

The Moon and the Bonfire

For Nigel and Janet

THE MOON AND THE BONFIRE

*An Investigation of Three Stone Circles
in North-east Scotland*

RICHARD BRADLEY

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Many individuals contributed to the project. There were the specialists whose work appears in these pages but there are also the numerous students and local people who took part in the excavations and the subsequent programme of fieldwalking, often in dreadful weather. Some of them played a central role in these activities, including Michelle Campbell, Ken Cooper, Hugh Fearn, Regula Gubler, Andy Jones, Gordon Noble, Hannah Sackett, Ronnie Scott, Susan Seright, Sue Taplin, Aaron Watson – and Nigel and Janet Healey who made us welcome in Tarland and provided so much hospitality. It is to them that this book is dedicated.

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Lastly, I must thank all those who have made this study possible. In many cases their contributions speak for themselves, as they have written parts of the text, but behind the scenes Tim Phillips did much to organise the archive – and the present writer – to ensure that post-excavation work proceeded smoothly and efficiently. Aaron Watson and Margaret Mathews prepared the illustrations and Jim Henderson kindly allowed us to use his fine photographs of Tomnaverie and Cothiemuir Wood.

Thank you all.

SUMMARY

This volume presents the result of three excavations and two fieldwalking surveys in Aberdeenshire. They were intended to shed new light on the character, chronology and structural development of the distinctive recumbent stone circles which are such a feature of north-east Scotland. Although the monuments share certain elements with other traditions of prehistoric architecture, and, in particular, with the Clava Cairns of the inner Moray Firth, no excavations at these sites had been published since the 1930s and their wider contexts had not been investigated by field survey. The new project took advantage of techniques which had not been used before, including pollen analysis and soil micromorphology, in an attempt to interpret these monuments in their wider chronological and geographical contexts. In that respect this work was the sequel to an earlier investigation of the Clava Cairns.

Three sites were examined by excavation. These were chosen to span the main distribution of recumbent stone circles. They were Tomnaverie on Deeside, Cothiemuir Wood on Donside and Aikey Brae in Buchan. The surroundings of Tomnaverie and Cothiemuir Wood were also examined by large scale fieldwalking. The project took into account the results of older excavations at monuments of this kind but did not attempt to interpret their surface remains as this work was already being conducted by the Royal Commission on the Ancient and Historical Monuments of Scotland. The principal excavation was at the Guardianship monument of Tomnaverie and was designed to inform the redisplay of the stone circle to the public. At the conclusion of the project, some of the recently fallen monoliths and kerbstones have been replaced in their original positions. Work at Cothiemuir Wood and Aikey Brae was on a smaller scale and was intended to see whether the structural sequence postulated at Tomnaverie was of wider application.

In all three cases it is clear that ring cairns or closely-related monuments were the earliest

structures and that the recumbent stone circles were a secondary development and may even have been associated with the closure of these sites. Tomnaverie produced sherds of Beaker pottery. A series of radiocarbon dates in the later third millennium BC is associated with the first stage in its structural development. There is little chronological evidence from the other sites, but two dates in the first millennium BC are probably associated with a later reconstruction of the monument at Aikey Brae. Tomnaverie was extensively reused during the same period and saw a further phase of activity in the 16th or 17th century AD. The central part of that monument was associated with a deposit of cremated bone.

The three excavated sites shared a number of distinctive architectural features. The people who built them seem to have been especially concerned with the character of the stones that they employed in their construction. These might be graded by height or arranged according to their shape, colour and texture. This applied to the kerbs and to the rings of monoliths, and at Cothiemuir Wood similar concerns may even have extended to the surface of the internal ring cairn. Each of the monuments made considerable use of the contrast between red and grey or white stones. Quartz was important at all three monuments, two of which were also decorated with cup marks. At Tomnaverie, the surface of the primary cairn included a series of radial divisions and a number of arcs of boulders, which may have been used to decorative effect. The central area of that monument showed signs of burning and may have been used as a cremation pyre, but not necessarily in its primary phase.

There was little evidence of domestic activity in the surroundings of Tomnaverie and Cothiemuir Wood. This is shown by the evidence of fieldwalking, which found that the main indications of earlier prehistoric settlement were some distance away from these monuments. The same interpretation is

supported by the evidence of pollen analysis and soil micromorphology. Very few artefacts were found in any of the excavations and even fewer in the areas close to these sites, although a large number of cup-marked rocks were located outside the stone circle at Tomnaverie.

The closing discussion emphasises three main features: the chronology and evolution of recumbent stone circles; the distinctive way in which these monuments were constructed and eventually closed by the erection of a recumbent stone circle; and their relationship to other traditions of prehistoric architecture in Britain and Ireland. This involves a new interpretation of some sites in Northern Britain, including Loanhead of Daviot, Old Keig, Moncrieffe and Oddendale, but it also introduces new ways of thinking about the structural development of individual monuments. Perhaps this followed a sequence that was laid down from the outset and took place over a short period of time. Many sites

seem to have been organised according to celestial alignments.

Recumbent stone circles have features in common with other architectural traditions in Scotland and beyond, but these are combined in an entirely idiosyncratic manner. The argument is illustrated by a detailed comparison with Clava Cairns. At the same time, a number of distinctive features do seem to be shared between local styles of monument which were important during the Early Bronze Age. They include the presence of human remains, evidence for burning, and southern or south-westerly alignments which may have been associated with the moon and sometimes with the setting sun. Such monuments seem to contrast with earlier traditions and may even emphasise an association between the dead and the hours of darkness. This argument has implications for the ways in which such monuments are studied. It also has lessons for the practice of landscape archaeology.

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The restored recumbent and flankers at Tomnaverie viewed by moonlight (*source: Jim Henderson*)

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The Aurora Borealis at Tomnaverie stone circle (*source: Jim Henderson*)

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PREFACE

In a sense this study begins and ends with Alexander Keiller, one of the pioneers of field archaeology in Britain (Murray 1999). A local landowner, from about 1920 he engaged in his own study of the stone circles of north-east Scotland. In an address to the British Association delivered in Aberdeen in 1934, he said this:

I have ... given a great part of the last fifteen years to examination, record, and survey of every megalithic monument within the territory under review (1934, 2).

He was intolerant of previous studies and scathing about the ways in which these sites had been interpreted:

Strange as it may seem, there is probably no part of the British Isles concerning which, archaeologically, more misrepresentation has been foisted upon students than the territory under review. [It] ... would indeed appear to have been for centuries the happy hunting ground of irresponsible cranks and monomaniacal theorists, many of whom have not done the country the doubtful honour of a visit ... (1934, 1).

Even Fred Coles, who had planned these monuments before him, did not meet his exacting standards:

Whatever one may think of him as an observer, a recorder, a surveyor, or an artist, ... I have had probably more opportunity than anyone living to mistrust him wholeheartedly in each of these several capacities (1934, 16).

Keiller had planned a major publication on the results of his surveys, but, as with many of his projects, this did not materialise. What did result from his activities was a new awareness of the monuments of north-east Scotland and of the need to preserve them. He concluded his paper to the British Association on a pessimistic note:

I feel that an unhappy duty must devolve upon me as representing, in some sort, on this occasion, local

archaeology, and that is to apologise, in all sincerity and with bitterness of heart, for the condition in which those who have travelled to Aberdeen will find our ancient monuments (1934, 22).

He expanded on this point in two privately printed papers which described the state of the local stone circles and proposed policies for improving it (Keiller 1927 and 1928). Again his comments were trenchant. A small sample will suffice. Of Corrstone he said:

The present condition of the circle is perfectly frightful. It is indeed perhaps one of the worst examples of a megalithic monument, scheduled or otherwise, in the whole of Scotland (1927, 3).

Stonyfield provoked the comment that:

One is appalled at the squalid, unkempt appearance of the circle. Although a scheduled monument, the area is full of hen houses and coops and tin platters, which rubbish lies about everywhere ... The whole place has an air of dirty slovenliness which is worse than anything else of the sort at any site in Aberdeenshire, save the disgusting Netherton of Crimond ... and the even more squalid Hill of Fiddes ... (1928, 11).

One of the monuments which was most imperilled was Tomnaverie. This was being removed by quarrying. Keiller persuaded the owner, Lord Aberdeen, to halt the work, but some of the stones had already been taken down. In 1927, he wrote that:

The immediate danger ... has now been held up, but whether this is due to the hectic riot which I created in the quarry last summer or to the subsequent scheduling neither matters nor can be decided (1927, 16).

Keiller proposed that 'the only solution to the problem before us is for all these monuments ... to be vested in the Office of Works, who will thereafter undertake the responsibility of preservation' (*ibid*, 19). That was exactly what happened at Tomnaverie where the damaged remains of the stone circle were taken into

Guardianship. The same happened at Loanhead of Daviot. Keiller had achieved his aim of publicising these monuments, and in the 1930s two large scale excavations were undertaken. Howard Kilbride-Jones worked at Loanhead of Daviot and Gordon Childe excavated Old Keig.

The new work reported here results from a similar initiative, and it had two aims of which Keiller might have approved: to shed fresh light on the chronology and interpretation of recumbent stone circles, and to improve their presentation to the public. The monument which he had helped to save from destruction at Tomnaverie was central to this exercise and, almost seventy five years after his 'hectic riot', the fallen stones have been re-erected and work has commenced on filling the abandoned quarry. On the day that the monoliths were replaced in their original positions, we were visited by Keiller's cousin, who had known him when she was a child. She felt that he would have been pleased with the outcome.

This monograph offers a new study of the excavated evidence from recumbent stone circles,

based primarily on the evidence of Tomnaverie and two smaller projects at Cothiemuir Wood and Aikey Brae. Although it does consider the results of older excavations, it is intended to complement the programme of survey at these monuments being carried out by the Scottish Royal Commission. When the results of both projects are available, I hope that they will do justice to the remarkable archaeology of this area.

Lastly, a word on the title of this book. 'An Investigation of Three Stone Circles in North-east Scotland' is accurate but utterly prosaic. It says nothing about the extraordinary character of these places or the ways in which they were used, and yet these are among the very features that we set out to investigate. For that reason I have borrowed the title of an Italian novel, *La Luna ei Falò*, published by Cesare Pavese in 1950 and translated into English in 1952. The two books have nothing else in common, but, when you read this study, I think the reason for my choice will be obvious.

RICHARD BRADLEY

Chapter 1

THE ORIGINS AND OBJECTIVES OF THE PROJECT

Richard Bradley

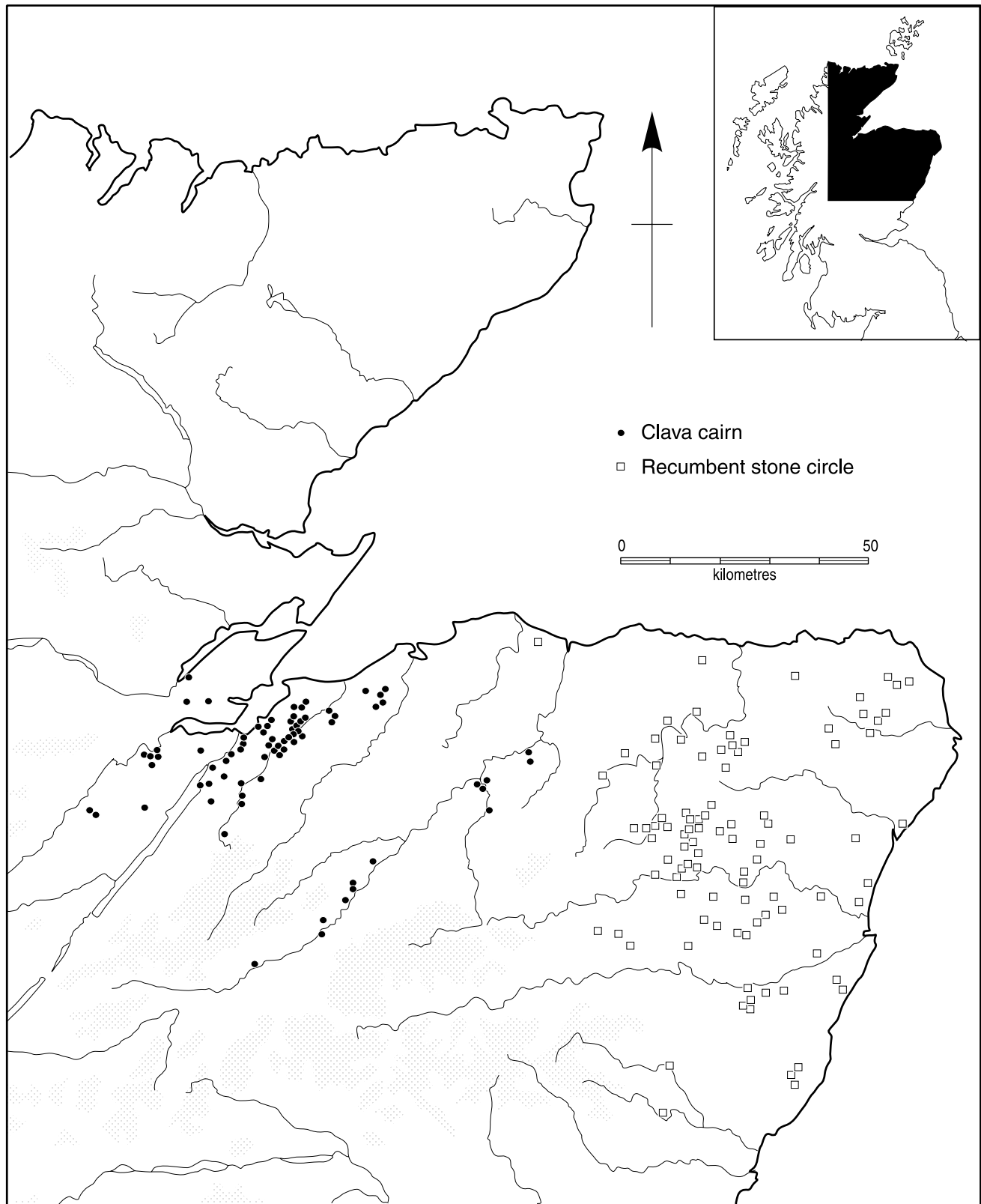
It is never easy to think of suitable terms to describe groups of prehistoric monuments, and sometimes the labels that are used hide as much as they reveal. In Scotland, two traditions of ancient architecture illustrate this problem (illus 1). Clava Cairns occur in the inner Moray Firth, and in Aberdeenshire there are recumbent stone circles, and yet it is agreed that these structures were closely related to one another (Burl 2000, chapter 12). Each includes a ring of uprights that normally encloses a cairn, but in one case that internal feature is quite inconspicuous, so the form of the perimeter gives these sites their name. In the other group, a stone circle surrounds a more substantial structure, and that cairn has become the defining characteristic of the monuments. The real differences between them are obscured by this terminology, for the contrast is one of scale.

There are more problems with such a simple scheme. Not all the sites mapped as recumbent stone circles are classic examples of the type and those towards the south of the distribution have distinctive characteristics of their own (Barclay and Ruggles 1999). Recumbent stone circles and Clava Cairns occur in neighbouring areas. They have many features in common, but some of them are shared with other structures in Scotland and beyond. The most distinctive feature of the north-eastern group is the presence of a massive horizontal block, which is why these sites are called 'recumbent' stone circles, but somewhat similar features have a scattered distribution outside that region. The Clava Cairns are equally distinctive because a number of monuments combine a passage grave and a ring of monoliths (illus 2), but again there are comparable sites elsewhere. Other characteristics connect the monuments of Aberdeenshire and the inner Moray Firth but are not peculiar to either of those areas. Both groups make use of graded rings of uprights with their

focus to the south or south-west, they employ materials of different colours or raw materials, and they incorporate cup-marked stones. Similar elements extend into other traditions (Barnatt 1989, 22; Lynch 1998; MacGregor 2002). They can be found on either side of the Irish Sea and involve not just rings of monoliths, but stone rows and megalithic tombs (Burl 1995; O'Brien 2002).

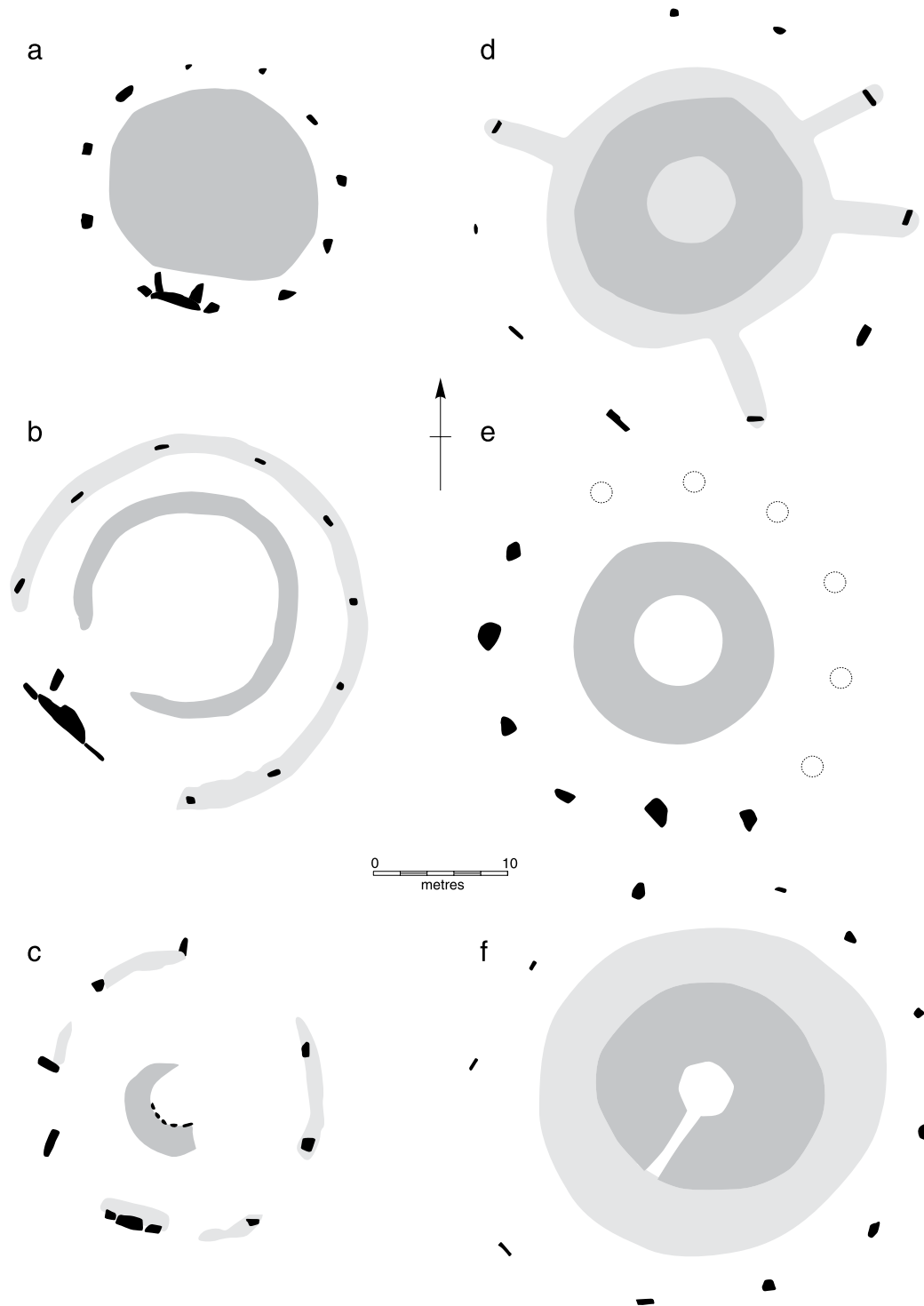
A popular way of considering such observations has been to think in terms of the movement of people from one area to another, so that any discussion of these monuments is dominated by questions of chronology. Thus the first edition of Burl's study of stone circles derives the monuments in Aberdeenshire from the Clava Cairns, and the latter group of monuments from Irish passage graves (1976a, 160–90). In the second edition, the sequence has been reversed. In the light of radiocarbon dates, he now considers that recumbent stone circles developed first and provided the stimulus for building the Clava Cairns (Burl 2000, chapter 12). On a smaller scale, he suggests that the architectural variations among the Aberdeenshire stone circles can be explained by the spread of this tradition from the area around Alford where the original prototypes had been built. Thus some of those on Donside are likely to be older than the rest.

Another way of considering such evidence is to study the manner in which the monuments of different regions referred to more widely available ideas and brought them together to form local styles of architecture. Rather than considering the diffusion of structural devices, like the grading of monoliths by height, this approach emphasises the ways in which communities might refer to a shared body of knowledge and put it to their own use. In that case it is not just a matter of mapping the distributions and associations of a series of different attributes. It also concerns the ways in which people



1 Distribution of recumbent stone circles and Clava Cairns according to Burl (2000).

THE ORIGINS AND OBJECTIVES OF THE PROJECT



2 Outline plans of selected recumbent stone circles and Clava Cairns. The plans on the left show the following recumbent stone circles: a) Easter Aquorthies; b) Sunhoney; and c) Castle Fraser. The shaded area inside the plan of Easter Aquorthies shows the extent of a parch mark surveyed by Sharon Arrowsmith and Chris Ball. The plans on the right show the following Clava Cairns: d) Balnuaran of Clava central ring cairn; e) Newton of Petty; f) Balnuaran of Clava south-west passage grave.

expressed their identities and the beliefs on which they were founded.

It is difficult to chart the spread of particular architectural devices when so little is known about the chronology of stone circles. Nor is it possible to review the ways in which they were used when few have been excavated to a modern standard. It is abundantly clear that what appear to be unitary monuments went through a sequence of structural changes. There is a need for new evidence to inform the discussion.

In a sense this study is the sequel to an earlier programme of research on Clava Cairns (Bradley 2000). Like the sites themselves, the two projects have points of similarity. They were undertaken by some of the same people, they made extensive use of field walking, and each was designed to establish the evolution of individual structures and to obtain samples for dating. But there the similarities end. Work at Balnuaran of Clava was originally

conceived in relation to wider debates about the nature of megalithic tombs, and during the early stages of the work less attention was paid to their local contexts. Research on recumbent stone circles had that emphasis from the outset and drew on the experience gained during the previous project. Moreover, this research was explicitly designed to help with the public presentation of two of these sites, Tomnaverie and Aikey Brae. In the case of Tomnaverie it also led to the reconstruction of a damaged monument.

Recumbent stone circles have a number of structural elements whose relationship to one another has never been resolved, nor is there any agreement over their chronology. Both questions became a major focus of this work. There are several components to consider. At most sites there is a ring of between eight and thirteen uprights which may increase in height towards the south or south-west where two tall pillars or



3 The recumbent and flankers at Sunhoney. (Source: Aaron Watson)



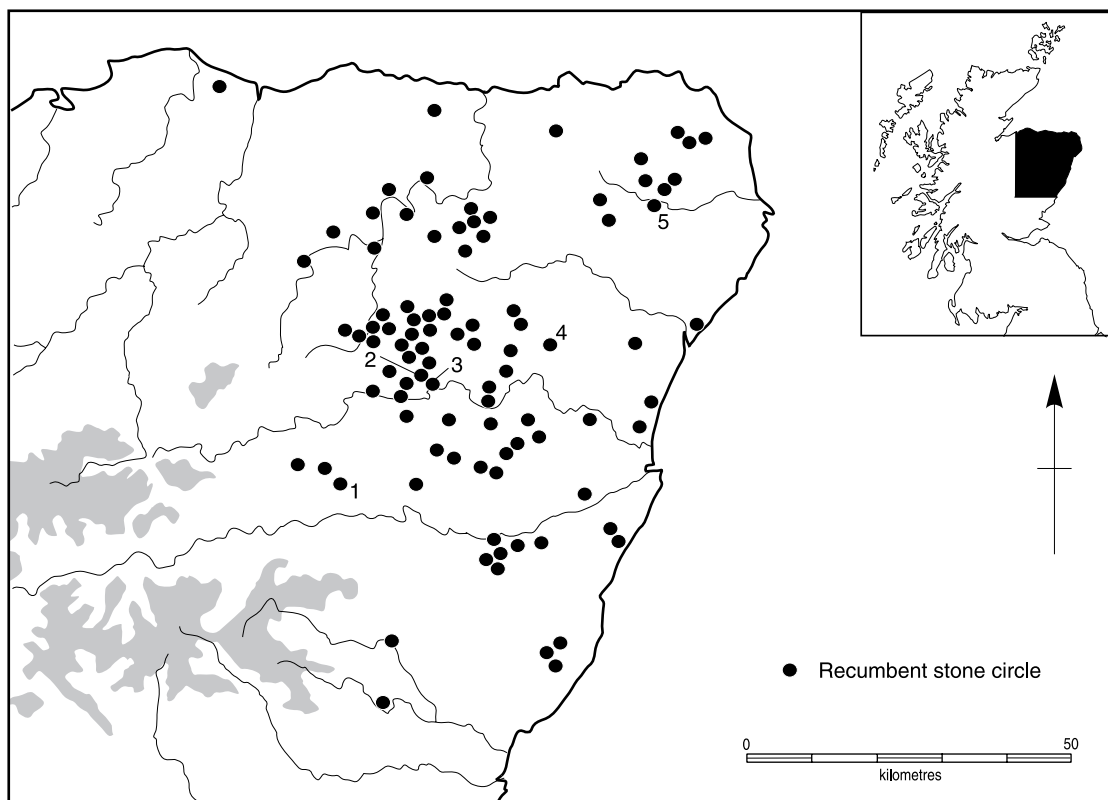
4 General view of the restored recumbent stone circle at Strichen.

'flankers' mark the limits of the recumbent stone (illus 3 and 4). Sometimes the components of the circle are linked by a bank or wall, and in certain cases a tail of rubble extends outside them. Inside the recumbent there are often traces of a cairn. At some sites this had originally been open at the centre, but such 'ring cairns' or 'platform cairns' (the distinction is based on their profile – see Lynch 1993, 113) were generally filled in during subsequent phases. Less frequently, the interior of the stone circle is occupied by a more substantial round cairn. Either may be associated with human remains and with evidence of burning.

It has been argued that the stone circles were the oldest features on such sites (I Shepherd 1987). This is a logical proposition, for in other parts of Britain rings of free-standing monoliths are commonplace. Moreover there are a number of cases in which it can be demonstrated that cairns were built inside them during a subsequent phase. Among the best known examples in Scotland are Balbirnie and Temple Wood (J N G Ritchie 1974; Scott 1989). There is little direct evidence from the north-east,

although this was the sequence suggested by the excavator of Loanhead of Daviot (Kilbride-Jones 1935). Something similar may have happened at Berrybrae where the remains of a stone circle were incorporated in a later walled enclosure (Burl 1995, 95–7 and 2000, 220).

The dating of recumbent stone circles has been influenced by the evidence from other regions which suggests that rings of upright stones existed by the early third millennium BC. This depends on radiocarbon dates from Callanish (Ashmore 1999) and the Stones of Stenness (Ashmore 2000, 125 and 2001, 125). In the east of Scotland there were further clues as to the origin of these monuments. Their distribution seemed to complement that of henges, which are assigned to the Late Neolithic period (Barclay 2003, fig 8.2). There was evidence of Neolithic ring cairns too, one of which may have been associated with standing stones (A Shepherd 1996), and the timber circle at Balfarg seems to show the characteristic grading towards the west. It provided radiocarbon dates between 2900 and 2450 BC (Mercer 1981). Such clues have been helpful, for the direct dating



5 Distribution of recumbent stone circles according to Burl (2000) showing the sites considered in the text.
1 Tomnaverie; 2 Old Keig; 3 Cothiemuir Wood; 4 Loanhead of Daviot; 5 Aikey Brae.

evidence from recumbent stone circles is slight. Few of the artefacts have satisfactory contexts and all the sites examined on a large scale have been badly disturbed. In Chapter 5 I shall argue that Beaker pottery was directly associated with the stone circle at Loanhead of Daviot, but most of the ceramics from these monuments may refer to secondary activity. The only radiocarbon dates come from Strichen and ‘a very late context’ at Berrybrae and fall in the Early Bronze Age (Burl, pers comm and 2000, 376–7). Neither excavation is published and at the moment it is unclear whether all the dates are relevant to the development of recumbent stone circles. On the other hand, those which fall between about 1900 and 1550 BC do seem to provide a *terminus ante quem* for the example at Berrybrae.

This new investigation was designed to resolve some of those issues, and for that reason the individual sites were selected with special care. Two principles were important here. Since Burl had suggested that recumbent stone circles

originated on Donside and spread only gradually to other areas, it was necessary to consider sites across their entire distribution (illus 5). At the same time, so many recumbent stone circles had already been excavated that it was essential to keep disturbance to a minimum. The policy that was adopted was to strip and plan one complete but damaged monument and to sample the surviving areas of stratigraphy to establish the structural sequence. In the light of that project two better preserved sites were then tested on a smaller scale to find out whether such a sequence might be of more general application.

Despite its peripheral location, the Deeside stone circle at Tomnaverie was selected as the main focus for this research. The site had been damaged by quarrying in the late 19th and early 20th centuries when some of the monoliths had been taken down (Coles 1905, 208–14). It seemed justifiable to investigate this monument on a large scale in preference to better preserved examples. As we have seen, the site had been placed in

Guardianship to prevent its destruction. Thought needed to be given to its display to the public. Burl describes it in these terms: 'Tomnaverie, ... a once fine recumbent stone circle, is a wreck ... Its stones are now a jumble' (1995, 10). One of the objectives of work in 1999 and 2000 was to disentangle this wreckage. It was important to find out how much of the monument actually survived. In the event the damage was less severe than Burl and other writers had supposed and it was possible to establish the original layout of the cairn and the stone circle.

The sites examined in 2001 were Cothiemuir Wood on Donside and Aikey Brae in Buchan. In each case they had undergone considerable damage in the past. Some of the monoliths had fallen or

been removed and the central areas of each site had been disturbed. On the other hand, parts of their perimeters still preserved the stratigraphic relationship between their main components: the stone circle and an internal cairn at Cothiemuir Wood, and the ring of monoliths and an enclosure wall at Aikey Brae.

Lastly, one of the aims of this work was to interpret these individual monuments in their wider setting. To this end pollen analysis and soil micromorphology were undertaken on samples from Tomnaverie and Cothiemuir Wood and a large area of cultivated land surrounding each of those monuments was investigated by field walking. The results of these different studies are presented in the following pages.

Chapter 2

EXCAVATIONS AT TOMNAVERIE

Richard Bradley and Tim Phillips

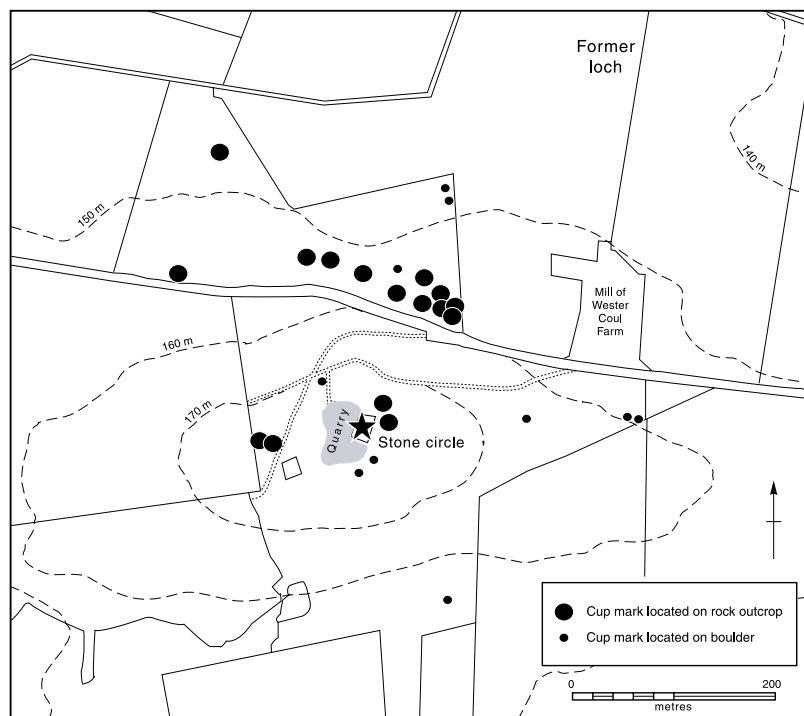
with contributions from Sharon Arrowsmith, Chris Ball, Angela Boyle, Peter Brewer, Donald Davidson, Stephen Lancaster, Brian Matthews, Alison Sheridan, Ian Simpson and David Trevarthen

2.1 BACKGROUND

The recumbent stone circle at Tomnaverie (illus 5, no 1) was located on the end of a granite ridge in the centre of the basin known as the Howe of Cromar (NJ 486034). The ridge is quite inconspicuous, although the monument can be identified on the skyline from much of the surrounding area. The site commands an all-round view which takes in almost the full extent of the basin and extends deep into the higher ground as far as two conspicuous mountains: Morven, 11km to the west, and Lochnagar, which is 30km to the south-west. The site was at the junction between

two different environments. On three sides the land is fertile and large areas are cultivated, but to the west the soils are significantly poorer. Just below the monument is the site of a loch drained in the 19th century (illus 6).

Three kilometres south of Tomnaverie is another loch, Braeroddach Loch, where Edwards and Rowntree (1980) have studied the local environmental sequence. Small-scale clearance began towards 4000 BC. A similar episode occurred in the first half of the third millennium and more substantial episodes followed in the Later Bronze and Iron Ages. The latter were associated with

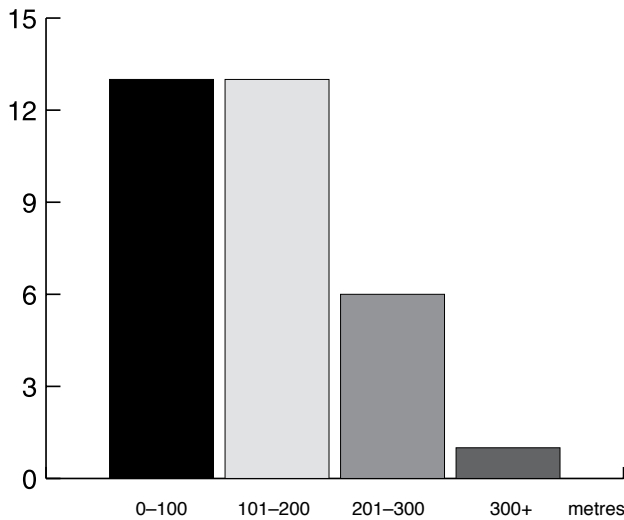


6 The surroundings of Tomnaverie stone circle, showing the distribution of cup-marked rocks, the extent of the modern quarry and the position of the former loch.

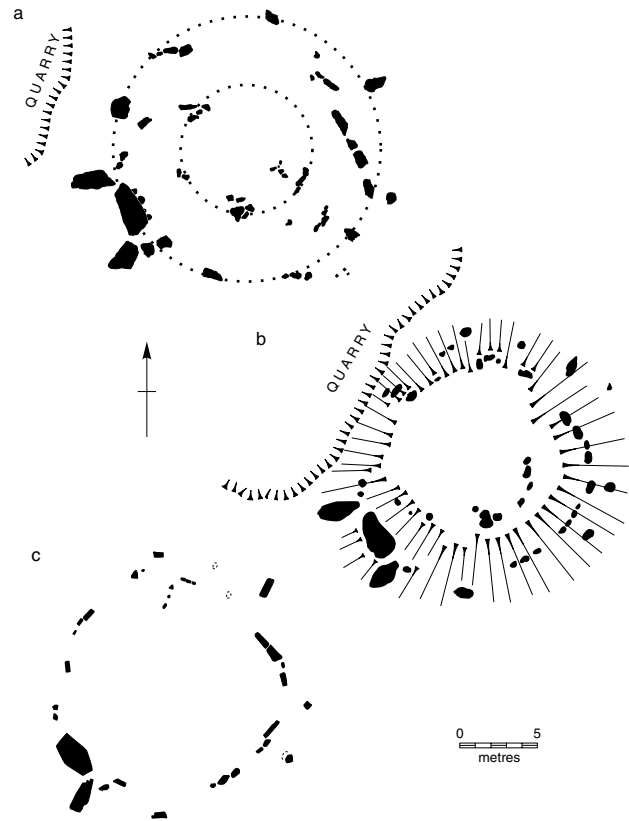
cereal cultivation and may be contemporary with a series of field systems and house foundations on the higher ground. These extend as far as the stone circle but respect the monument itself. Further to the north of that site there are records of cists and the remains of at least two more stone circles.

The ridge rose to a steep bluff where the quarry was established. The monument was located on the hilltop where the ground fell away to the north, west and the south. It was approximately level with the area to its east. As a result, it cannot be seen from quite large parts of the hill, only appearing as a prominent landmark as visitors approach the summit. Much of the lower ground is under the plough, but two extensive areas still remain in pasture. It is here that a network of older field walls and enclosures still survives. Work in 2000 located 29 cup-marked stones in this area (illus 6). The majority were large boulders which may have been disturbed when those fields were in use. Even allowing for the effects of quarrying, the decorated stones appear to increase in frequency towards the position of the monument (illus 7). There may also be a concentration of cup-marked rocks on the approach to the site from the north-east. That axis leads to the valley floor and the site of the loch. A number of these carvings are in a line running parallel to the modern road and seem to follow the course of a granite outcrop.

The quarry was established in the late 19th century and was an important source of road metalling until it closed in the 1920s. It is clear



7 The distribution of cup-marked rocks at Tomnaverie by distance from the centre of the stone circle.

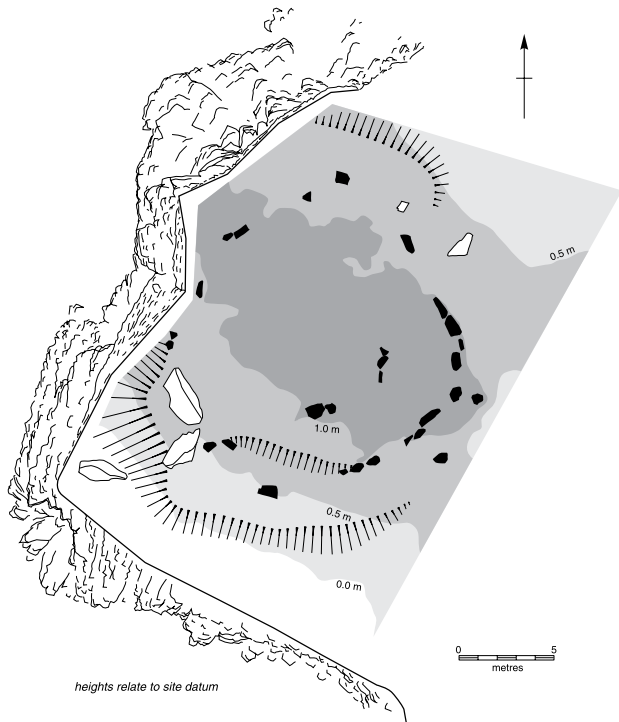


8 Successive surveys of Tomnaverie stone circle. a: Coles (1905); b: Ogston (1931); c: Thom (Thom, Thom and Burl 1980). Note how the quarry had encroached on the monument after the time of Coles's survey, removing one of the monoliths. Between the time of Ogston's survey and that by Thom one of the fallen flankers had been moved.

that the damage extended to the very edge of the monument, with the result that individual stones had been removed. Some of these changes may have been intended to prevent accidents. The recumbent stone (which weighs 6.5 tons) was taken away from the quarry edge and the two flankers (which weigh 2.5 and 3.5 tons respectively) were uprooted from their sockets. The monument was protected by taking it into Guardianship. No attempt was made to re-erect the stones that had been moved, but the surface vegetation was cleared and the site was put down to grass. Then the remains were enclosed by a fence.

2.2 THE STANDING MONUMENT

Three surveys of the monument had been carried out before the present campaign of fieldwork, by



9 Plan of the stone circle at Tomnaverie before excavation.
(Plan by courtesy of RCAHMS, Crown Copyright)

Coles (1905, 208–14), Ogston (1931, 93–5) and Thom (Thom, Thom and Burl 1980, 210). All the records agree in their basic details (illus 8), although Coles shows the position and profile of a monolith which has since been lost and Thom omits one of the flankers. Surviving photographs also show one of the standing stones before it was taken down.

These records were supplemented by a survey undertaken by the Royal Commission before the 1999 excavation. Their work drew attention to a number of features of the monument which had not been discussed before and had a significant impact on the planning of the fieldwork (illus 9). The monument had two main components: a cairn, defined on the exterior by sections of a substantial kerb; and a stone circle, with four standing monoliths and three or four others which had fallen or been moved. The spacing of these uprights suggested that several more were missing. There was also the recumbent stone which lay on its side so that the upper surface faced into the interior. The outer kerb of the cairn defined a circular space approximately 15m in diameter but this opened out towards the south-west to join the positions of



10 The remains of Tomnaverie stone circle after the stripping of the turf. (Source: Jim Henderson)



11 The remains of Tomnaverie stone circle after stripping and initial excavation.

the flankers. Outside this ring of uprights was the earthwork of a ramp which was most obvious to the north-east and south-west. Several blocks of stone on the surface of the monument were interpreted as the remains of an inner kerb, but now it seems as if they had been cleared off the nearby field. There were cup marks on the recumbent stone, one of the flankers and on the kerb of the internal cairn.

2.3 THE DESIGN OF THE EXCAVATION

The excavation was planned in two stages. The first was to strip the whole of the surviving monument and to plan it in detail. Having decided where there was most chance of establishing a structural sequence, this was to be investigated on a small scale. Another objective of this work was to look for deposits which might provide dating evidence.

The monument proved to be better preserved than anticipated. Beneath the turf a substantial cairn remained and it was possible to locate many of the kerbstones which had not been visible on the surface (illus 10 and 11). The same applied to one of the 'missing' monoliths. The central area of the monument contained a rather disturbed area

of smaller stones through which patches of burnt material could be seen. The removal of the surface cover also made it clear that the external ramp was a substantial feature extending out from the ring of monoliths for approximately four metres. Indeed it went beyond the perimeter fence that defined the apparent limits of the monument. The entire structure was 23m in diameter, compared with a previous estimate of 17m.

Given the size of the monument, the entire area was recorded using photogrammetry and the digitised plan was then checked according to a series of ground controls. This provided a stone-by-stone drawing of the entire structure which work in the second season confirmed was metrically accurate (illus 12). The saving of time in the field was immense. The photographic survey occupied an hour and half compared with conventional procedures which would have taken a week or more.

The resulting drawing formed the basis for the next two stages of analysis. The plan was checked on the ground and details of stone colours, raw materials and visible alignments were recorded together with any traces of charcoal or cremated

bone. These features helped to suggest where stratigraphic relationships could be investigated.

At first it seemed as if the monument had three components: an outer platform, a recumbent stone circle and a well preserved ring cairn (illus 13–16). The excavation was planned on this premise, although in the event the inner kerb did not materialise.

At this stage the work had three main objectives. First, a narrow section was excavated beneath the original position of the recumbent stone, which

had been moved during the operation of the quarry (Trench 3, illus 17). This procedure could not have been used on a well preserved monument, although Childe had somehow managed to tunnel underneath the recumbent stone at Old Keig (Childe 1933). Our work investigated the rubble foundation beneath this feature and the natural surface on which it had been built. The second objective was to investigate the stratigraphic relationship between the kerb of the ring cairn and the external ramp on which two of the monoliths



12 The surviving remains of Tomnaverie stone circle after initial planning.



13 The perimeter of Tomnaverie stone circle showing the position of the modern quarry.



14 The southern perimeter of Tomnaverie stone circle showing the remains of the external rubble platform. (Source: Jim Henderson)

seemed to be standing (Trenches 1 and 7). Lastly, a more extensive section was excavated to the centre of the monument (Trench 7). This also incorporated one of the kerbstones which remained *in situ*. The trench took in 20% of the central area of the monument, where we had expected to find an internal kerb.

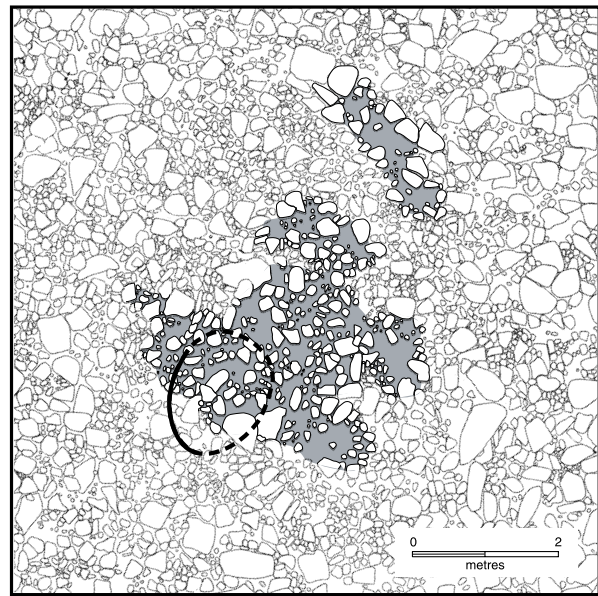
Two further objectives were added to the programme during the second season. Once some of the sockets for the monoliths had been found, larger areas outside the cairn were investigated (Trenches 2, 4, 5, 6, 8). This procedure revealed



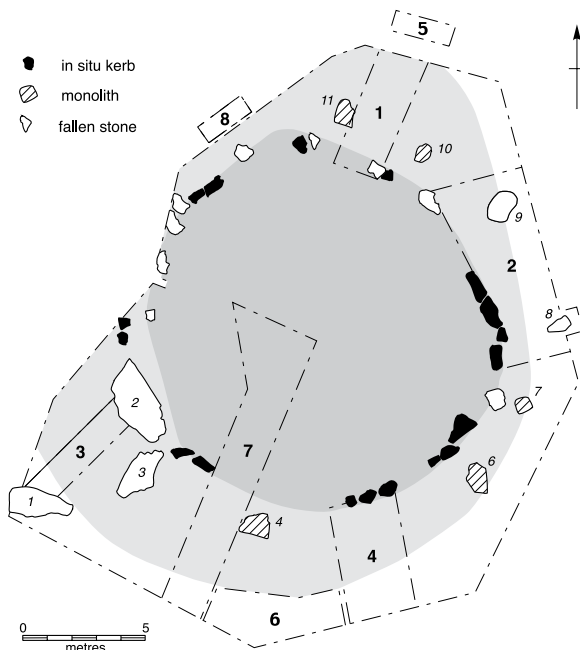
15 Detail of the rubble platform showing the position of one of the displaced flankers.



16 The north-east perimeter of Tomnaverie stone circle showing the positions of a stone socket and two fallen monoliths.



18 The central area of the platform cairn at Tomnaverie showing the surface evidence of burning (shaded) and the position of the central pit. Only the part of the pit defined by a continuous line was excavated.



