaker Vessel 5, belonging to Clarke's (1970) AOC group, Lanting and van der Waals' (1972) steps 1–2, and Needham's (2005), 'Low-Carinated' lineage, although some doubt must remain over the full profile of the vessel. The squared rim with internal and external bevelled surfaces is a feature of only a small number of other AOC vessels, all from the east coast of northern Britain (cf Leuchars, Fife; Castle Huntly, Angus; 'Forfarshire', Angus and Ponteland, Northumberland: Clarke 1970, figs 4, 9, 19 and 29).

Vessel 3 (Henge ditch 2010 fill 6080) (SF6036)

A single sherd, found in ditch fill 6080, measuring 17mm by 13mm. No decoration was evident as this was a fragment of the internal surface of the pot.

Vessel 4 (Henge ditch 2010 fill 6080) (SF6029)

Three relatively abraded rim sherds probably from an AOC Beaker, all found in the henge ditch terminal deposit 6080. The rim flares outwards in a manner characteristic of the sinuous and Low-Carinated AOC tradition. The impression of cord is faint in several places and stops *c* 15mm from the rim. The thickness of the wall varies from *c* 6.5–8.5mm. The fabric is sandy to the touch on both interior and exterior surfaces and is notably different in both colour (greyish brown: 7.5 YR 7/4) and finish to other sherds from the site. This may be due in part to a degree of rolling rather than representing the original surface finish and colour. This pot appears to have been exposed to a greater range of practices and processes prior to deposition than other, more complete vessels and may have been older; in other words, this pot may have been handled and/or used before deposition.

Vessel 5 (Timber setting posthole 6027, upper fill 6018) (SF Nos: 6011, 6012, 6014, 6013, 6015, 6018, 6035 (base), 6038, 6040, 6041, 6042, 6043, 6057, 6058, 6061, 6062, 6063, 6064, 6068, 6069, 6070, 6076, 6077, 6078, 6017, 6020)

Some 15% of a large AOC Beaker vessel (50 sherds) was recovered from upper fills 6018 and 6039 of timber setting Posthole 6027. Twelve sherds conjoin, two of these found across the two contexts. The absence of rim and base and paucity of upper body sherds makes assessing base and rim diameter problematic, but the recovered sherds provide an incomplete height of 158mm and an estimated total height of *c* 220–250mm (Figure 6.15b). The vessel appears to have had a sinuous profile and has a relatively gentle carination (by the standards of some AOC Beakers from eastern Scotland; cf Clarke 1970, figs 4–6) and was probably positioned a little under the vessel's mid-height. The average wall thickness (*c* 8.5mm; range: 5.5–10mm) is among the thickest from the site and may relate to the overall size of the vessel. The exterior surface is a light/greyish brown (between 7.5YR 6/4–7.5YR 6/6) and the internal core is grey (*c* 4.5mm thick). There is some fire clouding to the internal surface of the lower body of the vessel. The fabric is fine with some relatively scarce angular and rounded inclusions (max 5mm by 4mm), including quartzitic grits. Inclusions are especially rare to the exterior surface (<5%) but are more common on the internal surface and in section. Indeed, the exterior appears to have been treated with a wet hand-slip of fine slurry clay prior to decoration and burnishing, thus obscuring inclusions. Fine glittering specks of sand (less than 0.25mm diameter) can be seen across the sherds of the vessel and probably reflect the local geology and clay source.

The decoration consists of all over encircling twisted cord which has been impressed at uniform intervals (*c* 3.5–4mm). The cord impression is, however, of varying crispness and clarity. Interruptions are regular and may have been the result of the length of the cord available, the size of the vessel being decorated, and/or the position of a finger or thumb during application/impression of the cord around the body of the vessel. In other places the decoration has been smudged, particularly for a band *c* 20–30mm below the carination; this may have been the result of lifting and handling the pre-fired vessel. In other cases, the lines of impression have been 'closed' by a final smoothing or burnishing of the exterior surface. The degree of blurring, smudging and smoothing of the cord impression is unusual among smaller AOC vessels (often recovered from funerary contexts) and it may reflect the size and function of the vessel. At one point a piece of straw/grass or the loose end of the cordage has been accidently impressed into the exterior surface.

Abrasion on base sherd SF6069, but not on wall sherds, suggests that this slight damage occurred before, not after, deposition, related to prior handling and/or use. However, the overall minimal degree of abrasion across the vessel indicates that the sherds had not been exposed to the natural elements and human practices or processes for long before being incorporated into the upper fills of the posthole. The size and freshness of the conjoining sherds and the cross-context conjoin noted above supports the suggestion that a portion of a large Beaker vessel had been selected for deposition from a larger assemblage rather than incorporated into the upper fills of an existing hollow by accident or at random over a period of time. The vessel belongs to Clarke's (1970) AOC group, Lanting and van der Waals' (1972) steps 1–2 and Needham's (2005), 'Low-Carinated' lineage, although the sinuous profile of the vessel should be noted.

Vessel 6 (Timber setting posthole 6012, upper fills 6013, 6101) (SF6 Nos: 016, 6021, 6022, 6030, 6073?)

Six sherds representing less than 10% of a thin-walled (*c* 5mm) Beaker were found in the top 0.3m of upper fills (6013, 6101) of timber setting Posthole 6012 (Figure 6.16). The all-over-comb (AOComb) decoration was achieved using a comb with 5–6 teeth (*c* 3mm by 1mm) applied with lengths that overlap at an angle in several places. The fabric is reddish brown (7.5YR 6/6, brick-red in areas and fire-clouded elsewhere) with a blackish core (*c* 2.5mm). Inclusions are rare but include small (*c* 1mm diameter) greyish grits and several voids probably left by the burning out of organic inclusions. Wipe marks to the interior surface suggest this surface was smoothed while the exterior surface may have been burnished. The vessel had a sharp

Figure 6.16 Beaker sherd *in situ* during the excavation of Posthole 6012

carination and, once again, is likely to belong to Clarke's (1970) European Bell Beaker group, Lanting and van der Waals' (1972) steps 1–2, and Needham's (2005), 'Low-Carinated' lineage.

Means of manufacture

In some cases, it was possible to determine means of manufacture of pots from fracture patterns. Vessel 5 includes several sherds which present laminar/stepped horizontal fractures reflecting the construction technique of thin and flattened straps joined using the diagonal bonding method both between the edges of successive straps and possibly between the ends of individual straps, as demonstrated in the cross-section of several sherds and diagonal fracture lines. Fractures often occur along the lines of cord decoration and are a recurrent feature of this vessel/fabric, probably because they provided weak points close to incompletely bonded strap joins. This is noteworthy given the similarity of construction and fracture pattern of Vessel 2, albeit this vessel does not appear to have been made or fired with as much care.

6.4.2 Petrology and clay-source analysis

Ana Jorge

A series of thin-section petrology samples from vessels found at Forteviot were taken and compared with local (and regional) clay sources. The majority of these vessels were from Henge 2 contexts (see Table 6.3). These indicated that these vessels were made with clay from multiple sources.

Thin sections from vessels 1–7 were analysed (two from Vessel 1 found in the henge ditch terminal area of Henge 2, see Tables 2.5 and 6.2). It was clear that these vessels did not share the same fabrics. Sherds fabrics were found to range from coarse to fine clays, with no evidence for temper but inclusions of mostly volcanic rocks such as andesite, basalt and tuff and some sedimentary rocks.

The clays used to make the Beakers at Forteviot are compatible with the sediments of central Scotland's Midland Valley. It is very likely that the clays used to make these pots came from this geographical zone, rather than, for instance, the Highlands, where one would expect to find metamorphic rock inclusions within clay. Inclusions within early Neolithic pot fabrics at Wellhill, 4km from Forteviot, included serpentine, sourced from somewhere north of the Highland Boundary Fault (Alexander *et al* forthcoming; SERF3) suggesting different clay sourcing strategies were active across space and time during prehistory locally.

Unfortunately, the sedimentation history of the Midland Valley is too complex and deposits too heterogeneous internally to allow for a more precise

Table 6.2 Beaker sherds used for petrological analysis (analysis by Ana Jorge)

Sample ID	Beaker Vessel number	Context	Sherd ID
FNS-1	2	6087	6052
FNS-2	2	6080	6039
FNS-3	2	6080	6029
FNS-4	6	6013	6016
FNS-5	7	352	165
FNS-6	5	6018	6076
FNS-7	5	6018	6043
FNS-8	5	6039	6020
FNS-9	1	5064	5014

geographical provenance to be suggested other than at regional level. Variations in clay inclusions and fineness can occur even in clay sources in close geographical proximity, so the variations identified in our analysis does not necessarily suggest that sources some distance apart were being utilised in the second half of the 3rd millennium BC. Indeed, clay might have come from riverbanks or pits quite close to one another and not been visually differentiated by those collecting it.

Comparison was made with a series of clay samples taken from central Scotland and although some of these sources cannot be ruled out as having been exploited in prehistory, none positively matched our samples. Sources sampled included exposed riverbeds in the valley of the Earn and broader locales with a modern history of exploitation for brick-making in the area around Perth. It is possible, however, to *rule out* some geographical zones as the clay source. For instance, all the pottery sampled at Forteviot was made using non-calcareous clays which eliminates deposits such as the carboniferous shales and sediments with beds of limestone to the south of St Andrews, Fife. However, without much larger-scale systematic sampling, the best that can be stated at this stage is that all vessels analysed used regional clays, probably from the north or north-east parts of central Scotland.

6.4.3 Beaker chronology

All-over-corded and all-over-ornamented Beakers have long been viewed as among the earliest Beaker vessels in Britain and Scotland (eg Clarke 1970, 52–83; Lanting and Van der Waals 1972; Shepherd 1986, 7–9) and recent discoveries and dating projects (eg of the Amesbury Archer and Boscombe Bowmen from Wiltshire (Fitzpatrick 2011), Upper Largie, Kilmartin, Argyll and Bute (Cook *et al* 2010, 175–6); Sorisdale, Coll (Sheridan 2007, 97, 109, fig 11.3) and Dornoch Nursery, Highland (*ibid*)) suggest a date in the 25th–24th centuries cal BC (Table 6.3; *2470–2300 cal BC* at 95.4% probability by Bayesian modelling: Curtis and Wilkin 2019), albeit with some important caveats regarding details of form and context. This fits well with the radiocarbon date retrieved from willow charcoal in the same sequence of deposits as the Beaker sherds were found, 2496–2299 cal BC (SUERC-37867).

In the case of funerary Beakers, Needham has argued that Low-Carinated AOC vessels are likely to be chronologically earlier than those with more sinuous profiles (2005, 183–8). 'Low-Carinated' traces of the former are represented by Vessel 4 at Forteviot, while the larger vessels (2 and 5) appear to have had more sinuous profiles. However, we should be wary of extrapolating from the chronology of funerary Beakers in discussing the apparently non-funerary deposition of Beakers evident in the vicinity of the Forteviot Henge 2. Needham (*ibid*, 174–5) suggests that funerary vessels were abstracted from a larger sample/corpus of a 'life assemblage' and that the non-funerary sphere 'must be analysed in its own right for sequence'.

Table 6.3 Radiocarbon dates for AOC Beakers from Scotland (dates from Sheridan 2007; Cook *et al* 2010). Dates calibrated using OxCal v.4.3.2 (from Wilkin 2011)

Site name	Date (BP); Lab code	Calibrated date (95.4% probability)	Mode of deposition /dated material
Dornoch Nursery, Highland	3850±40 BP; GrA-36515	2470–2200 cal BC	Burial. Inhumation & cremation
Sorisdale, Coll, Argyll & Bute	3879±32 BP; OxA-14722	2470–2210 cal BC	Burial. Inhumation
Eweford, pit 3, East Lothian	3775±35 BP; SUERC-5299	2300–2040 cal BC	Grain associated with Beaker pottery in pit
Upper Largie, Kilmartin, Mid-Argyll	1. 3915±40 BP; SUERC-15646 2. 3880±35 BP; SUERC-15121 3. 3900±35 BP; SUERC-15120	1. 2570–2280 cal BC 2. 2470–2210 cal BC 3. 2480–2240 cal BC	Oak charcoal from burial (probable inhumation)

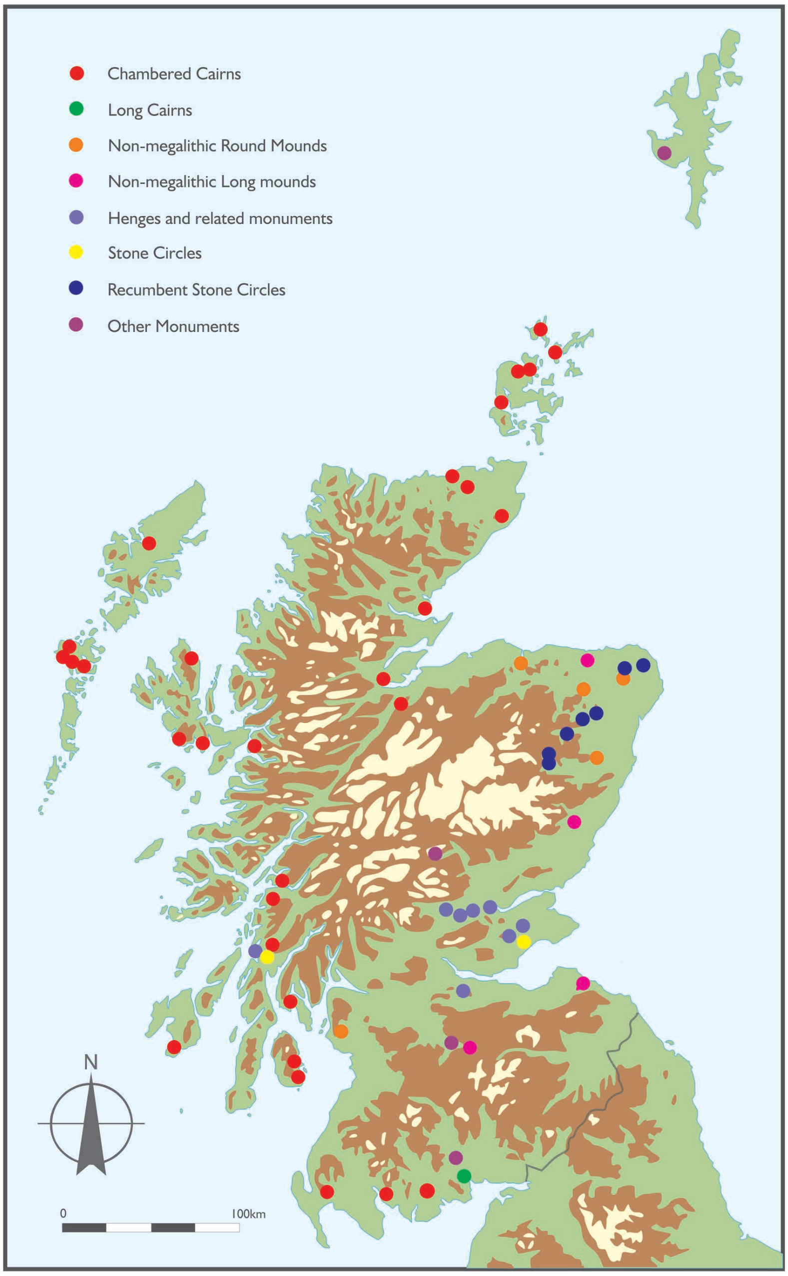


Figure 6.17 Map showing location of Beaker pots found in association with Neolithic and Chalcolithic monuments in Scotland (Wilkin 2016)

Indeed, in the case of the large vessels from Forteviot, it is questionable whether the presence or absence of carinations is relevant given the structural and cultural significance of variation in vessel size. Fragments of a 'Low-Carinated' AOC vessel were associated with a range of profile varieties in a non-funerary context at Eweford West, East Lothian, and has been dated to the 23rd–22nd century cal BC (MacGregor and Stuart 2007, 88–90; Sheridan 2007, 99).

6.4.4 Beaker deposition in Henge 2 and the timber setting

All five Beaker vessels discussed here were incorporated into pre-existing features associated with monumental constructions that had partially backfilled through natural processes, the postholes via post deterioration, and the henge ditch via natural silting and erosion. In other words, the pot sherds were not placed in specially excavated pits, but rather added to features that represented monuments and structures that were already of some antiquity at the time of deposition. We are more accustomed to Beakers being deposited complete and associated with mortuary contexts (Darvill 2010, 170–4), and the Forteviot Henge 2 Beakers have a context and manner of pot sherd deposition that suggests these cannot be explained away as accidental inclusions. As previously noted, Wilkin has documented instances of Beaker sherds being found in association with nine late

Neolithic and Chalcolithic henge and mini-henges across mainland Scotland (Wilkin 2016, 296ff and Figure 6.17). The identification of sherds of an AOC Beaker in the Henge 1 ditch terminal at Forteviot also appears to be part of the same phenomenon which we will return to in a broader discussion in Chapter 8. It is tempting to see Beaker sherd deposition across the monument complex at Forteviot as being contemporary activities that relate to a shift in the perception and meaning of all the henges.

How did the pottery end up in these features? It *is* conceivable that sherds from broken vessels found their way into these sunken features by chance. Surface scatters (and perhaps also the placement of complete pots in specific open locations) may have been culturally significant and visible markers of Beaker-users' presence and identity (see Sharples 2009). Such an explanation – accidental inclusion of surface potsherds – is offered for Beaker sherds found in the ditch of the Balfarg Riding School henge-enclosure (Barclay and Russell-White 1994, 127). However, there is little evidence for cross-context joins and none of sherds from the same vessel being found in different features at Forteviot. The assemblage in general consists of very few sherds that show rough abrasion; in other words, the majority do not appear to have been 'lying about' or accrued randomly. On the other hand, the relatively poor state, and paucity, of the sherds from Vessels 3 and 4 does suggest that the assemblage represents pots with different depositional biographies, and these sherds *may* therefore have been accidental incorporations. The identification of a highly abraded Beaker sherd in the fill of big Pit 6005 that could not be connected positively to any of the vessels discussed above may indicate that this sherd at least had been 'lying about' (section 6.6). Analysis (see sections 6.4.1 and 6.4.2) reminds us to consider also the manufacture and use-lives of vessels before they are broken into something different for deposition; hints from sherds of Vessels 4 and 5 indicate handling and perhaps use of these pots. They were not made simply to be deposited, as may have been the case with a near-complete AOC Beaker found in a pit in the nearby ring-ditch (section 7.3.1).

Sherds found in the henge ditch also showed some variability even within the same vessel, perhaps related to the circumstances of deposition or post-depositional processes. Vessel 2 sherds found amidst stone deposits in Fill 6087 were slightly different in character to those in the lens of darker material (6080) above it (the latter being where the few remnants of Vessels 3 and 4 were also found). Sherds in layer 6087 were in general larger, slightly smoother and less-abraded than those recovered from 6080, with a paucity of upper body and rim sherds in 6080. This may indicate taphonomic processes at work (material amidst the stones being better protected from ditch filling and cutting processes) or the outcome of sherds being deposited in different episodes with varying ditch fills.

The overall similarities between the identifiable vessels represented by a large number of sherds (Vessels 2, 5 and 6) suggests that they were involved in comparable (pre-) depositional practices and processes, probably over a relatively short period of time (and as noted, the same goes for the Henge 1 terminal Beaker, Vessel 7). The relative condition of the receiving cut features indicates this as well, with the postholes little more than hollows 0.3m deep when the pot was deposited, while the henge ditch contained a considerable depth of primary gravel fills. This makes it clear that when the henge was constructed, the location of those postholes was evident, even if the posts had gone. It is also notable that the majority of finds were from a relatively small zone around the henge entrance, with Postholes 6027 and 6012 in locations that flanked where the causeway was located (until it was later removed) and the remainder of the sherds in the ditch terminal. It is perhaps significant that the well-made Vessel 2 was the one chosen to be deposited in the henge ditch terminal, a significant position within henge monument tradition (see also section 4.5.4). No sherds were recovered from postholes that were deeper within the henge interior (ie furthest away from the causeway). It seems reasonable therefore to see the presence of sherds in these sunken features as deliberate depositional acts of ritual and/or of socio-political significance, placed in the right place at the right time in a rule-bound manner, in a transitional zone.

Pots may have been broken because it was taboo to deposit complete Beaker vessels due to their usual association with funerary practices. Indeed, the only near-complete vessel found at Forteviot, Vessel 2, within the interior of the ring-ditch, was almost certainly a grave good (section 7.3.1). A common theme of Beaker deposition placed within earlier cut features is the incompleteness of the vessels at the point of deposition. More than 70% of the non-funerary Beaker deposits at monuments found in the place we now call Scotland consist of small proportions of the original vessels (less than 25%), and the Forteviot Henge 1 and Henge 2 assemblage conforms to this pattern (Wilkin 2016).

The pottery from Forteviot Henges 1 and 2 finds parallels in deposits from other (related) monuments in the region including the (typologically later) Beaker sherds from the upper fills of a posthole at North Mains, Strathallan (Barclay 1984; Cowie in Barclay 1984, 155–63); the seemingly residual sherds of AOC and AOComb vessels from the single-entrance henge at Moncrieffe mini-henge (Stewart 1986) and, most notably, the AOC and AOComb vessels from a concentrated region of the upper fills of the Balfarg Riding School henge-enclosure, *c* 30km from Forteviot (Barclay and Russell-White 1994, 92, 183, 196–7; Cowie in Barclay and Russell-White 1994, 126–9). At all these sites, and henge monuments in southern England where Beaker sherds have been found (eg Mount Pleasant, Dorset: Wainwright 1979), ditches and postholes appear to have been intentionally re-cut prior to the deposition of Beaker pottery (*ibid*). The occurrence of large (and combinations of large and small vessels) has been noted at several other non-funerary sites and the context and manner of their deposition suggests that they cannot be described as everyday domestic refuse (eg Eweford West, East Lothian: MacGregor and Stuart 2007, 88–90; Elginhaugh, Midlothian: MacGregor 2007, 22–5, 516ff; Boghead, Moray: Burl 1985). Therefore, Forteviot indicates a Beaker deposition strategy that both shares attributes found elsewhere, but also has distinctive aspects, and thus is an important addition to the wider phenomenon of Beaker deposition at older monuments (cf Wilkin 2016). The place of this strategy in the development of the Forteviot henges will be explored later in this chapter and in Chapter 8.

6.5 Food Vessel cremation burial

Within the centre of the henge, a small cist containing a cremation burial and Food Vessel was found within an unassuming cut feature located 0.5m from the southern edge of massive early medieval Pit 6005 (Figure 6.3 shows the location). This discovery not only revealed the only non-Beaker pot (Vessel 8) of Bronze Age date found at Forteviot, but also added a further dimension to the Henge 2 transformation narrative (Brophy and Noble 2012b). The implications of this discovery, and the broader henge/barrow narrative for Henge 2, will be discussed in section 6.6, but here we focus on the Food Vessel burial.

6.5.1 The cist location and structure

A small crude cist was located within subcircular Pit 6061 (Figure 6.18). This pit measured 1.1m north to south by 0.9m, and had steep sides, a flat bottom and maximum depth 0.2m. It cut the eastern edge of large amorphous Pit 6025 and was located about 1.5m from Posthole 6049 (which also cuts 6025); earlier features would have been little more than hollows by the time of the burial ceremony. The cist (6116) consisted of a series of flat stones set on edge that created a rough and perhaps improvised subrectangular box with dimensions 0.5m by 0.3m, long axis just to the east of north (Figure 6.19). The stones did not form a complete circuit, but unmistakably defined this area. This box was just short of 0.2m high and did not have a capstone (presumably removed by plough truncation or disturbed by later activity in the vicinity; was it the flat siltstone slab found in ramp 6096?). The bottom of the pit/cist feature had a floor of small, rounded river pebbles

Figure 6.18 General excavation shot of the Food Vessel cist with Neil Wilkin

South-facing section through the Food Vessel burial within pit 6061

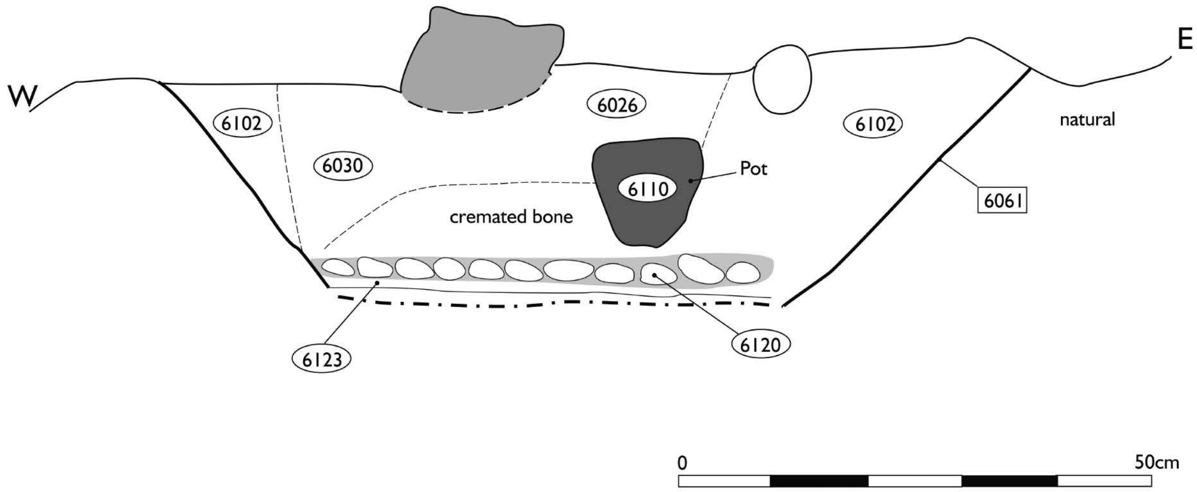


Figure 6.19 Section through Pit 6061 and the Food Vessel burial

Figure 6.20 Food Vessel, cremated bone and cist cleaned during excavation

(6120), and immediately atop this sat a Food Vessel (in the eastern half of the cist) and a large deposit of cremated bone (in the western half) (Figure 6.20). Amidst the cremated bone, an abraded sherd of AOC Beaker was recovered; was this added to the cremated remains or brought with them from the pyre site? The Food Vessel was somewhat squashed by post-depositional forces, while the cremated bone provided a radiocarbon date for the centuries on either side of 2000 cal BC (2045–1910 cal BC: 3632 ± 25 BP; SUERC-45563). The human remains and the pot sat within a dark brown silt matrix (Fill 6030) while the feature was sealed by a further silt deposit (6102), which contained flecks of cremated human bone.

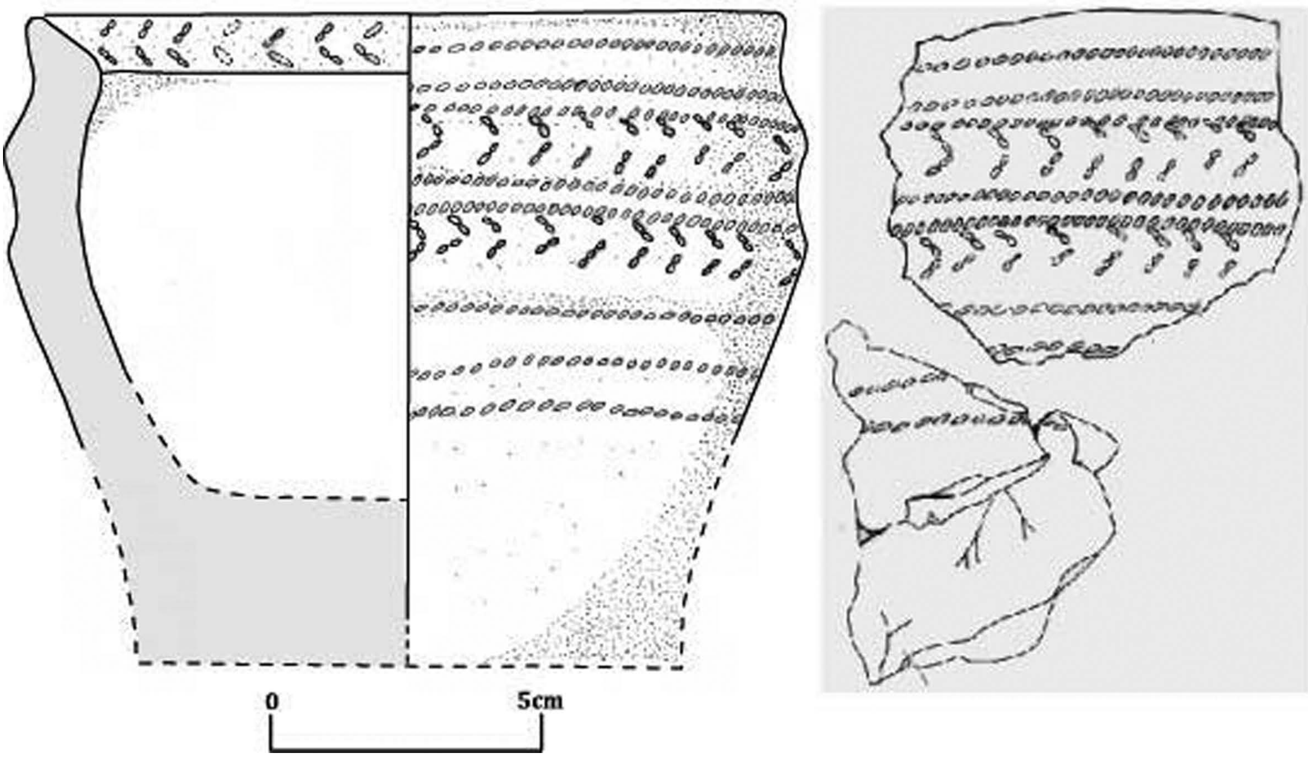
6.5.2 The Food Vessel

Neil Wilkin

Over 70 sherds, along with many more crumbs and sherds (ie >1g) missing interior and exterior surfaces (weighing *c* 700g), were found in small cist structure 6116. These all belonged to a thick-walled Food Vessel associated with a cremation burial. The extremely friable vessel had been fractured by post-depositional pressures and was lifted in several numbered sections for post-excavation reconstruction. While the side walls can be restored, the base could not be fully defined during excavation despite efforts to do so [personal observation as the author excavated this feature]. Unfortunately, this poses problems for identifying the original basal profile and thus adds a degree of uncertainty to the estimations of the original profile and height (Figure 6.21). It seems probable, however, that the heavy flat base of the vessel was eroded or damaged prior to discovery and excavation and gave the false impression that the vessel had a rounded base, as originally interpreted (Wilkin 2011). It is also possible that the base of the pot was missing/damaged before the vessel was interred, although this seems a less-likely scenario than poor post-depositional survival given the evidence for pressures on the walls of the vessel and its friability due to its light firing (see below).

