

Sample excavation at  
Croftmoraig stone circle, 2012

Richard Bradley

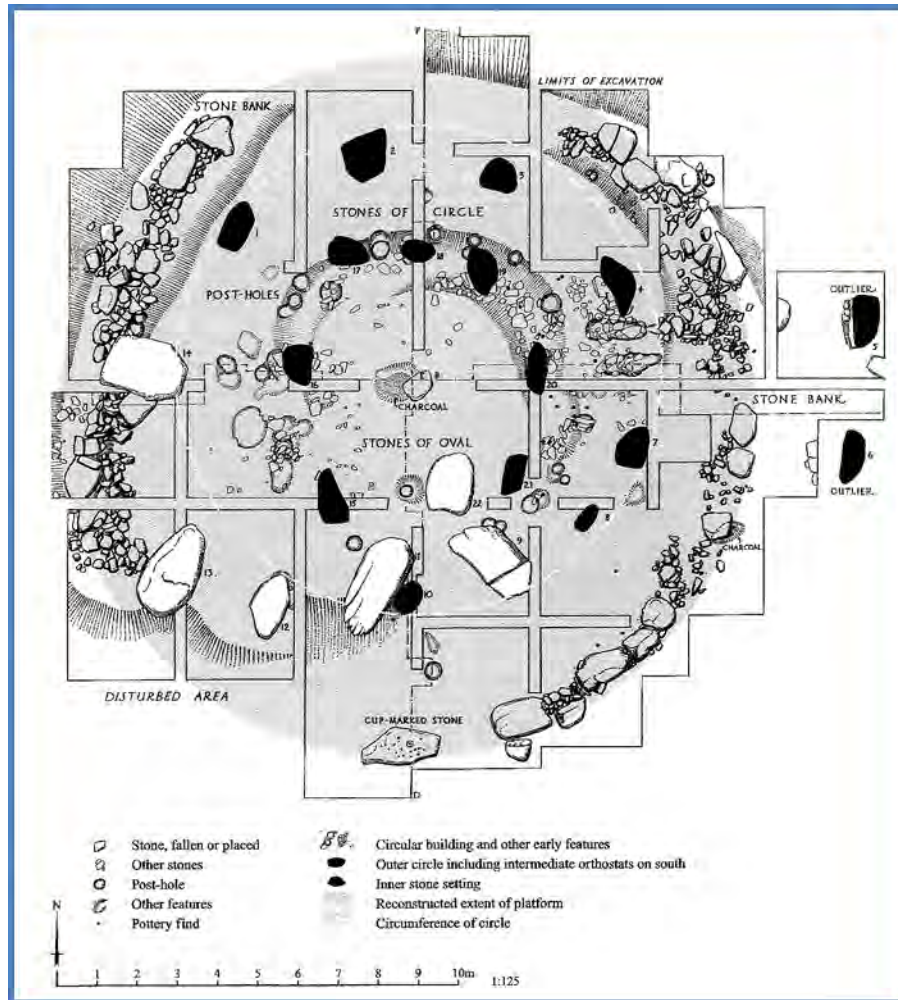


## The Croftmoraig stone circle



The stone circle at Croft Moraig (otherwise Croft Moraig) was first documented in the eighteenth century and was excavated by Stuart Piggott and Derek Simpson in 1965. Their report on the project appeared in 1971 and has formed the basis of all subsequent discussions of the monument.

The site had five distinct elements: (A) a rounded mound of glacial origin; (B) a ring of nine monoliths, eleven metres in diameter, four of which had fallen; (C) a pair of 'portal' stones outside the main circle; (D) an inner setting of eight standing stones measuring eight metres by six; and (E) a perimeter of stone blocks, eighteen metres in diameter, which can be interpreted as the remains of a wall.



Plan of the 1965 excavation

Excavation revealed a number of other features which had not been evident on the surface: a ring of posts, about seven metres in diameter, accompanied by a shallow gully and two slots interpreted as the foundation of a porch; a possible hearth in the centre of the site; two arcs of rubble underlying the outer wall; and two oval pits, one beside each of the portal stones. A smaller pit associated with a deposit of charcoal underlay one of the stones in the wall. The interior of the site, and, in particular, the positions of the oval setting and the portal stones, contained an exceptional quantity of quartz.

## The 1965 excavation

The excavation is documented in detail in the 1971 report, but the available information is supplemented by a series of over three hundred photographs in the National Monuments Record of Scotland, a pencil plan of the central area of the site after excavation, and a small number of sherds in the National Museum of Scotland. The site was excavated in ten foot squares, separated from one another by foot wide baulks, some of which were removed at the conclusion of the work. Only where the ground was disturbed or where individual monoliths were in danger of falling were parts of the site left unexcavated. Otherwise 90% of the monument was excavated down to the natural boulder clay.

## The structural sequence suggested in 1971

The original excavators proposed a three-phase sequence for the site. The original monument consisted of a timber circle, with its entrance towards the east. Inside it a shallow ditch extended around part of the perimeter. The chronological relationship between this feature and the post holes was difficult to establish, but the filling of the ditch contained sherds which Piggott and Simpson dated to the Neolithic period.

The second phase saw the erection of an oval setting of monoliths, six of them in the filling of the earlier ditch. The ground surface was levelled and showed some traces of paving. According to the excavators, the same process of levelling extended to the building of an outer bank or wall.

Finally, the outer circle was erected, together with the portal stones. The pits beside the pair of monoliths were interpreted as graves. They did not include any artefacts but an unburnt body would have left no trace in the acid subsoil. Three smaller monoliths were inserted between the taller stones in the ring, one of them in line with the long axis of the oval setting. This structure was tentatively dated to the Early Bronze Age.

That sequence was based on a number of considerations. The first was that timber settings should precede settings of monoliths, as they were known to do at sites in southern England. The identification of Neolithic pottery

associated with this structure added weight to the argument. The stone oval was bedded in the filling of the ditch and followed the same footprint, suggesting that it was built soon afterwards. It was also concentric with the outer boundary of the monument.

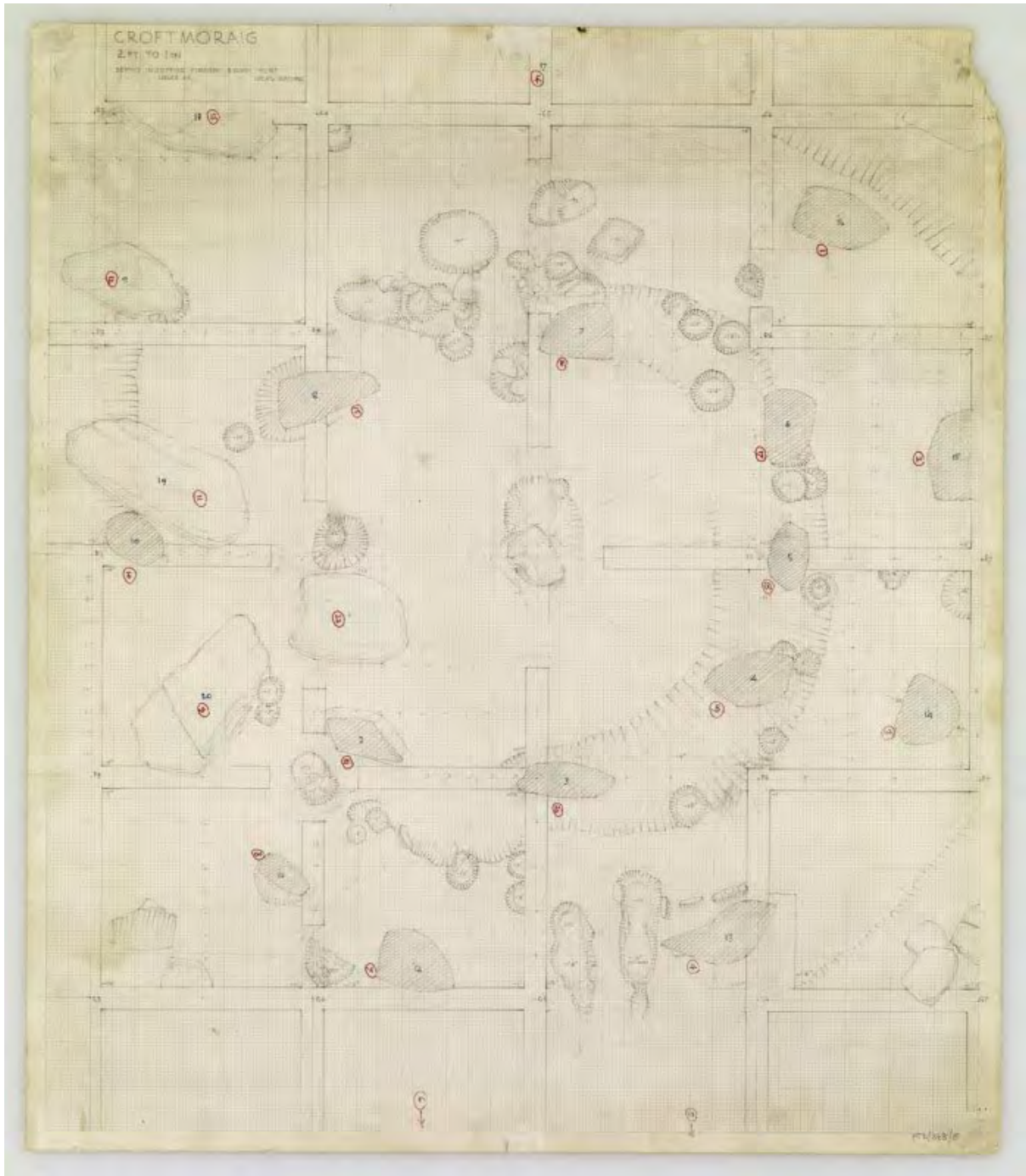
The last phase – the outer circle – was more difficult to characterise, as there was no stratigraphic relationship between it and the other features on the site. Two considerations encouraged Piggott and Simpson to assign it to a final phase of activity. It could hardly be earlier than a Neolithic timber circle for this would violate the sequence that had been established at sites in lowland England. At the same time the putative graves could be compared with burials dating from the Early Bronze Age. The excavators made it clear that this was simply their preferred hypothesis and that other interpretations of the sequence could be considered.