17 The parts of Tomnaverie stone circle examined by detailed excavation. The numbers in bold refer to the trenches and those in italics to the monoliths.

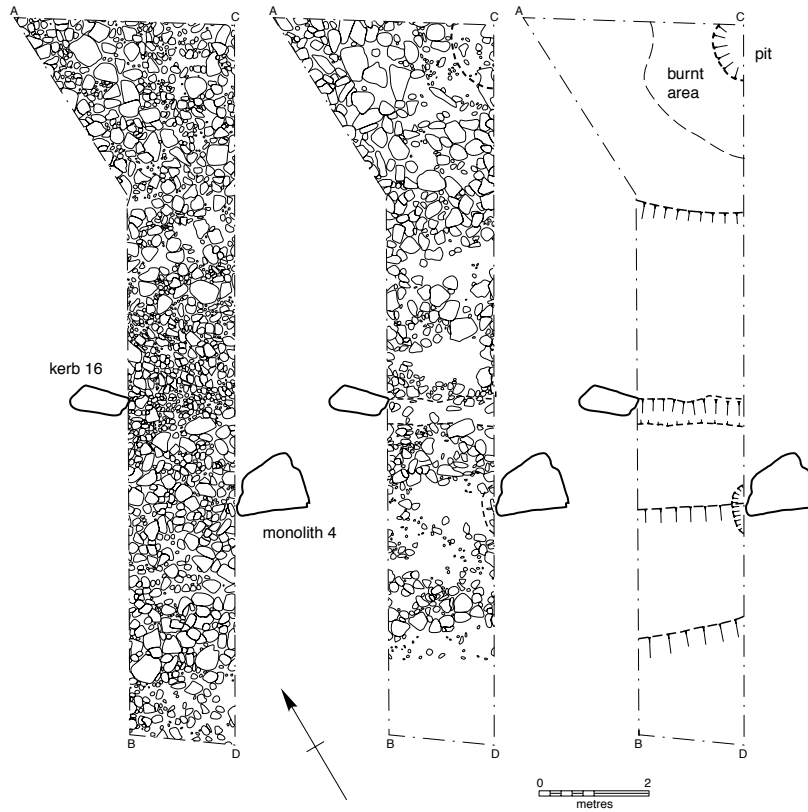
the sockets for both the flankers and those for three other stones, although one example on the edge of the quarry was not excavated further. Lastly, it became clear that the ‘missing’ lengths of kerb were marked by a trench filled with loose topsoil which resulted from the removal of large upright stones. This was excavated in its entirety.

2.4 THE STRATIGRAPHIC SEQUENCE

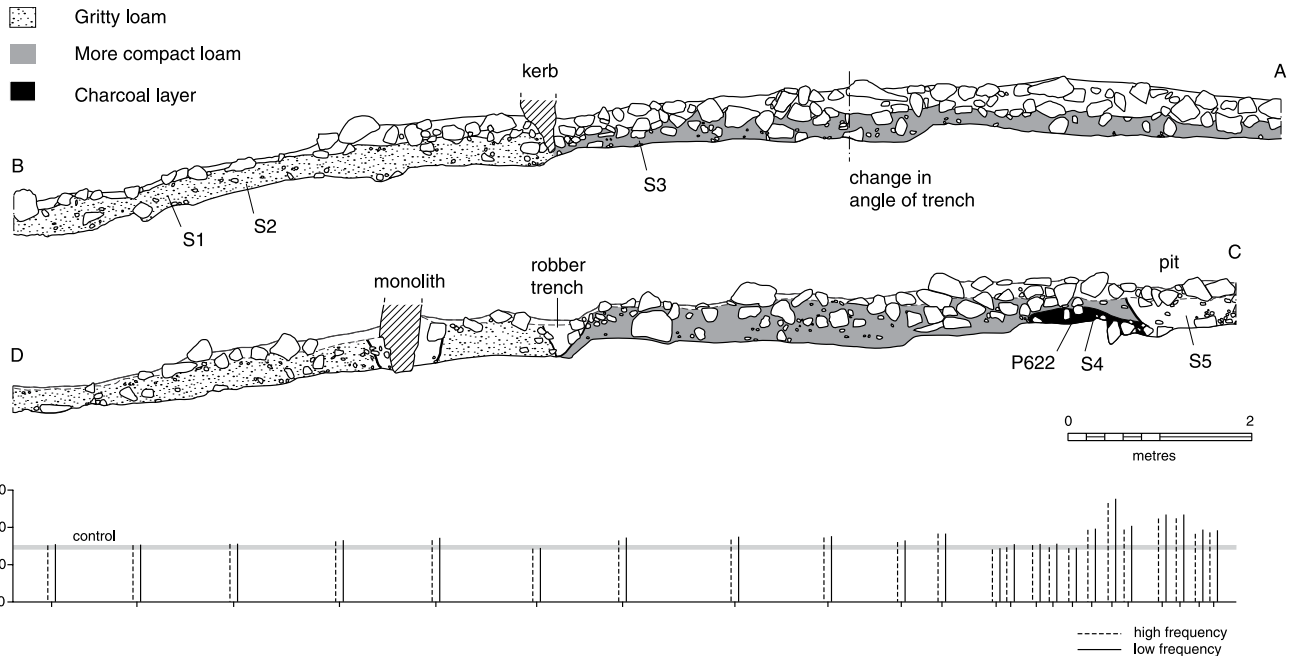
2.4.1 DEPOSITS PREDATING THE PLATFORM

The interior of the monument preserved an old land surface covered with a deposit of burnt soil, finely comminuted charcoal and small fragments of cremated human bone (illus 18). Part of this deposit had been cut by a later pit, but its outer edges were sealed by the material of the cairn. The burnt material formed a low mound up to 20cm high and may have extended across an area about 3m in diameter. This deposit probably developed *in situ*. A transect taken from the outer edge of the monument to its centre revealed an increase in magnetic susceptibility towards the summit of the hill. Again the area with the highest values underlay part of the monument (illus 19 and 20).

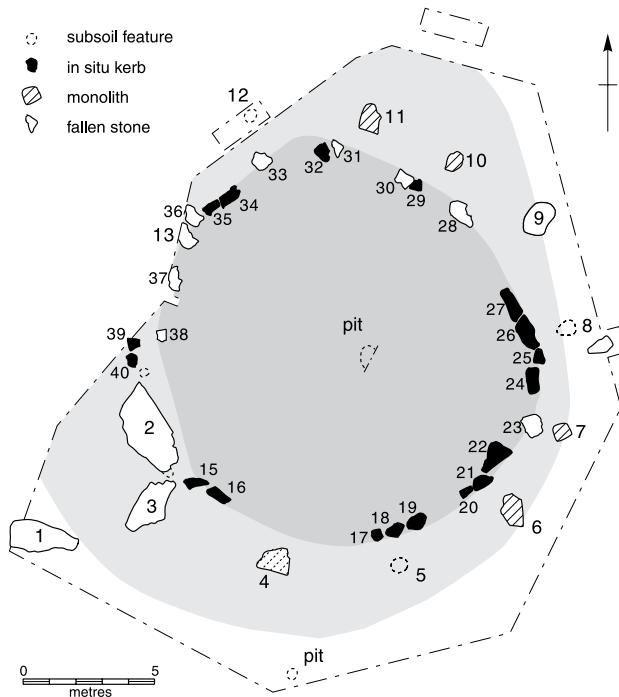
THE MOON AND THE BONFIRE



19 The stratigraphic sequence in Trench 7 at Tomnaverie. The left-hand plan shows the surface after stripping. The middle plan shows the banks of rubble in the lower level of the monument, and the right-hand plan shows the features defined on, or in, the natural subsoil.



20 Sections through the cairn and stone circle in Trench 7 at Tomnaverie. Their positions are indicated in illus 19. S1-5 indicate the positions of soil samples and P 622 shows the position of the pollen samples. The vertical bars along the base of the drawing record the magnetic susceptibility of the buried soil along the course of the trench.



21 Numbering of the monoliths and kerbstones at Tomnaverie.

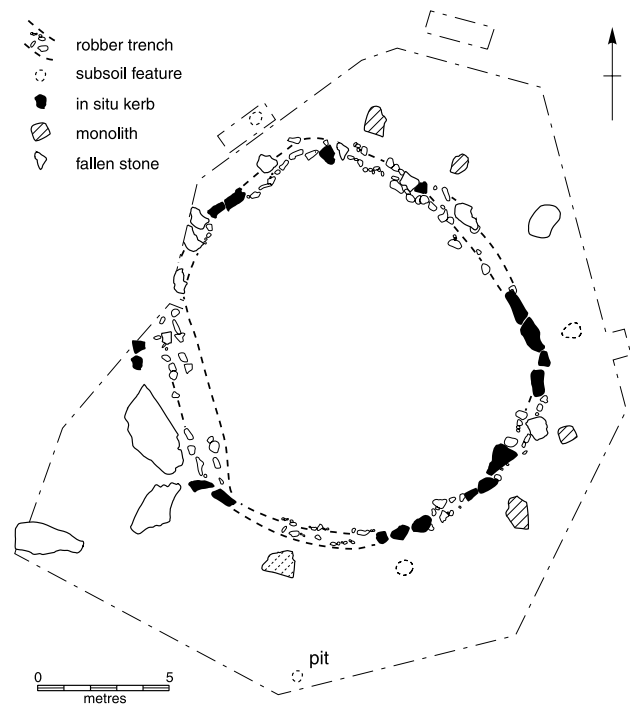
Having said this, it is clear that burning took place intermittently during later prehistory and again in the post-medieval period. This is shown by a series of radiocarbon dates. The loose material of the cairn may not have prevented charcoal from later phases percolating through the overlying rubble.

2.4.2 THE CAIRN OR PLATFORM (ILLUS 21 & 22)

The cairn enveloped that deposit of charcoal and cremated bone and overlapped its edges. It had a substantial outer kerb, part of which had been identified by field survey, but no inner kerb was necessary as it abutted the summit of the hill. Thus it resembled a ring cairn in being open at the centre but is better described by Frances Lynch's term 'platform cairn' (1993, 113). It was about 15m in diameter and, strictly speaking, it was polygonal rather than circular, with as many as eight distinct sections of kerb (illus 22). Although the presence of wedge holes suggested that people had intended to break up the stones, there was nothing to show that any material had been removed. Apart from the damage caused by vegetation, which may have affected the looser material in the centre, the original surface of the monument was intact.

Its outer kerb was composed of blocks and slabs of granite, but these may have been employed in different ways. Where the structure still survived, the less regular slabs were used on sloping ground and the blocks where the natural surface was level. The latter were large enough to retain the mass of the cairn. The slabs, however, were pinned in place between that material and an external bank of rubble; the individual stones did not have any sockets. The bank that had been piled up outside them was more apparent on the flanks of the hill and virtually disappeared where the ground was flat. Where kerbstones were missing or where they had fallen outwards, their position was marked by a shallow trench. This was not a foundation trench, as many of the stones had simply been wedged in position in between two masses of rubble (illus 23 and 24). Loose soil had filled the void that resulted when those kerbstones fell or were lifted from the ground. As a shorthand term, this feature will be referred to as the 'robber trench'.

Structural problems seem to have arisen because the platform extended so far down the slope on the west side of the site (illus 19–22). Here it seems as if the builders had to make careful provision for the material of the cairn to be supported. It is possible



22 Evidence for the kerb at Tomnaverie.

that a certain amount of turf or topsoil had been introduced to provide a better foundation. In addition, both sections through the external deposit of rubble on the southern perimeter of the monument found that the surface of the hill had been cut into a series of steps; a similar feature was observed in an early excavation at Castle Fraser



23 Packing for the displaced kerb at Tomnaverie, showing how it had been wedged in position in between two masses of rubble.

(illus 19, 20 and 25; Coles 1904, 299–303). In Trench 7, it is clear that the outer kerb of the monument had been held in place against the side of one of these ledges (illus 19 and 20). The soil layers were bounded by banks of rubble which would have had the effect of retaining walls (illus 25). On the bottom of one of these steps, directly

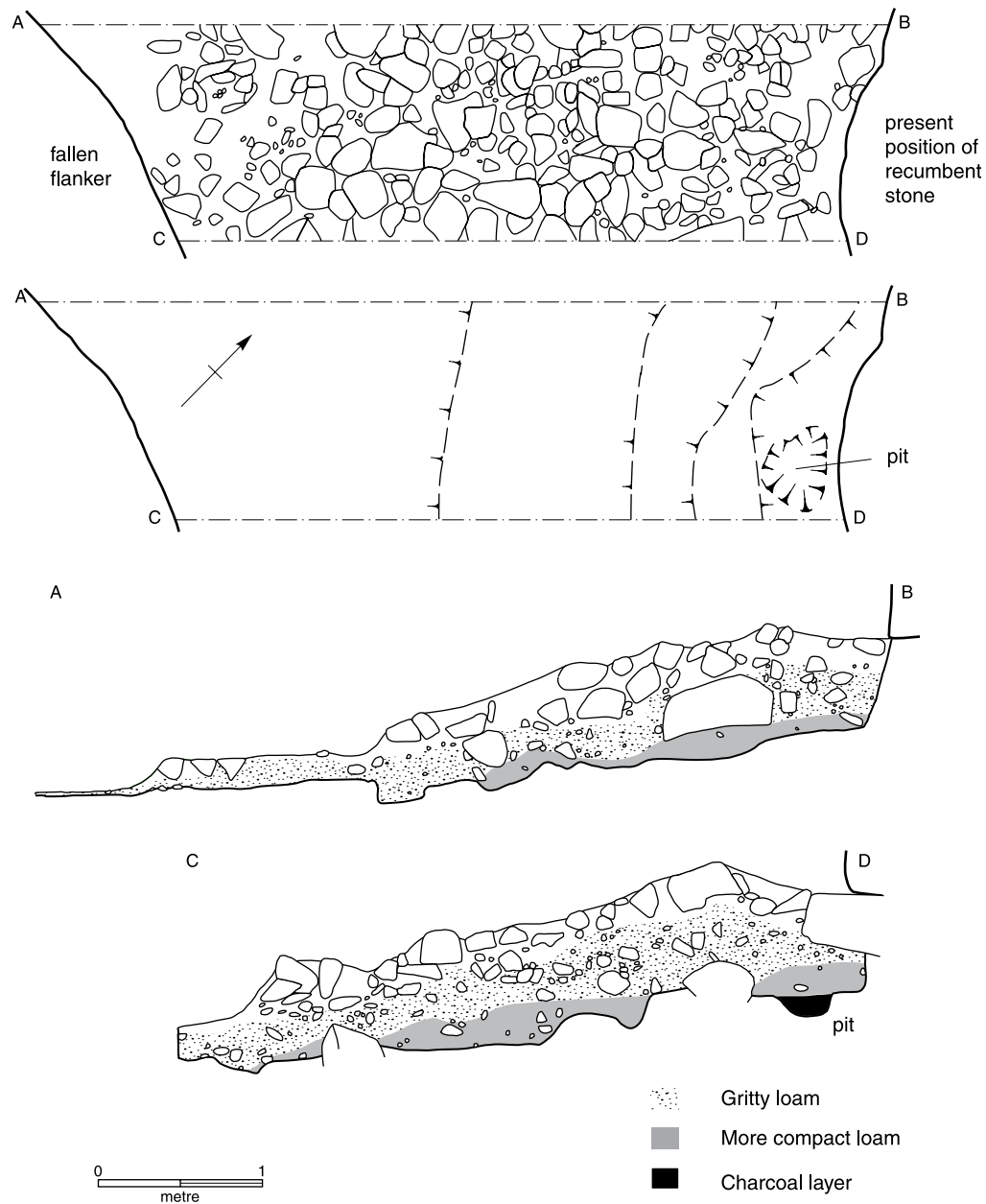


24 The robber trench for the kerb at Tomnaverie viewed from the exterior.

beneath the original position of the recumbent, a shallow pit had been dug into the natural bedrock and filled with charcoal (illus 26). This had clearly been excavated from the surface of that ledge, where more charcoal was found, and for that reason it cannot be an older feature truncated by the building of the monument. Samples from this context produced radiocarbon dates in the mid to late third millennium BC. Details of the individual determinations are given in Table 8. Professor Sturt Manning advises that five of the six determinations can be considered together; the sixth is inconsistent with the others. Since all five dates should refer to the same event, they can be combined as 3959 ± 23 BP. 'A date of c 2494–2457 BC is the most likely dating area within the three possible ranges at one standard deviation, or 2498–2432 BC within the four possible ranges at two standard deviations. The 25th century BC represents the most likely working hypothesis' (Sturt Manning, pers comm).



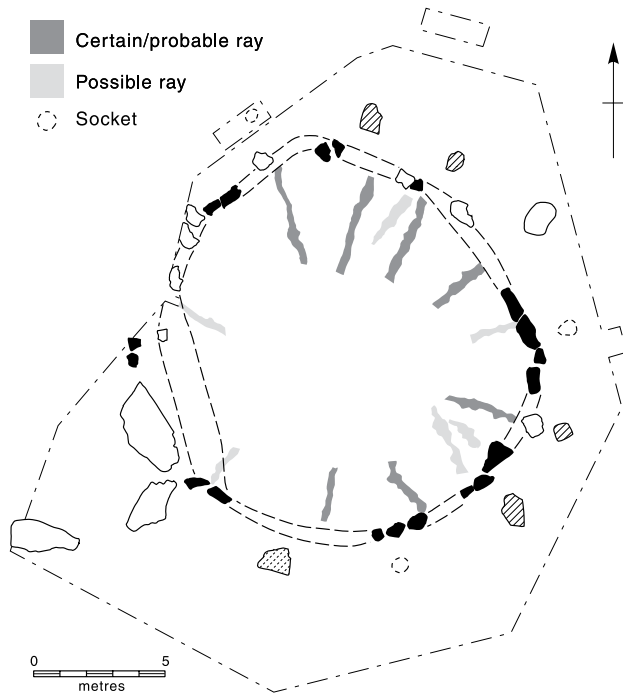
25 One of the banks of rubble in the base of the cairn in Trench 7 at Tomnaverie. (Source: Jim Henderson)



26 The stratigraphic sequence in Trench 3 at Tomnaverie. The upper plan shows the surface deposits revealed after initial stripping. The trench extends between the positions of a displaced flanker and the recumbent stone which had been rolled back into the interior of the monument; it would originally have been located on the surface of the rubble platform. The lower plan shows the features cut into the natural bedrock.

There was no evidence of similar procedures in other parts of the site and this has important implications. It seems to have been vital that the surface of the platform should be roughly level and that it should extend over the southern and western limits of the ridge. It was a massive construction and seems to have been designed to

bear a considerable weight. These developments do not seem to have happened by chance, for by moving the structure slightly further to the north, the builders would have avoided some of these problems. Its siting ensured that on three sides no dead ground could be seen beyond the monument.



27 The evidence of radial divisions in the cairn at Tomnaverie.

How was its construction organised? To judge from the deposits exposed in the quarry face, some of the raw material used in this structure could have been obtained in the vicinity. Many of the kerbstones were quarried, whilst the cairn was built from rounded boulders which might have been found on the lower ground. That was also true of the material of the outer ramp. One clue is provided by the distinctive deposits around Monolith 3, for here particular use was made of flat slabs. It was difficult to explain this until we observed a natural fault exposed in the quarry face a few metres away. This contained exactly the same material. Colour may have been important, too. The stones comprising the platform, the kerb and the external buttress were redder than those exposed by excavation on the natural surface around the monument. They may have been selected for inclusion in this structure. That was also true of a few quartz blocks which were placed in the edge of the ramp on the southern flank of the monument. Smaller pieces were scattered across the full extent of the site.

Parts of the kerb had been damaged, but four sections can be recognised. Those on the east and west are marked by larger kerbstones, whilst those used in the northern and southern lengths

were less substantial. It seemed as if the axis of the monument ran from north-east to south-west and that its limits had been marked by larger kerbstones than the others. Despite these differences of mass, the entire kerb had been graded by height. The large blocks towards the north east formed the lowest section and those towards the opposite side were taller. This was only apparent when some of the fallen kerbstones had been raised and the effect is so subtle that it may have been more apparent to the builders than to a stranger visiting the monument.

There were also some indications of the internal structure of the platform. Its creation seems to have entailed the movement of earth from other locations on the hill, so that parts of the cairn were really a skin of rubble over a layer of redeposited topsoil. That was apparent in the one section that



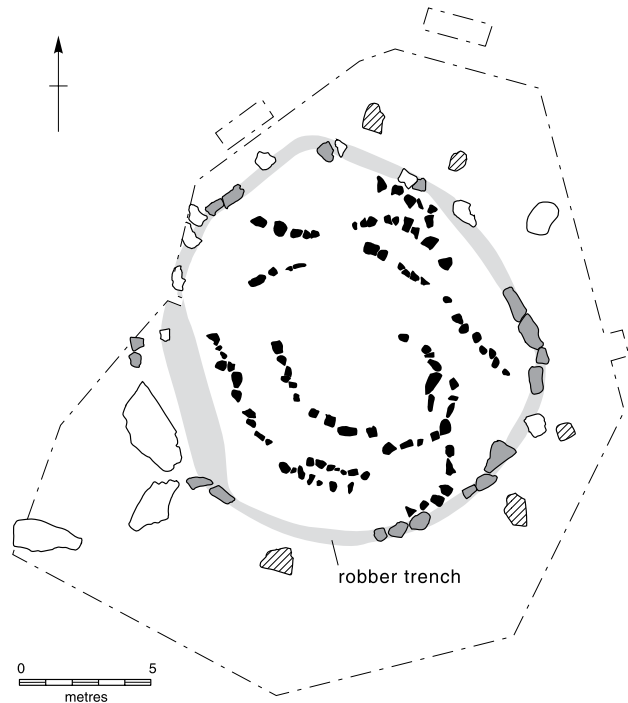
28 A radial division in the surface of the cairn at Tomnaverie.

we excavated to the centre of the monument, but in any case it may have been confined to the area where the slope was steeper and where more material would be needed to create a level platform.

The surface of that platform seemed to include radial lines of stones of approximately equal sizes joining the outer kerb to the open area in the centre. These were assigned to two different grades according to the confidence with which they could be identified (illus 27). There were 13 radial divisions, seven of which are regarded as certain or probable and six as possible examples. The more convincing examples were all located in the eastern half of the monument and only two contenders were recognised along its western perimeter. These had been laid out in almost



29 Another radial division in the surface of the cairn at Tomnaverie.

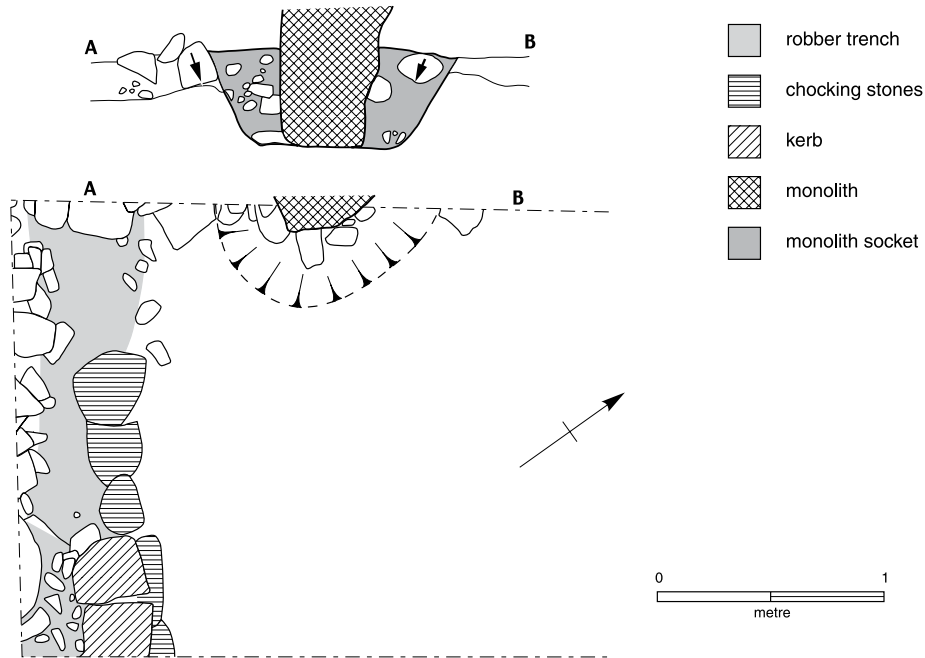


30 Arcs of boulders visible in the surface of the cairn at Tomnaverie.

symmetrical groups clustering towards the north-east and may emphasise a north-east/south-west axis. That would have given the monument a 'front' and 'back'.

Some of these radial divisions were created by rows of substantial stones and were easy to distinguish in the surface of the platform. In other cases, they looked more like drystone walls (illus 28 and 29). These were left unexcavated to avoid damaging the cairn, but their stratigraphic context became clear where they were exposed in the robber trench left when parts of the outer kerb were removed. Such divisions extended down to the old land surface, so they are a primary feature of the monument. In only four instances were they directed towards changes in the course of the perimeter, but two of them outlined the limits of the long straight stretch of kerb on the south-west edge of the platform.

At first it seemed as if the monument had an inner kerb. Arcs of boulders could be recognised towards the centre of the site, but they never formed a complete circuit and each followed a different course from the others (illus 30). There may be a simple explanation for this. The structure lacked an inner kerb since none was needed. The



31 The position of the kerb and Monolith 11 in Trench 1 at Tomnaverie, showing the position of some of the chocking stone used to manoeuvre the kerbstones into place. The socket for the monolith was dug through the external bank of rubble holding the kerbstones in place.



32 Fallen Monolith 9 at Tomnaverie.

surface of the platform was built flush with the deposits that had already accumulated on the hilltop. The core of the monument had been built outwards from the centre. Substantial boulders had been piled up around the surface of the hill, lapping over the deposit of charcoal and cremated bone which may have formed a low mound. This may once have been covered by a skin of smaller stones but the evidence was so slight that it was more apparent in plan than it was in section; this area had probably been disturbed by the growing trees reported by Coles (1905). Perhaps the appearance of concentric rings was intended by the builders. Like the radial divisions that could be seen in the surface of the platform, they may have been part of the design.

2.4.3 THE EXTERNAL RAMP

This structure extended around the perimeter of the monument, except where it had been truncated by the quarry. Like the kerb, its scale seems to have varied. To the south-west, where the gradient was steepest, it was a considerable feature with a clearly defined outer edge containing a few blocks of quartz, but to the south it was shallower and narrower. Here little of its structure survived.



33 Fallen Monolith 8 and its socket after excavation at Tomnaverie.
(Source: Jim Henderson)

Where it was most substantial, a clear break occurred along the line of the kerb (illus 20) and here the distinction between the boulders on either side of this feature was mirrored by separate deposits of topsoil at a lower level. Clearly this was not conceived as a continuation of the cairn itself, nor did it consist of material that had eroded off that structure: it was an independent entity. That is clear because the steps cut into the natural hillside continued beyond the kerb. In any case the outer edge of the ramp was not concentric with the main part of the cairn.

It seems to have been intended as an external revetment designed to hold the kerbstones in place. That was clearly necessary as some of them were leaning outwards and a number had fallen. They had been wedged in place in between the external deposit of rubble and the main mass of the cairn and were often supported internally and externally by packing stones, one group of which was integral to the material of the cairn whilst the other formed part of the exterior ramp. This is especially evident on the northern side of the monument in Trench 1, for both inside and outside the limits of the cairn there were rounded boulders which may have been used as chocking stones when the

kerbstones were manoeuvred into position (illus 31). At the north-eastern limit of the cairn, directly opposite the recumbent stone, sherds of Beaker pottery lay on the old ground surface at the foot of the kerb. They were sealed by the rubble of the external platform and must have been placed there before it was constructed.

This seems to provide additional dating evidence for the monument, but a complication arises with the results of excavation on a similar monument at Cothiemuir Wood (see Chapter 3). Here the external platform supporting the outer kerb of a ring cairn was not constructed in a single operation. Close to the

recumbent stone this deposit was laid down at the same time as the kerb, but on the opposite side of the monument (in the equivalent position to the Beaker sherds at Tomnaverie) an interval of unknown duration had intervened. Here the kerb had collapsed and been rebuilt before the platform was added. Again a number of artefacts had been placed at the foot of the kerbstones.

2.4.4 THE RECUMBENT STONE CIRCLE

The stone circle was located in the space between the kerb and the outer edge of the rubble bank. This made it possible to define the stratigraphic



34 Stone-packed socket for Monolith 5 at Tomnaverie.

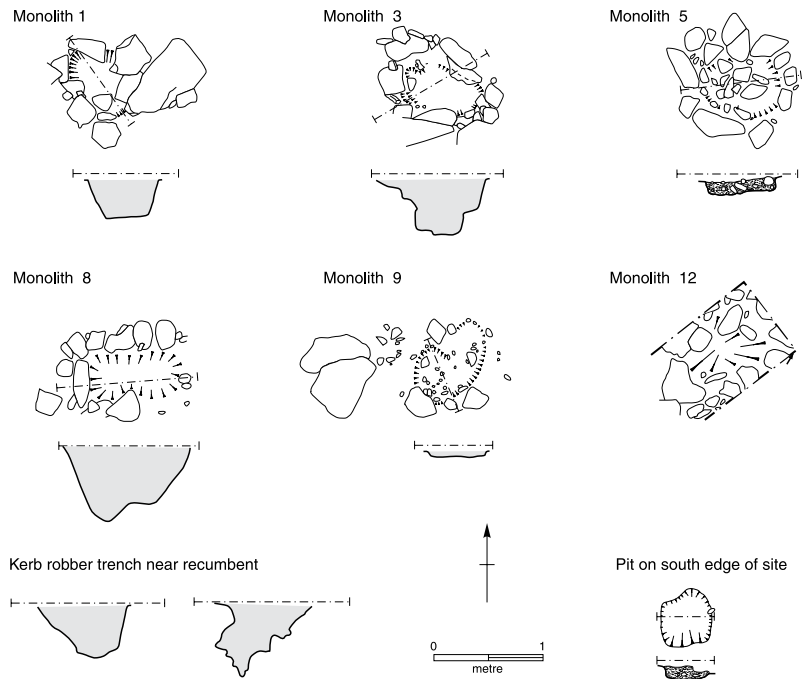


35 The excavated socket for Monolith 9 at Tomnaverie.

The flankers had quite deep sockets, but the others were relatively shallow, with flat or rounded bases. They contained rings of boulders which had acted as packing stones, and none had been excavated into the bedrock (illus 31–5). The socket for Monolith 9 was even shallower but had a flat bottom which fitted the contours of the fallen stone (illus 35). In this case the upright was hardly set into the ground and may have been secured by a cairn which no longer survives. The shallower sockets were on the northern or western sides of the monument where the external bank of rubble was least substantial, and that may suggest one reason why some of the stones had fallen.

Monoliths 4 and 11 remained in position. In each case the upright stone fitted tightly into a socket that had been dug down to the natural bedrock (illus 20 and 31). These features were recorded in box section and it soon became apparent that they had been excavated from the surface of the rubble. It follows that they were secondary to the platform and the external ramp. In Trench 7 the socket for Monolith 4 was cut through the filling of one of the terraces supporting the mass of the cairn (illus 20). Its characteristic profile suggested that the stone

relationship between the different parts of the monument. The positions of eleven monoliths, including the two flankers, fell within the excavated area (illus 21); a possible example, now lying flat, extended beneath the perimeter fence on the edge of the quarry (Monolith 13). This was not excavated for safety reasons but is shown as a standing stone in a drawing of the monument by Fred Coles (1905). Four stones remained *in situ*, and four or five others had fallen or been moved; Monolith 8 was not known before the excavation. In six instances their sockets were identified. One of these almost certainly belonged to a further upright (Monolith 5) which was found on the quarry floor. Another example, marked by a low cairn of packing material, was recognised on the edge of the excavated area and was not investigated further. This was probably the site of Monolith 12.



36 Profiles of the excavated sockets at Tomnaverie. The drawing also includes two profiles of the kerb robber trench immediately behind the recumbent stone and the section of the isolated pit on the southern edge of the excavated area.



37 The displaced recumbent stone at Tomnaverie. It would originally have been located in the position marked by the ranging pole.

had been manoeuvred into place from the interior of the monument.

The two flankers seem to have been pulled vertically out of the ground during the operation of the quarry. Their sockets were substantially undamaged and large packing stones still remained in position in their edges; these were left in place. Again neither socket cut into the natural bedrock. In both cases the profiles of these features matched the contours of the upright stones, each of which tapered towards the base, probably as a result of deliberate modification (Kilbride-Jones 1934, 83–6). Because of this characteristic they could not have stood before the platform was built. This suggests that both the sockets had been dug from the surface of the bank that provided additional support for the kerb (illus 36).

In the case of the recumbent stone the sequence is simpler still (illus 37). This had been rolled on its side by the quarrymen, and it was possible to investigate the area that had originally been underneath it. It was clear that the recumbent had not been set deeply into this deposit. Rather it had occupied a shallow hollow and had been held in place by massive chocking stones. These were firmly embedded in the surface of the platform and it would have been unsafe to investigate them in detail. In every case where stratigraphic evidence survives, the components of the stone

circle were secondary to those of the platform.

When the recumbent stone had been replaced in its original position we could investigate the area immediately behind it. This included two rows of larger stones embedded in the surface of the rubble. At first these were interpreted as a temporary seating for the recumbent before it was moved into position. Further investigation suggests another possibility, for these blocks marked the position of a shallow trench extending between two sections of the kerb at the points where they turned to join the flankers. Its filling included large angular fragments of granite and on its base was the stump of a



38 The foundation of the demolished kerb behind the recumbent stone at Tomnaverie viewed from the north-east. The stump of a broken kerbstone is immediately behind the scale.



39 The foundation of the demolished kerb behind the recumbent stone at Tomnaverie viewed from the south-west.

large upright stone of similar character to those in the nearby kerb (illus 38 and 39). The trench was of about the same depth as the feature left behind when parts of that kerb were removed but it had been refilled with rubble where the latter contained a deposit of topsoil. The most likely interpretation is that this trench had originally held a section of kerb facing towards the south-west. It seems to have retained blocks of unusual size. Its limits were marked by two of the radial divisions visible in the surface of the platform. At some point that kerb had been uprooted, leaving the lower part of one stone in place. The others were probably removed by undermining the structure from the interior of the monument. The resulting disturbance was then refilled, quite possibly with broken fragments of the original kerbstones.

These developments may have taken place when the stone circle was built, for at either end of this trench the kerb changed direction to meet the flankers. It seems possible that all these events were connected so that the platform was extended to join the recumbent stone and a section of its kerb was demolished. The hollow that remained was then filled in with rubble. Now these parts of the monument were linked together.

2.4.5 LATER PREHISTORIC DEVELOPMENTS

There is no archaeological evidence for further developments until the later prehistoric period. At this stage the exposed surface in the centre of the platform seems to have been re-used and there are further signs of burning, apparently associated with cremated bone. This is probably reflected by a series of radiocarbon dates centred on 1000 BC. A later intrusive feature in the centre of the circle contained sherds which probably date from the same period. Just outside the external ramp to the south of the monument was a shallow pit with two



40 Lifting one of the displaced flankers at Tomnaverie.



41 One of the displaced flankers at Tomnaverie being moved towards its socket.
(Source: Jim Henderson)

during the Aberdeenshire witch trials of 1597 (Goodare 2002, 54–5). In thin section the filling of this pit does not seem to be the result of *in situ* burning, but it still seems likely that fires had been lit somewhere nearby. This raises the possibility that the hilltop acted as a beacon. It is known that another part of the hill was used for lighting bonfires to celebrate more recent coronations.

2.5 RESTORATION OF THE MONUMENT (ILLUS 40–4)

At the end of the excavation the fallen kerbstones were reset in their original foundations, but only where their locations were unambiguous. The recumbent stone was returned to its correct position and both the

fragments of pottery in a similar fabric, but in this case there was no evidence of burnt bone.

2.4.6 POST-MEDIEVAL DEVELOPMENTS

In the centre of the platform a shallow pit had been dug into the natural surface of the hill and cut through the earlier deposits (illus 18). This was associated with large quantities of charcoal and cremated bone. At the time of excavation it was tentatively dated to the first millennium BC because it contained the sherds mentioned earlier, but the associated charcoal dates from the 16th and 17th centuries AD, suggesting that this is the real age of the pit. Similar dates were obtained from other samples in the centre of the monument. The cremated bones found inside this feature are indistinguishable from the material in the layers through which it had been dug, implying that they were residual. They contain a significant proportion of male bones and had been burnt to a high temperature. That disposes of an alternative interpretation, for it is not consistent with the idea that Tomnaverie had been re-used for executions



42 Tomnaverie: moving the recumbent stone back into its original position. (Source: Jim Henderson)



43 Tomnaverie: securing the recumbent stone in its original position.

flankers were re-erected in their original sockets. A stone on the quarry floor, long recognised as a component of the monument, was replaced in the nearest socket, which it fitted exactly (Monolith 5). Beside an empty socket identified in the first season of excavation was a fallen stone which had become buried in a patch of silt (Monolith 8). This fitted the socket and is interpreted as another component of the original monument. Its neighbour, Monolith 9, lay flat on the ground, but after it had been moved its socket was identified and excavated. Like the others, this stone has been replaced in its original position. After the excavation, the entire area of the monument was turfed, but a distinct groove, marked by grass of a different kind, was left to indicate the course of the kerb around the outer edge of the platform. At the time of writing new visitor facilities have been created at the site and the refilling of the quarry is well advanced.

2.6 THE FORM OF THE FINAL MONUMENT

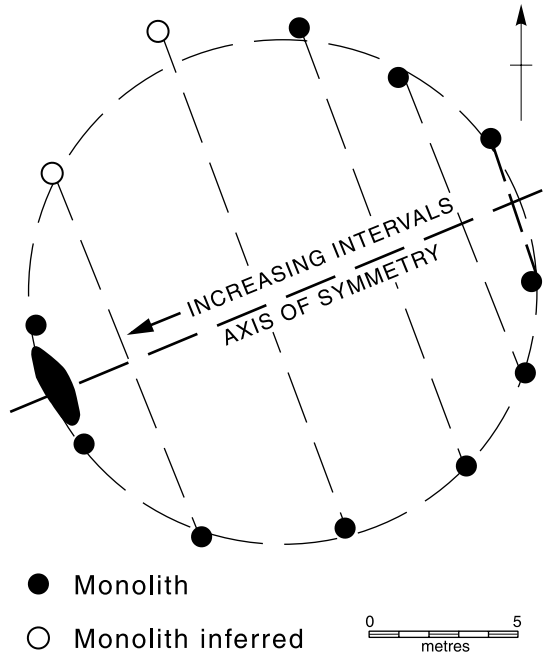
Once the fallen stones had been replaced in their original positions

it was easier to appreciate the distinctive form of the monument (illus 44). It consisted of a ring of twelve monoliths and a recumbent stone, disposed around the edge of a roughly level platform up to 60cm high. It was located on the end of a ridge and to the south and west had been terraced out across the contours. The monoliths and the flankers followed the circumference of a circle approximately 16m in diameter, but the recumbent was slightly off that alignment. The monoliths were perhaps arranged in pairs with a view to axial symmetry (illus 45). The standing stones were closer together opposite the recumbent and the flankers. They were approximately graded in height from north-east to south-west (illus 46).

All the uprights were pink in colour and seemed to consist of quarried stone, with the exceptions of Monoliths 5 and 11 which were possibly erratics. The recumbent was of glacial origin and is rather whiter than either of the flankers because it contains inclusions of quartz (illus 47 and 48). The flankers themselves came from different sources. The only stones with cup marks were the recumbent and Monolith 5. On the inner face of



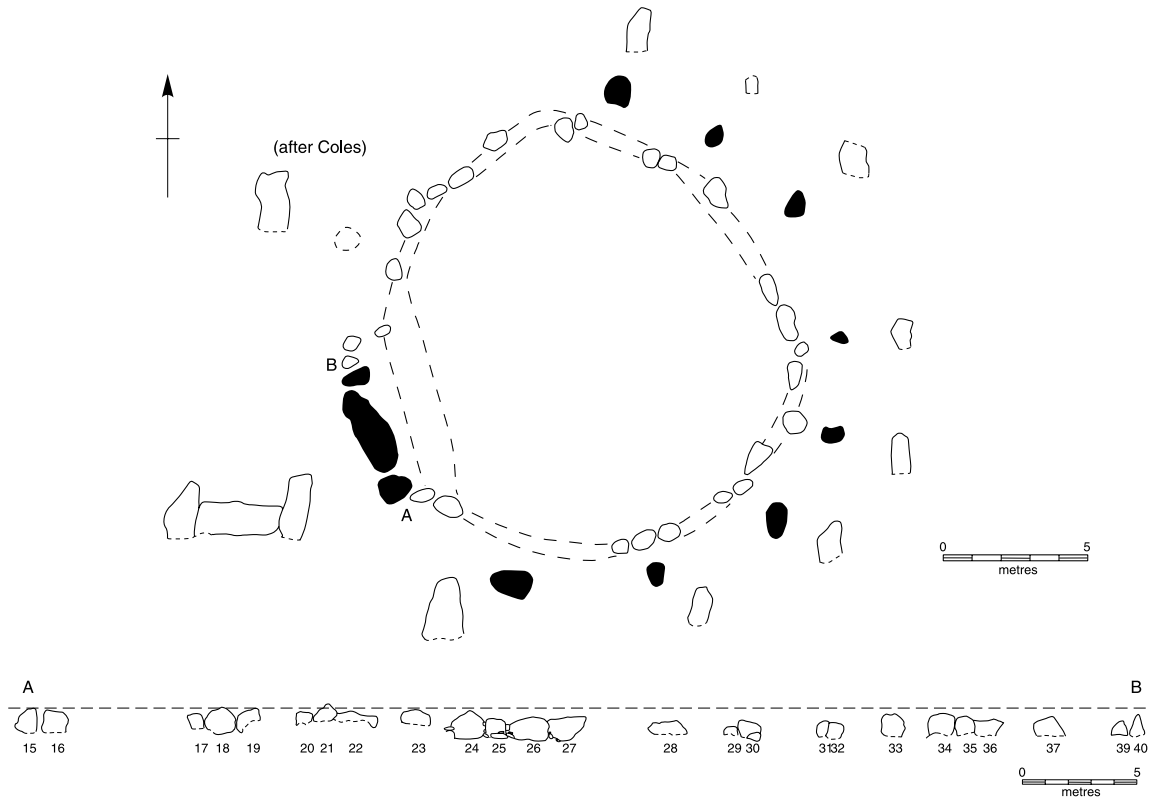
44 The stone circle at Tomnaverie after excavation and restoration of the monument. Morven is on the horizon in the centre of the picture. (Source: Jim Henderson)



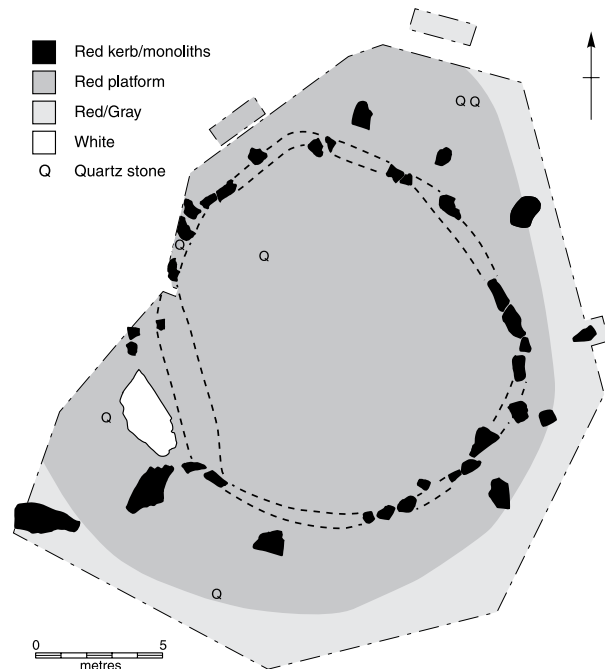
45 A reconstruction of the original layout of Tomnaverie stone circle.

the recumbent stone there is also a wedge-shaped hollow which recalls the form of an Early Bronze Age axehead like those depicted on the cist slab at Nether Largie North (RCAHMS 1988, 68–70). This seems to be of natural origin, but may provide one reason which this particular stone was used in the monument (illus 49).

It is difficult to establish the original form of the kerb which defined the outer limit of the platform. This was probably polygonal, with a long straight section on the south-west side and showed the same grading by height as the ring of monoliths. It was built out of pieces of quarried granite and boulders of similar character to the material used in the circle. Both these groups were red or pink. The largest kerbstones were along the north-eastern perimeter of the monument, but the bedding trench behind the recumbent suggests that this section had been built on a similar scale. Other lengths of kerb consisted of slabs rather than blocks of granite and they would have given these parts of the perimeter a jagged outline. Cup marks



46 Elevation of the restored kerb at Tomnaverie and profiles of the monoliths. For the stone numbers see illus 21. The profile of one of the standing stones, probably the now inaccessible Monolith 13, is based on a sketch by Coles (1905).



47 Stone colours at Tomnaverie. The plan also shows the distribution of unworked quartz in the monument. The two pieces close to the south-western perimeter of the monument were large blocks.

have been identified on the kerb towards the south of the monument. The interior of the platform was predominantly pink or red and was embellished by patterned stonework. Like the composition of the kerb, this made a distinction between the 'front' and 'back' of the monument. It also emphasised the long straight stretch of kerb to the south-west.

Outside the kerb there was a deposit of rubble which probably played two roles (illus 37). Its main function was to support the outer edge of the platform and to hold the kerbstones in place, but towards the position of the recumbent it also provided a ramp of rounded boulders up which the components of the circle could be drawn. This would have been especially important in the case of the recumbent stone. The edge of this external ramp described an even curve around the perimeter of the site and included a few large blocks of quartz, but there was no indication of a kerb.