The vessel has wall thickness of *c* 12–15mm, an external rim diameter of *c* 140mm and internal rim diameter of *c* 110mm. The estimated base diameter is *c* 100mm and the estimated height *c* 110–120mm, thus giving the vessel a squat, bowl profile. The pot has two cavetto zones positioned above the mid-height of the vessel: one formed between the lip of the vessel and the upper carination (*c* 21mm wide) and the second between the two carinations (*c* 17.5mm wide). The rim has an internally bevelled surface and a rounded exterior lip. The exterior surface and rim bevel is a greyish light brown (7.5YR 7/6 to 7/4) and

Figure 6.21 Drawing of the Food Vessel (Neil Wilkin)



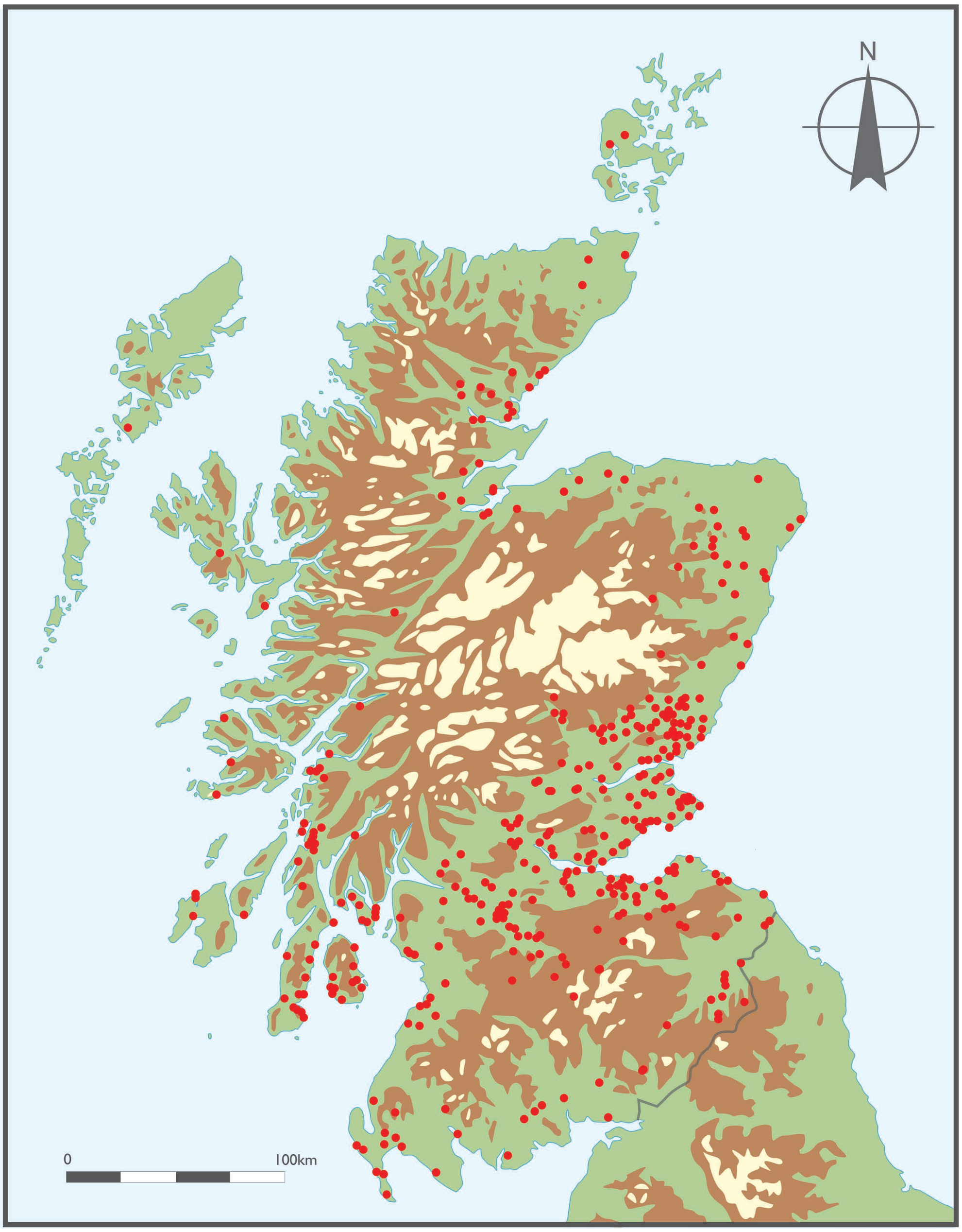


Figure 6.22 Map showing Food Vessel locations in Scotland (prepared by Marta Innes and redrawn by Lorraine McEwan, after Innes 2020)

appears to have been coated with a slip of fine clay slurry that obscures the inclusions that are considerably more frequent on the interior surface (which has a rougher texture than the exterior) and in the cross-section of the wall. The visible inclusions include black angular grits (*c* 3mm by 2mm and max 4mm by 4mm). The core is thick and black (*c* 10mm), suggesting a very rapid open-air firing, contrasting strongly with the firing of the (typo-) chronologically earlier Beaker Vessel 2 found in the Henge ditch.

Decoration consists of three lines of encircling twisted cord starting *c* 5mm below the rim followed by a row of horizontal 'herringbone' motif (placed on the carinations), two more lines of encircling cord, a further line of horizontal 'herringbone' motif (again placed on the carination) followed by three further lines of encircling twisted cord. The decorative scheme is therefore a balanced 'mirror-image' centred on the lower cavetto zone. The interior rim bevel also carries the herringbone motif pointing anti-clockwise around the rim. The degree of care with which it was applied and the relative lack of crispness to the application suggests it may have been added once the clay of the unfired vessel had begun to dry and perhaps as a final addition to the decorative scheme. The cordage used to decorate the vessel had substantial 'beads' of twisted cord (*c* 5mm by 2mm); considerably thicker than the cord used to decorate the Henge 2 Beaker assemblage. The construction of the Food Vessel did, however, share the diagonal bonding method of the Beaker

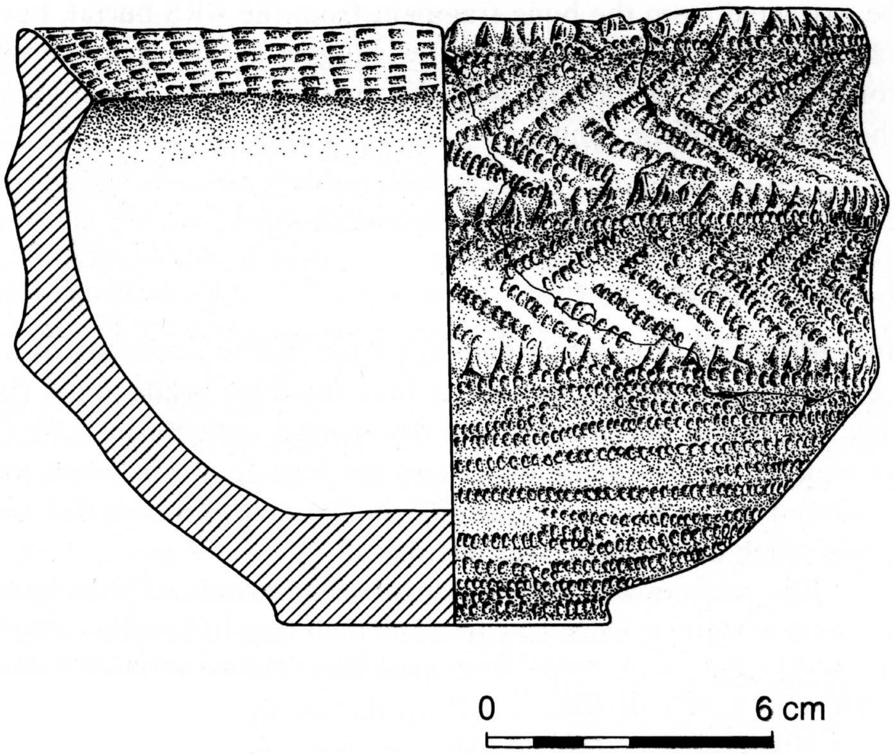


Figure 6.23 The Balfarg Riding School Food Vessel (from Barclay and Russell-White 1994, illus 53)

vessels, albeit using thick 'coils' (rather than thinned 'straps') and with an aesthetic that incorporated the construction technique of bonding coils into the morphology of the vessel itself in the form of the cordons/carinations that create the two cavetto zones of the Food Vessel.

The most salient typological features of the vessel are its 'tripartite' bowl form, internally bevelled rim, absence of stops/lugs, and its twisted cord decoration. However, in strict typological terms the vessel belongs to Abercromby's (1912) Type 2, Childe's (1935; 1946), Type B, Young's (1951) Tripartite Bowl, Manby's (1957) Type 2ii–iii and Burgess' (1980) Tripartite Irish-Scottish Bowls. It has some parallels among Brindley's (2007, 174–5) Stage 1 Irish Food Vessel Bowls but the decorative techniques and elements are uncommon. However, closer parallels can be found among Brindley's Stage 3 Bowls which have more widely spaced ornaments and include some vessels with tripartite forms (*ibid*, 174–5). Furthermore, cremation burials, many in cists, are the most popular mode of burial associated with Irish Food Vessel Bowls (cf Ó Ríordáin and Waddell 1993, 19–20).

While the vessel should therefore be considered within the wider context and inter-connections of the Food Vessel tradition, the closest and most direct parallels for both decoration and form are from northern Britain, particularly eastern central Scotland, Northumberland, eastern Yorkshire, and the Peak District, where vessels with tripartite forms (bowls and vases), heavy bases, and (twisted- and whipped-) cord decoration are common (Figure 6.22). Similar vessels include those from Gairneybank, Perth and Kinross (Cowie and Ritchie 1992), Aberdour Road, Dunfermline, Fife (Close-Brooks *et al* 1972, 127–8, fig 3) and Barns Farm, Dalgety Bay, Fife (Watkins 1983; also see Shepherd in Watkins 1983, 100 for discussion of additional examples from eastern central Scotland). Vessels with similar form and decoration in northern Britain include Holly Road, Leven, Fife, cist K (Lewis and Terry 2004, illus 18), Hagg Wood Cairn, Foulden, Borders (Craw 1914), and Lairg, Highland, Vessel 155 (from Burial Cairn 1) (McCullagh and Tipping 1998, 140, fig 90). Perhaps the most compelling comparison is the Tripartite Bowl from cist A, cairn B at Balfarg Riding School (Figure 6.23), where Food Vessel activity was, as with Forteviot Henge 2, preceded by AOC and AOComb deposition (see Table 6.4). This vessel was decorated using whipped cord but carries the same decorative motifs at the Forteviot vessel (herringbone and encircling lines) and a similar structure to the decorative scheme (Cowie in Barclay and Russell-White 1994, 138–40). In eastern Yorkshire, combinations of tripartite bowls and vases (with and without stops/lugs) and cord decoration are also well represented (eg Goodmanham 90, burial 1 (Kinnes

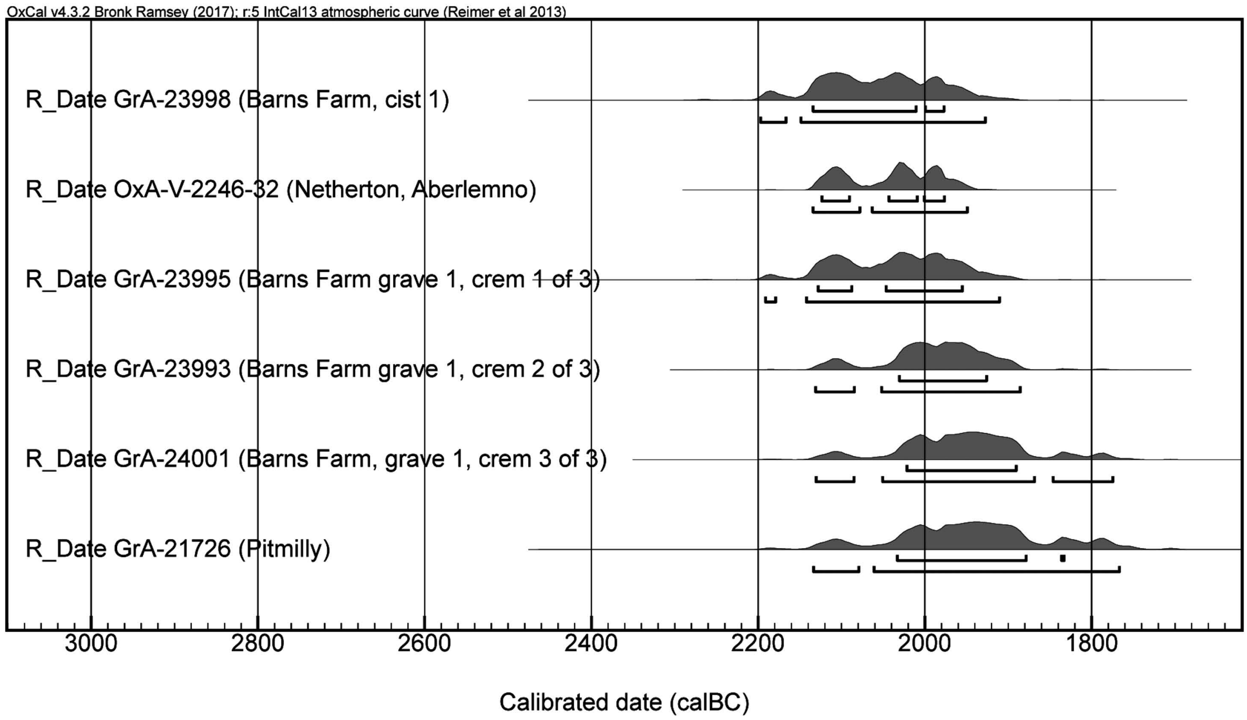


Figure 6.24 Radiocarbon dates for Scottish tripartite Food Vessel bowls (dates from Sheridan 2004; Wilkin *et al* 2010). Dates calibrated using OxCal v.4.3.2 Prepared by Neil Wilkin

and Longworth 1985, 8); Weaverthorpe 43, burial 6 (*ibid*, 46)).

With respect to decorative techniques more generally, in south-west Scotland twisted cord is among the most common of the decorative techniques deployed (*c* 33%), often in combination with other techniques; it is the only decorative technique in *c* 7.5% of cases (sample size: 66 Food Vessels, data from Cowie, in Barclay 1984). In the Food Vessel tradition heartlands of eastern Yorkshire, the Peak District, and north-east England, twisted cord is the most common decorative technique, applied to *c* 33% of the sample, and the only decorative technique on *c* 22% of cases (Neil Wilkin, personal dataset). Among the decorative elements represented, encircling lines and herringbone are among the most popular (sample size: 254 Food Vessels, with some regional variability: Wilkin 2014). Combinations of the two elements (*c* 10 examples) are the second most popular circumstance, occurring together in an even greater number when combinations with other techniques are included.

The carinations of the Forteviot Food Vessel have been picked out using a different decorative technique and this decorative structure can be paralleled on other tripartite vessels from east-central Scotland, including Balfarg Riding School cist A, cairn B (Cowie in Barclay and Russell-White 1994, 138–40), and Barns Farm cist 1, both in Fife (Watkins 1983,

Table 6.4 Radiocarbon dates for Scottish tripartite Food Vessel bowls (dates from Sheridan 2004; Wilkin *et al* 2009). Dates calibrated using OxCal v.4.3.2 (from Wilkin 2011)

Site name	Date (BP); Lab code	Calibrated date (95.4% probability)	Mode of burial
Barns Farm, cist 1, Fife	3670±45 BP; GrA-23998	2200–1920 cal BC	Inhumation and cremation
Barns Farm, grave 1, Fife	1. Cremation 1: 3655±45BP; GrA-23995 2. Cremation 2: 3620±40 BP; GrA-23993 3. Cremation 3: 3595±50 BP; GrA-24001	1. 2200–1910 cal BC 2. 2140–1880 cal BC 3. 2140–1770 cal BC	Inhumation and multiple cremations
Pitmilly, Kingsbarns, Fife	3590±60 BP; GrA-21726	2140–1760 cal BC	Cremation and ?inhumation
Netherton, Angus	3658±26 BP; OxA-V-2246-32	2140–1950 cal BC	Inhumation

100, fig 14). Also in geographical proximity, the Food Vessel from the central cist at Sketewan, Perth and Kinross (Mercer and Midgley 1998, 305, illus 21) features the same decorative combination of herringbone framed by three encircling lines applied with twisted cord; this was also associated with a cremation burial, although the form of the vessels is dissimilar.

The Food Vessel tradition in Britain and Ireland has a general chronological range of *c* 2200–1700 cal BC (Sheridan 2004; Brindley 2007). The recently acquired dates for several Food Vessel burials in Angus support this range (Wilkin *et al* 2009). Despite the popularity of this Food Vessel type, there are relatively few dates for tripartite Food Vessels from eastern mainland Britain. The single radiocarbon date from Forteviot for cremated bone found with the Food Vessel is therefore significant and falls within the currently available dates for tripartite Food Vessels (Table 6.4, Figure 6.24), which suggest a range of *c* 2150–1900/1800 cal BC.

6.5.3 Beaker sherd

Neil Wilkin

A single Beaker sherd was recovered from amidst the cremated bone. No vessel number was allocated to this sherd. This was an abraded sherd (18mm by 26mm) of AOComb decorated Beaker, lacking an interior surface and soft to the exterior surface. The sherd may originally have belonged to a vessel similar to Beaker Vessel 6 which was found in the upper fill of timber setting Posthole 6012. It is unclear if this was a deliberate deposit with the cremation or accidentally incorporated; its highly abraded appearance means that it was probably lying around for some time and may have been decades or even centuries old at the time of the Food Vessel burial.

6.5.4 Cremated bone

Stephany Leach and Kenneth Brophy

The cremated bone was found in the western half of the cist, spread across an area measuring 0.15m by 0.10m, with maximum thickness of deposit 70mm. All regions of the skeleton are represented in this material (Figure 6.25), and the lack of repetition of a sided element, or zone within, indicates a MNI estimate of one individual. Where present, the evidence consistently indicated the presence of a gracile adult. The open sutures of the cranial vault suggest a probably young adult at the time of death, while the apex present on the root of the third molar indicates an age at death of over seventeen years. No evidence of degenerative changes, such as osteoarthritis, were noted. Although cranial and pelvic bone fragments were present in this assemblage, the specific sexually dimorphic characteristics of these elements did not survive the cremation and deposition process to provide an assignment of sex for this individual. However, the bones consistently exhibited a 'female gracility', even allowing for shrinkage due to thermal-related dehydration. Nevertheless, the remains may represent a very slightly built young adult male.

The quantity of bone recovered from the cist, 1866g, indicates meticulous and time-consuming collection of remains, including the small bones of the hands and feet, and dental fragments. Most of the fragments exhibited a high degree of thermal alteration, the range of colours within medullary cavities of endocranial surfaces represent normal variation of oxidation within a burnt corpse. Curved transverse fractures or muscle shrinkage lines indicate the presence of soft tissue during the burning process. The bone fragments do not exhibit erosion of the fracture margins, or a 'polished' appearance indicative of disturbance by movement through sediment. This confirms the primary nature of this deposit in accord with the archaeological interpretation.

Very small quantities of cremated bone were also recovered from upper fill (6102) (weighing only 2g), the matrix of the burial itself (6030), and amidst the cist's pebble floor (6123). All fragments are consistent with those found in the centre of the cist, indicating

Figure 6.25 The cremated bone from the Food Vessel cist during analysis

a high degree of thermal alteration, careful collection of small bones such as fingerips, and a gracile build. Fragments that had become separated from the main burial did, however, show more fragmentation and erosion, almost certainly due to post-burial taphonomic processes.

Indication of meticulous collection of cremated remains from the pyre site is consistent with other Bronze Age cremation burials (McKinley and Bond 2001, 289). The average weight of bone recovered from such contexts is 1526g (*ibid*). These weight calculations relate to 'primary' central barrow burials, as opposed to, for instance, 'lighter' satellite fragmentary burials on the periphery of barrows in southern England (McKinley 1995). Generally, adult females generate less cremated bone weight than males (McKinley 1993), and a decrease in bone weight is noted for older individuals, especially older females (Christensen 2002). Increased quantities of cremated bone also correlate with obese individuals or those engaged in high levels of activity, due to associated increase in bone density (Bass and Jantz 2004). The British modern average weight for a female is 1271g, and 1861g for a male (McKinley 1993, 285–6). The tentative identification of the individual in the Henge 2 cist as a young female, based on modern cremation standards, would imply she was somewhat heavier in life that is average for a female today. (This casts some doubt on the interpretation of the indivdual as a woman, or that the remains represent a single person.) Even if the remains are of a male, the large quantity of bone is still significant as bone weight before and after cremation tends to remain the same (Gonçalves *et al* 2015, 64). However, the inclusion of small fragments of unidentified animal bone within this assemblage may have augmented the calculated bone weight of the deposit, so we should be cautious about over-interpretation here.

6.5.5 A modest burial with political overtones

This was a modest burial. There is a degree of care hinted at by the laying of rounded shiny pebbles to make a bed upon which the remains could be laid, to one side of the inverted Food Vessel but not inside it, as well as the collection of the bone (and pot sherd?) from the pyre (buried in a location that may have had Beaker significance). This could be contrasted with the rather more improvised, crude cist that the individual and Food Vessel were placed within, although again there is a certain charm to this stone box. This individual, probably a young adult woman, was buried with care deep inside an ancient enclosure, indicative of an important status for this person, although whether for positive or negative reasons is unclear.

The assessment of what is normal for a Food Vessel burial is unclear: overviews stress the incompleteness of the data due to the preponderance of Food Vessels recovered by antiquarians or in the absence of formal excavation (Sheridan 2004; Wilkin 2014; Innes 2020). With this caveat in mind, it is possible to say that typologically and chronologically Vessel 8 is not unusual, but the context of discovery is. Typically, Food Vessels are found in burial contexts and can be associated with either male or female remains. The upright position of the vessel in the grave is not typical, with Barclay (in Barclay and Russell-White 1994, 136) noting that across Scotland alone, 'a significant number had been placed deliberately on their side', perhaps to hold only a small quantity of liquid. Such containment cannot be precluded for our Food Vessel either given its stance, although surface observation did not reveal any obvious residues or contents. Food Vessels are twice as likely to be deposited in an inhumation burial as they are a cremation (Wilkin 2014, 118) and where the context is known, most were placed in some sort of stone cist. Earth-cut graves or pits were less common repositories, and many Food Vessel-associated burials were sealed by (kerb) cairns. We have no sense of how the burial at Forteviot was capped or marked; one would imagine a capstone covered the cist, subsequently removed by later disturbance, although the presence of a cairn or mound to mark the grave is less certain. The modification of the henge, perhaps into a fully enclosed barrow mound, may offer another clue; we will return to this sequence at the end of this chapter. The near-miss of the large early medieval pit being dug right next to this spot is probably fortuitous (from our point of view) rather than meaningful. It is likely that this small cist was simply missed.

Food Vessel burials in close association with henge monuments are not uncommon, with geographically close examples at North Mains, Balfarg Riding School and Cairnpapple, and further afield, Milfield North, Northumberland. However, these all differ markedly from what we found at Forteviot. At North Mains, three Food Vessels were recovered, all in different funerary contexts (Barclay 1984). Two were in the southern half of the henge interior, Burial B an adult female inhumation in a deep cist, and Burial D a probable inhumation in a shallow cist. The third burial (E), a possible inhumation with broken Food Vessel sherds in association with a chert flake, was placed in a pit dug into the henge bank on its north side. The Food Vessel in Burial B was placed next to the skull and analysis showed the pot at the point of burial contained a 'cereal-based drink or gruel based on meadowsweet' (*ibid*, 136). Barclay interpreted these burials as part of his Period III, which came some time after (undated) henge monument construction. One Food Vessel burial was identified at Balfarg Riding School, Burial 1/Cist A within Cairn B; this was a crouched inhumation within a stone cist sealed by a cairn, 30m to the west of the earlier, Grooved Ware-associated henge enclosure (Barclay and Russell-White 1994). Although limited bone survival made identification of sex difficult, the recovery from this cist of fragments of a jet disc necklace suggest this was a female's burial. A single Food Vessel stood 'securely' on a 'ledge' in Cist A within the western half of Cairnpapple henge (Piggott 1948, 97). The size of this cist suggests that it was a crouched inhumation burial, although only fragmentary unburned bone remains were found (*ibid*). Barclay (1999b, 39) has suggested that this was a secondary burial, beside the elaborate and earlier Beaker-associated 'North Grave', and that the cist was subsequently covered in cairn material. Two Food Vessels were discovered in pits (earth-cut graves) within Milfield North henge, both associated with inhumation burials (Harding 1981).

These examples suggest that the placement of a Food Vessel associated with a female burial off-centre within a Chalcolithic henge monument was not unusual, but the Forteviot example is the only instance where that burial was of cremated remains. This series of burials appears to hint at broader Beaker connections as well, which accords with the presence of an abraded Beaker sherd within the cremated bones at Forteviot, in what could be interpreted as a deliberate act. Perhaps it was a curious heirloom or keep-sake and became a grave good; on the other hand, the Beaker sherd may simply have been scooped up with the cremated bone at the pyre site. In either scenario a Beaker/Food Vessel cultural connection is suggested here, with perhaps the Food Vessel 'a fashionable novel alternative to Beaker pottery' (ScARF 2012b, 2.2.2), representing the first use of a non-Beaker ceramic in Forteviot since the late Neolithic.

Beaker burials are evident at Cairnpapple, Balfarg Riding School and North Mains, while Wilkin (2014, 144ff) has noted that both Food Vessels at Milfield North have Beaker traits. Food Vessel burials were secondary to Beaker burials at Cairnpapple and North Mains and may have been placed in relation to those earlier burials. This suggests a general entanglement between the ideas and people associated with these ceramic styles, played out through a process of replacement and/or emulation. Why? Wilkin (2014, 145, 147) has noted that at 'Milfield North and Cairnpapple new ideas and practices were perhaps introduced but appear to have appealed to previous practices in order to gain legitimacy and create new rituals and identities that exceeded the limitations of 'traditional' Beaker and Food Vessel practices', a process that appears to be evident at Forteviot, both in relation to material culture and burial practice, but also monumental architecture.

This is because the Food Vessel burial appears to be related to the ongoing remodelling and repurposing of Henge 2, already suggested by the removal of the henge causeway, which in effect blocked access to the interior of the enclosure. It is tempting to connect this directly with the Food Vessel burial and chronologically this cannot be ruled out. The transformation of the henge into a ring-ditch/barrow appears to have happened in the first half of the 2nd millennium BC, while the single date from a fragment of cremated bone in the small cist falls in the 31st to 30th century cal BC. Furthermore, the cist within which the burial was placed sits in the southern half of the henge enclosure but in a location that is on the north-south axis of that monument. However, it does not sit centrally, so we might conclude that a primary (Beaker?) burial once sat in that location, as was the case at North Mains and Cairnpapple, but was subsequently removed by early medieval pit digging. Certainly, the scale and form of the Food Vessel burial does indicate it may have been a secondary intrusion. The re-shaping of this monument may have included the construction of an earthen mound or barrow, perhaps initially focused on a Beaker burial, with a secondary Food Vessel added off-centre, which may have been accompanied by an enlarged mound. A cairn is less likely as no indication of cairn material was found. A final note: the henge entrance being blocked-off, and then mounded with earth, did not preclude a huge hole being dug into the middle of this monument over 2000 years later, indicative of the effort that went into this act (or perhaps there was no barrow). It is to this disruptive, later use of this monument that we now turn.

6.6 Later use of the henge

Several features found within and around Henge 2 post-dated all the activity discussed above, falling in later prehistory, the early medieval period, and perhaps later still. These discoveries will be summarised briefly here and discussed in more detail in SERF2 (chapter 5). Within the upper fills of the re-cut henge ditch,

Figure 6.26 Spearhead SF6080 found in Henge 2 ditch

Figure 6.27 Paved area on the edge of the big central area during excavation

probably in effect the ditch of a barrow (6149), a series of objects was found that could conceivably be the disturbed remnants of an Iron Age or early medieval burial in the ditch. These were an iron spearhead (SF6080; Figure 6.26) of Iron Age or later date (Fraser Hunter pers comm), a glass bead and metal wire, the latter two possibly part of the same piece of jewellery (SERF2, section 5.4). The objects were found between 0.3m and 0.4m depth within the ditch upper fill (6011/6019), suggesting the ditch was still visible at the time of deposition. They were probably placed on the base of the ditch, as they were not associated with a cut. The placement of an Iron Age spearhead in the ditch of a prehistoric barrow was noted at Four Crosses, Powys; this was interpreted as evidence for a formal burial (Barford *et al* 1986; Warrilow *et al* 1986, 85).

In the interior of the henge, overlying the inner edge of the henge/barrow ditch in the north-west sector of the monument, an arrangement of paving and associated burned material was found (Figure 6.27). The earliest element of this feature was a shallow pit, 6141, dug into the upper ditch fill (6011); this must have happened when the henge ditch was less than 0.5m deep. The pit measured 0.8m east to west, 0.3m across (and beyond the baulk for an unknown distance) and was 0.3m deep with a flat bottom. The fills of this pit included burnt gravel and Fill 6143, a greasy charcoal-rich deposit or accumulation that lined the pit, indicative of *in situ* burning. Partially over and adjacent to this pit was a paved surface (6121), covering an area 1.2m north to south by 0.8m, which had an irregular 'crazy paving' appearance; this whole collection of features was overlain in turn with a charcoal-rich silt layer 50mm thick and extending over an area 1.5m across and running beyond the baulk (layer 6088). (This latter material also overlay the remnants of the truncated ramp of probable Neolithic Posthole 6096.) The burnt deposit, 6088, was later cut by big Pit 6005. Analysis of charcoal in 6088 found evidence for mixed deposits of alder, hazel, willow and oak. Two radiocarbon dates generated by carbonised material in layer 6088 suggest this depositional event occurred in the 1st century BC, or the first two centuries AD (to 91.5% confidence; 1960 ± 30BP; SUERC-37783 and 1915 ± 30BP; SUERC-37787). This evidence suggests that in the late Iron Age fire-setting took place beside a formal paved surface, hinting at industrial processes. Evidence for ironworking was found within the mini-henge at nearby Moncrieffe. Stewart (1986, 142) saw this as an act of desecration, but it seems more likely

Figure 6.28 Big pit during excavation within Trench H and Henge 2 interior

that ancient sacred enclosures would have been chosen as appropriate places for the transformation of materials.