#### Problems with the excavators' interpretation

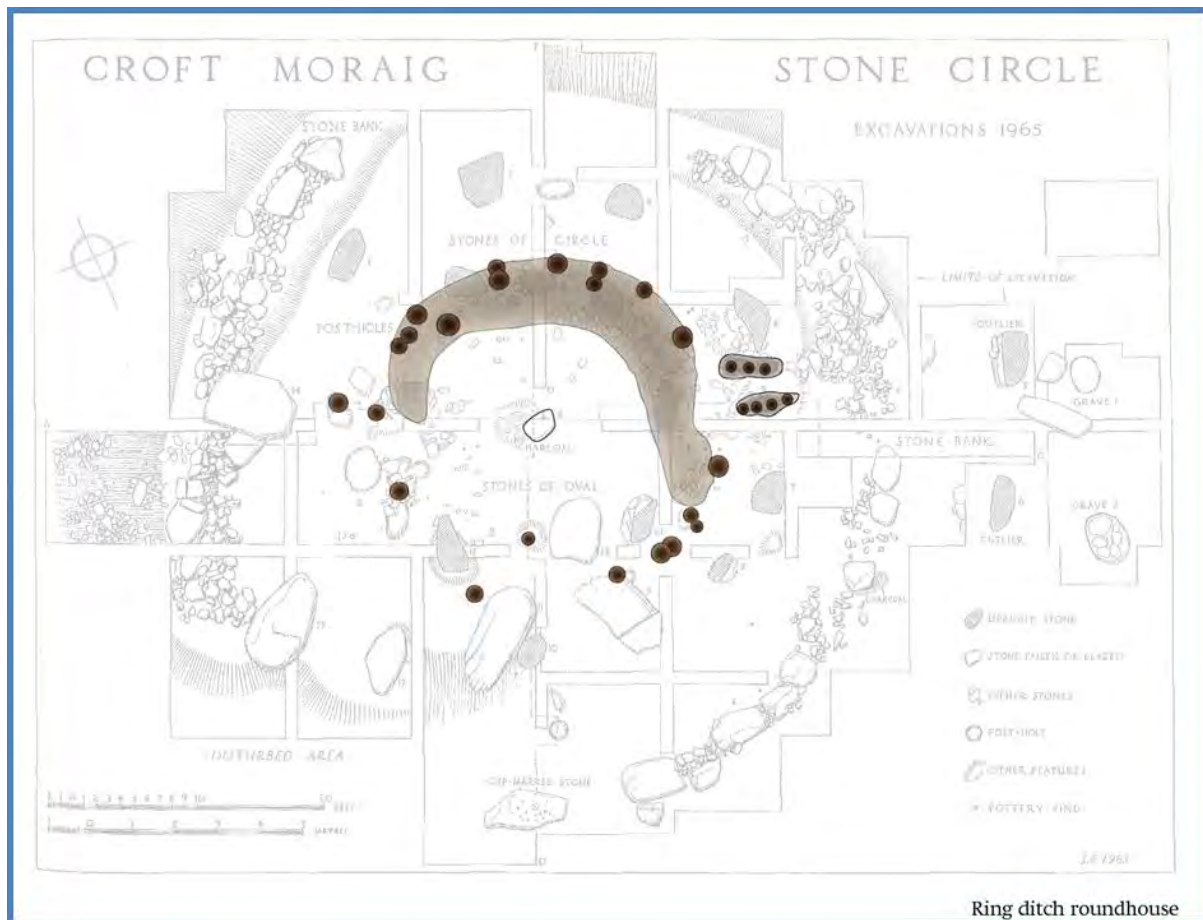
That is exactly what has happened in recent years. Three issues have arisen since their report appeared.

The first is that nearly all the pottery from Croftmoraig can now be recognised as a type whose currency extends from the start of the Middle Bronze Age to the Late Bronze Age: a period which could be two thousand years later than the original estimate. It is true that a few Neolithic sherds were present on the site, but they were eroded and in any case they were directly associated with the Bronze Age pottery and must have been residual.

A second problem is that more recent excavations have documented close parallels for the 'timber circle' and its associated features. They are known as 'ring ditch houses' and are strikingly similar in shape and size to the example underlying the oval setting of stones. That is particularly evident from an unpublished plan of this structure held in the site archive. Until recently it was thought that buildings of this kind dated from the Iron Age, but recent excavations in Scotland and Northern Ireland have established that they already existed by the middle of the Bronze Age. That would be consistent with the date of most of the pottery from Croftmoraig.



Stuart Piggott's unpublished pencil plan of the central area



The 'ring ditch house' inside the stone circle. The post holes shown are those recorded as 1 foot or more in depth in Piggott's unpublished plan

A third problem concerns the orientation of the monument. In the excavators' scheme it changes from the ESE (the alignment of the porch attached to the 'timber circle'), to the SSW (the long axis of the oval stone setting that replaced it). In their view the original orientation was re-established when the outer circle and portal stones were erected, yet access from that direction would have been impeded by the presence of the rubble 'bank' which they assigned to their second phase. An alternative sequence would avoid that problem.

That what Alison Sheridan and the writer proposed in 2005 - forty years after the original excavation took place. In the light of the problems already mentioned we suggested a different reading of the evidence.

### An alternative interpretation of the sequence

In our view the earlier structure was the outer circle, for which good parallels appear on sites attributed to the Early Bronze Age. The portal stones seemed to be part of the same design. The second phase was dated by the Bronze Age sherds found in 1965 and consisted of the ring of post holes, the timber porch, and the shallow ditch. At the time they were treated separately. The timber building was compared with the architecture of a roundhouse and the gully was interpreted as the quarry for a low mound or cairn. Since 2005 the writer has favoured the alternative interpretation that these features should be treated together as the remains of a ring ditch house. Finally, the monoliths of the stone oval were bedded in the refilled ditch and must have been a subsequent development. They were concentric with the outer bank of rubble and we followed Piggott and Simpson in suggesting that they were built simultaneously.

The new scheme meant that the first stone circle and the ring ditch house shared an ESE alignment. When the oval stone setting and the outer boundary were built the axis was redirected towards the SSW where it was emphasised by placing a decorated stone on the perimeter of the monument. This interpretation does not depend on any absolute dates, for Piggott and Simpson recorded that the only charcoal observed in 1965 was too small to be dated by radiocarbon. For that reason it was not collected.

### Problems with the new scheme

The new scheme has also come in for criticism. Alex Gibson has suggested that it would have been impossible to build the timber porch so close to one of the monoliths (4) in the outer circle. The project archive allays these doubts, for it shows that the stone socket and the slot for the timber structure did not overlap. In fact the excavators erected wooden posts in the sockets of their



'timber circle' and it can be seen from their photographs that these structures did not impinge on one another.

In the same way Adam Welfare has questioned the new sequence on the grounds that the published section drawings suggest that the monoliths 'were successively erected on an artificial platform laid over what was probably the remains of an earlier timber round-house'. That question was addressed in the 2012 excavation.

Finally, the chronology of 'flat rim ware' has become less precise since the site was reinterpreted in 2005. It extends from about 1500 BC for a period of almost 700 years. There was no way of telling where the structures at Croftmoraig fell during that period. The question has become increasingly topical now that it is known that a small stone circle on the Hill of Tuach at Kintore was enclosed by an earthwork, similar in appearance to a henge, between about 1000 and 800 BC. It would be worth establishing if that structure was equivalent to the outer boundary at Croftmoraig.