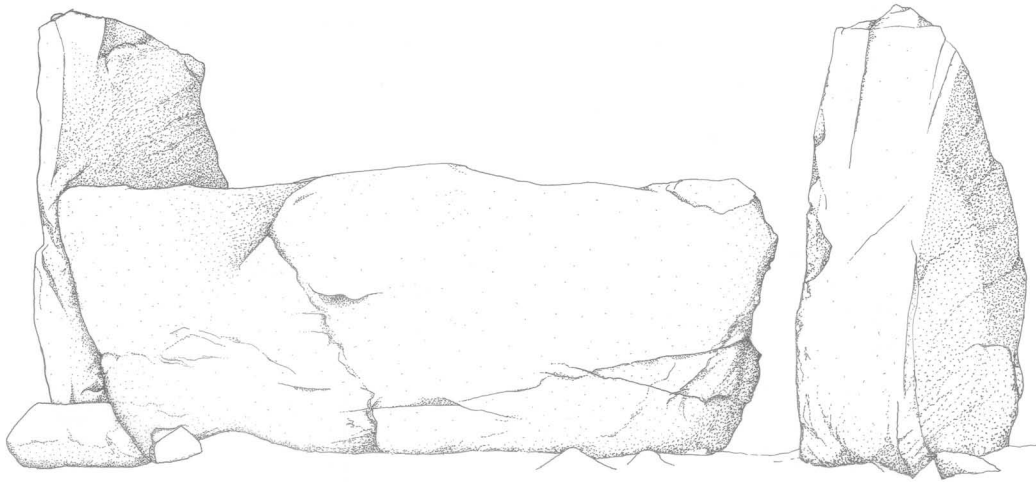
No fewer than eight of the radial divisions in the surface of the platform seem to point to the positions where later structures were to be built. Six of them are directed towards monoliths in the stone circle: 6, 7, 9, 10, 11 and 12 (the unexcavated

socket on the edge of the quarry). Two more are aligned on where the kerb of the platform would be redirected to join the flankers. That seems more than a coincidence.

There are also links between the kerbstones and the monoliths (illus 50). The clearest instance is towards the recumbent where the stones of the rebuilt kerb seem to have been selected to match the pointed top of one of the flankers (Monolith 3). Further connections link the shapes of individual monoliths to components of the kerb. This applies to Monoliths 5, 6, 7, 8 and possibly 11. The shapes of Monoliths 6, 7 and 8 match those of the nearest kerbstones. The rounded form of Monolith 5 is also mirrored in the stretch of kerb beside this stone. The grading of the uprights reflects that of the existing kerb, but it is notable that most of the other connections are in the area opposite the recumbent.

There may be further links between individual monoliths in the stone circle (illus 50). Monoliths 8 and 9 frame the view of the recumbent and flankers from the north-east. Both these stones have an unusually smooth texture. There could also be a connection between the angular shapes of Monoliths 7 and 10 which are on opposite sides of the circle from one another; Stone 10, however, is broken. In this case the relationship also extends to the nearest kerbstones. These links are confined to the north-eastern sector of the monument and do not seem to extend around the entire perimeter.

Why did this simple scheme break down? One possibility is that it reflects the sequence of construction, in which the circle was built some time after the kerb. Like other monuments of its type, the stone setting at Tomnaverie adhered to certain conventions concerning the number and spacing of the uprights (Burl 1976b). That did not allow much flexibility. Perhaps the resulting pattern was a compromise between the desire to suggest links between different components of the architecture and the protocols that specified how the stone circle should be organised. There appears to have been a conflict between the desire to match the monoliths to the nearest kerbstones and the wish to form connections between pairs of stones in the circle. Because the cairn was built first, it seems as if the nature of the kerb took precedence over other considerations.



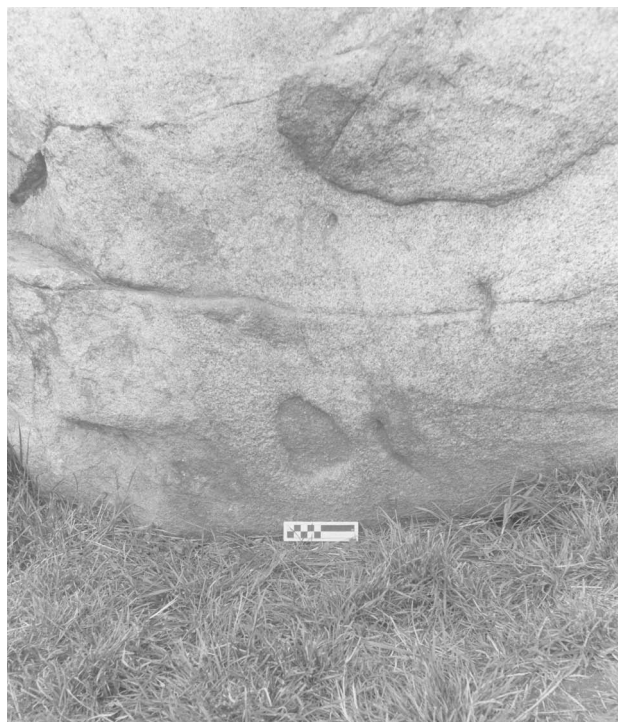
48 Details of the recumbent and flankers after re-erection. 48a shows the outer faces of the stones and 48b depicts their inner faces and shows the position of a cup mark on the recumbent and the position of the natural scar shown in illus 49.
(Drawings: Sharon Arrowsmith)



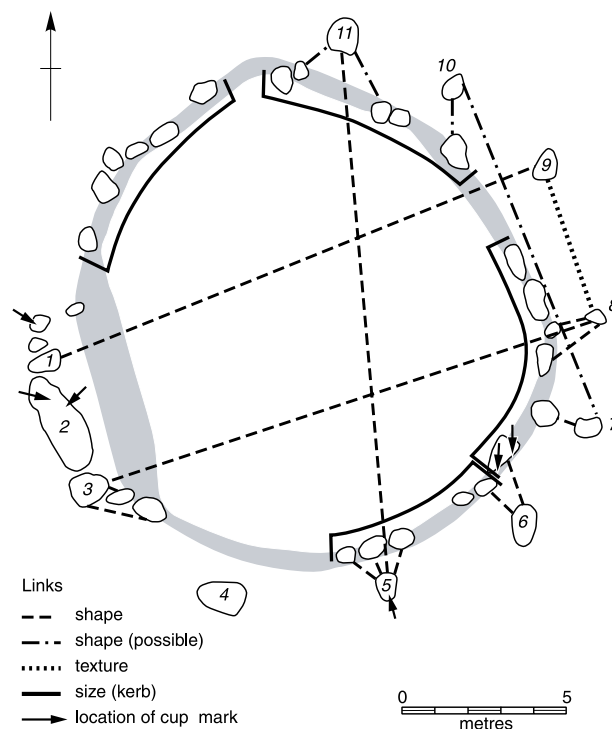
At all events, the finished structure was an impressive achievement. Once the stones had been replaced it became clear that the recumbent, like so many others in the region, had been precisely level and was framed by pillars of contrasting height and proportions. One of these (Monolith 1) was taller and flat topped, whilst its counterpart (Monolith 3) tapered to a point (illus 48 and 51). The contrast between the flankers is reflected by the two monoliths on the opposite side of the circle (8 and 9) which frame a view of the recumbent stone. Both have an unusually smooth appearance, and again they can be regarded as a pair. As if to

copy the configuration of the flankers, Monolith 9 is noticeably taller than Monolith 8.

That is only apparent from the exterior of the monument. Viewed from the centre of the platform, the recumbent stone obscures the foreground and highlights an intermediate band of hills. Above it there is a cleft in the horizon and beyond that again is the mass of Lochnagar, with two subsidiary peaks on either side. In a way that natural configuration recalls the arrangement of the recumbent and the flankers (illus 51). The connection between them is enhanced because the recumbent stone is whiter than the other parts



49 A natural scar on the inner face of the recumbent stone at Tomnaverie resembling a carving of a flat axe.



50 Possible links between the monoliths and kerbstones at Tomnaverie.



51 The restored recumbent and flankers at Tomnaverie showing a distant view of Lochnagar. (Source: Jim Henderson)



52 Distribution of the excavated artefacts at Tomnaverie.

of the circle. Again this may be significant, for Lochnagar retains a covering of snow for longer than the surrounding hills. Between the flankers a section of sky is visible above the recumbent stone. Ruggles has suggested that this corresponds to the position of the setting moon every eighteen and a half years. It is certainly outside the arc within which the sun could be observed from the centre of the circle (1999, Tables 5.1–5.3).

2.7 THE EXCAVATED MATERIAL
(ILLUS 52)

2.7.1 POTTERY (ILLUS 53)

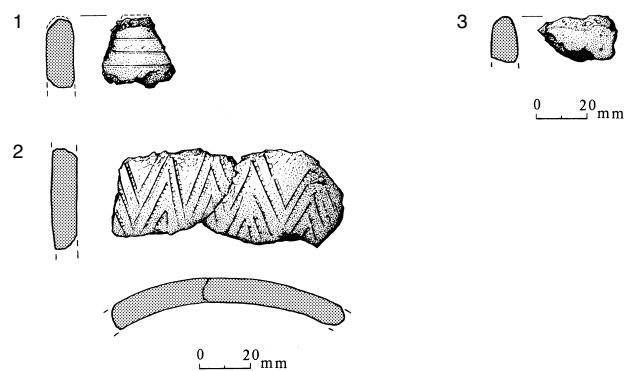
Alison Sheridan

The ceramic finds comprise twelve sherds, two crumbs and a fragment of a daub-like substance. The largest sherd is *c* 54mm by 40mm; and although the small size of most sherds precludes firm identification, it is clear that the assemblage includes both Early Bronze Age Beaker pottery

and Late Bronze Age plainware (see below on terminology).

Beaker

At least one, possibly two Beaker pots are represented, by SF nos 365, 369, 393, 420 and 421. All were found close together, on the old land



53 Excavated pottery from Tomnaverie. 1 and 2: Beaker; 3: Later Bronze Age.

surface, near the outside edge of the cairn kerb opposite the recumbent. Despite having slightly abraded edges, sherds 365 and 420 conjoin to form part of the belly of a Beaker, some 170mm in external diameter at this point and with a wall thickness of around 10.5mm (illus 53.1). Most of the outer surface of these sherds is decorated with fairly shallow impressions of a rectangular-toothed comb, arranged as loose nested chevrons running vertically down the body. Sherd 421 appears to be from the rim and upper neck area (although the rim surface is missing), and is probably from the same pot (illus 53.2). Straight-walled, and originally upright or slightly splaying, it is decorated with three shallow incised horizontal lines, and below the lowest is a very faint trace of a diagonal line, too slight to reveal whether it had been comb-impressed. Sherds 369 and 393 are heavily abraded and have lost most of their external surface, but enough survives (on 369, at least) to show that they had been decorated with comb impressions. To judge from wall thickness, fabric and colour, it is not impossible that these, too, come from the same pot but that they have suffered greater degradation. All six sherds are of a medium (ie not particularly fine or coarse) fabric that is slightly gritty; the exterior surface had probably been wet-smoothed to obscure the grits, which are more evident on the interior and where the exterior has been worn away. The inclusions occur in a density of around 15–20% (except on sherd 421, where they are sparser), and are mostly small (<1.5mm by 1.5mm), angular and sub-angular, and of a crystalline rock containing black and white minerals. Occasional gold-coloured mica platelets are also present and may have come from the same, deliberately crushed, tempering material. Other inclusions range up to 6mm by 4mm in size and include a dull grey, less angular rock whose fragments might have been present naturally in the clay. The colour is shown most clearly in sherd 421, which has a fresh fracture surface: the exterior and interior surfaces are light brown, to a depth of 2–3mm, and the core is black. This indicates a rapid firing.

The combination of straight neck, below-rim horizontal lines and vertical nested comb-impressed chevrons places this Beaker within Clarke's Northern series (particularly N3–N4), although the decorative elements are also found on some Southern Beakers (Clarke 1970).

According to Ian Shepherd's scheme for north-east Scotland (and particularly for the Buchan area), it could be allocated to his step 5 or 6 (Shepherd 1986). Although many Beakers of this general type have vertical chevron decoration arranged as discrete motifs of filled triangles interspersed with plain triangles (eg at Afforsk, Banff: Clarke 1970, fig 728), there are examples where the nested chevrons run over most of the surface (eg at Auchrynie, Aberdeenshire: *ibid*, fig 722; the angle of the chevrons is shallower than at Tomnaverie).

Unfortunately, in the light of the British Museum Beaker Dating Programme (Kinnes *et al* 1991), it is not possible to suggest a date range for this type of Beaker narrower than *c* 2300–1700 BC. Furthermore, although the suite of dates obtained from the pre-platform pit attest to initial monument-related activity during the second half of the third millennium BC (AA-49279–84), the exact chronological relationship between this pit and the Beaker find context is unclear.

Late Bronze Age plainware: probable and possible examples

The probable examples are sherd 652 and sherd spall 653 from the same pot from the pit beyond the platform on the south side of the monument, and probable rimsherd 278, from the interior of the monument to the north-east of the recumbent. The possible examples, comprising sherds and crumbs too small to be diagnostic, are 563 and 486, both from the central area, outside and at the edge of the central pit.

Sherds 562–3 are from the body of a fairly large, probably undecorated pot, whose diameter at this point is estimated at *c* 260mm and whose wall thickness is *c* 13mm. The inner surface has been carefully smoothed to a low sheen, with marks of the smoothing tool visible; the exterior, though smoothed, is slightly uneven. The fabric is fairly hard. Inclusions are small (up to 3mm by 2mm), at a density of *c* 7%, and consist of finely-crushed quartz (with some fragments having speckles of a black mineral). The outer half of sherd 652 is reddish-brown, the inner half black, suggesting that the pot had probably been fired in an inverted position. Its ancient fracture surfaces are slightly abraded.

Sherd 278 is likely to be a rimsherd; there is slight damage to its upper edge, but from the

sherd's overall shape it appears that its rounded top is a true rim, rather than a coil joint line (illus 53.3). Although the sherd is too small for a reliable estimate, the rim diameter will have been over 120mm; wall thickness is 10mm. Although both surfaces have been smoothed, the exterior is slightly uneven. The fabric is reasonably hard; inclusions comprise small (up to 2mm by 2mm), angular fragments of the black-and-white speckled stone seen in the Beaker and in 562-3, complete with at least one gold-coloured mica platelet; the density is approximately 3-5%. The fracture edges are slightly abraded, and core colour is obscured but appears to be blackish, with a reddish-brown surface colour.

The small sherd spall 563 (*c* 15mm by 13mm), and the equally small sherd spall 486 (plus crumbs), are really too small and abraded to allow confident identification; all that can be said is that they could be of the same type of pottery as that represented by sherds 562-3 and 278. Inclusions are very small and sparse, but in 563 individual black and white mineral specks are visible.

Despite the small size of all of the aforementioned pieces (the largest of which, 562, is *c* 44mm by 25mm), their appearance is consistent with that of the Late Bronze Age plainware (the so-called 'flat-rimmed ware') found in secondary deposits at other recumbent stone circles, such as Old Keig and Loanhead of Daviot, Aberdeenshire (Childe 1933; 1934; Kilbride-Jones 1935), and they may well have come from bucket-shaped pots. The term 'flat-rimmed ware' has long been agreed to be an inadequate and inaccurate, if handy, descriptor of later prehistoric plainwares spanning over a millennium; and although work has been in progress on examining their chronological and geographical variability (Catherine McGill, current PhD research, Edinburgh University), no significantly better terminology has yet been developed. Those examples which had definitely or possibly contained cremated remains, as at Duff House, Banff (Anon 1857, 298), could be included within the 'bucket urn' category; although here, too, current dating work undertaken for the National Museums of Scotland has revealed that this broad class of pottery was also of long duration (Sheridan 2003). Indeed, the Duff House example has been dated to the 13th century BC by Eogan (1994, 85-7), on

the basis of its associated gold jewellery. A date of 2820 ± 50 BP (GrA-21696, 1050-900 cal BC at 1 standard deviation, 1130-830 cal BC at 2 standard deviations) has recently been obtained for cremated bone associated with this kind of pottery at Old Keig; this is consistent with three of the dates obtained for the deposit of burnt material in the centre of the platform at Tomnaverie (AA-49291-3) and for Late Bronze Age activity at Aikey Brae. Similar dates have also been obtained for Late Bronze Age activity (including re-use of Early Bronze Age monuments) in and around the Clava cairns at Balnuaran of Clava, Highland (Bradley 2000, 115-121; 129-30).

The similarity in tempering material between this pottery and the Tomnaverie Beaker sherds might indicate that both had been made using locally-available material; investigation of the bedrock and drift deposits would be necessary to verify this.

Other, indeterminate pottery

Two sherds, 464, from close to the inside of the cairn kerb, and 525, from the central pit, are thinner-walled and of finer fabric than the rest of the Tomnaverie pottery. They are both undecorated, medium hard body sherds with smooth inner and outer surfaces and no significant colour difference between core and surfaces (indicating that they have been oxidised throughout during firing). The fracture edges of 464 are slightly abraded. Inclusions are tiny (<1mm by 1mm) and sparse, but include the same minerals as seen in the other sherds.

These sherds are described as 'indeterminate' because, although the Late Bronze Age pottery at Loanhead of Daviot encompassed a range of textures including some quite fine, nothing quite as fine and thin-walled as this is represented. It may be, of course, that these sherds are indeed of Late Bronze Age date; the repertoire of LBA wares is not well documented. They are certainly not wheel-thrown (thus any possible association with the post-medieval activity at the monument can be ruled out); and although they are comparable in fineness to Early Neolithic pottery, they are too small to be diagnostic, and it is not suggested that they are of this date.

Possible daub

The most intriguing ceramic item from Tomnaverie is 480, from outside the central pit. This fragment

of thoroughly fired/burnt clay is of irregular cylindrical shape, roughly 15mm in diameter and 12.5mm thick. Friable, and of variegated pale grey-orange colour, it contains a couple of tiny fragments of carbonised organic material and a small area of blackish, sandy clay but is otherwise free of inclusions. The outer surface is markedly smooth over part of its circumference, and the 'lower' surface is fairly smooth if uneven.

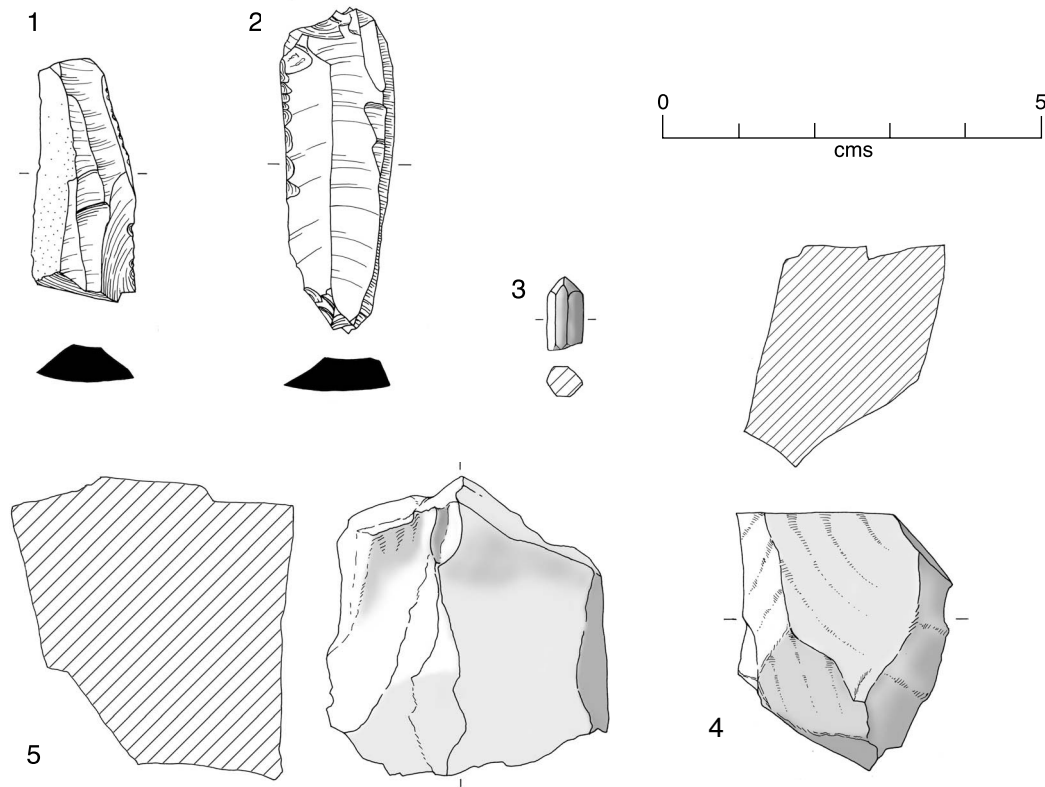
Although not a classic example, this resembles daub in its colour and appearance. Its shape and size suggests that clay has been pressed into the hollow interior of a withy (or indeed vice versa: that a withy had been pressed down into a fine clay surface), and subsequently burnt. Normally daub preserves impressions of the exterior of withies, and indeed withies are normally not hollow, when fresh; but it is nevertheless not inconceivable that some daub/clay could enter the end of an individual withy. Two possible interpretations suggest themselves: the first that this is from a wattle-and-daub structure constructed at the monument; the second

that some wattle-and-daub structure or artefact (eg bier) had been involved in the putative cremation ceremony, the remains of which were deposited in the centre of the monument. (A variant on this idea is that of a simple wattlework structure, such as a screen, set into a clay surface and subsequently burnt.) Of these suggestions, the first is not very persuasive, for if such a structure had existed, one would have expected more than one small fragment of daub to have survived. The second is possible, but no example of any such artefact/construction is known from a Bronze Age context. For now, the fragment must remain a mystery.

2.7.2 WORKED STONE (ILLUS 54)

Tim Phillips

In total 88 pieces of worked stone were recovered, one of the struck quartz chunks coming from the surface just outside the excavated area. One piece of natural crystal was also found. This is discussed



54 Lithic artefacts from Tomnaverie: 1: retouched flint blade; 2: retouched flint blade; 3: piece of natural crystal; 4: quartz core; 5: quartz core.

with the worked stone because of the deliberate deposition of similar material at Cothiemuir Wood. The assemblage is detailed in Table 1.

Raw material

The two main types of raw material present were flint and quartz, although one piece of worked rock crystal and a struck quartzite flake were also recovered (Table 1). Most of the quartz was inner material. Of the secondary worked pieces where the cortex could be recognised about half and been derived from pebble sources, and the rest from outcrops. The fieldwalking survey observed readily available pebble and outcrop quartz in the area around the site. This material was most likely derived from local sources.

On the primary and secondary pieces of flint all the recognisable cortex came from beach pebbles; there did not appear to be any pieces of mined Boddam flint (Saville 1993). This is similar to the material recovered by fieldwalking. The source of the flint was most likely on the east coast.

One small and broken fragment of natural crystal was found (illus 54, no 3). This was recovered whilst cleaning the surface of the cairn. Although its context is not secure, it is possible that it was a prehistoric deposit. This type of material was not found locally and must have been introduced.

Technology

None of the quartz showed signs of further modification. Most of the pieces were either

simple struck flakes or chunks from which one or two flakes had been removed, although three rudimentary cores were recovered (illus 54, nos 4 and 5). This would suggest the expedient use of a readily available raw material. However, most of the quartz assemblage consisted of inner pieces. This may indicate the intensive use of quartz or, alternatively, the final reduction of material taking place at the site. The latter is also suggested by the presence of a relatively high number of struck chunks, three cores and a couple of quartz chips which can be recognised as knapping debris.

The flint assemblage was composed of relatively small pieces. 12 of the 39 artefacts were small chips. This is consistent with the use of a raw material at a distance from the source. Most of the assemblage was composed of knapping debris, although two fine retouched blades were recovered (illus 54, nos 1 and 2). One of these was a primary struck piece. Four other blades and one possible broken blade were found. The flaking techniques, types and colours of the Tomnaverie material are very similar to those found by fieldwalking in the Howe of Cromar.

Artefact types

The only retouched artefacts were two flint blades found outside the kerb close to Monolith 8.

Stratigraphy (illus 52)

Worked stone was found in almost all parts of the site. There were only a few areas where it was rare or absent. There was a low density of material

Table 1 Summary of the lithic artefacts from Tomnaverie.

	Primary	Secondary	Inner	Total
Quartz flakes	–	4	23	27
Quartz chunks	–	5	12	17
Quartz chips	–	–	2	2
Rock crystal flake	–	–	1	1
Quartzite flake	–	–	1	1
Flint flakes	–	9	7	16
Flint blades / PBT*	1	1	3	5
Flint chunks	–	2	4	6
Flint chips	–	–	12	12
Natural crystal	–	–	–	1
Total	1	21	65	88

* Pieces possibly worked by blade technology

towards the south-west around the area of the recumbent stone. In the centre of the cairn most of the material was recovered in the excavation of the central pit and the disturbed area around it, but very little was found during surface cleaning. The general spread of material was in an arc around the central area, with a concentration towards the north-east side of the monument. This decreases towards the south and south-west and also appears to do so to the north and north-west, but much of that edge of the site had been removed by quarrying.

In the excavated areas, two pieces of flint came from a small pit on the southern edge of the platform and were associated with sherds of late prehistoric pottery. In the trench on the north-east side the two retouched blades were found close to the fallen Monolith 8 and another blade near to Monolith 9. One of the quartz cores came from the area where Beaker pottery was concentrated opposite the recumbent stone. Another quartz core came from the platform on the north side of the monument, and a third from the edge of the central pit. The small fragment of natural crystal was found on the platform to the south. This is not an especially conspicuous location and for that reason it need not be a modern 'visitor offering'.

Discussion

Three concentrations can be recognised in the distribution of worked stone. A group of artefacts in the centre of the monument may have been related to a range of activities, including the cremation of the dead. Further to the east and north-east, lithic artefacts were deposited in an arc around the limits of the cairn. There was a concentration of material in the excavated area just outside the kerb and opposite the recumbent stone. This included the fine retouched flint blades and the only sherds of Beaker pottery. The density of material decreased towards the southern and, perhaps, the northern sides of the site.

2.7.3 THE CREMATED HUMAN SKELETAL REMAINS

Angela Boyle

Introduction and quantification

Each find of a fragment, or group of fragments, of cremated bone was recorded separately in the

field. These amounted to 95 separate groups. These are summarised in Table 2. At the time of excavation it seemed as if all the cremated bone belonged in two discrete deposits: the site of a pyre associated with the primary use of the monument, and a pit containing sherds of later prehistoric pottery which had been cut through it. Radiocarbon dates confirm that there was a period of use in the Late Bronze Age but show that the pit was dug in the 16th or 17th century AD. It now seems that the human remains found in that pit were reworked from the deposits into which it was cut and for that reason all the skeletal remains can be regarded as a single deposit, although there is no indication of the length of time over which it accumulated.

Condition of the bone

Most of the cremated bone was in good condition. However, fragments from two contexts were weathered or abraded (479 and 583); one came from the central deposit and the other from the disturbed surface of the cairn.

Age and sex

It was possible to assign broad age categories to 28 of the deposits: these were subadult, adolescent, young adult and adult. Bones within four deposits were tentatively identified as male (469, 560, 585 and 605).

Weight

The majority of the deposits weighed 1g or less, and in this respect they contrast with the cremations from Loanhead of Daviot (Kilbride-Jones 1935, 214). Weights are summarised in Table 3. The expected weight for a cremation is derived from known weights of adult cremated remains from modern crematoria (using the >2 mm fraction to render them comparable with most archaeological cremated material). They have been found to range between 1001.5g and 2422.5g, with an average of 1625.9g (McKinley 1993). From a sample of about 4000 multi-period burials a range of 57–2200g was obtained from undisturbed adult burials (McKinley 1997). The reason for this variation is uncertain, but it is clear that widely different quantities of bone were included in burials at the time of deposition. Clearly, none of the deposits at Tomnaverie represents the complete remains of a single individual.

Table 2 Summary of all deposits of cremated bone at Tomnaverie.

Small find no.	Weight	Age	Sex	Colour	Identifiable fragments	Comments
13						unburnt animal or hare
54	1g	?	?	white and well calcined	long bone shaft	
55	1g	?	?	white and well calcined	nothing identifiable	
73	> 1g			white and well calcined	nothing identifiable	
86	> 1g			white and well calcined		possible animal, very smooth cortex
167	1g			white and well calcined	long bone fragments	
179	1g			white and well calcined	long bone shaft	
181	> 1g	?	?	white and well calcined	skull vault	
184	1g	?	?	white and well calcined	nothing identifiable	
185	> 1g			unburnt	possible animal	
358	> 1g	adult	?	white and well calcined	mandible	
360	1g	adult	?	white and well calcined	skull vault	
372	1g	?	?	white and well calcined	nothing identifiable	
373	7g	?	?	white and well calcined	skull vault, long bone shaft	
375	1g	?	?	white and well calcined	long bone shaft	
388	8g	adult	?	white and well calcined	left petrous, long bone shaft	
389	1g	?	?	white and well calcined	nothing identifiable	
398	1g	?	?	white and well calcined	nothing identifiable	
416	3g	?	?	white and well calcined	skull possibly zygomatic	
417	> 1g	?	?	white and well calcined	nothing identifiable	
467	1g	?	?	white and well calcined	skull vault	
469	4g	adult	M?	white and well calcined	quite thick frontal bone	
470	1g	?	?	white and well calcined	nothing identifiable	
472	17g	adult?	?	white and well calcined	long bone fragments	
475	> 1g	?	?	white and well calcined	nothing identifiable	
476	> 1g	?	?	white and well calcined	long bone shaft	
479	> 1g	?	?	white and well calcined	skull vault	fragments are abraded a single fragment is probable animal
494	7g	adult?	?	white and well calcined	long bone fragments	
495	> 1g	adult	?	white and well calcined	skull vault	
496	2g	?	?	white and well calcined	skull vault	
497	> 1g	?	?	white and well calcined	long bone shaft	
498	2g	adult	?	white and well calcined	skull vault	
499	> 1g	?	?	white and well calcined	long bone shaft	
500	1g	?	?	white and well calcined	nothing identifiable	
504	11g	?	?	white and well calcined	nothing identifiable	
506	3g	?	?	white and well calcined	nothing identifiable	
507	> 1g	?	?	white and well calcined	nothing identifiable	
508	6g	adult	?	white and well calcined	skull vault, long bone	
510	> 1g	?	?	white and well calcined	long bone shaft	
512	1g	?	?	white and well calcined	nothing identifiable	
513	1g	adult	?	white and well calcined	skull vault	
515	11g	adult?	?	white and well calcined	long bone shaft	
516	> 1g	?	?	white and well calcined	nothing identifiable	
517	> 1g	?	?	white and well calcined	skull vault	
523	4g	?	?	white and well calcined	skull vault	
524	69g	adult	?	white and well calcined	skull vault, cervical vertebra, femur, tibia	
529	> 1g	?	?	white and well calcined	skull vault, long bone shaft	
530	3g	?	?	white and well calcined	skull vault, long bone shaft	
532	> 1g	?	?	white and well calcined	skull vault	
533	3g	adult?		white and well calcined	skull vault	
534	6g	?	?	white and well calcined	skull vault, long bone shaft	
535	> 1g	?	?	white and well calcined	skull vault	

THE MOON AND THE BONFIRE

Small find no.	Weight	Age	Sex	Colour	Identifiable fragments	Comments
537	2g	adult? subadult?	? —	white and well calcined	skull vault and long bone skull vault	
540	3g	?	?	white and well calcined	nothing identifiable	
541	> 1g	?	?	white and well calcined	nothing identifiable	
542	2g	?	?	white and well calcined	?tibia	
544	5g	?	?	white and well calcined	skull vault, long bone shaft	
552	> 1g	?	?	white and well calcined	long bone shaft	
553	6g	?	?	white and well calcined	skull vault, long bone	
554	3g	?	?	white and well calcined	long bone shaft	
556	4g	?	?	white and well calcined	long bone	
557	8g	adult	?	white and well calcined	skull vault and long bone	
558	3g	?	?	white and well calcined	skull vault	
559	4g	?	?	white and well calcined	tooth root fragment, long bone shaft	
560	9g	adult	M?	white and well calcined	skull vault, long bone	very thick vault
561	1g	?	?	white and well calcined	nothing identifiable	
562	2g	?	?	white and well calcined	skull vault, long bones shaft	
567	1g	?	?	white and well calcined	nothing identifiable	
568	1g	?	?	white and well calcined	nothing identifiable	
569	2g	young adult	?	white and well calcined	skull vault	sutures quite open
570	3g	?	?	white and well calcined	nothing identifiable	
571	1g	?	?	white and well calcined	nothing identifiable	
572	3g	?	?	white and well calcined	skull vault, long bone	
573	2g	?	?	white and well calcined	long bone shaft	
574	1g	?	?	white and well calcined	skull vault	
575	17g	?	?	white and well calcined	skull vault, long bone shaft	
579	1g	?	?	white and well calcined	nothing identifiable	
581	17g	?	?	white and well calcined	humerus and tibia	
583	249g	adult	?	white and well calcined	skull vault, axial, upper and lower limbs	a single fragment of long bone has a weathered appearance
585	20g	adult	M	white and well calcined	occipital, long bone shaft	
591	> 1g	?	?	white and well calcined	nothing identifiable	
592	3g	?	?	white and well calcined	skull vault	
594	400g	adult	?	white and well calcined	skull, axial, miscellaneous long bone	
595	131g	adult	?	white and well calcined	skull vault, mandible, axial, upper limb	
598	121g	adult	?	white and well calcined	skull vault, petrous fragment, probable canine, rib, metapodial shaft, femur, tibia	
599	13g	adult	?	white and well calcined	skull vault, long bone	
604 II	14g	adult	?	white and well calcined	skull vault, long bone shaft	
605	326g	adult	M??	white and well calcined	skull vault, mandible, axial, upper limb	moderate suture closure
607	3g	adult?	?	white and well calcined	maxilla	
611	1g	?	?	white and well calcined	skull vault, tibia shaft	
614	9g	?	?	white and well calcined	skull vault, long bone shaft	
615	10g	adolescent		white and well calcined	skull vault, lumbar vertebrae, long bone shaft, distal epiphysis of fibular	
619	> 1g	?	?	white and well calcined	long bone shaft	
Trench 7, sample EE	9g	adult?	?	white and well calcined	skull vault, long bone shaft	
Trench 7, sample FF	3g	?	?	white and well calcined	long bone shaft	
Trench 7, sample II	1g	?	?	white and well calcined	skull vault, long bone shaft	

McKinley noted (*ibid*, 142) that primary burials in Bronze Age barrows produced high weights of bone (902.3g to 2747 with an average of 1525.7g) while the average weights of bone from cremation cemeteries were much lower (327g to 466g). At Barrow Hills, Oxfordshire, deposits other than the central ones were on the whole very much smaller. This may suggest deliberate selection and burial of a token deposit (Boyle 1999, 176). Other possible causes of loss need to be considered and these include incomplete recovery, disintegration and truncation due to ploughing.

Multiple burials

The number of individuals within a deposit is demonstrated either by obvious age-related differences in bone size and development as one would see between an immature and adult individual, or by duplication of identifiable bone fragments (McKinley 1997, 130). Multiple burials most commonly include a subadult or adult of either sex, with an immature individual (*ibid*, 142). A single deposit appeared to contain the remains of more than one individual. The deposit weighed only 2g but incorporated both adult and subadult skull vault.

Burnt animal bone

Possible burnt animal fragments were recognised in deposits 86 and 494, but the species cannot be identified. From a total of about 130 British Bronze Age burials an average of 16% contained cremated animal bone (*ibid*, 132). The quantities recovered were generally small, including parts of one or two species, most commonly immature sheep/goat or pig and bird. With both artefacts and animal bones it should be remembered that since not all the human bone was collected for burial it is probable that neither were all of the pyre goods. Hence those noted should be regarded as a minimum.

Temperature

Bone colour may be used as an approximate guide to firing temperature. Uniformity of colouration denotes even firing, with no evidence for variation in firing temperature or duration across different parts of the body. In all deposits the fragments were neutral white in colour. Shipman *et al* (1984) demonstrated that colour can be used as a very approximate guide to firing temperature. The appearance of the fragments suggests temperatures in excess of 645°C, and probably in excess of 940°C (Table 5).

Table 3 Weight categories of all cremation deposits at Tomnaverie.

Weight range	Cremation Nos	Total
1g or less	54, 55, 73, 86, 167, 179, 181, 184, 185, 358, 360, 372, 375, 389, 398, 417, 467, 470, 475, 476, 479, 495, 497, 499, 500, 507, 510, 512, 513, 516, 517, 529, 532, 535, 541, 552, 561, 567, 568, 571, 574, 579, 591, 611, 619, Tr 7 SII	46
<1–50g	373, 388, 416, 469, 472, 494, 496, 498, 504, 506, 508, 515, 523, 530, 533, 534, 537, 540, 542, 544, 553, 554, 556, 557, 558, 559, 560, 562, 569, 570, 572, 573, 575, 581, 585, 592, 599, 604II, 614, 615, Tr7 SEE, Tr 7 SFF	43
51–100g	524	1
101–150g	595, 598	2
201–250g	583	1
301–350g	605	1
351–400g	594	1
Total		95

Conclusion

It would seem most likely that the deposit containing cremated human remains is the detritus of a pyre site, particularly given the evidence for *in situ* burning. Presumably individuals were cremated here and their remains removed for reburial elsewhere.

2.7.4 SOIL MICROMORPHOLOGY

Stephen Lancaster, Donald Davidson and Ian Simpson

In seeking to establish the structural sequence at Tomnaverie, excavation also identified well-sealed fossil soils (palaeosols) and associated land surfaces beneath the monument. In this study thin section micromorphology is used to describe and interpret the features of these fossil soils. As soil properties reflect the cultural and natural environments in which they have been formed, it is anticipated that this will provide evidence of local environments prior to and during monument construction, and of post-construction processes that may have affected these soils. Furthermore, analyses and interpretation of soils from beneath this monument and one at Cothiemuir Wood (reported in Chapter 3) permits comparisons to be made with fossil soils found beneath another

distinctive class of Late Neolithic/Early Bronze Age monument in northern Scotland, the Clava Cairns, where micromorphological analyses have also been undertaken. This allows contrasts to be made between the fossil land surfaces beneath these two different classes of monument. An account of Tomnaverie is given here, and in Chapter 3, 3.6.2, the results of this work are compared with those at Cothiemuir Wood and other sites.

The Tomnaverie stone circle is situated on the crest of a hill on freely draining iron podzols of the Countesswell series, formed in till derived from granite and granitic gneiss (Soil Survey for Scotland 1957). The monument has three structural elements: a central cairn with a possible cremation pyre, a circle of monoliths and an outer platform of rubble. An excavated trench (Trench 7) extending from the centre of the cairn through the stone circle to the outer platform permitted field description (Munsell colour and texture) and sampling of the soils beneath the site. Five undisturbed soil samples were collected in Kubiena tins (80mm by 50mm by 40mm) from the trench: three beneath the outer platform area (two east and one west of the central cairn), one beneath the main core of the cairn and one from the central area.

Table 4 Weights of cremated bone within anatomical categories and size ranges for deposits greater than 100g.

Context	> 10mm					10-5mm					5-2mm					Total Weight
	Skull	Axial	Upper limb	Lower Limb	Unidentified	Skull	Axial	Upper limb	Lower Limb	Unidentified	Skull	Axial	Upper limb	Lower Limb	Unidentified	
583		8g	24g	2g	5g				2g	11g (127g misc)	14g	1g			249g	
594		19g		> 5g (62g misc)	1g				19g	16g (81g misc)	1g				96g	400g
595		6g		2g	6g	18g	5g			1g	25g				68g	131g
598		19g		23g		48g			10g	11g (misc)	1g				9g	121g
605		38g		2g	34g	3g	13g			2g	99g	1g			134g	326g

misc lb = miscellaneous long bone

Table 5 Colours observed after heating of fresh goat bone (Mays 1998, Table 11.1).

May's results		Shipman <i>et al</i> 's 1984 results	
Temperature (°C)	Colour	Temperature (°C)	Colour
185	red/orange	under 285	white or yellow
285	dark brown/black	285–525	red/brown, red/yellow, dark grey/brown or dark grey
360	black	525–645	black, blue or red/yellow
440	grey/brown	645–940	white, light grey or light blue/grey
525	grey/brown (lighter than that observed at 440°C)	940	white, some grey or red/yellow
645–1200	white, some pale yellow		

Thin section micromorphology

The sections were prepared from the undisturbed samples collected at the Micromorphology Laboratory, University of Stirling, following procedures based on Murphy (1986). All water was removed from the samples by acetone exchange and this was confirmed by specific gravity measurement. The samples were then impregnated using Polyester 'crystic resin type 1744' and the catalyst Q17447 (methyl ketone peroxide, 50% solution in phthalate). The mixture was thinned with acetone and a standard composition of 180ml resin, 1.8ml catalyst and 25ml acetone used for each Kubiena tin. No accelerator was used but the samples were impregnated under vacuum to ensure complete outgassing of the soil. The impregnated soils were cured for three to four weeks, culminating with four days in a 40°C oven. Resin impregnated soils were sliced, bonded to a glass slide and precision lapped to 30µm thickness, then cover-slipped to complete the manufacture of the thin section.

The manufactured thin sections were described using an Olympus BX-50 petrological microscope and by following the procedures of the International Handbook for Thin Section Description (Bullock *et al* 1985). This allows systematic description of soil microstructure, basic mineral components, basic organic components, groundmass and pedofeatures. A range of magnifications (×10–×400) and light sources (plane polarised, crossed polars and oblique incident) were used to obtain detailed description and these were recorded on a standard table (Table 6). Interpretation of

the observed features rests on the accumulated evidence of a number of workers, notably Courty *et al* (1989) and FitzPatrick (1993), and on recent experience of palaeosols found under archaeological monuments elsewhere in Scotland (Davidson and Simpson 2001; Simpson and Davidson 1998 and 2000).

Results

The soil beneath the monument is a sandy loam with common and frequent sub-rounded and subangular large stones; distinctive small to medium-sized stones are also evident within the centre of the monument, where a secondary pit had been excavated. Munsell colours permitted a distinction to be made between fossil soil horizons that could be regarded as 'A' horizons (darker coloured top-soils; 7.5 YR 3/2) and 'B' horizons (lighter coloured and immediately below top-soil horizons in undisturbed soils; 7.5YR 4/4). The absence of an 'A' horizon in places suggests truncation of soils prior to monument construction.

Table 6 provides a summary of features observed in the five thin sections taken from Tomnaverie. The coarse mineral component in all of these is dominated by quartz, with significant fragments of granite and granitic diorite. The suite of mineral material is typical of soils derived from glacial tills and morainic material within the region. The prominent feature of the slides is the ubiquity of traces of biological reworking. There are many excremental pedofeatures and the structure over most of the slide areas could be characterised

Table 6 Details of soil thin sections from Tomnaveric.

Coarse Mineral Material >20µm		Fine Mineral Material		Coarse Organic Material		Fine Organic Material													
Thin Section	Quartz	Granite	Granite	Diorite	Bone	Compound	Quartz	Feldspar	Biotite	Muscovite	Organ (vascular)	Tissue, charcoal	Tissue, uncharred	Fungal Sclerotica	Cell Residue	Amorphous, black	Matrix Coatings, brown	Matrix coatings,	
Tom	1	****	*	*	*	*	Dotted organo-minera	brown	&	dark	brown:	*	*	*	*	*	*	**	*
Tom	2	****	**	**	*	*	Dotted	brown:	organo-mineral	*	*	*	*	*	*	*	*	**	###
Tom	3	***	**	**	*	*	Dotted	drown:	organo-mineral	*	*	*	***	***	***	***	***	##	###
Tom	4	***	***	***	**	**	Dotted	brown:	organo-minetal	**	**	***	***	***	***	***	#	#	###
Tom	5	***	****	****	*	*	Dotted & grey	brown: mineral	organo-minetal	*	*	***	***	***	***	***	#	#	###

Thin Section	Pedofeatures	Microstructure	Coarse Material Arrangement	Groundmass b-Fabric	Related Distribution
Amorphous					
Tom	1	**	Granular to intergrain	microaggregate	Random, unpreferred
Tom	2	*	**Spongy	***to crumb, channels	unpreferred
Tom	3	*	Granular to intergrain	microaggregate	Random, unpreferred
Tom	4	**	* Bimodal	***granular: coarse mineral/excrement	Speckled
Tom	5	**	**	Bimodal to crumb	Speckled

Frequency class	refers to appropriate	Areas at 1985	Frequency class	textural palaeofeatures (Bullock et al 1985)
* Very Few	** Few	*** Frequent/Common	**** Dominant/Very Dominant	# Rate ## Occasional ### Many

as fine granular to intergrain microaggregates. The majority of the excremental features are of the bacillo-cylindrical/spherical form associated with enchytraeids, and occasional mamillated excremental pedofeatures are observed, which are associated with earthworms. Such features and structure are characteristic of soils in which bioturbation is a significant, ongoing process. In comparison with the surrounding soils, there is relatively little evidence of podsolisation. There are only infrequent occasional to rare traces of the types of pedofeatures associated with such processes, primarily re-deposited iron amorphous pedofeatures and iron-depletion rim features. It cannot, however, be determined whether this is due to the burial of soils interrupting incipient podsolisation, or whether other factors have determined the lack of podsolisation in comparison with the local soils.

The outer ramp and the platform cairn (thin section samples 1–4; table 6)

The coarse mineral material dominates this fabric, ranging from rock fragments of several mm in size to fine sand (*c* 100 μ m), although the rock fragments are generally smaller in sample 4. The fine material is largely composed of circular and bacillo-cylindrical excremental pedofeatures, with the amount of excremental pedofeatures and degree of coalescence increasing with depth and in sample 2 where distinct channel voids are also present. There are occasional instances of reworking of mamillated excremental pedofeatures into circular forms. The colour of the fine material varies in sample 1 and includes interspersed brown and dark browns. The coarse organic material takes two forms: uncharred vascular plant material, which is very pale and heavily degraded, and strongly coloured parenchymatic material, some of which is in relocated positions wedged between rock fragments. Frequent black amorphous organic material is also distributed throughout these samples. Depletion pedofeatures and reddish brown amorphous cryptocrystalline are largely absent from these samples, with the exception of sample 4 where there are very few of these features. Those structural units that are not bioturbated and have a single spaced porphyric related distribution with planar to serrate edges include soil fragments and clods formed through rupture across natural surfaces. Two types of matrix coatings are found

on coarse mineral material. One is dominantly brown and is composed of the fine organo-mineral material; the second matrix coating is composed of black fine organic material interspersed with coarser mineral material and is rarely found in samples 1 and 2.

Despite heavy and continuing reworking of these soils by soil organisms, especially enchytraeids, sufficient features remain to permit a limited interpretation of the land surface and activities immediately before monument construction. We suggest that the original land surface at the time of monument construction was an acid brown forest soil but with associated incipient podsolisation that was locally variable in its occurrence. The fossil soils also show evidence of disturbance prior to monument construction. Field observation of soils beneath this part of the monument, and fine material colour and coarse mineral material frequencies observed in thin section suggest that the soils have been truncated with removal of the 'A' horizon leaving a remnant 'B' horizon. The juxtapositioning of dark brown and brown material in sample 1 suggests that some of the original 'A' horizon remains, but has been mixed with 'B' horizon material. An alternative explanation for this characteristic is that new material has been introduced to this location to provide localised levelling of the land surface. Matrix coatings further support the interpretation that these soils have been disturbed and the two contrasting matrix coatings are distinctive, suggesting that disturbance may have been in two major phases. The matrix coatings are distinctive and their coarseness and lack of sorting indicate an abrupt and major disturbance rather than long-term micro-layered accumulation associated with frost activity or the dusty clay textural features of agricultural activity which can be found in 'B' horizons. We therefore suggest that these features relate to intensive preparation of the ground for the siting of the monument, possibly by deep deturfing, in a location that was marginal to subsistence activity.