A large proportion of the interior of Henge 2 was composed of a cut feature, which was shown through excavation to be a massive pit. This feature is visible as a cropmark, with parallel features in Henge 1 (excavated, shown to be early medieval, see section 5.7) and cropmark pits in the middle of Henges 3 and 4. The pit in Henge 2, 6005, was oval to elongate in shape, 12m west-north-west to east-south-east by 5m in plan and had maximum depth at the centre of 2.2m (Figure 6.28). The sides were steeply sloping and the base rounded. Lower fills suggested a period of waterlogging, with gravel, rubble and silt fills above indicating deliberate and rapid backfilling. A heavily abraded Beaker sherd was found near the bottom of this pit within Fill 6056 (SF6023); this small sherd (*c* 1g) was missing its interior surface and may have been part of an AOComb vessel (Wilkin 2011, 44). This probably indicates the scale of disturbance this pit caused – digging this feature also largely destroyed two postholes (6096 and 6134), clipped the edge of Posthole 6012 and Pit 6025, narrowly missing the Food Vessel cist, and damaged the area of paving and burning discussed in the previous paragraph. Any barrow mound (or less likely, cairn) would have had to be badly damaged to facilitate the digging of this pit. Although no datable material was retrieved from this feature, there is no reason to doubt that it belongs to the same pit-digging phenomenon identified in the vicinity from the 5th to 7th century AD within Henge 1, and it is conceivable that a central early Bronze Age Beaker burial was located and removed during the operation.

The final feature that was identified in this location was the remnants of the post-medieval trackway or road that runs from Dronachy to Forteviot, the line of which is followed by the modern field boundary (introduced in section 3.5.2, with route shown in Figure 5.12). This is marked in the trench in Figure 6.3. Traces of this trackway were ephemeral and partially obscured some of the prehistoric features that it was laid across, namely the henge ditch on the south side of the monument, while fragmentary remains extended over Posthole 6049 and big Pit 6005. The remnants of the road consisted of a layer of loose cobbles (6117) overlain by a compact band of light brown silt-clay with rounded pebble inclusions (6024, 6028); it survived to a maximum width of 4.5m and depth 0.2m, although for the most part was indicated by less-coherent patches of silt (see Figure 6.4). The road runs in a north-west to south-east orientation, indicating that when it was constructed it is unlikely that the henge/barrow presented much of a logistical challenge to cross over on carts; no diversion around the site was required. This denuding of the earthwork is likely explained by the post-medieval rig-and-furrow cultivation indicated in this location by cropmarks and SERF Project geophysical survey (section 2.4), which would have flattened the remnants of this monument.

6.7. Conclusion

The place that we now call Henge 2, as outlined in this chapter, has some similarity with nearby Henge 1 (Chapters 4–5). Both produced evidence for activity in this location in the first half of the 3rd millennium cal BC, henging (the act of enclosing a space within a henge earthwork) in the Chalcolithic, associated subsequent AOC Beaker deposition, and conversion to a monument of burial with a mound/cairn in the early Bronze Age. In both cases, the full prehistoric biography of these sites was obscured by interventions in the 1st millennium AD. Reporting on the Forteviot excavations will now conclude with yet another variation on this life cycle.

7

The ring-ditch and triple cist

Heather James and Meggen Gondek

with contributions from Kenneth Brophy, Ewan Campbell, Stephany Leach, Gert Petersen, Denise Telford, Neil Wilkin, and Dene Wright

7.1 Introduction

The enclosures to the north of the palisaded enclosure were not all henges. This was demonstrated by the excavation of a complex ring-ditch burial monument in 2010. This site showed continuity of practice with other monuments within the Forteviot complex but also had distinctive traits. Few radiocarbon dates, fewer diagnostic artefacts, and limited stratigraphic associations means our understanding of how this place developed, the order in which events happened, and the role of this monument remain a source of speculation. As such, in this chapter we present a possible narrative for the sequence of this monument, but we accept that there are other ways of reading the evidence and that what has been lost to the plough may have allowed us to tell a different story. However, once again, as was continually the case during our excavations, the results support the broader hypothesis that intensive ceremonial and funerary activity took place across this area in the 3rd millennium BC.

7.1.1 Cropmark evidence

This circular enclosure has a complex history of interpretation. It is located west of the avenue, close to the northern boundary of the palisaded enclosure; excavations confirm the two did not overlap. Attempts to map and describe this enclosure have differed in terms of the number and orientation of entrances, nature of the internal features, and interpretation of the site.

The ring-ditch was first recorded by St Joseph in the 1970s: his site 3 (Table 2.2). He depicted it as being of different character from the other henge-like cropmark enclosures. It was drawn as a thinner ditch with two gaps on the boundary, one of the north side, the other to the south; a complete circular ditched enclosure set concentrically within was also mapped (Figure 1.2). St Joseph noted the site was 19m across and may have been a 'Bronze Age ritual structure' (St Joseph 1978, 50). This monument was included in Harding and Lee's henge inventory (1987, site number 311), described as a 'subcircular enclosure' with central pit, and interpreted as a 'causewayed barrow' (*ibid*, 408). In this source the outer enclosure was shown with one entrance, on the south side. The inconsistent cropmark appearance of the site has no doubt played a role in the shifting interpretations of this monument. One RCAHMS air photo taken in 1977 shows only the outer ditch, perhaps the basis of the RCAHMS 1991 transcription (Figure 2.9), which depicts a single-ditched enclosure with entrance gap on the north-east side. The most recent RCAHMS transcription (Figure 2.5) depicts a double-ditched enclosure with outer entrances on the south-west and north-east sides, while Millican (2009; 2016a) depicted this as a single-ditched penannular enclosure with entrance on the south-east (Figure 3.3b). The NRHE classification for the site before our excavation commenced was 'henge/enclosure', a prevarication that confirms the ambiguous nature of this site as a cropmark.

7.1.2 SERF excavations 2010

The entire enclosure was exposed within Trench F (Figure 7.1). The excavation area that focused on the ring-ditch measured 25m by 25m although the complete trench was much larger, with the eastern half opened over the northern boundary of the palisaded enclosure (Figure 7.2) and discussed in Chapter 3. A sample of

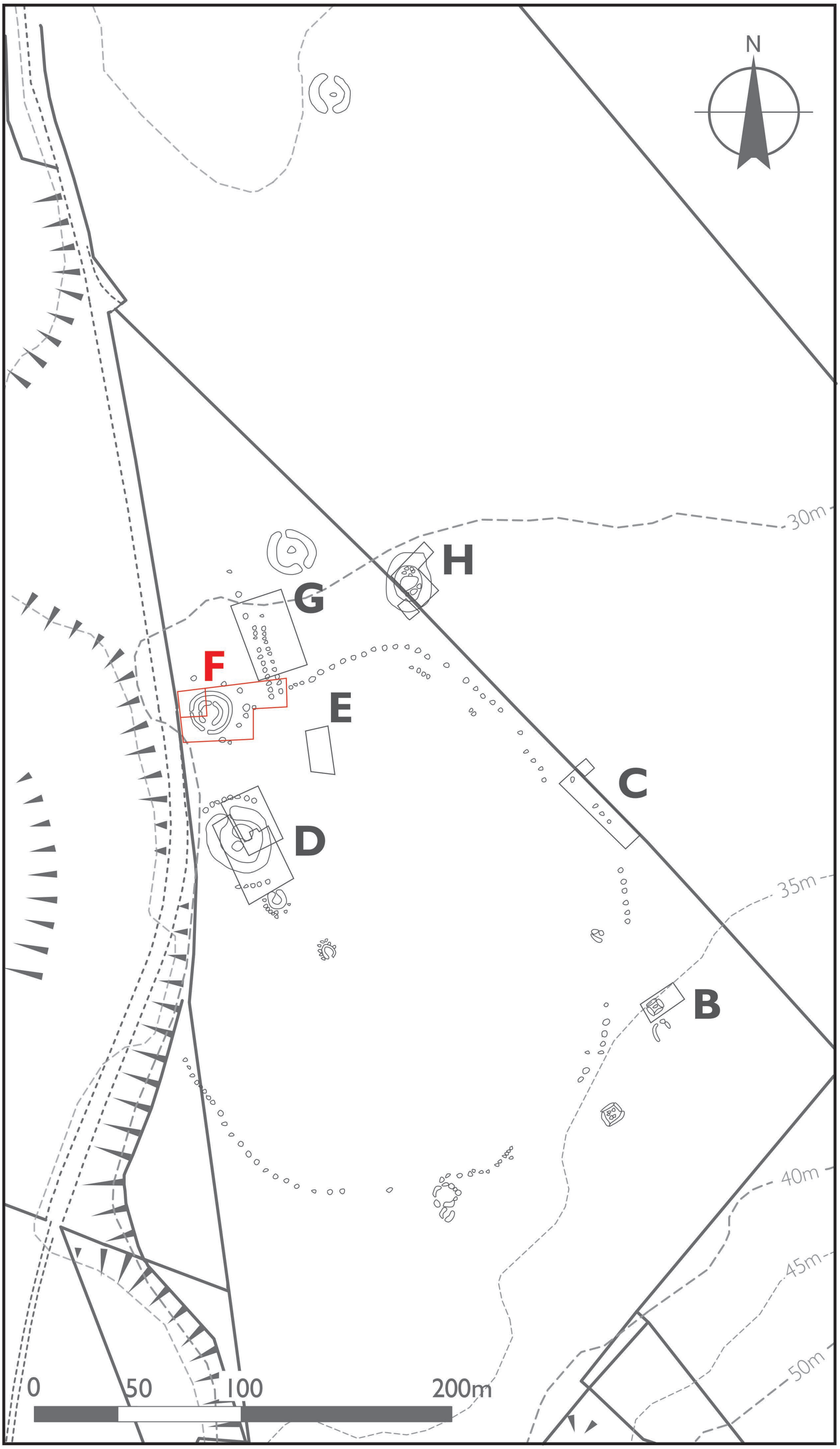


Figure 7.1 Plan showing the location of Trench F, the focus of Chapter 7, overlain on the cropmarks

Figure 7.2 Drone view of Trench F during excavations (© Flying ScotsCam)

Figure 7.3 General view of excavations in Trench F with baulk still in place

exposed archaeological features were excavated fully or to half-section, and the two ditches of the ring-ditch cut by multiple slots. A baulk was left in the trench, running 7m in from the western extent of the trench and being of 0.6m width (Figure 7.3). This related to experimental geophysical survey research (Cuenca-García 2012) that accompanied the excavation; the results are summarised in Chapter 2. A second baulk, running north-south across the northern half of the site, was removed towards the end of the excavation.

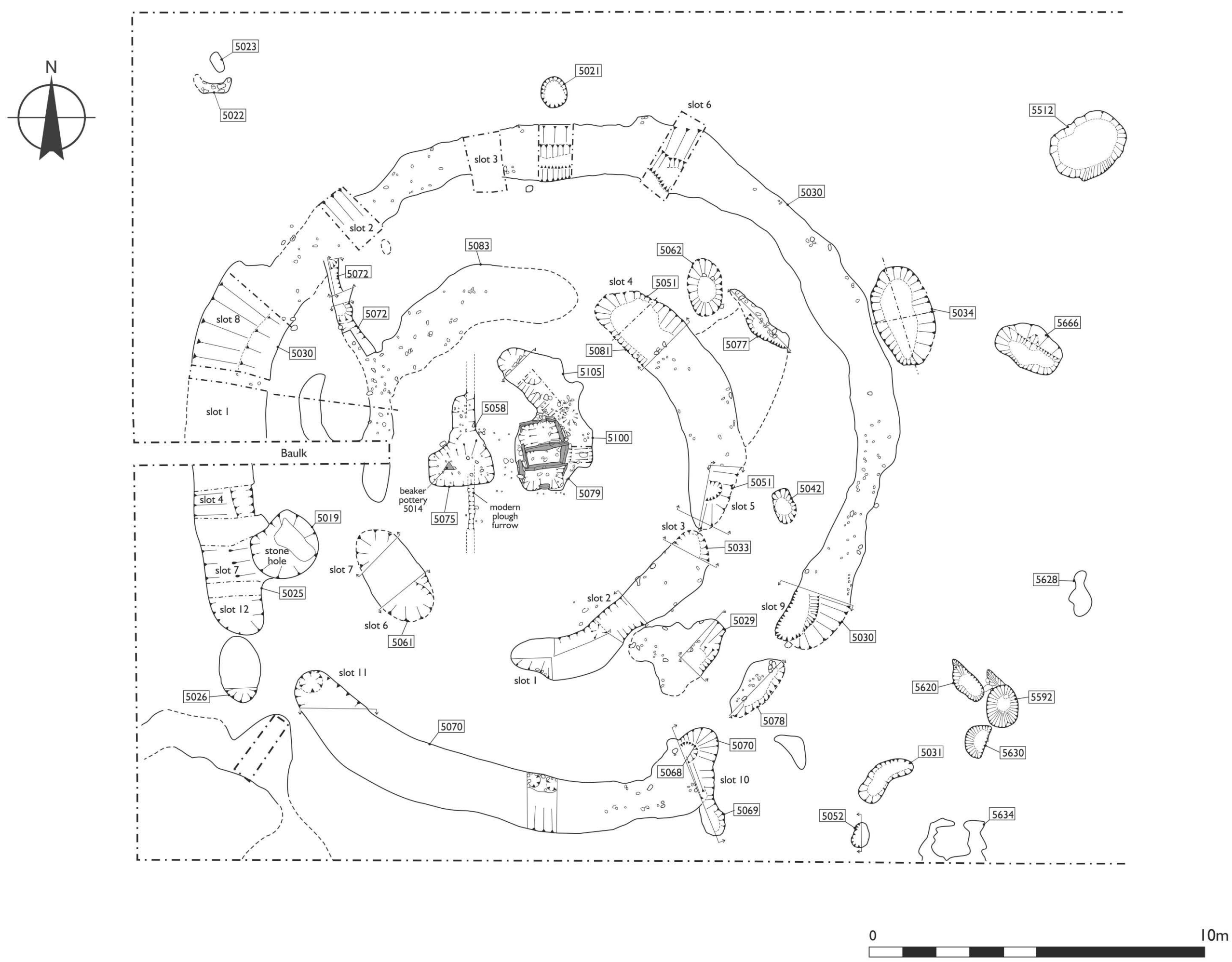
7.2 Excavated features

In the absence of clear chronological and stratigraphic relationships between most of the features within, and in the vicinity of, this monument, we will describe each element individually before going on to consider how this site might best be interpreted. The order in which features are discussed does not necessarily indicate the order in which events occurred in the past. Details of artefacts, ecofacts, and radiocarbon dating are given in section 7.3. For the location of all features, see Figure 7.4. The main elements of the enclosure were: two concentric segmented ditches, set between 2.5m and 3.5m apart; internal features associated with funerary activity; and assorted postholes, pits and tree throws in and around the enclosure. There was no indication of any banks or mound although the location in an arable field has ensured such features, were they to have existed, would have been denuded.

7.2.1 Outer ditch

The enclosure is defined by an outer ditch which encloses an area about 18m in diameter, with gaps in the south-west and south-east sides. Twelve slots were excavated across the ditch, with the cut north of the 'entrances' assigned number 5030, and the short ditch section between the gaps 5070. The ditches varied in

Figure 7.4 Post-excavation plan of the western area of Trench F. The eastern half of this trench is shown in Figure 3.7



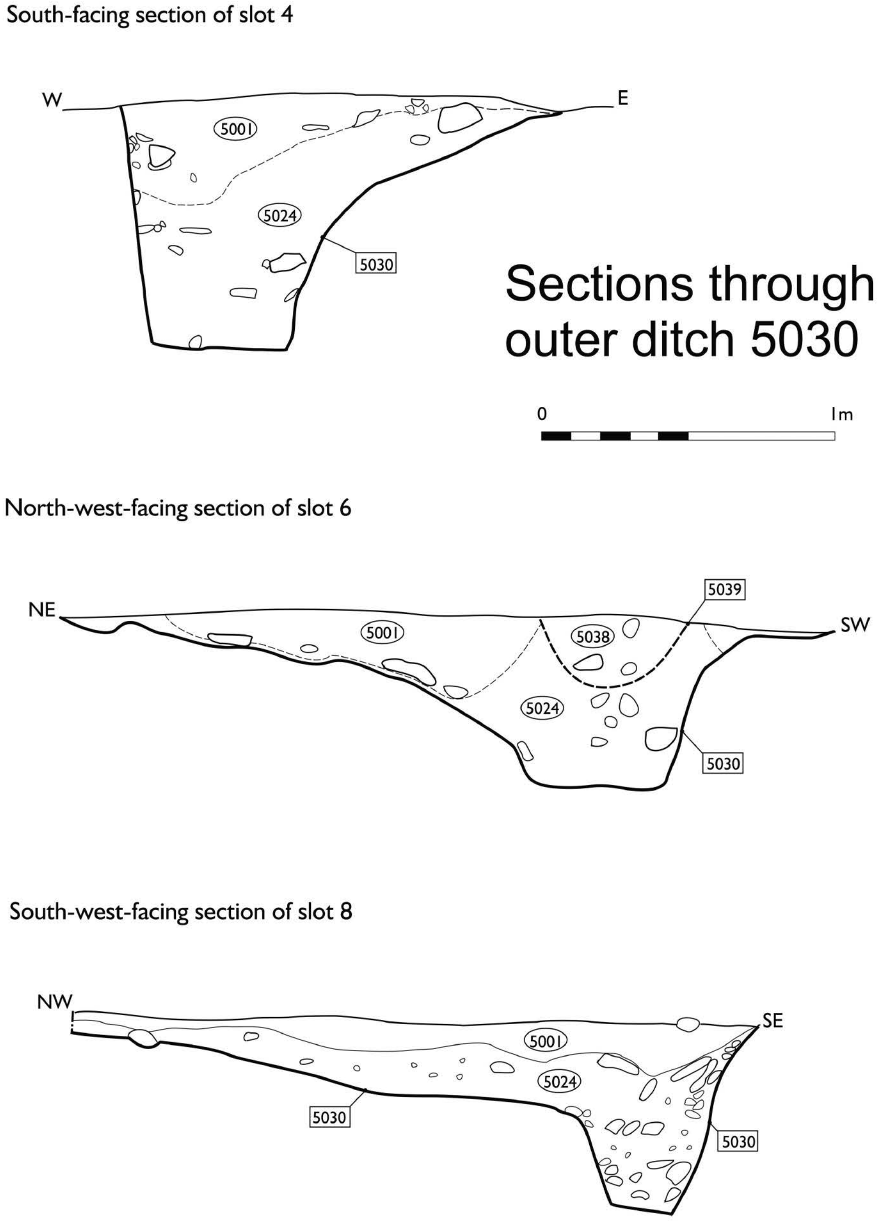


Figure 7.5 Sections through outer ditch 5030 in three places (slot locations are indicated in Figure 7.4)

width between 1.0m and 2.5m (widest on the western side), probably due to a combination of segmented construction and plough truncation. Both ditch segments had a similar profile and sequence of fills around the enclosure perimeter (Figure 7.5): an asymmetrical profile with steeply sloping inner face, gently sloping outer face, and depth varying from 0.55m to 0.70m. Possible posthole bases with diameters of *c* 0.3m were identified in the ditch bottom; the spacing between these features was unclear due to the excavation methodology, with narrow slots opened rather than large areas of ditch being exposed. Both the north and south segments of the outer ditch contained a similar, simple fill sequence: one lower, and one upper fill both silts with frequent stone inclusions, the larger of these toward the base of the ditch (Figure 7.6). The primary fill, 5024, was a loose orange-brown gravel silt, with large pebbles identified, perhaps disturbed remnants of post packing. The upper fill, 5001, was a compact reddish-brown sandy silt which had depth of no more than 0.3m at any point excavated. The fills were largely sterile, with no finds and little charred material.

The breaks in the ditches of the outer enclosure were defined by round-ended ditch terminals. Three of the entrance terminals displayed evidence for having once held posts, the exception being the western terminal of the south-west entrance. The south-west entrance gap, which was 2m across, appears to have been a genuine entrance to the interior. Shallow oval Pit

Figure 7.6 Two sections through outer ditch 5030 during excavation, the image on the right including the topsoil baulk

Figure 7.7 Putative south-east entrance gap in truncated ditch of outer enclosure

5026, measuring some 2.0m north-south by 1.2m, was located immediately outside the entrance, extending more than halfway across the gap. The chronological relationship between these features is unknown, but this pit may have been dug to partially block or narrow access to the interior of the enclosure. The south-east entrance gap is less convincing (Figure 7.7). Here, the space between the enclosure ditches appears to be some 3.4m, with Posthole 5078 filling most of this gap. This feature was elongate in plan, measuring 2.5m by 1.0m, long axis north-east to south-west, and up to 0.36m deep. Due to its shape, size, and traces of a posthole in the bottom of this feature, it seems likely that 5078 is a ditch segment rather than a separate feature. If this is the case, then the posts within the ditch may have been spaced *c* 2m apart from one another. Therefore, on balance, this was probably a penannular-ditched enclosure with a single entrance gap on the south-west side.

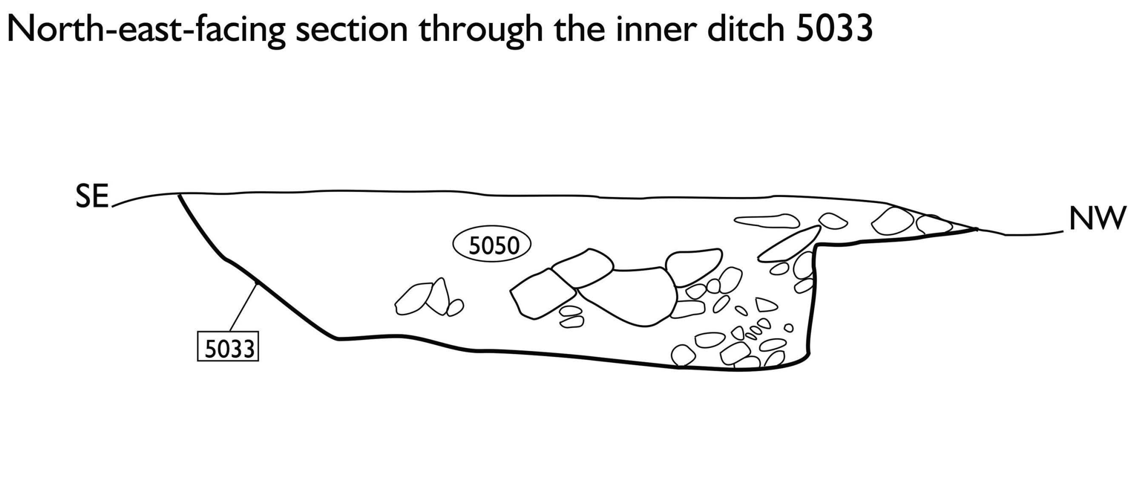
7.2.2 Inner ditch

The inner segmented ditch was concentric to the outer ditch and defined a circular area with internal diameter of 9m; the concentric ditches were spaced *c* 3m apart. The ditch was in four segments, with gaps on the north, east, west, and south-south-west sides; it is unclear if all segments were dug or even extant at the same time (although this seems likely given its coherence in plan). Seven slots were excavated into this ditch; six of the eight ditch terminals were investigated, only one of which, the southern end of north-eastern Ditch 5051, appeared to have contained a posthole.

The north-western (cut 5083), north-eastern (5051), and south-eastern (5033) ditch segments were of similar superficial form, each an arc of ditch of similar length (7.0m, 6.5m and 6.0m respectively), and between 0.20m and 0.35m deep. Ditch width varied from 1.9m in the north-east to 1.2m in the south-east. Each had a single clay-silt fill, with occasional charcoal patches evident, and variable quantities of stone and pebble inclusions. The north-east ditch segment appeared to have contained at least one post, and cobbles towards the base of this ditch here may have been disturbed packing stones. The profile of the inner ditch in this segment most closely resembled that of the outer ditch, with a near-vertical inner face (Figure 7.8). The south-eastern segment was similar in profile, but not enough of the north-western segment was investigated to be sure of its form. The final ditch segment (cut 5061), on the south-west side of the enclosure, was slightly shallower than the rest of the boundary. It measured 3.0m north-west to south-east by 1.3m, with depth 0.2m and single silt fill (5007) with oak charcoal inclusions; the profile appeared to be U-shaped.

The four gaps between these ditch segments were variable in form and formation. The two on the north and east were too narrow to be anything other than

Figure 7.8 Section through the inner ditch segment 5033



the product of a combination of prehistoric segmented construction, and modern plough truncation. The gaps in the south-west sector were larger. The western gap, 0.75m between segment 5061 and the segment to the north, may be another product of plough erosion, as it was immediately south of a ditch segment that was uncharacteristically narrow. However, the gap on the south-south-west side, 2.2m across, was much more convincing as an original feature of this monument. Once again, this seems to have been a penannular ditched enclosure, probably defined by a light timber setting or fence – another reason to suppose that the boundary was more continuous originally than it appears now.

A lead object (SF5005) of Roman or later date was found near the surface of the inner ditch south-east segment in upper fill 5008 (see Figure 7.22 and section 7.3.3 below, and SERF2, section 3.2). One radiocarbon date of 2780–2577 cal BC was obtained from oak charcoal within the short ditch segment 5061 of the inner enclosure (4120 ± 35BP; SUERC-37891). (A small quantity of carbonised cereal grains was also recovered from this ditch segment 5033 but a date could not be derived from these). This date is consistent with the monument being a segmented ring-ditch of the late Neolithic.

7.2.3 Features between the ditches

A seemingly random collection of features was identified in the space between the ditches including pits, postholes, stakeholes, slots, a possible standing stone, and natural features; ten were excavated (see Figure 7.4). Features will be described in a clockwise direction, starting from just south of the baulk with the putative standing stone. Little was found to indicate relationships between these disparate elements.

Standing stone and pits

A large ovoid dolerite/gabbro boulder, 1.6m in length and with a flat base (Figure 7.9), was found recumbent in a pit cut into the inner edge of the outer ditch, 1.5m to the north of the south-west entrance gap. This stone had been picked up as a clear anomaly in the geophysical survey (section 2.4; Figure 2.21). This is probably a prehistoric standing stone that was buried during post-medieval agricultural improvements (section 5.5). It appears the standing stone originally sat within the outer ditch of the enclosure within Socket 5025, a D-shaped feature identifiable within the ditch profile, and thus was an original element of this monument. It in effect marked the north side of the entrance gap, a role played by a timber post at the opposite ditch terminal. The original stone socket and ditch was subsequently truncated on the north side by large Pit 5019, which measured 1.12m by 0.90m and had a maximum depth of 0.60m. The fill of both 5025 and 5019 appeared to be the same (5002); it consisted of large rounded stones up to 0.40m across within a silt matrix (Figure 7.10). It is likely that this pit was dug to bury the standing stone at the time of it was toppled.

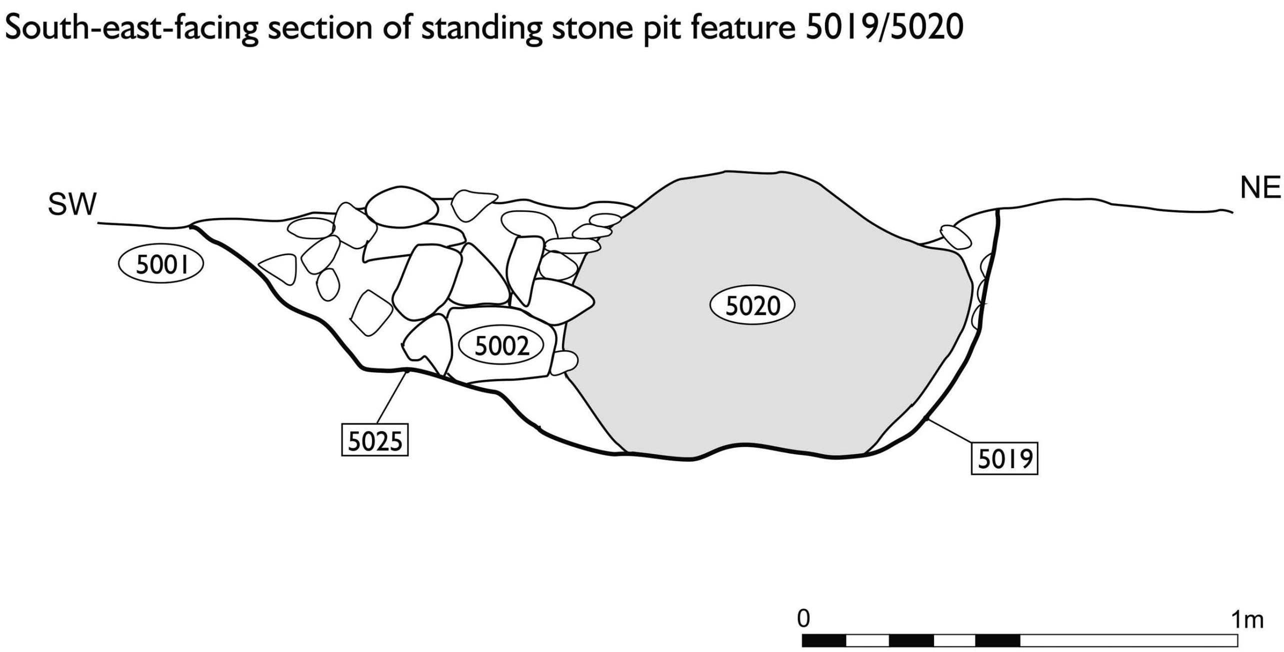
Cut features between the concentric ditches

Six further features were investigated in the northern half of the enclosure; the location of all are shown in Figure 7.4. Linear slot 5072, running north from inner ditch north-west segment 5083 to the outer ditch 5030, was almost certainly a modern plough furrow, as was shallow slot 5039. Immediately to the east were two small features, 5104 and 5032, possible stakeholes or small postholes. Both were located within 0.5m of the outer ditch; no equivalent features were located anywhere around the boundary. In the north-east zone of the enclosure, a large oval-shaped pit (or less likely a posthole), 5062, was fully excavated. This was shown to be 1.3m north to south by 1.2m in plan, with two fills, the lower gravel (5041) and upper sandy silt (5065). The sides were steeply sloping and the hole had a flat bottom. (If the ring-ditch did indeed have an axis south-west to north-east then any post within 5062 would have stood on this axis.) Immediately to the east of this feature was a linear slot, 5077, running for 1m in a north-west to south-east alignment.