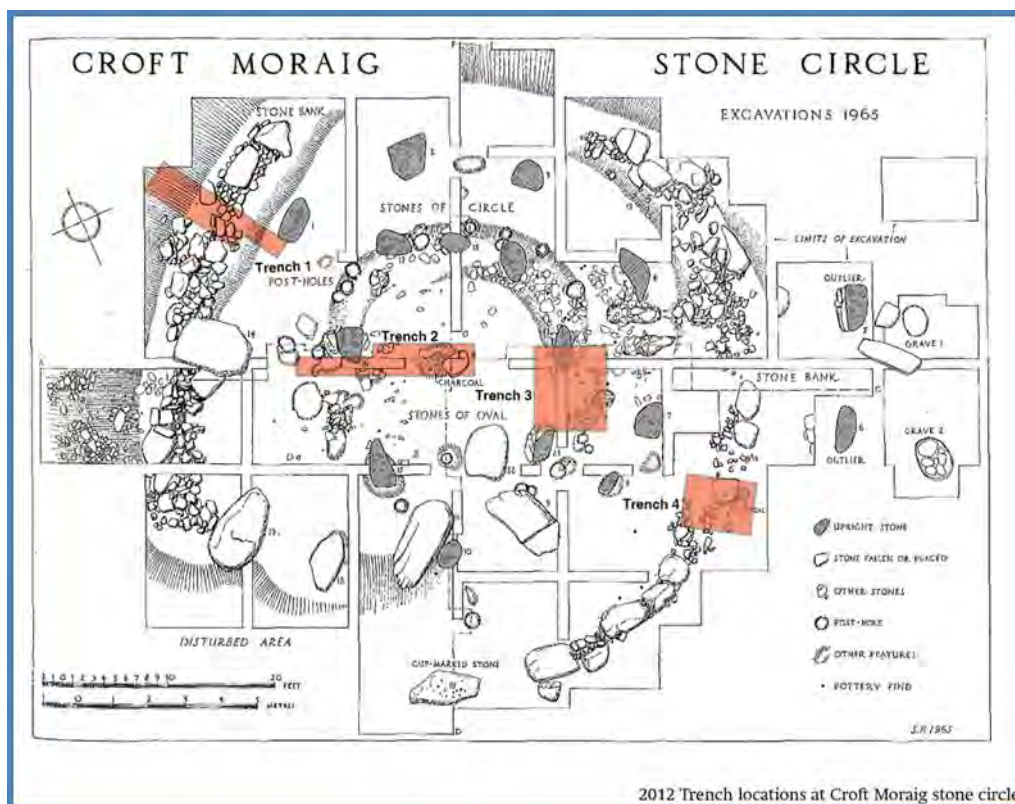
#### The aims of the 2012 excavation

Although the site archive contained a wealth of information that did not find its way into the excavation report, it was clear that few of these difficulties could be resolved without fresh excavation on the site. The new work had the following aims:

1. To collect sample of micro-charcoal from stratified deposits that were not completely excavated in 1965.
2. To shed light on the procedures followed in the 1965 excavation so that the published and archive record could be interpreted with more confidence
3. To resolve a few problems of interpretation suggested by a study of the site photographs.

## The research design for the 2102 excavation

Work in 2012 was confined to four small trenches in areas where the results of the 1965 excavation pose problems or where Piggott and Simpson recorded the presence of charcoal. Small fragments of the kind that were not retained in 1965 may be suitable for AMS dating. These four trenches had the following objectives:



Plan of the 1965 excavation, showing the areas re-excavated in 2012



General views of the 2012 excavation. (Left) Trenches 2, 3 and 4. (Right) Trenches 2 and 3.

Trench 1 was designed to investigate the perimeter bank or wall and its relationship to a nearby monolith (1) in the outer circle. The two were so close together that it was important to establish whether they dated from different phases. Moreover Piggott and Simpson never sectioned the boundary of the site, with the result that its structure has been difficult to interpret. They saw it as a rubble bank supported by an outer kerb. On the western edge of the site it seemed to have been built on a shallow terrace cut into the edge of the natural mound. Trench 1 was located at one of the few points where the large stone blocks defining the limits of the monument had been displaced, providing a rare opportunity to examine this feature in depth.

Trench 2 was to extend between a monolith (16) belonging to the inner oval and the centre of the site where Piggott and Simpson recorded 'a flat natural boulder embedded in the old surface [and] a shallow hollow ... with a sparse scatter of comminuted charcoal, suggestive of a hearth'. The boulder had obviously posed problems in the 1965 excavation as there are several detailed photographs of it in the project archive. The monolith might have been bedded in the terminal of the ring ditch. It was also important to establish whether the 'hearth' had been fully excavated. Part of Trench 1 was intended to follow an unexcavated baulk between two of the trenches dug forty seven years before.

Trench 3 was to follow a similar principle. Its aim was to investigate parts of two unexcavated baulks in the filling of the ring ditch at a point where the last excavators recorded fragments of charcoal and sherds. Indeed, most of the artefacts recovered in 1965 came from this part of the site. The trench was to extend between two monoliths in the inner oval (20 and 21), but their relationship to the material in the ditch was already well documented.

Finally, Trench 4 was to investigate one of the large blocks of stone forming the perimeter on the east side of the monument. In the 1971 site plan it is shown overlying a pit containing charcoal, and in Piggott's unpublished drawing in the project archive this feature is labelled as another 'hearth': an interpretation that was not carried through to the final report. If stratified charcoal remained *in situ*, it might provide a terminus post quem for the construction of a wall.

The methods used in the 1965 excavation

Before turning to the detailed results of fieldwork in 2012 it is important to understand the character of the previous excavation on the site. This can be worked out by combining the information contained in the site photographs with observations made in re-excavating Piggott's and Simpson's trenches.

The 1965 excavation was one of series of projects funded by the Ministry of Works with a view to presenting important monuments to the public. It was carried out quickly and occupied little more than three weeks.

The prehistoric deposits were removed and all the trenches extended down to the natural subsoil.

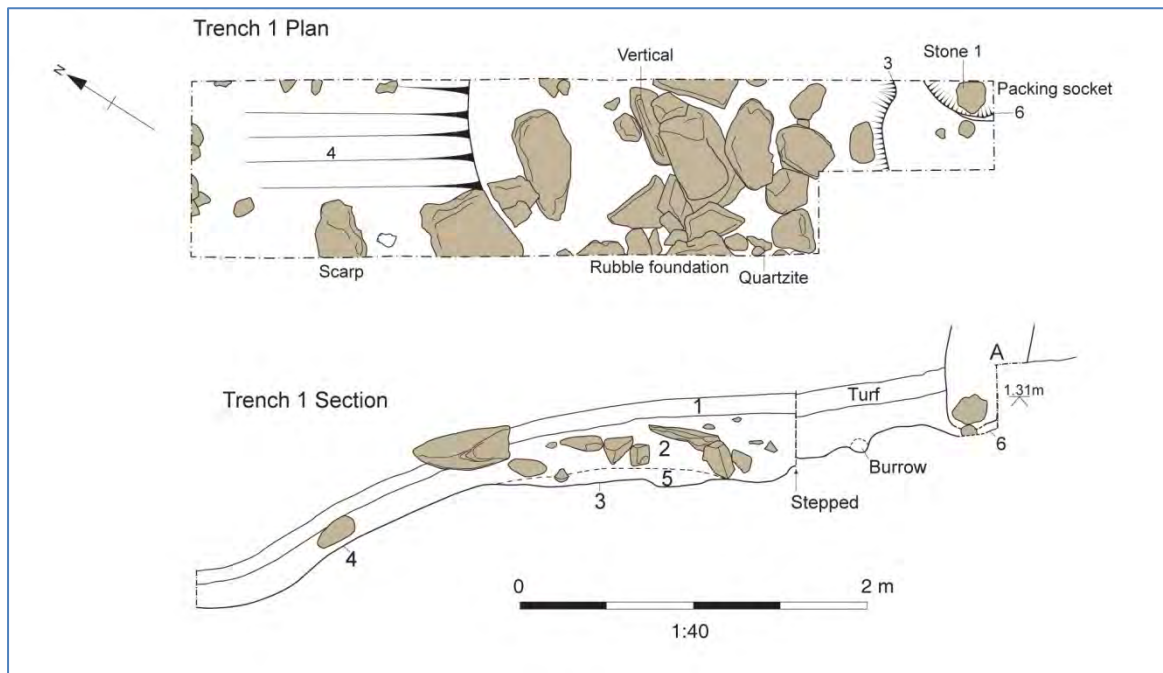
It is clear that the superficial level had been mixed by the action of worms, with the result that separate layers could not be distinguished except where features were cut into the clay. Only where the sockets for posts or monoliths contained packing stones could their positions be recognised at a higher level. The surface from which these features had been cut was well above the material of the glacial mound. Piggott and Simpson documented this evidence in their photographs and section drawings but they confused the issue by describing the clay of that mound as the prehistoric land surface. That was incorrect – in fact this was the first level at which the outlines of many of the features could be recognised.