The centre of the monument (thin section sample 5; table 6)

This sample comes from the filling of the later pit dug in the centre of the platform. Soil features observed in the thin section sample exhibit several distinct differences in composition in comparison

with samples 1–4. While the coarse mineral assemblage is comparable to that previously discussed, it is more rounded and there is evidence of mineral rubification (reddening), together with the frequent to common occurrence of bone fragments. Fine mineral material is typically brown organo-mineral with areas of grey mineral material and is not rubified. Matrix coatings are rare and where they occur are very thin, discontinuous and fragmented. Excremental pedofeatures are more clearly defined than in other slides and a wider range of types is observed. Some of the excremental pedofeatures are associated with Coleopteran and Dipteran larvae. There is no evidence of iron-rich amorphous cryptocrystalline pedofeatures or depletion pedofeatures indicative of podsolisation.

These observations suggest the introduction of heated mineral material and bone to the location of the monument rather than on-site, *in situ* cremation, which would also have rubified the surrounding fine mineral material. The rounded stone material is also introduced and can be considered as an incidental part of deposition. The presence of excremental pedofeatures of Coleoptera and Diptera larvae is of potential significance as these soil organisms are rapid colonisers. Given the relative lack of coalescence of the excremental pedofeatures it is possible to suggest that this deposited material was covered relatively rapidly after deposition, but probably not immediately.

2.7.5 CHARCOAL

Brian Matthews

The charcoal from the excavation was examined at the Forest Products Research Centre of Buckingham Chilterns University College. In the light of the radiocarbon dates the samples are best considered in two groups. Those from secure Early Bronze Age contexts below the recumbent contain the following species (in order of frequency from the most to the least abundant): hazel, alder, rosaceae and oak.

The second group comes from the centre of the cairn where the radiocarbon dates show there has been considerable disturbance and reworking of older deposits. Apart from those dated directly by radiocarbon, it is impossible to assign the individual samples to specific phases. Fortunately,

the range of species is virtually the same in every archaeological context. In order of frequency from the most to the least abundant they are: alder, hazel, oak, rosaceae and pine. Alder, oak, and pine were not among the species represented by pollen in the buried soil, but hazel and rosaceae were present. In view of the evidence for fires in this part of the site, it seems likely that wood of the other species was introduced as fuel.

2.7.6 POLLEN ANALYSIS

Peter Brewer

Two samples were taken from Trench 7 on the old land surface beneath the cairn.

Pollen extraction

The pollen was extracted using the standard procedure outlined by Moore, Webb and Collinson (1991) using both hydrofluoric acid and acetolysis processes. Approximately one cubic centimetre of each sample was processed along with three *Lycopodium* tablets to allow assessment of pollen concentration. The exceptionally high levels of silica in the samples meant that two prolonged treatments with hydrofluoric acid were necessary. Even after such a severe treatment a relatively high level of silica remained, which caused problems with pollen identification.

Condition of pollen

The state of preservation of the pollen was relatively good considering that it was extracted from a once biologically active soil. The pollen, however, had degraded to some extent, a matter which must be considered when assessing the results of this study. *Lycopodium* to pollen ratios of approximately 1:3 illustrate the productivity of the two samples.

Results of pollen analysis

A total of 348 and 335 grains respectively were counted for the two samples. Table 7 outlines the results.

Discussion

It can be seen from the table that the two samples agree remarkably well with one another, despite their different positions on the land surface beneath the cairn.

The vast majority of the pollen counted was wild grass (Poaceae) and ferns (Filicales), with no trees

and few shrubs. The high proportion of Poaceae pollen indicates an open grassland landscape, and this is supported by the occasional grassland herb. The high proportion of ferns is likely to be due to differential preservation, for their pollen is extremely resistant to degradation and they are often over-represented in soil samples. The ferns are likely to be from damp local woodlands, perhaps bordering the loch that was once nearby. The hazel (*Corylus*) in the samples is likely to be from the same habitat. Surprisingly there was no birch in the samples. The only anomalous grain recorded was *Sphagnum*. This could have been growing on the site and must be either a contaminant or a grain that was transported from the edge of the loch.

2.7.7 RADIOCARBON DATES

There are three groups of radiocarbon dates from Tomnaverie. The first of these is on single pieces of charcoal from the filling of the small pit immediately below the rubble foundation for the recumbent stone (Table 8). The pit was dug from the surface of one of the steps cut into the natural slope of the hill to prepare a foundation for the

cairn and these dates should provide a *terminus post quem* for its construction.

These dates have been analysed by Professor Sturt Manning who reports that all six cannot refer to the same event. The full set of determinations fails a Chi-Square test because AA-49283 is not of the same age as the rest. On the other hand, the remaining dates are consistent with one another. Since archaeological considerations suggest that they refer to the same event they can be combined as 3959 ± 23 BP. This can be calibrated as 2555–2538 BC, 2494–2457 BC or 2416–2409 BC at 68.2% probability, or 2564–2521 BC, 2498–2432 BC, 2423–2402 BC or 2367–2350 BC at 95.4% probability. The most likely date is in the 25th century BC.

The second group of samples came from the low deposit of burnt soil overlain by the inner edge of the cairn toward the centre of the platform (Table 9). These were expected to relate to the primary use of the monument, but in fact they belong to the same two phases as the material in the central pit, suggesting that this material may have percolated down through the rubble of the monument during later periods of re-use.

Table 7 Details of the pollen samples from Tomnaverie.

	Sample 622		Sample 624	
	Number	Per cent	Number	Per cent
<i>Lycopodium</i> marker	120	–	97	–
Concealed	4	1	8	2
Deteriorated	38	11	46	13
<i>Corylus</i>	23	7	29	8
Poaceae (wild)	152	44	119	34
Aster type	1	0	2	1
Rosaceae	1	0	0	0
<i>Sphagnum</i>	1	0	0	0
<i>Dryopteris</i>	4	1	1	0
<i>Osmunda</i>	1	0	0	0
<i>Polypodium</i>	20	6	29	8
<i>Pteridium</i>	1	0	4	1
Filicales endospore	102	29	97	28
GRAND TOTAL	348	–	335	–
UNIDENTIFIABLE	42	12	54	16
SHRUBS	23	7	29	8
HERBS	154	44	11	35
SPORES	129	37	131	38

Table 8 Radiocarbon dates from below the recumbent stone at Tomnaverie.

Lab code	Sample material	Yrs BP	C ‰	Calibrated dates	
				1 sigma	2 sigma
AA-49279	Alder charcoal	3975 ± 40	-27.2%	2570–2510 BC or 2500–2450 BC	2580–2390 BC or 2380–2340 BC
AA-49280	Alder charcoal	3985 ± 45	-26.8%	2580–2460 BC	2630–2340 BC
AA-49281	Alder charcoal	3985 ± 55	-27.1%	2620–2610 BC or 2580–2450 BC	2700–2300 BC
AA-49282	Alder charcoal	3850 ± 55	-27.5%	2460–2420 BC or 2410–2270 BC	2470–2190 BC or 2180–2140 BC
AA-49283	Alder charcoal	3740 ± 60	-27.4%	2280–2250 BC or 2230–2220 BC	2340–1950 BC
AA-49284	Alder charcoal	3985 ± 85	-26.7%	2580–2460 BC	2630–2340 BC

The third group of samples came from the filling of the charcoal-filled pit excavated through the centre of the monument (Table 10). It was originally thought to date from the Late Bronze Age on the basis of the associated pottery and cremated bone, but now it seems that this was residual material derived from the layer through which it had been excavated. The pit itself was clearly post-medieval.

2.8 DISCUSSION: THE EVOLUTION OF THE RECUMBENT STONE CIRCLE AT TOMNAVERIE

The introduction to this study summarised a number of the debates over the interpretation of recumbent stone circles. Were they Neolithic or Bronze Age? Had they been used over a long period of time? Were the stone circles the earliest components of these sites, and had the cairns inside

Table 9 Radiocarbon dates from the centre of the platform at Tomnaverie.

Lab code	Sample material	Yrs BP	C ‰	Calibrated dates	
				1 sigma	2 sigma
AA-49291	Charred alder twig	2795 ± 45	-25.4%	1010–890 BC or 880–860 BC	1050–820 BC
AA-49292	Charred alder twig	2870 ± 45	-25.6%	1130–970 BC or 960–940 BC	1220–900 BC
AA-49293	Charred alder twig	2795 ± 45	-25.2%	1010–890 BC or 880–860 BC	1050–820 BC
AA-49294	Hazel charcoal	305 ± 40	-27.1%	AD 1510–1600 or AD 1620–1650	AD 1480–1660
AA-49295	Hazel charcoal	385 ± 40	-27.1%	AD 1440–1520 or AD 1590–1630	AD 1430–1530 or AD 1540–1640
AA-49626	Alder Charcoal	410 ± 30	-26.7%	AD 1440–1487	AD 1430–1530 or AD 1590–1630

Table 10 Radiocarbon dates from the central pit at Tomnaverie.

Lab code	Sample material	Yrs BP	C ‰	Calibrated dates	
				1 sigma	2 sigma
AA-49285	Charred alder twig	510 ± 35	-26.6%	AD 1407–1436	AD 1320–1350 or AD 1390–1450
AA-49286	Charred alder twig	380 ± 40	-25.0%	AD 1440–1530 or AD 1590–1630	AD 1440–1530 or AD 1540–1640
AA-49287	Charred alder twig	410 ± 40	-27.4%	AD 1430–1520 or AD 1600–1620	AD 1440–1530 or AD 1560–1640
AA-49288	Charred alder twig	305 ± 40	-25.6%	AD 1510–1600 or AD 1620–1650	AD 1480–1660
AA-49289	Alder charcoal	335 ± 40	-27.3%	AD 1490–1530 or AD 1540–1640	AD 1460–1650
AA-49290	Alder charcoal	485 ± 40	-26.7%	AD 1409–1444	AD 1330–1350 or AD 1390–1480

them developed at a later date? This excavation provided some of the answers.

The dating evidence from Tomnaverie is limited but consistent. The only datable finds associated with its primary use were sherds of Beaker pottery. All the radiocarbon dates associated with the construction of the stone-built platform fall between about 2600 and 2000 BC and five of the determinations can be combined to suggest a date in the 25th century BC. This suggests that at least one part of the cairn was built early in the period when Beakers were used in north-east Scotland. The sherds from Tomnaverie are rather later in date, perhaps because the cairn was constructed over a significant period of time.

The second question was one of sequence. This is more clearly answered. The recumbent stone circle at Tomnaverie was the last structure to be built, although the site was re-used during the Late Bronze Age and again in the 16th or 17th century AD. That sequence may have implications for other stone circles in north-east Scotland, a possibility which is explored in later sections of this account. But it would be wrong to overlook the very individual character of this evidence. It is easy enough to divide the development of Tomnaverie into a series of structural phases, as if the monument consisted of a sequence of superimposed buildings, each in a different

architectural style. Are there other ways of thinking about these observations?

It seems that the entire sequence recovered by excavation was conceived by the builders from the outset. The successive elements were fitted on to one another in a predetermined order until the process reached its conclusion. Little was left to chance and the nature of the monument was not altered radically from the moment of its inception. That is very different from the history of other monuments, whose significance was reinterpreted until their fabric was transformed. Each successive phase in the stratigraphic sequence presupposes those that were to follow later, and thus the unfolding of the structural history of the monument is rather akin to a narrative (illus 55). It may even have played a part in a prescribed ritual or series of rituals. Like other sites of the same type, Tomnaverie may have been aligned on the moon. How far was this influenced by activity on the hilltop before building work commenced?

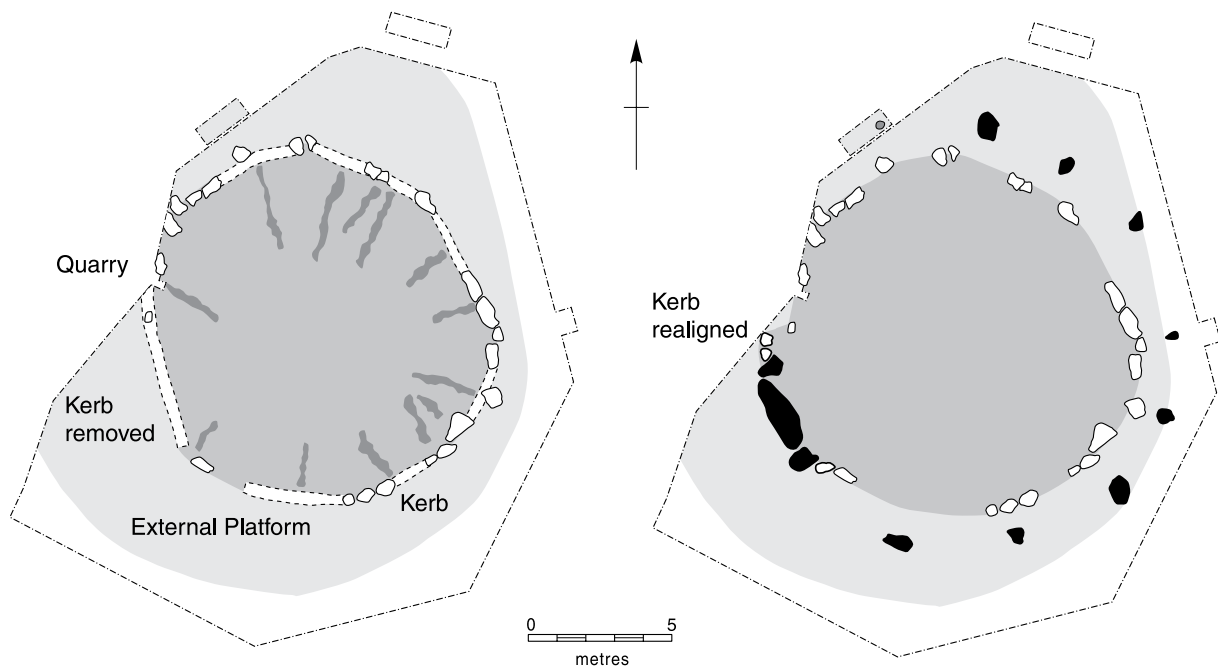
In principle, any conspicuous fire that had been lit on the ridge top could have been observed from much of the surrounding area, just as the excavation team were able to observe moor-burning on the horizon from the site of the stone circle. The same may apply if the hill had been the site of a post-medieval beacon; a nearby field was

certainly used for bonfires to celebrate public events during the 19th century. The one characteristic that distinguishes this particular position is that it is the only place which combines a view towards Lochnagar and the northernmost position of the moon (Ruggles 1999, Tables 5.1–5.3). Any further to the south and the position of the moon would not coincide with the summit of the mountain. Any further to the north and Lochnagar might not have been seen.

The platform that was constructed around the hilltop had an unusual character. It extended across the contours where the gradient was steepest even though this meant that more material was needed to build it. So important was it to maintain a roughly level surface that it was necessary to cut a series of shallow steps into the slope to support the mass of this monument. It may be relevant that these were closer together where the outer ramp would eventually have to bear the weight of the recumbent stone. The surface of the cairn was clearly divided into separate segments. On a small scale this was achieved by the way in which it incorporated a number of radial divisions, but these also served to separate it into two distinct halves, one to the north-east and the other to the south-west. This is shown in a more subtle manner by

the grading of the kerb. The distinctive character of that kerb also distinguished its eastern perimeter (and perhaps the corresponding sector to the west) from the lengths to the north and south which were built out of slabs rather than blocks. In addition, the platform was supplemented by an extensive bank of rubble. It was especially massive to the west where its outer edge included large pieces of quartz. All these features – the construction of the cairn and platform, the layout of the kerb, the location and symmetrical arrangement of the radial divisions – seem to anticipate the construction of the recumbent stone circle. In particular, the placing of the radial lines of stonework prefigure the organisation of space in the following phase, with its emphasis on the south-west.

Two elements are especially important here: the creation of a substantial platform and the positioning of a long straight section of kerb along its south-western limit. The effect of building a platform that extended beyond the break of slope was to obscure the immediate foreground and to create a vista that focused on the middle distance and beyond. The longest stretch of kerb, the ends of which are marked by the radial divisions on the south-west side of the cairn, gave it greater definition and emphasised an alignment that may



55 The structural sequence at Tomnaverie, showing the transformation of the platform cairn when the recumbent stone circle was built.

have been in people's minds from the earliest use of the site.

If so, the configuration of the recumbent stone circle becomes easier to understand for it was integrally linked to what had already happened at Tomnaverie. There are several clues. The part of the existing platform that was to support the largest stones had been provided with a suitable foundation well before the monoliths were put in place. The radial divisions which formed part of the same construction were integrally linked to the positions of some of the uprights, and two more indicated the places where the cairn was to be extended to join the circle. This amounted to more than prehistoric quantity surveying for when it happened a substantial length of kerb was demolished and replaced. It is interesting that the new section retained the grading by height already seen at this monument. Now that effect was echoed by the standing stones.

In other respects the construction of that circle scarcely marks a radical departure. The newly

built sections of kerb were carefully integrated with the flankers by using very similar raw materials. On the opposite side of the monument some effort seems to have been made to match the newly-erected monoliths to the character of the existing kerbstones. It would have been difficult to drag the largest stones into position across the steep flank of the existing cairn, but the creation of the recumbent stone circle did not effect a major alteration of the monument; rather, it enhanced its distinctive features and gave them added definition. That is surely indicated by the distinctive configuration of the recumbent stone and the flankers. These emphasised the orientation that had been a feature of Tomnaverie from the outset but they did so on a monumental scale. Once that had happened the entire construction remained unchanged. The building project was complete and the monument had achieved its definitive form. The reasons for these developments will be considered in Chapter 5.

Chapter 3

EXCAVATIONS AT COTHIEMUIR WOOD AND AIKEY BRAE

Richard Bradley, Sharon Arrowsmith, Chris Ball and Tim Phillips
with contributions by Catherine Chisham, Petra Dark, Donald Davidson,
Stephen Lancaster and Ian Simpson

EXCAVATIONS AT COTHIEMUIR WOOD

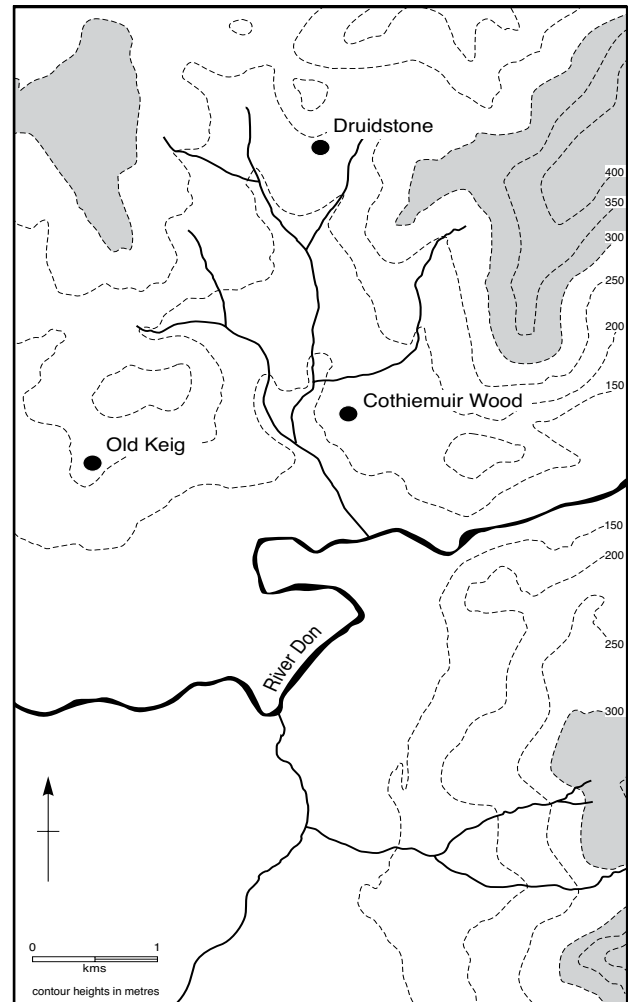
Richard Bradley with Sharon Arrowsmith and Tim Philips

3.1 BACKGROUND TO THE EXCAVATION

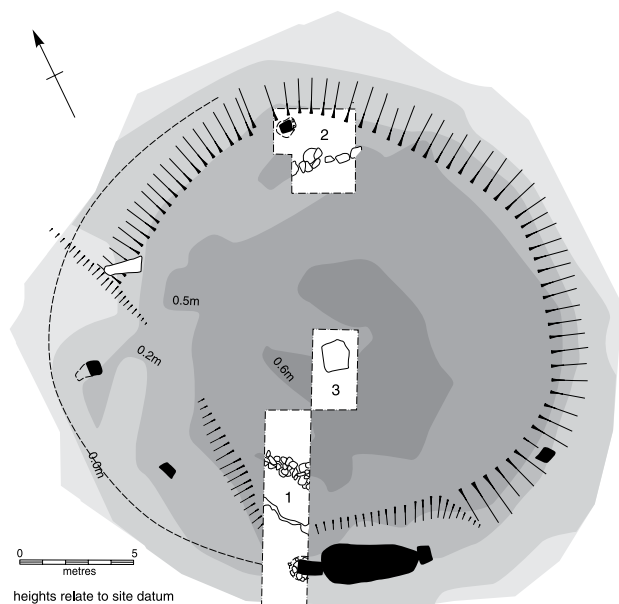
Burl has argued that recumbent stone circles were first built on Donside and that the concept was later taken up in other parts of north-east Scotland where they diverge from the 'classic' form (Burl 2000, chapter 12). The stone settings become more irregular, the recumbent and flankers are frequently misaligned, and the circles themselves are less obviously integrated with ring cairns. He suggests that this is because outlying regions were settled only gradually. During this time the original conception of the monuments was diluted. Not everyone would accept that interpretation, but it does raise problems for any account of these monuments that rests too heavily on an example at the edge of their distribution. It was important to look at sites in other areas. In the light of Burl's hypothesis Donside provided one obvious focus. In this case the work was not concerned with interpreting a structure to the public and had to be justified in terms of research. It was important to select a site where small scale work would be informative. At the same time, it would have been wrong to choose a monument that was so well preserved that limited excavation might be unwise.

One of the major monuments on Donside, the recumbent stone circle at Old Keig, had already been excavated by Gordon Childe (1933 and 1934). We decided to focus on its neighbour in Cothiemuir Wood. This met both our criteria. Part of the site had been investigated before, but there was no published record (Coles 1901, 214–17). A number of the monoliths were missing and only

one kerbstone could be identified. On the other hand, there were signs of a substantial cairn.



56 The locations of Cothiemuir Wood, Old Keig and Druidstone stone circles.



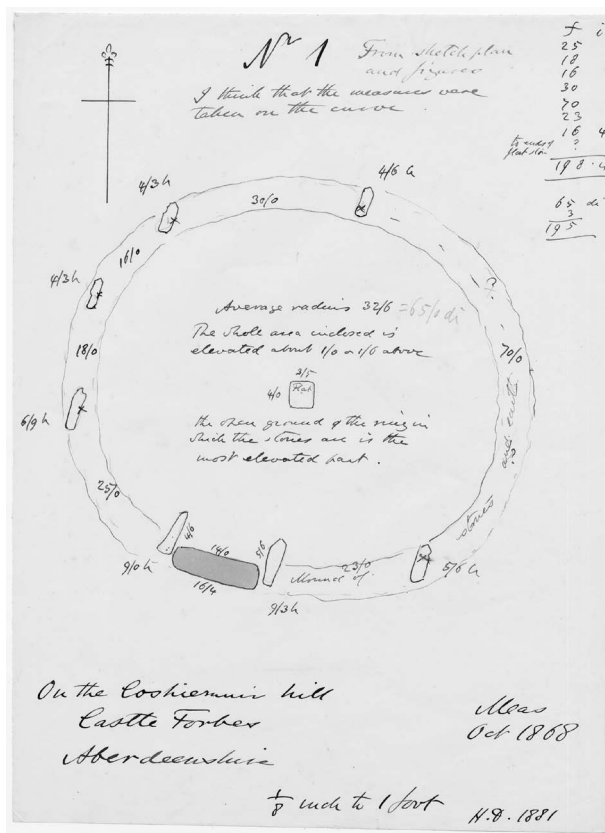
57 The surface remains of Cothiemuir Wood stone circle and the locations of the excavated areas. (Plan by courtesy of RCAHMS: Crown Copyright)

3.2 THE STANDING MONUMENT

The stone circle at Cothiemuir Wood (illus 5, no 3) is located on the summit of a low hill 1km north of the River Don at Castle Forbes (NJ 617198). It overlooks a valley to the west which separates it from the site of Old Keig, just over 2km away (Childe 1933 and 1934). The same valley leads to a third site at Druidstone, 2.5km to the north (illus 56; Coles 1901, 137-9). This is typical of the concentration of monuments around Alford. Although the stone circle at Cothiemuir Wood is located in a modern forest clearing, it could have commanded extensive views to the west along and across the valley of the Don. To the north and south, it overlooks fertile farmland, and to the east it might have had more limited views into the foothills of Benachie.

Like Tomnaverie, the monument was surveyed by the Royal Commission before the excavation. In its present state the site has a number of elements (illus 57). The best preserved feature is a massive recumbent stone containing veins of quartz. There are cup marks in its outer face. Both the flankers remain intact as well as two other monoliths, and there are traces of three more. All the material had been quarried except for the recumbent stone. There is a distinct cairn on the hilltop whose tail

follows the course of the stone circle. Three metres back from the edge of the cairn the top of a single kerbstone survives above ground. The central part of the site includes a large flat slab which covers an open pit. This is usually interpreted as a cist slab and its presence suggests that the monument has been seriously disturbed. There is no definite record of an earlier investigation but there is reason to suppose that Cothiemuir Wood may be the site referred to in 1692 when James Garden wrote: 'They did see ashes of some burnt matter digged out of the bottom of a little circle (set about with stones standing close together) in the centre of one of those monuments which is yet standing near the church of Keig' (quoted by Burl 2000, 215). The stone circle at Cothiemuir Wood is the most likely candidate because at the time it was located near to the only church in the vicinity. It is not known when the monument reached its present state but a previously unpublished survey conducted in



58 Plan of Cothiemuir Wood stone circle drawn by Sir Henry Dryden and based on Rait's sketch survey of 1868. (Reproduced by courtesy of Guernsey Museum)

1868 shows that it has remained unchanged for a considerable period (illus 58). Illus 59 records the numbering and profiles of the monoliths on the site today and illus 60 provides details of the recumbent and flankers.

3.3 THE DESIGN OF THE EXCAVATION

Following the excavation at Tomnaverie it was important to establish the chronological relationship between the stone circle and the cairn. There seemed to be two ways of achieving this (illus 61). To the south-west it looked as if the edge of the cairn might extend as far as the recumbent and flankers. Here their relationship could be explored by a single section incorporating the position of the standing stone (Trench 1).

Directly opposite the recumbent a monolith remained *in situ* within the apparent limits of the cairn, and nearby there was a smaller upright, which might have been part of a kerb. These were investigated by a small cutting (Trench 2), located on the same axis as the first. It extended into the monument from the outer edge of the cairn.

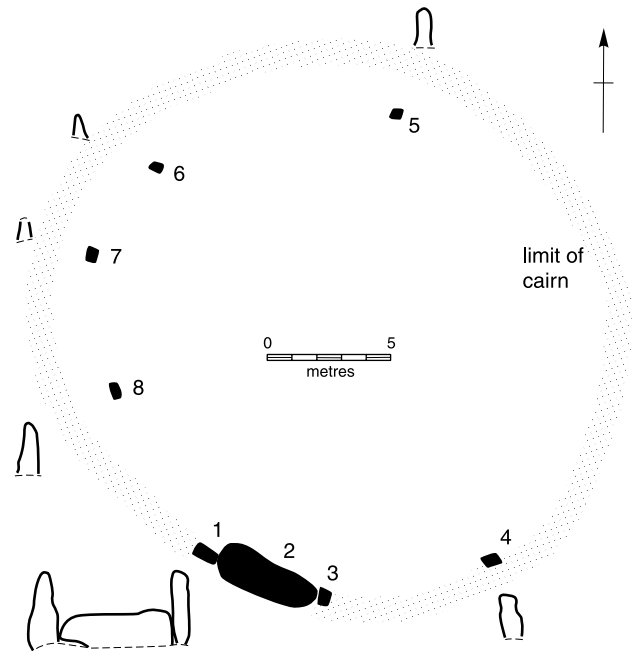
Work in the centre of the monument was more limited still. The area around the supposed cist slab was cleaned and planned to define the extent of earlier disturbance (Trench 3), but no excavation was carried out. Trench 3 was linked to the area investigated in Trench 1. Had the internal feature been a ring cairn, this procedure would locate its inner kerb.

Trench 1 was completely excavated apart from the area immediately against the flanker. More detailed work was unnecessary as its socket was visible in plan. Trench 2 was also excavated fully and the socket of the standing monolith was examined in box section. A small extension allowed us to plan the remainder of this feature. Work on Trench 3 was limited to planning its surface.

3.4 THE STRATIGRAPHIC SEQUENCE

3.4.1 DEPOSITS PREDATING THE MONUMENT

Beneath the cairn there were traces of an old land surface, which were confined to Trench 1. There were no structural features and very few artefacts were sealed by the monument, but the surviving remnants of the buried soil were examined by micromorphology and pollen analysis. The



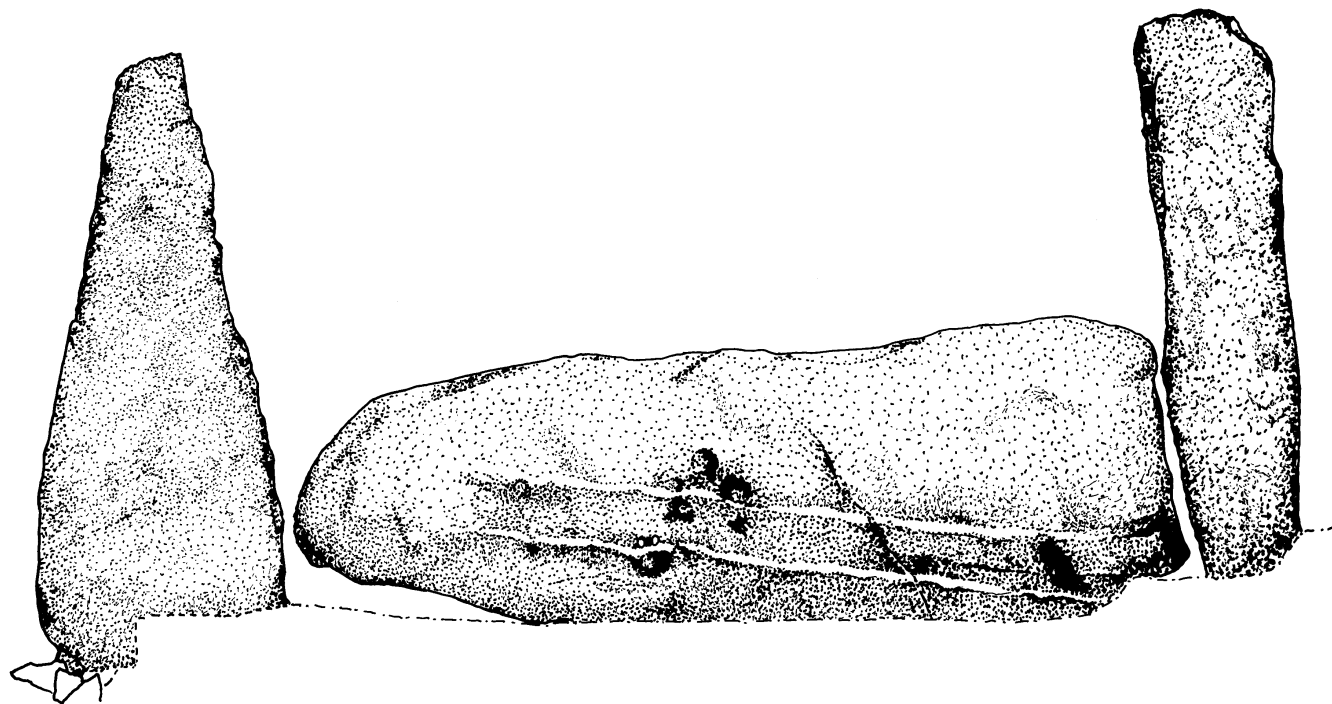
59 Numbering and profiles of the surviving monoliths at Cothiemuir Wood.

magnetic susceptibility of the old ground surface was recorded along the full extent of Trench 1. These samples showed higher values on either side of the inner revetment of the ring cairn, but they did not exhibit a uniform trend. The centre of the site was not examined, but here there were fire-cracked stones in the filling of an older excavation. It seems as if the position of the monument did provide evidence of *in situ* burning, but its significance remains in doubt.

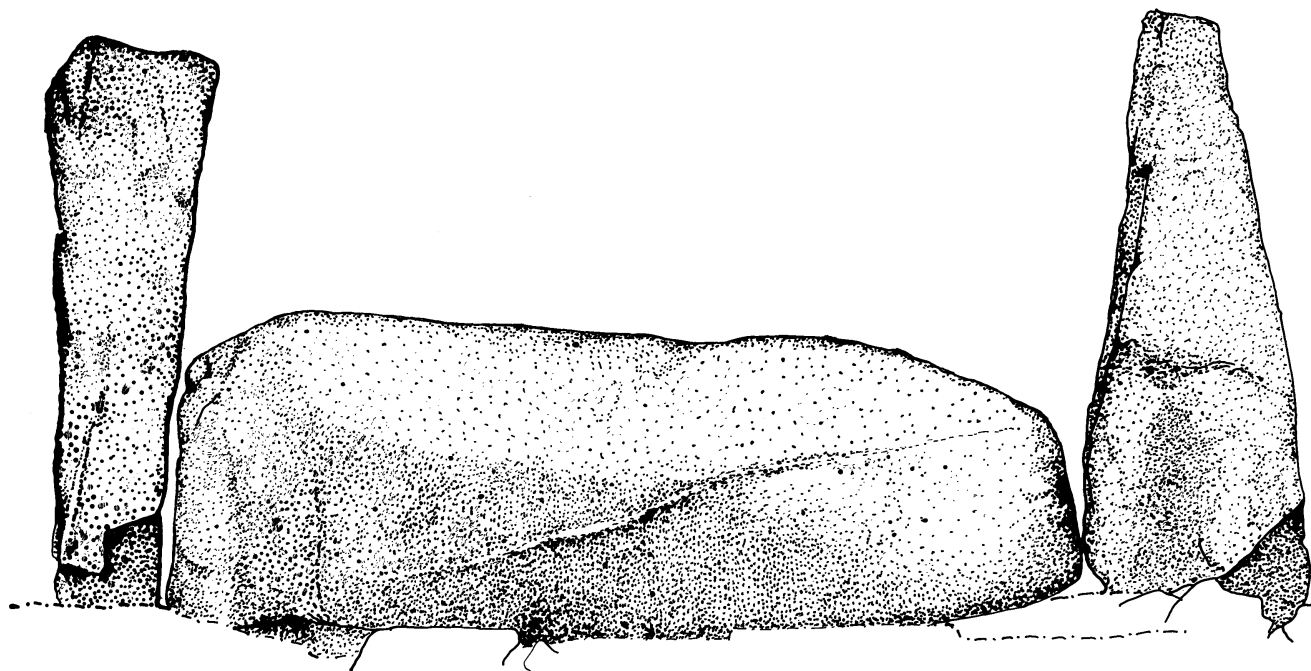
3.4.2 THE CAIRN

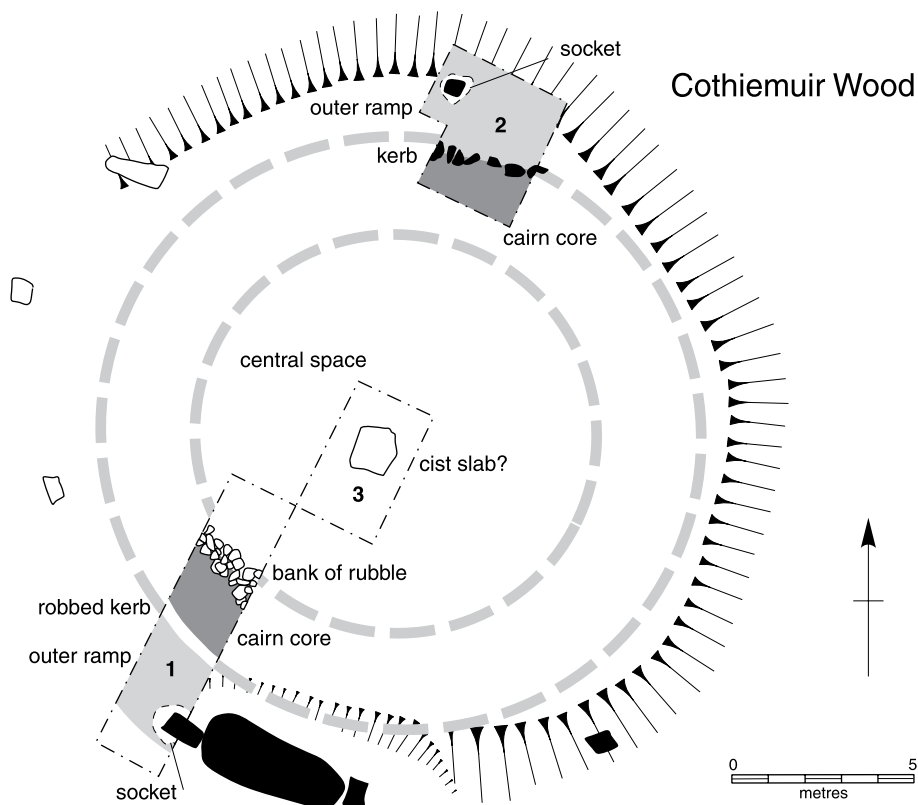
The first structure on the site seems to have been a ring cairn, 16m in diameter, defined by a rubble wall about 3m wide. This enclosed an open area approximately 10m across (illus 61). Its outer edge was retained by a substantial kerb, supported by an external buttress of rubble, and its inner limit by a bank of larger boulders.

The core of the ring cairn was composed of large rounded stones which had been placed directly on the old ground surface (illus 62 and 63). Those in Trench 1 may have been arranged in concentric arcs like their equivalents at Tomnaverie, but this could only be shown conclusively by a more extensive excavation. No trace of an outer kerb remained, but excavation



60 Details of the recumbent and flankers at Cothiemuir Wood. Illus 60a (above) shows the outer faces of the stones and the positions of two prominent quartz veins and a series of cup marks. Illus 60b (below) shows the inner faces of the stones and the position of a prominent quartz vein in the recumbent. (*Drawings: Sharon Arrowsmith*)





61 The location of the ring cairn at Cothiemuir Wood in relation to the layout of the excavation and the main structural features on the site.

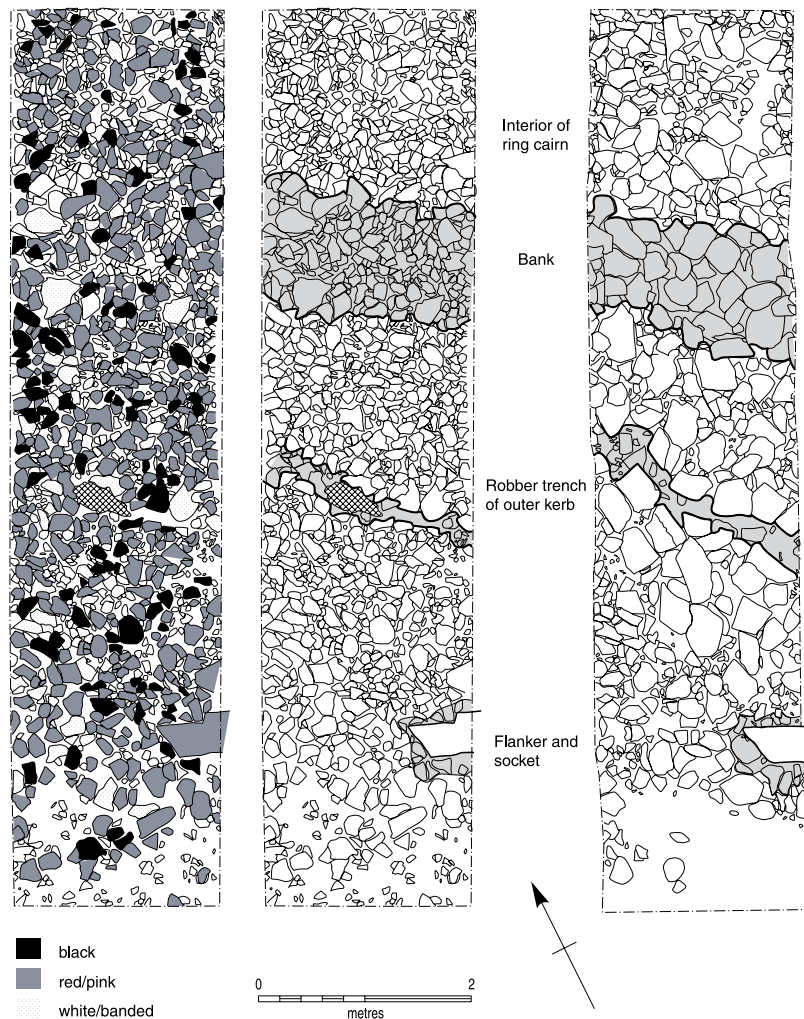
revealed a trench filled with loose topsoil exactly like that at Tomnaverie. Again the kerb seems to have been wedged vertically in the ground in between two deposits of rubble and secured by pairs of packing stones (illus 64). In this case there was no distinction between the rubble making up the core of the cairn and the material of the external buttress. The latter sloped down from the position of the kerb until just beyond the flanker it became difficult to define.

The inner edge of the cairn was not defined by a kerb but by a bank of still more massive boulders. Although its limits were sometimes marked by earthfast stones, they had probably sunk into the subsoil under their own weight (illus 65). There is no justification for considering them as the remains of a wall. The rubble could have been obtained on the surface of the hill and included blocks of quartz.

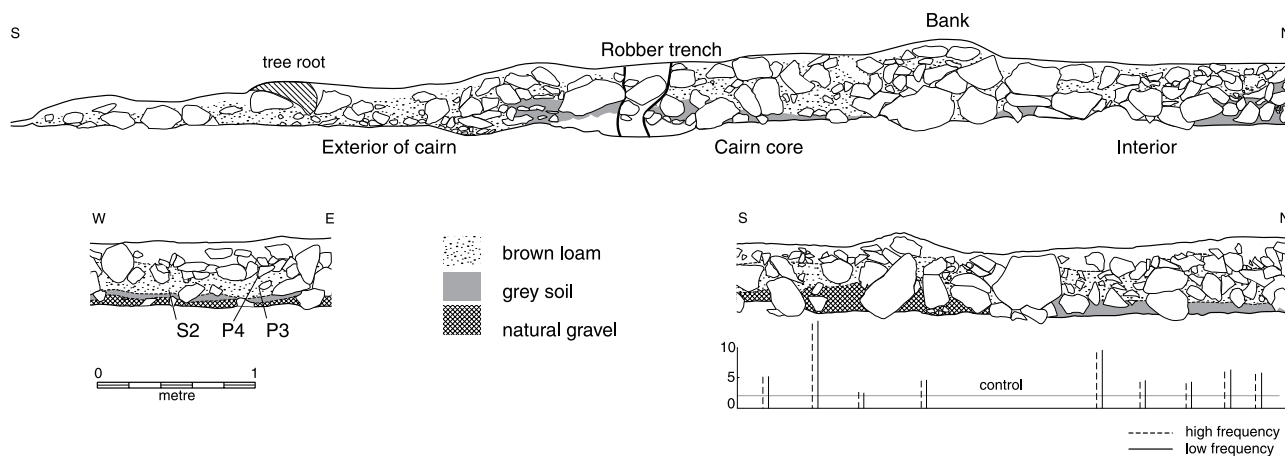
The cairn was better preserved on the opposite side of the site, in Trench 2. In this case the outer

kerb survived intact (illus 66–9). The single stone which had been interpreted as part of this feature had been correctly identified, but beneath the surface excavation revealed a roughly straight alignment containing no fewer than six others, all in their original positions. They had been propped up on the old land surface and were not bedded in the subsoil. They were supported by a ramp of less compact rubble. This material abutted the outer face of the kerb and was quite distinct from the core of the ring cairn.

Trench 2 provided more evidence of how the cairn had been built. It is obvious that the process was not accomplished in one operation. At the foot of the kerb, opposite the centre of the recumbent stone, there was a distinct concentration of pieces of worked quartz, as well as a rock crystal. Nothing similar was found underneath the cairn. Although the excavated area was small, the limits of this cluster were entirely within the trench. This material was directly sealed by the ramp, and that



62 Detailed plans of Trench 1 at Cothiemuir Wood. The left-hand drawing shows the colours of the stones revealed after initial stripping. The middle plan indicates the main features visible in the surface of the cairn and the right-hand plan shows them at the level of the lower layer of rubble. Note how the surface of the monument seems to have been capped with smaller stones than those in the main structure of the cairn.