In the southern half of the enclosure, aside from the features associated with the recumbent standing stone, two further features were excavated. Posthole 5042 lay half-way between the enclosure ditches. It was oblong in plan, measuring 1.1m north to south by 0.5m across, with steep-sides, a flat bottom and depth 0.25m. Three fills were identified, one of them (5043) an orange-brown sandy silt that may have been a postpipe with width 0.35m. A large but shallow, amorphous pit-like feature (5029) located adjacent to the south-west 'gap' in the outer ditch was quarter-sectioned. It was shown to be only 0.22m deep, and the sterile sandy silt and clay fills suggest it was a natural hollow or, less likely, a truncated tree throw.

Figure 7.9 The standing stone during excavation

Figure 7.10 Section drawing of standing stone and related cut feature



7.2.4 Internal features

Two large features were located within the centre of the inner segmented ditched enclosure (Figure 7.11), both of which upon excavation gave indications of funerary activity. Although these cannot be stratigraphically associated with the enclosure ditches, the location is suggestive, with the triple burial cist placed at the centre point of the ring-ditch.

Triple cist

A large amorphous feature was located at the centre of the enclosure; after excavation this was shown to be a tree throw (for a discussion on such features see section 3.3.4) cut by a large pit, within which was set a stone segmented compartment cist. This large but shallow, crescent-shaped feature (5105) measured *c* 4m north-west to south-east by 1.5m across. It had shallow sides, a flat base, and was rounded at the north end. Compact orange gravel and gravel silts (5037, 5106) filled most of the northern end of the feature, with the southern end mainly a clay silt (5099). Oak and hazel charcoal and carbonised hazelnut shells were recovered from this feature. Radiocarbon dating of the hazel charcoal and a nutshell produced two consistent earlier Neolithic dates of the first centuries of the 4th millennium BC (3950–3760 cal BC (90% confidence, 5035 ± 35BP; SUERC-37886) and 4000–3915 cal BC (59.6%, 5140 ± 35BP; SUERC-37887)). Two concentrations of charcoal in hollows or depressions in the tree-throw fills were identified (5101, 5076); the origins and significance of these deposits and their relationship to the cist is unknown.

It is likely that this exact spot was specifically chosen, with the relict tree throw probably still evident in the landscape because when this feature had partially, but not wholly, backfilled, it was cut on the south side by a large subrectangular pit (5079) which measured 2.1m north-west to south-east by 1.5m. The pit had steep sides and a stepped bottom which measured 0.40m deep on the south side, dipping sharply down to 0.65m depth in the remainder of the feature (Figure 7.12). This pit was almost entirely filled by the cist structure and contents, with a silt and stone deposit (5099) between cist and pit sides (Figure 7.13). The cist had been disturbed by ploughing and possibly by early medieval activity as the compartments were not voids and there were no *in situ* capstones. The structure was built of large, relatively thin, micaceous schist or sandstone slabs

Figure 7.11 Pre-excavation photograph of the pit (right) and cist / tree-throw features

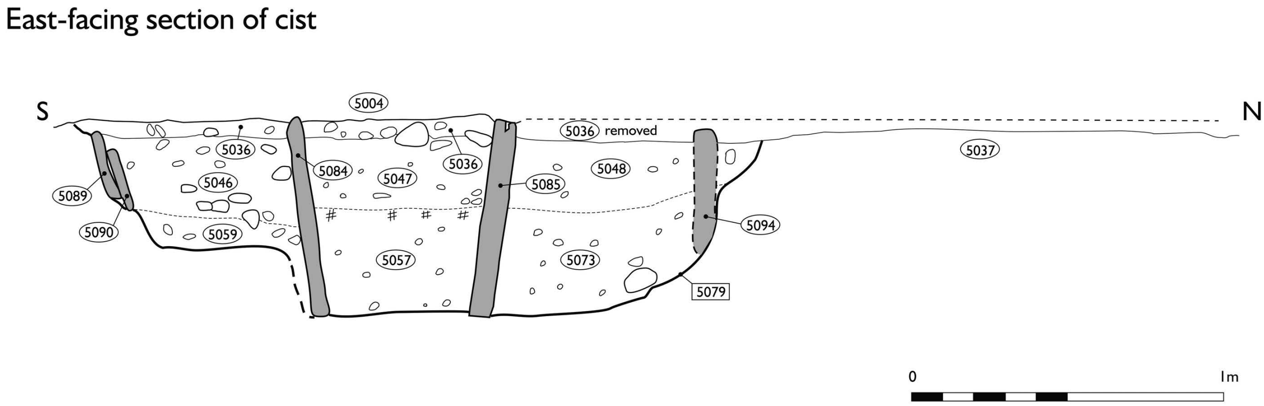


Figure 7.12 Section drawing through the triple cist structure

Figure 7.13 Post-excavation plan of the cist and Beaker pit

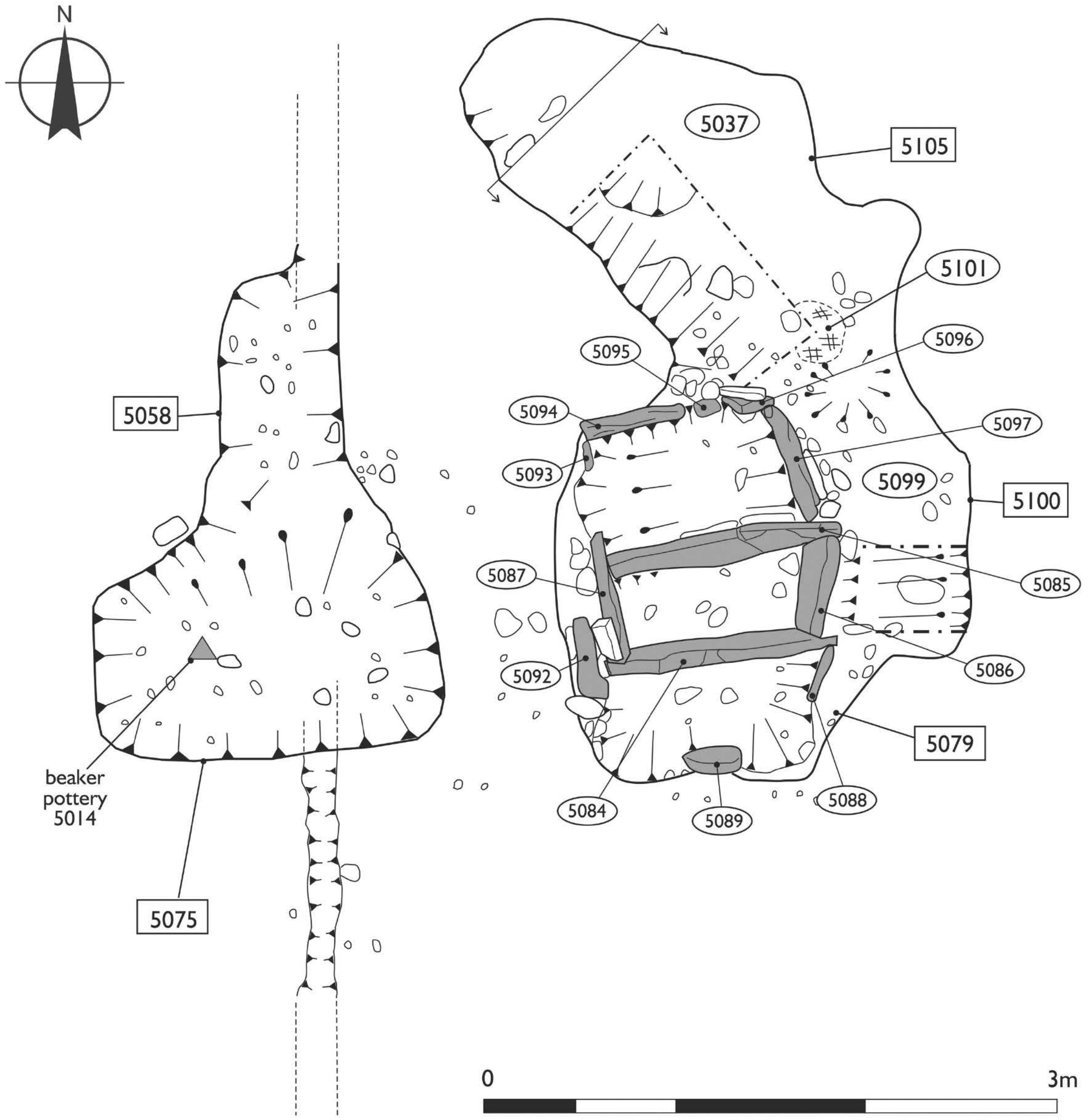


Figure 7.14 The triple cist after excavation with Pit 5075 behind

forming a subrectangular triple-compartment burial chamber with its long axis north to south (Figures 7.13 and 7.14). None of the cist compartments was regular in plan and the southernmost was notably shallower, coinciding with a step in the base of the cut (Figure 7.14). It may well be this represents an extension of the original cist pit (it was not possible to determine in section or plan), suggesting that the cist was constructed in phases, with the southernmost cell last in the sequence. The base of the cist was also the uneven base of Pit 5079.

The central, and probably primary, cist was defined by four upright slabs (numbered 5084, 5085, 5086 and 5087) that demarcated a compartment that was slightly wider at the top than the bottom (being 1.0m by 0.4m across at the base), probably due to slumping outwards through time. The cist slabs were supported by large packing stones against their bases at the south-west corner and north side, again perhaps because of structural insecurity. There were other irregularities as well: the western slab (5087) extended north beyond side slab 5084 and the cist narrowed towards the west end, being slightly trapezoidal in plan. One of the central cist stones (5084) has a notch in its upper face, to the left of which was a linear groove.

This central compartment contained a sequence of four fills which probably entered the cist after later disturbance, given that we would have expected it to contain a void when first established. The lower fill (5060) of this compartment, which took up almost half of the 0.6m depth, was a loose dark-brown clay-silt containing small pebble inclusions and charcoal flecks, with a 50mm thick band of similar fill with a concentration of charcoal and cremated bone (5057) above this. As 5057 was being excavated, there was a sense that a body stain could be discerned in this layer (a crouching figure, head to the west), tentatively supported by phosphate analysis (section 7.3.5), although it was impossible to record photographically. Radiocarbon dating has shown that this layer contains charred material dating to the 1st millennium AD (1595 ±35 BP, SUERC-37895; 1615 ±35 BP, SUERC-37896) which, as we will argue below, relates to a later disturbance of the structure. Layer 5057 contained abundant charcoal, dominated by oak and hazel, but including birch, blackthorn type, willow and elm. Of note were large quantities of cereal grains (>1000 grains), with both oats and six-row barley identified, although almost half the grain was indeterminate due to poor preservation. Hazelnut-shell fragments were also present in the assemblage. Most of the remainder of this compartment contained a mid-brown clay-silt deposit with numerous small pebble inclusions (5047), which included a much smaller quantity of charcoal; this was a similar range of types to the fill below, suggesting some disturbance of that context. The central area was, as with the rest of the cist, capped with a shallow layer of silty gravel (5004).

The northern cist compartment may have been the second in sequence or built at the same time as the central compartment; central slab 5085 is shared between these two, as is western slab 5087. This stone box was defined in a rather more piecemeal manner, however, with two flat slabs (5094, 5097), two small slabs (5093, 5096) and a cluster of fist-sized stones (5095) and chocking stones utilised to create the cist. The west side of the compartment had a gap in the stonework while the slab on the north side (5094) did not extend down to the base of the cut. This compartment measured 1.2m by 0.6m and had maximum depth 0.65, slightly broader at the base due to the leaning angle of slab 5085. Three fills were noted in this part of the structure. The primary fill, taking up just over half of the depth of this box, was a homogenous silt-gravel (5073) within which was recovered a flint 'small knife' (SF5013, see Figure 7.21 and section 7.3.2). Charcoal in this fill included carbonised oats and barley, while the layer above, a distinct silt-gravel fill (5048), contained a considerable quantity of carbonised hazelnut shells, possibly a deliberate deposit. This was capped by the silt layer 5004, within which two flint flakes were found (see section 7.3.2).

The southernmost cist compartment was probably an extension of what was originally a double-cist. It was incomplete, with most slabs or defining stones missing, either having been removed or never having been there in the first place. The shallow nature of this feature, maximum depth 0.4m, suggests its insertion against the central cist, utilising the side of that cist for its northern extent. Assorted slabs and sporadic stones suggest the other sides of the compartment, which otherwise is defined by the edge of Pit 5079. This compartment measured 1.2m by 0.6m so in this sense accorded with the other boxes except in depth and definition. Three fills were identified, the lower (5059) being only at most 0.15m deep, a redeposited coarse gravel with quartz pebble inclusions and

Figure 7.15 Pit 5075 during excavation

Figure 7.16 Beaker sherds from Pit 5075 *in situ*

fragments of charcoal and burnt bone. A fragment of cremated bone from this fill has been dated to 2030–1885 cal BC (3600 ± 29 BP; SUERC-45557). Above this shallow deposit was a 0.25m thick layer of dark orange to brown silt-gravel (5046), capped with silt layer (5004). No finds were recovered from this feature.

Beaker pit

Situated 0.5m to the west of the triple-cist pit was an amorphous large pit which contained most of a broken all-over-ornamented Beaker pot (section 7.3.1). The pit (5075) was subrectangular, measuring 1.9m east-west by 1.0m across in plan, with gently sloping sides and a flat base and a depth of 0.25m (Figure 7.15). The basal fill (5074) was a thin lens of charcoal 20mm deep and extended for 0.72m across the base of the pit – this may represent the charred remains of a wooden coffin or a bier upon which the body was carried and/or deposited in a crouched position. Where identified this charcoal was oak. The rest of the pit contained a medium-brown sandy silt (5064) with inclusions of oak charcoal, and a single carbonised cereal grain and a fragment of hazelnut shell. Potsherds were recovered from both fills, with a concentration in the western half of the pit (Figure 7.16). The base of the grave was sampled for phosphate which showed higher phosphate readings in the west end of the pit that may represent a crouched burial with head towards the west (section 7.3.5). The Beaker pit had been cut on the northern side by an oval-shaped feature (5058) which was probably modern, while a north-south modern plough furrow cut across both features.

7.2.5 Features outside the enclosure

Several features lying outside the ring-ditch in Trench F were investigated (shown on Figures 3.7 and 7.4). Posthole 5052, part of the boundary of the palisaded enclosure, and adjacent Tree Throw 5031, were 3.5m south-east of the outer ditch; these are described in Chapter 3. A large oval-shaped pit, with cut 5034, was fully excavated and was positioned within 0.2m east of the outer lip of the outer ditch. The pit was 3.06m north-south by 1.90m wide, 0.55m deep and with gently sloping sides and a rounded base. The primary fill, 5027, was a charcoal-rich dark brown to black sandy silt 80mm thick, containing lenses of light-brown sandy clay

(5049). This charcoal was mostly hazel and oak but also including ash, willow, alder and birch. Carbonised cereal grains were also present in significant quantities, with both oats and six-row barley represented, although a large proportion of the grain was indeterminate (Ramsay 2010). These appear to have been deposits associated with *in situ* burning. The remainder of the pit was filled with a dark grey-brown silt (Fill 5016) which contained charcoal, fragments of cremated bone and several stones up to 0.4m in length. This feature had much in common with a series of similar pits to the east that were interpreted as early medieval pyre or kiln sites (section 3.5.4).

The other features in this location were either assumed, or shown, to be natural, or were of unknown date and cause. For instance, a large amorphous linear spread of stony silt just outside the south-west entrance of the outer ditch (5012) was investigated and shown to be a band in the subsoil. A shallow linear scoop (5069) ran 1m north to south and abutted the outer southern ditch (5070) near its south-eastern segment terminal. It was 0.7m across, 0.2m deep with a rounded profile, and had a single dark brown to grey clay-silt fill (5010); the nature of this scoop and how it might relate, if at all, to the enclosure is unknown. A small scooped hollow of unknown origin was investigated 1m to the north of the outer ditch. This oval cut was 0.9m north-south by 0.5m, with a U-shaped profile and depth of 0.14m. The single fill was a silt-gravel with large stone inclusions (5021). Several potential cut features external to the ring-ditch were planned but not excavated, including two small features located 4m to the north-west of the ring-ditch, one of them banana-shaped (5022), the other oval (5023); taken together these may have been a single tree throw. An amorphous (unexcavated) banana-shaped feature just outside the south-east entrance of the outer ditch (assigned number 5011) may have been a similar, smaller, natural feature.

7.3 Specialist reports

7.3.1 The Beaker (Vessel 1)

Neil Wilkin

Description of the Beaker

An almost complete short and angular-necked Beaker with complex/geometric comb-impressed decoration was recovered from the western half of Pit 5075, located in the interior of the ring-ditch (Figure 7.17). The vessel, which stands *c* 147mm tall, with a rim diameter of *c* 128mm, base diameter of *c* 72mm and neck depth of *c* 40mm, is among the smaller finewear/funerary Beakers from eastern Scotland (Table 7.1). It has a gently curving ovoid body and relatively sharp angle between neck and body; the neck is short (less than a third of overall height) and gently 'cupped' upwards rather than flared outwards. The average wall thickness is *c* 8mm and the thicker base (*c* 10mm) rises to a gentle omphalos (*c* 16mm) at its centre. The rim has been carefully squared-off and is internally bevelled.

The vessel was constructed using the diagonal join technique and there are several instances of fractures between straps with the evidence for joins suggesting these were *c* 10mm wide in some places. A slip of finer clay 'slurry' was then applied to the exterior surface of the vessel and inclusions are, as a result, relatively sparse and more concentrated on the interior surface as yellowish-white, angular, possibly calcareous inclusions (max of *c* 5.5mm by 3.0mm). The fabric also contains grains of fine sand like the AOC Beaker sherds found in Henge 1 ditch terminal (section 4.5.2), probably

Figure 7.17 Beaker drawing (Neil Wilkin)

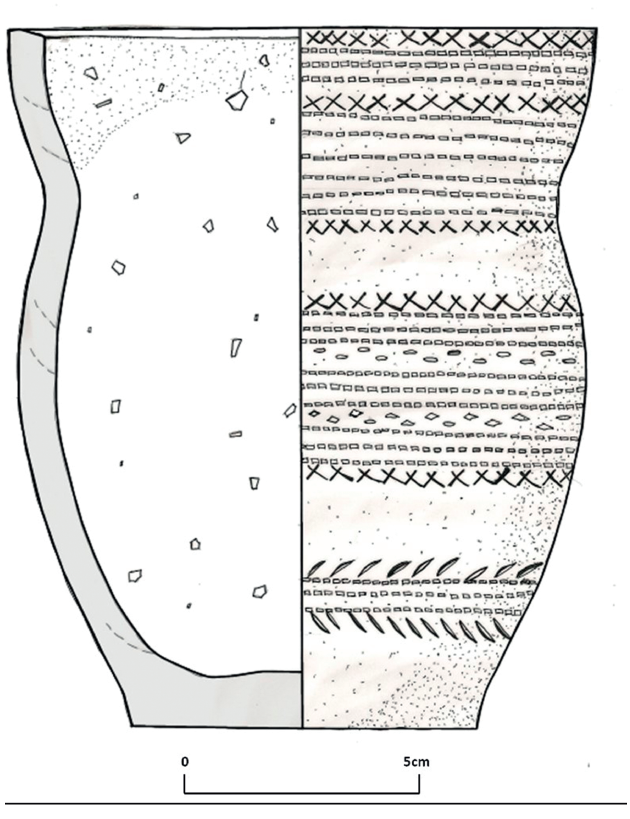


Table 7.1 Comparison between the dimensions of the Beaker from Forteviot and similar vessels from north-east Scotland

Site name	Height (mm)	Rim diameter (mm)	Base diameter (mm)	Neck depth (mm)	Wall thickness (mm)
Forteviot, double enclosure	147	128	72	40	8
Borrowstone 1, Kingswells, City of Aberdeen	146.5	130.5	90.5	49.5	9.5
Johnston, Leslie, Aberdeenshire	147.5	123.5	74	42	8.5
Sandhole, Fetterangus, Aberdeenshire	152.5	123.5	68.5	30.5	7.5
Mean averages of 56 North-East Beakers	165	137.5	83	46	8.5

reflecting the shared local geology and clay source (section 6.4.2). The exterior surface is pinkish-brown to buff (10R 6/8 and 7.5 YR 7/6) while the interior surface is a light grey (10 YR 7/2–10 YR 6/2), with the core varying from black to grey and a maximum of *c* 5–6mm thick. The inside of the vessel appears to have been wiped or smoothed, while a substantial section (*c* 50mm by 50mm) of the internal surface of the mid- to upper-belly has detached prior to deposition, probably due to fire spalling caused by a rapid temperature rise in the early stages of the open-air firing of the vessel. However, given the possible presence of calcareous inclusions, this may be an example of so-called 'lime blowing', a post-firing defect caused by calcareous inclusions turning to lime at high temperatures. Despite this internal damage the vessel was clearly deemed suitable for deposition as a special/funerary deposit.

The decorative scheme consists of crosses and fingernail impressions used to fringe bands of encircling lines of comb and oval impressions in three principal zones separated by undecorated areas. The decoration has been relatively uniformly and neatly applied using a tooth-comb (*c* 35mm long), oval impressions of 'ermine' motif (perhaps created using the edge of the comb or an oval/rhomboid shaped tool), and a relatively long fingernail impressed at an angle in a 'herringbone' style. All the motifs belong to Clarke's (1970, 424–5) Basic European Motif, Group 1 and Primary Northern British/Dutch, Motif Group 2.

Seed impression on Beaker interior

Neil Wilkin, Kenneth Brophy, and Denise Telford

The unusual impression of a seed of common black knapweed (*Centaurea nigra*) was identified inside the neck of the vessel, *c* 20mm below the rim (Figure 7.18). Impressions of grass, straw and seeds are commonly found on the exterior and bases of prehistoric vessels, accidentally impressed into the pre-fired clay. Impressions of grains on the walls of Beakers, interior or exterior, are, however, very rare. A single naked barley grain impression is present on the exterior face of a Beaker that was found in association with a female burial at Goodmanham 99, East Yorkshire (Neil Wilkin pers comm, and see Kinnes and Longworth 1985). The impressions of fourteen cereal grains, half naked barley, half emmer wheat, were identified on both the interior and exterior surfaces of a Beaker from Moel Hebog, Gwynedd (Jessen and Helbæk 1944, 18; Longworth 1984, no. 2105; Neil Wilkin pers comm).

The seed impression is located on the internal surface of the Beaker. This surface has been carefully smoothed and the impression is close to a row of fingernail markings on the exterior surface of the same sherd (*c* 30mm below the rim), suggesting that the plant was pressed into the undecorated internal neck with the forefinger while the thumb(nail) pushed against the exterior surface. This post-decoration application, as well as the prominent position on the vessel, suggests this was a deliberate act (Graham Taylor pers comm). It could be a potter's mark or perhaps knapweed had some significance in relation to the use of this vessel. However, it is possible that the impression occurred by chance.

Centaurea nigra has been found in several archaeological contexts, including two common knapweed flowerheads amongst 105 *Centaurea* flowerheads identified with the Roman-age Pewsey Hoard, Wiltshire (Henry *et al* 2017, 231). Bracken was identified with the spectacular Mylor Hoard, Cornwall, a late Bronze Age or early Iron Age assemblage of 33 socketed axes in a large ceramic pot although it is not clear if this was packing in the deposit, or intrusive (Knight *et al* 2015, 35, no. 54). Is there any significance to this plant? Darwin notes that the whole plant could have been used to produce, 'yellow, bright green, green, and rich dark brown' dyes according to folk tradition in Scotland (1996, 77). Parts of this plant have various recorded uses for medicinal purposes in folk and historical medicine in Britain and Ireland, for ailments as diverse as rheumatism and jaundice (Hatfield 1994; Allen and Hatfield 2004, 284), with the flowers chewed to help treat

Figure 7.18 (left) Impression of a seed on the internal surface of the neck of the Beaker found within the pit burial, Vessel 1; (right) row of fingernail impressions to exterior surface of the same sherd (photos: Neil Wilkin)

diarrhoea (Watts 2007). Interestingly, recent analysis has suggested that *Centaurea nigra* seeds have been shown to have successful antibacterial actions against penicillin-resistant E. coli (Kumarasamy *et al* 2003, 611). Telford (2019, 247) has suggested that pots such as Beakers would have been ideal for the infusion and consumption of liquid herbal remedies, so this grain impression may hint towards the role of this Beaker before it was placed in the grave.

Typology, *comparanda*, and dating evidence

In terms of conventional typology, the vessel belongs to Clarke's (1970, 153–61) Primary Northern British/Dutch group, Lanting and van der Waals' (1972) Step 5 and Needham's (2005) Short-Necked lineage. It is a good example of the funerary Beaker tradition that is so well represented in funerary contexts along the east coast of northern Britain, particularly in north-east Scotland and eastern Lothian (cf *inter alia* Clarke 1970, figs 445, 449, 471, 473; Murray *et al* 2008, illus 3). The chronological range of this type of vessel in eastern Scotland spans the Chalcolithic and first two centuries of the early Bronze Age (*c* 2400–2000 cal BC) (Sheridan 2007; Curtis and Wilkin 2019). Several particularly close parallels for the vessel are Borrowstone cist 1, Aberdeen (Shepherd 1986); Sandhole, Fetterangus, Aberdeenshire (Ralston 1997, illus 10) (Figure 7.19); and, to a lesser extent, Johnston, Leslie, Aberdeenshire (Clarke 1970, fig 573) and Upper Muirhall, Perth (Reid *et al* 1987, 65–7, illus 3), which share similar proportions and profiles (with gently 'cupped' necks) as well as similarly structured decorative schema: three zones of decoration, each using similar decorative elements and fringing crosses.

Two of these vessels (Borrowstone and Sandhole) are associated with early high-quality radiocarbon dates and indicate that the Forteviot vessel may have had a relatively early date (*c* 2400–2150 cal BC; see Table 7.2 and Figure 7.20) and thus belonged to the first range of funerary Beakers after Low-Carinated and all-over-decorated vessels. Indeed, the use of the 'ermine' motif appears to been a recurrent feature of early Short-Necked Beakers, including the vessel from Shrewton 5K, Wiltshire (Clarke 1970, fig 549), Ord, Auchindoir, Aberdeenshire (*ibid*, fig 495), Broomend of Crichie cist 1, Aberdeenshire (with a bone belt ring of Needham's primary archery package (Needham 2005, 11–12); Clarke 1970, fig 659), and Uppermill, Cruden, Aberdeenshire, which is undated but is also associated with elements of Needham's primary archery package (Clarke 1970, figs 551–2).

The closest *comparanda* for the vessel are thus from burials aligned east-west or north-east to south-west, which conforms to the east-west axis of the pit that contained the Beaker from Forteviot. Alexandra Shepherd (2012) has noted that fringing crosses are a motif commonly associated with Beakers which are smaller than average and with females and young males, as opposed to the larger Beakers (without such fringing) typically associated with more mature adult males. Unfortunately, neither the age nor sex of the

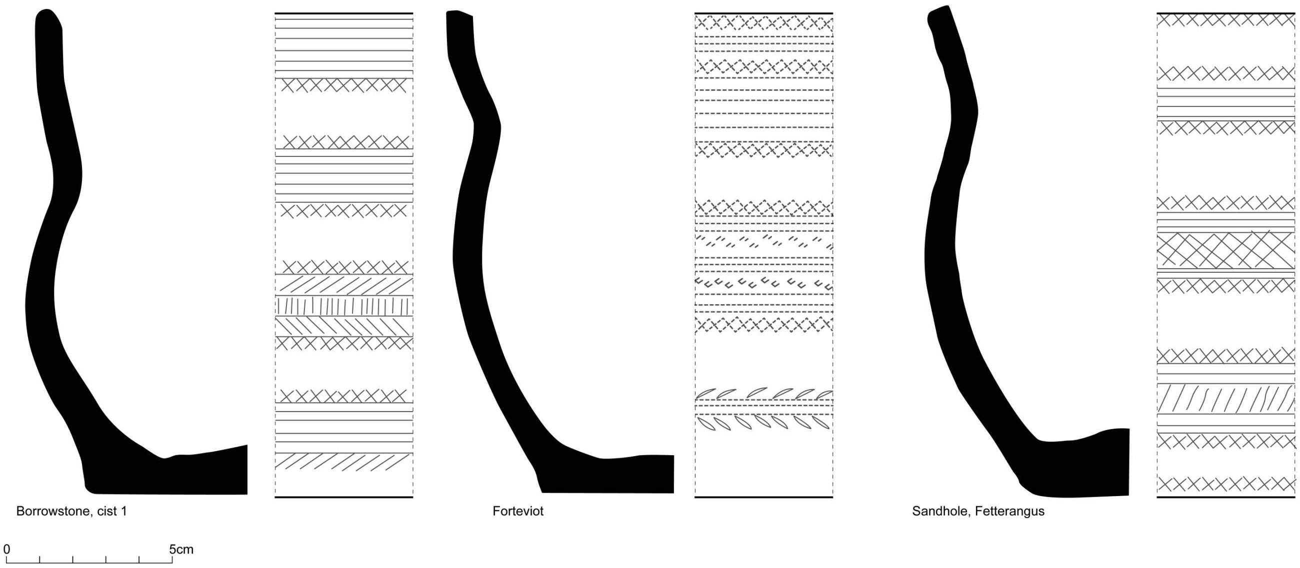


Figure 7.19 Similarities in the decorative motifs and structure of Beakers from (left to right): Borrowstone, Forteviot, Sandhole. (Note: Sandhole and Borrowstone vessels are decorated by incision; prepared by Neil Wilkin)

putative burial at Forteviot is known. However, research has shown that when funerary Beakers in eastern Scotland were placed at one end of inhumation burials, they were placed at the head-end rather than at the feet in over 80% of cases. (Based on a personal database of 30 examples, all but three from north-east Scotland, 83% of examples demonstrated this relationship.) If this was the case at Forteviot, underpinned by the phosphate analysis results (section 7.3.5), then the position of the Beaker at the west end of the pit would indicate that the occupant of the grave was probably female, as their heads were usually laid to the west or south-west (Tuckwell 1975; Shepherd 1990; 2012).