The overburden must have been removed rapidly, although the amount of quartz in the separate grid squares was carefully recorded. Perhaps it was because the excavation proceeded directly to the boulder clay that small fragments of cremated bone were overlooked. None is recorded in the publication of the 1965 excavation, but three pieces were identified in 2012, one of them in the filling of the earlier excavation. It was because the tops of the stone sockets seemed to be above the prehistoric ground surface that Welfare supposed that an artificial platform had been constructed over the remains of an earlier building. Re-excavation of some of the original trenches showed that they had been dug through the prehistoric ground level until every pit and post hole had been identified.

That is the only criticism of an excellent excavation. The site plan is extremely accurate - where the two excavations overlapped, no further features could be identified (although those examined in 1965 were not reopened). Moreover, Piggott's and Simpson's trenches were exactly where they showed them in their report and the unexcavated baulks conformed precisely to the positions indicated in their survey of the site. It is only unfortunate that Piggott's drawing of the central part of the monument, now in NMRS, was not used in the published report as it is more detailed and contains more information than the plan published in 1971.

## Details of the 2012 excavation

Trench 1 To the west, the trench extended from the perimeter of the platform, across the line of the previous excavators' rubble 'bank' and down the scarp outside it. To the east, it incorporated part of the socket for Monolith 1.



Plan and section of Trench 1



The deposit of rubble filling the scarp in Trench 1, with Monolith 1 in the foreground



Section of the deposit of rubble filling the scarp in Trench 1.

Contexts:

1. Loose topsoil filling the 1965 excavation.
2. Large angular rubble with a roughly level surface including a few flat-topped stones. The boulders were but loosely packed and some were vertical or nearly vertical in the ground.
3. The boulders filled context 3, which was a level terrace cut into the glacial clay. The eastern edge of this feature was disturbed in 1965 when the boulders in Context 2 were planned and left *in situ*.
4. The lower end of the step was a steep ramp cut into the natural clay. Even beyond the area stripped in 1965 it was filled with loose topsoil.
5. A thin layer of brown humic soil on the base of the terrace (Context 3) and sealed by the deposit of rubble (Context 2). A series of charcoal samples was collected from the surface of this layer where they were directly sealed by the largest boulders.



6. The edge of the socket for Monolith 1. It was only 15 cm deep. One large packing stone was identified extending above the level of the natural clay. The area had been excavated in 1965, but this feature was not recorded.

## Commentary

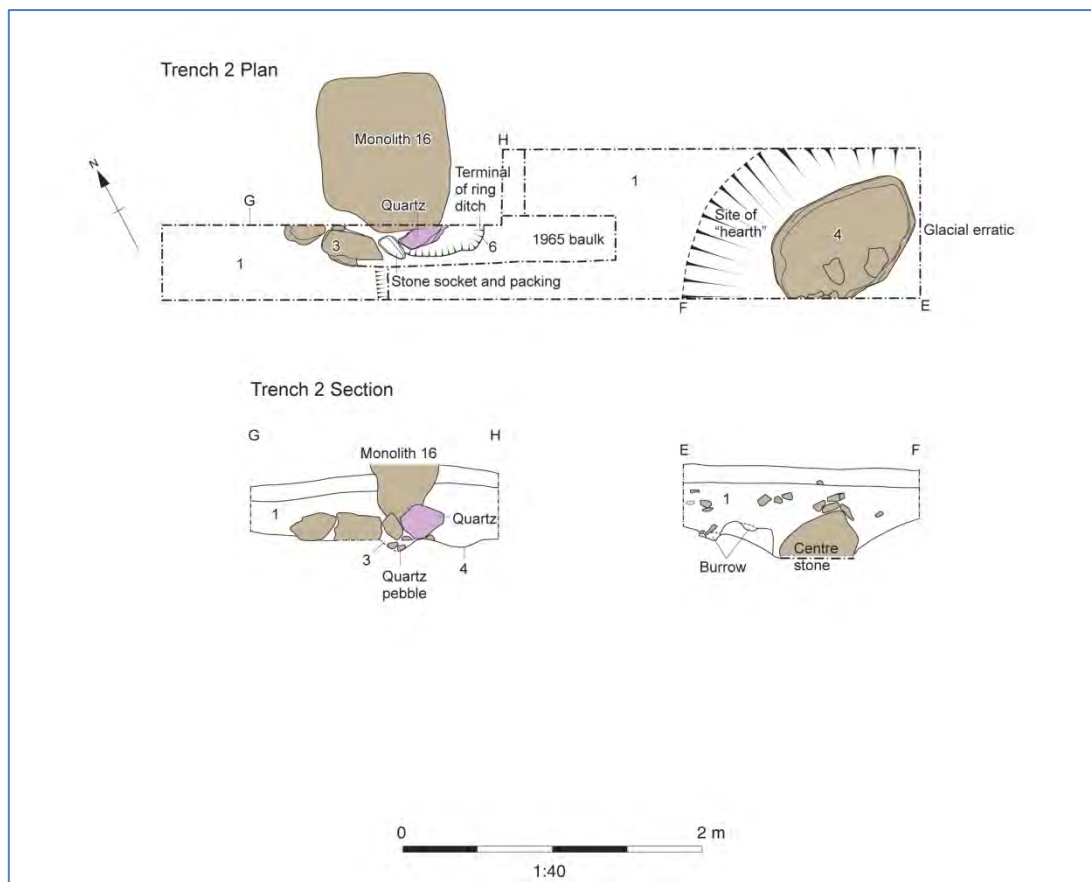
Context 3 is interpreted as an artificial ledge or terrace excavated to contain the large boulders which constitute Context 2. On its base was a thin layer of soil (Context 5) which probably resulted from a brief period of erosion before the stones were introduced. There was no 'kerb' and, taken together, Contexts 2, 3 and 5 represent the foundations of a substantial wall. The blocks which defined this feature have been displaced, which is why these features were accessible for excavation.

To the west, the ground was scarped by Context 4 which had the effect of making the perimeter wall look higher than was actually the case. To the east it was notable that the socket for Monolith 1 was exceptionally shallow.

Trench 2 extended from Monolith 16 in the inner stone setting as far as the central stone and the hearth identified in the 1965 excavation. It followed the course of an unexcavated baulk left between two trenches in the earlier project.



General view of Trench 2, with Monolith 16 in the foreground and the glacial erratic at the far end of the trench.



Plan of Trench 2, with sections of Monolith 16 and the glacial erratic.

#### Contexts:

1. The filling of the 1965 excavation. This contained a piece of cremated bone.
2. The unexcavated baulk, which was first identifiable below the modern turf and a worm-sorted horizon.
3. The socket of Monolith 16, which had been packed with large rubble including a block of quartz. It had been enlarged by a burrow containing a large piece of worked quartz.
4. The central stone (which is described in detail in a later section of this report). It was not level, as the previous excavators had reported), but dipped towards the west. It was embedded in the natural boulder clay (Context 5) and was clearly a glacial erratic.

5. The boulder clay of the mound. It may have been slightly over-cut when it was exposed in 1965. It dipped down against the edge of the erratic (Context 4) where the 'hearth' was excavated. The previous excavators had also dug round the edge of this stone to work out its relationship to the local geology. In the position of the hearth identified in the previous excavation a few small fragments of charcoal were recovered from the surface of this layer.
6. A shallow basin-profile cutting into the natural clay (Context 5). It was filled with clayey topsoil and cut by the stone socket (Context 3).



Trench 2, showing the glacial erratic in the foreground and a surviving baulk from the 1965 excavation at the base of Monolith 16