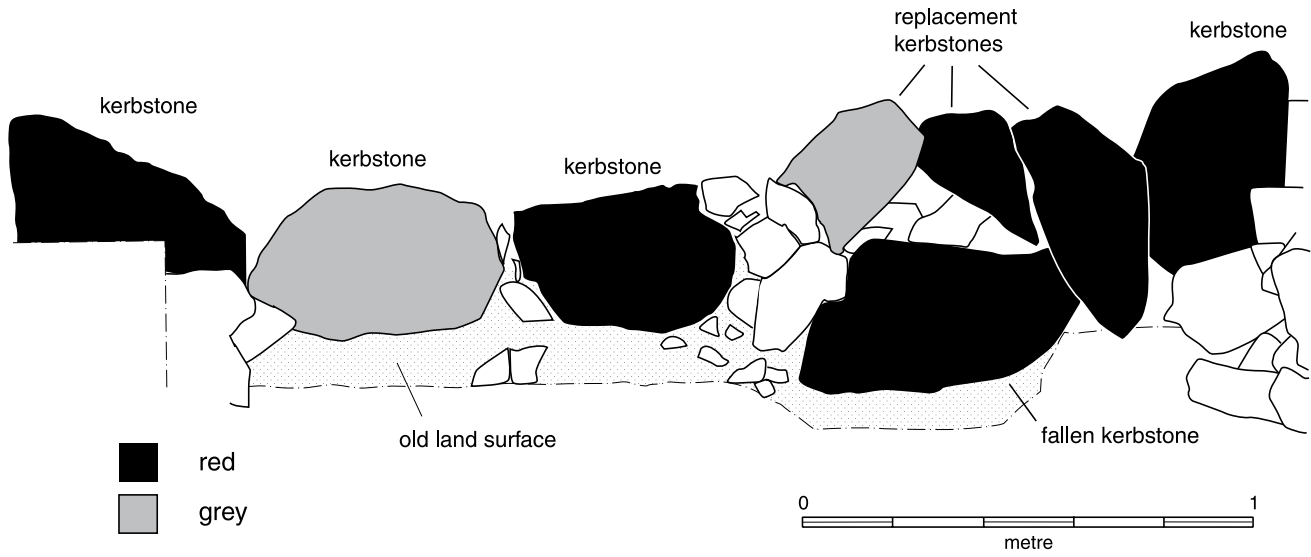
63 Section of the cairn and stone circle in Trench 1 at Cothiemuir Wood. S refers to soil samples and P to pollen samples. The vertical bars along the base of the drawing record the magnetic susceptibility of the buried soil along the course of part of the trench.



64 Paired packing stones in the robber trench for the outer kerb in Trench 1 at Cothiemuir Wood.



65 Section through the inner revetment of the ring cairn in Trench 1 at Cothiemuir Wood.



66 Elevation of the outer kerb of the ring cairn in Trench 2 at Cothiemuir Wood, emphasising the colours of the stones.



67 The kerb and core of the ring cairn at Cothiemuir Wood showing how the kerb was rebuilt over the position of a large fallen stone. Note the contrast between the small stones surfacing the monument and large boulders comprising its kerb and core.



68 The kerb and Monolith 5 in Trench 2 at Cothiemuir Wood showing the extent of the fallen kerb. (Source: *Jim Henderson*)

suggests an interval between the building of the kerb and the provision of the external buttress.

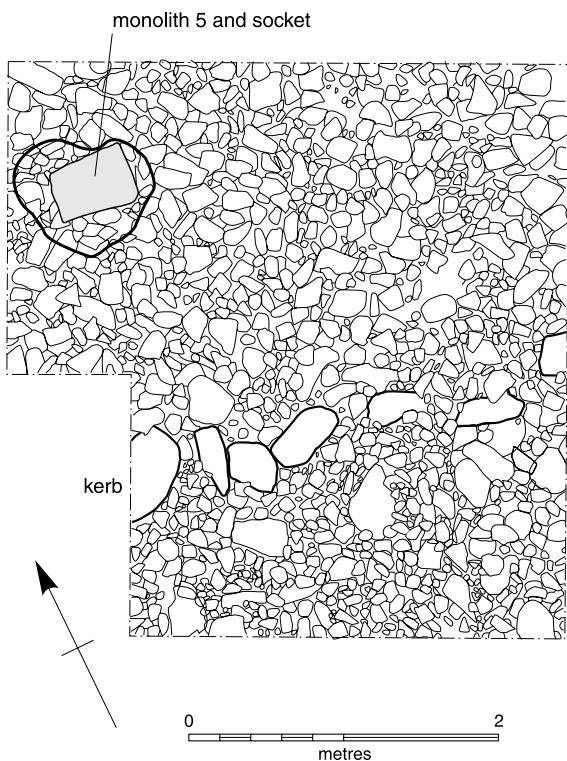
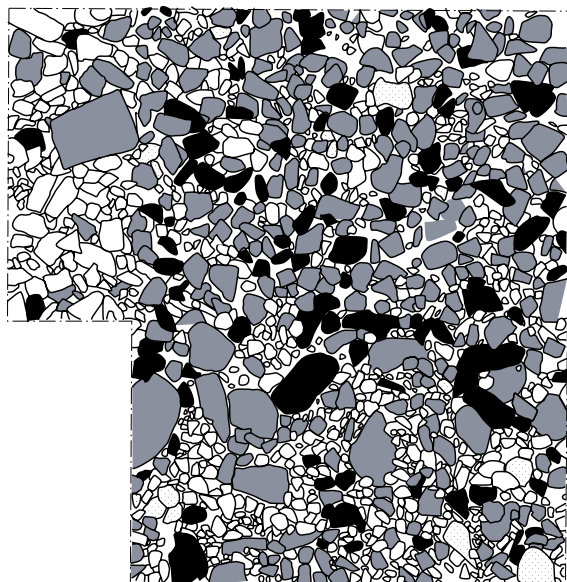
The second reason for suggesting that the construction of the ring cairn took some time is that the largest kerbstone had fallen down and lay flat on the ground. Rather than reinstate it, the builders had used it as the foundation for a group of less substantial stones which overrode it. Again some of these had been pushed outwards by the mass of the cairn, but this time they remained standing. They seem to have been selected for their colours as well as their structural properties, for they were alternately red and grey. They may have been quarried, but similar slabs occur on the surface of the hill

There is less to say about the interior of the ring cairn, which was only exposed towards the north-east end of Trench 1. This seems to have been filled in with a deposit of medium-sized boulders which were quite densely packed. The surface of this layer consisted of smaller rounded stones, some of them no larger than pebbles, and this deposit extended across the whole of

the excavated area, although little of it survived towards the outer edge of the monument. It created a cobbled surface quite different from the underlying rubble. A similar process may have taken place on the opposite side of the ring cairn, for in Trench 2 the rubble behind the outer kerb had been capped by smaller stones, which were predominately red in colour. Again they created a compact surface on top of the cairn, but in this case it does not seem as if it had extended beyond the kerb (illus 70).

3.4.3 THE RECUMBENT STONE CIRCLE

How was the stone circle related to the ring cairn? In Trench 1 it was clear that the western flanker had been set in a socket dug through the external bank beyond its outer kerb. Not only could the outline of that socket be observed in the surface of this deposit, it was clear that the packing stones used to support the monolith were of metamorphic rock quite distinct from the surrounding rubble. If the flanker was later than the ramp outside the ring cairn, too little survived of the final capping of small



69 The surface of the ring cairn in Trench 2 at Cothiemuir Wood after initial planning. The upper drawing records the colours of the stones and the lower drawing shows the outlines of the kerb and the socket for Monolith 5 before excavation.

cobbles to show whether its socket was cut through that deposit as well.

In Trench 2 the situation was even clearer, and in this case it was safe to section the socket of the standing monolith. This clearly cut through the rubble buttressing the outer kerb. It had also been dug through the layer of small stones that overlay it. The socket was asymmetrical, suggesting that, as at Tomnaverie, the stone had been erected from the interior, using the kerb as a fulcrum. This may account for the disruption of the kerbstones in this area, and again the evidence suggests that the erection of the circle brought the structural sequence to an end (illus 71 and 72).

3.4.4 THE CENTRAL AREA

There is little to say about the part of the central area investigated by Trench 3 (illus 73 and 74). It had been badly disturbed and it is still not clear whether the flat slab had originally covered a cist. There was a void underneath it, but no signs of any side slabs. It seems to have been placed over the filling of an excavation that occupied much of the 2001 excavated area. Perhaps the slab was exposed on the surface to represent the position of a cist that had been encountered during that earlier work. The filling of this disturbance was made up of medium-sized stones, like those filling the interior of the ring cairn in Trench 1, but in this case some of them had been burnt. It is not clear where these features belong in the structural sequence.

3.5 THE FORM OF THE FINAL MONUMENT

To judge from the spacing of the surviving uprights, the stone circle at Cothiemuir Wood would have included 12 monoliths, as well as the recumbent stone (illus 75-6). They could have been closer together towards the north-east and more widely spaced to the south-west. The positions of the surviving monoliths suggest that the layout was symmetrical about an axis running at an angle of about 85 degrees to the recumbent just east of its centre. Such a circle would have had a diameter of 20m, and the recumbent and the flankers would have been located accurately on its perimeter (illus 77). It may not have been precisely symmetrical with the earthwork of the

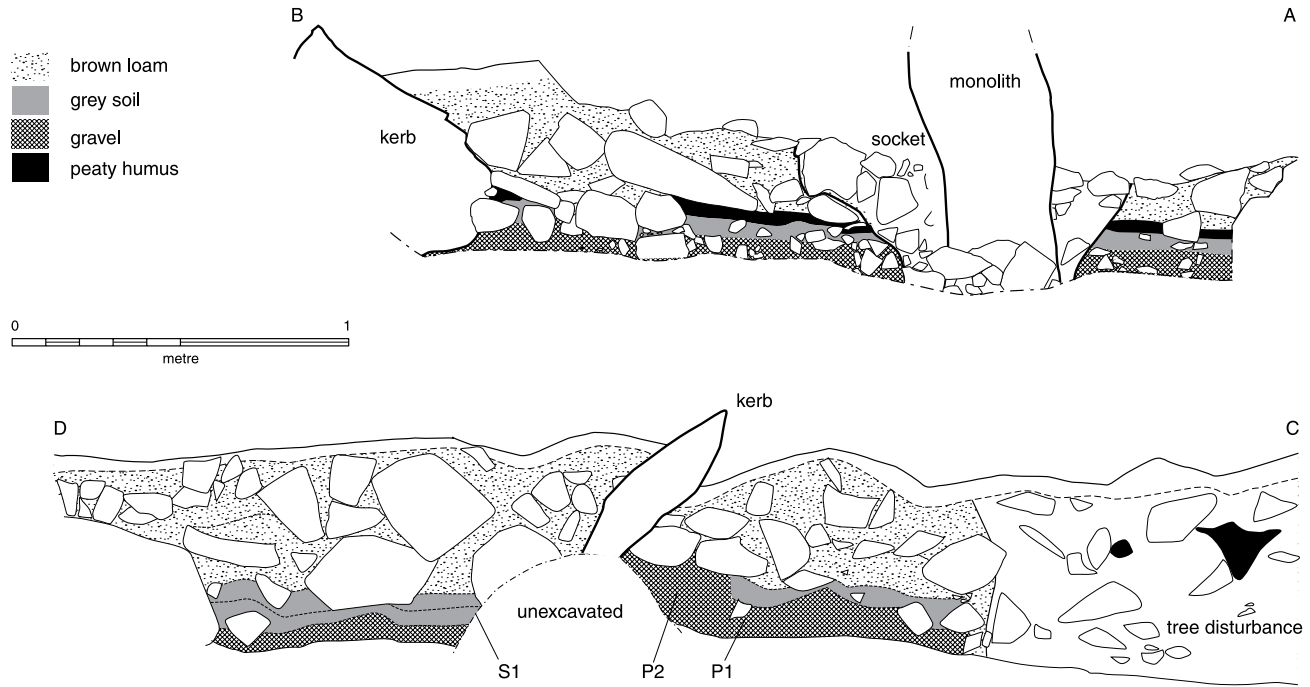


70 The collapsed kerb in Trench 2 at Cothiemuir Wood. Note how a new length of kerb was built over the fallen stones.

71 The kerb and Monolith 5 in Trench 2 at Cothiemuir Wood. (Source: *Jim Henderson*)

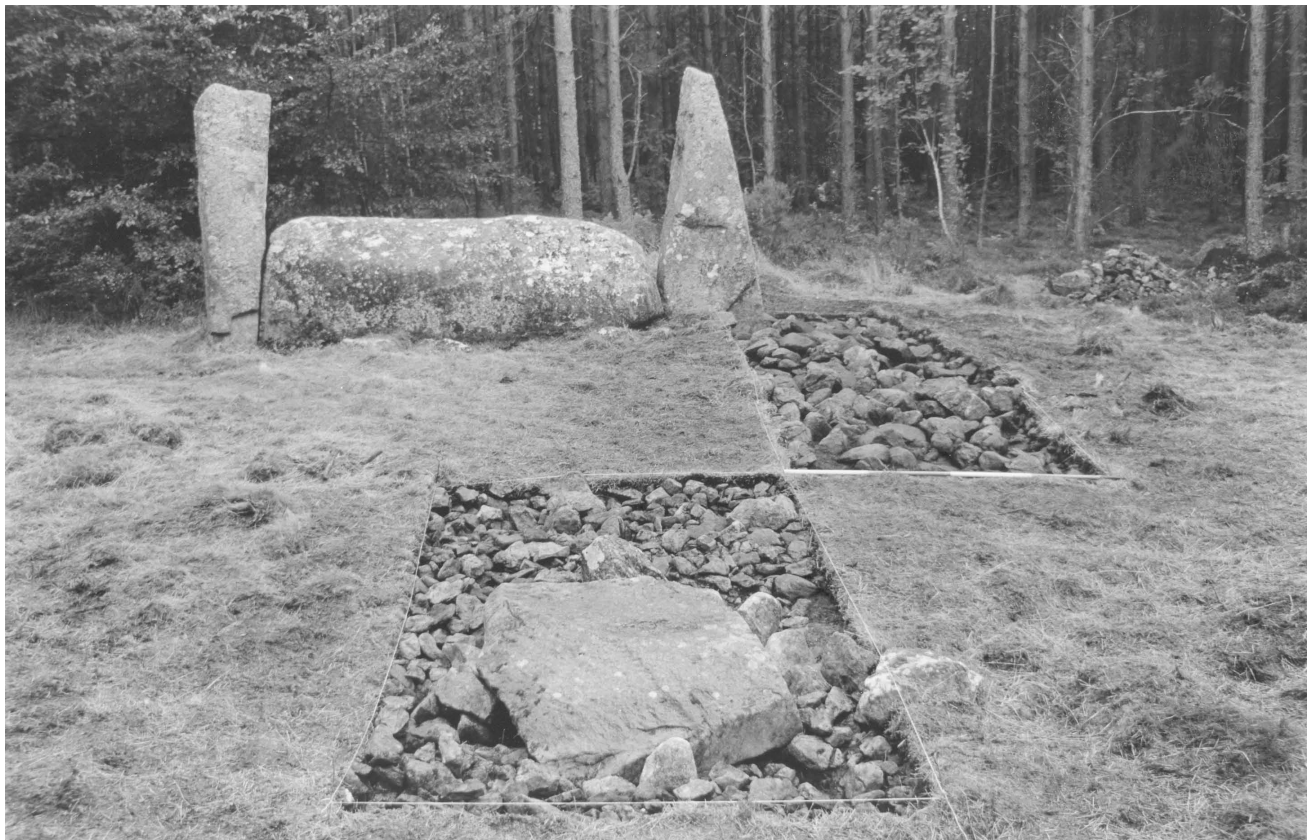


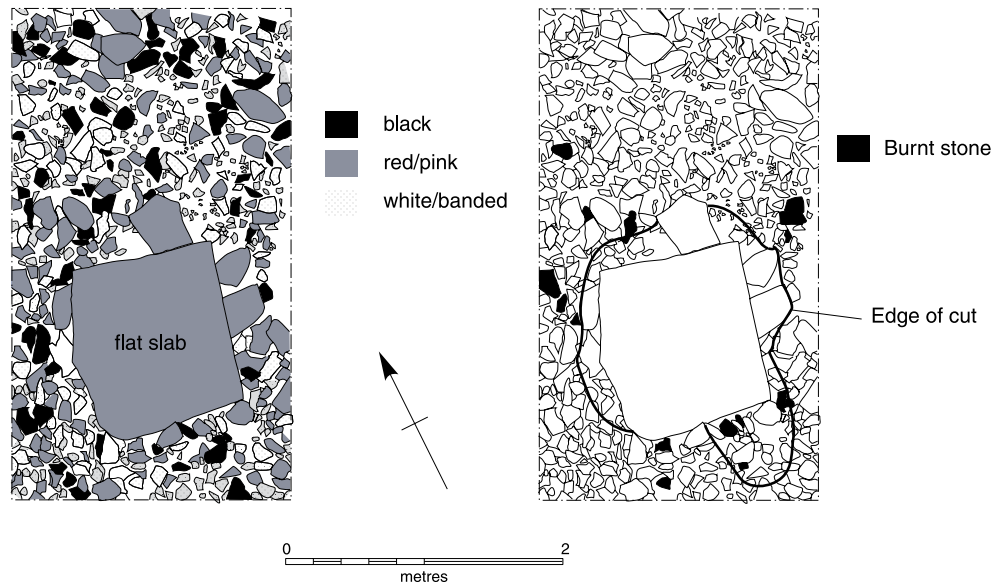
THE MOON AND THE BONFIRE



72 Section of the excavated area in Trench 2 at Cothiemuir Wood. The monolith stands in a socket dug through the rubble supporting the external kerb of the ring cairn.

73 General view of Trenches 1 and 3 at Cothiemuir Wood with the displaced slab covering a refilled excavation in the foreground.





74 Plan of the excavated area in Trench 3 at Cothiemuir Wood. The left-hand drawing shows the colours of the stones, and the right-hand drawing records the extent of antiquarian activity and the distribution of burnt stones.

earlier cairn. It lay close to its crest to the north and nearer to its base towards the south. The length of kerb exposed in Trench 2 was straight rather than curving, which suggests that the cairn might really have been polygonal.

The cairn made effective use of the hilltop which was apparently flat; there was no clear evidence that it had been scarped. The monument gave the impression of being a more considerable structure than was actually the case. There was originally an open area at its centre and its surface may have been sufficiently level for it to be considered as a 'platform cairn' (Lynch 1993, 113). It is not clear whether the central space at Cothiemuir Wood had been filled before the circle was constructed. The monoliths in Trench 2 had certainly been erected after the final capping of the cairn with smaller stones, but it is not certain whether this was the equivalent deposit to the filling of the centre; in Trench 1 the area around the flanker was too disturbed for the equivalent relationship to survive. Nor is it known whether that central space had been used for lighting fires or even for cremating the dead. Magnetic susceptibility provides equivocal evidence, and all the burnt stones come from a later disturbance. They cannot be associated with any particular phase.

In another respect the monument contrasts with that at Tomnaverie where the internal platform had been surfaced by boulders and

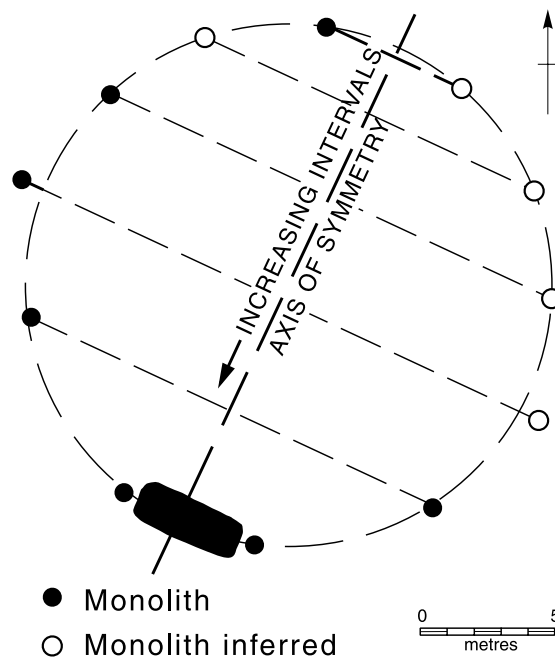


75 Trench 1 at Cothiemuir Wood in the course of excavation showing the material of the cairn in relation to one of the flankers. (Source: Jim Henderson)



76 Trench 1, the recumbent and flankers at Cothiemuir Wood. (Source: Jim Henderson)

made considerable use of patterned stonework. At Cothiemuir Wood, the rubble of the cairn was eventually concealed beneath a thin layer of cobbling, but on the north-east side of the monument this had apparently been selected for its colour. That practice extended to two other components of the monument. The kerbstones in Trench 2 showed a striking alternation between red and grey slabs. The monoliths conformed to the same scheme. Both the flankers were pink, whilst the recumbent stone was grey to white and contained inclusions of quartz. Similarly, the one surviving stone in the south-eastern part of the circle was grey, whilst all those in opposite sector were pink. The shapes of the standing stones observed a similar distinction. The monoliths on the west side of the circle (Monoliths 6, 7 and 8) were wedge-shaped with a wide base, whilst the surviving monoliths on the east side (Monoliths 4 and 5) were straight-sided and square. The contrast between the two halves of the monument is reflected in the distinctive configuration of the



77 A reconstruction of the original layout of Cothiemuir Wood stone circle.

flankers. Both were stones of similar proportions and may have been deliberately shaped. One was set point downwards in the ground, while its counterpart was the other way up. The difference is so obvious that it can hardly have happened by chance. In between the two monoliths the moon would have appeared in the sky over the recumbent stone.

3.6 THE EXCAVATED MATERIAL

3.6.1 WORKED STONE

Tim Phillips

36 pieces of worked stone were recovered from the excavation (illus 78). One piece of natural crystal was also found. This is discussed with the worked stone, as it appears to have been deliberately deposited. The assemblage is detailed in Table 11 and the number of pieces from each trench in Table 12.

Raw material

The raw material consisted mainly of flint and quartz. Most of the worked quartz pieces were inner flakes, with a handful of secondary flakes and inner and secondary chunks. On only three of the secondary pieces was it possible to identify the cortex. Two pieces were from outcrop quartz, and one from a pebble. The sample is not large enough to suggest the source of raw material. However, the fieldwalking survey observed readily available outcrop and pebble quartz within the immediate vicinity of the site. In these circumstances, it seems safe to assume that this was locally derived material.

Only one of the pieces of flint was a secondary flake. The area of cortex on this was too small to

determine its source. The other pieces were similar in colour and type to the flints recovered from fieldwalking. The primary and secondary pieces in the latter assemblage tended to have beach pebble cortex. It is probable that the excavated flints were derived from a similar source.

One large piece of granite had been used as a hammerstone (illus 79, no 1). The raw material could be obtained locally. The same can be said of the piece of natural quartz. Fieldwalking has shown that this material occurs in the area around the monument and in the valley to the north.

Technology

None of the quartz flakes showed signs of further modification. This would suggest that they had been produced for expedient use before being discarded. This may be supported by the presence of, sometimes large, struck chunks from which one or two flakes had been removed. However, the majority of the pieces were simple inner flakes which would suggest either that knapping was occurring off-site, or that already-prepared pieces were being brought to the monument. Again the flakes were similar to the pieces recovered from fieldwalking. Even so, it would be unwise to speculate further, as the excavated areas were small.

The two flint flakes were fairly small. One was a retouched artefact and the other a waste flake. The size of the pieces may reflect the lack of local flint sources, with material being worked down until it was no longer of use. As with the quartz, the assemblage is too small to allow any definite statement.

Artefact types

One of the quartz chunks was recognisable as a core with several distinct platforms from which flakes

Table 11 Summary of the lithic artefacts from Cothiemuir Wood.

	Secondary	Inner	Total
Quartz flakes	6	22	28
Quartz chunks	2	3	5
Flint flakes	1	1	2
Utilised stone	–	–	1
Natural crystal	–	–	1
Total	9	26	37

Table 12 The distribution of lithic artefacts at Cothiemuir Wood.

	Trench 1	Trench 2	Trench 3
Struck Quartz	13	19	1
Struck Flint	2	–	–
Utilised Stone	1	–	–
Natural Crystal	–	1	–
Total	16	20	1

had been removed (illus 79, no 2). The retouched flint was a thumbnail scraper of the type associated mainly with Beakers (Clarke 1970, chapter 23; illus 79, no 4). The utilised piece of granite was a hammerstone which had been used on two sides. The natural crystal was a particularly fine piece when compared to the examples recovered by field walking in the area. Its base was broken (illus 79, no 3).

Stratigraphy (illus 78 and table 12)

Although artefacts were found at different levels within the excavation, none of these was securely stratified. In Trench 1 pieces could have easily slipped through the cairn material. The only artefact that could be described as *in situ* because of its size is the hammerstone. The one piece of quartz from Trench 3 was probably derived from the upcast when the centre of the monument was investigated.

In Trench 1 worked stone was found both inside and outside the cairn. The only point of note is that no pieces were recovered within the robber trench for the outer kerb or from the structure of the ring cairn. The hammerstone came from just inside the line of the inner bank of rubble close to the top of the cairn. The thumbnail scraper was recovered from just beyond that feature towards the base of the cairn.

In Trench 2 the lithic artefacts were tightly clustered just beyond the outer kerb next to Monolith 5. The quartz core was amongst this group. The natural crystal was found to one side of this cluster close to the kerb on the old land surface.

Discussion

The thumbnail scraper is of a type that is often associated with Beakers. It was found within the

cairn material. The clustering of worked stone in Trench 2 may be of greater significance. Here a number of pieces were concentrated within a small area. The piece of natural crystal may well have been a placed deposit. Indeed, the position of these finds outside the kerb and directly opposite the recumbent is similar to where Beaker sherds were found at Tomnaverie. Only a small area of the monument was excavated and it would be unwise to make too much of the worked stone that was recovered. Even so, distinct differences can be observed on opposite sides of the stone circle. These may relate to how the site was used in prehistory, with more formal or structured activities taking place to the north-east.

3.6.2 SOIL MICROMORPHOLOGY

Stephen Lancaster, Donald Davidson and Ian Simpson

This section reports on the palaeosols found beneath the recumbent stone circle at Cothiemuir Wood. Having considered this particular monument, it compares the evidence with the results of a similar study carried out at Tomnaverie (see Chapter 2). The discussion also extends to the palaeosols preserved beneath the Clava Cairns.

Study site and sampling

The monument at Cothiemuir Wood is located on freely drained, low base status, intermediate brown forest soils of the Tarves series formed from till derived from mixed acid-igneous, acid metamorphic and basic igneous rocks (Soil Survey for Scotland 1957). A low cairn or platform of rubble was constructed on a flat hilltop. The platform was open at the centre and revetted on the exterior with a kerb and a buttress of rubble and on the interior by a bank of

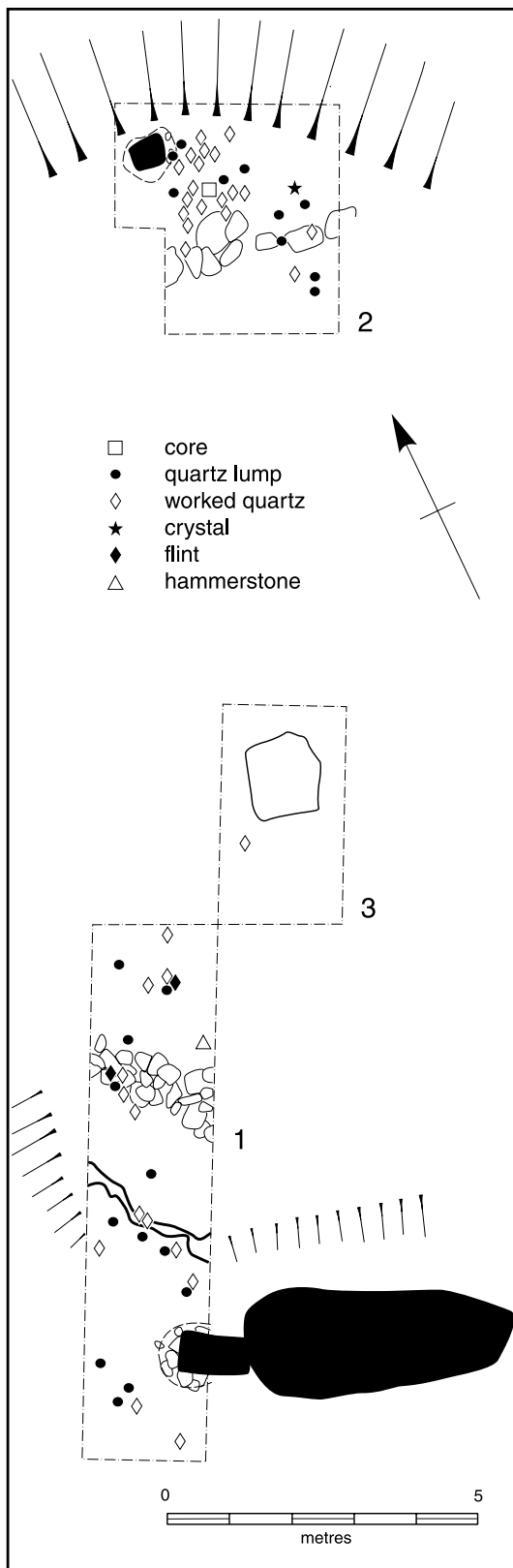
Table 13 Details of the soil thin sections from Cothiemuir Wood.

Thin Section	Coarse Mineral Material > 20µm					Fine Mineral Material			Coarse Organic Material			Fine Organic Material								
	Quartz	Granite	Granite Diorite	Bone	Compound Quartz	Feldspar	Biotite	Muscovite	Dotted organo-minera	dark	brown:	Organ (vascular)	Tissue, charcoal	Tissue, uncharred	Fungal Sclerotica	Cell Residue	Amorphous, black	Matrix Coating, brown	Matrix coating,	
Trench (Upper)	1	***	***	**	**	*	*	**	Dotted organo-minera	dark	brown:		**	**	*	*	*	*	*	**
Trench (Lower)	1	***	***	**	**	*	*	**	Dotted organo-minera	dark	brown:		*	*	*	**	*	*	#	
Trench	2	***	***	**	**	*	*	**	Dotted organo-minera	dark	brown:		*	*	*	*	*	#		

Thin Section	Pedofeatures			Microstructure			Coarse Material Arrangement			Groundmass b-Fabric			Related Distribution		
	Amorphous	1	2	Granular	to intergrain	microaggregate	Random,	unreferred	Speckled	Porphyro-gefuric	Speckled	Porphyro-gefuric	Speckled	Porphyro-gefuric	
Trench (Upper)	1	**	***	Granular	to intergrain	microaggregate	Random,	unreferred	Speckled	Porphyro-gefuric	Speckled	Porphyro-gefuric	Speckled	Porphyro-gefuric	
Trench (Lower)	1	*	*	Spongy	to intergrain	microaggregate	Random,	unreferred	Speckled	Porphyro-gefuric	Speckled	Porphyro-gefuric	Speckled	Porphyro-gefuric	
Trench	2	*	**	Intergrain	microaggregate	Random,	unreferred	Speckled	Porphyro-gefuric	Speckled	Porphyro-gefuric	Speckled	Porphyro-gefuric	Porphyro-gefuric	

Frequency class refers to appropriate Areas at 1985) Isotextural palaeofeatures (Bullock et al 1985)

* Very Few ** Few *** Frequent/Common **** Dominant/Very Dominant # Rare ## Occasional ### Many



78 The distribution of lithic artefacts in the excavation at Cothiemuir Wood.

massive boulders. Three small trenches had been excavated on the site, allowing field description of the underlying soils and collection of undisturbed soil samples in Kubiena tins (80mm by 50mm by 40mm). The extremely stony nature of the soils mean that only two samples could be collected – one from Trench 1 and one from Trench 2 – beneath the stone rubble of the site. The samples were prepared and analysed using the methods described in Chapter 2.

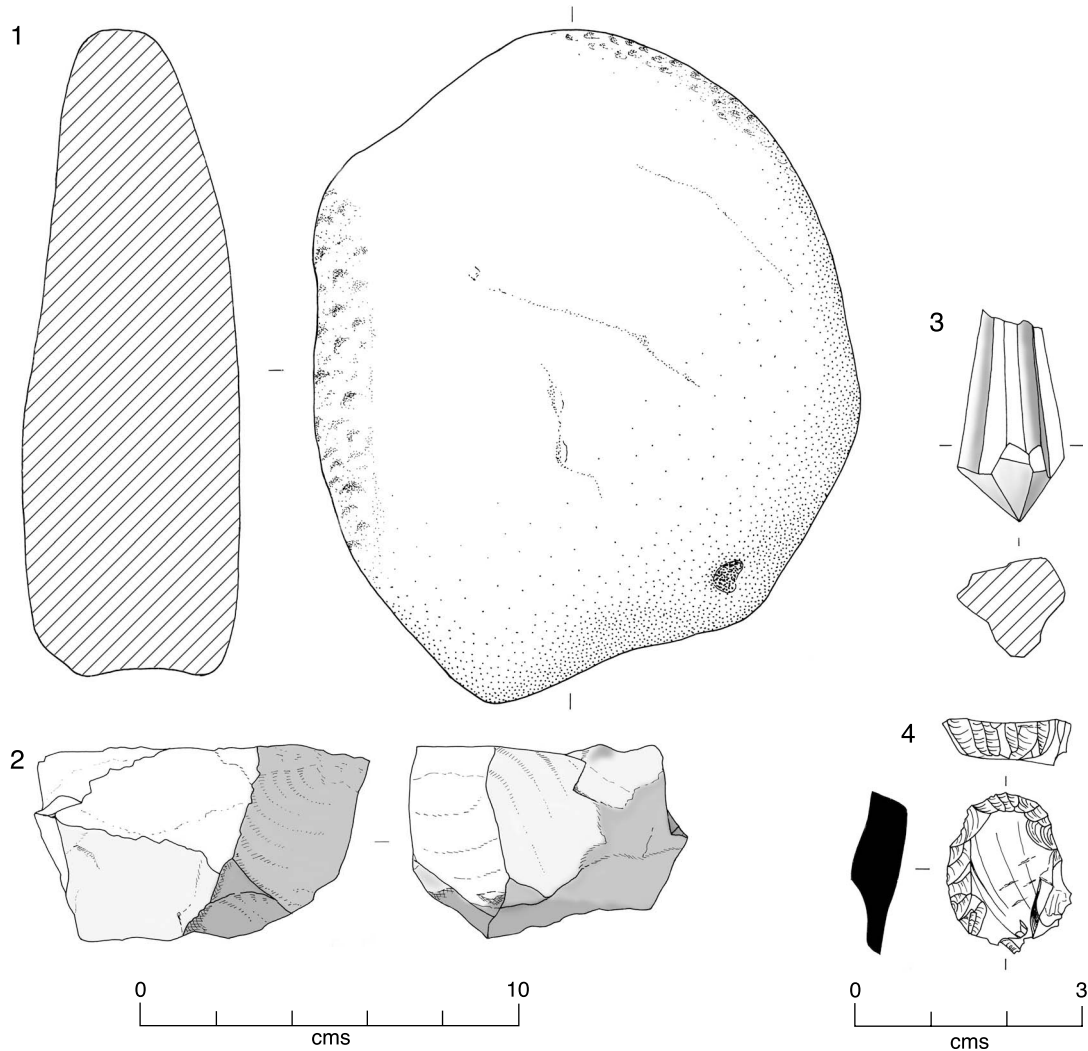
General observations

The soil beneath the monument is very similar to that at Tomnaverie: a sandy loam with common and frequent sub-rounded and subangular large stones. Munsell colours permitted a distinction to be made between fossil soil horizons that could be regarded as ‘A’ horizons (darker coloured top-soils; 7.5 YR 3/2) and ‘B’ horizons (lighter coloured and immediately below top-soil horizons in undisturbed soils; 7.5YR 4/4). Table 13 provides a summary of features observed in the two thin sections taken from Cothiemuir Wood. They share the same features as those taken from Tomnaverie and the description in Chapter 2, 7.4, also applies to this material. The only differences are that there were distinctive small to medium-sized stones within the central area at Tomnaverie and that an ‘A’ horizon was absent beneath part of that monument.

Thin section samples 1–2 (table 13)

Here the coarse mineral material is slightly different from that at Tomnaverie with a more frequent occurrence of biotite, reflecting different soil parent materials although still randomly arranged; bone is absent from the coarse mineral material suite and fine mineral material includes dark brown and brown colours. Charred tissue features are evident throughout these thin sections with few amorphous black fine organic materials and rare matrix coatings, which are thin and discontinuous. A wide range of excremental pedofeature types are again a major component of the thin sections, and are frequent and common in dark brown coloured fine organo-mineral materials and few in brown organo-mineral materials.

As at Tomnaverie, these stony fossil soils have been heavily reworked by soil organisms, limiting interpretation of land surfaces and



79 Lithic artefacts from Cothiemuir Wood. 1: hammerstone; 2: quartz core; 3: natural crystal; 4: flint scraper.

ground preparations prior to the construction of the monument. However, the occurrence of amorphous, iron-based, cryptocrystalline features and depletion pedofeatures suggests that soils in this locality were becoming more podsolised, at least at the time when the rubble and kerbs of the monument were laid down. The limited occurrence of matrix coatings in thin section, and the absence of coarser coatings suggests only limited ground disturbance immediately prior to monument construction, an interpretation reinforced by the intact 'A' horizons with dark-brown coloured fine mineral material. The few charred tissue features suggest that burning of surface vegetation cover

may have taken place before the monument was constructed: the absence of bone related to these features indicates that burning was not related to cremation activity. Features indicating agricultural activity, including soil amendment features in the 'A' horizon and textural pedofeatures in 'B' horizons, are not evident.

Conclusions and comparisons with Tomnaverie

A degree of caution is needed when drawing conclusions from these studies of Cothiemuir Wood and Tomnaverie. A small number of thin section samples (seven) were collected from stony soils beneath only two monuments. Furthermore

biological reworking of these fossil soils may have resulted in the loss of features indicative of land surfaces immediately prior to monument construction. Despite the limitations embedded in these studies, a limited interpretation of pre-monument land surfaces can be made.

The monuments were located on acid brown forest soils with indications of podsolisation. There are no features to suggest agricultural activity or low levels of disturbance, implying that the location of these monuments may have been peripheral to the main areas of settlement. These observations are in partial contrast to conclusions drawn from the Clava Cairns at Balnuaran of Clava. Cultivation activity superimposed on podsolised soils has been identified beneath these monuments, although abandonment of cultivation may have meant that this area of land was marginal, like Tomnaverie and Cothiemuir Wood, at the time of monument construction (Simpson and Davidson 2000).

Thin section micromorphology analyses indicate differences in ground preparation between Tomnaverie and Cothiemuir Wood. At Tomnaverie there was major disturbance of the site with topsoil removal, possibly followed by some in-filling with introduced or re-packed topsoil material to flatten the site before construction. In contrast to Cothiemuir Wood, burning off of vegetation cover seems to have been the only ground preparation involved. These observations suggest that there was no consistent ground preparation for these monuments. Whilst monument construction appears consistent and ritualistic, as do the functions associated with these monuments, ground preparation may not have been ritualised to the same extent.

3.6.3 POLLEN ANALYSIS

Catherine Chisham

The opportunity arose to examine the environment before and after the creation of the archaeological features observed at the site. To that end, four spot samples (*c* 5g weight) were taken by Peter Brewer during the excavations. Two were taken from Trench 1: P3 from a buried soil, and P4 from the filling of the central area of the monument. Similarly, two samples were taken from Trench 2: P1 from the buried soil, and P2 from the overlying fill. However, on-site observations suggest that the

sediments in Trench 2 were sealed prior to those in 1, so the two sets were not mirror samples. The relationship of the two locations is shown in *illus* 63. Depths below an arbitrary +0.4m above datum have been used for ease of presentation of results. These depths were as follows:

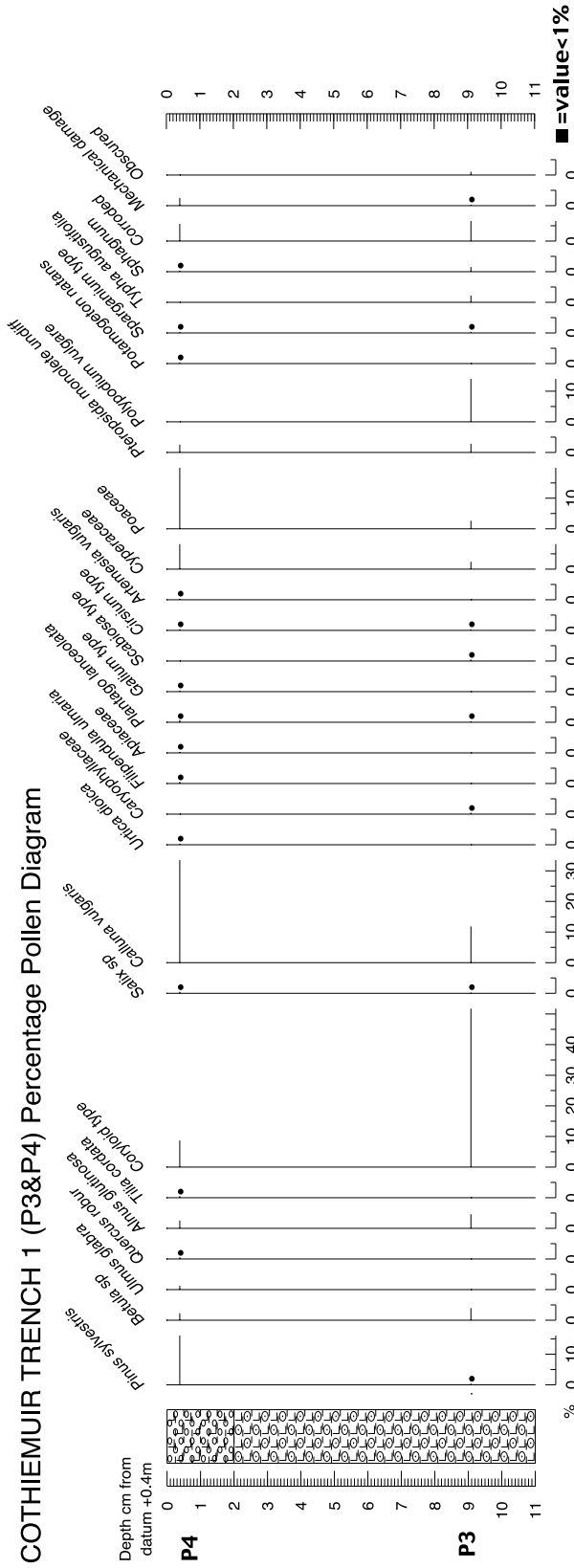
P4	0.4cm	Trench 1
P3	9.1cm	Trench 1
P2	34.2cm	Trench 2
P1	42.5cm	Trench 2

From each spot sample 1g of sediment was processed by standard procedure (Moore, Webb and Collinson 1991) and the resulting slides passed to the author for analysis. The slides were traversed at 1mm intervals under the 400× magnification of a Lietz Dialux 20 transmitted light microscope, to a minimum count of 350 pollen grains for each level. 1000× magnification was used for critical identifications. Identification was carried out with reference to the keys of Moore *et al* (1991) and Faegri and Iversen (1989) and to modern material held in the Department of Archaeology, University of Reading. The pollen nomenclature was used according to Bennett (1994) and Bennett *et al* (1994) and the species placed in their taxonomic order according to Stace (1997). The state of preservation of damaged pollen grains was noted and all unidentifiable grains were classified according to the following hierarchy: corroded, degraded, mechanical damage and unidentifiable (unknown). Calculation of individual taxa as a percentage of the total pollen and spores excluding *Sphagnum* was undertaken to produce the percentage pollen diagrams of *illus* 80. Unidentifiables were calculated as a percentage of the total pollen sum plus themselves. The Troels-Smith stratigraphic logs given on the diagrams are based on the field section drawings. Due to the small number of samples examined for each location, zonation of the diagrams would have been inappropriate; instead discussion is based on individual samples and comparison with other samples.

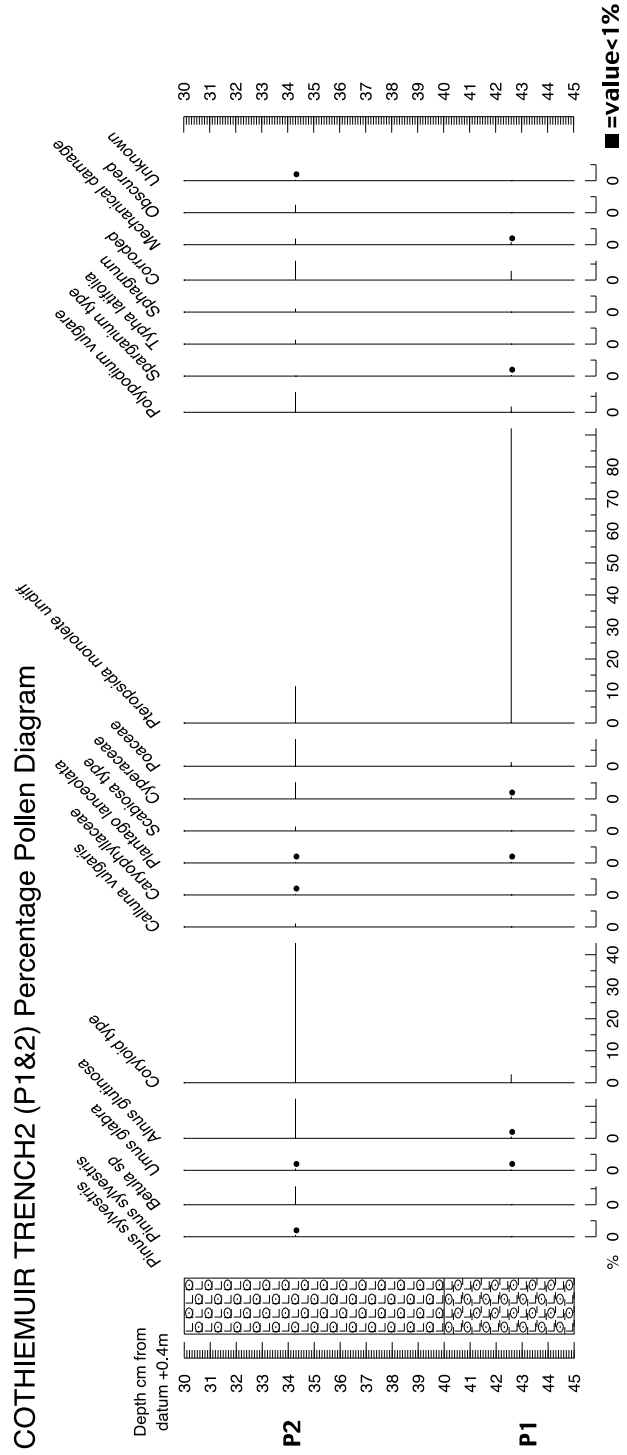
Results

P2–P4 displayed moderate to good preservation, with slight corrosion of individual grains, but few were unidentifiable. P1, however, displayed poor preservation and, although the target count was

COTHIEMUIR TRENCH 1 (P3&P4) Percentage Pollen Diagram



COTHIEMUIR TRENCH2 (P1&2) Percentage Pollen Diagram



80 Cothiemuir Wood: pollen diagram.

achieved, the state of the grains observed and the range and counts of individual species indicate that the results for this level may have been biased by poor preservation. The results have been presented and discussed below, but the interpretations made for P1 are tentative.

P1: This sample from a gravelly buried soil proved to have poor preservation. Only nine taxa were observed and over 90% of the count was of Pteropsida monolete undifferentiated ie fern spores of a species unidentifiable due to the loss of the diagnostic outer coat or perine. The counts of arboreal, shrub and herb pollen were minimal but included *Alnus glutinosa* (alder), *Ulmus* (elm), *Corylus avellana*-type (hazel), Cyperaceae (sedge family) and Poaceae (grass family). A single grain of *Plantago lanceolata* (ribwort plantain) was observed.