The use of fingernail impressions on the lower body is, however, difficult to parallel among Short-Necked British Beakers from funerary contexts and appears to have been an intentional and active choice given the availability of the tool(s) used to create both crosses and 'ermine' impressions. Together with the impression of *Centaurea nigra*, with its potential medicinal properties, it served to personalise the vessel and imbue it with body-related properties.

Table 7.2 Dated Beaker burials with similar features to the Forteviot pit burial beaker; see text for references. (Dates from Shepherd 2005; Sheridan 2007; Curtis *et al* 2008. Dates calibrated using OxCal v. 4.0. Note: All dates on unburnt human bone.)

Site name	Date (BP); Lab code	Calibrated date (95.4% probability)	Features of decoration and form shared with the Forteviot Beaker	Age/sex1
Borrowstone, cist 1, Kingswells, City of Aberdeen	3865±40 BP; GrA-29077	2470–2200 cal BC	Criss-cross motif, three zones of decoration, cupped short-necked profile	Young adult female
Paradise Road, Kemnay, Aberdeenshire	3833±28 BP; OxA-V-2246-41	2460–2150 cal BC	Criss-cross motif, three zones of decoration, cupped short-necked profile	Young adult female
Fallaws Farm, Monikie, Angus	3785±26 BP; OxA-V-2246-34	2300–2130 cal BC	Criss-cross motif, three zones of decoration, cupped short-necked profile	Elderly ?female
Upper Ord, Auchindoir and Kearn, Aberdeenshire	3854 ± 31BP; OxA-V-2243-40	2470–2200 cal BC	Ermine motif; short-necked profile	Adult/elderly male
Sandhole, Fetterangus, Aberdeenshire	3845±32 BP; OxA-V-2172-23	2460–2200 cal BC	Criss-cross motif, three zones of decoration	Young adult male
Broomend of Crichie, cist 1, Aberdeenshire	1. 3835±33 BP; OxA-V-2166-34 2. 3720±35 BP; OxA-13214	1. 2460–2150 cal BC 2. 2280–1980 cal BC	Ermine motif; cupped Short-Necked	Two adult males

1Data from Dr Meg Hutchison, *Beakers and Bodies Project*, University of Aberdeen

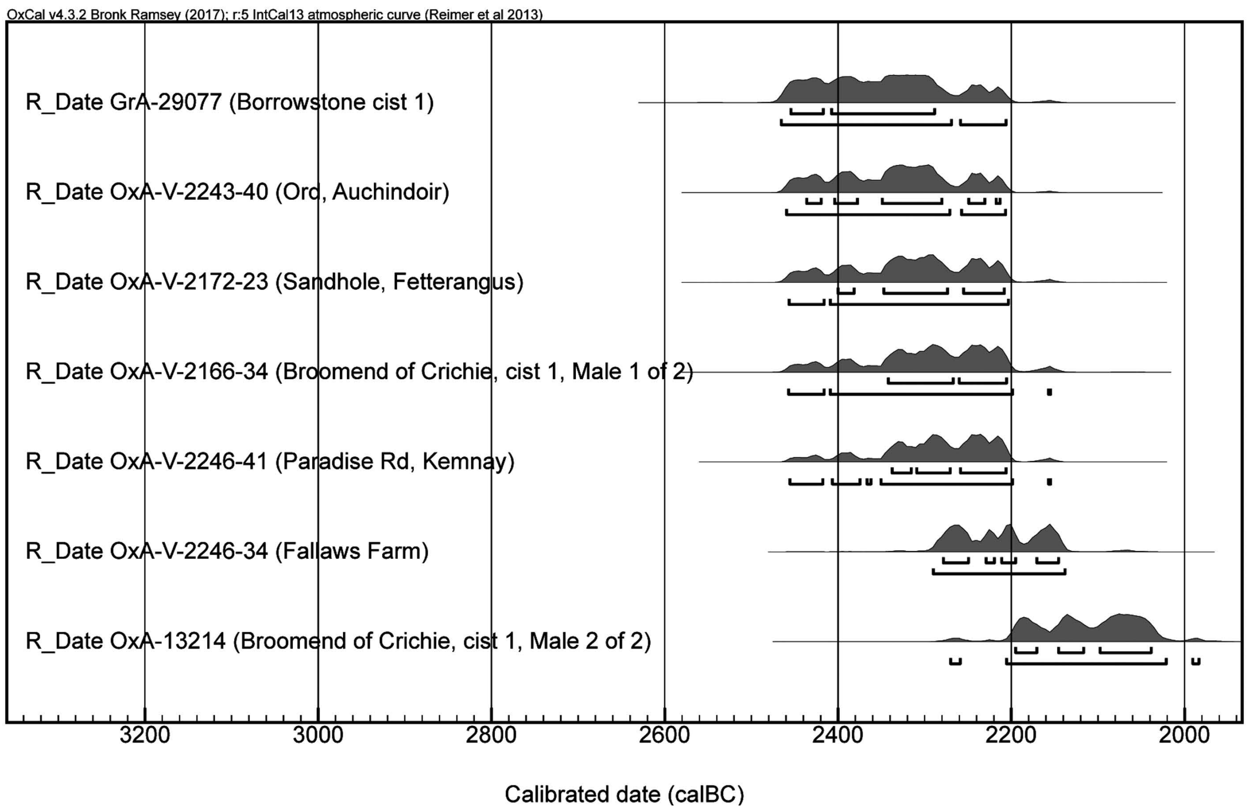


Figure 7.20 Dated Beaker burials with similar features to the Forteviot ring-ditch vessel (dates from Shepherd 2005; Sheridan 2007; Curtis *et al* 2008). Dates calibrated using OxCal v.4.3.2

7.3.2 Lithics

Dene Wright

A complex invasive retouched 'small knife' (SF5013) was recovered from the lower fill (5073) within the northern compartment of the triple cist (Figure 7.21). (This object was described previously as an arrowhead: James and Gondek 2010, 17). Both the right- and left-hand sides have semi-invasive direct retouch from the proximal end to the upper medial, and the invasive direct retouch from the upper medial culminating in a point at the distal end. There is damage to the point at the distal end although this may be post-depositional and not necessarily due to use-wear. This 'small knife' is analogous to a Bronze Age-type slug knife from the double cist at Meldon Bridge palisaded enclosure (Speak and Burgess 2000, 30) and in that case was interpreted as being a grave good associated with a burial. (This structure will be returned to in the discussion below.) Such knives are generally regarded as belonging to the early to middle Bronze Age (Clarke 1932).

Two worked lithics were recovered from silt spread (5036) approximately above the location of this cist compartment. One (SF5006) is a bipolar flint flake core with an unprepared cortical platform. The other (SF5006) is of Arran pitchstone with proximal and distal ends missing. It measures 10mm by 6mm, with width 2mm. Pitchstone is generally associated with early Neolithic events in mainland Scotland (cf Ballin 2015). Due to later disturbance of this structure, these cannot be linked meaningfully with the cist or ring-ditch.

Figure 7.21 Flint knife SF5013

7.3.3 Lead object

Ewan Campbell

A cast rectangular lead object (SF5005; Figure 7.22) of indeterminate function was found in upper fill 5008 of the ring-ditch inner ditch and may be Roman or of later date. This could be interpreted as a deliberate deposit in a still-visible ditch, or simply residual (SERF2, section 3.2).

Figure 7.22 Lead object SF5005

7.3.4 Cremated bone

Stephany Leach

Cremated bone was found in eight locations during excavations in and around the ring-ditch, six in the triple-cist arrangement, one from the pyre pit 5034, and one from the possible Tree Throw 5031 adjacent to palisaded enclosure Posthole 5012. The upper fill (5016) of Pit 5034 located immediately to the east of the outer ditch of the enclosure yielded only two fragments of cremated bone amounting to less than 1g, being 8mm and 16mm in length. Although these displayed surface characteristics consistent with human bone, it was not possible to ascribe these remains confidently as human. This differs from the other pyre pits in the entrance zone of the palisaded enclosure (eg 005, 5512 and 5514), which contained large quantities of cremated human bone although superficially these features appear similar.

Cremated bone was recovered in varying quantities from each of the three compartments in the triple cist. The total weight of bone recovered from the south cist was 4.7g and represents a few fragments of calcined and very highly eroded bone. Although only a minimal amount, all found in lower fill 5059, this compartment produced the greatest quantity of cremated bone within the cist structure. A section of long bone, probably humerus and a small fragment of foot phalanx identified this material as human and of adult proportions. A high degree of thermal alteration is indicated by the pale colour and fracture patterns exhibited, and the very high degree of erosion, almost polishing, of the bone surface and fracture margins indicates much movement of the fragments within these abrasive sediments. These characteristics would suggest an assemblage comprised of disturbance residue, due to accidental inclusion in the fill of this feature. This material may relate to the earlier feature containing charcoal-rich lenses, which the cist cuts through (possible tree throw 5105). Alternatively, these few fragments may represent a deliberate token or cenotaph, structured deposits within the fill of the cist. Due to the presence of a high degree of surface polishing and assemblage composition/weight, it is extremely unlikely that these fragments represent a primary deposition of cremated remains within the cist. The estimated MNI is one, due to the lack of repetition of elements or zones within an element: however, the remains do not represent the deposition of an individual, merely a scatter of bone fragments.

The total weight of bone recovered from the central cist was only 2.7g and represents a few fragments of highly calcined and very highly eroded bone, exhibiting very similar characteristics to the material recovered from the southernmost compartment. The bone fragments recovered from fill 5057 (located about half-way up the filled cist compartment) exhibited slightly less abrasion to the fracture margins than fragments found in the upper fill (5047), perhaps due to a less harsh sedimentary environment. No specific demographic details were identified; this material probably represents fragments of adult bone due to their proportion. The characteristics of this minimal assemblage are in accord with those derived from the adjacent compartments and lacked any evidence that may further elucidate the suggested hypothesis that this deposit in the central cist was a later intrusion and not a primary burial. Only 1.5g of cremated bone were recovered from the contexts comprising the fill of the northern cist compartment. Very little evidence may be gleaned from these fragments, other than they are of an extremely similar nature to the bone recovered from the other two compartments. They are of consistent morphology to human remains, and they exhibit a high degree of thermal alteration and erosion.

In total, less than 12g of cremated bone fragments were recovered during the excavation of the ring-ditch at Forteviot. It would, therefore, appear unlikely that this location represented an area of focus for the burial of cremated individuals, as seen elsewhere in the Forteviot complex. The characteristics of this minimal bone assemblage is more indicative of disturbance residue, or perhaps token depositions, the taphonomic characteristics implying a post-depositional history involving a high degree of movement causing erosion and abrasion of these fragile bone fragments. This is consistent with the positioning of these cremated remains within silt fills which must have accumulated after the cist was disturbed, as when first used for burial it would almost certainly have been a sealed void containing one or more inhumations. (The cremated remains do not indicate that they were a disturbed primary burial within the cists.) The origin of these fragments, or location or primary deposition, remains unclear.

Very little may be deduced about the demographic characteristics of these few bone fragments. For the triple cist, the estimated MNI is one, due to the lack of repetition of elements or zones within an element; however, as stated, the remains do not represent the deposition of an individual, merely a scatter of bone fragments. It is conceivable that they were derived from more than one individual. Apart from the identification of an adult-proportioned fragmented toe bone in the southern cist compartment, no further demographic, health or lifestyle evidence could be gleaned from these few fragments.

7.3.5 Phosphates

Gert Petersen

Phosphate samples were taken from the base of the Beaker pit and of layer 5057 within the central compartment of the triple cist. In both cases, there was reason to believe that an inhumation burial was once interred in the feature. The methodology adopted, and a word of caution about the results, is outlined in section 2.5.3.

The results in the Beaker pit 5075 (Figure 7.23) showed higher phosphate readings in the west end of the pit, typically 20/25ml/kg and tapering off towards the east. The area of higher readings of 20–25mg/kg measured *c* 0.5m by 0.5m. This likely represents the torso of a buried body and a 0.1 × 0.1m concentrated area of phosphates in the north-west may be where the head lay.

Figure 7.23 Results of the phosphate analysis of the Beaker pit

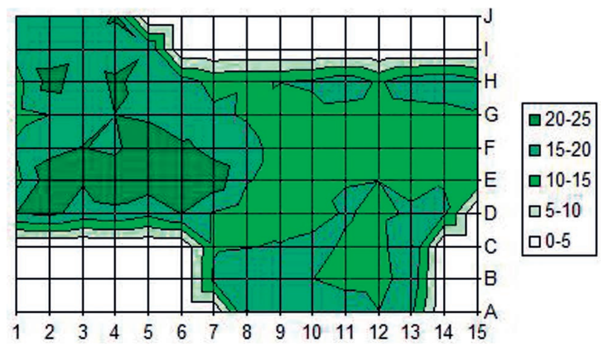
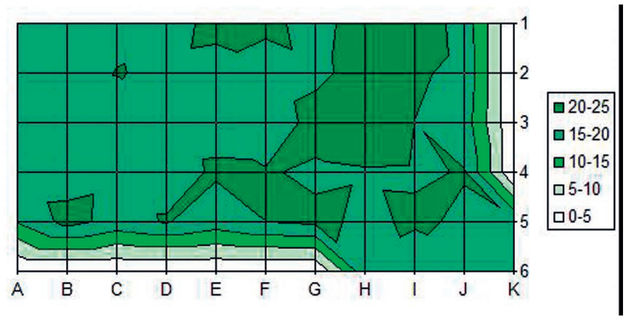


Figure 7.24 Results of the phosphate analysis of the triple cist



The results for the analysis of layer 5057 within the central compartment of the triple cist (Figure 7.24) suggest a body stain that was tentatively identified at the time of excavation might indeed be what is left of a buried body. There is a considerably higher concentration of phosphate, typically 20–25mg/kg, over the area in the eastern part of the grave where the main trunk of the body would have been according to the excavator's observation. In the far south-west a high concentration of phosphate measuring *c* 100mm by 60mm could be interpreted as being the head. At the north-east and south-west edges of the cist a gradual reduction of phosphate level can be seen which indicate the extent to which the phosphates have leached.

7.3.6 Radiocarbon dates

Derek Hamilton

Eight radiocarbon dates were sourced from material in Trench F in the vicinity of the ring-ditch, most mentioned already (Table 2.4). These cannot be modelled and in isolation tell us little about the sequence of the ring-ditch but they do align what was happening at this location with similar activities across the Forteviot complex.

Two results come from a probable tree throw 5105, from a fragment of hazel charcoal and a charred hazelnut shell from a fill (5076). This may be representative of tree clearance in the Neolithic, the dates being 3950–3760 cal BC and 4000–3915 cal BC (SUERC-37886 and SUERC-37887 respectively). We cannot rule out this material having been deposited or washed into the hole left by this tree, but such holes could be enduring features and are vulnerable to infill with residual materials.

One radiocarbon date of 2780–2577 cal BC was obtained from the inner ditch (SUERC-37891), from oak charcoal within short ditch segment (or pit) 5061. This late Neolithic date overlaps with ongoing activity in the area at this time, such as post erection, and may well be indicative of the date of this element of the monument. A single date, from oak charcoal from palisaded enclosure Posthole 5052 (located 3.5m south-east of the ring-ditch) was similar (2704–2561 cal BC (62.6% confidence, 4080 ±35BP, SUERC-37890)), suggesting construction of the palisaded enclosure and inner ditch of the ring-ditch were closely contemporary acts.

One radiocarbon date of 2030–1885 cal BC came from a fragment of cremated bone found within the southern compartment of the cist (SUERC-45557). This date is consistent with this element of the monument being a later development.

Two dates from carbonised material in the central cist compartment indicate this material does not relate to cist construction, assuming this structure to be prehistoric. These dates, from hazel charcoal and a grain of barley, were both in the first half of the 1st millennium AD (AD 396–547; SUERC-37895 and SUERC-37896; AD 381–542 (both to 95.4%)) and are consistent with one another. Interestingly, these dates are also consistent with two dates associated with carbonised material from so-called pyre pit 5034, hard up against the eastern outer-ditch edge of the ring-ditch. The 5034 dates, also from hazel and barley charcoal, were almost exactly the same (SUERC-37888; SUERC-37889); this and several similar features are explored further in section 3.5.4 and SERF2, section 5.3.

7.4 A complex monument

Kenneth Brophy and Gordon Noble

Interpretation of this ring-ditch was impacted by a lack of diagnostic artefacts in primary contexts, and a wide temporal scatter of radiocarbon dates. In plan it appears to be a late Neolithic segmented multiple-ditch enclosure, of a kind more commonly found in southern Britain (Kinnes 1979). The ring-ditch probably had earthwork and timber components, and a standing stone beside one entrance. It may have been mounded at some point in its use-life and was likely constructed in phases, with the ditch dug in segments. The purpose was, presumably, to enclose a double cist although we cannot be sure when this was constructed. It is likely that some burials within the centre of the ring-ditch were later insertions during the Beaker period, again in line with similar monuments elsewhere (cf Peterson 1972). Finally, the monument was disturbed in the early medieval period, and largely destroyed by more recent agricultural improvements.

7.4.1 The form and appearance of this monument

This monument consisted of three surviving elements: an outer ditch with a gap on the south-west side, an inner segmented or causewayed ditch with a gap on the south-south-west, and a standing stone. The ditches probably held timber fences or small posts. The concentricity of the ditches, and the rough alignment of entrance gaps giving the structure a south-west to north-east axis, suggest these elements were constructed in relation to one another although not necessarily at the same time. It is probable a mound entirely covered the cist and perhaps part or all of the enclosing fences, although we know neither the scale or temporality of that development, nor the number of phases that a such a mound might have gone through. Mound building episodes may have been prompted by successive internal burials. The mound, if made only from material dug out from the ditches, was probably relatively low (and so more vulnerable to post-medieval ploughing). It is also possible that initially this monument had a living tree within its interior or was constructed around the hollow left by a cleared or fallen tree.

The outer ditch defined a space with diameter 18m, which accords in scale with Henges 1 and 2 (with maximum internal diameters of 22m and 17m respectively). However, the boundary was of an entirely different character from those massive (and later) earthworks. This monument also appears to have been marked out by two circles of posts which were up to 0.3m in girth and, given a maximum ditch depth of *c* 0.75m, perhaps between 2.5m and 3.0m in overall length, 1.8m to 2.3m of that above ground. (These figures do not consider truncation.) Posts were packed with stones and set against the inner face of the ditches that were, in effect, construction trenches. It is unknown if they formed a solid fence or were free-standing posts. The spacing of the posts is unclear but they may have been up to 2m apart. It is possible lighter timber elements such as crossbeams ran between each post, which would have added stability to the structure. Botanical evidence produced little charcoal to suggest what wood type(s) were used for these boundaries, so we must conclude post-charring and fence-burning did not occur. As no postpipes or decay cones were identified, it seems probable that the posts were removed before they rotted although the slot-based excavation methodology may have missed evidence to contradict this assertion. It is also possible that the timber element of this monument would have been the internal framework for an earthen mound, a less elaborate version of the nearby North Mains barrow (Barclay 2003).

The external south-west entrance gap was marked by a timber post on one side, and a standing stone on the other. It is tempting to see this large boulder as a glacial erratic erected where it was found, as was shown to be the case for the Cuckoo Stone at Stonehenge (Parker Pearson 2012, 147–50). Just outside this entrance was large Pit 5026, which may have partially blocked this gap at some point, although we do not know the relative sequence of pit and ditch digging.

The inner ditch, at first glance more segmented than the outer, may only have had one gap, on the south-south-west side; other, smaller gaps probably indicate segmented construction (a common Neolithic style). Together these entrances would have presented a staggered journey into the interior of the monument. The ditch segment on the south-west side of the entrance gap contained charred oak and provided the only date for the ring-ditch boundary, in the late Neolithic. Evidence for a fence or post-setting here is less convincing than for the outer ditch, but there are indications that a lighter fence once stood here, again propped up against the inner face of the ditch. We cannot rule out the possibility that this internal element of the monument was a circuit of ditches or extended pits, defining the central space, 'simply holes dug for some ritual or ceremonial purpose' as Atkinson *et al* (1951, 15) put it in relation to the similar Site I at Dorchester-on-Thames.

The chronology of this monument is far from secure but our working hypothesis is that initial construction of the ring-ditch appears to have been in the late Neolithic, but the internal burials do not all belong to this period. The double cist with at least one inhumation may date to the same time as monument construction but the cist extension and associated cremation deposit, and the Beaker pit burial, belong to the Beaker period. The monument was likely mounded – a barrow – for most of its use-life and perhaps the earliest component of what became a barrow/cairn cemetery towards the end of the 3rd millennium BC (section 8.7).

There are few parallels for this double segmented ring-ditch, or non-megalithic round barrows of Neolithic date, in northern Britain either extant or in the cropmark record (cf Kinnes 1979; 1986, 40). Pitnacree, Strath Tay, is a Neolithic round barrow although a monument of an entirely difference scale and trajectory to the Forteviot ring-ditch (Coles and Simpson 1965). North Mains barrow, in the Earn Valley, is again larger, as well as being definitively later in date (Barclay 1984), but the internal wooden structure of this mound indicates a possible role for the timber element of the Forteviot ring-ditch. *Single* penannular ditch enclosures of similar size are ubiquitous in the cropmark record, although representing a wide range of dates and functions: excavated examples such as the cremation cemetery at the aforementioned Balneaves Cottage (Russell-White *et al* 1992) may have looked rather like the Forteviot example when mounded over but development and use were very different. A single-ditch penannular enclosure of similar size (22m across) in close association with a standing stone has been identified at nearby Haugh of Aberuthven (aka Belhie) as a cropmark (Figure 2.12) The ditch of this monument has a segmented appearance and might be interpreted as a ploughed-out barrow (Harding and Lee 1987, 404–5) of unknown date. Other penannular and mini-henge cropmark sites here (Ralston 1988) indicate this is a cemetery contemporary in use with Forteviot, but without the earlier timber monumentality evident.

Late Neolithic multiple ring-ditches and barrows are a more common phenomenon in England and Wales (eg Kinnes 1979; Harding 1996). As with Forteviot, such monuments often survive, and are reused, into the Beaker period; they rarely stood in isolation. However, unlike Forteviot, there seems to be an

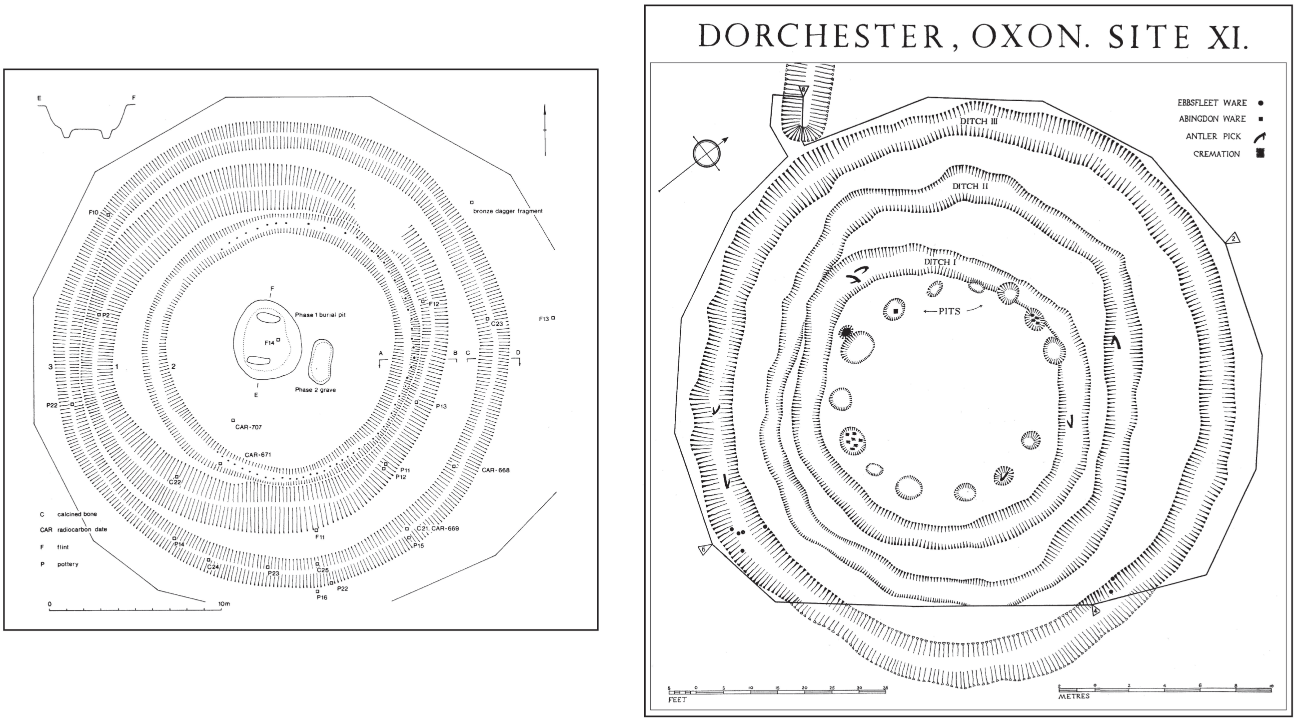


Figure 7.25 Possible parallel sites: (a) Four Crosses site 5 (from Warrilow *et al* 1986); (b) Dorchester-on-Thames Site XI (from Atkinson *et al* 1951)

Impressed Ware connection. For instance, at the extensive early Bronze Age barrow cemetery at Four Crosses, Powys, a complex of some 27 ring-ditches and barrows set in a roughly linear cemetery have been identified as cropmarks and during developer-funded excavations (Havard *et al* 2017). One of these monuments was late Neolithic in origin, a ploughed-flat multi-period ring-ditch known as Site 5 (Warrilow *et al* 1986, 63ff). This monument started its life in the Neolithic period with the central grave pit dated to just before 3000 cal BC set within an elliptical ring-ditch measuring 20.17m by 20.50m across (Figure 7.25a), associated with Impressed Ware pottery (*ibid*, 81–3). The internal pit burial was rectangular and contained decayed human bone and the body 'shadow' of an adult crouched inhumation, alongside a flattened round-bottomed bowl and cattle jawbone. Two slots in the grave pit may have contained other inhumations (*ibid*, 64). Subsequently, additional ditches were added, a Beaker-period burial with jet button inserted into a pit off-centre, and Beaker sherds placed into the ditches.

The large monument cropmark complex at Dorchester-on-Thames, apparently focused on an early Neolithic cursus monument, includes multiple ring-ditches, segmented-ditch enclosures, and ploughed-out barrows, some of which could be viewed as similar in nature to the Forteviot ring-ditch (Atkinson *et al* 1951; Bradley and Chambers 1988; Whittle *et al* 1992). The few circular burial monuments that date to the Neolithic have complex sequences of alteration and reuse (summarised in Whittle *et al* 1992, 196, tables 11 and 12). Sites II and XI belong to the Neolithic phase of the complex, perhaps originating around the same time as Four Crosses Site 5; both were triple-ditched enclosures, with no entrance gaps evident, associated with Impressed Ware sherds recovered from primary ditch fills (*ibid*, 196; Atkinson *et al* 1951, 60–2). The ditches represented different phases of construction (Bradley and Chambers 1988, 278; Figure 7.25b) and both were probably mounded burial monuments, site II at least being associated with cremation deposits (Whittle *et al* 1992, 197; Noble and Brophy 2017, 15). Site I is also a double-ditched enclosure that likely dates to later in the Neolithic. This includes an inner penannular ditch defined by elongate pits enclosing an area 12m in diameter with a gap on the west side, situated within a larger oval ring-ditch (Atkinson *et al* 1951, 8–9). The internal segmented-ditch enclosure was associated with round-bottomed Neolithic pottery, undecorated Beaker sherds, a *petit tranchet* flint arrowhead, and an antler pick (*ibid*, 9). The excavators were unclear on the chronological relationship between the ditches, but suggested they shared an orientation (*ibid*). Cremated remains and inhumation burials were found within the interior, including late Neolithic cremation deposits associated with bone pins (Whittle *et al* 1992, 196).

7.4.2 The triple cist and Beaker pit

The possibility that the ring-ditch enclosure was constructed around a tree throw (or living tree) is intriguing and very much in character with the way trees appear to have related to monumentality at Forteviot in the late Neolithic. This significant connection was augmented by using the place where the tree throw was located for construction of an unusual segmented compartment cist.

This stone structure consisted of two coherent boxes (the central and northern compartments) which share enough similarities – and two side slabs – to be considered contemporary with one another. The limited evidence available suggests the central compartment had a crouched inhumation burial placed within, although the identification of the body stain is far from conclusive. No grave goods were found in this compartment; the simple flint knife was recovered

Figure 7.26 The double cist found at Meldon Bridge (from Speak and Burgess 2000, 33, illus 19)

from the northern compartment but no evidence was found for a primary burial in that area of the cist. The southernmost compartment is barely a cist, either due to later disturbance and robbing, or perhaps it was a crude attempt to form a cist using existing slabs. The single radiocarbon date from a fragment of cremated bone found in this compartment suggests a burial was placed here, perhaps later disturbed. A third scenario, that this was the socket for a grave marker with associated token cremation deposit, cannot be ruled out, similar to the monolith at the North Grave, Cairnpapple (Piggott 1948).

Double cists are rare enough, and there are no known parallels in Scotland for the apparent triple cist at Forteviot. Those that are known are certainly, or probably, Bronze Age. Perhaps most pertinent here is the heavily disturbed double cist excavated within Meldon Bridge palisaded enclosure (Speak and Burgess 2000, 30). Cist P12 was found beneath a Roman road and appears to have been robbed and badly disturbed during construction of that feature; later quarrying and ploughing caused further damage. The cist was defined by sandstone slabs of similar size to those at Forteviot (up to 0.60m long, 0.35m wide, 0.18m thick) and, as with Forteviot, chocking stones were utilised to fill in gaps in the cist sides (Figure 7.26). The cists seem to have shared a central slab; internally, no body was found but a flint slug knife (like that found in the Forteviot cist) and D-shaped perforated jet pendant were recovered. The excavators suggested the Roman road builders had made off with the rest of the jet necklace and left behind a 'rim fragment of glass unguent bottle' (*ibid*). The structure of this cist was in total 1.0m by 0.8m, set within a larger pit that was up to 0.4m deep, slightly smaller than the Forteviot example. Remnants of a smashed Food Vessel nearby were speculated by the excavators to have been cast aside from the cist although this cannot be proved (*ibid*, 33).