## Commentary

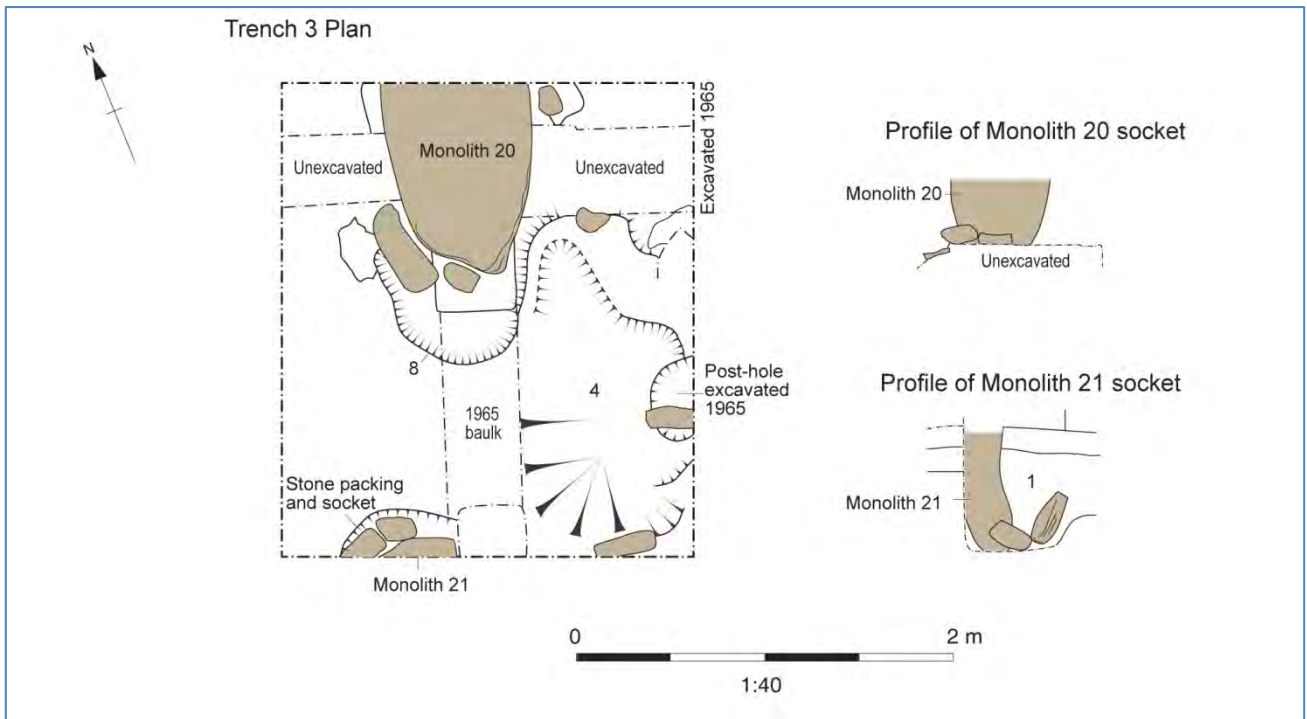
It seems possible that the socket for Monolith 3 was cut through the western terminal of the ring ditch reported by Piggott and Simpson (Context 6). Too little of this feature remained undisturbed for this idea to be taken further. On the other hand, the packing of the standing stone was clearly associated with two large fragments of quartz.

The central stone (Context 4) was a natural feature, as the previous excavators had said, but to the west it seems to have been exposed by digging the shallow feature interpreted in 1965 as the remains of a hearth. A small amount of charcoal from the surface of the boulder clay is all that survives of that feature.

Trench 3 extended between two monoliths in the oval setting (20 and 21) and sampled the surviving parts of the baulks between four trenches excavated in 1965. They were located over the unexcavated eastern arc of the ring ditch.



Trench 3, showing Monoliths 20 and 21 and the unexcavated baulks left in the 1965 excavation.



Plan of Trench 3, with details of Monoliths 20 and 21



General view of Trench 3, showing the surviving baulks from the 1965 excavation. Trench 2 is in the background

## Contexts:

1. The filling of the 1965 excavation
2. The surface of the surviving baulks left after that excavation
3. A thin lens of greasy slightly organic silt left on the base of the ring ditch on the bottom of one of the trenches excavated by Piggott and Simpson. This survived only locally and contained small fragments of charcoal.
4. A thin lens of greasy slightly organic silt left on the base of the ring ditch on the bottom of another trench excavated by Piggott and Simpson. Again this survived only locally and contained small fragments of charcoal.
5. The material of a baulk left unexcavated in 1965. It became increasingly greasy and organic with depth and was excavated in 2.5 cm spits. Again it included traces of charcoal.
6. The material of a second baulk left unexcavated in 1965. It became increasingly greasy and organic with depth and was excavated in 2.5 cm spits. Again it included traces of charcoal.
7. The material of a third baulk left unexcavated in 1965. It became increasingly greasy and organic with depth and was excavated in 2.5 cm spits. Again it included traces of charcoal.
8. A shallow depression in the base of the ring ditch. The filling resembled that of Context 4.

[The sockets for Monoliths 20 and 21 were recorded in 1965, as was a stone-packed posthole. They were drawn but not re-excavated].

## Commentary

Contexts 4-8 correspond to the filling of the ring ditch recorded by Piggott and Simpson and, like their excavation, contained small pieces of charcoal and a sherd. It also included two tiny fragments of cremated bone. This may be significant as the previous excavation did not record any human remains. They also contained a number of pieces of flaked or broken quartz. That is important



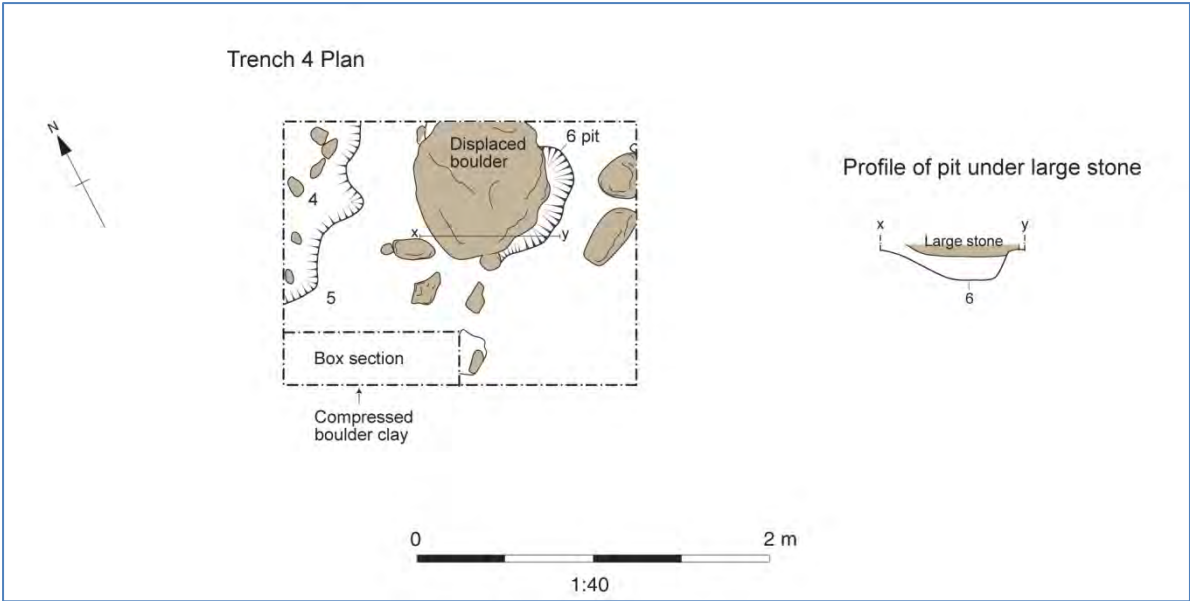
as it had been thought that the distribution published in 1965 was that of unworked pebbles.

The excavation also confirmed the observation first made in 1965 that the sockets for the monoliths cut through the filling of the ring ditch.

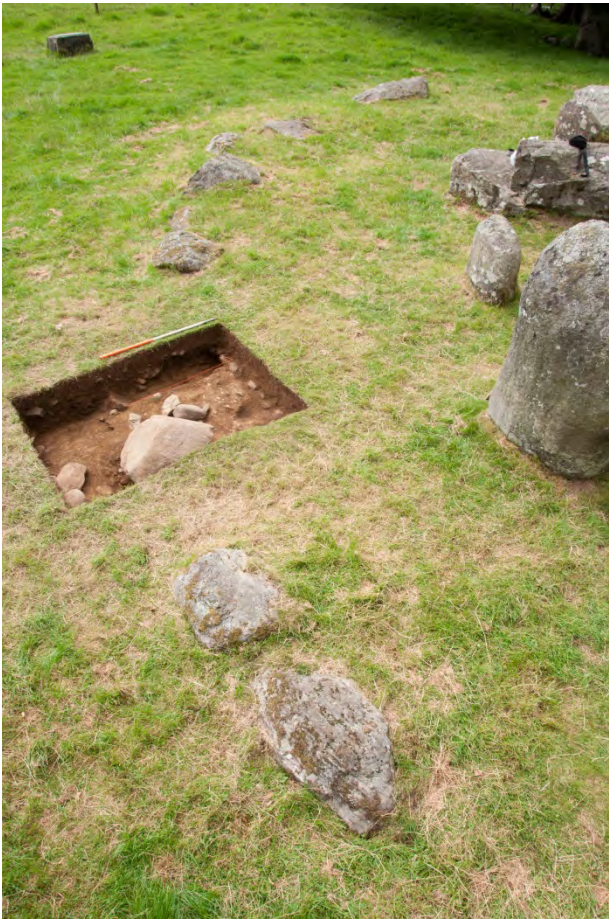
Trench 4 investigated a charcoal-filled pit which was shown on the site plan as underlying one of the stones interpreted as part of the outer wall.



General view of Trench 4, showing the edge of the pit (6) underlying the large boulder



Plan of Trench 4, showing the position of the large boulder which overlay a shallow pit (6).