P2: This sample from *c* 8cm above P1 came from the filling of the monument and displayed a more coherent pollen assemblage, but again a limited number of taxa (15). Arboreal and shrub pollen formed over 60% of the count and included *Alnus glutinosa* (alder), *Betula* (birch), *Pinus sylvestris* (pine) and *Ulmus* (elm). *Corylus avellana*-type (believed to be *Corylus avellana*: hazel) formed the dominant species, at 44% of the total pollen. *Calluna vulgaris* (common heather) was also present but formed only 1% of the assemblage. Herb pollen was found to include Cyperaceae (sedge family), Poaceae (grass family), Caryophyllaceae (pink family), *Plantago lanceolata* (ribwort plantain) and *Scabiosa*-type (scabiouses). Aquatics and spore-producing plants included *Typha latifolia* (bulrush), Pteropsida monolete undifferentiated and *Polypodium* (polypody) in appreciable quantities. There were also a few spores of *Sphagnum* moss.

P3: The dominant taxon (of 17 taxa) in this sample from the buried soil proved to be *Corylus avellana*-type at > 50% total pollen. *Alnus glutinosa* (alder), *Betula* (birch), *Pinus sylvestris* (pine) and *Salix* (willow) were also present in small numbers and there was an appreciable amount of *Calluna vulgaris* (common heather) at > 12% Total Pollen. Sedge, grass and herb types were present only in small quantities and included *Plantago lanceolata* (ribwort plantain). Aquatic and spore types were present, including > 10% *Polypodium* (polypody).

P4: A more varied assemblage was observed in this assemblage, with a greater number of tree

and herb species represented (22 taxa in total) *Alnus glutinosa* (alder), *Betula* (birch), *Pinus sylvestris* (pine) and *Ulmus* (elm) were present in small numbers and grains of both *Quercus* (oak) and *Tilia cordata* (lime) were observed in this sample alone from the site. The pine formed 16% total pollen and *Corylus avellana*-type (probably hazel) *c* 10%. The dominant species was *Calluna vulgaris* (common heather), which formed over 34% total pollen. 8% Cyperaceae (sedges) and 20% Poaceae (grasses) was recorded. Herb types were present in small numbers but with a large number of species represented including *Plantago lanceolata* (ribwort plantain), *Artemisia*-type (mugwort), Apiaceae (carrot family), *Cirsium*-type (thistles), *Urtica dioica* (common nettle). Few spores were observed.

Interpretation

P1: The assemblage observed, notably the high percentage of Pteropsida and the presence of *Alnus*, *Sparganium* undiff. and *Polypodium* indicates that marshy conditions were present locally. Few other conclusions can be drawn due to the state of preservation, but it is worth noting that, at the end of the trench that was spot-sampled, excavators noted the presence of a moist, peaty area. A small pool of standing water may be indicated for the time of soil formation.

P2: Species of mixed deciduous woodland are suggested to have been present in small numbers locally but the assemblage observed indicates relatively open conditions with *Corylus avellana*-type, *Alnus*, *Betula* and Poaceae. Moist conditions are indicated locally by the presence of the *Alnus*, Cyperaceae, aquatic and spore types, but there are no indications of a substantial body of still or moving water. Heather appears to have been present but did not form a significant part of the vegetation when this level formed. The small amount of *Pinus* pollen is suggested to have been part of the regional pollen rain, the grains having travelled some distance to the site. As a high pollen producer, had pine been locally present, its grains would probably have dominated the assemblage.

P3: Hazel appears to have been the dominant species in the local area and conditions were open, with little woodland development and the presence of heather but low levels of grass and herb pollen. The presence of *Alnus*, Cyperaceae, *Sparganium*

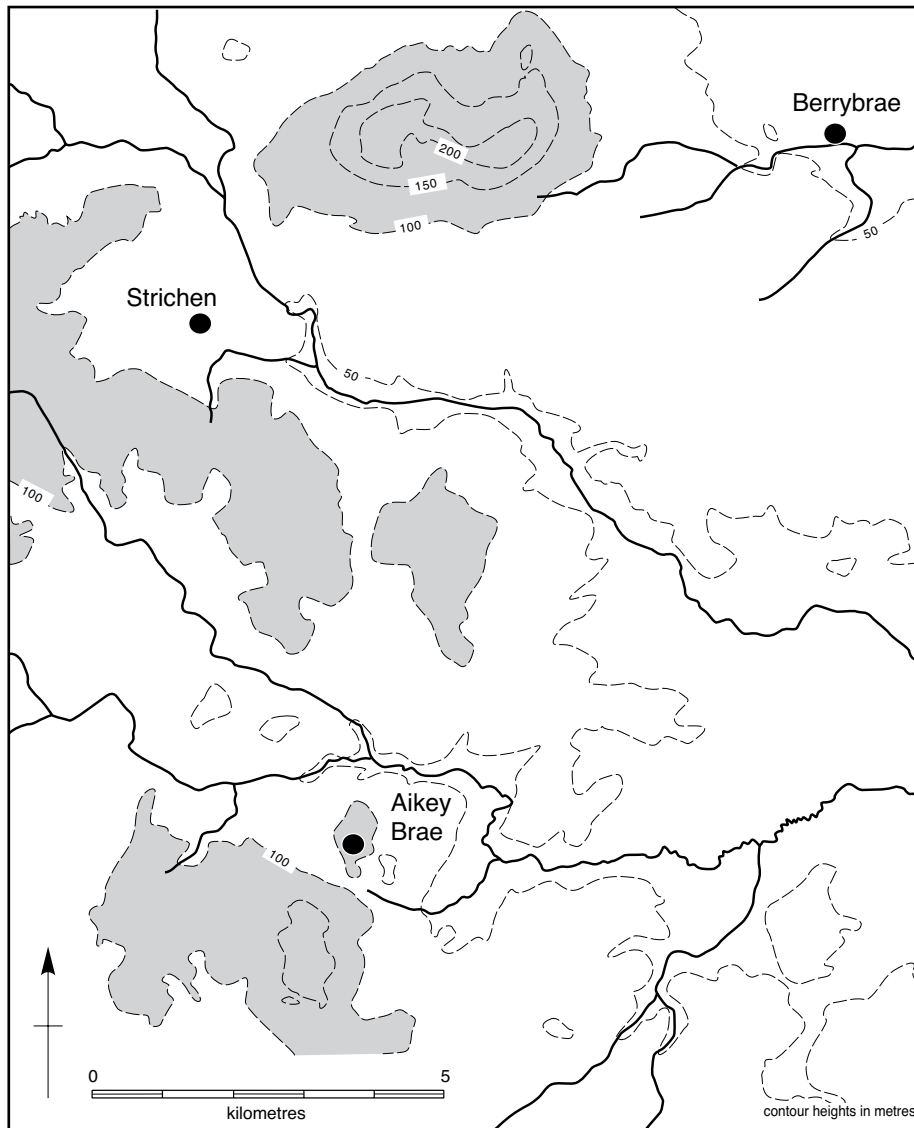
undiff. and *Polypodium* indicate the presence of moist conditions in the vicinity but no large body of still or moving water.

P4: Again, open conditions are indicated but a greater number of deciduous woodland species are represented than in the other samples. *Tilia cordata* is notable as an insect-pollinated thermophilous species. Today, it is a low pollen producer and its mode of pollination means that presence of the grains indicates local presence of the species. *Calluna vulgaris* pollen forms the dominant species in this assemblage, accompanied by Poaceae, apparently at the expense of *Corylus avellana*-type

when compared with the underlying sample P3. The spread of open heath and grassland is indicated and a reduction in moist or boggy conditions at the site. The presence of a variety of herbaceous types suggests further opening up of the landscape and several of the species observed provide indications of disturbed ground.

A sequence of environmental change at the site cannot be established from the use of four samples, but a number of interesting points arise from this analysis.

Moist conditions existed in the vicinity, notably around the area of Trench 2. By the time that the



81 The locations of Aikey Brae, Strichen and Berrybrae stone circles.

interior of the ring cairn was filled – an episode represented by P4 – these conditions appear to have reduced or nearly disappeared; local drying is indicated.

Full woodland cover did not exist at the site at the time of development of the buried soil nor during the filling of the central area. The presence of a number of tree and herbaceous species as well as the damp areas indicates perhaps a mosaic of vegetation. Widespread tree clearance would not have been necessary during the creation of the monument. *Corylus avellana*-type was notably common in the assemblage. The shrub prospers in open and woodland edge conditions and its dominance, along with the presence of grass and herb species, notably *Plantago lanceolata* (ribwort plantain), indicates relatively open conditions. The latter, a weed of disturbed and open ground, is often used as an indicator of human activity and was present in all the samples in small quantities.

Calluna vulgaris (common heather) was far more common in the upper level than in the buried soil, indicating the spread of heathland at the time of, or after, the creation of the monument. This is more marked at Trench 1 (P4) where a large increase was accompanied by one in grasses and a decrease in hazel. It seems likely that P4 refers to a later period than P2, reflecting the continuing development of heathland conditions.

Pinus appears to have increased coincident with the spread of heath and grassland in P4. The reasons for this rise are unclear but may be due to one of the following scenarios.

The grains could have been introduced as contamination post-deposition, during site collection or during sampling as there are local modern-day pine plantations in the area. However, the grains were in the same state of preservation as the rest of the assemblage. No cell contents were observed, and this is not thought to be the case.

A small number of pine trees may have colonised locally with the spread of heathland. This is feasible since both thrive in similar acid conditions. However, pine is a prolific pollinator and, if locally present, tends to dominate a pollen assemblage. In addition, pine is a highly competitive species and there is no obvious reason why it should have been less successful during the formation of the buried soil.

Due to its high rate of production and long-distance dispersal pine pollen forms a background to most regional pollen assemblages. It is possible that the decrease in shrub (hazel) cover may have caused a decrease in the filtering-out of the regional pollen rain, allowing more pine grains to reach the site. Unfortunately, such an effect is unquantifiable in the palaeoenvironmental record.

It is notable that despite the obvious signs of human activity at the site with the creation of the stone circle, no cereal pollen was encountered during this analysis, indicating that arable cultivation was unlikely to have been taking place in the local area.

Conclusions

As described above, a sequence of environmental change cannot be established from this analysis, although the potential to do so exists should a further column of samples be analysed in the future. However, some useful conclusions can be drawn that answer a number of specific questions about the environment in which the stone circle was created and used. It is believed that further opening up of an already somewhat open area occurred with the spread of heath and grassland and that local marsh conditions existed but may have dried up during the period represented by the pollen samples. Anthropogenic changes to the vegetation are indicated but no arable cultivation was identified and no microcharcoal was observed on the pollen slides.

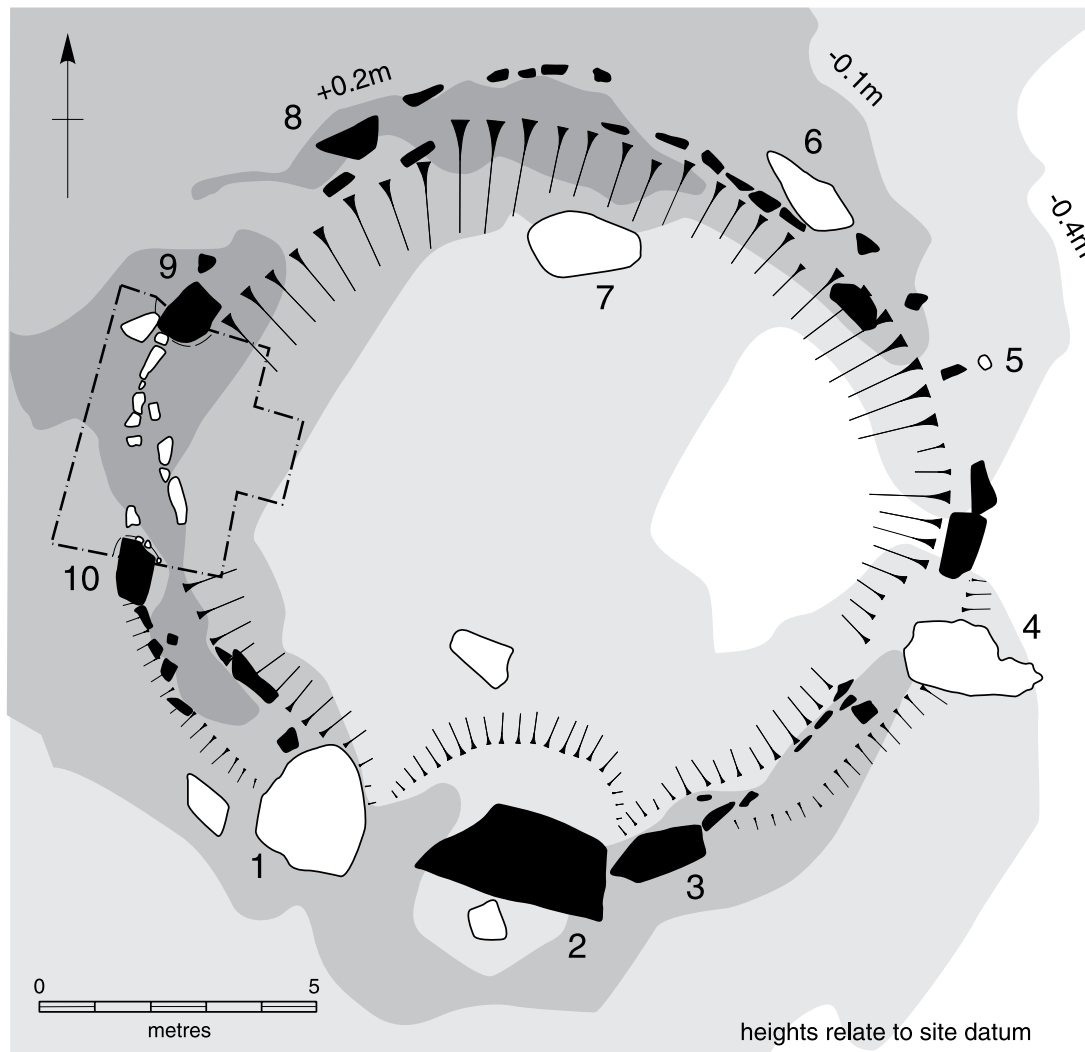
3.7 DISCUSSION: THE EVOLUTION OF THE RECUMBENT STONE CIRCLE AT COTHIEMUIR WOOD

There is no evidence to suggest the absolute date of the monument at Cothiemuir Wood, although in many ways it is similar to that at Tomnaverie. The structural sequence was much the same, the internal cairns were of similar diameter (16m at Cothiemuir Wood and 15m at Tomnaverie), and in both cases the stone circles seem to have included 12 monoliths and a recumbent. Even the spacing of the uprights followed the same conventions. For that reason they could be broadly contemporary with one another.

The earliest activity at Cothiemuir Wood is not understood, but the construction of an internal

ring cairn may have taken a significant length of time. A deposit of quartz had been placed at the foot of the kerb directly opposite the recumbent and in the equivalent position to the Beaker sherds at Tomnaverie. There was a long enough interval for one of the stones to have fallen down and been replaced before an external buttress was built. Indeed the setting of the outer kerb varied between the 'front' and 'back' of the monument, as did the final capping of the cairn. In Trench 2 the stones seem to have been selected for their distinctive colour, but this did not happen on the other side of the monument.

The stone circle was a later development than the ring cairn, but, as at Tomnaverie, these two structures exhibit an essential continuity. The monoliths at Cothiemuir Wood were organised according to the same colour scheme as the existing kerb. Similarly, the outer ramp which helped to hold that kerb in place was built on a more considerable scale on the south-west side of the cairn. Perhaps this was because the builders knew that before the project could be completed this material would have to bear the weight of the recumbent stone. Again it seems as if the evolution of this monument had been envisaged from the start.



82 The surface remains of Aikey Brae stone circle and the location of the excavated area. With the exception of those inside the excavation, fallen stones are shown in white and upright stones in black. (Plan by courtesy of RCAHMS: Crown Copyright)

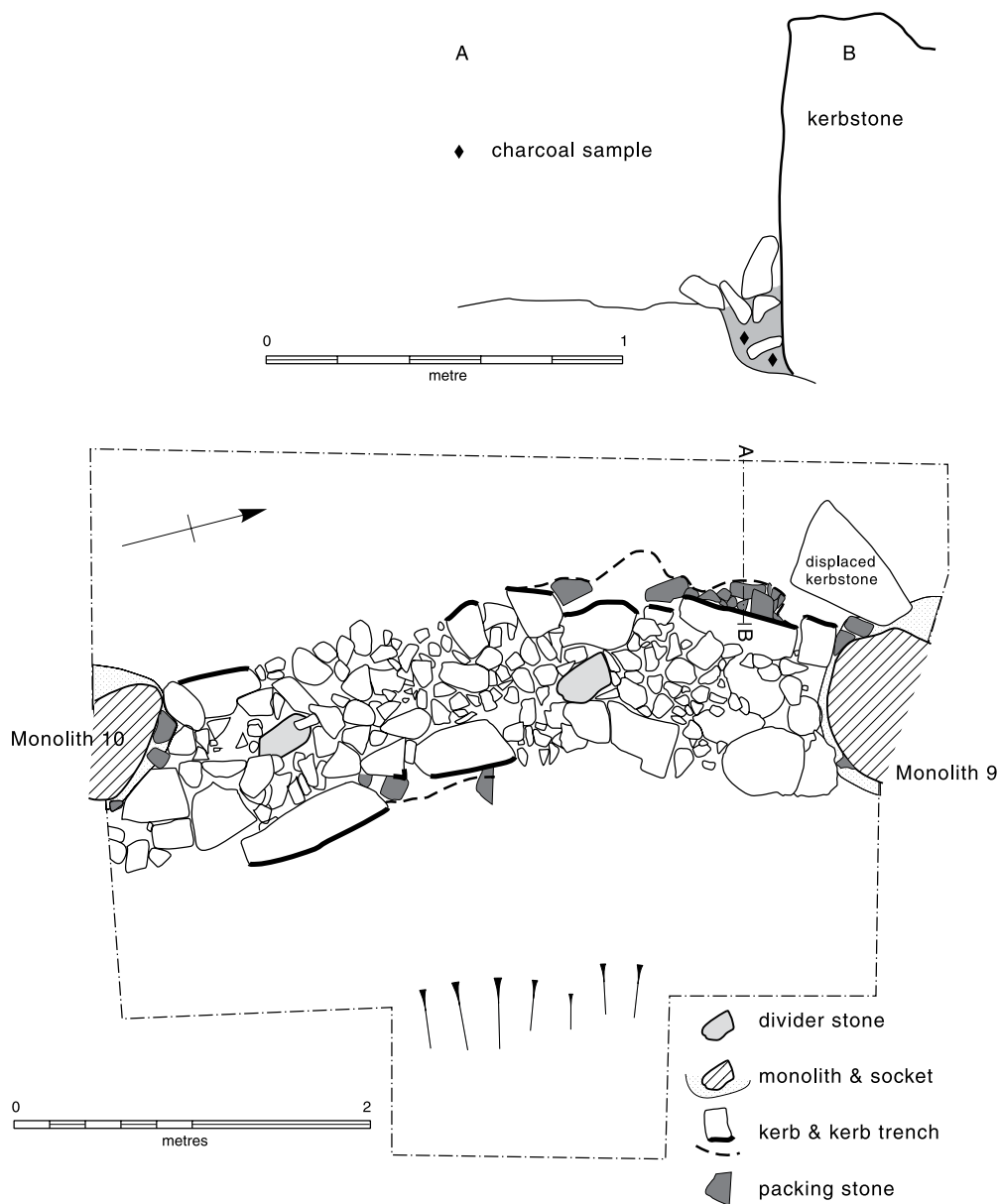
EXCAVATIONS AT AIKEY BRAE

Richard Bradley and Chris Ball

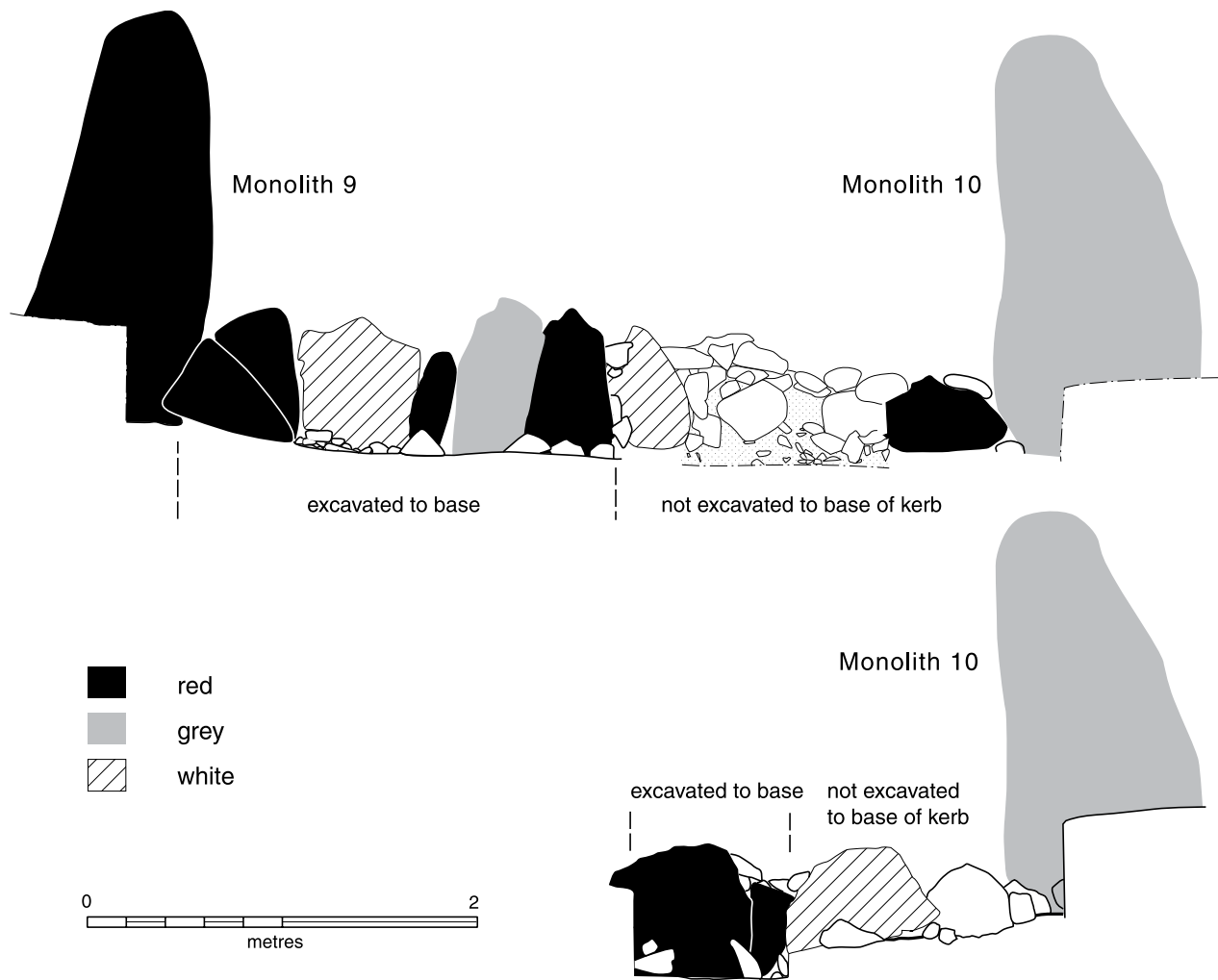
3.8 BACKGROUND

The excavations described so far suggest that some of the recumbent stone circles of Deeside and Donside had more in common than had been supposed from their surface appearance. On the other hand, Burl was right to distinguish the monuments in the main part of their distribution from a small group

in Buchan, of which Berrybrae and Strichen were recently excavated examples (illus 81; Burl 2000, chapter 12). These differed from most of the others, as they were generally smaller and lacked substantial cairns. Instead they formed embanked or walled enclosures with a ring of monoliths along their outer limits. One of the best preserved monuments is at



83 Plan and profile of the excavated area at Aikey Brae.



84 Elevations of the excavated kerbstones and monoliths at Aikey Brae. The upper drawing shows the outer face of the wall and the lower drawing its inner face as revealed by excavation.

Aikey Brae, but, like the stone circle at Cothiemuir Wood, only the perimeter remains intact (Coles 1904, 266–70). That made it a suitable candidate for small scale excavation.

3.9 THE STANDING MONUMENT

The recumbent stone circle at Aikey Brae (illus 5, no 5) was typical of the monuments in Buchan. Again it was surveyed by the Royal Commission before excavation began. It is 16m in diameter. It is located on the edge of a hill (NJ 959471) and its interior is slightly lower than the surrounding area. It is defined by an earthwork bank 2.5m across on

which nine monoliths and a recumbent stone were set (illus 82). The axis of the monument is towards the SSW and the stones increase in height in that direction. Protruding through the surface of the bank are two parallel lines of upright slabs which are set about 1.5m apart. Parts of the site had been damaged. One of the flankers had fallen and other monoliths are represented only by stumps. The central area had recently been disturbed but had already been extensively dug without result in 1875 (Peter 1885, 377; Coles 1904, 270). The monument occupies the southern side of a conspicuous hill and would command extensive views in all directions.



85 The relationship of Monolith 9 to the enclosure wall at Aikey Brae.

3.10 THE DESIGN OF THE EXCAVATION

Because the site had been disturbed, there was no point in investigating its interior. For that reason the excavation focused on the relationship between the bank and the monoliths of the stone circle. In order to achieve unambiguous results, the excavation incorporated the positions of two adjacent monoliths and a four metre length of earthwork running between them. One reason for doing so was that the placing of the standing stones did not seem to conform very closely to the position of the bank. That might be because these structures were of different dates. Just as important, the slabs that protruded from the earthwork suggested that this feature might mark the position of a wall like those at Strichen and Berrybrae. This proved to be

correct, but it was so well preserved that it was left intact.

3.11 THE STRATIGRAPHIC SEQUENCE

3.11.1 THE WALLED ENCLOSURE

As expected, the bank proved to be the remains of a rubble wall about a metre wide, defined by distinct inner and outer kerbs (illus 83). Both had been masked by deposits of rubble which probably resulted from later stone clearance. These should not be considered as integral features of the monument. Part of the wall had also been disturbed by tree roots and by burrowing animals, but other sections remained intact. The outer kerb was the better preserved. In its surviving state it consisted of alternating red and grey or



86 The relationship of Monolith 9 to the enclosure wall at Aikey Brae. Note how one of the kerbstones seems to have been removed when the standing stone was erected.

white slabs, between 50cm and 80cm high, some of which were set vertically in an irregular trench cut into the natural subsoil to a depth of 15cm and packed with angular boulders (illus 88). Two charcoal samples from the middle and lower fillings of this feature respectively date from the Late Bronze Age. The remaining kerbstones seem to have rested on the ground surface. Only a small part of the inner kerb remained in position, but it also seems to have been divided between stones that were alternately red and white. Again it had been set into a trench excavated into the subsoil. The core of the wall was not investigated by excavation but included blocks as much as 40cm in maximum dimension. Along the centre of that wall there appeared to be two substantial boulders set on end which had perhaps acted as dividers separating the kerbs. Alternatively, they might belong to an earlier phase of construction, but that could only be established by a more extensive excavation.

3.11.2 THE RECUMBENT STONE CIRCLE

There were two monoliths within the excavated area, both of them substantial stones that had withstood later damage to the site (illus 89–92). Monolith 9 was located on the course of the wall just described, whilst its counterpart (Monolith 10) overlapped with the course of its outer kerb. For safety reasons their sockets were left unexcavated, but both could be identified in plan. In the case of Monolith 9 it was particularly easy to establish the relationship between the socket and the enclosure wall, for its erection had entailed the removal of at least one large slab belonging to the outer kerb. The monolith had fitted tightly into its socket, supported by packing stones, and the displaced kerbstone had been wedged against the outside edge of the upright to provide it with additional support.

Monolith 10 was related to the wall in a similar way. Again the edge of its socket was clearly visible in plan, showing that the stone had fitted tightly into the underlying rubble. It was supported by packing stones. In this case the inner kerb of the wall was missing altogether, whilst at least one component of the outer kerb had also been removed. The space in between the next kerbstone and the monolith had been filled in with large boulders which would have provided it with further support. In each case, then, the

stone circle was a later development than the walled enclosure.

3.12 THE FORM OF THE FINAL MONUMENT

In its original form the monument at Aikey Brae had been an enclosure about 16m across, almost the same diameter as the ring cairns at Tomnaverie and Cothiemuir Wood. There was no sign of an entrance, although one could certainly have existed in the disturbed area occupied by the later recumbent. The wall had been carefully built and was faced by quarried slabs both externally and internally (illus 88). These showed the now familiar alternation between red and grey or white stones. Surface observations suggest that this scheme was maintained around the entire perimeter of



87 The enclosure wall and Monolith 10 at Aikey Brae. Note how the monolith is not aligned with the centre of the wall.



88 The outer kerb of the enclosure at Aikey Brae, showing the stone-packed foundation trench extending along part of the perimeter of the enclosure.

the enclosure. Opposite the recumbent the inner kerb was taller than its counterpart, while in the excavated area the relationship was the other way round.

That enclosure was supplemented by the creation of the recumbent stone circle. This followed its perimeter almost exactly, although individual monoliths drifted off line because of the practical difficulty of bedding them in the material of the existing wall. The circle probably had nine monoliths including the flankers and was symmetrically organised around an axis extending from the (now fallen) Monolith 7 to the centre of the recumbent stone. It was graded in height towards the SSW and, according to Ruggles, could have been directed towards the major southern moonset (1999, Tables 5.1–5.3). The same axis was apparent from the shapes of the monoliths. Although the stone circle had been damaged, those in its eastern part seem to have been smooth

and rounded and those to the west were rougher and more angular. A similar distinction between the two halves of the monument was suggested at Cothiemuir Wood.

3.13 THE EXCAVATED MATERIAL

3.13.1 WORKED STONE

Tim Phillips

A total of 43 pieces of worked stone were recovered from the excavation. The assemblage is detailed in Table 14. Three different areas within the trench can be identified: A, outside the monument; B, the rubble wall; C, inside the monument. The lithics from each of these areas are detailed in illus 89 and Table 15.

Raw material

The two main types of raw material were quartz and flint, although a few pieces of crystal quartz

Table 14 Summary of the lithic artefacts from Aikey Brae.

	Secondary	Inner	Total
Quartz flakes	12	6	18
Quartz chunks	1	–	1
Split quartz pebbles	–	–	1
Quartz hammerstones	–	–	4
Crystal quartz	–	3	3
Split quartzite pebbles	–	–	2
Flint flakes	2	7	9
Flint chunks	1	–	1
Flint chips	–	4	4
Total	16	20	43

and quartzite were also present. Most of the quartz consisted of secondary struck flakes. The pieces on which the cortex could be identified showed that about half had been derived from outcrop quartz and the other half from pebbles. Quartz could be seen in two of the cultivated fields nearby, and this material may well have been obtained locally.

On two of the secondary pieces of flint the cortex could be identified as coming from beach pebbles. Although the flint assemblage was small, the range of types and colours were very similar to those recovered from Tomnaverie and Cothiemuir Wood. There did not appear to be any pieces of the mined Boddam flint (Saville 1993).

The three pieces of crystal quartz refitted exactly and came from one large chunk which had probably been struck with one hard blow (illus 90, no 1). They were found within 0.15m of each other in the same context, below the turf. The two pieces of quartzite were split pebbles.

Technology

None of the quartz flakes showed signs of further modification. They had probably been produced for expedient use. However, unlike the Cothiemuir Wood assemblage, most of the material consisted of secondary pieces, and there was only one struck chunk. Indeed, along with the two pieces of quartzite, there was also a quartz split pebble. The three refitting pieces of crystal quartz made up a single piece that had been struck in its centre. The individual parts did not make usable tools. Flakes had been removed from the original piece before it was broken, but this had probably happened prior to it being brought to the site; no other crystal quartz was recovered. Moreover, the whole piece could still have been used to obtain flakes, but instead it had been intentionally destroyed. All the pieces of flint were relatively small, and indeed, four were small chips. Most were debitage and only one had been burnt.

Table 15 The distribution of lithic artefacts at Aikey Brae.

	Area A	Area B	Area C
Flaked quartz	9	2	9
Quartz hammerstones	4	–	–
Crystal quartz	–	–	3
Split quartzite pebbles	1	–	1
Flint	6	3	5
Total	20	5	18

Artefact types

There were two flint scrapers, one of ‘thumbnail’ type (illus 90, nos 2 and 3). The small size of the flint could suggest the use of a distant raw material, although the coast and the Boddam flint mines are only 16km away.

Stratigraphy (illus 89)

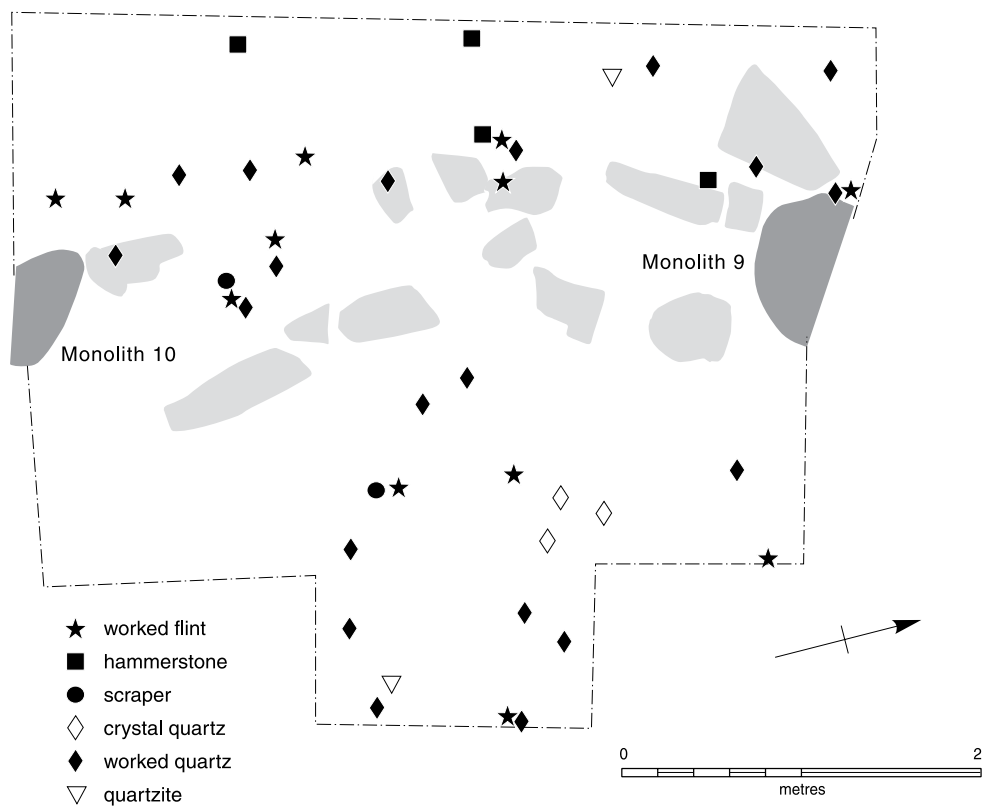
A number of artefacts were found along the outer edge of the enclosure wall. This was true in the context beneath the turf and in the rubble below. A few pieces were found further back from the wall, including two of the hammerstones (illus 90, nos 4 and 5). One piece of quartz and a waste flint flake were recovered from the filling of the socket of Monolith 9 at the north end of the trench. The rubble wall was only excavated at the southern end of the exposed area where it had already been disturbed. Worked stone, including a flint scraper, was found in the disturbed area. No artefacts were recovered from the top of the wall. The lithics from the interior of the stone circle showed a different

distribution from those outside it. They tended to cluster away from the rubble wall towards the interior of the monument and included the small thumbnail scraper. This pattern was true in all contexts in which worked stone was recovered.

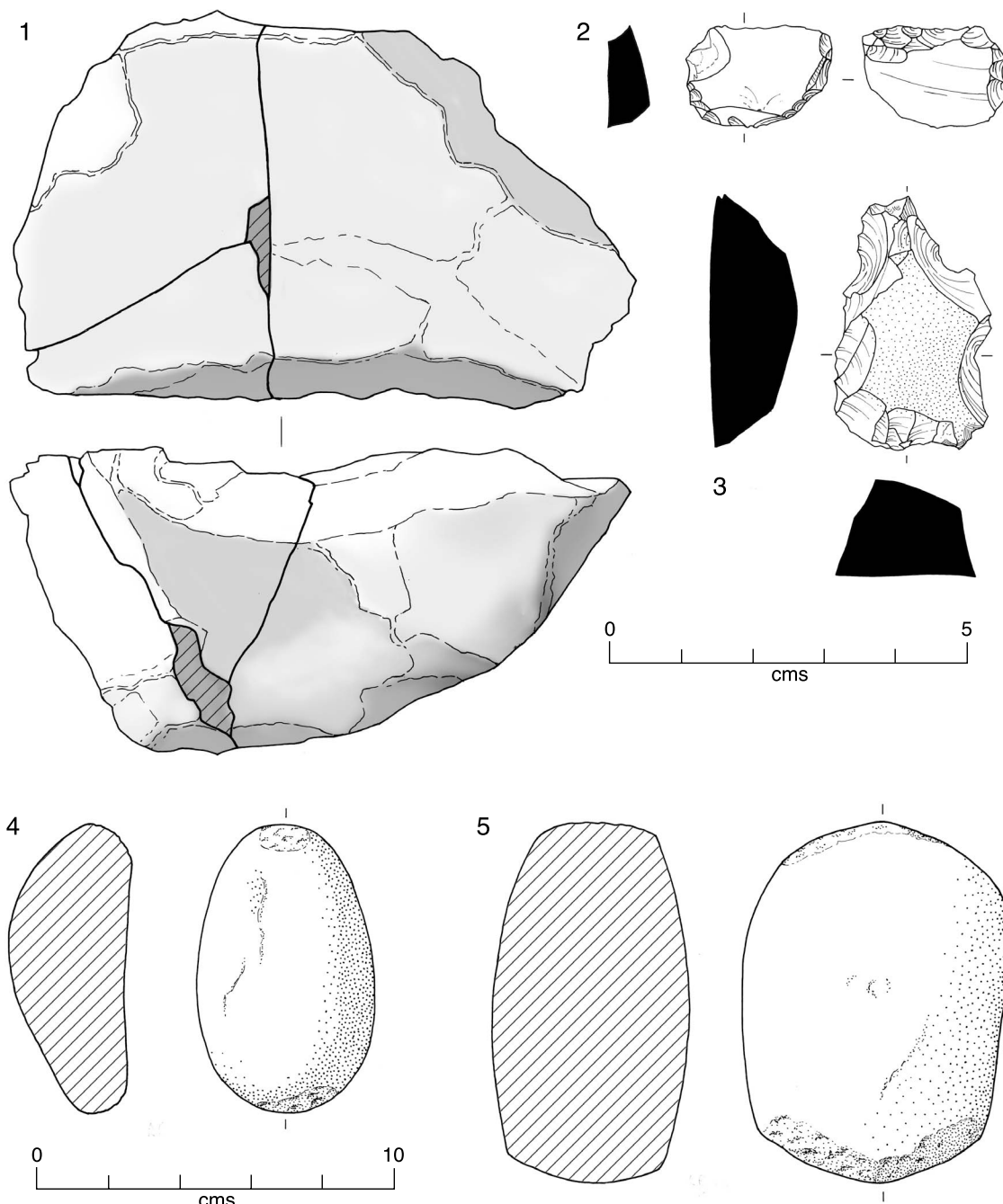
Discussion

Given the size of the excavated area at the site, it would be unwise to make too much of the material recovered. Even so, a few general points can be made about its nature and distribution. The density of worked flint is relatively higher at Aikey Brae than at the other two stone circles investigated during the project. This is the site that is nearest to the known raw material sources, but even here the amount of flint is small. The low numbers and small sizes of the pieces may reflect one aspect of the activities taking place at these sites. It did not involve the deposition of large numbers of artefacts.

Different depositional activities can be seen in the three different areas of the trench at



89 The distribution of lithic artefacts in the excavation at Aikey Brae.



90 The lithic artefacts from Aikey Brae. 1: shattered piece of crystal quartz, drawn as refitted; 2: flint scraper; 3: flint scraper; 4: quartz hammerstone; 5: quartz hammerstone.

Aikey Brae. Material was not being deposited on the top of the rubble wall; it was only found in the disturbed zone at the southern end of the excavated area. This would suggest that these pieces were deposited either before or during the construction of the wall. Outside the monu-

ment, activities were concentrated next to the rubble wall. Four quartz hammerstones were recovered from this area. Inside the stone circle activity was concentrated towards the centre. This included the destruction of a fine piece of crystal quartz.

Table 16 Radiocarbon dates from the outer kerb trench at Aikey Brae.

Lab code	Sample material	Yrs BP	C ‰	Calibrated dates	
				1 sigma	2 sigma
AA-49296	Charred Pomoideae twig	2865 ± 50	-27.2%	1130–970 BC or 960–930 BC	1220–900 BC
AA-49297	Charred Pomoideae twig	2855 ± 45	-27.2%	1120–920 v	1210–1170 BC or 1160–890 BC

3.13.2 CHARCOAL

Petra Dark

Charcoal samples from the middle and lower filling of the outer kerb trench were identified as belonging to the family Pomoideae.

3.13.3 RADIOCARBON DATES

Both charcoal samples from the outer kerb trench were dated by radiocarbon (Table 16). Each sample consisted of a single twig fragment. They were sealed by a level of compact clay interpreted as part of the packing for the kerb. These dates were unexpectedly late, and their significance is discussed in Chapter 5.2.

3.14 DISCUSSION: THE EVOLUTION OF THE RECUMBENT STONE CIRCLE AT AIKEY BRAE

At Tomnaverie it seems as if the building of the recumbent stone circle was the culmination of a

complex sequence, and the same may have been true at Cothiemuir Wood. The monument at Aikey Brae was an altogether simpler structure and here there is little to show that the addition of a ring of standing stones brought any radical change: the circle was superimposed exactly on the earlier wall. One reason for taking this view is the evidence from Strichen and Berrybrae. Strichen had been badly damaged and it was not clear whether the stone circle was a secondary development, as it was at Aikey Brae. At Berrybrae, however, the sequence was reversed and there a walled enclosure of very similar character was added to an existing stone circle. There may have been a greater flexibility in the ways in which these monuments could develop in Buchan. These comparisons are taken further in the concluding discussion in Chapter 5.

Chapter 4

THE RESULTS OF FIELDWALKING AT TARLAND AND CASTLE FORBES

Tim Phillips

It remained to establish the place of these monuments in the prehistoric pattern of settlement. This question was investigated by two fieldwalking surveys, each of which focused on the area surrounding one of the excavated monuments. For logistic reasons it seemed most efficient to confine each project to a single large estate in order that problems of arranging access could be minimised and the maximum available time could be devoted to fieldwork. This was feasible as two of the sites, Tomnaverie and Cothiemuir Wood, were in rather different natural settings, although both were close to large tracts of arable land.

FIELD WALKING SURVEY IN THE HOWE OF CROMAR

4.1 BACKGROUND

Many flints, some carved stone balls, stone axes, 'cinerary urns' and bronze axes have been found in the Howe of Cromar over the last 200 years. Most of these finds are listed as coming from the parish of Tarland, but the exact findspots for most of this material are uncertain. Where the grid references for stone and flint axe finds are known, they tend to be around the edges of the Howe. A few other finds are quite well provenanced. Three cists have been found in the same area. A further example was discovered above the 300m contour to the north-west of Tomnaverie. This contained ashes and charcoal (NJ40NE3; this and subsequent references are to the National Monuments Record of Scotland). To the north-east of the site, on the 200m contour, there was a simple cist (NJ40NW6). The site of another stone circle of uncertain type, Waulkmill (NJ40SE4, Coles 1905), was located on the valley floor. All that remains of this site is a single standing stone. On the ridge on the eastern side of the Howe is

the site of a supposed stone circle, Brankholme Cottage (NJ40NE4), which was destroyed around 1847. In the centre of the Howe, not far from the shore of the drained loch, what may be part of a ring ditch is known from an aerial photograph taken in 1998 (NJ50SW32), but this may be the site of a souterrain. The evidence indicated a substantial prehistoric presence in the Howe of Cromar, but the exact nature and location of this activity was uncertain (illus 91).

4.2 THE SCOPE OF THE SURVEY

The intention was to sample as much as possible of the local topography around the Tomnaverie stone circle, apart from the position of a loch on the floor of the basin which was not drained until the 19th century. The area to the south of the stone circle was also under-represented, but this reflects the unproductive nature of the land, little of which was ploughed. Line walking at 20m intervals was the chosen method. This had already been successful in locating areas of prehistoric domestic activity in Strath Tay and around the shores of the Moray Firth (Bradley 2000, chapter 9; Phillips 2002, 272–94, 346–51). At this scale the presence or absence of prehistoric activity can be identified across a large area of land. Moreover, it has been shown that artefact types are recovered in the same proportions by walking at 20m intervals as in 5m line walking (Bradley 2000, 192). This method has the advantage that large areas can be covered quickly and efficiently by a small team. The material was bagged by field, and the location of individual finds was marked on sketch plans of the areas walked. By this means any discrete clusters of material were recognised at once and the locations of diagnostic artefacts were recorded. This level of detail could be achieved without any significant loss of time.