A double cist burial of Bronze Age date but on a much smaller scale was found during SERF Project excavations at Cranberry in 2016. Here, plough damage and water action had denuded the cist elements, with slab fragments defining two similarly sized shallow square boxes measuring approximately 0.4 across. The size of these compartment suggests that they could only ever have held cremated remains and indeed a small quantity of burnt bone was recovered from one half of this structure (SERF2, section 5.2).

Other discoveries in northern Britain were made much earlier, and are less-well understood. Coles (1902) assisted in the recovery of two complete Food Vessels from a double cist found during construction of Succoth Place, Edinburgh, in 1901. Here, the primary cist had overall dimensions of 1.0m long by 0.6m wide, and was 0.5m deep, while the secondary was slightly smaller; they shared a central slab, and all stonework was local sandstone (Figure 7.27). A double-compartment cist, luted with clay, was found at the centre of West Mains of Auchterhouse cairn, Angus, in 1887 and found to contain 'piles of bones', a cremation burial, and a Bronze dagger (Hutcheson 1898). A rather more unusual variant on the double-cist form was identified during investigations of a natural mound at Pitmilly Law, Fife in 1868 (Skinner 1869). Several cists were found by 'two labourers in full digging panoply' (*ibid*, 56), including a pair of cists set one atop the other. This structure contained no finds or bones, and both compartments were long and shallow, so presumably later prehistoric.

Several examples of double cists have been identified in Ireland (eg Waddell 1990, 75, 87, 105, 117, 141). Glover (1975) reported on the discovery and excavation of such a 'segmented cist' at Kinkit Townland, near Strabane, County Tyrone. Found during farm improvement work in 1973, the cist consisted of two compartments defined by seven slabs. One compartment measured 0.50m by 0.23m with depth 0.44m, the other 0.54m by 0.28m to 0.18m with depth 0.35m. Cremated bone associated with this deposit indicated two young adults were buried here, one in each half of the cist, and grave goods found included a 'broken bone needle and a V-perforated bone button' (*ibid*, 150). Such objects have been found in Bronze Age cist burials in Ireland in conjunction with, amongst other things, Food Vessels and plano-convex knives, and in one case, a jet necklace (*ibid*, 151). Both Waddell (1990) and Glover (1975) compiled information on other double-compartment cists in Ireland, the latter listing sixteen examples in total. Glover also divides these into three types: a single cist divided in two by the insertion of a central slab; two adjacent cists sharing a single central slab but being of different shape, size and/or orientation; and adjacent cists sharing a single central slab and having parallel sides 'like a ladder' (*ibid*, 152). The latter type describes the Forteviot example well. Where dating could be demonstrated, all were Bronze Age. A triple cist was investigated near Royal Oak, County Carlow, in 1884 (Vigurs 1889). Here, irregularly sized chambers were defined by a combination of granite and limestone, and these included cremated remains, an inhumation burial, and two pots.

One would imagine that the ladder-like arrangement of cists at Forteviot was covered by a capstone or capstones, but this may have been removed during modern farming activity, or not replaced after activity in the 1st millennium AD. Several large flat stones noted during the SERF Project lying outside the field on the nearby slope down to the Water of May could be contenders for the missing capstone. The linear groove and notch on a central cist slab were likely caused by plough damage, probably associated with modern farming.

The enclosure that surrounds the cist appears to be spatially related, although the order in which these components were constructed is unknown; the suspicion must be that the cist was either earlier, or closely contemporary with at least one boundary. If this boundary was the inner ditch, then this would place the cist in the late Neolithic, as was the case at the Four Crosses site. A mound may also have been constructed over this structure although in the end this offered little protection from being investigated by accident or design long after its construction.

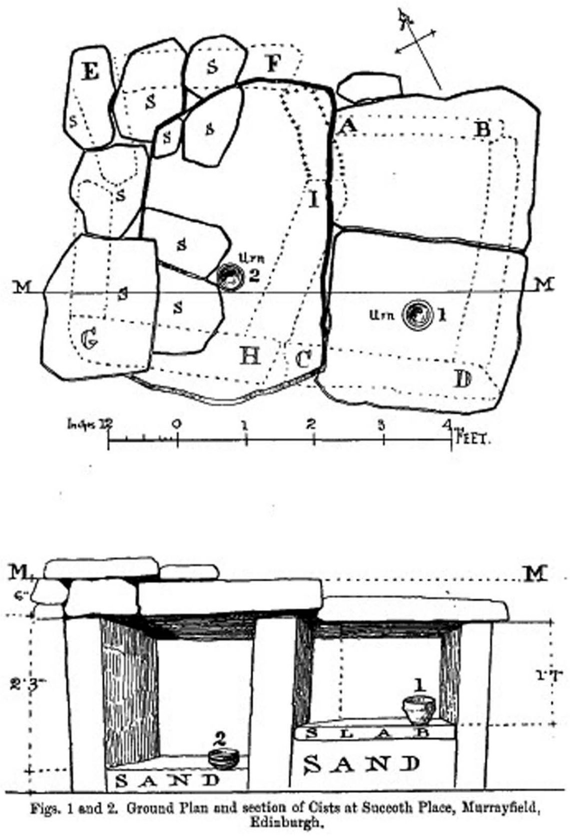
In this scenario, the Beaker pit burial was a secondary insertion into this monument, perhaps related to an expansion associated with the outer ditch, and/or a larger mound. The pit within which this Beaker was found would also suggest this, off-set from the centre of the ring-ditch. How this related to the potential cremation deposit, dated to the early Bronze Age, inserted into the southernmost cist extension is unclear, but again this was likely a secondary mortuary act spatially arranged close to an earlier double cist.

Burials accompanied by Beakers in pits are very rare in northern Britain, with one of the few examples having been found at East Beechwood Farm, Inverness, Highland, in advance of development (Suddaby and Sheridan 2007). In this instance, the undecorated Beaker was found crushed in an isolated shallow, flat-bottomed pit. It was found with a small plano-convex knife but no human remains or body stain was found. The east-west orientation of this pit allowed a funerary interpretation (*ibid*, 80). Pits of similar orientation with Beakers have also been found at Sorisdale, Coll, Argyll and Bute (Ritchie and Crawford 1978; Sheridan 2007), and dug into Biggar Common long barrow, South Lanarkshire (Johnston 1998). An undecorated Beaker found in a pit of non-funerary function was found at Boghead, Aberdeenshire (Burl 1985; Suddaby and Sheridan 2007, 83). In other words, the Forteviot discovery represents a rare example of the phenomenon of a Beaker pit burial.

Pits are the most common context for Beakers to be found in Ireland, although none is associated with a formal burial (Carlin 2018, 65ff, 120–2). Human remains have been found in pits with Beakers at various sites, but complete bodies are very rare, and the Beakers usually fragmentary. Carlin (*ibid*) suggests the most convincing pit-burial with Beaker connections is a crouched female inhumation in a partially stone-lined pit at Mell, County Louth; animal bones and two scrapers were also found in this grave (McQuade 2005). Here, the head was at the west, as was probably the case at Forteviot (section 7.3.5). No pot was found in this grave, but Carlin suggests that the proximity to a 'Beaker-associated occupation spread' indicates this burial was 'conducted by Beaker users aware of Beaker-associated burial practices in Northern Britain' (2018, 122).

The Beaker differs from the AOC Beakers which predominate elsewhere at Forteviot, which might have its own significance. The evidence we have for a corpse in this pit, and the possible insertion of a bier or wooden deposit beneath the body, hints at some of the ceremony surrounding this burial. Such a discovery is not unique, with a possible bier identified at the dagger-burial just 50m to the south within Henge 1

Figure 7.27 Succoth Place double cist (from Coles 1902, 671, figure 2)



(Chapter 5). The Beaker itself appears to have been broken before deposition, and may have had an interesting biography, indicated by a manufacturing flaw and the impression of a knapweed grain into the interior of the vessel. This rare discovery may have some significance in relation to the potter and/or the deceased, and the smashing of the pot appears to have happened close (in space and time) to the point of burial due to a lack of wear and abrasions on its surface and the relative completeness of the assemblage. It is possible, however, that the Beaker, like other features in this location, was damaged by the plough.

The insertion of a Beaker-period burial into this late Neolithic ring-ditch accords with the sequence of events elsewhere at Forteviot but does not represent the end of the story. At some point, perhaps over two millennia later, it appears the cist was opened or investigated. It is possible the structure was robbed or exposed in the early medieval period, the emptied cist being filled with material in an episode associated with the creation of Pit 5034 (SERF2, section 5.2). That pit, on the edge of the outer ditch of the ring-ditch, contained large quantities of charred barley and oats which were interpreted as pyre material: it produced similar middle 1st millennium AD dates to the carbonised material found within the cist. More generally, these dates are consistent with cremation, burning and depositional activity happening in the vicinity around this time (SERF2, chapter 5). The apparent deposition of burnt material in the cist (and the removal of prehistoric materials?) is in keeping with the apparently inquisitive nature of the early medieval inhabitants of this area, typified elsewhere with the digging of massive pits within the henges (SERF2, chapter 5). The power of this place seems to have endured long after its meaning had been forgotten.

7.5 Rare variants

As with other circular enclosures at Forteviot, the ring-ditch had a spatial association with the palisaded enclosure, contained funerary activity from the 3rd millennium BC, was altered architecturally over time, and was reused in the 1st millennium AD. Interestingly, the triple cist and Beaker pit indicate two rare variants on burial rites with few parallels, suggesting a tantalising set of practices that represent different groups with their own cultural traditions making their mark on this place.

It is also possible to see in this monument the kinds of mythologising that was going on at Forteviot – this was a place that was re-invented through reference to the past. The cist and ring-ditch were centred on the location of an old tree and/or hollow which itself might have been a place of deposition; the demise of this tree could also have been connected to the first clearance of this place, the advent of farming, and facilitating timber monumentality here. A glacial erratic that was lying on the surface, partially submerged, was perhaps erected where it lay, an offering from the land, with a form that could, from the right angle, be said to evoke an axe, again with woodland clearance connotations. An individual was buried here in a pit between the standing stone and the cist, adding to the genealogy of this location. Stories were spun and connections made through powerful social actions.

8

Forteviot in the age of transition

Kenneth Brophy and Gordon Noble

8.1 Introduction

How do we come to terms with the breadth, quantity, and quality of archaeological discoveries made across four productive excavation seasons at Forteviot? In reporting on the results of those excavations (Chapters 3–7) we outlined how we might understand *this place* in prehistory. The scope and ambition of the SERF Project has ensured that Forteviot is now one of the best-understood monument complexes in north-west Europe dating to the 3rd millennium BC, far removed from the low-key role that this site played in the literature before our fieldwork began. But what are the broader implications for *other*, contemporary places in northern Britain and beyond?

The broad narrative suggested by the evidence at Forteviot is not unique. It is a narrative about continuity of place, and cultural transition, in the periods that have traditionally been defined as the late Neolithic, Chalcolithic and early Bronze Age. The extended chronological sequence uncovered at Forteviot suggests that breaking down these temporal labels might be helpful; better to consider this as a place where at least fifty generations of people gathered, mourned, laboured, celebrated, and remembered. These people were acting out identities in a place that offered not only the reassurance of tradition, but also a place where social, cultural and ideological change could be enabled, played out, and perhaps contested. Our excavations suggest this was a place of both nostalgia and innovation, embodying the past and the future, a very human paradox that we can identify with today. Activity took many forms, which we crudely characterise as ritual, ceremony, the treatment of the dead, and deposition. Communal and private acts carried out according to set cultural rules, with a backdrop of monumental architecture and spaces to perform within and between. Monuments have been a big focus of our excavations; thousands of years ago these would have enabled the maintenance of power structures while also enacting social change. Table 8.1 summarises the main phases of activity and when they happened, according to our excavations at Forteviot between 2007 and 2010, and also offers a starting point for the broader discussion in this chapter.

The key to understanding continuity and change at Forteviot in the 3rd millennium BC is the bigger picture: the social, ideological and cultural changes that were evident across much larger geographical areas and played out on the ground in architecture, burial forms, ritual practice, and material culture. At Forteviot, these changing traditions were played out across time, but not necessarily applied wholesale. We were able to identify examples of a distinctive, local flavour to events. The evidence from Forteviot offers us only a partial snapshot into the lifeways of the monument builders and the dead; where they were living and farming is a discussion for another place, and another day (SERF3).

8.2 Origin story: early Neolithic Forteviot

One of the great transitions within prehistory was the arrival of farming – the start of the Neolithic – and the associated social change and package of novelties; in eastern Scotland this probably happened around the 38th century cal BC (Whittle *et al* 2011, 838–40). However, there is little evidence of anything happening at Forteviot that troubled the archaeological record during the first three-quarters of the 4th millennium,

Table 8.1 Summary sequence of monument construction and activity across the Forteviot monument complex

<table>
<tr><th>Century cal BC</th><th>Henge 1</th><th>Henge 2</th><th>Palisaded enclosure</th><th>Ring-ditch</th></tr>
<tr><td>31st</td><td>Standing stone?</td><td></td><td></td><td></td></tr>
<tr><td>30th</td><td>Cremation cemetery established</td><td></td><td></td><td></td></tr>
<tr><td>29th</td><td>Cremation cemetery in use</td><td></td><td></td><td></td></tr>
<tr><td>28th</td><td></td><td></td><td>Erection of palisaded enclosure boundary?</td><td>Standing stone erected?</td></tr>
<tr><td>27th</td><td rowspan="2">Timber circle construction</td><td rowspan="2">Timber post setting erected</td><td rowspan="2">Erection of palisaded enclosure boundary</td><td rowspan="2">Double cist set within ring-ditch</td></tr>
<tr><td>26th</td></tr>
<tr><td>25th</td><td>Henge earthwork construction</td><td>Henge earthwork construction</td><td rowspan="3">Gradual decline of the monument</td><td rowspan="2">Beaker burial</td></tr>
<tr><td>24th</td><td>Beaker deposition in henge ditches</td><td>Beaker deposition in remnants of features & post erection</td></tr>
<tr><td>23rd</td><td>Ditch depositional events</td><td>Ditch depositional events</td><td></td></tr>
<tr><td>22nd</td><td></td><td></td><td></td><td></td></tr>
<tr><td>21st</td><td>Cist with dagger-burial and cairn construction</td><td></td><td></td><td></td></tr>
<tr><td>20th</td><td>Burning turf event</td><td rowspan="2">Food Vessel burial / Henge conversion to barrow?</td><td></td><td rowspan="2">Third cist compartment added</td></tr>
<tr><td>19th</td><td></td><td></td></tr>
</table>

other than some sporadic pit digging and woodland clearance. There is little that distinguishes this location from any other at that time, with no hint of what was to come.

This contrasts sharply with locations upriver. At Wellhill and Cranberry, 4km upstream, SERF excavations in 2014–17 revealed evidence for ardmarks and possible field ditches in association with early Neolithic ceramics and pit-digging (Brophy and Wright forthcoming; SERF3). Wellhill seems to have been a place of significance in the early Neolithic, reusing a location already marked by the hollows of a Mesolithic pit-alignment, perhaps already cleared of trees (Brophy and Wright forthcoming; Figure 8.1). If anywhere was going to be the place to develop into a major ceremonial complex in the area, this should surely be it, with pit digging, deposition, and Mesolithic heritage all common factors in emergent Neolithic monument complexes. The Wellhill area did continue to develop, with Leadketty palisaded enclosure nearby, although activity at this location seems to have been associated with farming and settlement (SERF3).

Taken together with the cursus monument complex upriver around Crieff and Comrie (section 2.3.3), it appears that the attention of generations of early farmers living in the valley of the Earn was not on the area we now call Forteviot, which was a place of woodland, sporadic clearances and perhaps farmed areas, as well as a potential source of clay for making pots. However, the significance of this place was radically transformed at the end of the 4th, and beginning of the 3rd, millennium BC.

8.3 The cremation cemetery and the Grooved Ware complex

What was the catalyst for the emergence of the Forteviot monument complex? Perhaps it is as simple as the fact that this place had no significant past and was viewed as an appropriate place: a blank canvas upon which to create a history. This contrasts starkly with contemporary monument complexes across Britain and Ireland. We can see the tangible outcome of the decision to establish Forteviot in the form of the erection of at least one standing stone, and subsequent establishment of a cremation cemetery, around or just after the 30th century cal BC. The standing stone did not last long, but the cremation cemetery,

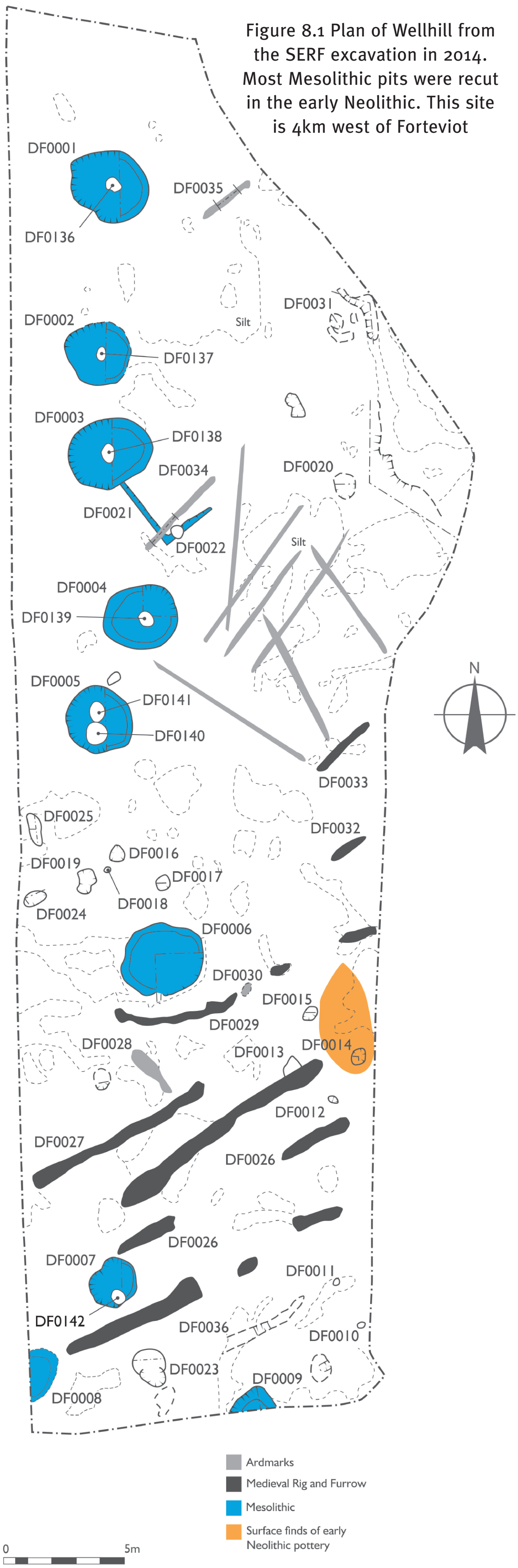


Figure 8.1 Plan of Wellhill from the SERF excavation in 2014. Most Mesolithic pits were recut in the early Neolithic. This site is 4km west of Forteviot

perhaps marked by a circular mound or platform, became an obsessive focus for generations to come (Figure 8.2).

Cremation cemeteries appear to be pivotal developments at many major ceremonial complexes of the late Neolithic in Britain and Ireland (eg Parker Pearson 2012; Noble and Brophy 2017). Yet these burial acts cannot be viewed in isolation, being just one tangible aspect of what has in recent years become known as the Grooved Ware complex (Thomas 2010). This term is used to denote a series of apparently related cultural, social, and material changes that happened across Britain and Ireland between the 31st to 29th centuries BC, marking the beginning of what is traditionally called the late Neolithic at around the time of the emergence of Grooved Ware pottery. Movement from essentially rectangular monument and house architecture to circular or oval forms is evident at this time (Bradley 2007, 94ff; Darvill 2016b). Four-post structures appear to have been a part of this new way of doing things, often found in association with Grooved Ware (Thomas 2010; Noble *et al* 2012; Brophy 2016); examples in the Earn valley include Green of Invermay, within 0.5km of the Forteviot complex (see Figure 1.8). Ray and Thomas (2018, 245–6) suggest Orcadian-style subrectangular house forms with internal furniture were another incarnation of this set of cultural practices.

Extreme monumentality (in terms of scale and resource-impact) became more commonplace in the final centuries of the Neolithic period as well, mostly in new timber post and earthwork forms. It has been argued that this represents the conspicuous consumption of labour (Darvill 2010, 163; see also Bradley 2007). Megalithic architecture changed also, with chambered cairns mostly blocked up, a new variant on the passage-grave form emerging in Orkney and Ireland (Jones 2008, 185), and standing stones becoming more common. It was also during this time that innovative mortuary practices emerged, notably single inhumation burials with grave goods beneath round and oval mounds in southern England and Yorkshire (*ibid*, 186; Kinnes 1979). Such discoveries remain rare and Cummings has suggested such burials were reserved for special individuals or children (2017, 192–3; Healy 2012, 149ff). Cremation cemeteries were also established within this cultural milieu, with increased instances of cremated remains being placed in secondary contexts related to older mounds and monuments (Cummings 2017, 193).

However, it is also the case that variability in house forms, material culture, and burial practices, suggest the Grooved Ware complex was not universally adopted (Thomas 2010; Barclay and Brophy 2020). Orkney, for instance, had its own trajectory in the late Neolithic when compared with eastern lowland Scotland or Yorkshire, even though overlapping practices do connect these places. (Ironically, there is evidence to suggest some of these practices emerged in Orkney in the late Neolithic: Thomas 2010; Ray and Thomas 2018, 242). No Grooved Ware was found at Forteviot although this ceramic style has rarely been found in association with cremation cemeteries elsewhere in Britain (see section 4.3). This suggests that both local and broader cultural traditions were feeding into practice and material culture developments in the later Neolithic.

This broader social and cultural context is the one within which we need to view Forteviot. Recently, a narrative has emerged suggesting that the late Neolithic in Britain was a period of increasing isolation from continental Europe (vander Linden 2012), as well as population (Bevan *et al* 2017; Olalde *et al* 2018) and farming decline (Stevens and Fuller 2012; Bishop 2015). Such narratives have led to a general conclusion that the first half of the 3rd millennium BC, when Forteviot rose to prominence, was a period of cultural conservatism, competitive monumentality, and the rise of cult activity, all perhaps indicative of an inward-looking society in decline or looking for a new form of identity. Yet does the evidence from Forteviot support such claims? In some senses, yes, but the lack of both settlement evidence and animal and human bone in eastern Britain during this time (the main sources of evidence driving late Neolithic decline theories) mean that is difficult to see how the Earn valley fits within this broader narrative. Forteviot could equally be read as evidence of a cohesive, durable and dynamic cultural group, which suggests we should be cautious about generalising regarding a uniform 'British' late Neolithic (Barclay and Brophy 2020).

Returning to the local picture, why might the cremation cemetery at Forteviot have been such an enduring presence, aside from its association with socio-political change? Cremation appears to have been a powerful act for Neolithic communities, preserved both in material form, but also, presumably, through oral tradition and shared community memory. Davies and Mates (2005, xvii) note the cremation process is 'rooted in beliefs drawn from myths and religious doctrines and ritually expressed in symbolic ways that give meaning to life and significance to human destiny'. Cremation as a practice is very effective at mediating the production and reproduction of social memory because of the dramatic and transformative process at its heart (Williams 2004, 5). Big fires and the visceral burning of loved ones would have

Figure 8.2 Visualisation by Alice Watterson of a Neolithic cremation ceremony taking place at Forteviot

Figure 8.3 Experimental creation of a 'flashbulb memory event': burning pyres as part of the Burning the Circle event on Arran in 2014 (photo: G MacGregor)

been potent aids to social memory, 'flashbulb memories' (Noble 2006; Brophy *et al* 2018) that are difficult to forget (Figure 8.3). Williams (2004, 21) has also argued that through the cremation process, mourners can create a new identity that can serve particular social and political concerns. This might involve selectively forgetting or erasing aspects of a deceased's life-history, and in the case of Forteviot, this may have enabled the community to move on from prior established traditions.

The recasting of identities and the manipulation of memory through the funerary process can be compared to the operation of oral memory in traditional societies. Goody and Watt (1963), for example, show how collective memory in oral tradition can be radically reshaped by changes in social, political and cultural context and is much more flexible and pliant than memories consigned to text. This is particularly true for genealogies in oral cultures which serve as mnemonics for systems of social relations governed primarily by present social concerns, acting as '"charters" of present social systems rather than as faithful historical records of times past' (Goody and Watt 1963, 310). This perhaps hints at the significance of the individuals whose remains were buried at Forteviot and their role in heralding new ways of doing things.

Cremation cemeteries in Britain tend to have had monumental associations, often situated within enclosures, or being enclosed; most went on to become major monument complexes or long-lived ceremonial and burial locations, such as Stonehenge, Dorchester-on-Thames, Llandygái, and Balfarg-Balbirnie (Noble and Brophy 2017). In most cases, monumental architecture appears to have been designed to accentuate the location of cremation burials, but also to contain and control access to that location. In several examples – as with Forteviot – this took the form of multiple phases of enclosure construction, 'wrapping' the dead (Croucher and Richards 2014).

This is evident with the construction of a henge bank at Stonehenge, for instance, thereby cutting off visual affordances towards stone settings and cremation burial spots within, and restricting physical access (Parker Pearson 2012, 309–10). A henge was also constructed in association with Neolithic cremation burials at Llandygái, one burial being placed in a pit and others in association with a circle of pits which may have once held timber planking; one feature here may have been an empty socket for a standing stone (Lynch and Musson 2001). Porous boundaries as opposed to solid banks are evident at other enclosed cremation cemeteries such as Forteviot (timber circle) and Cairnpapple Hill (a timber or stone circle). These marked the cemetery but did not remove it from view or necessarily stop access, although in both cases a henge was later constructed to change the character of these places (Barclay 1999b). The presence of charred planks at monuments containing cremation burials of Neolithic date such as Dorchester-on-Thames Site IV (as well as Llandygái) suggest variable forms of enclosure were appropriate (Atkinson *et al* 1951, 39; Lynch and Musson 2001, 51–3), and again an earthwork enclosure was a later addition to the monumental architecture at Dorchester-on-Thames.

The monumentality associated with – and following – the establishment of a cremation cemetery appears to reflect the transformative nature of that mortuary rite. This played itself out not only with the transformation of a place but also iconoclastic behaviour. At Forteviot the standing stone (or stone setting) that defined the cremation cemetery was (probably) broken, while the standing stones associated with the Cairnpapple and Llandygái cemeteries were removed. At other late Neolithic cremation cemeteries, changes to architectural elements were important transformative acts, often accompanied by the deposition of at least some of the cremation deposits. This was the case at Forteviot with the placement of cremated human remains around the broken standing stone stump. Similarly, a late Neolithic cremation burial in feature C14 at Woodhenge, Wiltshire, was inserted into a feature from which a standing stone had been removed (Parker Pearson *et al* 2013, 168–9). At Stonehenge, cremation deposits were placed in voids created by the removal of standing stones (Parker Pearson *et al* 2009).

The timber circles at Dorchester-on-Thames offer another variant. Gibson (1992) has argued that Sites IV, V and VI were timber circles in their early incarnations and that the timber uprights were transformed – perhaps pulled out and/or burnt – during the placement of cremated remains. Cremations were placed in the voids left by the removal of the uprights or found in the upper fills of postholes where the post had been destroyed by fire, as occurred at Site 3. Although the wood making up the monument at Site 3 showed signs of decay the radiocarbon dates suggest any use of this monument was perhaps not longer than a few generations, since the dates for 'primary' and 'secondary' use are similar (Whittle *et al* 1992, 170). Cummings has suggested that cremation remains were deposited strategically in relation to monuments in the late Neolithic in both primary and secondary contexts, 'a substance in the creation and use of monuments' (2017, 193), human remains being viewed as having magical qualities even in small quantities.

The transformation of the architecture of these monuments could be said to reflect the fleshed corpse's journey on the cremation pyre, underlining death as a ritualised transition (Hertz 1960). In this respect, the rituals and ceremonies conducted at these sites may have been focused on transforming the body and soul. Death is, of course, the ultimate *rite de passage* where the dead move through rites of separation, liminal periods of stasis, and finally rites of incorporation into a new identity and status (van Gennep 1960). The transformation and perhaps destruction of the architecture of some of the late Neolithic cremation cemetery monuments may have underlined death as a journey and a process. It may also have made the funeral ceremonies a more memorable event, similar to the destruction of *malangan* carvings at the end of funerary events in Papua New Guinea (Küchler 1987). In this way the destruction of the architectural elements may have been part of the 'technologies of remembrance' used by at least some late Neolithic communities to ensure the transformation of the dead into new identities as part of a memorable event in the history of the community (Jones 2003). Healy (2012, 150–1) has noted that most inhumation burials which date to the first half of the 3rd millennium BC in Britain are disarticulated and/or partial, another element of this death and dismantlement narrative.

Within the emergent socio-political context of the period leading up to 3000 cal BC, developments at Forteviot were timely and appropriate and seem to have marked out this place, by association with a specific group of people and innovative memorial practices, as one of the most significant centres of monumentality in Britain. A series of transformative monumental construction projects, and associated rites and communal effort, appear to have been catalysed by the establishment of the cremation cemetery, the material outcome of wider ideological and cultural change. This resonated for at least a millennium.

8.4 Remaking the woodland world in the late Neolithic

In the centuries after the establishment of the cremation cemetery, Forteviot became something of a building site, with the erection of scores of large oak posts marking the palisaded enclosure, then a timber circle, while other posts may also have been dragged here and erected in the place that became Henge 2. Monumentality on this scale ran parallel to the transformation of the landscape and native woodland, with oaks removed from the surrounding forest. As noted already, extreme acts of monumentality using oak posts were in keeping with activities at other locations in Britain and Ireland in the middle centuries of the 3rd millennium BC (Gibson 2002; 2005; Ray and Thomas 2018, 245ff). Forteviot was not even the only palisaded enclosure on this scale in the Earn valley (Noble and Brophy 2011b; Millican 2016a).