The position of Trench 4 in relation to the course of the perimeter wall

## Contexts:

1. The filling of the 1965 excavation.
2. The natural clay, with a few larger stones on its surface which were planned and photographed in 1965.
3. An area of disturbed humus, below Context 1 in the eastern half of the trench. It was interpreted as ploughsoil and contained small quantities of charcoal.
4. A geological feature apparently excavated but not planned in 1965
5. The surface of Context 2 along the western edge of the trench. It contained small pebbles and was exceptionally compact. Excavation showed that it was simply the surface of the natural boulder clay.
6. The shallow pit recorded in 1965 which extended beneath a large stone belonging to the perimeter wall. Its upper edge was overcut in 1965, but the base had not been completely excavated and contained a small quantity of charcoal.

## Commentary

On excavation it became clear that the stone belonging to the wall was no longer in position. It had moved slightly to the east. Context 5 marks its original site and it is where the surface of the boulder clay was compressed – the wall must have stood directly on the ground surface.

It means that the pit (Context 6) did not underlie that wall, as implied by Piggott and Simpson. On the other hand, it may well have been dug against its outer face. It seems likely that the top of this feature had been disturbed by the plough, which may explain the presence of charcoal in Context 3.

## The excavated material

Not many artefacts were recovered in 2012, most of them from the filling of the previous excavation.

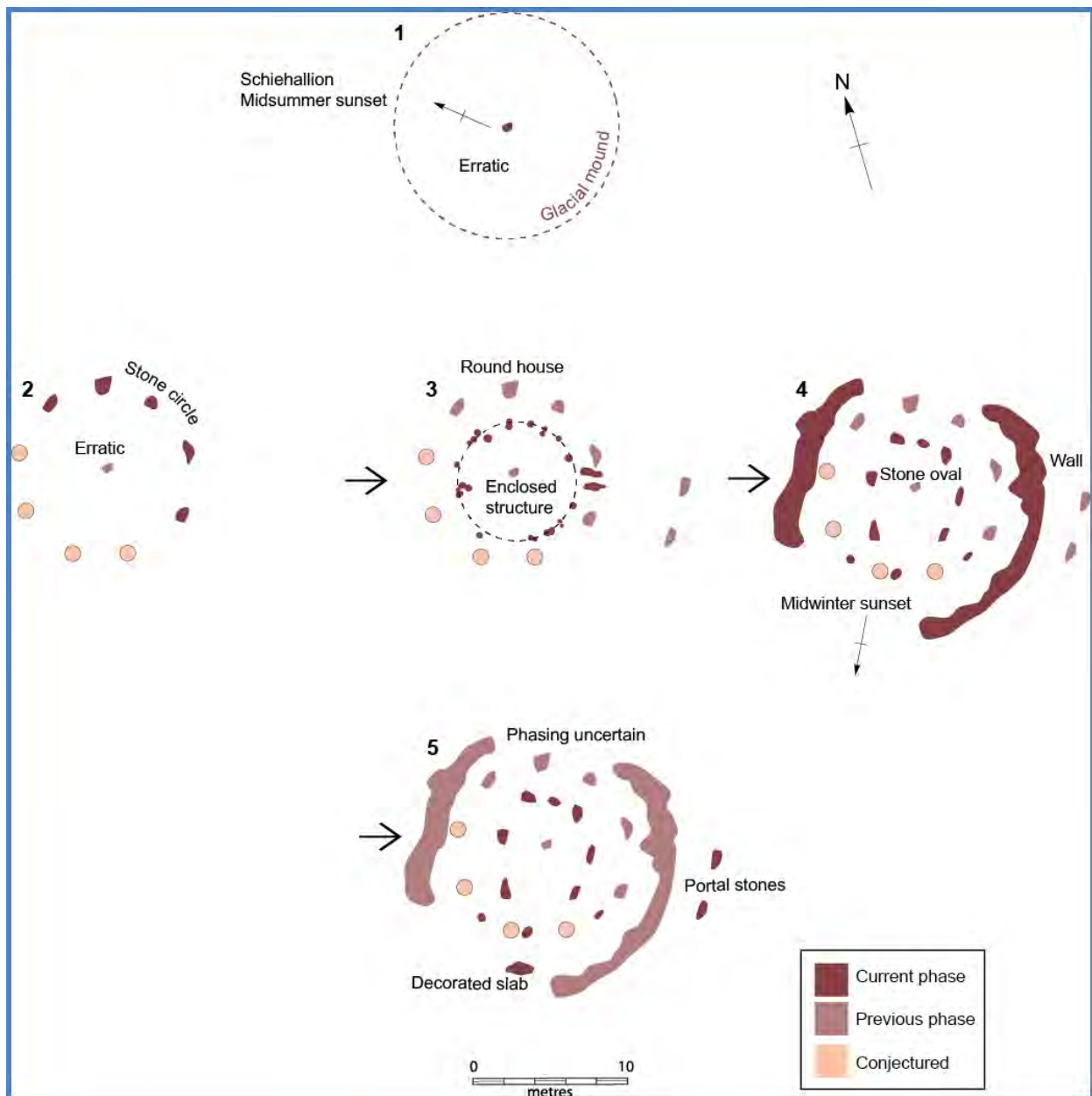
Apart from charcoal samples which have yet to be processed and identified, they consist of a single sherd from the filling of the 'ring ditch', three

tiny fragments of cremated bone (two of them from the same context and one from the 1965 excavation), and a small quantity of quartz flakes and fractured pebbles. The stone artefacts have yet to be examined in detail but those from stratified contexts appear to have deliberately worked or broken. They are presumably related to the material mapped by Piggott and Simpson, but it seems as if the pieces of quartz recovered by them were disposed of outside the area re-excavated in 2012. The one piece of pottery – a body sherd – is in the same fabric as the Bronze Age sherds from the first excavation.

### Towards a reinterpretation of Croftmoraig

Although the new excavation achieved nearly all its objectives, it also raised new issues. Whilst the dating of the radiocarbon samples collected in 2012 should have a decisive impact on our understanding of the site, other themes can already be discussed.

## New evidence of sequence



A provisional interpretation of the structural sequence at Croftmoraig

The first is the sequence of structures on the site. Fieldwork in 2012 has done nothing to undermine the argument put forward seven years ago that the chronology suggested by Piggott and Simpson is incorrect. The new excavation confirmed that the stone oval was later than the filling of the ring ditch house. Indeed, it found a sherd very similar to those from the previous project. Similarly, it suggested – but could not prove – that the outer circle came so close to the wall defining the western perimeter of the monument that it would have been difficult to build it if that barrier was already there.

These ideas are strengthened by an examination of the photographs in the site archive. Piggott and Simpson observed that the surface from which the inner oval had been erected featured ‘flat or roughly flat stones ... in the manner of very rough or patchy paving or cobbling’. They did not mention that slabs of similar character were used to pack the monoliths of the inner oval and were also employed to provide a level foundation for the outer wall. There is less information on the packing employed in the outer circle, and in the one case in which it involved similar material (Monolith 4) the photographs show that the slabs were found in the boulder clay in the course of digging the socket. Otherwise the contrast between the two settings of monoliths is striking.

That particular monolith (4) was immediately adjacent to the porch of the ‘ring ditch house’ but the photographs show that the two features did not intersect. Indeed they avoided one another so precisely that this relationship cannot have been fortuitous. It seems likely that the posts respected a monolith that was already present. The opposite relationship is improbable for it hard to see how the position of the stone could have avoided the older porch if its wall had already decayed, leaving no trace behind.

### The monoliths and the platform

It is claimed that the monoliths in the outer circle and the oval setting are graded according to height. The argument is plausible but the observation is based on measurements of those that are still standing. Four monoliths in the outer circle and one in the inner oval have fallen and had not been considered. The photographs in the project archive make it possible to estimate the

original lengths of the uprights that are bedded in the ground and to compare them with the dimensions of the fallen stones. This procedure shows that the longest in the outer circle were towards the south; Monolith 11, which lies flat on the ground today, was the tallest component of the structure and was located on the SSW. The same method confirms that the inner oval was also graded by height towards the SSW, where Monolith 22, which has also fallen, was originally the tallest in the setting.

Piggott and Simpson did not provide much information on the character of the mound on which the stone settings had been built. Although it has been described as a platform, in its original form it seems to have been a rounded mound of glacial origin, no different from other examples in the area. There is a contour survey of the monument in the 1971 report, and this has been supplemented by longer profiles across the monument and its immediate surroundings recorded in 2012. They confirm a feature that is apparent on the site even after the 1971 excavation. To the north and south the mound retains its original profile, but to the east and west it could have been modified. It is obvious that the scarp on the western edge of the monument is an artificial feature that may have been contemporary with the construction of the outer wall. The profile of the glacial mound may also have been sculpted to create an even gradient extending from the position of the portal stones as far as the western limit of the stone circle. Just as the monoliths are graded towards the south and west, the mound perhaps was altered so that it increased in height towards the WNW. It is not clear when this happened, but it is likely that the construction of an outer wall formed part of the same scheme. That might mean that the socket of Monolith 1 in the outer circle was truncated. This sequence could explain why four of its neighbours (Monoliths 9, 11, 13 and 14) have fallen – they were destabilised when the surface topography was altered. Another local stone setting on a modified glacial mound is at Lundin near Aberfeldy.