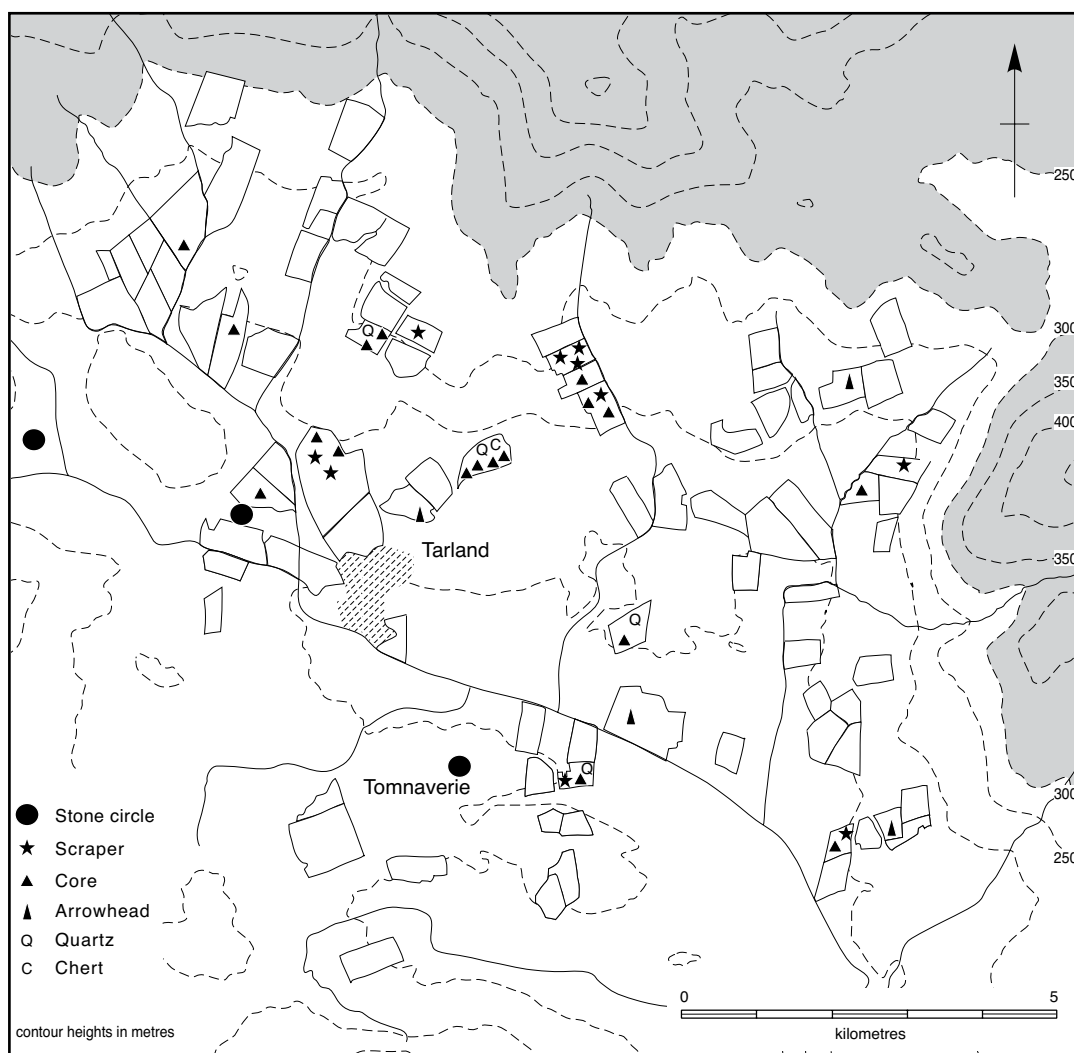


91 The extent of the Howe of Cromar fieldwalking survey in relation to the distribution of artefacts and monuments previously recorded and showing the concentrations of lithic material identified in the survey. 1: Titaboutie; 2: Tarland Lodge; 3: Knappieround; 4: Rowan Bank North; 5: Rowan Bank South; 6: Ranna.

4.3 THE ARTEFACT ASSEMBLAGE

Across an area which extended from the highest cultivated land in the Howe of Cromar at 350m OD down to the shoreline of the former loch 86 fields, comprising 516.5 hectares, were sampled. The work was undertaken in ploughed or seeded fields and on land under winter crop that had recently germinated. All these fields were well weathered, providing the best possible conditions of surface visibility. 492 lithic artefacts were recovered. They are listed in Tables 17–20.

The vast majority of the artefacts were flint. Where the cortex could be identified it was overwhelmingly from beach pebbles. This would indicate that the material was being brought in from outside, probably from sources on the east coast. The next largest component of the assemblage was struck quartz. Where the cortex could be identified this came mainly from pebble sources, but outcrops of this material were also being exploited. Natural pebble and outcrop quartz were found throughout the study area, indicating that local sources could



92 The distribution of diagnostic artefacts in the Howe of Cromar fieldwalking survey.

have been used. A few pieces of worked chert, quartzite and rock crystal were also found.

The flint assemblage comprised mainly secondary and inner worked pieces, and there was very little primary material. This is the expected pattern for a material being used at a distance from its source. Interestingly, none of the quartz showed signs of primary working. This may suggest the intensive use of quartz, or may simply be a reflection of the problems of distinguishing worked quartz from plough-struck pieces in cultivated fields (Saville and Ballin 2000).

Most of the artefacts showed the same flaking techniques as the material recovered from the

excavation of the stone circle. They included a partially made transverse arrowhead and four barbed and tanged arrowheads (illus 93, nos 5–8 and 13). These should be of approximately the same age as the stone circle. A small proportion of the artefacts may date from the Mesolithic or Earlier Neolithic periods. These included a few flint blades, blade cores (illus 93, nos 1, 2 and 4) and a core rejuvenation flake, but the quantity of this material was low, making up only 5% of the assemblage. The results of the survey suggest that in only one area was there a concentration of this type of material, and it appears to be mixed with later artefacts.

Table 17 The raw materials used in the lithic assemblage from the Howe of Cromar field survey.

Flint	384
Quartz	94
Chert	4
Quartzite	2
Rock Crystal	2
Total	486

Table 18 The composition of the lithic assemblage from the Howe of Cromar field survey.

Flakes	267
Blades & PBT*	23
Chunks	85
Chips	87
Rolled Flint Pebbles	5
Cores/Core Pieces	18
Gun Flint	1
Total	492

* Pieces possibly worked by blade technology

Table 19 The artefact assemblage from the Howe of Cromar field survey.

Retouched	19
Utilised	20
Scrapers	10
Blade Cores	3
Arrowheads	5

Table 20 The representation of worked flint and quartz from the Howe of Cromar field survey.

	Flint	Quartz
Primary	13	–
Secondary	134	38
Inner	237	56

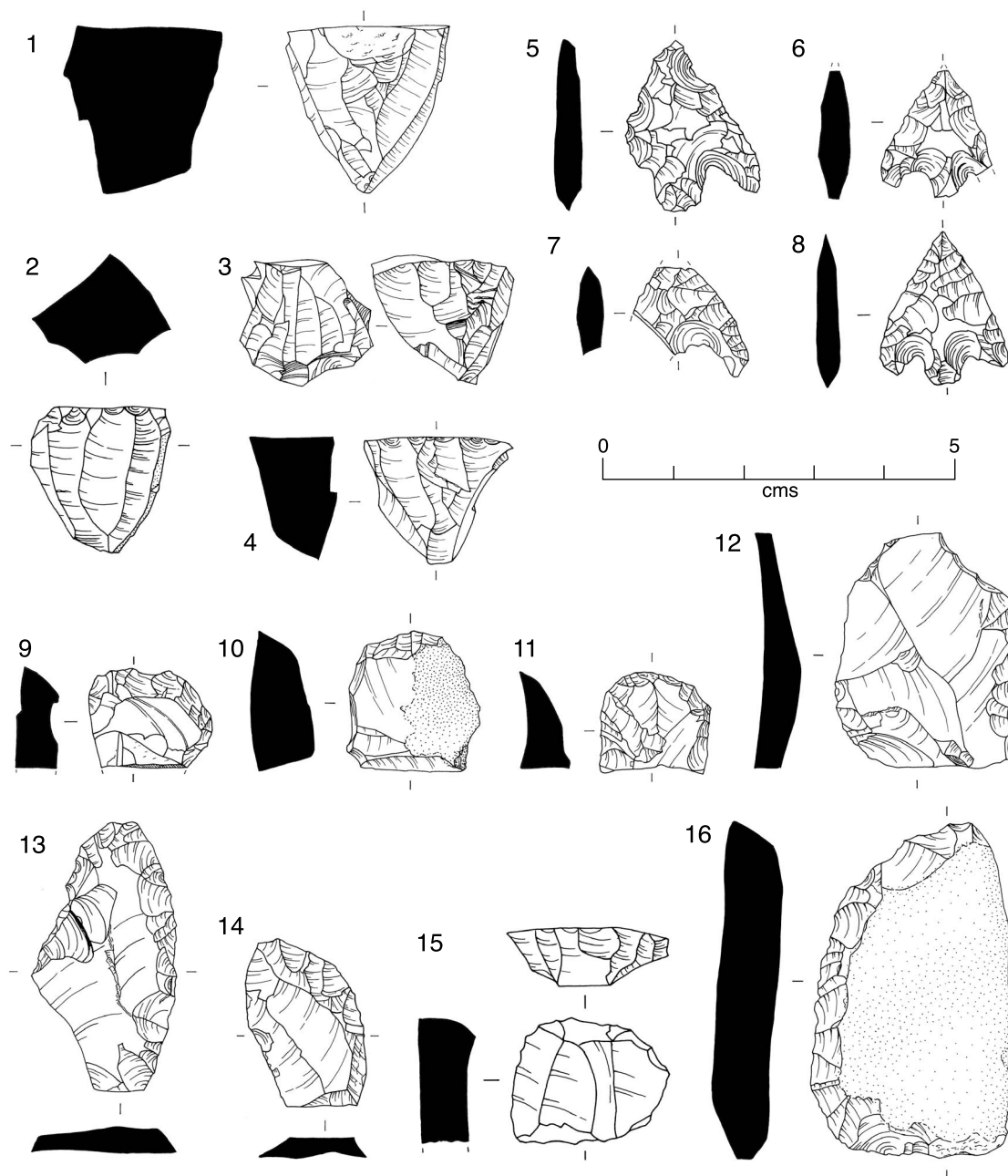
4.4 THE DISTRIBUTION OF SURFACE FINDS (ILLUS 92)

The higher densities of material extended across the fields north of the Tomnaverie stone circle, where they were found between the 150m and 300m contours. There was a smaller area with a similar density of artefacts close to the shoreline of the former loch. With that exception, the lower densities of finds came from the fields on or below the 150m contour, that is, the area around the loch and close to the Tomnaverie stone circle. The distributions of worked flint and quartz were similar to one another, although there was a higher proportion of flint in some of the fields on the higher ground. The fields beside the Waukmill stone circle produced few finds, but there was a higher density of lithic material in the fields rising up to the north of this site. However, it is uncertain whether this monument was a stone circle of the recumbent type. The area around the Brankholme Cottage site was not sampled.

The relative densities of flint and quartz are reflected by the distribution of retouched and utilised artefacts. The great majority of these were scattered on south-facing slopes between the 150m and 300m contours, to the north of the Tomnaverie stone circle and beyond the head of the loch. There was a single cluster of material by the eastern shore of the loch. These parts of the landscape included finds of cores and scrapers (illus 93, nos 9–12 and 14–16). Although most of the arrowheads were found in these areas, they tended to be isolated finds away from the main concentrations of material.

4.5 DETAILS OF THE MAIN CONCENTRATIONS

In six places distinct concentrations of artefacts were recognised (illus 91). One of these was close to the eastern shore of the loch, whilst the other five 'sites' were in a limited area north of the modern village of Tarland. This is the part of the landscape with the highest overall density of lithic material. These clusters were well defined and their extent was easy to map in the field. All were in sheltered locations and faced into the sun. Apart from one concentration, which may result from a knapping event, they could mark the positions of settlements. The Tomnaverie stone circle is visible from all but one of these places.



93 The lithic artefacts from the Howe of Cromar fieldwalking survey. 1: burnt flint core; 2: flint core; 3: burnt flint core; 4: flint core; 5: barbed and tanged arrowhead; 6: barbed and tanged arrowhead; 7: barbed and tanged arrowhead; 8: barbed and tanged arrowhead; 9: flint scraper; 10: flint scraper; 11: flint scraper; 12: flint scraper; 13: unfinished flint arrowhead or knife; 14: flint scraper; 15: flint scraper; 16: knife/side scraper.

1. *Titaboutie* (N^o 5033 0373)

This site is on the eastern side of the Howe of Cromar just above the old shoreline of the loch. The surface finds were concentrated on a spur of land split between two fields on the 150m contour. The

scatter included a scraper, a utilised flake with silica gloss, as well as a core rejuvenation flake which may date from the Mesolithic or Earlier Neolithic period. No material was found in the lower areas of the fields or on each side of the scatter.

2. *Tarland Lodge (Ný 4880 0543)*

This field lies back from the north side of the loch just below the 200m contour. The lithic material was concentrated on the break of slope in the centre of the field. This included one quartz, one chert and two flint cores. Only occasional finds were recovered from the area below.

3. *Knappieround (Ný 4822 0525)*

This site is located on a level spur about 1.5km south-west of the previous site. Field conditions allowed all the surface finds to be collected. The material consisted of 205 very small flint flakes (plus 16 similar pieces from 20m line walking). This was probably the site of a knapping floor where one or more events had taken place. The material was spread over an area measuring 13m by 30m.

4. *Rowan Bank North (Ný 4773 0565)*

A large concentration of material was found towards the top corner of this field, on the 200m contour. This included two flint cores and a scraper. The field is about 1km north of the drained loch, and the site was just below a spur to the north, which is covered by trees. It is probable that the concentration spreads into this area.

5. *Rowan Bank South (Ný 4790 0535)*

This site was lower down the same field as the previous concentration. It consisted of a small but discrete collection of artefacts including a scraper. It was located on a level area in the centre of an undulating slope.

6. *Ranna (Ný 4823 0644)*

This is the only site from which Tomnaverie cannot be seen. It is located in a sheltered valley on the 250m contour, about 2km north of the drained loch. The artefacts were concentrated at the lower end of two fields on each side of a stream. Among the lithic artefacts were a high proportion of blades and a blade core, suggesting that there may be a Mesolithic or Earlier Neolithic component to this site, although these finds were probably mixed with later material.

4.6 DISCUSSION

Allowing for the limitations imposed by the availability of cultivated land in the area around the

stone circle, the concentrations of lithic material lie between 1.8km and 2.9km away. Although Tomnaverie is highly visible from most of the scatters, topographically they would have been separated from the monument by the loch or by areas of low marshy land. The stone circle's apparent isolation may be misleading as some parts of the study area have more cultivated fields than others, but this is unlikely because the stone circle is located in the zone with the lowest density of artefacts. Of the 86 fields sampled in the survey, only eight were completely devoid of lithic material. Five of these are within a short distance of Tomnaverie. The same would not apply to the other stone settings in the study area. They were destroyed many years ago and nothing is known of their forms or date.

Tomnaverie overlooks large parts of the Howe of Cromar and commands a view in all directions. However, it is also located towards the limits of the fertile soil on the northern side of the basin. The land to the south is much poorer. In this sense the stone circle is not located in the centre but on a natural boundary. The results of field survey strongly suggest that it was also at the edge of the earlier prehistoric landscape. It could be seen from a number of settlement sites, and yet it was also detached.

FIELD WALKING SURVEY ON THE
CASTLE FORBES ESTATE

4.7 BACKGROUND

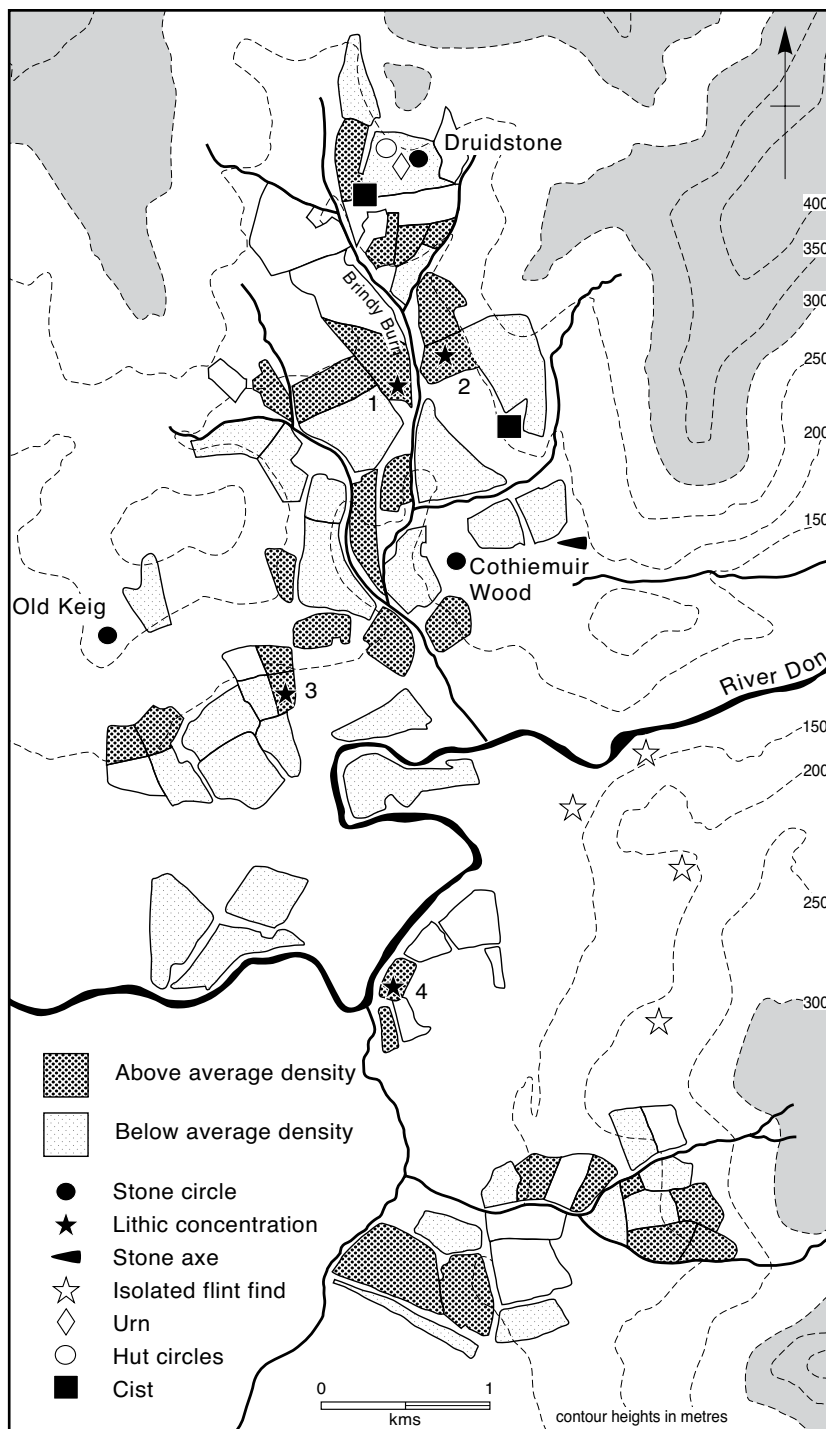
Again it seemed important to relate the Cothiemuir Wood stone circle to the wider pattern of settlement. The same applies to its neighbour at Druidstone. Too few cultivated fields were available to extend the analysis to Old Keig. Apart from the stone circles, no other prehistoric monuments survive within the immediate vicinity. Two cists (NJ62SW16 and NJ62SW142) were found during land improvement to the north of Cothiemuir Wood. They were located on the top of the ridge on the eastern side of a stream. Urns containing charred bones (NJ62SW14 and NJ62SW15) were discovered in the immediate vicinity of the Druidstone recumbent stone circle. Flint arrowheads of unknown type (NJ61NW5) were found on the west-facing valley side to the south of Cothiemuir Wood, and a stone axe

(NJ61NW3) has been recorded on the rising ground to the east. A stone ball and a carved stone ball (NJ51NW19) reportedly come from Keig parish, but their exact find spots are unknown. All these artefacts were found in the 19th century. The exact nature of prehistoric activity in this area was uncertain. The stone circles, cists and chance finds indicated some form of occupation, but no systematic study had taken place (illus 94).

4.8 THE SCOPE OF THE SURVEY

The project used the same method as the Tomnaverie field survey, but with one important difference. Some of the winter crop around Cothiemuir Wood had grown higher than was desirable, but the tractor tracks that allowed access for spraying and feeding the crop were spaced at 20m intervals. Individual tracks allowed about 0.5m width of visibility. Where the winter crop was judged to be too high, both the tractor tracks were walked, allowing a corridor one metre wide to be sampled. Eight fields were walked by this method. The results were similar to those from the areas investigated by more conventional methods.

74 fields, comprising 619.9 hectares, were sampled. They included the available land immediately around the Cothiemuir Wood stone circle and the valley of the Brindy Burn draining down from the north. The study area extended up to the 275m contour and included the area around the Druidstone recumbent stone circle. To the west, a series of fields on the slope below the Old Keig stone circle were walked. The sample reached from the banks of the Don at 125m up to the 250m contour, but the area immediately around this monument



94 The extent of the Castle Forbes fieldwalking survey in relation to the distribution of artefacts and monuments previously recorded and showing the concentrations of lithic material identified in the survey. 1: Brindy West; 2: Brindy East; 3: Airlie; 4: Heughhead.

could not be sampled because the land was under pasture. To the south, a block of fields were also walked as far as the 225m contour.

4.9 THE ARTEFACT ASSEMBLAGE

241 lithic artefacts were recovered. They are listed in Tables 21–4.

Roughly equal numbers of both flint and quartz artefacts were recovered. Most of the identifiable

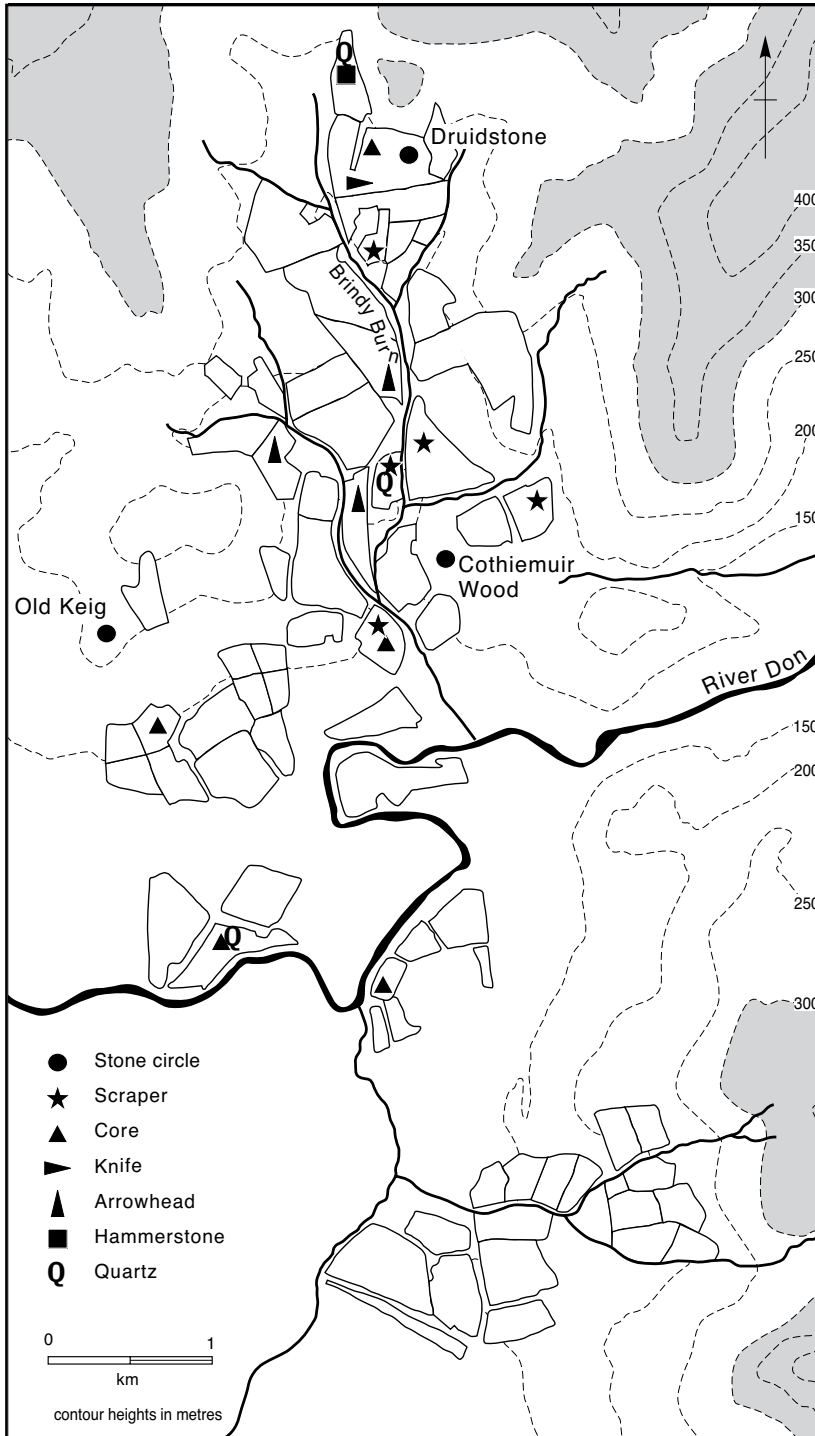
cortex on the flints was from beach pebbles, and pebble and outcrop cortex could both be recognised on the quartz. As at Tomnaverie, it would appear that flint was being brought from the coast, whilst local sources of quartz were being exploited.

Natural pebble and outcrop quartz occurs on the middle slopes of the study area, but fewer were found in fields nearer to the River Don. One piece of worked quartzite and a piece of flaked quartz crystal were also recovered.

The material had been worked in a similar way to the finds from the Howe of Cromar. There were few primary pieces, and the assemblage consisted mainly of secondary and inner material of both flint and quartz. The intensive working of flint is probably a reflection of the distance from the raw material sources. In the case of the quartz this may represent intensive exploitation, or it could result from the difficulty of identifying primary flakes in cultivated fields.

Natural quartz crystals of varying sizes were found in one part of the study area. They were noticed in the fields around the stone circle and along the Brindy Burn to the north. None was seen in the area to the south and the west. A particularly fine piece of crystal, which had been purposefully placed, was recovered from the excavation at the Cothiemuir Wood stone circle. The results of field survey suggest that it was locally derived.

Most of the worked flint showed similar flaking techniques to the material found in the Tomnaverie survey and excavation, as well as the two pieces recovered at the Cothiemuir Wood stone circle. It included a barbed and tanged arrowhead and a plano-convex knife (illus 96, nos 3 and 5) which would be of similar date to the stone circles (Clark 1932). A small number of artefacts may date from



95 The distribution of diagnostic artefacts in the Castle Forbes fieldwalking survey.

THE RESULTS OF FIELDWALKING AT TARLAND AND CASTLE FORBES

Table 21 The raw materials used in the lithic assemblage from the Castle Forbes field survey.

Flint	116
Quartz	123
Quartzite	1
Quartz Crystal	1
Total	241

Table 22 The composition of the lithic assemblage from the Castle Forbes field survey.

Flakes	189
Blades & PBT*	16
Chunks	19
Chips	11
Cores	5
Quartz Hammerstone	1
Total	241

*PBT: Pieces possibly worked by blade technology

Table 23 The artefact assemblage from the Castle Forbes field survey.

Retouched	10
Utilised	7
Scrapers	5
Arrowheads	3
Plano-convex knife	1

Table 24 The representation of worked flint and quartz from the Castle Forbes field survey.

	Flint	Quartz
Primary	6	2
Secondary	60	41
Inner	50	80

the Earlier Neolithic period. Among them were a few blades, as well as two leaf-shaped arrowheads, one used and one partially made (illus 96, no 4). These arrowheads were isolated finds at a distance from the major densities of material.

Another group of artefacts recovered from the first terrace of the River Don showed a different flaking technique. These pieces had been roughly, almost expediently, worked and may date from the later prehistoric period. However, a settlement with seven hut circles probably dating to this time is recorded close to the Druidstone monument (NJ62SW6). No artefacts were found within the immediate vicinity of that site.

4.10 THE DISTRIBUTION OF SURFACE FINDS (ILLUS 95)

The higher densities of material were found in the fields on the lower and middle slopes between the 150m and 250m contours. In the valley of the Brindy Burn these tended to be the areas just above the stream. The one exception was a collection of lithic artefacts found on the first terrace of the River Don just below the 125m contour, but, as we have seen, this material was different from the rest of the assemblage recovered by fieldwalking. This was the only concentration of surface finds in any of the fields sampled along the banks of the river. The fields closest to the Cothiemuir Wood stone circle produced a low density of surface finds, although a general spread of worked material was recognised on the sloping ground 500m south of the monument. No artefacts were identified around the Druidstone stone circle. Over a ridge to the east of this site, where the land slopes down towards the Brindy Burn, there was a high concentration of material, but this area is visually and topographically separated from the monument. Similarly, there was very little material recovered from the areas around the locations of the two destroyed cists. The plano-convex knife was an isolated find from within 20m of the position of the ploughed-out cist above Druidstone. It may originally have come from a burial. Across the study area the distributions of worked flint and quartz were similar to one another.

The majority of the retouched and utilised pieces reflect the areas of highest artefact densities. They were scattered on the lower and middle

slopes between the 150m and 250m contours. These finds include cores and scrapers (illus 96, nos 2 and 6). The one exception is a flint core found on the first terrace of the Don. The leaf-shaped arrowheads were isolated finds, having little association with other lithic material. By contrast, the barbed and tanged arrowhead came from amongst a discrete cluster of material above Brindy Burn.

4.11 DETAILS OF THE MAIN CONCENTRATIONS

Four distinct concentrations of artefacts were recognised (illus 94). Three of these were on middle slopes to the north and south-west of the Cothiemuir stone circle, in the part of the landscape with the highest overall density of surface finds. All three of these locations faced into the sun. The fourth was an isolated, but distinct, group of artefacts beside the River Don to the south of Cothiemuir Wood. These clusters were well-defined and formed very noticeable concentrations in the field. Moreover, most of the land around them was walked so as to demonstrate their distinctive character. The Cothiemuir Wood stone circle is visible from all four 'sites', Old Keig from two of them, but Druidstone cannot be seen from any of these locations.

1. *Brindy West (Nř 6135 2083)*

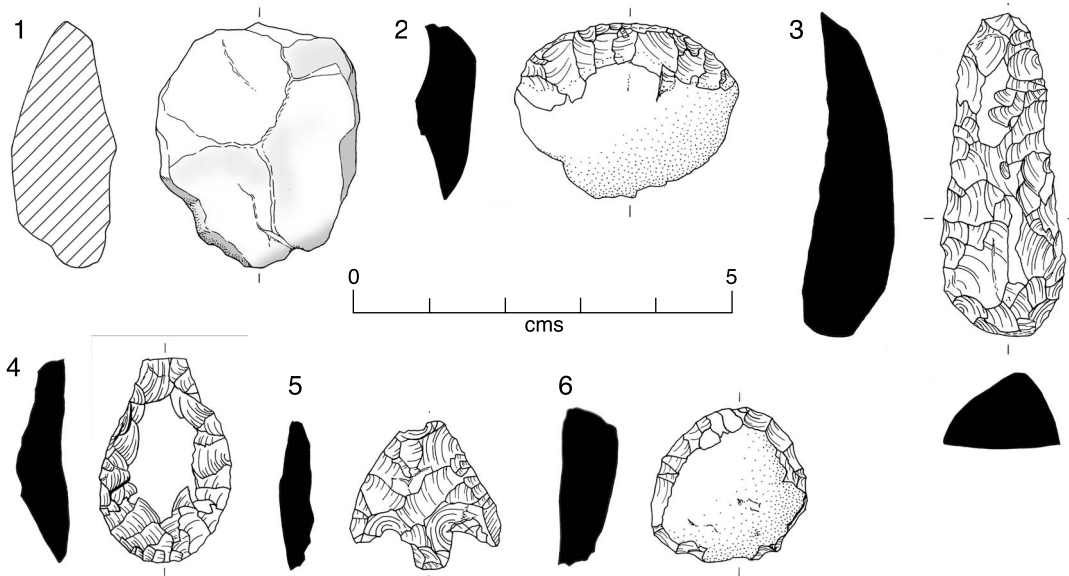
This site lies on the 175m contour about 1.25km north of the stone circle at Cothiemuir Wood. It is on a gentle slope above the Brindy Burn and overlooks what is now a drained wetland. The surface finds occur at the point where the stream valley opens out towards the River Don to the south. The scatter included a barbed and tanged arrowhead.

2. *Brindy East (Nř 6163 2100)*

This scatter is directly opposite the Brindy West site on the other side of the Burn. The concentration of material occupies a similar location. The assemblage included a large utilised flake covered in silica gloss.

3. *Airlie (Nř 6070 1915)*

This site is located just under 2km south-west of the Cothiemuir Wood monument, below Old Keig. A distinct concentration of artefacts was recognised on the 150m contour, on the edge of a spur. The distribution of artefacts may extend into the field to the east which was not ploughed. The location is south-facing and overlooks the flood plain of the Don. The artefacts included a flint core.



96 The lithic artefacts from the Castle Forbes fieldwalking survey. 1: quartz scraper; 2: flint scraper; 3: plano-convex knife; 4: unfinished leaf-shaped arrowhead; 5: barbed and tanged arrowhead; 6: burnt flint scraper.

4. *Heughhead (Nř 6170 1720)*

This concentration of material was found in a sheltered location beside the River Don, about 2.5km south of Cothiemuir Wood. The assemblage was characterised by an expedient technology and included a roughly worked core.

4.12 DISCUSSION

As at Tomnaverie, there were limits to the areas of land available for survey. Even so, the concentrations of material lie between 1.25km and 2.5km away from the stone circle in Cothiemuir Wood. Moreover, very little material was recovered from the fields closest to the site. The pollen report from the Cothiemuir excavation indicates a damp and marshy local environment with sedges and no evidence for cultivation. This area was 'improved' for agriculture in the nineteenth century when it was drained. The drainage ditches around the site can be 2m or more deep which is an indication of how wet it was in the past. It suggests that the settlement sites identified by fieldwalking were separated from the monument by an area of bog or

marshland. The same applies to the stone circle at Druidstone. The higher densities of material were both visually and topographically separate from the monument. The two known cist burials were sited in prominent locations on the top of a ridge but, whilst their positions could be seen from the lithic concentrations, they were also detached.

The Cothiemuir Wood stone circle overlooks a large part of the floodplain of the Don. It is located at a critical point where the river flows eastward into a narrow gorge and the tributary Brindy Burn joins it from the north. In that sense the site seems to be on the edge of the landscape. To the east the land rises steeply to the foothills of Bennachie. This is a natural topographical boundary and also the point where two natural routeways meet: one going north and the other eastward. The results of field survey suggest that the monument was quite isolated, not just at this wider level but in relation to the micro-topography. Despite the apparent differences between the locations of the Tomnaverie and Cothiemuir Wood stone circles, the results of field survey suggest that there were important similarities.

Chapter 5

THE IMPLICATIONS OF THE PROJECT

Richard Bradley

5.1 FEATURES SHARED BETWEEN THE EXCAVATED SITES

One of the starting points for this study was Burl's suggestion that there was considerable regional variation among the recumbent stone circles of north-east Scotland and that it could be explained by differences in the adoption of this kind of monument over time (Burl 2000, chapter 12). In his view the classic examples were to be found on Donside and later variants of the form on Deeside and in Buchan. Although the only radiocarbon dates from primary contexts come from Tomnaverie, his hypothesis does not seem to be supported by the results of this project. In fact all three of the sites described here have a number of structural features in common. The cairns at Tomnaverie and Cothiemuir Wood have almost the same external diameter as the walled enclosure at Aikey Brae and in two cases there is also evidence for the careful selection of red and grey or white stones. Again each structure was replaced by a recumbent stone circle, but at Aikey Brae this was superimposed on the earlier wall whilst at the other sites it enclosed the existing monument.

There are also more subtle relationships to consider. It may be that each of these monuments had a 'front' and a 'back': a possibility significantly increased by the evidence from a number of monuments near Alford which seem to have been approached by a causeway leading into the stone circle from the north east (*ibid*, 225). It was on that side of the monument at Tomnaverie that Beaker sherds had been deposited at the foot of the kerb, and a concentration of pieces of quartz occupied the equivalent position at Cothiemuir Wood.

These effects are enhanced by the local topography. The circle at Tomnaverie cannot be seen from large parts of the hill. It only becomes visible close to the highest point. On nearing the

summit from the north east, the flankers are the first features to come into view. Then the other monoliths appear and, finally, the recumbent stone. In the background the landscape opens out, with a far horizon framed between the tallest pillars. The view includes the summit of Lochnagar. A similar effect is created on all three sites. In each case the immediate foreground is concealed from view, but a vast expanse of middle ground can be seen beyond the monument. The vista emphasises areas some distance away from the sites themselves and also frames a segment of the sky.

When the monuments were intact, other features would have enhanced these visual effects. Someone standing on the north-east side of these monuments would not be able to perceive the subtle variations in the height and spacing of the monoliths. To some extent these would be obscured by the effects of perspective so that the upright stones might look as if they were of about the same heights as one another. This arrangement would emphasise the circularity of the monument as it appeared to an outside observer. On entering the circle, however, the grading and spacing of the monoliths would have had a different effect, for the internal area might seem bigger than is actually the case. The distinction between the flankers and the two 'halves' of these circles could also be disorientating, and that would help to focus attention on the recumbent stone where both arcs of upright stones converged.

At Tomnaverie these effects were made still more explicit by the radial divisions that were visible in the surface of the monument. They cluster in two symmetrical groups towards the north-east side of the cairn and draw the eye to the centre of the site where so much burning took place. From there they open out again and lead towards the pillars on either side of the recumbent stone. In passing across the monument from 'front' to 'back', the eye

is drawn first to the summit of the hill and then to the view beyond the monument itself.

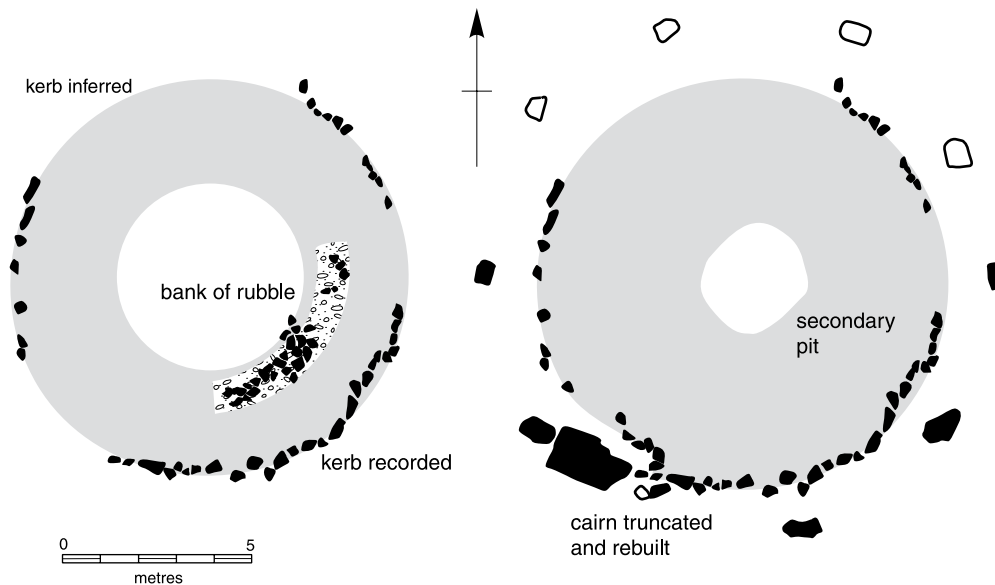
5.2 THE SEQUENCE IN THE NORTH-EAST

The results of this fieldwork suggested that the monuments in different parts of north-east Scotland may have more in common than many writers had suggested, but are these findings consistent with our knowledge of other sites?

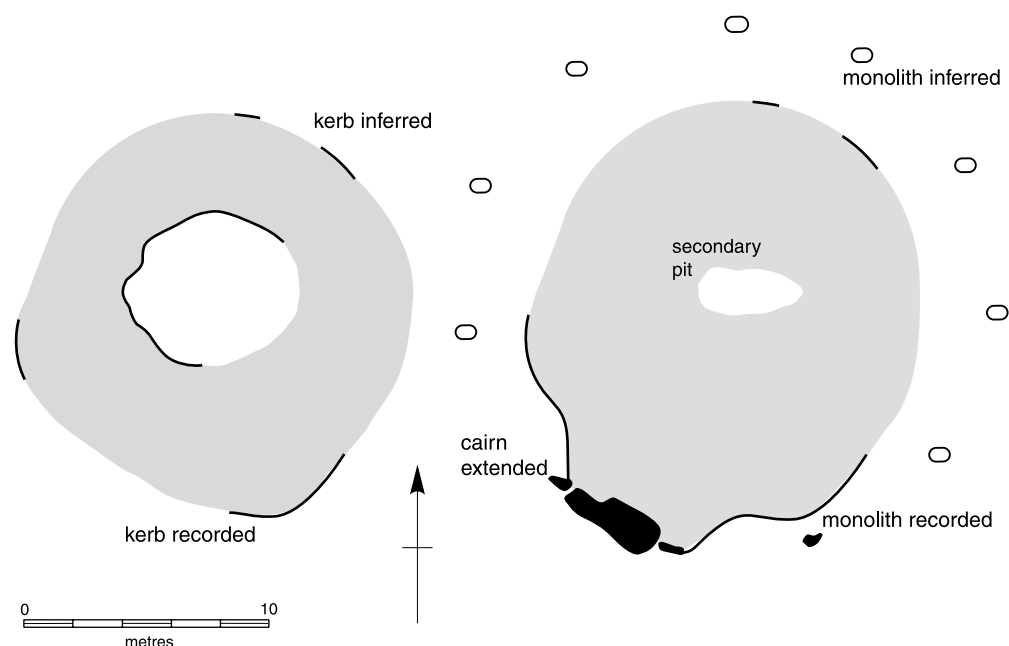
We must consider their sequence and chronology. In one respect, all the projects produced similar results. Two sites began as circular enclosures and the third as a rubble platform. In every case the stone circle was a later development. This might seem at variance with the evidence from other excavations. At Berrybrae, Burl concluded that the stone circle was earlier than a rubble wall like that at Aikey Brae (*ibid*, 220). There is no reason to question this, but he also showed that the circle itself had been built on ‘a levelled clay and rubble platform’ (Aubrey Burl, pers comm). It is worth considering whether that might have been equivalent to the first structure at Tomnaverie. There was a small ring cairn inside the circle at Berrybrae but its chronological position is not clear, although it was damaged when the wall was built.

Again at Loanhead of Daviot, the excavator argued that the stone circle was an early development (Kilbride-Jones 1935). The recumbent was directly linked to a setting of slabs which was overlain by the edge of a low ring cairn. The sequence is not as straightforward as that suggests, for the circle and the cairn are not concentric with one another and the recumbent and flankers seem to cut into its perimeter. The nearest section of kerb was built in a quite different style from the rest. Kilbride-Jones’s sequence could be reversed, in which case the stone circle would be later than the cairn. When the south-west sector of the circle was erected it truncated the edge of the existing monument and, as a result, part of the kerb was reconstructed (illus 97). The development of the site could have been similar to that at Tomnaverie.

A similar development may have taken place at Old Keig where a still more massive stone circle enclosed the remains of a ring cairn. Childe published the excavation in two successive reports and it is not easy to integrate their findings (Childe 1933 and 1934). The earlier article suggests that the ring cairn was a roughly circular structure, with a surviving section of its outer kerb running parallel to the recumbent. The second paper suggests that the same kerb changed direction to join each of the flankers in the way that happened



97 An interpretation of the structural sequence at Loanhead of Daviot, showing the original ring cairn on the left and, on the right, its transformation into a recumbent stone circle. Information from Kilbride-Jones (1935).



98 An interpretation of the structural sequence at Old Keig, showing the original ring cairn on the left and, on the right, its transformation into a recumbent stone circle. Information from Childe (1933 and 1934).

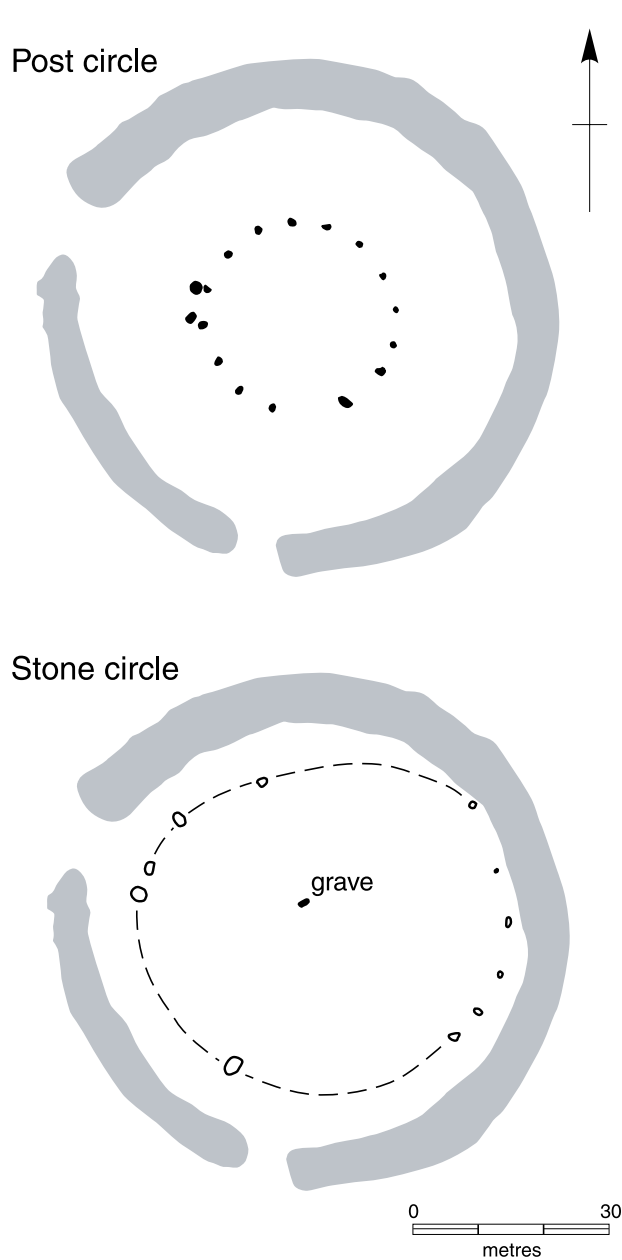
at Tomnaverie. Successive plans of the excavation depict two quite different arrangements. Again the cairn may have been extended in a later phase (illus 98).

These arguments run counter to the excavators' own interpretations of Old Keig and Loanhead of Daviot, which refer to the existence of hard trampled layers beneath the cairns on both sites. They thought that these might have formed during the transport and erection of the monoliths. On the other hand, comparison with the evidence from Cothiemuir Wood suggests that such deposits may result from podsolisation: a natural process which was little understood when work at these monuments took place.