The timber monumentality evident at Forteviot, like other palisaded enclosures, would have entailed large-scale sourcing of oak trees from surrounding woodland, which would have had the effect of either thinning or clearing areas. The clearing of trees, whether deliberately or serendipitously, would have facilitated social gatherings, provided materials for monument and house construction, enabled practices that broke the ground (ploughing, pit digging) and broadened opportunities for depositional activity. These positive benefits must surely have outweighed the more problematic aspects of woodland clearance: the killing of ancient trees, a sacrifice that, Noble suggests, required reparation (2006, 97) (Figure 8.4). One such outcome might have been the re-erection of some posts, deposited in postholes, the woodland reborn (*ibid*; Brophy 2015, 199). Ray and Thomas (2018, 203) have called this a 'transformational choreography of woodland'. Consideration of woodland clearance in the Neolithic (eg Brown 1997; Moore 1997; Noble 2006; 2017; Tipping *et al* 2009) has tended to focus on the early centuries of the period when the land was being opened for farming. However, large-scale monumentality such as that seen at Forteviot suggests large-scale woodland management and clearance were also late Neolithic phenomena. The constant factor in Neolithic woodland clearance is that these trees were not merely regarded as building materials to be exploited or obstacles to be removed but had a significance and an afterlife that helped forge a particular kind of late Neolithic society and world view (Noble 2017).

As noted in section 3.5.1, the sourcing and movement of large oak trees would have been socially significant. It could be argued that one of the major reasons why huge oak posts (tree trunks essentially) were moved was to express an individual or

Figure 8.4 Visualisation by Alice Watterson of tree-dragging at Forteviot in the late Neolithic

community's wealth and influence, with as many people as possible encouraged to be involved (an argument made for megaliths by Parker Pearson (2012, 266–73)). It would be reasonable to argue that larger megaliths or big posts would have been moved by communities who were able to provide alcohol and food in return for people's labour (*ibid*, 267–8). In this respect, the actions surrounding the construction of massive monuments must have been a major element of the social significance and prestige of such places (Richards 2004; 2009). More broadly, trees were part of the living landscape and their incorporation into a cosmology that involved the enclosure of a place of the ancient dead would have been loaded with significance. It is also possible to see echoes, in the variable treatment of the posts at Forteviot and other palisaded enclosures, of the different means by which woodland was cleared (burning, felling, ring-barking, digging out), suggesting that there may well have been a concern with tree biography and the death of that tree in the life of the post. (Similar arguments have been made about early Neolithic timber cursus monuments: see Brophy 2015; Brophy and Millican 2015.) Posts and trees were also vulnerable to natural processes such as fire, lightning strikes, fungal infection, and damage by high winds.

There is nothing about the Forteviot timber monuments which suggests the 'expedient architecture' that Richards has proposed was evident at the roughly contemporary Ring of Brodgar stone circle (2013, 103–4). At Forteviot, posts were set into deep postholes and often charred to mitigate against the effects of damp soils to ensure they were stable for as long as possible; running repairs may also have been affected for some posts. Nonetheless, we should see these great timber circles in the same light as the great stone circles Richards (*ibid*) has written so evocatively about, for they belong to the same period and the same milieu, both in terms of the effort needed to source and erect uprights, but also the fundamental social significance of great enclosures as gathering places with connections to the places that the materials and labour came from.

Although late Neolithic monuments seem extreme in terms of labour requirements, Cummings (2017, 231) notes that if we view such building projects as being carried out over the course of extended periods rather than in one intense burst of effort, then the size of construction team, and expenditure of effort, becomes more manageable. A slow-architecture perspective shifts focus from large, multi-community collaborations with a 'project management group' or 'directing mind' in charge to smaller scale, perhaps less formal or ritualised spurts of activity at certain times of the year or at periodic intervals. Similarly, it has been argued by others that this was the basis upon which massive cursus monuments might have been constructed (Pryor *et al* 1985, 301; Loveday 2006; Brophy 2015).

It seems likely that even during the time that Forteviot, and similar places, were building sites they were also centres for ritualised actions, ceremony and deposition. While there may not have been risk assessments, building activity would surely have been governed by a set of rules which would ensure spiritual safety. We are used to the idea that the construction of more mundane structures such as houses can be a ritualised process through evidence from archaeology and ethnography (Parker Pearson and Richards 1997). This can take the character of foundation deposits in the construction of houses – for example the presence of animal or human burial under house floors in Iron Age structures from the Western Isles (eg Campbell 1992; Mulville *et al* 2012). At Forteviot, finds in general were very rare and none was suggestive of any form of basal or foundational deposit, but significant deposits have been found at other monuments of this type.

At Dunragit a stone axe was found in a posthole at the junction between the palisaded enclosure and an earlier cursus monument – a deposit which may have both marked the construction of the new monument and recognised the importance of the older structure (Thomas 2004, 103). At Meldon Bridge, finds related to the palisaded enclosure were also few, but several postholes contained extensive deposits of charred material, the most striking of which was post B03 which had over 0.3m of charred remains at the base of the posthole. The excavators saw this as an expedient disposal of waste material, but equally we could see these events as foundation or purification deposits within the postholes. Looking further afield, we can see the importance of foundation deposits at other palisaded enclosures across Europe. At an enclosure at Dösjebro, southern Sweden, for example, a monument of similar date and morphology to Forteviot, whole axes and fragments from axe-making were found deliberately placed in postholes of the timber monument, some of the deposits seemingly placed in organic bags or containers deposited during the placement of posts (Andersson *et al* 2004, 215). This may suggest that the construction of monuments of this type and the setting of the posts had a ritualised dimension and that acts of deposition were made amidst the labour of moving and erecting big posts. These were special places where special acts were played out.

8.5 Henge transformations

The next, and hugely significant, transition played out at Forteviot occurred around the middle of the 3rd millennium BC: the emergence of a cultural tradition that included metalworking technologies along with other materials and practices that appear to have originated from continental Europe. Recently, the term 'Chalcolithic' has been used to describe this period in Britain, generally regarded as the third quarter of the 3rd millennium, or the 25th to 23rd centuries cal BC (Sheridan 2008; Allen *et al* 2012; Heath 2012). This can be summarised as the period when Beakers and copper were in circulation, but before bronze arrived on the scene, and is a period marked by degrees of continuity and change. Significant developments in this period relate to burial practice, material culture, monumentality, and social organisation (Needham 2005; 2012). Characteristic new materials at this time include objects made from copper, gold and tin. Single inhumation burials were also relatively new developments; burial goods include Beaker pots, archery equipment (arrowheads, belt rings and wrist guards), and more rarely metal objects such as copper knives or gold objects (O'Connor 2004). These innovations belong to Needham's (2012, 9) proposed 'Pioneer phase' (2450–2300 cal BC). The origins of this change are hotly debated, with recent aDNA analysis

Figure 8.5 Reconstruction by David Simon of the henge group at Forteviot once each enclosure had been converted into a burial monument

Figure 8.6 Visualisation by Alice Watterson of a ceremony taking place amidst ruined and overgrown monuments

suggesting new populations brought these new things from continental Europe (Olalde *et al* 2018). A lack of uncarbonised bones at Forteviot, and therefore aDNA and isotope data, precludes our excavations from adding to this debate from a genetic viewpoint. However, the archaeological record indicates new monuments, materials, and cultural traditions appearing at Forteviot at this time over several generations in the middle of the 3rd millennium BC.

Despite these seemingly radical developments, late Neolithic monuments appear to have remained reference points. Palisaded enclosures, perhaps unsurprisingly, continued to act as arenas for activity into the second half of the 3rd millennium, even as they became ruinous. In northern Britain alone, early Bronze Age burials have been identified within the palisaded enclosures at Forteviot and Meldon Bridge, while ring-ditch barrows are situated just outside the Dunragit and Leadketty monuments. Another development associated with the second half of the 3rd millennium BC in eastern lowland Scotland was the construction of henges. Where dated, such monuments in mainland Scotland almost all belong to this period (Barclay 2005a; Bradley 2011; Younger 2015). Over the course of no more than half a dozen generations, the place we now call Forteviot was radically transformed, through a combination of reuse and iconoclasm of earlier cultural traditions (Figure 8.5). It is disappointing, therefore, that due to later modifications we were unable to shed light on activities that happened within Henges 1 and 2 at Forteviot at the time of, and in the decades after, their construction. Of course, it is possible that whatever happened within left no traces: Ray and Thomas (2018, 255) have suggested that henges created new spaces suitable for performance.

The earthworks of Henges 1 and 2 enclosed locations with a history: a cremation cemetery at the former, timber setting(s) at the latter. Here, the act of 'henging' effectively closed these locations and their ruins to easy visual and physical access (Brophy and Noble 2012b; Figure 8.6). Following the narrative that henges were constructed to contain *something* (Warner 2000; Barclay 2005a; Bradley 2011), we might consider that some traces of ancestral activity may have become problematic, but the continued use of these locations was even more important. Richards (2013) used the evocative concept of 'wrapping' to describe architectural processes surrounding taboo things and places in Britain's Neolithic and in Polynesia (Richards 2013; Croucher and Richards 2014). The time and cultural context of construction of the Forteviot henge group suggests the reuse of earlier sites may have been a means of re-establishing and reinforcing connections at a time of change. Tentatively, therefore, we would argue henging seems to have been a strategic response

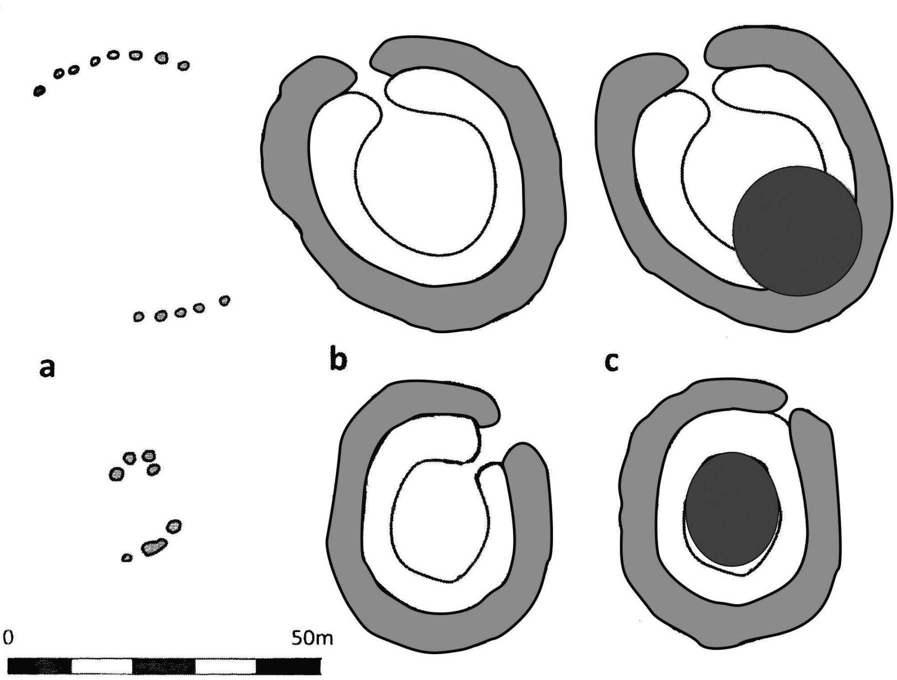


Figure 8.7 Putative sequence of henging, blocking and mounding at Forteviot (from Brophy and Noble 2012b, figure 8). Henge 1 (above); Henge 2 (below)

to social change at Forteviot, the material outcome of new traditions, and perhaps new people, in this locale.

Another material indicator of the 'Beakerisation' of these locations, which occurred in the middle of the 3rd millennium cal BC, was the deposition of Beaker sherds within key locations: in posthole hollows within Henge 2, and ditch terminals at Henges 1 and 2. None was deposited as a complete pot, nor were any associated with a burial. Recent reviews of Beaker pots and sherds found within Neolithic and Chalcolithic monument contexts demonstrate Forteviot is not unique in this respect (Wilkin 2011; 2016). Analysis of data from Scotland alone has shown Beakers found in association with nine hengiform earthworks (Wilkin 2016, 296ff; see Figure 6.18), while a single abraded sherd of Beaker of unknown form was found in the upper fill of the henge ditch at Cairnpapple (Barclay 1999b, 29–32; Wilkin 2016, 298–9). Fourteen sherds, some burned and abraded, from one Beaker (less than 25% of the complete vessel) were found within 'the topmost fill of [a] hollow formed by two rotted posts' at North Mains (quote from Wilkin 2016, 300–301, after Barclay 1984). These non-funerary deposits were interpreted by Wilkin as indicating community negotiation with the new cultural package of materials and the transfer of 'ritual knowledge' (*ibid*, 279–80). More widely this is an eastern British phenomenon, with Gibson (2012) noting, in a history of the study of henge monuments, recurring Beaker-henge associations, both funerary and non-funerary. Beaker sherds were recovered from the upper ditch fills at Milfield North henge, Northumberland (Harding 1981). Commonly abraded, these sherds may be, as was the case for Vessel 2 from Henge 1 at Forteviot, from pots that had been used before breakage and deposition.

The trajectory of henge transformation and the deposition of Beaker materials at Forteviot could be viewed as an ongoing negotiation of these spaces and access to them that played itself out over the second half of the 3rd millennium; the alterations made to these henges appear to show a staged process of adding safeguards to supplement whatever was intended through the initial henge construction. This strategy might explain not just Beaker deposition, but also the insertion of burials into the henge interiors, and the transformation of henges with the construction of mounds and cairns. At Henge 2, entrance into the monument interior also appears to have been stopped. It is as if no chances were being taken, with the process of wrapping compounded by completely shutting off any future access into – or out of – the henges (Figure 8.7). This narrative suggests closure was being sought, and finally achieved, with the apparent abandonment of the complex after the closure of Henge 2. But not before a series of unusual and extravagant burials were staged. In the absence of excavation we cannot be sure if the same sequence occurred at Henges 3 and 4.

8.6 Death returns to Forteviot: bronze, burials, and Needham's fission horizon

While the Chalcolithic was clearly an important horizon of change in British prehistory, full metalworking traditions and practices appear to be a characteristic only of the last few centuries of the millennium, the early Bronze Age (*c* 2200–1900 cal BC). Needham has characterised the earlier part of the Bronze Age as the 'fission period', where there was increased variety and occurrence of burials with Beakers and other grave goods (2005; 2012). These include artefact types that became widespread but show little relation to Continental traditions or styles such as Food Vessel pottery, an apparently insular tradition of early Bronze Age pottery that Gibson has suggested shared traits with Neolithic Impressed Wares (2015). Grave goods and burials in some areas, particularly Tayside and around the Great Glen, also become more elaborate in this period – with a small number of dagger-burials and burials with jet necklaces and other rich grave assemblages being a feature of the late 3rd millennium BC. Many of these material innovations are evident at Forteviot, with variations in early Bronze Age burial practice at Forteviot indicative of the enaction of a range of social and ideological changes. We shall look at the significance of the various burials found at Forteviot in turn.

The Forteviot dagger grave (Figure 8.8) is perhaps the clearest expression of early Bronze Age traditions at Forteviot, with various elements – notably the Masterton flat dagger and the fire-making kit – classic grave goods of the early Bronze Age (Needham 2005). Falling late in the Forteviot sequence, towards the end of the 3rd millennium, it would seem to have been a significant statement of the continued sanctity and significance of this complex for Bronze Age groups in the Earn valley. The strategic location of the cairn suggests mourning was not the only motivation for the burial of this, probably older, male. As Brück (2004b, 326) has observed, 'death requires the recasting of a world temporarily thrown into disarray. Early Bronze Age funerals could have therefore been enterprises in world-building – strategic representations of identity, purpose and place'; this could play itself out with local, and regional, significance. Clearly, the location was loaded with significance, set within, and cutting into the fabric of, an earlier henge earthwork; such 'slighting' is also evident at Cairnpapple Hill (Piggott 1948; Barclay 1999b). The labour-intensive creation of the cairn included 'cairning' (the megalithic version of 'mounding') of at least part of the henge interior, thus putting this area beyond use. This happened within metres of the ancient founding cremation cemetery, which itself may still have been marked at that time by a low mound; the cairn perhaps also overlapped this feature.

The creation of the dagger-burial and cairn occurred during the floruit of bronze working in Scotland's north-east, the so-called Migdale-Marnoch 'sunburst' of true

Figure 8.8 Alice Watterson's visualisation of the dagger grave at Forteviot during the burial ceremony

bronze metallurgy (Needham 2004). During this period, extensive networks developed that involved the flow of objects, materials, and probably some people, across Britain, Ireland, and beyond. These were networks to which people at Forteviot were evidently connected. In the same period dagger-burials had their greatest currency, the main concentration of examples in northern Britain being found in eastern Scotland (Wilkin 2009; Figure 5.45). Yet this was not the area that was most directly involved in bronze working at that time – that was the north-east where the distribution of moulds for early Migdale-Marnoch object types is heavily focused (Needham 2004, 224, 235). Social groups in this region appear to have monopolised metalworking skills and raw materials in the early centuries of the true bronze-working tradition. This is particularly intriguing given that the raw materials were most probably sourced in south-west Ireland (copper) and south-west England (tin), but the importance of this area may have been due to the early impact of Beaker traditions in this area (*ibid*, 235–6). While the north-east was an important origin point for early bronze working, few of the early bronze objects are found in this region – rather they are generally found in areas without evidence for production (*ibid*, 238). The 'richest' areas include the head of the Great Glen and central Scotland. These two areas have been termed 'flow control zones' by Needham (*ibid*, 241), who suggests individuals in these areas may have acquired status through control of the flow of tin and copper to metalworking centres located to the north and east. Is this how the individual buried at Forteviot achieved status in society, and how the community acquired the materials deposited with the dead? Needham also suggests that the practice of honouring senior males through 'dagger graves' probably spread from southern England northwards and may have been linked with the establishment of the tin supply from the south-west to the north of Britain.

Other nuances are possible, hinted at by the non-metallurgical materials that fortuitously survived in the cist, suggesting personal qualities beyond status. For instance, it has been argued, based on funerary associations, that fire-making may have been an important task given to older men with limited mobility (Nieszery 1992, 368; Teather and Chamberlain 2016, 200). The presence of a fire-making kit is not in itself unusual (these are almost always found in funerary contexts and associated with males from this period) but it suggests that this may have been an individual whom mourners wanted to continue to care for after death (Teather and Chamberlain 2016, 202). The willow bowl in the grave may have contained sustenance for this journey beyond life, while the flowers buried with this person suggest tenderness and emotion at the graveside (or perhaps just a desire to mask the smell of decomposition). The suite of organics found with the dagger-burial suggest this (probable) man had a medical/healing role within his community, or he suffered from ill health (Telford 2019). The small knife could have been associated with acts of sacrifice, indicating a connection with some kind of spiritual power. Such traits may have been part and parcel of a Bronze Age warrior chief's life and role but they tend to get lost amongst discussions of power and weaponry. The possible birch bark bier points to a ceremonial and public journey to the grave, one that could support both a warrior/leader or shaman narrative.

A very different strategy was adopted for the burial found within Henge 2. This appears to have been a young woman who was cremated and her remains carefully collected for placement in a small improvised cist near the centre of the enclosure. (It is possible a Beaker burial preceded this burial in a more central location, only to be removed by early medieval intervention.) We found no direct evidence for a mound here, although it seems probable that this cist was either covered in mound material, or was a secondary insertion into a pre-existing mound. The difference between these two burials – both within henges and within 200m of one another – is stark. Unlike the dagger-burial, which was explicitly of its time, the cremated young woman seems more timeless, going to her grave with less extravagance and fewer cultural touchstones buried with her. There is no association with the ancestral or founding cremation cemetery, but the abraded Beaker sherd hints at a material connection to the past, and the fine Food Vessel in this burial suggests localised ceramic traditions and maybe a different cultural affiliation. Perhaps significantly, the dagger-burial was within the palisaded enclosure, the small cist cremation outside its boundary. It is interesting to note that as far as we can tell, in the early Bronze Age men were buried within the boundary of palisaded enclosures, while women were interred outside. A further burial in a secondary context outside the palisaded enclosure, again in association with an earlier burial, is the Beaker pit grave within the ring-ditch. This unusual burial, however, fits in with the overall trajectory evident elsewhere at Forteviot: situated in a location with an ancient heritage, subject to the processes of enclosing, burial, closure, and possibly mounding, representative of a specific ideology played out in a sacred place. The secondary use of the triple cist may be another indicator of this phenomenon.

8.7 A remarkable choreography

The details of each individual site biography at Forteviot are important, but we must also consider the relationships of these monuments to one another, and their setting. Such monument complexes, straddling the 4th and 3rd millennia BC, usually consisting of multiple enclosures and mortuary foci, have been recognised for well over a century. Dorchester-on-Thames was one of the first monument complexes intensively and cohesively studied by excavation (in advance of quarrying: Atkinson *et al* 1951). Recognition that certain places attracted multiple monuments over extended periods of time is reflected in the development of terminology such as 'monument complex', 'sacred geography' and 'clusters'. As well as monumentality, these were places that attracted deposition and burial. Earlier monuments and activities influenced what came later, while architectural and material culture changes reflected broader social and ideological trends. Such extensive complexes are usually located along river valleys, thus requiring the sacrifice of good-quality farmland. These were pre-eminent centres of social and religious power in the Neolithic and beyond, often having an enduring presence in the landscape.

The study of such monument complexes is indebted to seminal fieldwork and analysis undertaken around the Dorset Cursus on Cranborne Chase, Dorset (Barrett *et al* 1991). Aside from spatial and chronological connections between multiple monuments, a series of tropes for the study of such complexes was established: alignments and intervisibility between monuments and topography; embellishment and emulation between monuments and landscape features; and the architectural incorporation of possible astronomical phenomena (Bradley 1993). The how and why of the emergence and resilience of such monument complexes, and relationships suggested between people, materials, and the land, are significant themes that have underpinned the SERF Project as well as major recent fieldwork campaigns including the *Stonehenge Riverside Project* (Parker Pearson *et al* 2008) and Harding's work at Thornborough (2013).

Forteviot in the 3rd millennium was more than the sum of its parts. Established as a place of note through cremation practices and small-scale construction acts around or just after the 30th century cal BC, this complex grew over a millennium. The dynamic of the development of this monument complex appear contradictory: earlier monuments were memorialised, but access to them was often restricted. Nesting and closing down of space is suggested by the construction of enclosures over several centuries: the palisaded enclosure, timber circles, the ring-ditch, four classic henge monuments, and at least one mini-henge. The massive timber enclosure had an especially significant impact, with a location outside, or inside, its boundary, of particular import. Palisaded enclosures appear to have been 'monument magnets', with various examples replete with associated internal and satellite monuments and enclosures, from West Kennett, to Hindwell, to Dunragit (cf Gibson 2002): such monuments did not exist in isolation.

The accumulation of henge monuments at Forteviot is especially noteworthy. Only one complex in Britain has more classic henge monuments, the Milfield Basin (Harding 1981; Waddington 1999), and here the nine sites are much more widely spaced (mean distance apart at Milfield is 1.09km, as opposed to less than 0.20km at Forteviot (after Harding and Lee 1987, 44, recalculated to include Henge 4)). The Forteviot henge monuments, two excavated henges (Henges 1 and 2) and two known only as cropmarks (Henges 3 and 4) are remarkably uniform, being of roughly the same size and varying from subcircular to oval in plan. There are variations, however, in the number of entrances: Henges 1 and 2 had one (Class 1 henges), Henges 3 and 4 two (Class 2). It is likely that all four locations were in use, and retained significant, for centuries, if not longer; henge monuments are typically defined by their earthwork element and yet this is usually just one phase of the use of a location (Younger 2015; 2016a).

How did these henges relate to one another? We know that the earthwork phases of Henges 1 and 2 were roughly contemporary, but at the time of construction they were separated by the remnants of the palisaded enclosure boundary. Moving between these monuments would have involved a circuitous route, perhaps along the avenue. Henges 2 to 4 do not appear to have any encumbrances between them although they are not arranged in a way that suggests an obvious spatial logic. At Milfield the henges are thought to have been part of a processional routeway (in places marked by an avenue) (Waddington 1999). Three Class 2A henges (two entrances, two ditches) at Thornborough were also arranged in a line, Harding suggesting they may have been thus arranged to mirror the star arrangement forming Orion's Belt (Harding *et al* 2006). Harding (2013, 195) has also noted the

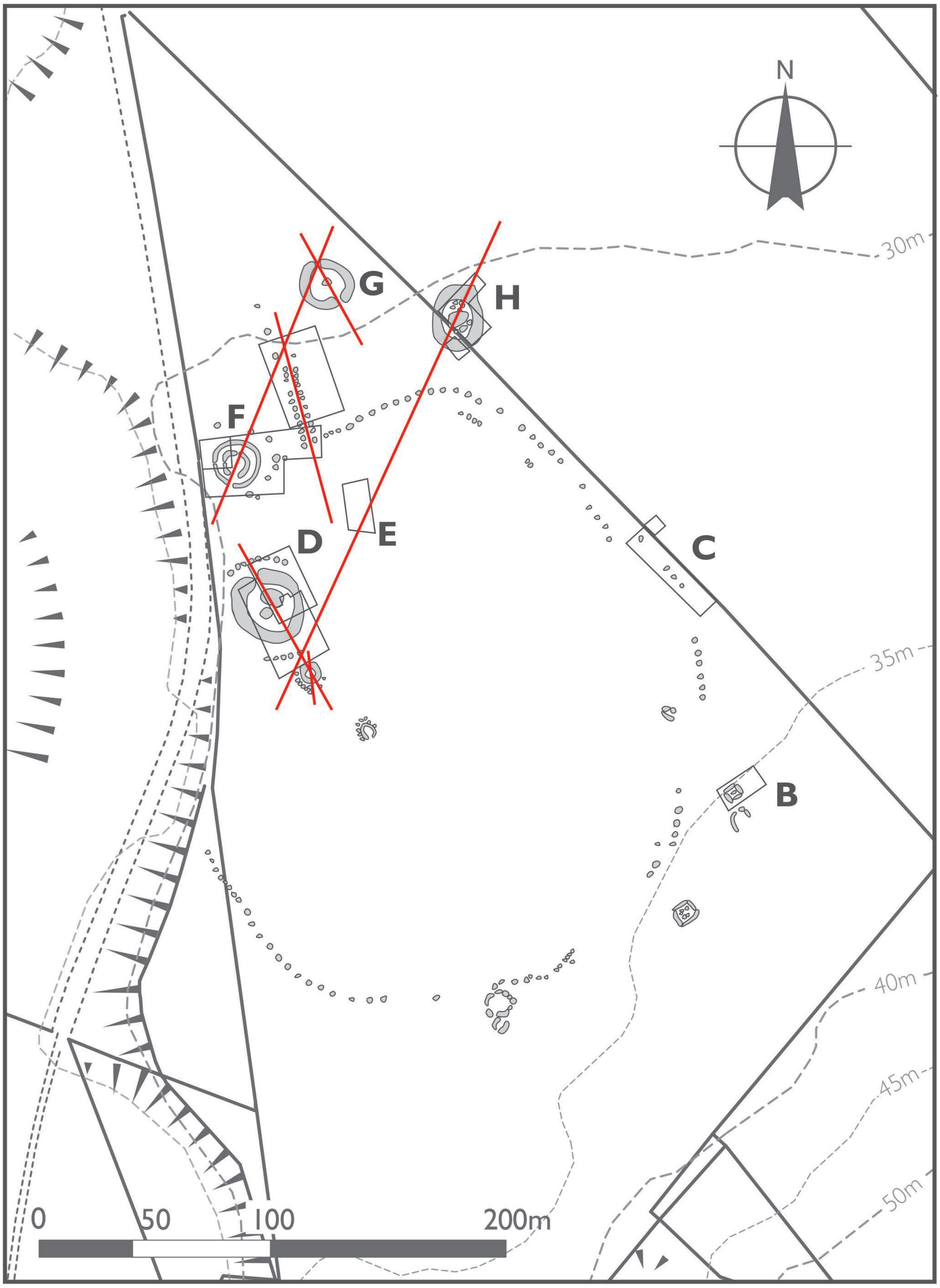


Figure 8.9 Alignments within the Forteviot complex. The red lines follow the axial orientation of Henges 1–3, the ring-ditch, and the palisaded enclosure avenue. Henge 4, to the north of the area shown, had a near north-south axis. The excavation areas and trench letters are also shown

obvious routeway that these henges and their aligned entrances suggests. No such arrangement is evident at Forteviot. We have no precise sense of the lie of the land at Forteviot at the time of this monumentality either; it is possible trees were dotted around and within the monuments, and partitions, fences and other surface obstructions may have broken up the space in ways that we cannot appreciate. We should not assume that any of the enclosures in this complex were clearly visible, or accessible in a straight line, from one another, but they do appear to be arranged in relation to one another in at least one respect – through their orientation.

Each henge has a relatively similarly orientated long axis (Figure 8.9), all within the north-west/north to south-east/east sector, with Henge 4 and Henge 2 aligned closer to north to south. The cists within Henge 1 and the ring-ditch had a north-south long axis. All four henges have an entrance on the northern side. Studies of the significance of henge alignment are uncommon. Harding and Lee (1987, 35–7) suggested henge entrances may have facilitated framing of, and aligning on, astronomical events and landscape features. They note that Class 1 classic henges most commonly align in the north to north-east sector (not the case at Forteviot) and Class 2 classic henges tend towards south/south-south-east to north-west/west-north-west axes, to which the Forteviot examples adhere. Henge orientations appear in some cases to relate to topography. The long axis of some Class 2 henges has been associated with the alignment of nearby Roman roads by Loveday (1998) using the argument that henges and Roman roads utilised the same sort of routeways in the landscape. However, while the Class 2 henges at Forteviot (3 and 4) are located just 400m to the south of the Roman road that runs along the Gask Ridge, the road has an axis almost perpendicular to the henges. Richards' (1996) suggestion that henge orientations tend to run parallel to rivers and/or river valleys does not work entirely at Forteviot either, although all the henges align towards the Earn to the north and the nearby Water of May tributary does flow northwards.

Wainwright (1989, 165–6), and Harding (2003, 45) note possible general alignments on solar events amongst henges. We have not undertaken a detailed analysis of the Forteviot henge alignments, but no obvious patterns are evident. Looking to the north might indicate a connection with a lunar standstill event (Thom 1971), while the north-west orientation could align towards the midsummer sunset. The opposite south-east focus is redolent of widespread prehistoric interests in the midwinter sunrise (Oswald 1997), although only Henge 3 has an entrance looking in this direction. North-east alignments could suggest another midsummer solstice connection, but this alignment is avoided completely at Forteviot except for the late Neolithic ring-ditch. The contrasting orientation of this circular monument with the later henges could find a parallel in the shifting axis of astronomical significance in the 3rd millennium BC that has been suggested for both Croft Moraig stone setting (Bradley and Sheridan 2005), and across the Dorchester-on-Thames monument complex (Bradley and Chambers 1988).