### The perimeter wall

The modification of the mound may have accompanied the building of the perimeter wall which consists of a series of roughly flat-topped blocks of stone

which in some of the archive photographs seem to have been set on top of a thin band of rubble.

The 2012 excavation provides a possible explanation, for Trench 1 showed that the western edge of the mound had been terraced and the resulting ledge packed with rubble which provided a secure foundation for the wall. By contrast, the large stone investigated in Trench 4 had been displaced, but its original position was on the surface of the mound. That supports the idea, suggested by photographs of the 1965 excavation that the large stones along the eastern perimeter of the monument were laid on the ground, where slabs or boulders were employed to raise them to the appropriate height and to ensure that the top of the wall was level. To the west, on the other hand, the foundation of the same wall was in a flat bottomed trench or scarp. It was floored with larger rubble which had the effect of supporting the weight of the wall and keeping its upper surface more or less flush with that of the platform. The reason for this procedure became apparent when levels were taken on all the stones that still remained in position. In contrast to the surface of the mound, they followed an approximately horizontal course around the limits of the monument, with a range of variation of only 20 cm. Where the platform was lowest they rested on its surface, and where it was significantly higher they were supported by a rubble foundation excavated into the subsoil. This structure would have been a substantial barrier. That was particularly true around the western limit of the mound where the natural subsoil outside this feature had been dug away to create a substantial scarp.

### The central stone

The central stone hardly figures in Piggott's and Simpson's account, yet it is clear that it was located in the middle of the site. Their section drawings and photographs demonstrate that its top was exposed at the level from which the stone sockets had been excavated. They commented that it was accompanied by a deposit of charcoal interpreted as a hearth. Having established that the boulder formed part of the glacial geology, they said nothing more about it.





Details of the glacial erratic at the centre of the monument in Trench 2

In fact the stone is out of the ordinary. It is an exceptionally hard piece of schist and is both rounded and polished. It is scratched as a result of its transport by ice. The surface is smooth and is characterised by a striking series of coloured bands, which vary from orange to a creamy yellow or blue-green. It also includes a series of blue-grey speckles. The orange tint results from the fact that it was embedded in the boulder clay. All these features are apparent when the surface is moist. They recall the appearance of the banded pebbles occasionally employed for axeheads and maceheads during the prehistoric period. Although glacial erratics are common in the local landscape, this stone is quite distinctive and cannot be matched among the material of the beach at the east end of Loch Tay.

## The monoliths

The geology of the monument was summarised in the excavation report, but Rosemary Stewart has observed a striking contrast between the two stone settings. Where sufficient evidence is available, the portal stones and the monoliths in the outer circle all consist of the same kind of rock – epidiorite. The inner oval setting is made up of several different kinds of raw material. All the stones at Croftmoraig could have been obtained from one location, but it is clear that the people who built the monument intended the two settings to look different from one another.

## The decorated stones

Piggott and Simpson drew attention to the presence of decorated stones in the monument. They identified a concentration of cup marks towards the top of Monolith 19; in fact they were probably referring to its neighbour, Monolith 20, where the potential carvings are of natural origin. There was a genuine cup mark on a fallen monolith (14), and in his manuscript plan Piggott identified another on the outer wall. This is not mentioned in the 1971 report and he was right to reject it. The same report illustrates a series of cup marks and two cups and rings on the upper surface of the stone at the southern edge of the monument. They were redrawn in 2012 when several cup marks were recognised on its side.

That particular stone is two metres long and its axis follows the alignment of the wall. A section drawing published in 1971 suggests that it lies on a layer of soil, rather than the rubble foundation seen at other points around the perimeter of the site. That impression is confirmed by photographs in the archive. Because its decoration is in a style attributed to the Late Neolithic and Early Bronze Age it is possible that it was reused. More important, it lies at the apex of the oval stone setting and emphasises its orientation towards the SSW. It occupies a break in the course of the wall (which was badly damaged in this area), and one possibility is that it had been placed across an entrance in order to bring the use of the monument to a

close. This should have happened in the latest structural phase at Croftmoraig and might be compared with the blocking of the entrances of circular earthwork monuments ('henges') at about the same time.

### The portal stones

The two monoliths outside the eastern perimeter of the circle are usually referred to as portal stones and were treated by Piggott and Simpson as a formal entrance: a view supported by the putative graves beside them. Again this interpretation presents some problems. They have no close parallels at other stone circles and are not correctly aligned on the centre of the monument; instead they are directed further to the north. That is surprising since the surviving monoliths in the ring were laid out so accurately.

Two further possibilities arise. The first is that they are all that now remain of a longer avenue of paired stones like that at Broomend of Crichton. There is no evidence to support this suggestion, and on such a complex geology geophysical survey is unlikely to resolve the problem. Josh Pollard has observed that most avenues do join stone circles at an angle, as if to prevent a direct approach to the interior. If that had been the case at Croftmoraig, it would assign these monoliths to the first phase of activity.

The alternative is to consider them as a distinctive structure in their own right, for pairs of standing stones are a special characteristic of Strath Tay. That idea was first suggested by Margaret Stewart fifty years ago. A more recent development has been the dating of related structures on the west coast to the Middle or Late Bronze Ages. It may be no coincidence that this was probably the period when the inner oval was erected at Croftmoraig. Both features could have been built together. The problem is unlikely to be resolved.

### The setting and alignment of the monument at Croftmoraig

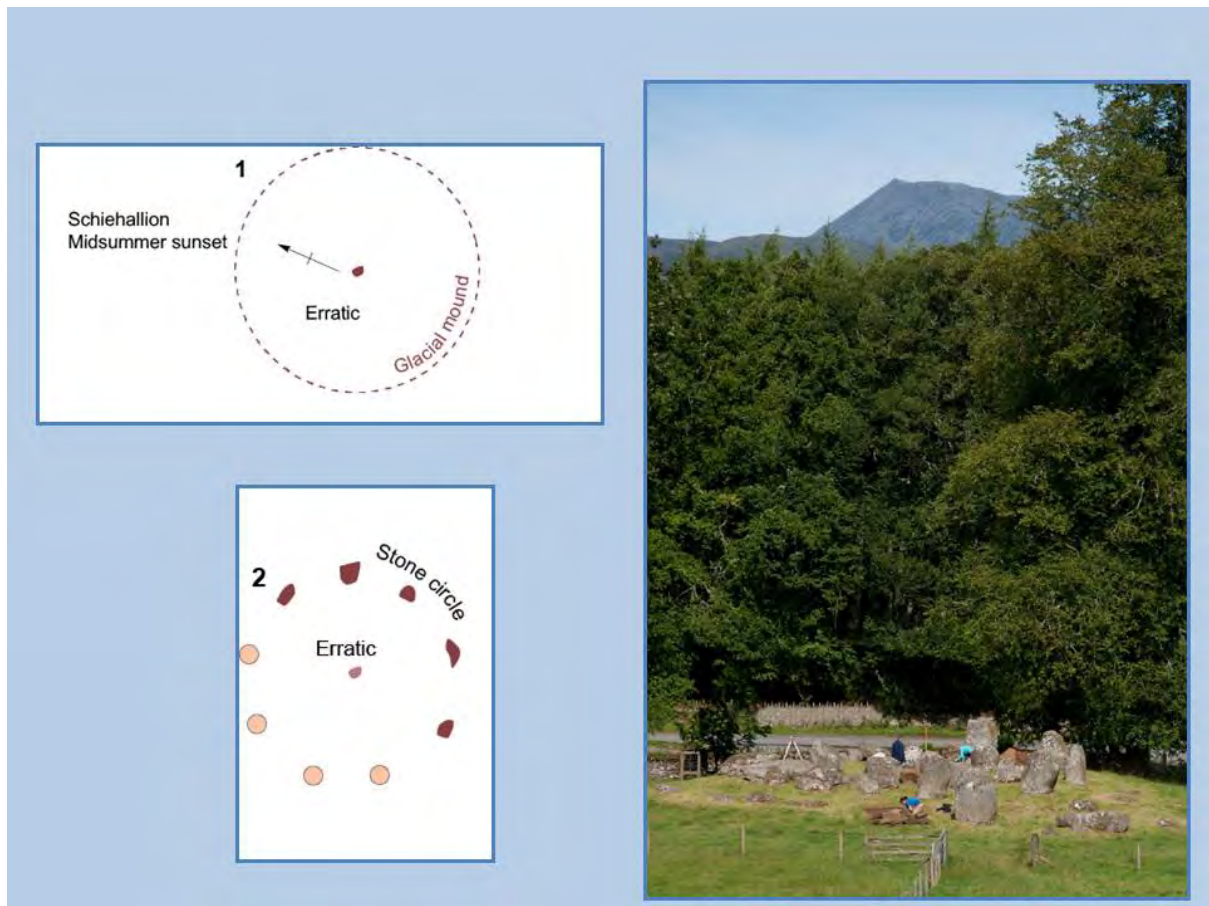
The Croftmoraig stone circle is set back from the ground beside the Tay and is divided from its river valley by a low ridge. That was where a round barrow was built overlooking the area to the north. The stone circle, however, was

more isolated, but it did command a view to the south west towards a pass on the route between Loch Tay and Strathbraan. The monument is overlooked by higher land to its east.