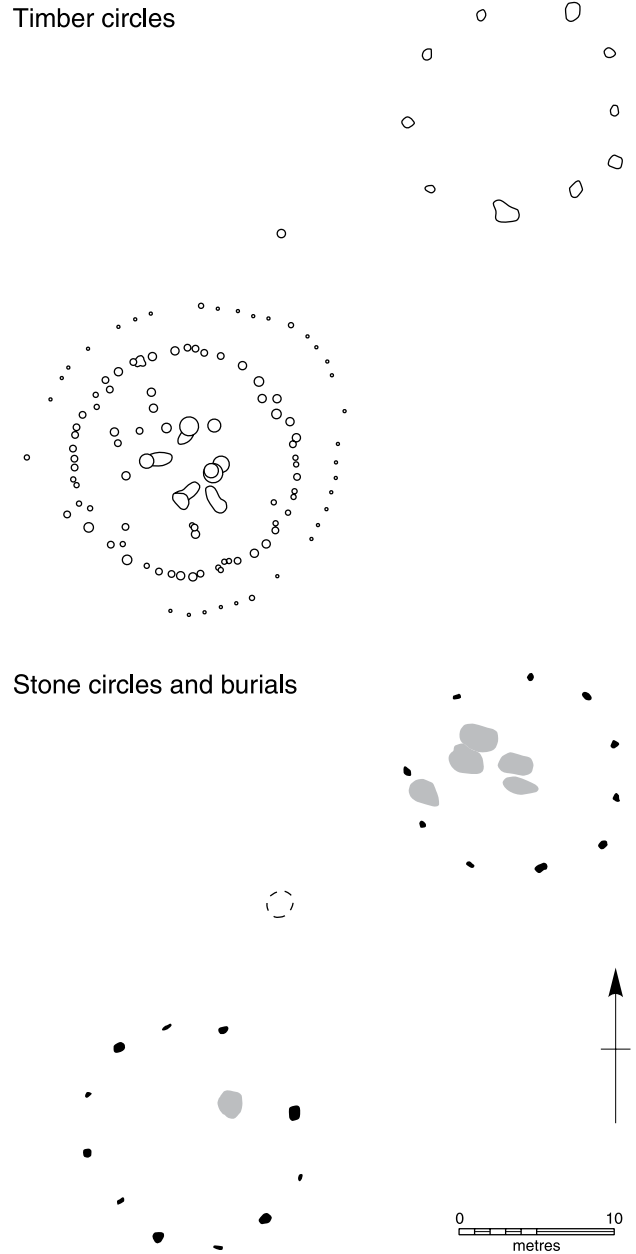
A second question concerns the dating of these developments. The platform at Tomnaverie has a *terminus post quem* in the mid to late third millennium BC and the stone circle at Berrybrae a *terminus ante quem* between about 1900 and 1550 BC (Burl 2000, 376). Beaker pottery was associated with construction of the platform at Tomnaverie and with the enclosure wall at Berrybrae (*ibid*, 220). If my interpretation of the sequence at Loanhead of Daviot is correct, Beaker pottery may be associated with the building of the recumbent stone circle there.

The dates from Aikey Brae present a problem. They are much later than those associated with a similar structure at Berrybrae and compare better with dates for the re-use of Tomnaverie. It seems unlikely that these samples were intrusive, but it was noted that only some of the kerbstones at Aikey Brae were set in a trench and that others had rested on the ground surface. It may be that one section of the kerb had been reset during a subsequent phase and this may account for the radiocarbon dates associated with this part of the monument. A cremation at Strichen had a similar date (*ibid*, 376), and, to judge from the associated pottery, Old Keig and Loanhead of Daviot could have been reused during the same period (Kilbride-Jones 1935; Childe 1933 and 1934; Sheridan 2003).

Having said that, it seems possible that stone circles were still being built in the Later Bronze Age. One example may be a stone setting orientated toward the south-west at Croft Moraig in Strath Tay (Bradley and Sheridan in prep; Piggott and Simpson 1971). The distinctive stone circles of south-west Ireland also belong to that period (O'Brien 2002) and these have sometimes been compared with sites in Aberdeenshire (Burl 2000, 225), although the similarities between these two groups can be overstated. These points need more



99 The structural sequence at Balfarg according to Mercer (1981).



100 The structural sequence at Machrie Moor according to Haggarty (1991).

investigation in the future. For the moment, the exact date of Aiky Brae must remain in question.

5.3 THE SEQUENCE IN ITS WIDER CONTEXT

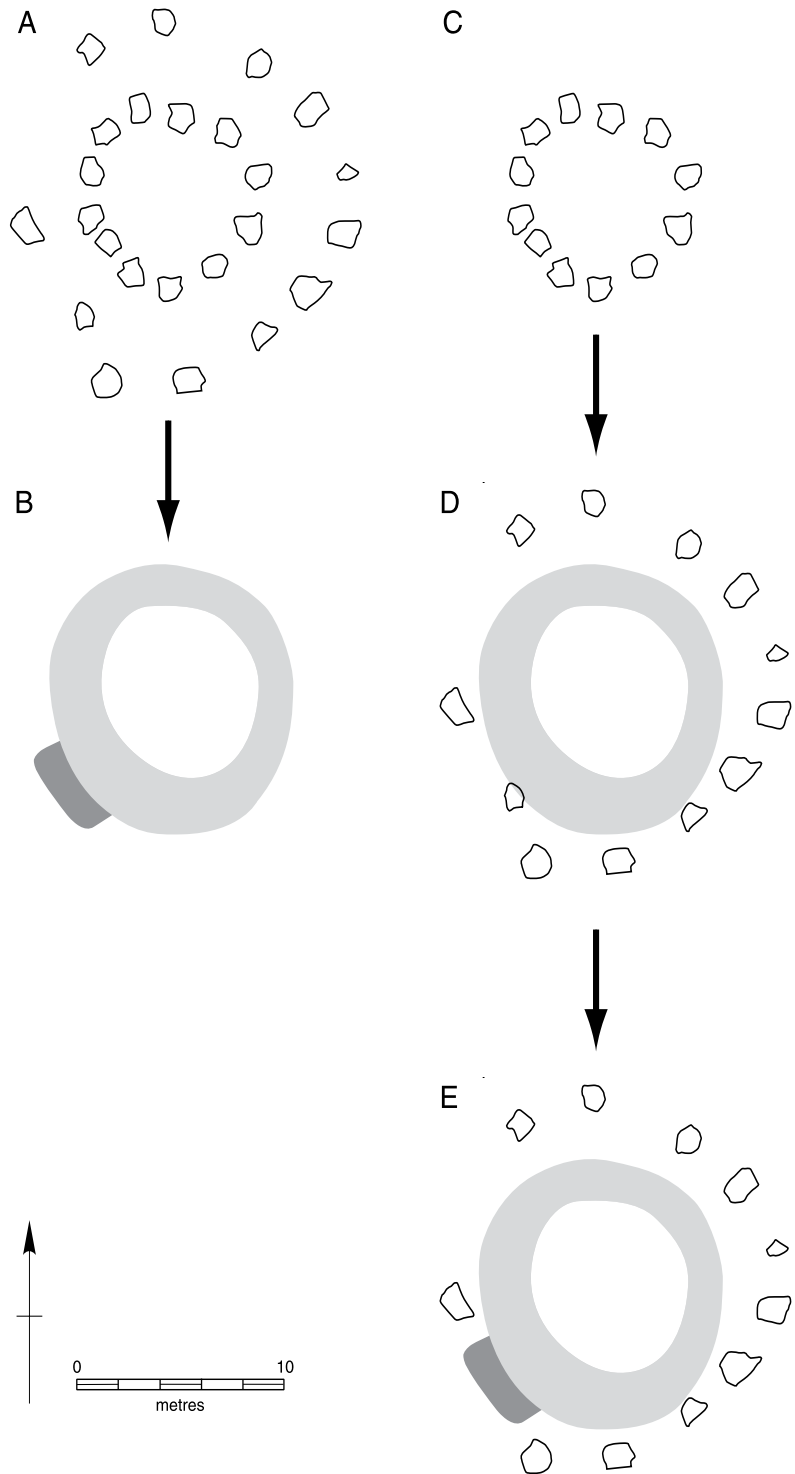
Recumbent stone circles share some attributes with other kinds of monument. This is not the place to consider them at length, but it is worth

pointing out that the sequence described here is consistent with what is known from other parts of Scotland and northern England. This account is restricted to a few well excavated sites. Apart from the presence of the recumbent, the stone circles of north-east Scotland have a number of features in common. They are often graded by height and orientated between the south and the west. In many cases the monoliths enclose a ring cairn.

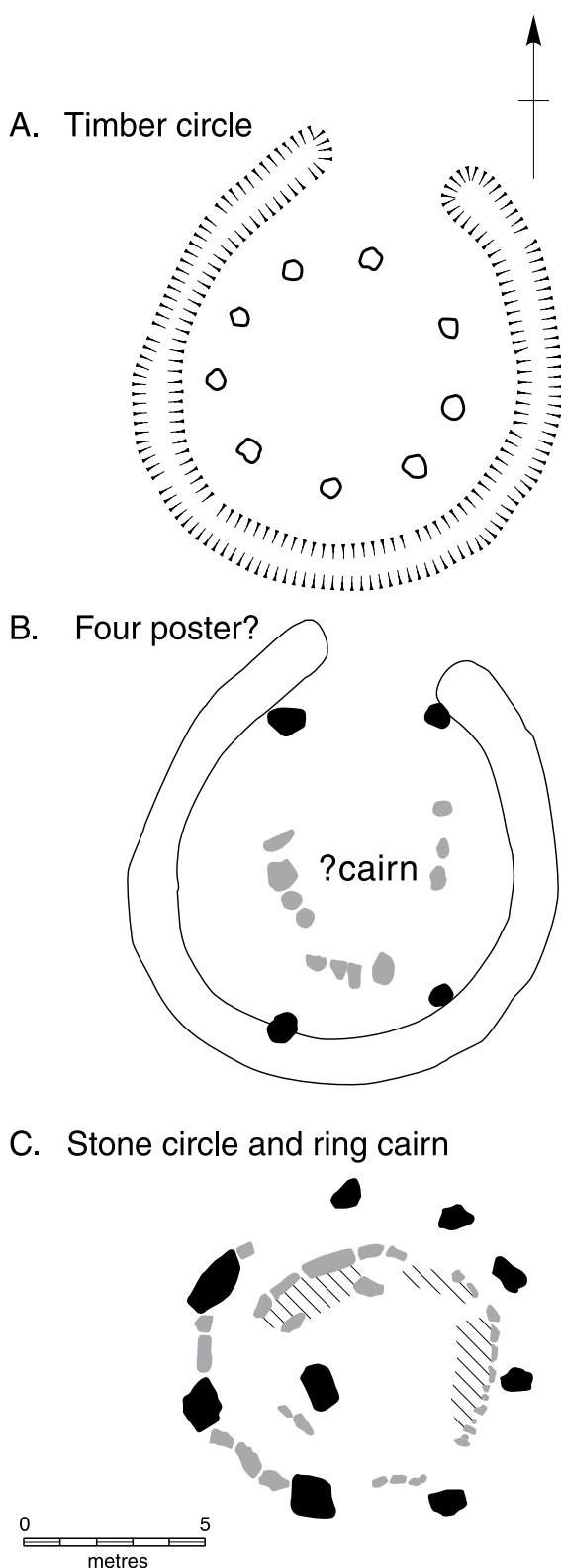
Some of these elements were already important during the Late Neolithic period. The timber setting inside the henge at Balfarg seems to have been graded in height towards the west (Mercer 1981), and two similar structures on Machrie Moor had much the same orientation. This may be significant as all three were replaced by stone circles (Haggarty 1991). Like its predecessor, the example at Balfarg increased in height towards the west (illus 99), and at Machrie Moor the stone circles were built side by side, perpetuating the axis of their wooden predecessors (illus 100). This alignment extended from the tallest stone in one circle to the highest monolith in its neighbour. At Balfarg and Machrie Moor the change may run in parallel with that between Grooved Ware and Beakers.

Some of the same elements were recognised during excavations at Oddendale in Cumbria (Turnbull 1997). The excavator suggested that there were two main periods of activity on this site: first, a double circle of upright posts and then a ring cairn whose position overlay the inner setting of timbers. In a later phase the cairn was supplemented by an approximately rectangular platform to its south-west, a feature which Turnbull compared with the recumbent stone in the Scottish monuments. The timber setting provided radiocarbon dates between about 2850 and 2350 BC, but these were based on samples of oak charcoal and may be rather too early. The stone phase, on the other hand, was loosely associated with Beaker pottery, and a burial in the centre of the ring cairn contained a few sherds of similar character.

These developments are broadly comparable with those described so far, although it is possible to suggest an alternative reading of this evidence (illus 101). The inner timber circle was precisely circular, whilst the outer



101 Alternative interpretations of the structural sequence at Oddendale, based on information from Turnbull (1997). A and B summarise the excavator's sequence: two circles of posts are replaced by a ring cairn (lighter tone) with an external rubble platform (darker tone). C, D and E present a different reading of the same evidence, in which a single circle of posts is replaced by a ring cairn with an external timber setting. The rubble platform is added during a subsequent phase.



102 The structural sequence at Montcreiffe according to Stewart (1985).

setting was flattened towards the south-west where the spacing of the uprights was uneven. Although the infilled sockets of the smaller circle were overlain by the cairn, there was no stratigraphic relationship between that structure and the remaining post-holes. The sequence could be interpreted in a different way. At Oddendale a free-standing timber circle might have been replaced by a cairn enclosed within a ring of upright posts. That outer timber setting was flattened on the south-west side of the monument as if to anticipate the position of the platform that was to be built there. If so, the unusual monument at Oddendale would recall the configuration of recumbent stone circles not only in the distinctive form of the stone circle setting but also in possessing an outer ring of uprights. Certain difficulties still remain, for the radiocarbon dates from both the rings are identical to one another and the sockets had clearly held posts rather than monoliths. The latter arrangement may seem rather unusual, but it is also found on an Early Bronze Age monument at Brenig 44 in North Wales, with a construction date of about 2170–1880 BC (Lynch 1993, chapter 11).

At the Scottish site of Moncreiffe events followed yet another course (Stewart 1985). In this case the orientation of the monument changed during its period of use (illus 102). The original construction was a henge with its entrance to the north. It may have enclosed a ring of posts, although this cannot be proved. It may have been replaced by a setting of monoliths associated with a small cairn. The monument maintained the alignment of its predecessor and could be interpreted as an elongated 'four poster'. It was superseded by a stone circle with an internal ring cairn. In contrast to the earlier structures, this was graded in height towards the south-west. The uprights in that sector were linked by horizontal blocks which overlay sherds of Beaker pottery.

At Oddendale it is not clear whether the ring cairn was the last development on the site, but at Moncreiffe a similar structure was attributed to the same phase as a stone circle, whose monoliths increased in height towards the south-west. The same combination occurs among the Clava Cairns where two of the excavated examples, Newton of Petty and Balnuaran of Clava, have radiocarbon dates between about 2350 and 1750 BC (Bradley 2000, 160–1). Like Tomnaverie, the monument at

Clava had a graded kerb, which is a feature that it shares with the ring cairn at Raigmore, which dates from about 2300–1800 BC (Simpson 1996), and Sketewan, whose date falls between 2050 and 1850 BC (Mercer and Midgley 1997). Other ring cairns may be rather earlier. For example, one structure at Balfarg was built on a surface associated with Impressed Ware (Barclay and Russell-White 1993, 110–19). This is particularly relevant as its kerbs were composed of lengths of red and white stone. It seems as if some of these architectural devices were extremely long lived.

That may even explain the later re-use of these sites. It also applies to a number of the Clava Cairns, and to monuments in other parts of Scotland. This is demonstrated not only by the radiocarbon dates from the circles at Balnuaran of Clava and Newton of Petty, but also by those from Balbirnie, Temple Wood, Strichen, Castle Fraser, Fullerton and Old Keig (Burl 2000, 376–7; Sheridan 2003).

5.4 THE NATURE OF RECUMBENT STONE CIRCLES

When Burl wrote about recumbent stone circles in 1970, he drew attention to a feature that has assumed a growing importance ever since: ‘Altogether, of the fourteen sites for which there are excavation accounts, eleven had signs of fire’ (Burl 1970, 72). Since then, that total has increased with excavation at Strichen, Tomnaverie and Cothiemuir Wood. Burl also drew attention to the accounts of cremated bones from these monuments. In such cases, it is difficult to decide to which phases they belong. Nonetheless it is interesting that both Childe (1933 and 1934) and Kilbride-Jones (1935) considered that they had found the remains of pyres. It may be unwise to extend this interpretation too far as the direct dating of cremated bones from a variety of sites in Scotland suggests that this way of treating the dead may have developed after recumbent stone circles were first built (Sheridan 2003). The use of some of these sites as pyres could have been a secondary development, and at Loanhead of Daviot an enclosed cremation cemetery developed alongside the recumbent stone circle (Kilbride-Jones 1936).

In any case Burl was careful to point out that not all the deposits of burnt material were associated with cremated bones. The finds of human remains

were generally confined to the central area of each site. This was probably the case at Tomnaverie where the first stone structure overlay a deposit of burnt soil; that may also have happened at Old Keig, although most of the burnt deposits there were probably later in date. Much clearer evidence comes from Loanhead of Daviot where a similar deposit of burnt soil and cremated bone was sealed beneath the inner margin of the ring cairn in a position not unlike that of the higher magnetic values at Cothiemuir Wood. There are two points to make here. Since many monuments were open at the centre, not all the burnt material may belong to a primary phase. This is clearly shown by the dates from Tomnaverie. At the same time, it is not necessary to suppose that all the burnt material was associated with cremations. As Lynch has pointed out, ring cairns in other regions of Britain and Ireland are associated with deposits of charcoal and in some cases bones are absent. At the Brenig in North Wales, she could show that these deposits contained different species of wood from the cremation burials on the same site (Lynch 1993, 136).

Some pyres did exist, however, and at Sketewan on Tayside a ring cairn had been constructed around one (Mercer and Midgley 1997). At Tomnaverie it seems possible that the platform enclosed the position of another, although this cannot be proved, and the same could have happened elsewhere. That sequence continued until the centre of the ring cairn was filled with rubble. This process is clearly documented at Cothiemuir Wood, but it has not been possible to link the closing of these cairns with the building of stone circles around their perimeter, although the idea has obvious attractions. Nevertheless at six of the seven sites where an outline sequence can be suggested the circle was apparently the latest structure to be built. In most cases, then, the raising of the monoliths brought the building programme at an end. The same seems to have been true at Balnuaran of Clava, where stone circles were built around the passage graves as access to those monuments was restricted (Bradley 2000, 166–8). Again it seems likely that the evolution of these structures followed a prescribed path.

It looks as if the building of recumbent stone circles was the last act in constructing these sites. That may explain the symbolism of the recumbent and flankers, for, as Burl has noted, they look like

a blocked entrance (2000, 218). This has been compared with the closing of Irish passage graves, but the two groups of sites are too distant in time from one another for this to be entirely convincing. Even if the sites were symbolically closed, it seems clear that many of them were still visited and used. That is certainly suggested by the burials found within a number of recumbent stone circles, which include a range of artefacts that date from every part of the Bronze Age. It also seems likely that fires went on being lit inside these monuments. This was clearly demonstrated at Cullerlie. That site did not have a recumbent stone, but excavation demonstrated that the bases of the monoliths had been burnt *after* they had been erected (Kilbride-Jones 1935, 217). The implications are clear. Activity may have continued, with or without interruption, even when the building programme was complete.

Burl has suggested that the recumbent and flankers were the first parts of the north-eastern circles to be built (2000, 221). This raises problems, for the remaining components of these monuments seem to have been laid out with greater care. They show an emphasis on axial symmetry, they often employ the same number of uprights, and their architecture was organised around raw materials of different sizes, shapes and colours. Even the spacing of the monoliths could be governed by strict conventions. It is the stone setting towards the south or south-west of the site that can be more irregular. It frequently departs from the perimeter of the circle and may be incorrectly aligned in relation to the rest of the monument. It can also be set well inside the circumference of the ring so that in extreme cases it abuts the outer edge of the cairn. The largest stones would have been difficult to manoeuvre over the loose rubble and this might account for the difficulty of locating them precisely. In other cases they may have been set back from the other parts of the circle so that the flankers would look like a door leading directly to the cairn. Had the recumbent stone been in position already, it would have been easy to construct an accurate circle, using it to lay out a baseline, but that does not seem to have happened. The implication is that the erection of the recumbent and the flankers was the final act in constructing these monuments. That is aptly symbolised by the image of a closed door.

5.5 THE WIDER CONNECTIONS OF THE SITES

Before discussing recumbent stone circles in more detail, it is important to emphasise a point made in Chapter 1. Although these monuments form one of the most obvious regional types in Northern Britain, they were constructed out of elements that have a much wider distribution. Two features may be especially important in considering their broader context: the grading and orientation of the circles, and the evidence of patterned stonework. It is necessary to compare the evidence from Aberdeenshire with sites distributed across most areas of Britain and Ireland.

I begin with the orientation of these monuments. Among the key sites in the north is Kintraw in Argyll, for here a massive round cairn was defined by a graded kerb which rose in height towards the south-west, where a small stone setting resembled the focal point of a recumbent stone circle (Simpson 1967). Similarly at Beltany in County Donegal a rubble platform was enclosed by a ring of uprights, with the tallest monolith to the WSW where it was located diametrically opposite a triangular cup-marked stone (Lacey 1983, 72–3). Long Meg, on the edge of the Pennines, shares some of the same characteristics. In this case the effect was enhanced because the monument was built on sloping ground so that its entire perimeter increased in height towards the same direction, where a decorated standing stone was directed towards the midwinter sunset (Burl 1994). The Ring of Brodgar was also constructed on sloping ground, and this might have created a rather similar impression, especially as the tallest surviving monolith is on the west side of the circle (J N G Ritchie 1988).

Certain of these features are also found in southern England, for even Stonehenge is graded in height towards the south-west. It is well known that it faced the midsummer sunrise but it was also aligned on the setting sun at midwinter (Cleal, Walker and Montague 1995, chapter 3). That site echoes the Scottish evidence in its use of materials of different colours. More massive stones were placed towards the south-west of the outer circle at Avebury (Pollard and Gillings 1998, 155–6), and yet another variant on the basic pattern is provided by a monument at St Neots on the edge of Bodmin Moor (Wainwright 1965). In this case a cairn which was originally open at the centre



103 Patterned stonework in the cairn at Tomnaverie, compared with the plans of stone settings at Beaghmore and Copney, Northern Ireland. Beaghmore and Copney after Pilcher (1969) and Foley and MacDonagh (1998).

was bounded by a circle of low monoliths. The uprights were of approximately the same heights as one another, but in the middle of the monument there was a grave whose long axis faced south-west. Some of the same ideas extend to timber monuments. The best known of these, the circle at Holne next the Sea, was also graded in height towards the south-west, where a narrow entrance was orientated on the sunset (Brennand and Taylor 2003). Other timber circles in East Anglia faced in the same direction (Clark 1936; Ashwin and Bates 2000, 86). These are not the only examples of this

distinctive phenomenon, but they are sufficient to illustrate its wide distribution.

The second element is the use of patterned stonework in the construction of these monuments. There are a number of features which are echoed on other sites. The careful attempt to match the monoliths of the stone circle to the components of the existing kerb at Tomnaverie is found at Balnuaran of Clava (Bradley 2000, chapter 2). At Cothiemuir Wood and Aikey Brae it seems that the use of coloured stones was more important and this feature is repeated at Clava, Balfarg

(Barclay and Russell-White 1993, illus 41) and Sketewan (Mercer and Midgley 1997, illus 25), as well as some of the stone circles on Machrie Moor (Haggarty 1991). In each case there was a special emphasis on the use of red, white and grey.

At Tomnaverie, the platform cairn also featured a series of radial divisions which seem to have been a primary feature of the monument. They are also found as stone alignments in the central ring cairn at Balnuaran of Clava and as fence lines in the earthwork enclosure buried beneath the round barrow at North Mains, Strathallan (Barclay 1983, 189–212). In southern England, field survey suggests that similar features may have been incorporated in the design of Silbury Hill (Field 2002). The arcs of boulders in the surface of the cairn at Tomnaverie are more unusual, but both these kinds of patterning have been identified at sites in Northern Ireland (illus 103). These monuments consist of circles defined by a low kerb within which there are numerous rings or radial alignments of small stones. The best known examples are at Beaghmore and Copney and are assigned to the Early Bronze Age (Pilcher 1969; Foley and MacDonagh 1998). At the centre of the three well-preserved structures at Copney there were the remains of robbed cist burials, whilst examples at both these sites are approached by small stone rows. Some lead directly to the main body of the monument, while others approach them at a tangent. Those at Beaghmore follow the now-familiar alignment from north-east to south-west.

These features have been compared with the stone rows of Caithness, but a more appropriate comparison might be with sites in Aberdeenshire. It is possible that something similar was found during the 19th century at a number of recumbent stone circles near Alford. According to antiquarian accounts, four of these monuments were approached from the north-east by stone ‘causeways’, at least one of which seems to have been a substantial structure (Burl 2000, 225). In turn, they might be compared with the evidence from Broomend of Crichtie where a paired stone avenue may have led from another stone circle of this type (J Ritchie 1920). In this case the alignment seems to have been reversed, as it apparently originated on the SSW side of the monument and crossed the interior of the nearby henge.

We can consider one other source of information, for there is some evidence for trampling in

the entrances to a series of Irish stone circles. Again they were located on the north-east. These monuments are found in Munster and have sometimes been compared with the recumbent stone circles in Scotland (Burl 2000, 225), but it seems as if such monuments are later in date than those in Aberdeenshire.

5.6 THE SITING OF RECUMBENT STONE CIRCLES

Much has been written about the locations of recumbent stone circles, but for the most part this has been concerned with their orientation. Many sites were on raised ground with extensive views to the south and west. Some, like Tomnaverie and Cothiemuir Wood, were on hilltops but others were located on slopes. In either case it was important to construct them on a level platform. Burl has suggested that each monument may have served a local community (2000, 220), but how were they related to the wider pattern of settlement?

One feature of the recent project was its use of pollen analysis, soil micromorphology and field walking. These were employed in combination at two of the sites, Tomnaverie and Cothiemuir Wood. In both cases the results were much the same. The monuments seem to have been established in places with limited vegetation cover; as anticipated, they could have commanded extensive views. There was no evidence of nearby farmland. They may have been positioned on, or even beyond, the edges of the settled area. This is in contrast to the Clava Cairns where the monuments appear to have been constructed close to occupation sites.

The results of field walking support this interpretation. Lithic scatters of the same general period as these monuments could be found in the same regions as the sites at Tomnaverie and Cothiemuir Wood. They were generally on south-facing slopes and, whilst they occurred at a variety of different elevations, few finds of artefacts were made in the vicinity of the stone circles themselves. This is especially important as there was a phase of land clearance during the period when Tomnaverie was built (Edwards and Rowntree 1980). Clearly, the site of the stone circle was not central to that activity. The recumbent stone circles may have been constructed at a distance from the settled land, and in both cases it is likely that they could be recognised on the skyline from the occupation

sites: an effect which would have been enhanced if fires had been lit inside them.

Recumbent stone circles are usually orientated towards the south or south-west (Ruggles and Burl 1985). Although many of the monuments would have faced the 'winter sun low in the sky' (Ruggles 1999, 95), the range of alignments extends too widely for this to have been the only element and it seems likely that others emphasised the position of the moon at midsummer. Tomnaverie is one of a small group of sites whose orientation is well outside the segment of the sky in which the sun appears. Ruggles has calculated that the monument could have been directed toward the moon every eighteen and a half years (1999, Tables 5.1–5.3). The view from these enclosures was influenced by the position of the recumbent and flankers. Not only did these obscure the immediate foreground, they sometimes highlighted the position of a more distant hill and a segment of the sky. This would have been much easier to achieve where the monument had been built on a level foundation. Tomnaverie is especially interesting in this respect. Here the view emphasised the summit of Lochnagar, 3km away. This is important because the mountain lay well beyond the area that seems to have been occupied at the time (I Shepherd 2001).

Monuments might adhere to these conventions, even though the moon could never have been seen over the recumbent stone. This happened at Midmar Kirk and Sunhoney owing to the height of the Hill of Fare which is located to the south of the monuments. In other cases – and Tomnaverie is one of them – the moon would not have appeared over the centre of the recumbent every year (Ruggles and Burl 1985). Perhaps their axis was more important as a concept than it was on the ground. If so, it may be less important to distinguish between sites that seem to face the setting sun and those directed towards the moon. The same idea has been suggested by O'Brien (2002, 160–6), who contends that monuments in Munster observe a south-western alignment because it was associated with the onset of darkness. In Irish tradition the south-west was the domain of the dead. That idea has a particular relevance to the recumbent stone circles of Scotland, for the field walking surveys reported here suggest that at least some of them were set apart from the daily world and constructed so that they were cut off from their

immediate surroundings. This idea needs further investigation on the ground, but the evidence presented in this study suggests that they could be aligned on distant landmarks and on a section of the sky. Inside these monuments conspicuous fires had burned and in some cases they may have been where the dead were reduced to ashes. The smoke would have risen into the air above them, and at night the monuments themselves could have been illuminated by the moon. When the structural history of individual sites was at an end, they were enveloped by rings of monoliths dominated by the recumbent and its flankers. This feature was both an entrance and an obstacle, but it allowed the light of the moon to pass between the portals. This is not a new idea, for it was first suggested by Burl over twenty years ago (Burl 1980 and 1981).

5.7 THE SYMBOLISM OF RECUMBENT STONE CIRCLES

In a recent article Parker Pearson and Ramilisonina (1998) proposed a new interpretation of Stonehenge. It is a scheme that has a wider relevance. They emphasise two observations. At many sites timber structures are replaced by settings of stones, and this distinction, they argue, is reflected in the material associated with them. Wooden monuments are often found with quantities of artefacts, including the residues of feasting. Stone circles, on the other hand, rarely produce many finds and are principally associated with the remains of the dead. Could this be explained in terms of a wider symbolic system? Wood is an organic material. It comes from living trees but ultimately it is subject to decay, as are human bodies. Stone, on the other hand, is indestructible and is likely to last for enormous periods of time. The same is true of bone. Parker Pearson and Ramilisonina argue that this distinction is crucial to the interpretation of such monuments. The timber circles are associated with the living and their activities; stone circles are devoted to the dead. They enclose sites that had once been connected with the living but they also bring their use to an end. That is not unlike the structural sequence identified in this paper, and it is one that applies to no fewer than four of the other monuments considered earlier in this chapter: Balfarg, Moncreiffe, Machrie Moor and Oddendale. At a fifth site, Croft Moraig, it

Table 25 The changing character of ceremonial monuments in the Late Neolithic and Early Bronze Age.

	Earlier Monuments (Late Neolithic)	Later Monuments (Early Bronze Age)
	Passage graves; henges; timber circles; earlier stone circles	Later stone circles; recumbent stone circles; Clava Cairns; wedge tombs; stone rows
<i>Raw materials</i>	Wood, or stone replacing wood	Stone
<i>Associations</i>	Varied material culture; residues of feasting	Human remains; some quartz
<i>Decoration</i>	'Megalithic' art; some cups and rings	Mainly cup marks
<i>Evidence of fires</i>	Occasional	Locally abundant
<i>Alignment</i>	Solar, especially sunrise	Mainly lunar; occasionally sunset
<i>Dominant association</i>	Daylight	Darkness
<i>Symbolism</i>	The living	The dead

seems as if events took a different course, for here the timber circle may date from the Later Bronze Age (Bradley and Sheridan in prep; Piggott and Simpson 1971).

We can link this scheme with another observation. Whatever their raw materials, earlier monuments were generally associated with the movements of the sun at the summer and winter solstices and, most probably, the equinoxes. That applies to passage graves like Newgrange, Knowth and some of those at Loughcrew and also to circular enclosures like Stonehenge and Woodhenge. Later monuments were more closely linked to the position of the moon. Recumbent stone circles are among the best known examples of monuments with this alignment, but they also include Clava Cairns and wedge tombs on either side of the Irish Sea. The same applies to the stone rows of western Scotland, those of south-west Ireland and, to a lesser extent, to some of these monuments in Ulster (Ruggles 1999, chapter 8).

There are other links between a number of the regional traditions mentioned here. Individual

monuments can be associated with deposits of quartz and cremated bones, and often they are embellished with cup marks (Burl 1980 and 1981). These structures hardly ever had timber precursors. This development extends from the late third millennium to the beginning of the first millennium BC, suggesting that it took place over approximately fifteen hundred years. The recumbent stone circles of north-east Scotland belong to the earlier part of that sequence.

Published accounts of these sites suggest a basic division between monuments that had been associated with the sun and those related to the moon. Structures that were aligned on the midwinter sunset form an intermediate category, and it may be significant that the best known of these, the passage grave at Maeshowe, could have been among the latest Neolithic monuments of its type (MacKie 1997). On a broader level, the distinction between predominantly eastern and western alignments may correspond to the difference between day and night. It adds a further element to the contrast that Parker Pearson and

Ramilisonina observed between monuments constructed out of wood and those built from stone. Again it may be related to a wider symbolic system. The basic pattern is set out in Table 25. The earlier monuments are linked with the activities of the living. They are associated with daylight and sometimes with the rising sun. The later monuments are associated mainly with the dead, with darkness and the moon.

There are obvious limitations to this kind of analysis, and it is only right to acknowledge that the paper by Parker Pearson and Ramilisonina (1998) has been criticised for the way in which it compares the structural sequence at British monuments with the symbolic system evidenced in their own fieldwork in Madagascar (Barrett and Fewster 1998). It may be that their interpretation is on surer ground where it interprets specifically archaeological evidence, for the model has an internal coherence that is persuasive in its own terms. In the same way, the scheme set out in this chapter should be judged in terms of its ability to make sense of a number of observations that are usually treated in isolation.

Even if this approach has its attractions, the scheme is probably too simple, for there was clearly an overlap between the currency of monuments with solar alignments and those directed towards the moon. Indeed, megalithic structures like the chambered cairns at Balnuaran of Clava seem to combine both these features (Bradley 2000, 126). There is no reason why buildings with quite different alignments could not have been employed alongside one another, just as many prehistoric landscapes contain formal arrangements of monuments of entirely different types. Table 25 suggests that the dominant imagery of stone-built monuments may have changed over time, but it does little to explain why these structures took so many different forms. There is still a need for fine-grained analyses of individual sites. Again it may be less important to identify celestial alignments than it is to distinguish between monuments that were associated with daylight and those associated with darkness. In simple terms, some were directed towards the eastern horizon and others appear to have faced west. Those directions may have been imbued with a special significance even under natural conditions in which astronomical events could not have been seen.

5.8 IMPLICATIONS FOR LANDSCAPE ARCHAEOLOGY

Whether or not we accept this specific analysis, two points are clear. Recumbent stone circles may have been directed towards the moon and in some cases they may also have faced the winter sun. This project has suggested that some of these sites were cut off from the pattern of everyday land use and were apparently placed on open ground towards the edges of the ancient pattern of settlement.

Rather than domestic activity, the dominant associations of recumbent stone circles seem to be with human cremations and with evidence of fire, although we should resist the temptation of making an automatic link between the two. Certain monuments may include the remains of cremation pyres, but there are others in which burnt bones appear to have been absent. Perhaps it is time to combine these different observations, as Burl did when he commented on the association between monuments with lunar alignments, deposits of quartz and finds of cremated bone (Burl 1980 and 1981). That might well account for the importance of white or grey materials in the architecture of these monuments. A second element is the widespread evidence of burning, and again this may be connected with distinctive organisation of the cairns and stone circles with their striking predilection for red stone. These elements may have been linked in a more systematic manner. If the stone circles of north-east Scotland were associated mainly with the moon, they would have been at their most significant at night. It might also have been then that these places were illuminated by fires. This distinctive practice may have continued into the Middle and Late Bronze Ages when a number of these monuments were reused.

That association between the hours of darkness and the commemoration of the dead suggests a different view of the world from some of the monuments of the Late Neolithic with their emphasis on the rising sun. It also suggests a different perception of the landscape. A number of writers have commented on the ways in which reconstructions of the prehistoric world emphasise the importance of visual phenomena. That is especially true of the body of work that has taken its inspiration from phenomenology, for it pays special attention to the roles played

by long distance alignments and views (Tilley 1994). Exactly the same emphasis characterises another kind of archaeology that prides itself on its scientific methodology. Geographical Information Systems have also been used to investigate the siting of particular monuments in the ancient landscape and the sometimes complex visual relationships between them (Lock 2000; Wheatley and Gillings 2002). In each case the emphasis is on what might have been *seen* in the past. Both approaches presuppose that such places were most significant during the hours of daylight. This may not have been the case.

Surely the most important feature of any monument aligned on the moon is that it would have been used at night. That would have had a drastic effect on its relationship to the surrounding area. As the poet Pauline Stainer has written, 'Nothing simplifies/like moonlight' (2003, 179). It has quite different qualities from sunlight, foreshortening and often blurring topographical details. It also emphasises the sky quite as much as the ground. The point is perfectly illustrated in the work of the German painter Caspar David Friedrich (Koerner 1990).

Moonlight would have created special effects within the monuments of north-east Scotland. It would bring out the textures of the individual monoliths and would certainly have enhanced the appearance of the cup-marked stones. It would also pick out any pieces of quartz. At Tomnaverie, blocks of this material had been placed along the south-western edge of the site, and both there and at Cothiemuir Wood the recumbent stones included deposits of the same material.

The use of these monuments at night would have other implications. The senses are heightened during the hours of darkness and sound travels more clearly and over longer distances, if only because competing sources of noise are often excluded. None of these claims is in any way remarkable, for they form part of many people's experience of being in the countryside at night. Modern town dwellers are so accustomed to noise and light pollution that they can be surprised by these simple effects. There is one other factor to mention. Recumbent stone circles seem to have unusual acoustic properties which result in the sounds being amplified within the enclosed area at the expense of the space around them (Watson and Keating 1999). It is impossible to prove that

such effects had been contrived by the builders, yet they would certainly have been apparent to the people who visited these sites.

The lighting of fires within these monuments would have affected human perception in other ways. If this had taken place during the daytime, its impact would have been quite local, although of course this activity could be identified from surrounding settlements by a plume of smoke rising into the air. At night, however, the flames would have had quite different effects. They would always have been in motion and would have cast shadows among the standing stones until the monuments themselves seemed to be alive. Most local details were lost in the all-encompassing glare, and the more distant surroundings of these sites would have seemed correspondingly remote. For those who were allowed to go there, the lighting of fires inside these monuments separated such places from the landscapes around them, while, for others, they provided a spectacle in which the stone circles dominated the terrain in a way that could never have happened in daylight.

Landscape archaeologists have rarely thought about these issues.

5.9 IMPLICATIONS FOR THE STUDY OF PREHISTORIC MONUMENTS

In Chapter 1 I considered the ways in which prehistoric monuments might be conceived. The similarities and differences between particular structures were explained in terms of the gradual movement of people and ideas. Thus in 1976 Burl had suggested that recumbent stone circles developed from Clava Cairns and that their forms gradually diverged as different parts of the landscape were settled for the first time (Burl 1976, 160–90). Twenty-four years later he reversed this hypothetical sequence in the light of radiocarbon dates, instead suggesting that the stone circles of north-east Scotland developed before those around the inner Moray Firth. This represented a major change in his thinking, but these architectural developments were still explained in the same way. The evolution of the monuments was played out over a period of time during which they were constructed in one region after another. It is a classic diffusionist argument and one which he also applied to the local distribution of recumbent

stone circles (Burl 2000, chapter 12). As we have seen, the programme of fieldwork reported here has emphasised the similarities between monuments in separate parts of Aberdeenshire rather than their differences.

On a larger scale the same is true if we compare recumbent stone circles with Clava Cairns. In many respects their architecture has even more in common now than it had when Burl first discussed this question. The argument extends from points of detail to larger questions of interpretation and chronology.

The points of detail are particularly striking. They concern a number of important elements in both traditions of architecture (Bradley 2000, chapters 2 and 7). Common features include the importance of radial divisions at Tomnaverie and also in the central ring cairn at Balnuaran of Clava. Another is the use of graded kerbs, which is seen in all the major monuments at Balnuaran of Clava and also at Tomnaverie. Indeed the inner kerb of the Clava ring cairn is graded so subtly that the effect is hardly noticeable: a feature which it shares with the outer kerb at Tomnaverie. The cobbled surface of the platform outside the south-west passage grave at Balnuaran of Clava is very similar to the capping of the cairn at Cothiemuir Wood, and the use of coloured stone is important, too. The selection of red, grey or white raw material is a feature which Tomnaverie, Cothiemuir Wood and Aikey Brae all share with Easter Acquorthies and the main cemetery at Clava (Lynch 1998). It is also found at a few other cairns around the Inner Moray Firth. A further link between the Clava type site and Tomnaverie concerns the ways in which these monuments were built, for in each case their outer kerbs seem to have been revetted by an external bank of rubble. The relationship between Tomnaverie and the passage graves at Balnuaran of Clava is especially striking in this respect. Lastly, there is the distinctive stratigraphic sequence observed in the recently excavated monuments of both traditions, in which the stone circles were constructed after the internal cairns had been built. They may represent the final stage in the evolution of these structures and in some respects the 'pairing' of individual kerbstones and monoliths at Tomnaverie matches the more complex arrangement that was followed at Balnuaran of Clava.

More general links can also be suggested between these two traditions. In both groups of sites it seems as if the evolution of individual monuments followed a prescribed sequence that had been laid down at the outset. Just as the stone circles at Clava were erected as access to the passage graves was closed, the erection of rings of monoliths in north-east Scotland may have been completed by the provision of the recumbent stone. Together with the flankers, this had the appearance of an enormous blocked entrance. In the same way, the ring cairns in both these traditions seem to have been characterised by evidence of *in situ* burning, although this is much more pronounced among the Aberdeenshire monuments. Examples in both regional groups seem to have been filled in with a deposit of rubble.

All these features add weight to the already accepted links between recumbent stone circles and Clava Cairns, such as the number and grading of the monoliths and their orientation towards the south-west. Indeed the solar alignment of the two surviving passage graves at Balnuaran of Clava represent the only major anomaly, and it is unusual within this broader tradition of monuments (Bradley 2000, 126).

The dating evidence from both traditions remains extremely limited, but modern fieldwork provides little objective basis for supposing that one tradition developed before the other. It is possible that some of the characteristics of recumbent stone circles are prefigured in the Late Neolithic of north-east Scotland, but the currency of Clava Cairns and recumbent stone circles must have overlapped and may even have run in parallel throughout their histories. Nor are these the only groups of monuments that should be considered in this context. As I mentioned earlier, many of their characteristic features – the grading of the uprights, their emphasis on the south-west and the use of coloured stones – also occur in other parts of Britain and Ireland.

For that reason it is worth returning to a second possibility that I outlined in Chapter 1. Perhaps the recumbent stone circles, like the Clava Cairns and other less distinctive traditions, drew on a range of ideas that were current over a larger area during the Late Neolithic/Early Bronze Age. These may not have been conceived as architectural or structural devices, so much as the embodiment of particular beliefs. The graded stone circle, for instance,

might refer to the importance of the south-western sky, and the use of white and red stones may even stand for the moon and the bonfire of my title. What really matter are the idiosyncratic ways in which these elements were combined in different regions. That cannot have come about by chance. What archaeologists think of as architectural traditions were carefully constructed statements about the concerns of particular communities. They also provided the physical framework within which those ideas could be explored and expressed in public ceremony.

Such ideas might have taken different forms in different areas and may also have changed over time. The ways in which they were reflected in architectural form might have been equally varied, but those variations are unlikely to have come about by accident. Rather, the contrasts in the styles of stone circles may have been intended to draw attention to local identities and to local ways of thinking about the world. Archaeologists have been concerned with points of similarity and have used these to trace the evolution of particular traditions of monument building, but it is just as likely that those traditions developed in opposition to one another. They were constructed from some of the same elements but their meanings may not have been the same.

Consider the relationship between recumbent stone circles and Clava Cairns. As we have seen,

there are many points of similarity, and these are important in establishing their chronological context. On the other hand, some of the very same elements were employed in quite different ways in these two traditions. This is likely to be significant, as the monuments themselves are found in adjacent areas.

As we have seen, recumbent stone circles were located towards the edges of the prehistoric landscape. They were rarely associated with many finds apart from human bones, and pollen analysis suggests that they were set apart from the occupation sites of the same period. Some of them occupied quite conspicuous positions in the landscape and their sites could certainly have been recognised from the settlements of the people who built them. Clava Cairns, on the other hand, rarely occupy such prominent positions in the terrain. They are often inconspicuous and they were built very close to settlements and even on abandoned living sites (Bradley 2000, chapters 8 and 9; Henshall and Ritchie 2001, chapter 3).

The contrast may go even further. Although both groups of monuments adopt similar orientations towards the south and west, the architecture of one group of sites explicitly picks out a segment of the sky whilst the other does not do so. The recumbent stone may symbolise the closure of these monuments, and yet the circles that contain

Table 26 Some contrasting characteristics of recumbent stone circles and Clava Cairns.

	Recumbent Stone Circles	Clava Cairns
Relationship to settlement sites	Remote but visible from a distance	Close integration
Landscape setting	Often conspicuous	Usually inconspicuous
Evidence of fires	Abundant	Limited
Form of the primary cairn	Ring cairn	Ring cairn; passage grave
Appearance of the primary cairn	Less conspicuous	More conspicuous

the Clava Cairns are completely permeable. In both traditions the monoliths exhibit the same grading by height, but only in the north-east is this emphasised by a massive construction joining the tallest monoliths. In the same way, recumbent stone circles normally enclose ring cairns and never include passage graves, whilst the Clava Cairns employ both types, sometimes on the same site. The ring cairns are normally more prominent than their counterparts in north-east Scotland. The large passage graves at Balnuaran of Clava are directed towards the midwinter sunset, and in this case any lunar alignment plays a subsidiary role.

The main contrasts between these traditions are summarised in Table 26.

It seems as if both architectural traditions drew on similar elements, but it is clear that in many respects they used them in quite different ways. The same applies to the wider distribution of these elements across the British Isles, but at present too little is known about individual groups of monuments for this argument to be taken further. It provides an important problem for future research.

5.10 CLOSING REMARKS

Alexander Keiller should have the last word, for he played a crucial role in publicising the stone circles of north-east Scotland and securing their preservation. But he also developed a concern, which eventually amounted to an obsession, with related monuments in other parts of the British Isles. It is through that combination of detailed local studies and research across an altogether larger area that progress is most likely to be made.

In 1934 Keiller gave a lecture on 'Megalithic monuments of North-east Scotland' to the British Association for the Advancement of Science. He prefaced it with these words:

While grateful to the authorities for granting me so long as forty minutes for this paper, I would stress the fact that forty hours would not be sufficient to deal adequately with a subject of such complexity and yet, at the same time, of such archaeological importance, to say nothing of its intrinsic absorbing interest (1934, 1).

In bringing my study to a conclusion, I have come to share this sentiment.

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