Perhaps the explanation for the common henge orientation at Forteviot lies in history and setting. The repeated north to north-western focus of the henges appears to have been encoded by earlier architecture. The avenue runs outwards from the palisaded enclosure in a north-north-west direction, and as noted in section 3.5.2, this structure joined the northern boundary at a peculiar angle in order to create this alignment. Given the apparent longevity of this monument within the landscape, it is not a huge leap to suggest this influenced later activities in the vicinity. Henge 1 has the same axis as the nearby avenue, and the avenue itself aligns on a cropmark of another ring-ditch, perhaps a fifth henge (Figure 1.5). Palisaded enclosure avenue alignments have generally been considered significant in terms of the interior, not exterior of the monument (eg Gibson 2002; 2004). Looking along the 'gunsight entrance' (after Thomas 2015, 156) from inside the enclosure or avenue *outwards* to the north would have allowed the narrow framing of a view of the Gask Ridge and Perthshire mountains beyond, peaks also visible from the henges (section 2.2.1; Weston 2007, 210). Associations with henge orientation and mountains/local prominent hills has also been identified at Milfield North (Harding 1981, 131), although in these cases the topography to the south was generally flat; this is not the case at Forteviot where more hills, the Ochils, are situated to the south. Croft Moraig is a more local parallel of a Bronze Age monument with a mountain association, in this case Schiehallion (Bradley and Sheridan 2005, 274). It is also possible these monuments are aligned towards the River Earn and its fording point. This has been argued to be the case for entrances at the Mount Pleasant mega-henge, an alignment which may have drawn on 'the importance of arrival or departure by the river or across the ford' (Greaney *et al* 2020; see also Wainwright 1979).

The agglomeration of monuments continued to expand through time, with old elements reworked into mounds and barrows. Henges 3 and 4 might have been converted into burial monuments, as was the case at Henges 1 and 2. Multiple ring-ditches within and to the north of the palisaded enclosure hint at further burial monuments (although it is possible some of these may be part of the Pictish cemetery (SERF2, chapter 4)). The Mijas cairn, whose height to width ratio suggests it is more likely to be Neolithic than Bronze Age (Barclay 1999a, 123–4) should not be forgotten in this context. Forteviot appears to have become an extended barrow cemetery towards the end of the 3rd millennium BC. It is not clear how movement and visibility were maintained between these burial monuments, and by this time the palisaded enclosure and henges would have been somewhat denuded. The continued reworking of this place, and associations made with the land, and perhaps the sky, suggest that ancient places retained a tangible, and perhaps spiritual, relevance.

8.8 The end of the age of sacred landscapes

In his popular book about Bronze Age Britain, Parker Pearson (2005, 84–5) breaks the late Neolithic and early Bronze Age down into a series of 'Ages', and Forteviot corresponds to most of them. The 3rd millennium BC is divided into the Age of Ancestors and then the Age of Sacred Landscapes, which accords well with the obsessive memorialisation of the cremation cemetery at Forteviot and subsequent monumental augmentation that followed. Several centuries into the 2nd millennium, and certainly by 1600 BC, Parker Pearson suggests a shift into the Age of Land Divisions, defined partly by movement away from extravagant monumentality and partly by movement towards land use concerned with farming, animal husbandry, and roundhouse architecture. This makes sense in relation to Forteviot as well, because this place in effect disappears from archaeological visibility in the first half of the 2nd millennium cal BC. People may still have been visiting – even using – this location, but throughout much of later prehistory nothing was being done that troubled the archaeological record, and all the while ditches silted up, mounds slumped, and timber posts rotted, leaving nothing but stumps and then hollows.

It was not until later in the Iron Age that this ghostly ruinous place saw interventions and alterations once again, a re-animation driven by what must have been a combination of curiosity and political and religious strategy. This activity in the late Iron Age, initially in the form of fires and possibly mortuary rites, was the first indication of an emerging pattern of revivification of the ancient mounds and hollows that would still have been extant even into the 1st millennium AD and probably later still.

This chapter has attempted to demonstrate that the sequence of activity at Forteviot did not exist in isolation, but rather was aligned with a series of major changes that are recognisable in the archaeological record for many parts of Britain and Ireland. Local and regionally distinct elements ran alongside innovations and novelties adopted from elsewhere. Some aspects of what we found at Forteviot were commonplace, others highly unusual. We found material and monuments we would have expected, but some gaps remain – why was no Grooved Ware evident for instance? The discoveries at Forteviot have not only shed light on the significance and durability of that place for over a millennium in prehistory, but also added valuable insights, evidence and information to our broader understanding of the 3rd millennium BC in the region and beyond.

9

Reflections and recommendations

Kenneth Brophy and Gordon Noble

9.1 SERF Phase 1 impact

Thanks to the SERF Project excavations, an 'invisible' cropmark site such as Forteviot, largely ignored since its identification by St Joseph in the 1970s, has now been recognised as an important monument complex within Neolithic studies in Britain. Our discoveries have played a full role in debates about the nature, emergence, and maintenance of monument complexes in the Neolithic; Bronze Age burial practice; and social change in the 3rd millennium BC. In hindsight, the extended period of post-excavation and writing-up of the excavations has been advantageous as major debates about Neolithic, Copper Age and Bronze Age identity in Britain emerged only recently, based on isotopic and aDNA analysis of big datasets (such as Oldalde *et al* 2018 and Madgwick *et al* 2019). The late 2010s have become a period of dynamic re-evaluation of our understanding of the 5th to 2nd millennium BC in Britain and beyond, and Forteviot can now be part of these discussions.

Forteviot features in contemporary synthetic books

Figure 9.1 SERF community engagement: the pop-up museum in Dunning, where material from the Forteviot excavations was displayed in 2012 (photo: S Warren)

about the Neolithic, such as Cummings' *The Neolithic of Britain and Ireland* (2017), Noble's *Woodland in the Neolithic of northern Europe* (2017), and Ray and Thomas' *Neolithic Britain* (2018). Syntheses of palisaded enclosures and other forms of Neolithic monumentality have drawn on our excavation results (cf Noble and Brophy 2011a; Gibson 2012; Millican 2016a; 2016b). Our post-excavation programme coincided with the publication of Thomas' excavations at Dunragit palisaded enclosure, a valuable contribution to the discussion about the role these huge monuments played in late Neolithic society (Thomas 2015). We benefitted too from publication of data related to other Neolithic monument complexes, from the Stonehenge cremation cemetery (Parker Pearson *et al* 2009), to a new chronological sequence for Mount Pleasant (Greaney *et al* 2020). Synthetic PhD research on Neolithic timber monuments (Millican 2009), eastern lowland henge monuments (Younger 2015), and an exploration of healing strategies in the Neolithic (Telford 2019), all coincided with the life of the SERF Project, drew on SERF data, and greatly enhanced our interpretations of what was found at Forteviot. All three of these PhD researchers spent time on SERF Project excavations. The Beaker assemblages, and contents of the dagger-burial, have played a role in the syntheses of Beakers placed in non-funerary contexts (Wilkin 2016) and fire-making kits (Teather and Chamberlain 2016). Neil Wilkin's research into Food Vessels in England (2014) followed a season's digging at Forteviot in 2010 during which he excavated the Food Vessel cist within Henge 2. SERF Project alumnus Marta Innes has since undertaken a complementary PhD on Food Vessels found in Scotland (Innes 2020), again drawing on and benefitting the Forteviot narrative.

The SERF Project was more than just an assorted collection of excavations, and as set out in Chapter 1, there was very much a community archaeology and public engagement aspect to the project (Figure 9.1). As part of the ongoing dissemination of the project, the *Cradle of Scotland* exhibition has been curated online, which summarises some of the points made in this volume, and a popular publication is planned. The SERF Project was also influential in the establishment of *Scotland's Archaeology Strategy* (Scottish Strategic Archaeology Committee 2015). This document sets out a vision for Scotland to be:

> A place where the study of the past offers opportunities for us now and in the future to discover, care for, promote and enjoy our rich and diverse heritage, contributing to our wellbeing and knowledge and helping to tell Scotland's stories in their global context.

As such, the ethos of research, training and public engagement at the heart of the SERF Project has been regarded as a model upon which to build future practice in the heritage sector in Scotland.

9.2 Closing loops

There is no doubt that the excavations at Forteviot were also successful in terms of the initial research questions that we set ourselves. These broad questions were set out in Chapter 1, and are repeated here:

- exploring the nature and chronology of the archaeological features identifiable from the air as cropmarks south of the village of Forteviot, and any associated archaeology not visible from the air;
- explaining why Forteviot was chosen for the location of a Neolithic monument complex (the 'Why Forteviot?' question);
- investigating and trying to understand the enduring significance of this location in prehistory, how it developed, was maintained, and when and why it declined;
- considering the relationship between prehistoric sites and later land-use in this location, and assessing periods of continuity and hiatus;
- making sense of settlement and occupation of the broader landscape in prehistory and beyond;
- contextualising the significance of Forteviot in its local, regional, national and international context;
- documenting the survival of archaeological features in the ploughzone and assessing the efficacy of current management of the cropmarks.

Proposed answers to some of these questions (notably Q1–3 and 6) have been discussed at length in the excavation results chapters and in Chapter 8. Evidence that helps to answer question 4 has been discussed in terms of excavation results, and this issue will be taken up in more depth in SERF2. The issue of broader settlement patterns and occupation of the landscape (Q5) was very much a focus of the 'environs' phase of the SERF Project and the hillfort excavation programme, the full results of which will be published elsewhere (SERF3 and SERF4; Table 1.2; section 9.4). The final research question related to cropmarks (Q7) is discussed in section 9.3.

It is worth noting that the excavations discussed in this volume have gone some way to tackling issues and questions raised in ScARF (the initial iteration of which was published in 2012). The preparation of the relevant documents for the volume – the Neolithic panel (ScARF 2012a) and Chalcolithic / Bronze Age (ScARF 2012b) – coincided with the Forteviot excavations. The research questions contained within each report were carefully considered in the writing up of this volume and associated research papers. Indeed, our excavations are discussed in the Neolithic panel report, being mentioned across a wide range of categories of monuments, material culture and mortuary practice. ScARF is an ongoing process, with our work during the SERF Project informing the development from 2019 onwards of a regional research framework for Perth and Kinross across the Mesolithic, Neolithic, Copper and Bronze Ages, and medieval thematic areas. It is also hoped that the SERF project methods and results will impact the management and study of one of the most important, but neglected archaeological resources – cropmarks (see below).

This is not to say that everything went as well as it could have and with more time and resource we could have done more. There are still gaps in our understanding of the relationship between all four henges at Forteviot (Henges 3 and 4 remain unexcavated) and we did not investigate every feature of the monument complex at Forteviot (the Mijas cairn being a notable omission). The extensive nature of the cropmarks at Forteviot meant that we were only able to sample a small (but we would argue meaningful) proportion of the palisaded enclosure boundary and even less of the interior. Our inability to pin down the location of the potentially contemporary pitted or timber enclosure immediately to the east (Figure 2.6) is a source of personal disappointment. We intended to excavate more of the Henge 1 cremation cemetery but were unable to access that field again in 2011. Yet one could argue that the law of diminishing returns may have minimised the impact of such additional excavation, and it was wise to concentrate time and resources in Phase 2 of the project on the wider landscape context. The impact that this work had on answering the above research questions will be considered in SERF3.

9.3 Cropmark management

One of the striking aspects of the SERF Project excavations at Forteviot is the preponderance of cropmark sites investigated. This is in stark contrast to other large-scale Neolithic monument complex investigations across Britain in the 21st century where upstanding remains are more commonplace, such as the *Stonehenge Riverside Project* (eg Parker Pearson *et al* 2008), the Thornborough project (Harding 2013), and assorted Orcadian excavations (eg Richards 2013). Indeed, everything reported on in this volume is the result of cropmark excavations, with the closest parallel in northern Britain being Thomas' campaign of work in south-west Scotland in the late 1990s/early 2000s (Thomas 2007; 2015). Thomas' work focused on subsurface remnants of Neolithic monument complexes at Holm Farm, Holywood, and Dunragit, although an upstanding henge (The Pict's Knowe), and artificial mound (Droughduil 'motte') were also excavation targets. More widely, comparable research projects from recent decades include Llandygái (Lynch and Musson 2001), and the lower Welland Valley, Cambridgeshire (Pryor *et al* 1985; Pryor 1988) in terms of the range of cropmarks investigated, and lessons learned.

The nature of the archaeological resource at Forteviot shaped our fieldwork methodology, but also precipitated research question 7 (see list above) directly related to the interpretation, potential, and future management of cropmarks. SMC was required for each of these excavations, indicating the national significance of Forteviot even as subsurface plough-denuded traces, and as such our sampling strategy was designed in collaboration with (as was) HS to maximise returns, protect a fair proportion of asset, and explore the levels of survival of buried archaeology.

Cropmarks are a diminishing resource (created by the plough but also gradually destroyed by that same means) so there were no guarantees the archaeological (and natural) features recorded as dramatic cropmarks survived when we commenced excavations. There have been instances of cropmark locations being excavated, only to find the archaeology has been wholly, or almost completely, removed by the plough. Only one pit survived of a lengthy pit-alignment at North Straiton, Fife, upon evaluation (Carter 1996). Modern ploughing can remove earthworks remarkably quickly, with for instance the Neolithic hengiform enclosure at Brownsbank visible as a slight earthwork in the 1970s (RCAHMS 1978, 115) but defined by a ditch of minimal depth (Figure 9.2) by the time the site was excavated in the 2000s (Brophy and Noble 2006). On the other hand, there are also documented instances

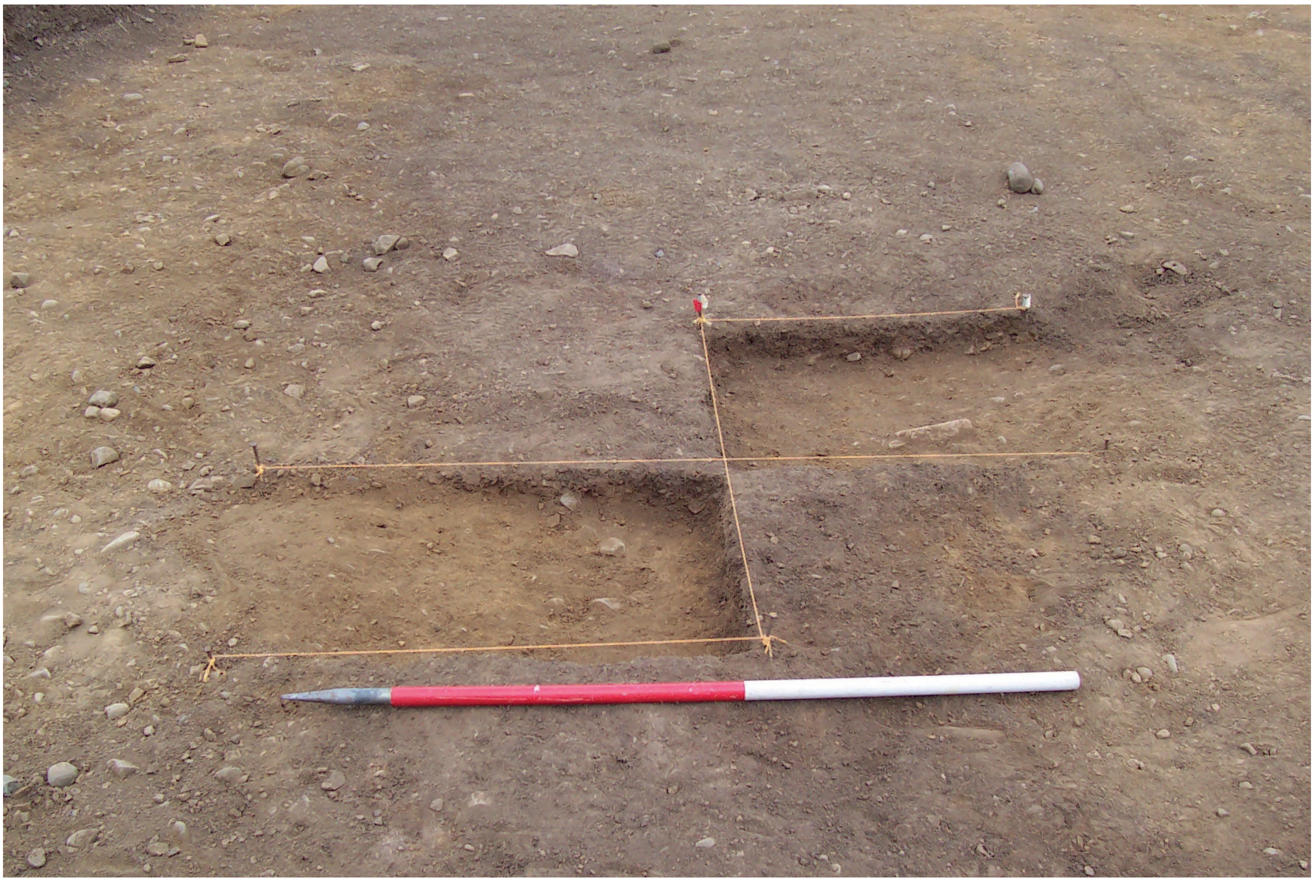


Figure 9.2 Heavily truncated section through the ditch of the Neolithic enclosure at Brownsbank, South Lanarkshire, during excavations in 2006

of cropmark excavations essentially revealing exactly what the cropmarks suggested they would, timber halls being good examples (eg Barclay *et al* 2003; Murray *et al* 2009).

At Forteviot, it appears we excavated here just in time. There were no obvious cropmark features for which we did not find a corresponding subsurface trace although not all of these were anthropomorphic. While that does not mean truncation and plough damage have not occurred, it does suggest the Forteviot cropmarks offer a fair representation of the archaeological resource, and that their Scheduled Monument status remains appropriate. Silt channels and palaeochannels obscured very little of the archaeology on aerial photographs but caused problems in identifying features in the trenches (notably around the avenue in 2007). Indeed, very few features found during excavations were not evident on aerial imagery, although some, such as features around the ring-ditch, were only identified in hindsight. For the most part, observations made from cropmark evidence were borne out by our investigations, with, for instance, the interpretation that there was an irregularity in the cropmark depiction of the northern ditch of the Henge 2 boundary vindicated by excavation. Close analysis of cropmarks before commencing excavation is vital. It is worth noting in this respect that cropmark evidence at Forteviot has been far more useful than geophysical surveys (section 2.4).

In section 2.3.1 we noted our observations about potential levels of plough truncation in the fields at Forteviot. Despite this, our excavations indicate a considerable depth of archaeology survives in fields south of the village (we found features up to 2m in depth, see Figure 9.3). However, we also identified clear evidence for plough damage and denudation of the resource. No earthworks or above-surface traces survive, a state of affairs we have suggested relates directly to post-medieval improvements and ploughing. The process of damage to the site has been hastened, we would argue, by the current regime of planting potatoes on a five-year cycle which entails deep ploughing (Figure 9.4); we have no sense of when this began. Over features as ephemeral as Pictish graves, and prehistoric cremation deposits, this can be devastating (SERF2, chapter 4). The rubble layer overlying and within the Henge 1 ditch included boulders that had been struck by a plough; this fate had also been

Figure 9.3 Test pit within Forteviot village, showing the deep overburden of topsoil not evident in the plough zone to the south

Figure 9.4 The depth of potato ploughing – Bowling Green Field, 2008

suffered by the buried standing stone beside the ring-ditch (Figure 9.5) and one of the slabs of the triple cist. Modern plough scrapes, as well as earlier rig-and-furrow, were evident in all our trenches.

Monitoring of plough damage was carried out to a modest extent during the SERF Project. For instance, after excavations in 2008 at the square barrow cemetery in the Bowling Green Field (Trench J; SERF2, 4.2) coloured gravel was left within some excavated features during backfilling. Subsequent revisiting of this field after ploughing has so far failed to recover any of this gravel, suggesting ploughing is not currently further damaging these graves. If this material is recovered and documented during a future field-walking exercise, it should be able to shed light on the mobility of objects within the fills of archaeological features but will also act as a trigger warning of plough damage to this fragile resource.

There is no doubt ploughing will continue to denude the archaeological resource at Forteviot. The fact most cropmarks are within Scheduled Monument areas is, in effect, of no management benefit to these sites where ploughing is concerned. Any cropmark site within arable land is at risk from ploughing, whether Scheduled or not; deep ploughing cannot be prohibited if this practice was in place before the designation was made. During the life of the SERF Project HS/HES produced various rural management documents that deal, at least in part, with cropmarks. For instance, *Managing Scotland's Archaeological Heritage* (Historic Scotland nd) recommends that deep ploughing, pan-busting, de-stoning and subsoiling, do not take place over cropmark or lithic scatter sites where possible (*ibid*, 6) although this is not enforceable. A more recent booklet called *Cropmark Archaeology*, published by Historic Scotland in 2015, almost wholly concerns their archaeological potential. *Archaeology and Rural Land Use Rural Advice Note 15*[1] is on the topic of cropmarks (Archaeology Scotland 2015). These advice notes are available for all farmers but not proactively sent to them; however, they do cover cropmarks in general and not just Scheduled examples. On the matter of management, the note states, 'ideally these sites should be removed from cultivation and put down to grass' with a 5–10m buffer. Given this course of action will be economically unrealistic in most cases, the note goes on to suggest 'minimum tilling methods' should be adopted where possible, which

Figure 9.5 Plough damage to a large boulder within the ditch of Forteviot Henge 1

excludes potato and carrot planting for instance. This advice, and suggestions not to dig drains across cropmarks, is advisory only, although the latter course of action would be illegal without SMC.

Excavations at Forteviot suggest cropmark Scheduling, and advisory notes on their management, are insufficient. Elements of the monument complex *will* disappear within the next decade under the current ploughing regime. Furthermore, the depth of remains found to have caused the cropmarks at Forteviot will not be replicated at all cropmarks sites and so we cannot assume all sites will be as resilient to modern agricultural methods. The discovery of possible Neolithic ardmarks in the ploughzone at Wellhill, near Dunning, during SERF Phase 2, indicates the potential for the survival of ephemeral archaeological remains in fields that have *not* been ploughed for decades (Brophy and Wright forthcoming). Historic England (and previously, English Heritage) proactively encourage management agreements that involve taking parts of fields with cropmarks out of cultivation, and the use of 'minimum cultivation techniques', noting the benefits not just to the survival of the archaeology, but also in mitigating against soil erosion and preserving wildlife habitats (eg COSMIC project, DEFRA 2006). However, such agreements are expensive and rarely applied to cropmark sites in Scotland.

In summary, our excavations at Forteviot (and elsewhere in the SERF Project) have indicated cropmark sites are being damaged by deep, regular ploughing in environments with relatively thin topsoil, and are extremely vulnerable. It is likely some archaeological material and features have already been removed by ploughing, and this will probably accelerate into the future. These cropmark sites (and this applies more broadly across Scotland) are not adequately protected by current HES designations, boundaries or buffer zones. More positively, we have demonstrated the ongoing efficacy of the large-scale excavation of cropmarks sites. A close reading of aerial photographs allowed us to explore the granularity of the archaeology before excavations commenced and showed good correspondence with geophysics (where it worked) and excavation results. Cropmarks are an invaluable source of archaeological information, not merely pretty pictures. Of course, they rarely tell the whole story, but offer an introductory point, and their preservation and management should be of urgent concern for the heritage sector in Scotland and beyond.

9.4 Phase 2 environs excavations summary

During the post-excavation and writing-up phase of the Forteviot excavations, Phase 2 of the SERF Project ('environs') was ongoing, with fieldwork completed in 2017. Post-excavation and writing-up of those excavations in preparation for SERF3 continues at the time of writing this volume, but it is worth noting here briefly the scope and nature of that work, and some preliminary discoveries of relevance to Forteviot. Where relevant, excavations from SERF Phase 2 have been discussed throughout this volume, notably discoveries at Leadketty and Wellhill, 4km from Forteviot.

Phase 2 of the SERF Project continued to deal with many of the initial project research questions but also looked at the broader landscape. Through time the temporal scope of the project also expanded with the identification of Mesolithic and Iron Age features. A series of excavations was carried out, mostly under the direction of one of the authors of this monograph (Brophy) and Dene Wright. In summary, excavations occurred at the following sites (years and main excavation targets are listed here as well, for locations see Figure 1.8):

- Leadketty 2012 – late Neolithic palisaded enclosure, four-poster building, mini-henge
- Baldinnies 2013 – Iron Age enclosure and roundhouse
- Wellhill 2014–15 – Mesolithic pit alignment, early Neolithic farming traces and pit cluster, early Bronze Age cremation burial and barrow
- Millhaugh 2014 – Bronze Age kerb cairn
- Leadketty 2015–16 – Iron Age pits and timber structure
- Dun Knock 2015 – Neolithic hilltop ditched enclosure and Iron Age hillfort with previous investigation in 2008 re-evaluated
- Cranberry 2016 – Neolithic pit-alignment, Bronze Age cist, Iron Age palisaded enclosures, roundhouse and ditched enclosure
- Cranberry 2017 (mini-henge and enclosure).

All these excavations have Data Structure Reports (DSR) which can be accessed on the SERF Project website, have accompanying *DES* entries, and are reported in an ongoing series of publications (eg Noble and Brophy 2014; Brophy and Wright forthcoming; Alexander *et al* forthcoming; see Table 1.2). These sites will form the basis of the SERF3 monograph. As with

Figure 9.6 SERF Project Cranberry excavations in 2016 (drone photo by Tessa Poller)

Forteviot, almost all these sites were discovered as cropmarks and investigated using similar open-area methods (Figure 9.6). Together with Forteviot, these excavations represent the most extensive investigation of a cropmark landscape ever undertaken in Scotland.

Clearly the discoveries at Leadketty are directly relevant to the consideration and interpretation of Forteviot given the superficial similarity (and chronological overlap) of the late Neolithic palisaded enclosures in these locations (Noble and Brophy 2014). The contrasting nature of the biographies, appearance, role and status of these monuments will be considered in depth in SERF3. Discoveries such as the Mesolithic pit-alignment at Wellhill (Figure 8.1) and potential Neolithic field banks and ardmarks at Wellhill and Cranberry (Brophy and Wright forthcoming) are significant beyond what they can tell us about the grand narrative. The identification of an early Neolithic hilltop enclosure at Dun Knock (SERF4) will add further depth to our understanding of this river valley in prehistory. It is therefore to be expected that the volume you are reading just now will tell only part of the story; results reported here will be further contextualised by Phase 2 discoveries.

9.5 A beginning, not the end

Forteviot and its environs should be regarded as being as significant in the 3rd millennium BC as World Heritage-ascribed landscapes in Britain and Ireland such as Stonehenge, Avebury, Brú na Bóinne, and the Heart of Neolithic Orkney. Defined by extravagant monumentality that was built, altered and used by dozens of generations of prehistoric farmers, such complexes allow us to track social organisation and change during a crucial period of transformation across north-west Europe. The lack of a detailed settlement record for this period means that such major monument complexes provide one of the best sources of evidence for what was happening during the period 3000–2000 BC.

That the story did not end here is one of the most remarkable things about Forteviot. Unlike the other major Neolithic and Bronze Age monument complexes noted above, Forteviot became a focus for intensive reworking, mythologisation and physical alteration towards the end of the 1st millennium BC, and then later when the rich prehistoric legacy became a source of materials, myths and legitimacy for early medieval kings. SERF2 takes the story of many of the sites discussed in Chapters 3–7 into the Iron Age and beyond. Details such as the big pits dug into the central areas in Henge 1, the possible Iron Age burial in the ditch of Henge 2, and the pyre pits that littered the entrance zone of the palisaded enclosure, will be discussed in full, alongside other aspects of the early medieval power centre that emerged amidst the prehistoric ruins of Forteviot. In a sense, the events discussed in this volume were, and are, only the beginning.

1 https://archaeologyscotland.org.uk/projects/rural-land-use/identifying-and-managing-archaeology/

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In this volume (SERF1), the three other major SERF syntheses have been abbreviated thus:

SERF2

Campbell, E & Driscoll, S T 2020 *Royal Forteviot: excavations at a Pictish power centre in eastern Scotland*. CBA Res Rep **177**. York: Council for British Archaeology.

SERF3

Wright, D & Brophy, K forthcoming *Prehistoric Dunning: excavations of a prehistoric farming and settlement landscape*. York: Council for British Archaeology.

SERF4

Poller, T forthcoming *Hillforts of Strathearn*

Abbreviations used

BGS (British Geological Society), 1985 *Geology of the Perth and Dundee District*. London: HMSO

DES Discovery and Excavation in Scotland

NSA *The New Statistical Account of Scotland 1845: volume 10 Perthshire by the ministers of the respective Parishes*. Edinburgh: William Blackwood & Sons

OSA *The Old Statistical Account of Scotland 1791–1799 edited by Sir John Sinclair: volume XI South and East Perthshire, Kinross-shire*. Wakefield: E P Publishing (1976)

OSNB *Ordnance Survey Name Books* 1859–62*: volume 26 Perthshire*

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Entries in **bold** refer to the illustrations

Prehistoric Forteviot

The Strathearn Environs and Royal Forteviot Project (SERF), run by the University of Glasgow, was one of the largest research projects undertaken in Scotland in recent decades. The original stimulus for the project was a major complex of cropmarks situated to the south of the early medieval royal centre of Forteviot in eastern Scotland, celebrated as the site of the palace of Cináed mac Alpín (d AD 858).

This volume reports on SERF excavations between 2007 and 2010 at one of the most important prehistoric ceremonial complexes in Britain, which began with a cremation cemetery just after 3000 BC. The excavations, supported by over 130 radiocarbon dates, focused on a late Neolithic palisaded enclosure, timber setting, and ring-ditch as well as two Chalcolithic henge monuments. Evidence was found for complex sequences of activity at the henges and ring-ditch, each monument undergoing transformation into a burial monument in the late 3rd millennium BC. Discoveries included a dagger-burial containing two copper weapons, as well as the first positive evidence for flowers in a Bronze Age burial in Britain and the most complete fire-making kit of that age found in Europe.

This volume reports on the prehistoric remains; details of the early medieval investigations can be found in CBA Research Report 177: *Royal Forteviot: excavations at a Pictish power centre in eastern Scotland* (Campbell and Driscoll 2020).

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