Trees cover the land immediately west of the monument and it is from a vantage point a little upslope to the east that the distinctive siting of the monument becomes apparent, for the view over the circle is dominated by the peak of Schiehallion 11 km away. The same effect can be observed when the vegetation is reduced in winter and especially when there is snow on the mountain.



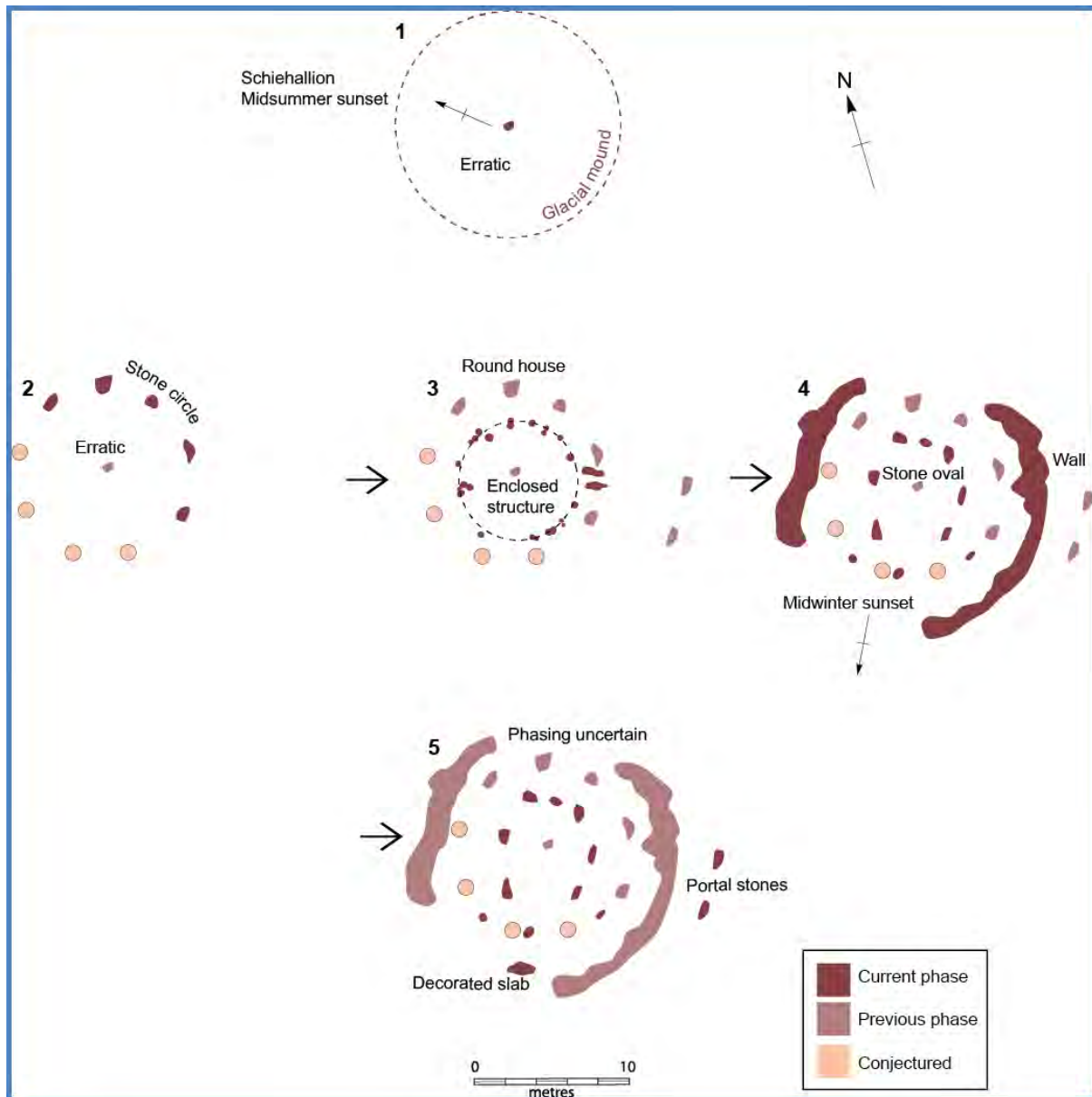
View over the Croftmoraig stone circle, with the summit of Schiehallion in the background



An interpretation of the relationship between the glacial mound, the erratic boulder, the summit of Schiehallion and the first monument at Croftmoraig

Although that creates a striking visual effect, there is another reason for postulating a connection between the circle and the mountaintop. Observations made independently by George Currie and Douglas Scott suggest that, viewed from the centre of the monument, the sun sets very close to the peak of Schiehallion at the midsummer solstice. The same effect can be observed by looking into the stone circle from the higher ground a short distance to its east. That observation is important for it shows that the setting sun can be observed well above a belt of mature trees. There is no environmental evidence from Croftmoraig, but, assuming the area occupied by the stone circle was largely open – and it would have been impossible to

construct the monument otherwise – the same relationship should have been visible during the prehistoric period. At the same time the long axis of the oval stone setting was directed towards the position of setting sun at midwinter. It seems as if the layout of the monument was directed towards the sunset at both the turning points of the year.



A provisional interpretation of the sequence at Croftmoraig. The oval setting attributed to Phase 4 is orientated towards the midwinter sunset.

How was this relationship first established? The earliest features at Croftmoraig predate the stone settings altogether and probably formed before the area had any occupants. They were the mound and the conspicuous stone on its summit. Both owed their origin to geological processes that affected the Southern Highlands, but at some stage people seem to have become aware that from that mound, and, in particular, from the glacial erratic on its surface, there was a view of the midsummer sunset over the most conspicuous mountain in the region. There is no way of telling when it first became apparent – it may have happened during the Neolithic period when a small quantity of pottery was deposited at Croftmoraig – but at some stage that effect was enhanced by the erection of a ring of monoliths on top of the mound, with the banded stone at its centre. From that point onwards what had been a ‘natural’ phenomenon was embellished in architectural form.

### Working hypotheses

New research at Croftmoraig suggests a complex sequence of events on the site. The first was the recognition that quite by chance the midsummer sunset could be observed behind Schiehallion from a striking orange rock on top of a natural mound.

The position of that boulder was emphasised by erecting a ring of monoliths around it. They emphasised its pivotal position, but, like many similar monuments in the Scotland, the stones of the circle were also graded by height in the direction of the setting sun. The first monument is undated, but comparison with other excavated sites suggests that it was built during the Early Bronze Age. That is because the few stone circles firmly dated to the Neolithic period do not provide similar evidence of grading.

In a subsequent phase the interior of the circle was occupied by a timber building whose structure can be compared with that of a ring ditch house. Its porch faced ESE, but there may have been a second opening in the opposite wall. Neither entrance provided direct access to the centre where the boulder would still have been visible. Pending radiocarbon dates, this building appears

to have been built in the Middle or Late Bronze Age. Although it has structural links with domestic architecture, its location inside a stone circle suggests that it played a specialised role.

That is apparent from the later history of the site. The wooden building was replaced by an oval setting of monoliths soon after it went out of use. They were also graded in height towards the SSW and aligned in the general direction of the setting sun at midwinter. When that happened the interior of the site was levelled and some parts of it may even have been paved and covered with worked and broken quartz. It is conceivable that its topography was altered so that the ground inside the circle sloped from east to west as if to emphasise the view towards Schiehallion. At the same time the monument was enclosed by a considerable wall. It was made even more conspicuous because the western edge of the mound was scarped to give a greater impression of height. Because the site has been damaged it is not clear whether the enclosure had been breached by an entrance, but it does seem possible. The two portal stones may have been erected at this stage. This cannot be proved but, like the interior of the oval setting, they are associated with a concentration of quartz.

Certain problems remain unresolved. When, and how often, were fires lit beside the central stone? Was the first stone circle erected on a rounded mound, and was that mound reshaped during the final phase of activity when a wall was built to enclose the stone settings? Were the portal stones an integral part of the original monument, or were they added later? Was the cup and ring-carved stone placed in an entrance, and was it intended to signify that the monument was no longer in use? How significant are the fragments of cremated human bone found in 2012, and was the monument associated with the dead throughout its history or only at particular times? There are limits to what any excavation can achieve and it will be difficult to answer some of these questions.



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